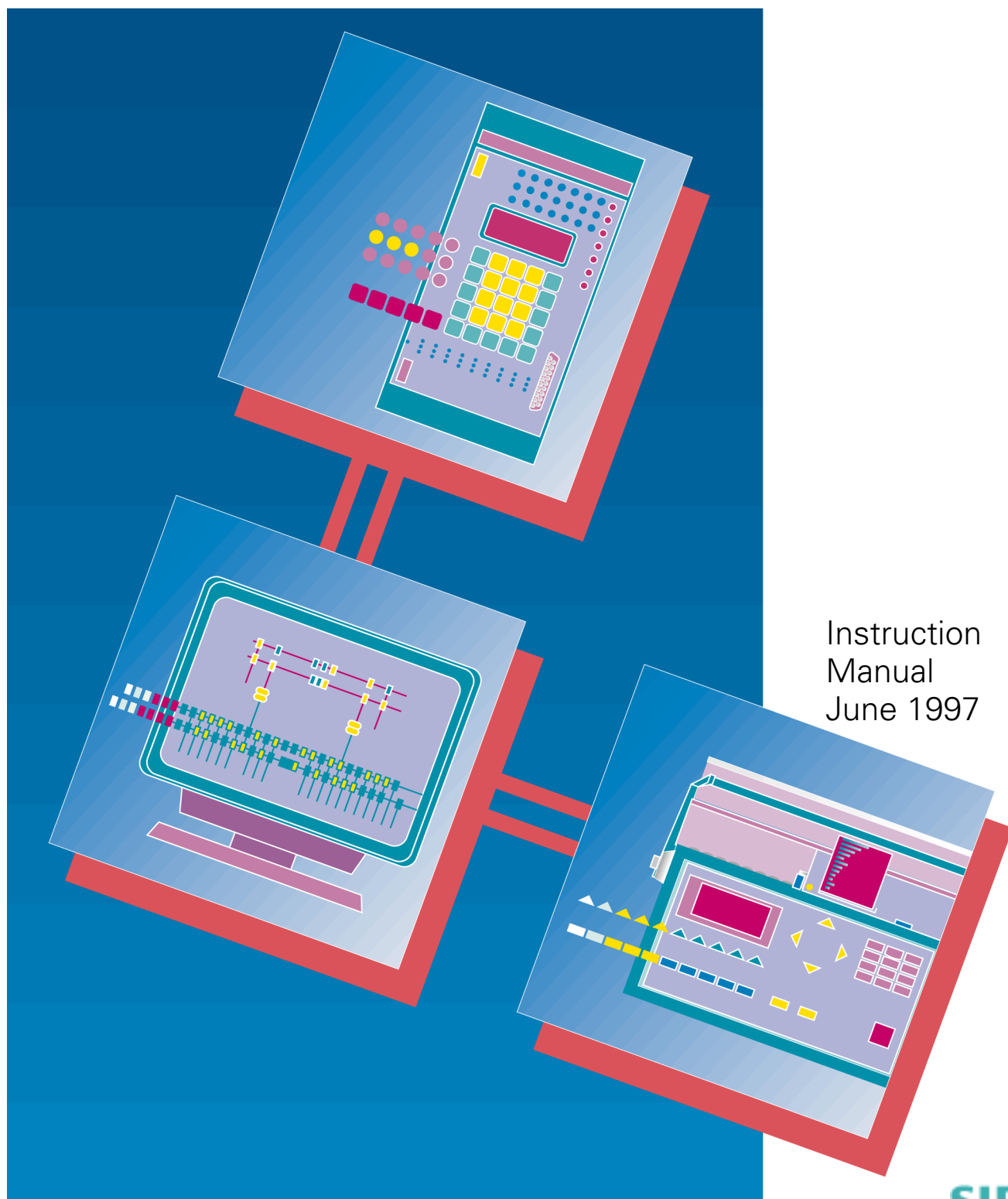


SIEMENS

Protective Relaying DIGSI V 3.3 Operating and Analysis Software



Instruction
Manual
June 1997

SIEMENS

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Instruction Manual

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We have checked the contents of this document for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections included in subsequent editions. Suggestions for improvement are welcomed.

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Technical data subject to change.

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F.1 Summary

This chapter is intended to help you in your first contact with DIGSI. It is operation-oriented and explains excerpts of basic subjects. However, this chapter is not a replacement for the Instruction Manual. It is essential that you should study the Instruction Manual carefully to be able to work safely with DIGSI.

- ⊙ Installation
- ⊙ Substation management and backup
- ⊙ Creating the substation, feeder and protection device
- ⊙ Opening and closing the substation, feeder and protection device
- ⊙ Editing parameters in dialog mode "With file"
- ⊙ Transmitting parameters to the protection device in dialog mode "With protection device direct"
- ⊙ Read information from the protection device in dialog mode "With protection device direct"
- ⊙ Temporary dialog



Section XXX

This symbol refers to the Section in the Manual in which you can find further explanations on the topic.



Alternative paths

This symbol refers to possibilities which are alternatives to those previously described.

Messages which may occur during processing are not described. If necessary, refer to the specified section of the Manual for information.

F First Steps

F.2 Installation

Decide, which of the following types of installation is accurate:

- Ⓒ You are installing any version of DIGSI for the first time. In this case read Section F.2.1.
- Ⓒ You wish to update an installed, older version. In this case read Section F.2.2.
- Ⓒ You wish to reinstall individual components of DIGSI, e.g. new firmware versions. In this case read Section F.2.2.

You should close all other programs before starting the installation. INSTALL cannot be opened if one of the DIGSI, KONVERT, DIGRA or DIGV2V3 programs is already open.

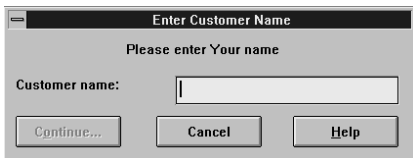
F.2.1 Installing DIGSI for the first time



Section 1.3.1

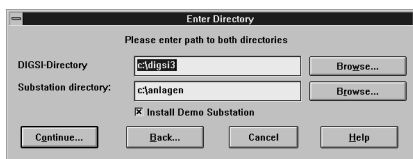
If you are installing any version of DIGSI for the first time, proceed as follows:

- Ⓒ Insert installation diskette 1 into any diskette drive. In the further description, drive A is selected as the installation drive.
- Ⓒ Start the Windows file manager. Open a window for the installation drive in this case and double click the file "diginst.exe".



An info box is initially displayed. Select "Continue" to continue with the installation. A dialog box is opened to enter your company or department name. The name entered here is registered as a licensee in DIGSI. It is essential to enter a customer name. You cannot continue the installation without this entry.

1. Position the cursor in the input field "Customer name". Enter your company or department name.
2. Confirm your input with "Continue".



After having confirmed your input, you are requested to enter two destination directories. All program-specific files are stored in the DIGSI directory. All files which contain substation-specific data are stored in the substation directory.

Directories for both the program and substation files are suggested as basic settings. If you don't want to accept these directories, you can enter new ones.

**Caution!**

Please note the following rules and limitations for the inputs:

- ⊙ The substation directory must not be a subdirectory of the DIGSI directory.
- ⊙ Observe the applicable DOS conventions.
- ⊙ Check that the defined drive exists. The drives must not be READ ONLY. Diskette drives cannot be used.
- ⊙ Directories which do not yet exist are created by DIGSI.

To define new directories, proceed as follows:

1. Position the cursor in the input field "DIGSI directory". Enter the name of a directory including the path.
2. Position the cursor in the input field "Substation directory". Enter the name of a directory including the path.
3. Confirm your inputs with "Continue".

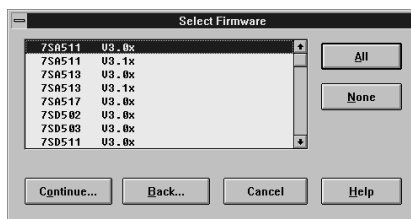


To select an existing directory, proceed as follows:

1. Select "Browse". Another dialog box is then displayed.
2. Select an existing directory in the selection field "Directories". If the desired directory is on a different drive, select this using the dropdown list "Disk drive".
3. Select "OK" to accept the selected directory. The current dialog box is then closed, and you return to the previous dialog box.
4. Repeat this procedure if necessary for the other directory.
5. Select "Continue" to accept both directories.

If you have defined a directory which does not yet exist, you will first be asked to confirm your intention. Select "Yes" if the directory you have defined is to be created.

A further dialog box is displayed. This permits you to define files to be installed specific to protection devices.



DIGSI can only communicate with protection devices for which the corresponding data have been installed. The dialog box provides a summary of all currently available types of protection device with the associated firmware releases. The entries are sorted alphabetically according to the type of protection device.

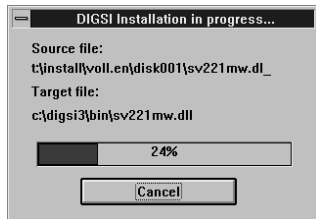
1. Mark all device types or firmware releases for those protection devices for which you wish to edit data or where you wish to communicate with them. You have to mark at least one entry.

Select "All" to mark all displayed entries. A previously made individual selection is then rejected.

Select "None" to unmark all displayed entries. A previously made individual selection is then rejected.

F First Steps

2. Select "Continue" to accept the marked types of protection device/firmware releases.



You have now made all inputs required for the installation. The installation parameters are currently being prepared. As soon as the preparation has been terminated, the installation program commences with the installation of the files from diskette 1.

A further message is output once all files from installation diskette 1 have been copied into the directory created for them. You will be requested to insert the next installation diskette.



Insert the required diskette into the installation drive. If your installation drive is not the same as the indicated drive, correct the entry in the input field.

1. Check the displayed name of the drive. Is it correct, proceed with step 2. If not, position the cursor in the input field "into disk drive". Enter the name of the installation drive.
2. Select "OK" to continue the installation.
3. Continue the procedure analogous to steps 1 and 2. A message is output once all files have been copied into the destination directories. Confirm this message with "OK".

The installation program automatically creates a program group for DIGSI and the associated components. The window of this program group is opened at the end of the installation.

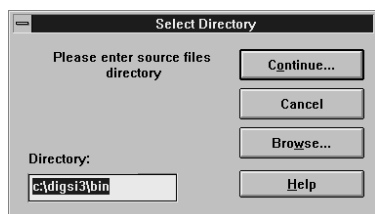
F.2.2 Update installation of a newer version or of individual components



Section 1.3.2

If you wish to install a newer version of DIGSI or to reinstall individual components, proceed as follows:

1. Open the DIGSI program group.
2. Double click the INSTALL icon.



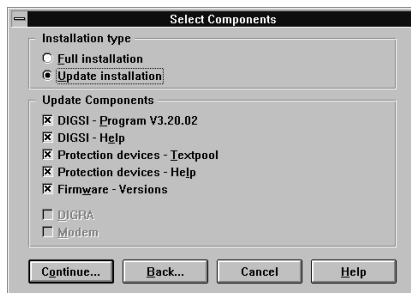
An info box is initially output. Select "Continue" to continue with the update installation. A further dialog box is displayed. This requests you to enter a source directory from which you wish to install components or the complete program.

1. Insert the first installation diskette into the installation drive.
2. Position the cursor in the input field "Directory". Enter the name of the drive including the root directory.
3. Confirm your input with "Continue".



If you have copied your installation diskettes onto the hard disk, enter the corresponding drive name including the path by hand. You can also select an existing directory in interactive mode.

1. Select "Browse". A further dialog box is displayed.
2. Select the corresponding directory in the selection field "Directories". If the desired directory is on a different drive, select this using the dropdown list "Disk drive".
3. Select "OK" to accept the selected directory. The current dialog box is then closed, and you return to the previous dialog box.
4. Select "Continue". The current dialog box is then closed.

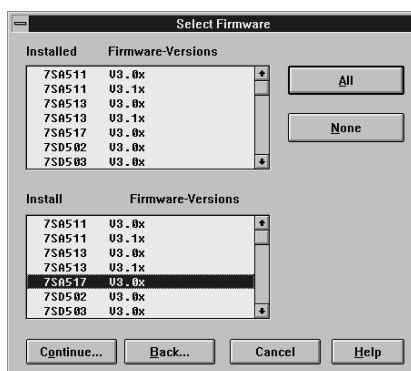


If all required inputs are correct, a dialog box is displayed to permit you to select components. You have the possibility to select one of the installation types "Full installation" or "Update installation". The selection of the installation type influences the scope of the installation.

1. Select the option "Full installation" if you wish to completely update the existing program version. Select the option "Update installation" if you wish to update individual components of the existing program version.
2. If you have selected the option "Update installation", mark the components you wish to update.
3. Select "Continue" to confirm your selection. The current dialog box is then closed. Depending on your selection, either a further dialog box is then opened or processing of the installation parameters is commenced directly.

A further dialog box is displayed if you

- ⊙ have selected the option "Full installation" or if you
- ⊙ have selected the option "Update installation" and have marked the option "Firmware versions" in addition.



The display field "Installed firmware versions" provides a summary of all types of protection device which are already installed together with the associated firmware versions. The entries are sorted alphabetically according to the type of protection device.

The selection field "Install firmware versions" provides a summary of all additionally available types of protection device with the associated firmware versions. The entries are sorted in the same manner.

1. In the selection field, mark all device types and firmware versions whose device-specific information components are to be updated.

Select "All" to mark all displayed entries. A previously made individual selection is then rejected.

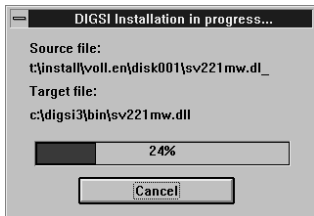
Select "None" to unmark all marked entries. A previously made individual selection is then rejected.

F First Steps

2. Select "Continue" to accept the marked types of protection device and the firmware versions and to continue with the installation. This button is only active if you have marked at least one firmware version.

If you have confirmed your selection with "Continue", a dialog box is displayed to permit you to select help files for types of protection device. This dialog box is also output if you have only marked the option "Protection devices – Help" in the dialog box "Select components". The design and operation of the dialog box for selection of the protection device help are comparable to the dialog box "Select Firmware".

It is recommendable to install the associated help for every installed type of protection device. Proceed as described above.



You have now made all inputs required for the installation. The installation parameters are currently being prepared. As soon as the preparation has been terminated, the installation program commences with the installation of the files from diskette 1.

A further message is output once all files from installation diskette 1 have been copied into the directory created for them. You will be requested to insert the next installation diskette.



Insert the required diskette into the installation drive. If your installation drive is not the same as the indicated drive, correct the entry in the input field.

1. Check the displayed name of the drive. Is it correct, proceed with step 2. If not, position the cursor in the input field "into disk drive". Enter the name of the installation drive.
2. Select "OK" to continue the installation.
3. Continue the procedure analogous to steps 1 and 2. A message is output once all files have been copied into the destination directories. Confirm this message with "OK".

The installation program automatically creates a program group for DIGSI and the associated components. The window of this program group is opened at the end of the installation.

F.3 Substation Management and Backup

The specific data for a substation including all components comprise a large number of individual items of information. The substation is the highest level in the hierarchy, the feeder is the second level and the protection device is the third level. Each level is identified by a name and address.

F.3.1 Directory structure



Appendix A.1/A.2

The substations are managed by creating an appropriate directory structure. Fig. F.1 provides an initial summary of this directory structure.



Digs210g

Fig. F.1 Directory structure of substation management

A series of subdirectories reflects the hierarchy in the substation management.

Substation directory

DIGSI creates a separate directory for every new substation you configure. The same also applies for feeders, which are created as subdirectories of the substation directories. Finally, protection devices are created as subdirectories of the feeder directories. In the final resort, opening or closing substations, feeders and protection devices therefore means opening or closing directories.

The name of each substation directory begins with the prefix "anl" for "Anlage" (substation). The name becomes unambiguous through the extension with a three-digit figure. This figure is numbered in ascending order beginning with "001". However, this figure does **not** necessarily correspond to the address of the substation.

F First Steps



Caution!

You must not intervene manually either in the assignment of names or in the structure of the directories (for example with the help of the File Manager). Any changes, such as deleting substations, may only be carried out with the help of DIGSI!

Common higher-order directory

All substation directories can be combined to form a higher-order directory. You can define the name of this directory during the installation of DIGSI. The installation program proposes the name "anlagen". In this process, however, you cannot move an individual substation separately into a different directory structure. The reason for this is that all existing substations are registered in the file "anl.dir". If a substation registered in this file is physically no longer present, DIGSI issues an error message.

Separate higher-order directory

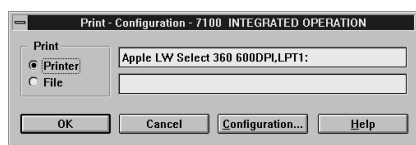
It is better to store each substation directory in a separate higher-order directory. This allows you to shift the data of a complete substation easily into a different directory. To do this, you only have to shift the higher-order directory.

Print substation overview



Section 8.2

You can obtain a summary of the current substation configuration using a substation overview. You can also output this overview on a printer. The substation overview contains information on the current substation including all existing feeders and protection devices.



Select the option "Print overview" in the menu "Substation". The dialog box "Print" is then opened.

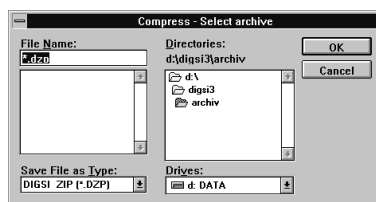
1. Select the option "Printer". The current standard printer and the selected parallel port are output in the display field to the right of the option field.
2. Select "OK" to output the data on the printer. The current dialog box is then closed.

F.3.2 Archive substation data



Section 4.1.7

Compressing substation data

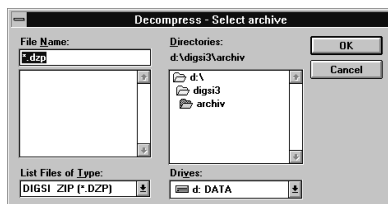


All of the data relating to one substation can be stored compressed in one file. As required, the substation data can be extracted from this file and then processed in their original form again.

Open a substation. Select the "Compress" option in the "Substation" menu. You will see a dialog box where you can enter the file name with path.

1. Select a directory in the "Directories" selection field. DIGSI suggests the "archiv" directory as the default setting.
2. If the directory is on a different drive, select this drive from the dropdown list "Drive". You can also select a disk drive in order to save the compressed data on removable disks.
3. Position the cursor in the input field "File name". Enter a name for the archive. Please observe existing DOS conventions.
4. Select "OK" to save the substation data in compressed form. The current dialog box is closed.

Decompressing substation data



To decompress the data of a substation, no substation may be open. Select the "Decompress" option in the "Substation" menu. A dialog box appears where you can select an archive.

1. DIGSI shows the "archiv" directory as the default setting. You may have saved your archives within a different directory. In this case select the appropriate directory in the selection field "Directories".
2. If the directory is on a different drive, select this drive from the dropdown list "Drive".
3. Highlight the name of an archive in the selection field.
4. Select "OK" to decompress the substation data of the highlighted file. The current dialog box is closed.



If you have selected "OK", you will see another dialog box. Define a destination directory path for the decompressed substation data with the help of this box.

1. Position the cursor in the input field "New dirrectory". Enter a name for the archive. It is mandatory that a new directory name should be entered. This directory can also be a subdirectory of another directory. In this case select the required path in the "Directories" selection field. If the directory is on a different drive, select this drive from the dropdown list "Drive".
2. Select "OK" to start decompression. The current dialog box is closed.

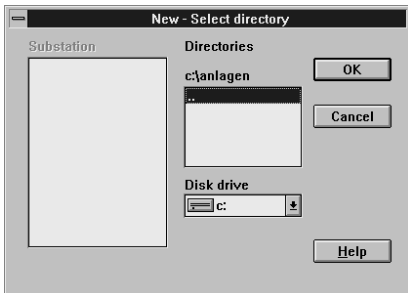
F.4 Creating the Substation, Feeder and Protection device

In the following steps you establish the requirements for editing parameters.



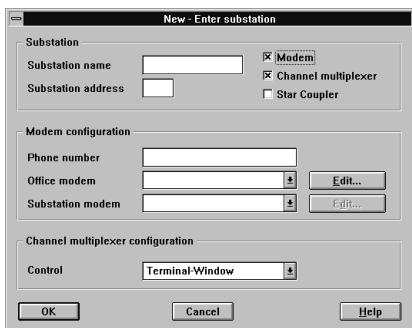
Section 4.1.1

Select the option "New" in the menu "Substation". A dialog box is first displayed to permit you to select a directory. All substation, feeder and protection device data will subsequently be saved in subdirectories which will be automatically created for this selected directory.



1. In the dropdown list "Disk drive", select the drive on which the desired directory is located.
2. Select the desired directory in the selection field "Directories".
3. Check that your inputs are complete and correct. Confirm your selection with "OK".

A further dialog box is then opened. You can define the name and address of the substation using this second dialog box (the communication settings remain unconsidered in this example). The substation name is used for easier identification within DIGSI; it is not subsequently transmitted to the protection device. On the other hand, the substation address is transmitted into the protection device even if it is not relevant to the unambiguous identification of the protection device.



1. Position the cursor in the input field "Substation name". Enter a name with a maximum length of 15 characters. The name should correspond to the name of the real substation for which you wish to subsequently create data. The name must not yet exist in the selected directory. Upper-case and lower-case letters are interpreted as different characters.
2. Position the cursor in the input field "Substation address". Enter a substation address between 1 and 254. It is not essential for the substation address to be unambiguous. However, it should correspond to the substation address already configured in the protection device if possible.
3. Check that your inputs are complete and correct. Confirm your inputs with "OK".



Section 4.2.1



Following confirmation of the last dialog box, you will be requested to create a new feeder. You can define the name and address of the feeder in interactive mode. The feeder name is used for easier identification within DIGSI; it is not subsequently transmitted to the protection device. The feeder address is used to unambiguously define the feeder within DIGSI. The feeder address is transmitted into the protection device even if it is not relevant to the unambiguous identification of the protection device.

1. Position the cursor in the input field "Feeder name". Enter a name with a maximum length of 15 characters. The name should correspond to the name of the real feeder. The name must not yet exist in the current substation. Upper-case and lower-case letters are interpreted as different characters.
2. Select an address for the feeder from the dropdown list "Feeder address". Only addresses are displayed which have not yet been assigned to other feeders in the current substation.
3. Confirm your inputs with "OK".



Section 4.3.1

Following confirmation with "OK", a further dialog box is displayed to permit you to define the name, address and ordering code of a new protection device. The selection of a device name defines a device type including device firmware. You can only transmit the set parameters to devices of the selected type and with the selected firmware. The device address serves for unambiguous identification of the device within DIGSI and within the real substation. The device address is transmitted into the protection device, and must only exist once within the complete substation. The version of the selected type of device is coded in the ordering code (Cat. #). Input of the ordering code also influences the parameter settings which are subsequently possible.

1. Mark a protection device type in the selection field "Device name". This device type must agree with the type of protection device for which you subsequently wish to set parameters.
2. Select an address for the protection device from the dropdown list "Device address". Only addresses are displayed which have not yet been assigned to other protection devices in the current substation.
3. Certain positions in the ordering code are set to question marks in the basic setting depending on the protection device. In order to define the version of the protection device in DIGSI, alphanumeric characters must be assigned to these dummy values. Select "Cat. #". A dialog box with several dropdown lists is then displayed. Only those dropdown lists are active which are relevant to the respective protection device. Define the device version in DIGSI using these dropdown lists, and thus the ordering code. Confirm your selection with "OK".
4. You then return to the previous dialog box. The contents of the display field "Cat. #" have been updated. Check that your inputs are complete and correct. Also confirm this dialog box with "OK".



Alternative paths

You have now satisfied all requirements necessary to start the dialog.

You have the possibility to access existing files using the DIGSI copy functions. The following possibilities are described in this Manual:

- Section 4.1.5:** Copy data of open substation
- Section 4.2.5:** Copy data of open feeder
- Section 4.3.6:** Copy data of current protection device
- Appendix A.2:** Copy data of substation, feeder and protection device

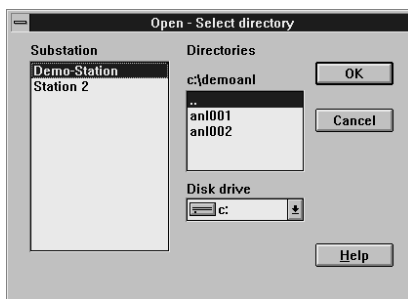
F.5 Opening and closing the Substation, Feeder and Protection device

If you wish to prepare and transmit data to a protection device, you must first open the corresponding substation including feeder and protection device.

F.5.1 Opening the Substation, Feeder and Protection Device



Section 4.1.2

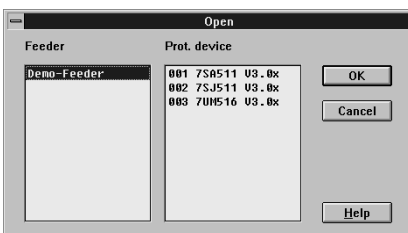


Select the option "Open" in the menu "Substation". A dialog box is then displayed to permit you to select a directory and a substation. You can select a directory in the selection field "Directories". The names of all substations present in the selected directory appear in the selection field "Substation". If no substation names are displayed in this selection field, there are no substations present in the selected directory.

1. In the dropdown list "Disk drive", select the drive on which the desired directory is located.
2. In the selection field "Directories", select the directory in which the desired substation is located.
3. Mark the desired substation in the selection field "Substation".
4. Check that your inputs are complete and correct. Confirm your selection with "OK".



Section 4.2.2



If feeders are present in the selected substation, you will be requested to open one of them. You can open a feeder and a protection device present in this feeder in interactive mode.

1. Mark the desired feeder in the selection field "Feeder".
2. Mark the desired protection device in the selection field "Protection device".
3. Check that your inputs are complete and correct. Confirm your selection with "OK".

F.5.2 Closing the Substation, Feeder and Protection Device



Section 4.1.3

You can close the complete substation. Select the option "Close" in the menu "Substation". You will be asked to confirm your intention. Select "Yes" if you really want to close the opened substation. Select "No" if you do not wish to close the substation.

If you have confirmed your intention with "Yes", the current substation is closed together with the feeder and protection device if open.



Alternative paths

Perhaps you still wish to transmit parameters of further protection devices within the opened substation. To do this, you can close just the protection device or the feeder including protection device. The following possibilities are described in this Manual:

Section 4.2.3: Close the current feeder

Section 4.3.4: Close the current protection device

F.6 Editing Parameters in Dialog Mode “With File”

This section describes the steps which are necessary for editing parameters **before** you communicate with a protection device. These are the following steps:

1. Starting the dialog with file
2. Setting the parameters
3. Presetting for activation of a parameter set
4. Terminating the dialog with file

F.6.1 Starting the Dialog with file



Section 5.1

To start the dialog, select the menu “Dialog” in the DIGSI window “Substation management”. A dialog box is then displayed to permit you to select the dialog mode.



DIGSI differentiates between the dialog modes “With file”, “With protection device direct” and “With protection device via ...”. This section describes the editing of parameters in the mode “With file”. Therefore select this option.

1. Select the option “With file”.
2. Confirm your selection with “OK”.

The required files are read in once you have confirmed your selection with “OK”. A corresponding message is output. The DIGSI window “Dialog” is opened once the files have been read in successfully (see Section 3.2).

F.6.2 Setting the Parameters

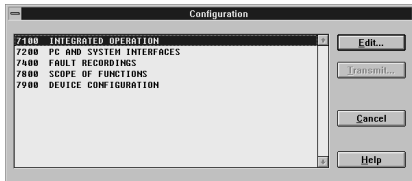


Section 5.2

Configuration parameters



Section 5.2.1.1



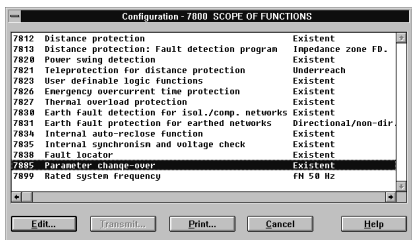
The parameterization of a protection device comprises the three topic areas "Configuration", "Marshalling" and "Settings". Apart from the fundamental configuration topics, all parameters described below are device-specific. They should therefore only be understood as examples. The following explanations for these parameters and functions refer to the protection device type 7SA511 V 3.0x.

It is always recommendable to commence parameterization with the editing of the configuration parameters. To do this, select the option "Edit" in the extension menu "Configuration". A dialog box is then output to permit you to select the fundamental configuration topics:

- Ⓒ Integrated operation
- Ⓒ Configuration of PC/system interfaces
- Ⓒ Fault recordings
- Ⓒ Scope of functions
- Ⓒ Device configuration.

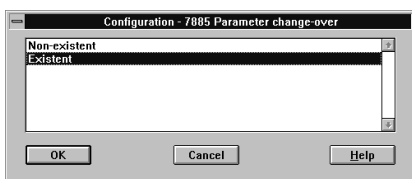
Each topic comprises several device-specific parameters. In order to edit these configuration parameters, you must first mark a topic. Commence with the topic "Scope of functions". This topic decisively influences the visibility and settings possible for other data, for example in the fields of annunciations and measurements.

1. Mark the topic "Scope of functions".
2. Select "Edit".



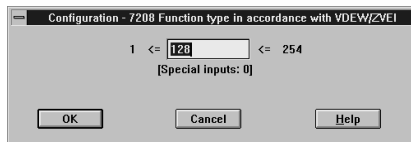
A further dialog box is then displayed which provides the available, **device-specific** parameters on the topic "Scope of functions". Select the parameter whose setting you wish to change. In our example, this is the parameter "Parameter change-over". This parameter has a direct influence on the option "Select parameter set" in the extension menu "Settings". This option is only active if the mentioned parameter is set to "Existent". If the parameter is set to "Non-existent" and you wish to carry out the parameter change-over nevertheless, you must configure it now.

1. Mark the parameter "Parameter change-over".
2. Select "Edit".



A third dialog box is then displayed which shows the settings possible for the marked parameter. Select the setting you require for the marked parameter. For example, the parameter is to be set to "Existent".

1. Mark the setting "Existent".
2. Confirm your selection with "OK".



Proceed as described in order to edit further parameters for the topic “Scope of functions”. Values must be entered directly for certain parameters. In such cases, a dialog box is output similar to the adjacent Fig.

The top half of the dialog box contains an input field. The minimum and maximum permissible values of the parameter are displayed on the left and right of this field. A special input outside the permissible range is possible in certain cases. Such a special input is displayed below the input field. Enter a value within the displayed permissible range or according to the special input into the input field. Confirm your inputs with “OK”. You then return to the previous dialog box.

Select “Print” if you wish to output the displayed parameters on a printer or into a file. Print functions and associated dialog boxes are described in Section 8.2.

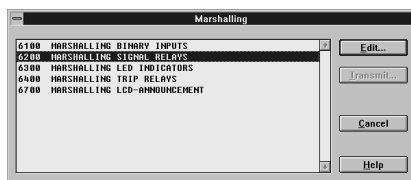
Select “Close” once you have finished editing the current configuration topic. You then return to the dialog box which shows you the topic summary.

Proceed in an analogous manner for the other topics. Select “Close” if you wish to terminate processing of the configuration parameters. You will then be asked to confirm your intention to save the modified parameters. Select “Yes” if the modified parameters are to be saved. Select “No” if you wish to reject all modified parameters.

Marshalling parameters



Section 5.2.2

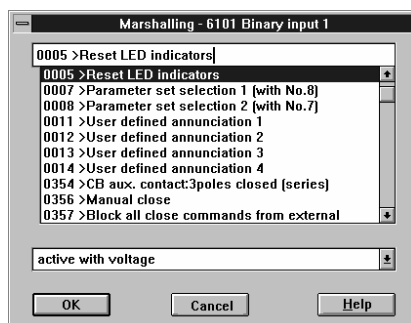


The editing of marshalling parameters is fundamentally the same as the described editing of configuration parameters. First select the option “Edit” in the extension menu “Marshalling”. A dialog box is then output to permit you to select the fundamental marshalling topics:

- ⊙ Marshalling of binary inputs
- ⊙ Marshalling of signal relays
- ⊙ Marshalling of LEDs
- ⊙ Marshalling of trip relays.

Each topic comprises several device-specific parameters. Proceed analogous to the editing of configuration topics and parameters.

When setting marshalling parameters, a dialog box for multiple selection is displayed which has not been explained. This dialog box shows you all possible settings of the selected marshalling parameter. You can define an additional setting using a dropdown list below the selection field



1. You have two options for selecting a setting. On the one hand, you can highlight a setting as usual within the display area. However, you can also enter the annunciation number of a parameter setting in the input box above the display area. As you are entering the number the appropriate setting is selected in the display area. Press one of the keys \uparrow or \downarrow to enter the selected setting in the input box.

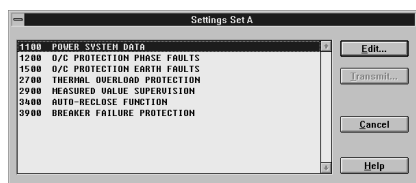
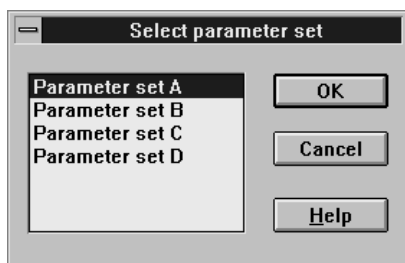
2. Select the desired additional setting using the dropdown list.
3. Check your inputs and confirm your selection with “OK”.

F First Steps

Settings



Section 5.2.3



Alternative paths

Select "Close" if you wish to terminate processing of the marshalling parameters. You will again be asked to confirm your intention to save the modified parameters. Select "Yes" if the modified parameters are to be saved. Select "No" if you wish to reject all modified parameters.

The editing of setting parameters is fundamentally the same as the described editing of configuration and marshalling parameters. The saving of the setting parameters provides a special feature, however.

Most protection devices support four independent parameter sets for setting parameters. One of the sets is always active. The option "Select parameter set" in the extension menu "Settings" permits you to select a parameter set **for editing**. This parameter set is also identified as the "Current set". This option does **not** define the active parameter set (see Section 5.3 or Section F.6.3).

However, the option referred to is not available if the parameter change-over is deactivated. If this is the case, first return to the topic "Configuration parameters" in this Section.

Select the option "Select parameter set" in the extension menu "Settings". A dialog box is then displayed to permit you to select a parameter set. The dialog box shows you the four parameter sets A, B, C and D in the selection field.

1. Mark the parameter set you require.
2. Confirm your selection with "OK".

To edit the setting parameters, select the option "Edit" in the extension menu "Settings". A dialog box is then displayed to permit you to select device-specific setting topics. The name of the selected parameter set is displayed in the title bar of the dialog box.

Proceed with all topics and parameters analogous to the previous description. Select "Close" if you wish to terminate processing of the setting parameters. You will again be asked to confirm your intention to save the modified parameters. Select "Yes" if the modified parameters are to be saved. Select "No" if you wish to reject all modified parameters.

If you have already edited parameters for a protection device, you can assign all or part of these parameters to another protection device. Please refer to:

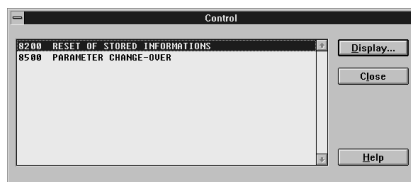
Section 4.3.6: Copy data of current protection device

F.6.3 Presetting for Activation of a Parameter Set



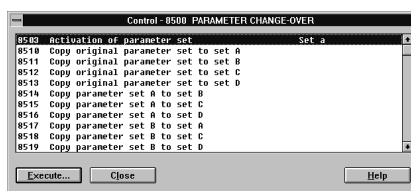
Section 5.3.1

As described in Section F.6.2, most protection devices can manage several parameter sets. The protection device must be informed during the transmission of which parameter set is to be the active set following a reset.



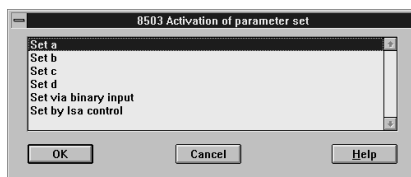
Select the option "Edit" in the extension menu "Protection device" (menu "Control"). A dialog box is then displayed to permit you to select control functions.

1. Mark the function group "Parameter change-over".
2. Select "Display".



A further dialog box is then displayed which shows all individual functions combined in the marked function group. The function "Activation of parameter set" which is marked in our case requires further inputs before it can be executed.

1. Mark the function "Activation of parameter set".
2. Select "Execute".



A third dialog box is then displayed. This requests you to select a parameter for the function to be executed. The following parameters are available:

- Set A
- Set B
- Set C
- Set D
- Set via binary input
- Set by ISA control

1. Mark the parameter you require.
2. Confirm your selection with "OK".

Following this confirmation you return to the previous dialog box. The display of the dialog box has been updated according to your selection. Select "Close" to return to the dialog box of the function overview. Also select "Close" there to leave the control function.

F.6.4 Terminating the Dialog with file



Section 5.9

You can terminate the dialog once you have edited all parameters. Select the menu "Stop". This menu does not contain any further options. You will be directly asked to confirm your intention. Select "Yes" if you really wish to terminate the dialog. Select "No" if you do not wish to terminate the dialog.

F First Steps

F.7 Preparations before establishing a direct connection

Before establishing a direct connection between DIGSI and the protection device some preparations are necessary as shown in the following steps:

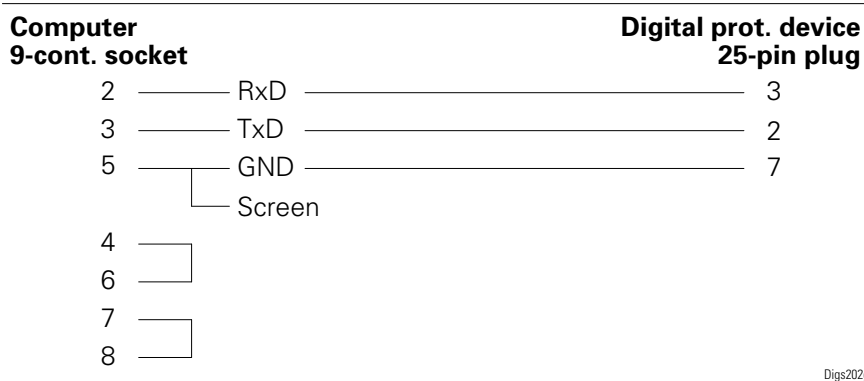
- ⊙ Carry out settings on the protection device
- ⊙ Establish physical connections between computer and protection device
- ⊙ Configure interface to protection device in DIGSI
- ⊙ Set the detection device response time

F.7.1 Establish physical connection between DIGSI and the protection device



Appendix A.6

Connect a free serial port of your computer to the front operating interface of the protection device. Use the 7XV5100-2 cable shown in Fig. F.2.



Digs202g

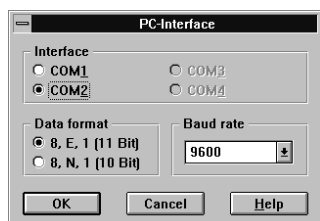
Fig. F.2 Contact assignments for cable 7XV5100-2

F.7.2 Configure Interface to Protection Device in DIGSI



Section 6.2.8

You must provide DIGSI with information on the communication interfaces of your computer.



Select the option "Interface" in the extension menu "Protection device". A dialog box is displayed for defining the interface, transmission format and initial value of the baud rate.

1. Select one of the options "COM port" (1 to 4) in the selection field "Interface". The designation of the selected option must correspond to the serial computer port to which the protection device is connected.
2. Select the option "8,E,1" in the selection field "Data format".
3. Select an initial value for the baud rate from the dropdown list "Baud rate". Select "1200" for a protection device V2. Select "9600" for a protection device V3.
4. Select "OK" to accept the selected settings. The current dialog box is then closed.

F.7.3 Settings on the protection device



Appendix A.7

You must carry out settings on the protection device summarized in Table F.1.

Table F.1 Settings on protection device with operation via PC interface

Address	Meaning	Setting
7211	PC interface	DIGSI V3
7215	PC baud rate	_____
7216	PC parity	DIGSI V3

F.7.4 Set the Protection Device Response Time



Section 6.2.9

The protection device response time is monitored by the computer during telegram transfer. You can define a maximum protection device response time within defined limits.



Select the option "Response time" in the extension menu "Protection device". A dialog box for entering the response time is then displayed.

The displayed value corresponds to the currently set response time in milliseconds. To change this, enter an integral value between 50 and 10000.



Caution!

The preset value should not usually be changed. A modification is only meaningful if a timeout frequently occurs during the dialog.

1. Position the cursor in the input field "Response time". Enter an integral value between 50 and 10000.
2. Select "OK" to accept the selected response time. The current dialog box is closed.

F.8 Transmit Parameters in Dialog Mode “With Protection Device Direct” to the Protection device

This example session describes the steps necessary to transmit data to the protection device in dialog mode “With protection device direct”. The example is divided into the following steps:

1. Starting the dialog with protection device
2. Transmitting the prepared parameter sets
3. Setting and transmitting individual parameters
4. Terminating the dialog with protection device

As preliminary steps you have created and opened substation, feeder and protection device (see Sections F.4 and F.5).

F.8.1 Starting the Dialog with Protection device



Section 5.1

In the context of the dialog, parameters from protection device files can be transmitted into a protection device. The substation, feeder and protection device addresses of the opened substation, feeder or protection device components must agree with the configured addresses in the protection device. This also applies to the selected type of protection device and the defined device version. If this is not the case, corresponding error messages are output during establishment of the connection. These comments are not relevant if you are working with temporary files.



To start the dialog, select the menu “Dialog” in the DIGSI window “Substation management”. A dialog box is then displayed to permit you to select the dialog mode.

DIGSI differentiates between the dialog modes “With file”, “With protection device direct” and “With protection device via ...”. This section describes the editing of parameters in the mode “With protection device direct”. Therefore select this option.

1. Select the option “With protection device direct”.
2. Confirm your selection with “OK”.

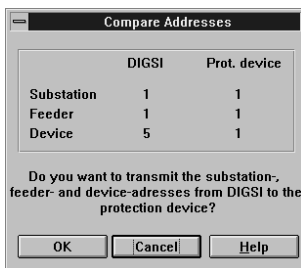
A connection to the protection device is established once you have confirmed your selection with “OK”. A corresponding message is output. The DIGSI window “Dialog” is opened when the connection has been successfully established (see Section 3.2).



Section 6.3.2

Communication between DIGSI and a connected protection device is only possible if the substation, feeder and protection device addresses agree. If this is not the case, the addresses must be adapted. A message is displayed.

Select "OK" to transmit all addresses set in DIGSI to the protection device. Existing protection device addresses are overwritten in the process. Therefore you will be asked to confirm your intention. Select "Yes".



A reset is carried out in the protection device once the addresses have been transmitted. Following a reset, the configuration parameters, and possibly also the control parameters, must be transmitted again from DIGSI to the protection device.

A message is displayed if the protection device type opened in DIGSI does not agree with the connected type of protection device. Confirm the message with "OK" and adapt the protection device type in DIGSI accordingly (see Section 4.3.5).



Alternative paths

You should cancel the establishment of connection if there are any problems. In this case read Section F.10.

F.8.2 Transmission of Prepared Parameter Sets



Section 5.2.1.3

You can transmit prepared parameters which are saved in files into the connected protection device. The procedure is comparable for configuration, marshalling and setting parameters.

To transmit configuration parameters, select the option "File → Protection device" in the extension menu "Configuration". Select this option in the extension menu "Marshalling" or "Settings" if marshalling or setting parameters are to be transmitted.



Careful!

The parameters in the protection device are overwritten when transmitting! A reset is carried out in the protection device following the transmission. You will therefore be asked to confirm your intention.

Confirm with "Yes" if the parameters are to be transmitted into the protection device. Existing protection device data of the same type are overwritten in the process. Select "No" if you do not wish to transmit parameters into the protection device. The existing protection device data then remain unchanged.

If you have confirmed your intention with "Yes", a corresponding message is output. A reset is carried out in the protection device following the transmission of the parameters. A corresponding message is also output.

F First Steps

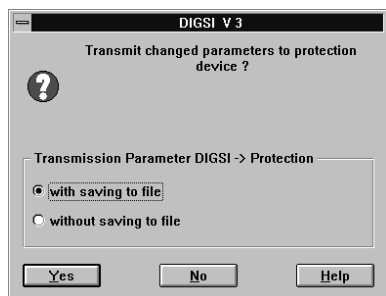
F.8.3 Setting and Transmitting Individual Parameters



Section 5.2 You can also modify individual parameters in the protection device. This is equally possible when working with prepared parameters or with a temporary file.

You initially proceed as described in Section F.6.2 "Setting the Parameters". Select the option "Edit" from the associated extension menu depending on the desired type of parameter.

Corresponding dialog boxes are displayed as a reaction to your selection. Some of the dialog boxes have a button labelled "Transmit". This button only becomes active if you have modified the setting of at least one parameter. When you select this button, all parameters which have been modified up to then will be transmitted.



Before parameters are transmitted, they can first be saved if required in the substation you have opened or in the temporary substation. You will therefore be asked to confirm your intention before the parameters are transmitted.

Select one of the two options "With saving" or "Without saving". Confirm the subsequent question with "Yes" if the parameters are to be transmitted to the protection device. Existing data of the same type will be overwritten. Select "No" if you do not wish to save the parameters or transmit them to the protection device. The existing data remain unchanged.

F.8.3.1 Terminating the Dialog with Protection device



Section 5.9 You can terminate the dialog once all relevant parameters have been transmitted to the protection device. Select the menu "Stop". This menu does not contain any further options. You will be directly asked to confirm your intention. Select "Yes" if you really want to terminate the dialog. Select "No" if you do not wish to terminate the dialog.

F.9 Read Information from the Protection device in Dialog Mode “With Protection Device Direct”

This example session explains the steps necessary to read information from the substation or a protection device in dialog mode “With protection device”. The example is divided into the following working steps:

1. Starting the dialog with protection device
2. Transfer of parameters from the protection device into a file
3. Reading of annunciations from the protection device
4. Reading of measurements from the protection device
5. Reading of faults from the protection device
6. Terminating the dialog with protection device

As preliminary steps you have created and opened substation, feeder and protection device (see Sections F.4 and F.5).

F.9.1 Starting the Dialog with Protection device



Section 5.1

In the context of the dialog, information from the protection device can be transmitted into associated files in the computer. The substation, feeder and protection device addresses of the opened substation, feeder or protection device components must agree with the configured addresses in the protection device. This also applies to the selected type of protection device and the defined device version in DIGSI. If this is not the case, corresponding error messages are output during establishment of the connection. These comments are not relevant if you are working with temporary files.



To start the dialog, select the menu “Dialog” in the DIGSI window “Substation management”. A dialog box is then displayed to permit you to select the dialog mode.

DIGSI differentiates between the dialog modes “With file”, “With protection device direct” and “With protection device via ...”. This section describes the reading of information from the protection device. Therefore select the option “With protection device direct”

1. Select the option “With protection device direct”.
2. Confirm your selection with “OK”.

A connection to the protection device is established once you have confirmed your selection with “OK”. A corresponding message is output. The DIGSI window “Dialog” is opened when the connection has been successfully established (see Section 3.2).

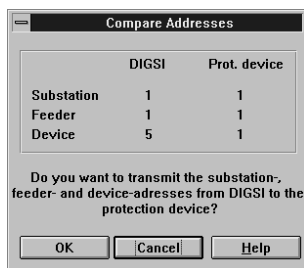
F First Steps



Section 6.3.2

Communication between DIGSI and a connected protection device is only possible if the substation, feeder and protection device addresses agree. If this is not the case, the addresses must be adapted. A message is displayed.

Select "OK" to transmit all addresses set in DIGSI to the protection device. Existing protection device addresses are overwritten in the process. Therefore you will be asked to confirm your intention. Select "Yes".



A reset is carried out in the protection device once the addresses have been transmitted. Following a reset, the configuration parameters, and possibly also the control parameters, must be transmitted again from DIGSI to the protection device.

A message is displayed if the protection device type opened in DIGSI does not agree with the connected type of protection device. Confirm the message with "OK" and adapt the protection device type in DIGSI accordingly (see Section 4.3.5).



Alternative paths

You should cancel the establishment of connection if there are any problems. In this case read Section F.10.

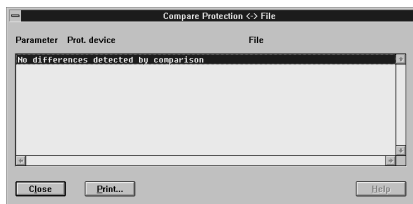
F.9.2 Transfer of Parameters from the Protection Device into a File



Section 5.2.1.2

You can transmit parameter settings present in the protection device into the corresponding files in the computer. This is possible both in dialog with opened substation, feeder and protection device components as well as with temporary files. The procedure is comparable for configuration, marshalling and setting parameters.

The parameters in the corresponding file are overwritten during the transfer. You should therefore first use the facility for comparing the parameter settings in the protection device and in the file.



Using the example of configuration parameters, select the option "Protection device <-> File" in the extension menu "Configuration". The configuration parameters from the protection device are then transmitted to a temporary memory area in the computer. The configuration parameters in the corresponding file are not modified in the process. A corresponding message is output.

The result is displayed in a dialog box at the end of the transfer and comparison. Select "Close" when you have checked the displayed results. The current dialog box is then closed.



Section 5.2.1.4

If you have decided to transfer configuration parameters, select the option "Protection device -> File" in the extension menu "Configuration". Select this option in the extension menu "Marshalling" or "Settings" in line with the transmission of marshalling or setting parameters respectively.

**Careful!**

The parameters in the corresponding files are overwritten when transmitting! You will therefore be asked to confirm your intention.

Confirm with "Yes" if the parameters are to be transmitted from the protection device into the corresponding file. Existing data of the same type are overwritten in the process. Select "No" if you do not wish to transmit parameters from the protection device. The existing data then remain unchanged.

If you have confirmed your intention with "Yes", a corresponding message is output.

F.9.3 Reading of Annunciations from the Protection Device



Section 5.4.1

Annunciations are generated in the protection device or initiated by the connected peripherals. They are generated by the protection device at the time the event occurs. An annunciation can be assigned to several categories:

- ⊙ Operational annunciations
- ⊙ Network disturbances
- ⊙ Earth fault annunciations
- ⊙ Spontaneous annunciations
- ⊙ General query annunciations
- ⊙ CB switching statistics.



Section 5.4.1.1

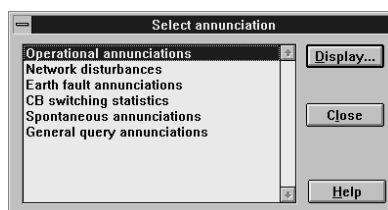
You can display, update, save and print annunciations. To do this, select the option "Edit" in the extension menu "Annunciation". A dialog box is then displayed to permit you to select an annunciation category. The scope of the displayed annunciation categories depends on

- ⊙ the type of protection device,
- ⊙ parameter settings which have been defined using the extension menu "Configuration".

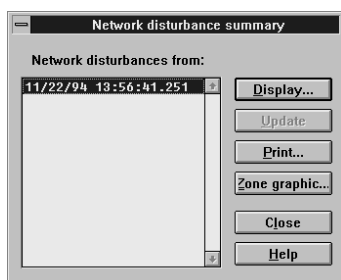
Each annunciation category comprises the annunciations which belong to this category. To display these annunciations, proceed as follows:

1. Mark the annunciation category whose individual annunciations are to be displayed.
2. Select "Display".

The current annunciations are initially transmitted from the protection device to the computer. A corresponding message is output, and a dialog box is subsequently opened.



F First Steps



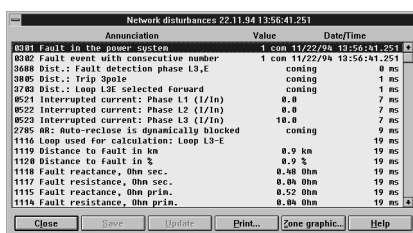
This dialog box shows a summary of network disturbances which have occurred. This type of dialog box is only obtained when selecting network disturbances and earth fault annunciations. These two types of faults are documented by a large number of individual annunciations. All individual annunciations refer to the time at which the fault occurred. The opened dialog box shows all faults which have occurred, sorted according to date and time. The number of faults which can be displayed simultaneously depends on the protection device.

Select "Update" to read in new faults and to update the display.

Select "Print" to output the displayed summary on a printer or into a file. Print functions and associated dialog boxes are described in Section 8.2.

Proceed as follows to display individual annunciations for a fault:

1. Mark the fault whose individual annunciations are to be displayed.
2. Select "Display".



A further dialog box is then displayed. This dialog box shows all individual annunciations which have occurred for the selected fault.

Select "Save" in order to save the displayed annunciations in a file. The file is created automatically. No more inputs are necessary.

Select "Update" to read in new annunciations and to update the display. You will be asked to confirm your intention if you have not yet saved the displayed annunciations. Select "Yes" if you wish to save the displayed annunciations. Select "No" if you do not wish to save the displayed annunciations.

Select "Print" if you wish to output the displayed annunciations on a printer or into a file. Print functions and associated dialog boxes are described in Section 8.2.

Select "Close" if you do not wish to check any further annunciations. The current dialog box is then closed. You will be asked to confirm your intention if you have not yet saved the displayed annunciations. Select "Yes" if you wish to save the displayed annunciations. Select "No" if you do not wish to save the displayed annunciations.

You then return to the previous dialog box. You can now select further faults or a different annunciation category. To do this, select "Close". The dialog box is then closed, and you return to the dialog box which provides a summary of all available annunciation categories.

You can then select further annunciation categories or terminate the procedure. To do this, select "Close". The dialog box is then closed.



Alternative paths



Section 5.4.1.2

You can also transmit annunciations from the protection device into the computer without displaying them first. The annunciations are transmitted and saved separately for each category. All categories apart from "Spontaneous annunciations" are transmitted.

Select the option "Protection device -> File" in the extension menu "Annunciations". You obtain a separate message for the transmission of each category.

F.9.4 Reading of Measurements from the Protection Device



Section 5.4.2

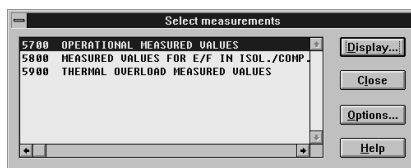
The protection device obtains measurements as voltage and current rms values, as well as frequency values, from the connected transformers. Linked measurements can be generated in the protection device from the received measurements. The measurements are combined in different categories specific to the protection devices:

- ⊙ Operational annunciations
- ⊙ Earth fault annunciations
- ⊙ Overload measurements.



Section 5.4.2.1

You can display, save and print measurements. The display of the measurements in the dialog box is updated every 2 seconds. Select the option "Edit" in the extension menu "Measurements".



A dialog box is then displayed for selection of a measurement category. The scope of the displayed measurement category depends

- ⊙ on the selected type of protection device,
- ⊙ on parameter settings defined using the extension menu "Configuration".



The measurements belonging to each category are combined in that particular category. Prior to the display of measurements you must define a save mode for the cyclically transmitted measurements. To do this, select "Options". A further dialog box is then opened which provides three different options for the save mode:

Manual

Select this option if measurement sets are only to be saved when requested manually.

All incoming message frames

Select this option if all incoming measurement sets are to be saved automatically.

Every x min

Select this option if measurement sets are to be saved automatically at cyclic intervals. Enter the desired cycle time in the associated input field.

1. Select the option you require.
2. Confirm your selection with "OK".

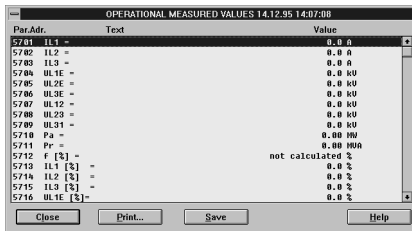
You then return to the previous dialog box.

1. Mark the measurement category whose individual measurements are to be displayed.
2. Select "Display".

All current measurements are then transmitted from the protection device into the computer. A corresponding message is output. A dialog box is opened once the transmission of measurements has been completed.

F

First Steps



Par. Adr.	Text	Value
5703	IL1 =	0.0 0
5702	IL2 =	0.0 0
5703	IL3 =	0.0 0
5704	UL1E =	0.0 kV
5705	UL2E =	0.0 kV
5706	UL3E =	0.0 kV
5707	UL12 =	0.0 kV
5708	UL23 =	0.0 kV
5709	UL31 =	0.0 kV
5710	Pa =	0.00 HPa
5711	Pr =	0.00 HPa
5712	F [%] =	not calculated %
5713	IL1 [%] =	0.0 %
5714	IL2 [%] =	0.0 %
5715	IL3 [%] =	0.0 %
5716	UL1E [%] =	0.0 %

This dialog box shows all measurements of the selected category in the order in which they occurred. The display is updated every 2 seconds.

If you have selected an option for automatic saving, the measurements are saved either when they arrive or in the defined cycle. The button "Save" is not active.

The button "Save" is active if you have selected the save option "Manual". Select "Save" in order to save the displayed operational measurements in a file. You will be asked to confirm your intention. Select "Yes" if you wish to save the displayed measurements. Select "No" if you do not wish to save the displayed measurements.

Select "Print" if you wish to output the displayed measurements on a printer or into a file. Print functions and associated dialog boxes are described in Section 8.2.

Select "Close" if you do not wish to check any further measurements. The current dialog box is then closed. You will be asked to confirm your intention if you have not yet saved the displayed measurements. Select "Yes" if you wish to save the displayed measurements. Select "No" if you do not wish to save the measurements.

You then return to the previous dialog box. You can now select further measurement categories or terminate the procedure. To do this, select "Close". The dialog box is then closed.



Alternative paths



Section 5.4.2.2

You can also transmit measurements from the protection device into the computer without displaying them first. The measurements are transmitted and saved separately for each category.

Select the option "Protection device -> File" in the extension menu "Measurements". You obtain a separate message for the transmission of each category.

F.9.5 Reading of Faults from the Protection Device



Section 5.5.1

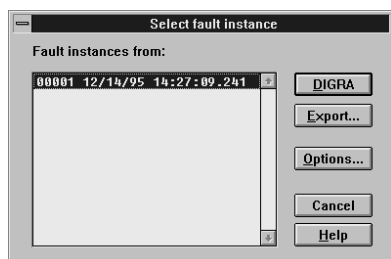
DIGSI supports the archiving and analysis of faults. The analysis is carried out by the DIGRA program. At least one fault must be read in before faults can be processed.

Select the option "Fault recording" in the menu "Fault processing". A fault summary is then read out from the protection device. A corresponding message is displayed.

If faults are present, a dialog box is displayed with a summary of all existing faults. A number is assigned to the faults. The faults are sorted in ascending order according to their date and time. You can now export individual faults or analyze them with the DIGRA program. Please refer in this Manual to:

Section 10: The DIGRA program

Section 8.1.2: Export of fault data





Alternative paths

You can also transfer faults from the protection device into the computer without displaying them first in a summary. The faults are saved separately.



Section 5.5.2

Select the option "Protection device → File" in the menu "Fault". You will first be asked to confirm your intention. Select "Yes" if you wish to transmit all faults from the protection device into the computer. Select "No" if you do not wish to transfer any faults from the protection device into the computer.

F.9.6 Terminating the Dialog



Section 5.9

You can terminate the dialog once all relevant information has been read out of the protection device. Select the menu "Stop". This menu does not contain any further options. You will be directly asked to confirm your intention. Select "Yes" if you really want to terminate the dialog. Select "No" if you do not wish to terminate the dialog.

F.10 Temporary Dialog

DIGSI gives you the option of a dialog without an open substation. You can thus exchange information directly with a protection device without having prepared the appropriate files (substation, feeder etc.). DIGSI creates temporary files for this type of dialog.

You should use this option particularly if problems occur when establishing a connection with the protection device. As a rule, a dialog with a temporary substation is safe and trouble-free process. However, it can only be used in the "With protection device direct" mode.

First close any substations that may be open. Then start the dialog in the "With protection device direct" mode. The rest of the procedure is identical to dialog with substation. For more information, read the Instruction Manual:

Section 5.1.1.2: Editing with protection device

1 Introduction

DIGSI is a tool for the operation of SIEMENS numeric protection devices and the analysis of operational and fault data. The operating and analysis software provides a wide range of input functions which are completely carried out in interactive mode:

- ⊙ Dialog in different modes, also for older systems using implemented DOS–DIGSI module
- ⊙ Support of communication between computer and protection device using modems, channel multiplexer and star coupler
- ⊙ Parameterization functions for configuration, marshalling and settings
- ⊙ Test and control functions
- ⊙ Display, storage and printout of various annunciations, e.g. earth fault annunciations, network disturbances etc.
- ⊙ Display of statistical values
- ⊙ Display, storage and printout of measurements and fault data
- ⊙ Display of the zone characteristics of the distance/impedance protection as a zone diagram
- ⊙ Bidirectional transfer functions for various data
- ⊙ Password protection and assignment of access privileges down to the individual address level.

The **DIGRA** program has been developed for the analysis and graphic output of fault data. You can activate it directly using DIGSI or call it as an autonomous module. Below is a list of some of the performance data:

- ⊙ Display of fault data as an overview
- ⊙ Display of the real-time response of the fault data as analog and binary recordings
- ⊙ Display and suppression of individual analog and binary recordings
- ⊙ Zoom and shift functions for adapting the display
- ⊙ Tabular display of amplitude and phase angle for any selectable points in time
- ⊙ Calculation of rms values, distortion factors and Fourier coefficients for any selectable points in time
- ⊙ Storage and printer output functions.

DIGSI communicates with SIEMENS protection devices with firmware release V 3 and later (devices with VDEW interface). Protection device files which were produced with DIGSI V 2.x for former firmware releases can be converted to the current firmware release for certain protection devices. The additional KONVERT module is available for this purpose.

The **DIGV2V3** program copies device data from systems in the DIGSI V 2.x format into systems in the current DIGSI format. All device files with parameters, annunciations, fault records and measurements are saved according to the current DIGSI directory structure. They can be edited following the copy procedure using the DOS–DIGSI module integrated in DIGSI.

The DIGRA, KONVERT and DIGV2V3 programs are included in the delivery of DIGSI.

1 Introduction

1.1 Information on this Manual

This Manual describes the operation of DIGSI, DIGRA, KONVERT and DIGV2V3. However, it does not contain any fundamental information on protective relaying. It is assumed that you already possess such knowledge, as well as knowledge of the used operating system.

Parameters, control functions and test functions which are specific to individual protection devices are not explained. You can obtain information on such from the Manual of the respective protection device.



Caution!

Read the Manual completely before you start working with DIGSI or one of the additionally supplied programs. Each chapter describes an important function of the program and its application.

First steps

A summary of the installation instructions, basic information about substation management and backup as well as a description of example scenarios are included in this chapter. Use this first part of the Instruction Manual to be able to work quickly with the basic functions of DIGSI.

Chapter 1

This chapter provides you with a summary of the topics in this Manual. The summary is followed by general operating information and the description of installation and system requirements.

Chapter 2

This chapter describes how to call and start the DIGSI operating and analysis software. You will also be informed of how to terminate or leave the program.

Chapter 3

This chapter describes the basic design of the DIGSI windows. You are also provided with a summary of all DIGSI menus and menu options.

Chapter 4

This chapter describes all operations necessary in the context of substation management. These are functions such as the creation, opening, closing, copying and deleting of files.

Chapter 5

This chapter describes all functions relevant in conjunction with the dialog. These include functions such as parameterization, control, testing and fault recording.

Chapter 6

This chapter provides information on higher-level communication. Topics such as the establishment and cancellation of connections are included in this chapter.

Chapter 7

This chapter provides information on user-oriented functions. Such functions include, for example, the management of a user list or the assignment of access privileges.

Chapter 8

This chapter describes export and print functions in DIGSI.

Chapter 9

This chapter describes supplementary functions for DIGSI such as the generation of a request for modification.

Chapter 10

This chapter describes the DIGRA program. You are provided with information on the most important operating functions of this analysis software.

Chapter 11

This chapter describes the DOS-DIGSI module. You are provided with information on the most important operating functions of this operating software.

- Chapter 12** This chapter describes how you can use the KONVERT program. You are provided with information on the most important operating functions of this conversion software.
- Chapter 13** This chapter describes how you can use DIGV2V3. You are provided with information on the most important operating functions of this copying software.
- Chapter 14** This chapter is devoted to a description of the DIGSI Mailbox. You will find out how to establish a connection to the DIGSI Mailbox, how to navigate inside the Mailbox and how to download files from the Mailbox into your own computer.
- Appendix** The Appendix contains, *inter alia*, information on available cables or examples with respect to higher-level communication.

1.2 General Operating Information

The operation of DIGSI corresponds to the defined Windows conventions. It is assumed you have knowledge of these. Certain important terms and actions will be briefly summarized nevertheless.

Terms The **Marking** of an object highlights it, activates it, or changes its appearance in some other manner. It is the preliminary stage for an action, but does not usually trigger an action. Such an object may be a menu or a menu option.

Select means the choosing of an option which initiates an action. You select an option from a menu or a dialog box. An object is often marked before you can select the action to be subsequently used on it.

The term **Open** refers to menus, windows and boxes which contain options. Menus are opened when their name has been marked and selected. Windows and boxes are opened when a corresponding option has been selected.

Expressions used The description of unambiguous actions when using the program are defined here.



In the text you will find sentences similar to: Select the option "New" in the menu "Substation".

When using a mouse, this means: position the mouse pointer to the menu "Substation". Press the left mouse pushbutton. The menu is then opened. Position the mouse pointer to the menu option "New". Press the left mouse pushbutton. The corresponding action is then triggered.

When using the keyboard, this means: press the **ALT** key. Move the selection bar to the menu "Substation" using the arrow key **←** or **→**. Move the selection bar to the menu option "New" using the arrow key **↓**. Then press the **↵** key. The corresponding action is then triggered.

The selection can alternatively be made using a hotkey. This is the key corresponding to the letter which is underlined in the menu or the menu option.

1 Introduction

- Notes** Two different symbols are used in this Manual as notes. They are positioned in the comment column to the left of the continuous text.
-  **Caution!** The symbol "Caution" is always shown wherever particularly important information is present.
-  **Careful!** The symbol "Careful" is always shown wherever data could be damaged or lost by an action.

1.3 Installation

Minimum system configuration

The installation of DIGSI including all additional components is completely carried out in interactive mode.

The following **Minimum requirements** are necessary for the system configuration to permit full utilization of all DIGSI functions:

- ⊙ IBM PC-compatible computer with 386SX CPU
- ⊙ 4 MB main memory (RAM); 8 MB recommended
- ⊙ Hard disk with 40 MB vacant memory for the installation of all program components and additional data
- ⊙ 3.5-inch, 1.44 MB diskette drive
- ⊙ VGA card and VGA monitor
- ⊙ Two serial interfaces for connection to protection device and mouse
- ⊙ Mouse supported by Windows 3.1
- ⊙ Connection cable to protection device (only for dialog mode "With protection device")
- ⊙ MS-Windows 3.1 in conjunction with MS-DOS version 5.0
- ⊙ Alternatively you can use one of the operating systems MS Windows 95, MS Windows NT version 3.51 or IBM OS/2 version 3.0

Types of installation

The installation program checks whether a previous version of DIGSI or the current version V 3.1 is already installed. If this is not the case, a **Full installation** is initiated. If program components are found, however, the installation program initiates an **Update installation**.

If you are installing DIGSI for the first time, please follow the instructions in Section 1.3.1. If you wish to update an installed, older version, please read Section 1.3.2. This section is also relevant if you wish to reinstall individual components of DIGSI.

Start installation

Insert installation diskette 1 into any diskette drive. In the further description, drive A is selected as the installation drive.

Select the option "Run" in the menu "File" of the program manager. A dialog box appears with an input field. Enter the name of the installation file together with the installation drive in this input field:

a:\diginst.exe

Confirm your input with . The installation program is then initialized. You can alternatively start the installation from the file manager. Open a window for the installation drive in this case and double click the file "diginst.exe".



Caution!

INSTALL cannot be opened if one of the DIGSI, KONVERT, DIGRA or DIGV2V3 programs is already open.

Terminate installation

You can abort the installation of DIGSI at any time. Press the key to do this, or select "Cancel" in the corresponding dialog boxes. You will be asked to confirm your intention.



Digs011g

Fig. 1/1 Confirmation of intention before aborting installation



Select "Yes" to terminate the installation. The installation is terminated following the output of a message.



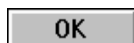
Select "No" if you wish to continue the installation. You then return to the previous dialog box.

A message is output if you have confirmed your intention with "Yes".



Digs012g

Fig. 1/2 Message output following aborted installation



Select "OK" to confirm the message. The installation is then terminated.

1.3.1 Full Installation

A full installation is initiated if the installation program does not find any components of the current DIGSI version or a previous version. An info box is initially displayed. Note that, when acknowledging this info box, you confirm that you accept the license conditions of Siemens AG.

1 Introduction



Digs001g

Fig. 1/3 Info box for full installation of DIGSI



Select "Continue" to continue with the installation. The current info box is then closed.



Select "Cancel" if you wish to terminate the installation. You will be asked to confirm your intention before the installation is terminated (see Fig. 1/1).

A dialog box is displayed if you have confirmed the info box with "Continue". This requests you to enter a customer name.



Digs002g

Fig. 1/4 Dialog box "Enter Customer Name"

The dialog box contains an input field. Enter your company or department name in this field. The name entered here is registered as a licensee in DIGSI.

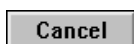


Caution!

It is essential to enter a customer name. You cannot continue the installation without this entry.



Select "Continue" to accept the entered customer name. The current dialog box is then closed, and the installation continued. This button is only active when you have entered a customer name.



Select "Cancel" if you wish to terminate the installation. The current info box is then closed. You will be asked to confirm your intention before the installation is aborted (see Fig. 1/1).

Another dialog box is displayed if you have confirmed the last dialog box with "Continue". This requests you to enter two destination directories. All program-specific files are stored in the DIGSI directory. All files which contain substation-specific data are stored in the substation directory. A separate input field is provided for each directory.

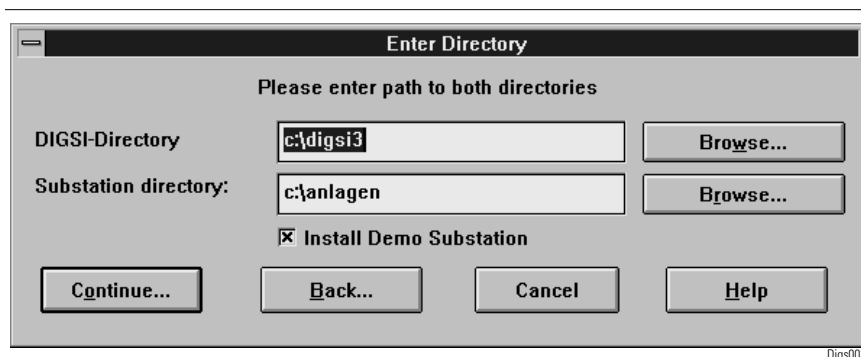


Fig. 1/5 Dialog box "Enter directory"

Select directory

Directories for both the program and substation files are suggested as basic settings. You can accept these directories, or enter new ones. Directories which do not yet exist are created by DIGSI.



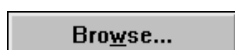
Caution!

Please note the following rules and limitations for the inputs:

- ⊙ The substation directory must not be a subdirectory of the DIGSI directory.
- ⊙ Observe the applicable DOS conventions.
- ⊙ Check that the defined drive exists. The drives must not be READ ONLY. Diskette drives cannot be used.

Install demo substation

Mark this option to install the files for a demo substation. DIGSI automatically creates the directory "DEMOANL" in this case. The installation of these files is recommendable since learning of program operations is facilitated using the demo substation. This option is already marked in the basic setting.



Select "Browse" to select an existing directory as the DIGSI or substation directory. The dialog box shown in Fig. 1/6 is then displayed.

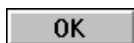
1 Introduction



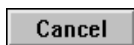
Digs004g

Fig. 1/6 Dialog box "Browse"

Mark an existing directory in the selection field "Directories". If the desired directory is on a different drive, select this using the dropdown list "Disk drive".



Select "OK" to accept the marked directory. The current directory is then closed, and you return to the previous dialog box.

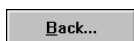


Select "Cancel" if you do not wish to select a directory or use the marked directory. The current dialog box is then closed, and you return to the previous dialog box.

If you have confirmed your selection with "OK", the corresponding input field in the dialog box shown in Fig. 1/5 is updated. Repeat this if necessary for the other directory.



Select "Continue" to accept the entered directories and to continue with the installation.



Select "Back" to return to the previous dialog box. The current dialog box is then closed, and your selection is cancelled by this action.



Select "Cancel" if you wish to terminate the installation. The current dialog box is then closed. You will be asked to confirm your intention before the installation is aborted (see Fig. 1/1).

If you have confirmed your selection with "OK", your inputs will first be checked. If you have defined a directory which does not yet exist, this can be created by the installation program. You will first be asked to confirm your intention.



Digs005g

Fig. 1/7 Confirmation of intention before a directory is created



Select "Yes" if the directory you have defined is to be created. The dialog box from Fig. 1/5 is then closed, and the installation is continued.



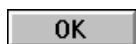
Select "No" if the directory you have defined is not to be created. You then return to the last dialog box. Enter a different directory if necessary or terminate the installation.

Corresponding messages are output if there is a formal error in your input.



Digs021g

Fig. 1/8 Message output with a read-only drive

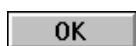


Acknowledge the message with "OK". Modify the attribute of the selected drive or select a different drive.



Digs022g

Fig. 1/9 Message with invalid drive



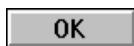
Acknowledge the message with "OK". Select a different drive.

1 Introduction



Digs023g

Fig. 1/10 Message with incorrect directory



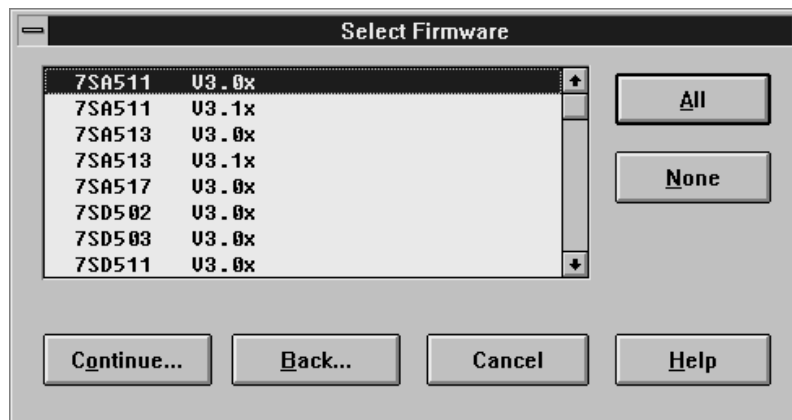
Acknowledge the message with "OK". Check the path data and select a different directory if necessary.

If all inputs are correct the dialog box shown in Fig. 1/11 is displayed. This permits you to define files to be installed specific to protection devices.



Caution!

DIGSI can only communicate with protection devices for which the corresponding data have been installed. Individual components may have to be reinstalled if necessary (see Section 1.3.2).



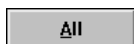
Digs006g

Fig. 1/11 Dialog box "Select firmware"

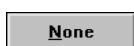
The dialog box provides a summary of all currently available types of protection device with the associated firmware releases. The entries are sorted alphabetically according to the type of protection device.

Select type of protection device / firmware

Mark all device types or firmware releases for those protection devices for which you wish to edit data or where you wish to communicate with them.



Select "All" to mark all displayed entries. A previously made individual selection is then rejected.



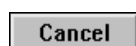
Select "None" to unmark all displayed entries. A previously made individual selection is then rejected.



Select "Continue" to accept the marked types of protection device/firmware releases and to continue with the installation. This option is only active if at least one firmware release has been marked.



Select "Back" to return to the previous dialog box. The current dialog box is then closed, and your selection is cancelled by this action.



Select "Cancel" if you wish to terminate the installation. The current dialog box is then closed. You will be asked to confirm your intention before the installation is aborted (see Fig. 1/1).

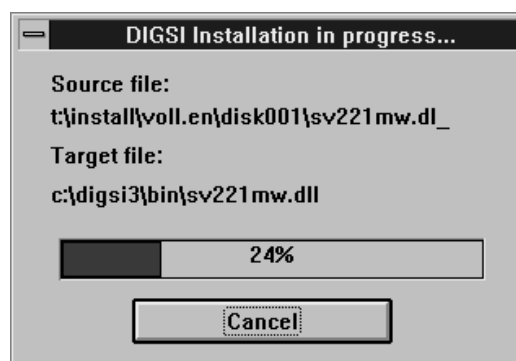
You have now made all inputs required for the installation. A message is output if you have confirmed your last selection with "Continue". This message informs you that the installation parameters are currently being prepared.



Digs007g

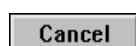
Fig. 1/12 Message during preparation of the installation parameters

As soon as the preparation has been terminated, the installation program commences with the installation of the files from diskette 1. A message as shown in Fig. 1/13 informs you of the current status of the installation.



Digs008g

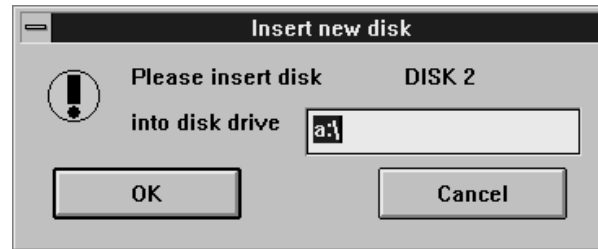
Fig. 1/13 Message during the installation of DIGSI



Select "Cancel" if you wish to terminate the installation. The current message box is then closed. You will be asked to confirm your intention before the installation is aborted (see Fig. 1/1).

A further message is output once all files from installation diskette 1 have been copied into the directory created for them. You will be requested to insert the next installation diskette.

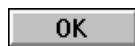
1 Introduction



Digs009g

Fig. 1/14 Dialog box "Insert new disk"

Insert the required diskette into the installation drive. If your installation drive is not the same as the indicated drive, correct the entry in the input field.



Select "OK" to continue the installation. The current dialog box is then closed, and a message is output as in Fig. 1/13.



Select "Cancel" if you wish to terminate the installation. The current dialog box is then closed. You will be asked to confirm your intention before the installation is aborted (see Fig. 1/1).

Continue the procedure analogous to the previous instructions. A message is output once all files have been copied into the destination directories.



Digs010g

Fig. 1/15 Message following successful installation



Acknowledge the message with "OK".

The installation program automatically creates a program group for DIGSI and the associated components. The window of this program group is opened at the end of the installation.



Digs013g

Fig. 1/16 Program group DIGSI

The program group contains the icons for DIGSI, DIGRA, KONVERT, DIGV2V3 and INSTALL.

1.3.2 Update Installation



You can call the INSTALL program for subsequent installation of components for the current version following a successful full installation. The program icon for INSTALL is shown on the left. You can find this icon in the DIGSI program group.

INSTALL is started by double clicking the icon. You can alternatively start INSTALL using the option "Run" in the menu "File" of the program manager. An info box is initially output.

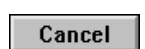


Digs016g

Fig. 1/17 Info box for update installation of DIGSI



Select "Continue" to continue with the update installation. The current info box is then closed.



Select "Cancel" if you wish to terminate the installation. The current dialog box is then closed. You will be asked to confirm your intention before the installation is aborted (see Fig. 1/1).

If you have acknowledged the last dialog box with "OK", a further dialog box is displayed. This requests you to enter a source directory from which you wish to install components or the complete program.



Dig017g

Fig. 1/18 Dialog box "Select directory"

1 Introduction

Select directory

An update installation is usually carried out using the installation diskettes. Insert the first installation diskette into the drive. Enter the name of the drive including the root directory in the input field of the dialog box.

If you have copied your installation diskettes onto the hard disk, you must enter the corresponding drive name. Also enter the complete path to the individual files.

Browse...

Select "Browse" to select an existing directory in interactive mode. A dialog box corresponding to Fig. 1/6 in Section 1.3.1 is then displayed. Proceed as described there.

Continue...

Select "Continue" to import the defined directory as the source directory for the update installation. The current dialog box is then closed, and the update installation continued.

Cancel

Select "Cancel" if you wish to terminate the installation. The current dialog box is then closed. You will be asked to confirm your intention before the installation is aborted (see Fig. 1/1).

If you have confirmed your selection with "Continue", your inputs will first be checked. A message is output if the installation files cannot be accessed.



Digs014g

Fig. 1/19 Message with missing file "DIGINH.DIR"

OK

Acknowledge the message with "OK". Enter the path via which the installation files can be accessed.

If all required inputs are correct, a dialog box is displayed to permit you to select components.

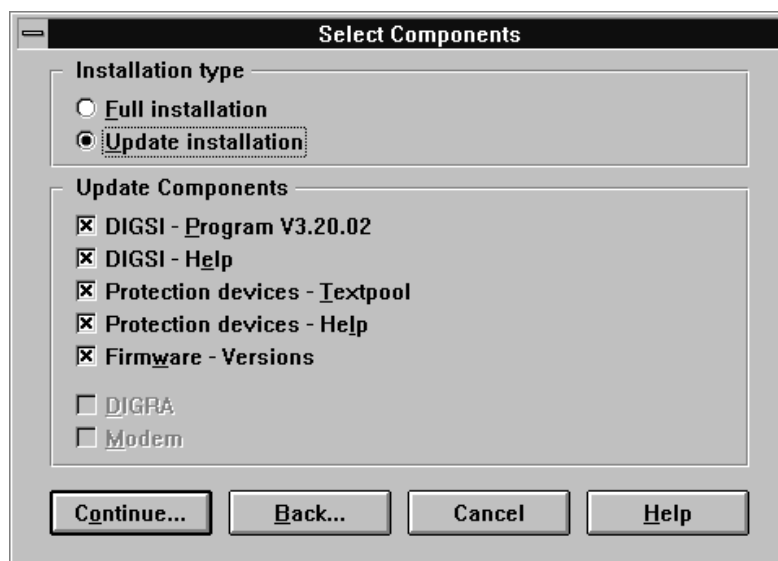


Fig. 1/20 Dialog box "Select components"

Installation type

The selection of the installation type influences the scope of the installation. Select the option "Full installation" if you wish to completely update the existing program version. Select the option "Update installation" if you wish to update individual components of the existing program version.

Update components

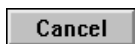
These individual options are available when you select the option "Update installation". Mark the components you wish to update.



Select "Continue" to confirm your selection. The current dialog box is then closed. Depending on your selection, either a further dialog box is then opened or processing of the installation parameters is commenced directly.



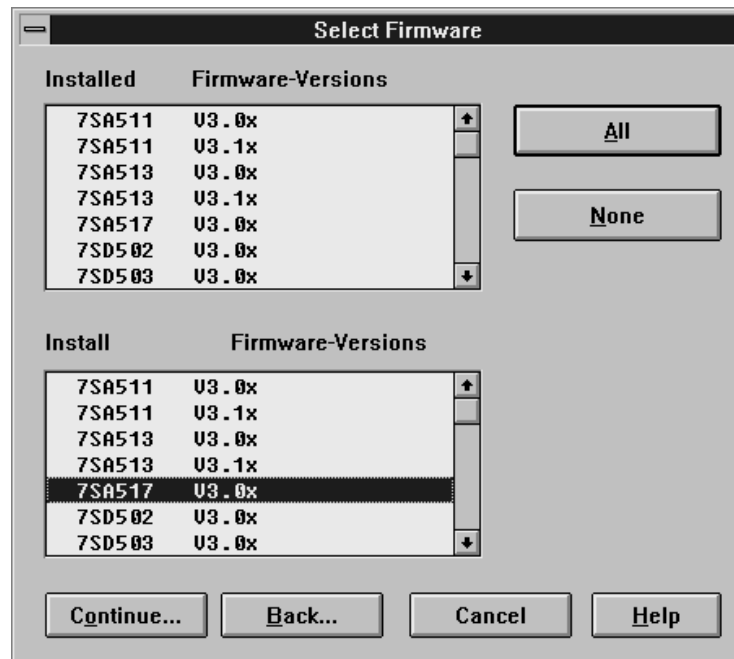
Select "Back" to return to the previous dialog box. The current dialog box is then closed. Your selection is rejected by this action.



Select "Cancel" if you wish to terminate the installation. The current dialog box is then closed. You will be asked to confirm your intention before the installation is aborted (see Fig. 1/1).

A further dialog box is displayed if you have marked the option "Firmware versions" and confirmed your selection with "Continue". This permits you to select the types of protection device to be installed including the firmware versions.

1 Introduction



Digs020g

Fig. 1/21 Dialog box for selection of firmware versions

Installed firmware versions

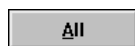
The display field provides a summary of all types of protection device which are already installed together with the associated firmware versions. The entries are sorted alphabetically according to the type of protection device.

Install firmware versions

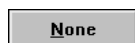
The selection field provides a summary of all additionally available types of protection device with the associated firmware versions. The entries are sorted in the same manner.

Select type of protection device and firmware

In the selection field, mark all device types and firmware versions whose device-specific information components are to be updated.



Select "All" to mark all displayed entries. A previously made individual selection is then rejected.



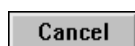
Select "None" to unmark all marked entries. A previously made individual selection is then rejected.



Select "Continue" to accept the marked types of protection device and the firmware versions and to continue with the installation. This button is only active if you have marked at least one firmware version.



Select "Back" to return to the previous dialog box. The current dialog box is then closed. Your selection is rejected by this action.



Select "Cancel" if you wish to terminate the installation. The current dialog box is then closed. You will be asked to confirm your intention before the installation is aborted (see Fig. 1/1).

If you have confirmed your selection with "Continue", a dialog box is displayed to permit you to select help files for types of protection device.



This dialog box is also output if you have only marked the option “Protection devices – Help” in the dialog box shown in Fig. 1/20. The design and operation of the dialog box for selection of the protection device help are comparable to the dialog box shown in Fig. 1/21. It is recommendable to install the associated help for every installed type of protection device.

Further installation is identical to the previously described full installation.

1.4 The DIGSI Help System

Contents DIGSI provides comprehensive online help. The contents of this help extend beyond a simple explanation of the operating functions. The help provides detailed information which can be considered as an extension to this Manual.

Calling You can access the DIGSI help in different manners:

- ⊙ Select the option “Index” in the menu “Help”. A window is displayed which shows all available topics of the online help. Select the desired topic.
- ⊙ Select the button  in the tool bar. A window is displayed which shows all available topics of the online help. Select the desired topic.
- ⊙ You have already opened a dialog box and then select the button “Help” in this box. A window is displayed with a help topic relevant to the context. You can of course also branch from this topic to other topics.
- ⊙ Press the  key. Depending on your current position in the program, you obtain a window with the help index or a topic relevant to the context.



Most dialog boxes have a button for calling the DIGSI help. This will not be referred to further when describing the individual dialog boxes.

A Огфггг аеS Vfd æаггг DIGOI

This chapter describes the various possibilities for starting and terminating DIGSI.

A3 Огфггг DIGOI

With the MS–Windows operating system, programs and possibly also files are represented by specific icons.



The program icon for DIGSI is shown on the left. You will find this icon in the DIGSI program group. Both the program group and the icon are automatically created during the installation of DIGSI.

Double click the icon to start DIGSI. You can alternatively start DIGSI using the option "Run" in the menu "File" of the program manager.



Caution!

You cannot start DIGSI if you have already opened KONVERT or DIDV2V3.

When starting DIGSI for the first time following the installation you will be requested to enter a user password. This user password subsequently permits you to access certain superuser functions. If necessary, you can redefine the password using the option "Modify password" in the extension menu "DIGSI" (see Section 7.3).




Digs024g

Fig. 2/1 Dialog box "Enter user password"

The dialog box in Fig. 2/1 contains two input fields. Both fields are empty. The cursor is positioned in the top input field.

Enter password

Enter a password in the first input field with a maximum length of 20 characters. Upper–case and lower–case letters are interpreted as different characters. A star is displayed for each entered character. Then move to the bottom input field using the  key. Enter the same password here as a check. The user password is only accepted if both inputs are identical.



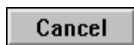
Caution!

The input of a user password is essential! Also note that you must never forget the user password. Access privileges which may have been assigned can only be modified if you know the password!

Starting and terminating DIGSI



Select "OK" to confirm the user password. The current dialog box is then closed.



Select "Cancel" if you do not wish to enter a user password. The current dialog box is then closed, and DIGSI is terminated.

If you have confirmed your input with "OK", the two inputs will be checked to see that they are identical. A message is output if this is not the case.



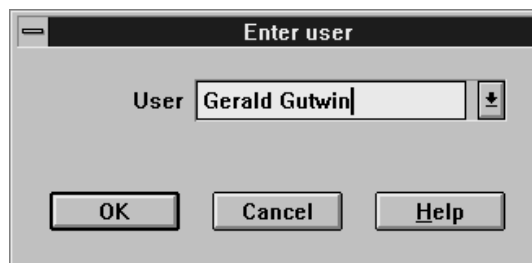
Digs025g

Fig. 2/2 Message with incorrect password input



Select "OK" to acknowledge the message. You then return to the previous dialog box. Enter your user password again, or cancel the procedure.

Following correct input of a user password, a dialog box is displayed for you to enter a user name.



Digs026g

Fig. 2/3 Dialog box "Enter user"

Enter user name

If you have already used the currently installed version, the dialog box displays the name of the last user. Acknowledge this name, or enter a new name. The entered name may have up to 19 characters. Upper-case and lower-case letters are interpreted as different characters. Your name has been stored if you have already worked with DIGSI, and you can select it using a dropdown list.

Starting and terminating DIGSI

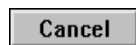


Caution!

The input of a user name is essential! If you cancel this procedure, you also terminate DIGSI.



Select "OK" to confirm the user name. The current dialog box is then closed.



Select "Cancel" if you do not wish to enter a user name. You will be asked to confirm that you really want to terminate DIGSI. See also Section 2.2.

Terminating DIGSI


You can terminate DIGSI in different manners:

Click the box in the top left corner of the title bar. A menu with basic functions is then opened. Select the option "Close".

It is faster to double click the box. The menu is not opened in this case.

Both possibilities are available in both the DIGSI window "Substation management" and the DIGSI window "Dialog". The mentioned procedures only have an effect, however, if no dialog or message boxes are open. You should therefore first close all opened boxes.

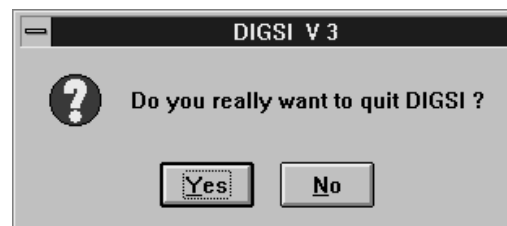
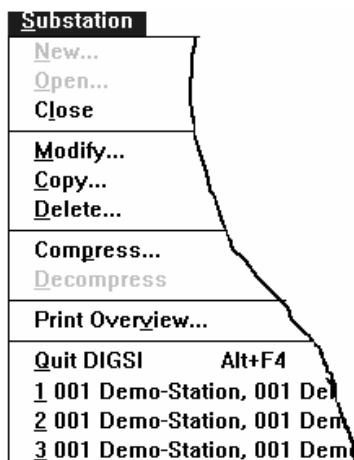


An easy way is to click the button  in the tool bar.

The third possibility for terminating DIGSI is to open the menu "Substation" in the DIGSI window "Substation management". Then select the option "Quit DIGSI".

As an alternative to mouse operations, DIGSI can also be terminated using the key combination **Alt** + **F4**.

All mentioned procedures do not immediately terminate the program. You will always be asked to confirm your intention.



Digs027g

Fig. 2/4 Confirmation of intention to terminate DIGSI



Select "Yes" if you really want to leave the program. The DIGSI window "Substation management" is then closed, and the program terminated. If a modem connection exists, this is first cancelled automatically.



Select "No" if you wish to cancel termination of the program.

3 Windows, Menus and Options

DIGSI provides two types of window as the basis for your processing:

- © **The DIGSI window "Substation management"**
This window is displayed when you call the program and enter a user name.
- © **The DIGSI window "Dialog"**
This window is displayed when you select the menu "Dialog" in the DIGSI window "Substation management".

This chapter describes all elements of the two windows including the tool bar and the structure of their menus.

3.1 The Design of the DIGSI Window "Substation Management"

After calling the program, you automatically access the DIGSI window "Substation management". This window is divided into five areas: title bar, menu bar, tool bar, working area and status bar.

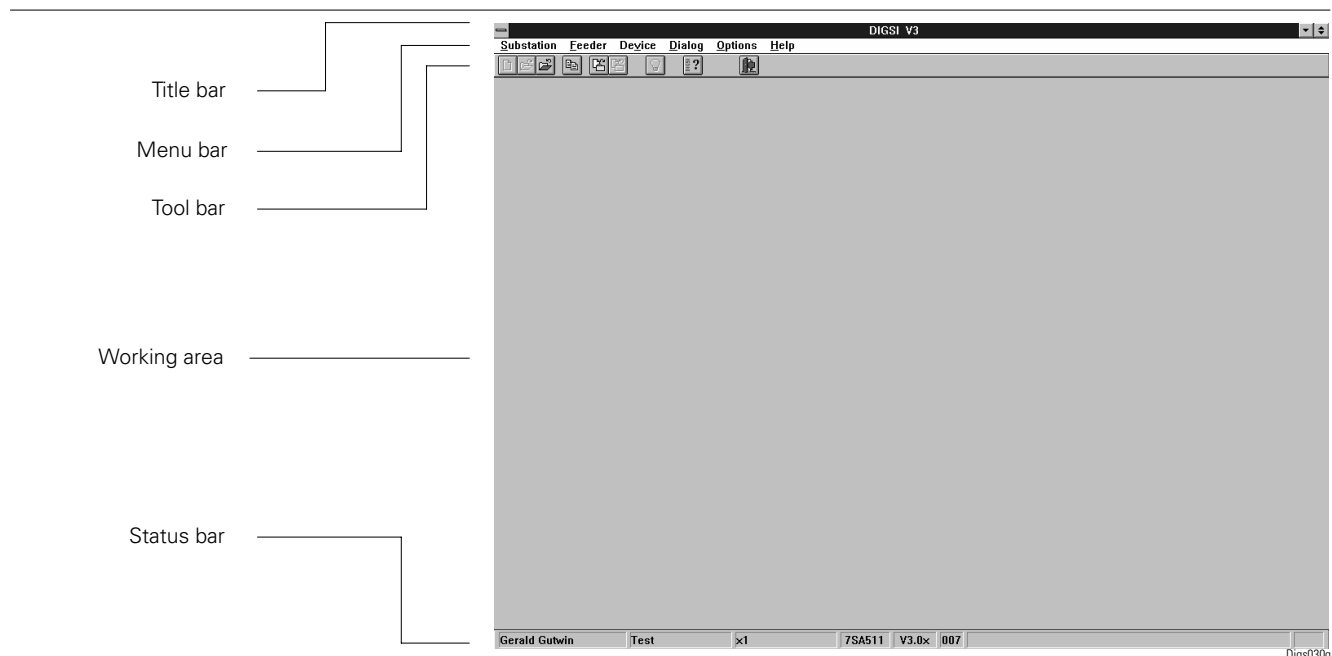


Fig. 3/1 The DIGSI window "Substation management"

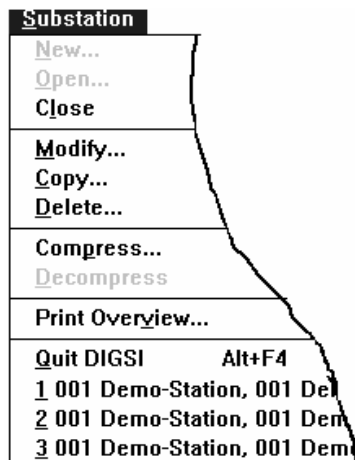
3

Windows, Menus and Options

- Title bar** The top line in the DIGSI window "Substation management" is the title bar. It contains the following elements from left to right:
- ⊙ The button for the menu of basic functions
 - ⊙ The program name including the version number
 - ⊙ The button for reducing the window to symbol size
 - ⊙ The button for changing the window size.
- Menu bar** The menu bar contains all menus required for working in the DIGSI window "Substation management" including their options. All menus and options are described starting at Section 3.1.1.
- Tool bar** The tool bar contains nine buttons providing you with quick access to the most frequently used functions. The tool bar is described in Section 3.3.
- Working area** The working area is the largest part of the screen. It is used to display dialog and message boxes. These can be shifted and positioned as desired within the area.
- Status bar** The bottom line in the DIGSI window "Substation management" is the status line. The following information is displayed in this from left to right:
- ⊙ Name of user
 - ⊙ Name of opened substation
 - ⊙ Name of opened feeder
 - ⊙ Type of selected protection device
 - ⊙ Release version of protection device firmware.
 - If you are working in one of the dialog modes "With protection device direct" or "With protection device via ..." (see Section 5.1.1.2), the release version is output completely, e.g. 3.01.
 - If you are working in the dialog mode "With file" (see Section 5.1.1.1), the last digit of the release version is replaced by an "x", e.g. 3.0x.
 - ⊙ Address of selected protection device

You can obtain additional explanations on the entries in the status line. Position the mouse pointer to one of the entries and click the left mouse button. A box is then displayed with additional information on this entry. The box is closed automatically after a predefined time.

3.1.1 The Menu "Substation"



This menu is directly active when you call the program. It contains all options which support working with substation-specific data:

- ⊙ The creation of new substations, the selection of existing ones, and the closing of opened ones
- ⊙ The editing of substation data using the options "Modify", "Copy" and "Delete".
- ⊙ The archiving of substation data using the options "Compress" and "Decompress".

This menu additionally provides an option for printing a substation overview and for termination the program.

If you select the menu "Substation", you gain access to the following menu options:

- New** Select this option to create a new substation. Select a substation directory using dialog boxes, and define the name, the address and the communication settings of the new substation. This menu option is only active if no other substation is open. See Section 4.1.1.
- Open** Select this menu option to open an existing substation. You can select an existing substation in a substation directory using dialog boxes. This menu option is only active if no other substation is open. See Section 4.1.2.
- Close** Select this menu option to close an open substation. This menu option is only active if a substation is open. See Section 4.1.3.
- Modify** Select this menu option to modify the name, the address and the communication settings of a substation. The modifications are carried out in interactive mode. This menu option is only active if the corresponding substation is open. See Section 4.1.4.
- Copy** Select this menu option to copy the data of one substation into another substation. The copy procedure is carried out in interactive mode. This menu option is only active if the source substation is open. See Section 4.1.5.
- Compress** Select this menu option to save the data of a substation in compressed form in a file. The compress procedure is carried out in interactive mode. This menu option is only active if a substation is open. See Section 4.1.7.1.
- Decompress** Select this menu option to decompress the data of a substation stored in a file. The decompress procedure is carried out in interactive mode. This menu option is only active if no substation is open. See Section 4.1.7.2.

3

Windows, Menus and Options

Delete Select this menu option to delete selected data or all data of a substation. The delete procedure is carried out in interactive mode. This menu option is only active if the corresponding substation is open. See Section 4.1.6.

Print overview Select this menu option to print a substation overview. The preparations for printing are made in interactive mode. This menu option is only active if the corresponding substation is open. See Section 4.1.8.

Quit DIGSI Select this menu option to terminate the program. If a substation is open, it is automatically closed. See Section 2.2.

1 (to 5) The menu "Substation" is automatically extended by the last five opened protection devices including substation and feeder. The display is in the following form:

1 001 Demoanlage, 001 Demoabzweig, 001 7SA511 V3.0x, c:\demoanl			
	Subst. name	Feeder name	Subst. directory
	Subst. address	Feeder address	Release version of prot. device firmware
Consecutive number		Type of prot. device	
		Device address	

Fig. 3/2 Display format for last opened protection devices

Select this option to gain rapid access to protection devices which have already been edited.

3.1.2 The Menu "Feeder"



This menu is initially inactive when the program is called. It only becomes active when you have opened a substation or created a new one using the menu "Substation". It contains all options which support working with feeder-specific data:

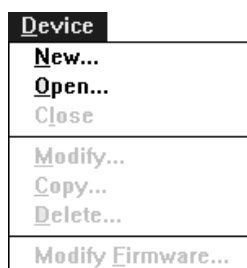
- ⊙ The creation of new feeders, the selection of existing ones, and the closing of opened ones
- ⊙ The editing of feeder data using the options "Modify", "Copy" and "Delete".

If you select the menu "Feeder", you gain access to the following menu options:

New Select this menu option to create a new feeder. Define the name and address of the feeder using a dialog box. This menu option is only active if no other feeder is open. See Section 4.2.1.

- Open** Select this menu option to open an existing feeder. You can select an existing feeder using a dialog box. This menu option is only active if no other feeder is open. See Section 4.2.2.
- Close** Select this menu option to close an open feeder. This menu option is only active if a feeder is open. See Section 4.2.3.
- Modify** Select this menu option to modify the name and address of a feeder. The modifications are carried out in interactive mode. This menu option is only active if the corresponding feeder is open. See Section 4.2.4.
- Copy** Select this menu option to copy the data of a feeder into another feeder of the current substation or a different substation. The copy procedure is carried out in interactive mode. This menu option is only active if the source feeder is open. See Section 4.2.5.
- Delete** Select this menu option to delete selected data or all data of a feeder. The delete procedure is carried out in interactive mode. This menu option is only active if the corresponding feeder is open. See Section 4.2.6.

3.1.3 The Menu "Protection Device"



This menu is initially inactive when the program is called. It only becomes active when you have opened a substation or feeder or created a new substation or feeder using the menus "Substation" and "Feeder". It contains all options which support working with data specific to a protection device:

- ⊙ The addition of new protection devices, the selection of existing ones, and the closing of opened ones
- ⊙ The editing of data specific to a protection device using the options "Modify", "Copy" and "Delete".

This menu additionally provides an option for modifying the firmware version of the opened protection device.

If you select the menu "Protection device", you gain access to the following menu options:

- New** Select this menu option to add a new protection device. Define the name, address and Order No. (ordering code) of the protection device using a dialog box. This menu option is only active if no other protection device is open. See Section 4.3.1.
- Open** Select this menu option to open an existing protection device in interactive mode. This menu option is only active if no other protection device is open. See Section 4.3.2.
- Close** Select this menu option to close an open protection device. This menu option is only active if a protection device is open. See Section 4.3.4.

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Modify Select this menu option to modify the name, address and Order No. of a protection device. The modifications are carried out in interactive mode. This menu option is only active if the corresponding protection device is open. See Section 4.3.5.

Copy Select this menu option to copy the data of a protection device into another protection device of the current substation or a different substation. The copy procedure is carried out in interactive mode. This menu option is only active if the source protection device is open. See Section 4.3.6.

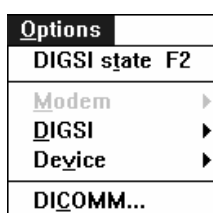
Delete Select this menu option to delete selected data or all data of a protection device. The delete procedure is carried out in interactive mode. This menu option is only active if the corresponding protection device is open. See Section 4.3.7.

Modify firmware Select this menu option to modify the firmware release of a protection device. This menu option is only active if the corresponding protection device is open. See Section 4.3.8.

3.1.4 The Menu "Dialog"

Dialog This menu is active directly when you call the program. It does not contain any further options. The DIGSI window "Dialog" is opened when you select the menu "Dialog". See Sections 3.2 and 5.

3.1.5 The Menu "Options"



The DIGSI operating and analysis software provides a number of possible settings which are combined in the menu "Options". This menu is active directly when you call the program. The settings have effects at the program, file and communication levels. Each of the three menu options "Modem", "DIGSI" and "(protection) Device" branches to an extension menu which provides further menu options. This is indicated by an arrow tip next to each option. If you select the menu "Options", you gain access to the following menu options:

DIGSI status Select this option to obtain information specific to the program and system. This option is always active. See Section 9.1.

Modem Select this menu option to branch to the extension menu "Modem". This option is only active if the program component "Modem functions" has been installed.

DIGSI Select this menu option to branch to the extension menu "DIGSI".

Device Select this menu option to branch to the extension menu "Protection device".

DICOMM Select this menu option to select a DICOMM mode. This option is inactive during the dialog. See Section 6.2.1.

3.1.5.1 Extension Menu "Modem"Office Modem...Connection...Substation Modem...

This extension menu contains options which permit the definition, editing and deletion of modem-specific settings.

If you select the extension menu "Modem" you gain access to the following options:

Office modem

Select this menu option in order to create, modify or delete configurations for office modems. The individual actions are carried out in interactive mode. This option is inactive during the dialog. See Section 6.2.5.

Connection

Select this menu option in order to select a hang up mode for an existing modem connection in interactive mode. You are additionally provided with information on the state of the current connection. This menu option is always active. See Section 6.2.7.

Substation modem

Select this menu option in order to create, modify or delete configurations for substation modems. The individual actions are carried out in interactive mode. This option is always inactive during the dialog. If you are working in the window "Substation management", this option is only active following the input of a user password. See Section 6.2.6.

3.1.5.2 Extension Menu "DIGSI"Request for Modification...User...✓ Password...Change Password...DOS-DIGSI...Access Privilege...

This extension menu contains program- and user-oriented options.

If you select the extension menu "DIGSI" you gain access to the following options:

Request for modification

Select this option to generate or print a description of modification wishes in interactive mode. This menu option is always active. See Section 9.2.

User

Select this option to enter, modify or delete a user name. The individual actions are carried out in interactive mode. This option is inactive during the dialog. See Section 7.1.

Password

Select this option to enter the user password in interactive mode. This option is always active. By entering the user password you activate the option "Access privilege". See Section 7.2.

Change password

Select this option to change the current user password in interactive mode. This option is always active. See Section 7.3.

DOS-DIGSI

Select this option to start the DOS-DIGSI module. This option is inactive during the dialog. See Section 11.1.

Access privilege

Select this option to control the access to individual function components in interactive mode. These components include, for example, protection

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device types or address blocks. This option is only active when you have entered the user password using the option "Password". A further requirement is that you are located in the DIGSI window "Substation management". See Section 7.4.

3.1.5.3 Extension Menu "Protection Device"

I nterface...
R esponse Time...
D elete Device Files...
T ransmit w ith/ w ithout Saving...
M odify baud rate...
C ommand A rchive...
D ate/ T ime...
R eset LEDs
I nitiate F ault Record ...

This extension menu contains protection device-oriented options.

If you select the extension menu "Device" you gain access to the following options":

Interface Select this option to define the communication interface to the protection device and the transmission format in interactive mode. This option is inactive during the dialog. See Section 6.2.8.

Response time Select this option to set the maximum response time of the protection device during message transfer. The desired value is entered in a dialog box. This option is inactive during the dialog. See Section 6.2.9.

Delete device files Select this option to delete selected protection device files. The selection is carried out in interactive mode according to criteria specific to the contents and time. This option is only active during the dialog. See Section 5.8.2.

Transmit with/without saving Select this option to define a basic setting for the transmission of parameters. This option is always active. See Section 5.8.1.

Modify baud rate Select this option to temporarily change the transmission rate of the protection device interfaces. The baud rate is modified in a dialog box. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 6.5.

Command archive Select this option to gain access to the command archive. This function is not currently implemented in the protection devices.

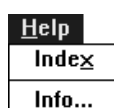
Date/time Select this option to set the date and time in the protection device. The setting is made in a dialog box. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.8.3.

Reset LEDs Select this option to reset the LEDs on the protection device. Resetting is triggered directly when selecting the option. This option is only active

in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.8.4.

Initiate fault record

Select this option to manually trigger a fault record. A fault record length can be entered in interactive mode. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.5.3.

3.1.6 The Menu "Help"

This menu is directly active when you call the program. You gain access to the following options when you select the menu "Help":

Index

Select this option to gain access to the DIGSI help. A window is then displayed showing all available topics of the online help. See Section 1.4.

Info

Select this option to obtain brief information of the current release version of DIGSI.

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3.2 The Design of the DIGSI Window “Dialog”

After selecting the menu “Dialog” in the DIGSI window “Substation management” you access the DIGSI window “Dialog”. The design of this window is identical to that of the DIGSI window “Substation management”.



Fig. 3/3 The DIGSI window “Dialog”

- Title bar** The title bar is identical to that of the DIGSI window “Substation management”.
- Menu bar** The menu structure of the DIGSI window “Dialog” is significantly different to that of the DIGSI window “Substation management”. The two menus “Options” and “Help” are identical, however. These are therefore not described again here.
- Tool bar** The tool bar is identical to that of the DIGSI window “Substation management”. The tool bar is described in Section 3.3.
- Working area** The working area is identical to that of the DIGSI window “Substation management”.
- Status bar** In the dialog mode “With protection device”, the status bar is extended by the following information: the number of incoming spontaneous annunciations is visible at the right-hand edge (see Section 5.4.1).
In the same manner as in the DIGSI window “Substation management”, you also obtain additional information on the entries in the status line. Proceed as described in Section 3.1.

3.2.1 The Menu "Quit"

Quit

This menu is directly active when you select the dialog. It terminates the dialog and does not contain any further options. When selecting the menu "Quit" you return to the DIGSI window "Substation management" when you have confirmed your intention. See Section 5.9.

3.2.2 The Menu "Parameter"

Parameter	
C onfiguration	▶
M arshalling	▶
S ettings	▶
P rotection -> File	
F ile -> Protection	
C ompare Protection <-> File	
A SCII export...	
P rint...	

This menu is directly active when you select the dialog. It comprises all information inputs to the protection device. These information inputs are divided into the following fields: configuration, marshalling and settings.

Each of the three associated menu options branches to an extension menu which provides further options. This is identified by an arrow tip next to each option. In addition, you have direct access to options which have an effect on all parameters of the three subranges.

You gain access to the following options when you select the menu "Parameter":

Configuration

Select this option to branch to the extension menu "Configuration".

Marshalling

Select this option to branch to the extension menu "Marshalling".

Settings

Select this option to branch to the extension menu "Settings".

Protection -> file

Select this option to transmit configuration, marshalling, setting and control parameters together from the protection device into a file. The transfer is carried out when you confirm your intention. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.2.1.2.



Careful!

The parameters in the opened file are overwritten when parameters are transmitted from the protection device!

File -> protection

Select this option to transmit configuration, marshalling, setting and control parameters together from a file into the protection device. The transfer is carried out when you confirm your intention. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.2.1.3.



Careful!

The parameters in the protection device are overwritten when parameters are transmitted from the file!

Compare protection <-> file

Select this option to compare configuration, marshalling, setting and control parameters in the protection device with the corresponding parameters in a file. To achieve this, the parameters are transferred from the protection device to the computer. They are stored there in a temporary memory area. The parameters in both the protection device and the file remain unchanged. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.2.1.4.

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ASCII export Select this option to save configuration, marshalling, setting and control parameters together in a file in ASCII format. The name and the path for the file are entered in a dialog box. This option is active in all dialog modes. See Section 8.1.1.

Print Select this option to print configuration, marshalling, setting and control parameters. The preparations for printing are carried out in dialog mode. This option is active in all dialog modes. See Section 8.2.

3.2.2.1 Extension Menu "Configuration"

<u>E</u> dit...
P rotection -> File
F ile -> P rotection
C ompare Protection <-> File
A SCII export...
P rint...

The adjacent Fig. shows the extension menu "Configuration". This contains options for defining protection and additional functions of the protection device.

The individual options can be used to edit, export and print configuration parameters. The comparison of configuration parameters and a bidirectional transfer between the computer and protection device are also possible.

Edit Select this option to edit configuration parameters. Editing is carried out in several stages in interactive mode. This option is active in all dialog modes. See Section 5.2.1.1.

Protection -> file Select this option to transmit configuration parameters from the protection device into a file. The transfer is carried out when you confirm your intention. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.2.1.2.



Careful! The configuration parameters in the opened file are overwritten when the configuration parameters are transmitted from the protection device!

File -> protection

Select this option to transmit configuration parameters from a file into the protection device. The transfer is carried out when you confirm your intention. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.2.1.3.



Careful! The configuration parameters in the protection device are overwritten when the configuration parameters are transmitted from the file!

Compare protection <-> file

Select this option to compare configuration parameters in the protection device with configuration parameters in a file. To achieve this, the configuration parameters are transferred from the protection device to the computer. They are stored there in a temporary memory area. The configuration parameters in both the protection device and the file remain unchanged. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.2.1.4.

ASCII export Select this option to save configuration parameters in a file in ASCII format. The name and the path for the file are entered in a dialog box. This option is active in all dialog modes. See Section 8.1.1.

Print Select this option to print configuration parameters. The preparations for printing are carried out in dialog mode. This option is active in all dialog modes. See Section 8.2.

3.2.2.2 Extension Menu "Marshalling"

<u>E</u> dit...
P rotection -> File F ile -> Protection C ompare Protection <-> File
A SCII export... P rint...

The adjacent Fig. shows the extension menu "Marshalling". This contains options for assigning the physical inputs and outputs to internal logic states.

The individual options can be used to edit, export and print marshalling parameters. The comparison of marshalling parameters and a bidirectional transfer between the computer and protection device are also possible.

Edit Select this option to edit marshalling parameters. Editing is carried out in several stages in interactive mode. This option is active in all dialog modes. See Section 5.2.1.1.

Protection -> file Select this option to transmit marshalling parameters from the protection device into a file. The transfer is carried out when you confirm your intention. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.2.1.2.



Careful!

The marshalling parameters in the opened file are overwritten when the marshalling parameters are transmitted from the protection device!

File -> protection

Select this option to transmit marshalling parameters from a file into the protection device. The transfer is carried out when you confirm your intention. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.2.1.3.



Careful!

The marshalling parameters in the protection device are overwritten when the marshalling parameters are transmitted from the file!

Compare protection <-> file

Select this option to compare marshalling parameters in the protection device with marshalling parameters in a file. To achieve this, the marshalling parameters are transferred from the protection device to the computer. They are stored there in a temporary memory area. The marshalling parameters in both the protection device and the file remain unchanged. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.2.1.4.

ASCII export

Select this option to save marshalling parameters in a file in ASCII format. The name and the path for the file are entered in a dialog box. This option is active in all dialog modes. See Section 8.1.1.

Print

Select this option to print marshalling parameters. The preparations for printing are carried out in dialog mode. This option is active in all dialog modes. See Section 8.2.

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3.2.2.3 Extension Menu "Settings"

S elect parameter set E dit...
P rotection -> File F ile -> Protection C ompare Protection <-> File
A SCII export... P rint...
Z one characteristics... Q MICRON export...

Select parameter set

The adjacent Fig. shows the extension menu "Settings". This contains options for setting the protection device parameters.

The individual options can be used to edit, export and print setting parameters. The comparison of setting parameters and a bidirectional transfer between the computer and protection device are also possible.

Select this option to select one of up to four parameter sets for editing. The selection is made in a dialog box. This option is only available if the parameter change-over has been activated. See Section 5.2.3.

Edit

Select this option to edit setting parameters. Editing is carried out in several stages in interactive mode. This option is active in all dialog modes. See Section 5.2.1.1.

Protection -> file

Select this option to transmit setting parameters from the protection device into a file. The transfer is carried out when you confirm your intention. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.2.1.2.



Careful!

The setting parameters in the opened file are overwritten when the setting parameters are transmitted from the protection device!

File -> protection

Select this option to transmit setting parameters from a file into the protection device. The transfer is carried out when you confirm your intention. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.2.1.3.



Careful!

The setting parameters in the protection device are overwritten when the setting parameters are transmitted from the file!

Compare protection <-> file

Select this option to compare setting parameters in the protection device with setting parameters in a file. To achieve this, the setting parameters are transferred from the protection device to the computer. They are stored there in a temporary memory area. The setting parameters in both the protection device and the file remain unchanged. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.2.1.4.

ASCII export

Select this option to save setting parameters in a file in ASCII format. The name and the path for the file are entered in a dialog box. This option is active in all dialog modes. See Section 8.1.1.

Print

Select this option to print setting parameters. The preparations for printing are carried out in dialog mode. This option is active in all dialog modes. See Section 8.2.

Zone characteristics

Select this option to obtain a graphic display of the zone characteristics of the distance/impedance protection. This option is only present in the extension menu "Settings". It is always active. See Section 5.7.

OMICRON export Select this option to save parameters in a file in the OMICRON format. The name and the path for the file, as well as the setting of specific parameters, are entered in dialog boxes. This option is only present in the extension menu "Settings". It is active in both dialog modes. See Section 8.1.3.

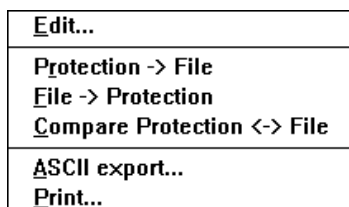
3.2.3 The Menu "Control"



This menu is directly active when you select the dialog. It permits you to gain access to control functions and parameters specific to protection devices and to control circuit breakers.

Device Select this option to branch to the extension menu "Protection device".

Circuit breaker Select this option to obtain the possibility to display and control circuit breakers in interactive mode. This option is only active in dialog modes "With protection device direct" and "With protection device via ..." and only for specific protection devices (e.g. 7SJ531). See Section 5.3.3.



The adjacent Fig. shows the extension menu "Control". This permits you to gain access to control functions and parameters specific to protection devices. Such control functions are for example the editing of parameter sets or the deletion of annunciation memories.

Edit Select this option to edit control parameters or execute control functions. Editing and executing are carried out in several stages in interactive mode. This option is active in all dialog modes. See Section 5.2.1.1.

Protection -> file Select this option to transmit control parameters from the protection device into a file. The transfer is carried out when you confirm your intention. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.2.1.2.



Careful!

The control parameters in the opened file are overwritten when the control parameters are transmitted from the protection device!

File -> protection

Select this option to transmit control parameters from a file into the protection device. The transfer is carried out when you confirm your intention. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.2.1.3.



Careful!

The control parameters in the protection device are overwritten when the control parameters are transmitted from the file!

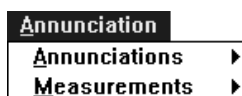
Compare protection <-> file Select this option to compare control parameters in the protection device with control parameters in a file. To achieve this, the control parameters are transferred from the protection device to the computer. They are stored there in a temporary memory area. The control parameters in both the protection device and the file remain unchanged. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.2.1.4.

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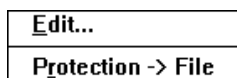
- ASCII export** Select this option to save control parameters in a file in ASCII format. The name and the path for the file are entered in a dialog box. This option is active in all dialog modes. See Section 8.1.1.
- Print** Select this option to print control parameters. The preparations for printing are carried out in dialog mode. This option is active in all dialog modes. See Section 8.2.

3.2.4 The Menu "Annunciation"



This menu is directly active when you select the dialog. It comprises all information outputs of the protection device. These outputs are divided into annunciations and measurements.

Each of the two menu options branches into an extension menu which provides further options. This is identified by an arrow tip next to each option.



The adjacent Fig. shows the extension menus "Annunciations" and "Measurements". The two extension menus are identical.

The shown menu provides options for editing and for the unidirectional transfer of annunciations and measurements.

- Edit** Select this option to display annunciations and measurements and to save them if necessary. Editing is carried out in several steps in interactive mode. This option is active in all dialog modes. See Sections 5.4.1.1 and 5.4.2.1.
- Protection -> file** Select this option to transfer annunciations or measurements from the protection device to the computer. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Sections 5.4.1.2 and 5.4.2.2.

3.2.5 The Menu "Fault"



This menu is directly active when you select the dialog. It handles the transfer of faults from the protection device to the computer and the subsequent display or analysis with the DIGRA program.

- Fault record** Select this option to analyze faults using the DIGRA program. DIGRA is opened following the selection of a fault in interactive mode, and the selected fault is loaded. This option is active in all dialog modes. See Section 5.5.1.
- Protection -> file** Select this option to transfer faults from the protection device to the computer. This option is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.5.2.

3.2.6 The Menu "Test"

Test

This menu is only active in dialog mode "With protection device". It permits you to trigger test functions specific to protection devices. The tests are carried out in several steps in interactive mode. This menu does not contain any further options. See Section 5.6.

3.2.7 The Menu "Options"

The functions of this menu are identical to those of the menu "Options" of the DIGSI window "Substation management". See Section 3.1.5.

3.2.8 The Menu "Help"

The functions of this menu are identical to those of the menu "Help" of the DIGSI window "Substation management". See Section 3.1.6.

3.3 The Tool bar

DIGSI has a tool bar for fast access to frequently used functions. The toolbar has nine buttons. All of the functions that can be activated with these buttons can alternatively be activated by selecting the corresponding menu options.

You can also obtain quick information about an individual button. Position the mouse pointer on the button and keep the left mouse button pressed. A short text describing the meaning of the button then appears in the status bar.



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Fig. 3/4 The DIGSI tool bar



Select this button to create a new substation. Select a substation directory using dialog boxes, and define the name, the address and the communication settings of the new substation. This button is only active if no other substation is open. See Section 4.1.1.



Select this button to open an existing substation. You can select an existing substation in a substation directory using dialog boxes. This button is only active if no other substation is open. See Section 4.1.2.



Select this button to close an open substation. This button is only active if a substation is open. See Section 4.1.3.

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Select this button to copy the data of one substation into another substation. The copy procedure is carried out in interactive mode. This button is only active if the source substation is open. See Section 4.1.5.



Select this button to save the data of a substation in compressed form in a file. The compress procedure is carried out in interactive mode. This button is only active if a substation is open. See Section 4.1.7.1.



Select this button to decompress the data of a substation stored in a file. The decompress procedure is carried out in interactive mode. This button is only active if no substation is open. See Section 4.1.7.2.



Select this button to reset the LEDs on the protection device. Resetting is triggered directly when selecting the button. This button is only active in dialog modes "With protection device direct" and "With protection device via ...". See Section 5.8.4.



Select this button to gain access to the DIGSI help. A window is then displayed showing all available topics of the online help. See Section 1.4.



Select this button to terminate the program. If a substation is open, it is automatically closed. See Section 2.2.

4 Substation Management

DIGSI supports the management of substation-specific data by means of a tree-type structure according to the hierarchy:

Substation → Feeder → Protection device (see Appendix A.1).

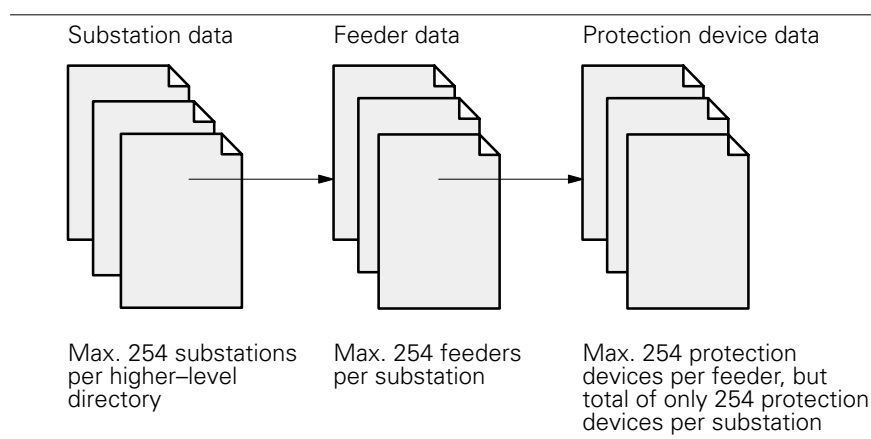


Fig. 4/1 Hierarchy: Substation → Feeder → Protection device

The following sections describe all functions available for the editing of substation, feeder and protection device data.

4.1 Substation-based Functions

The substation is the highest level in the hierarchy referred to above. Each substation is identified by a name and address (see Appendix A.1). DIGSI supports the management of up to 254 substations within a higher-level directory.

4.1.1 Create a New Substation

To create a new substation, select the option "New" in the menu "Substation". A dialog box is then displayed for selection of a directory.

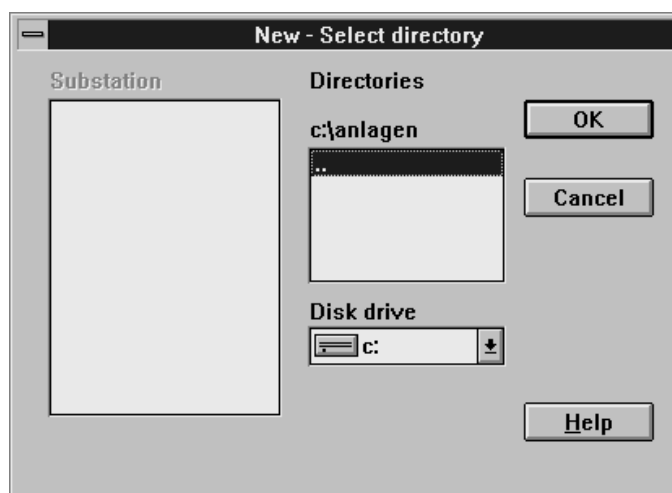


Select directory

As an alternative to the menu option, you can also select the button displayed on the left in the toolbar.

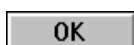
In the basic setting, DIGSI displays the substation directory which was defined last. This also applies to the drive. You can also store your substation in a different directory which already exists. Select the corresponding directory in the selection field "Directories". If the directory is on a different drive, select this using the dropdown list "Disk drive".

4 Substation Management

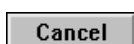


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Fig. 4/2 Dialog box "New – select directory"

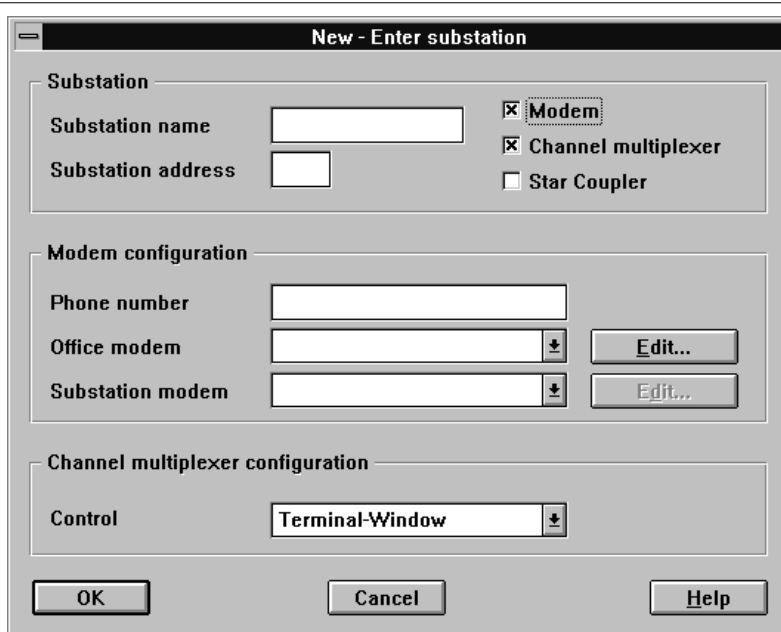


Select "OK" to accept the marked directory. The current dialog box is then closed.



Select "Cancel" if you do not wish to select a directory. The complete operation is aborted. The current dialog box is then closed.

If you have confirmed the selected directory with "OK", a further dialog box is then opened.



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Fig. 4/3 Dialog box "New – enter substation"

Using this second dialog box you can define

- ⊙ the substation name,
- ⊙ the substation address and
- ⊙ various presettings for communication with the protection device.

The dialog box has a number of input and option fields. In the basic setting, all input fields are empty, and the cursor is positioned in the input field "Substation name".

Enter substation name

In the input field "Substation name", enter a name with a maximum length of 15 characters. The substation name should correspond to the name of the real substation for which you subsequently wish to edit data.



Caution!

The name must not yet exist in the selected directory. Upper-case and lower-case letters are interpreted as different characters.

Enter substation address

Position the cursor in the input field "Substation address". Enter an address between 1 and 254. It is not essential for the substation address to be unambiguous. However, it should correspond if possible to the substation address already configured in the protection device.

Enable dialog modes

You must first enable certain dialog modes for the current substation. You can then subsequently work in these modes. The control fields "Modem", "Channel multiplexer" and "Star coupler" are available for this. The associated dialog mode can only be selected prior to starting the dialog if the corresponding control field has been marked.

With protection device via modem

Mark the control field "Modem" in order to enable the dialog mode "With protection device via modem" for the current substation.

With protection device via channel multiplexer

Mark the control field "Channel multiplexer" in order to enable the dialog mode "With protection device via channel multiplexer" for the current substation.

With protection device via star coupler

Mark the control field "Star coupler" in order to enable the dialog mode "With protection device via star coupler" for the current substation.

Define modem configuration

If you wish to communicate with the protection device via modems, you require an office modem and a substation modem. You can save different settings under different modem names for each of these modems (see Section 6.2.5.1 and 6.2.6.1).

Select modem name

Select modem names from the dropdown lists "Office modem" and "Substation modem". The settings saved under these modem names are then loaded into DIGSI. A selection is only possible if the control field "Modem" is marked.

Enter telephone number

Position the cursor in the input field "Phone number". Enter the telephone number under which the substation modem can be dialled. An input is only possible if the control field "Modem" is marked.



Select "Edit" to edit the settings if necessary and to transmit them into the connected modem. Settings for substation modems can only be edited following input of the user password.

4 Substation Management

Select setting for channel multiplexer

If you have marked the control field "Channel multiplexer" you must select a setting for the channel multiplexer!

Select the setting "7XV55" from the dropdown list "Control" if you have connected a channel multiplexer of type 7XV55. The channel multiplexer port is automatically selected in this setting if you have made the standard settings on it (see Appendix A.8.3). Alternatively select the setting "Terminal window" if you are not working with a channel multiplexer of type 7XV55. You must then select the channel multiplexer port manually.

OK

Select "OK" to accept all settings. The current dialog box is then closed.

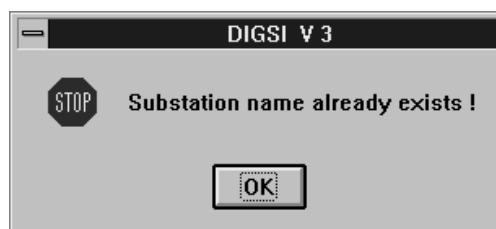
Cancel

Select "Cancel" if you wish to abort the procedure. The current dialog box is then closed.



Caution!

If you have confirmed your inputs with "OK", the substation name will first be checked to see that it is unambiguous. A corresponding message is output if the name already exists.



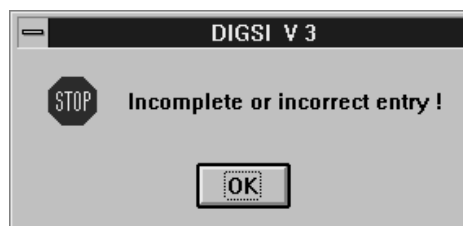
Digs038g

Fig. 4/4 Message if substation name already exists

OK

Acknowledge the message with "OK" to return to the last dialog box. Enter a new substation name or abort the operation.

The address is also checked to see that it is within the permissible range. A corresponding message is output if the range has been violated.



Digs039g

Fig. 4/5 Message if the substation name already exists

OK

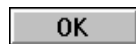
Acknowledge the message with "OK" to return to the last dialog box. Enter a new substation address or abort the operation.

If you have marked at least one of the two control fields "Modem" or "Channel multiplexer", the corresponding inputs are checked for completeness. An appropriate message is output if they are incomplete.



Digs276g

Fig. 4/6 Message if the data for the remote control are incomplete



Acknowledge the message with "OK" to return to the last dialog box. Supplement the missing data.

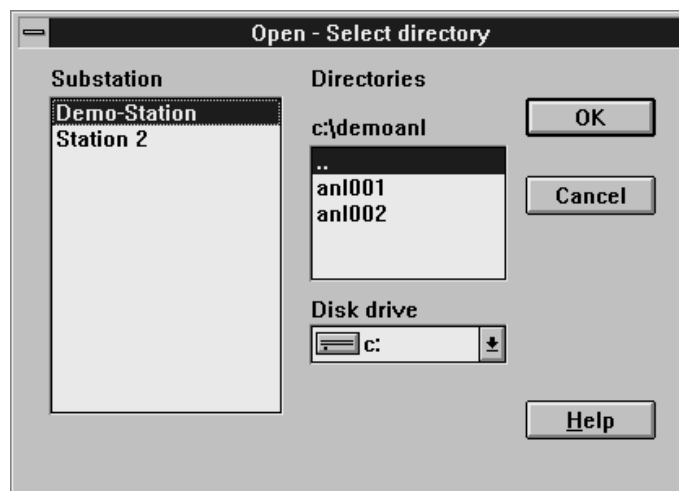
If a substation has been created correctly, a further dialog box is displayed. This requests you to create a feeder. This operation is described in Section 4.2.1.

4.1.2 Select an Existing Substation

To select an existing substation, select the option "Open" in the menu "Substation". A dialog box is then displayed to permit selection of a directory and a substation.



As an alternative to the menu option, you can also select the button displayed on the left in the toolbar.



Digs040g

Fig. 4/7 Dialog box "Open – select directory"

Select directory

As the basic setting, DIGSI displays the last defined substation directory. This also applies to the drive. Your substations can also be stored in a different directory. Select the corresponding directory in the selection field "Directories". If the directory is on a different drive, select this using the dropdown list "Disk drive".

4 Substation Management

The directory "demoanl" has been selected in our example. This directory contains a substation with the name "Demo-Station" if you requested this during the installation.

Select substation

The names of all substations present in the selected directory appear in the selection field "Substation". Mark the desired substation in this selection field.



Caution!

If no substation names are displayed in the selection field "Substation", there are no substations present in the selected directory.

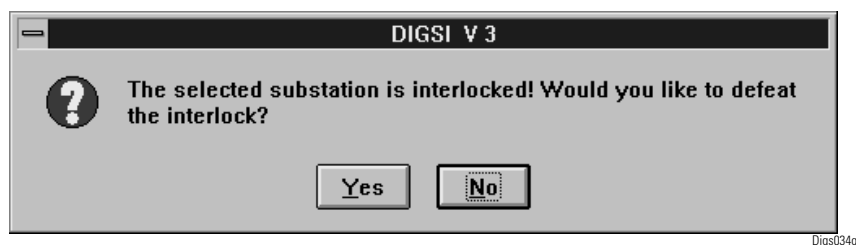
OK

Select "OK" to open the marked substation. The current dialog box is then closed.

Cancel

Select "Cancel" if you do not wish to select a substation. The operation is then aborted, and the current dialog box is closed.

Problems may occur in network operation if several users access the same substation. To prevent this, substations are interlocked for further users once they have been opened. If you wish to open an interlocked substation, you will be asked to confirm your intention.



Digs034g

Fig. 4/8 Message output with interlocked substation

Yes

Select "Yes" if you wish to delete the interlock. The selected substation is then opened.

No

Select "No" if you do not wish to delete the interlock. The selected substation cannot be opened in this case. The operation is then aborted.



Careful!

If several users access a substation simultaneously, the last data save operation carried out is decisive! If you delete the interlock, this may possibly result in data losses.

You will also be asked to confirm your intention as in Fig. 4/8 if DIGSI V 3.1 was terminated during the last session by a system crash.

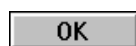
A further dialog box is opened if a substation has been opened and a feeder has already been created for this substation. This dialog box requests you to select a feeder. This operation is described in Section 4.2.2.

A corresponding message is output if no feeders have yet been created for the selected substation.



Digs041g

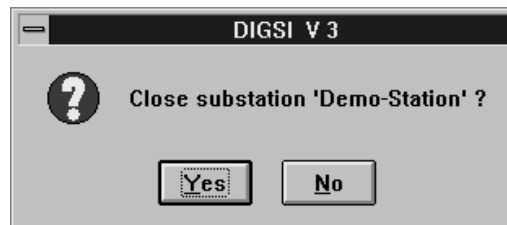
Fig. 4/9 Message if no feeders are present



Acknowledge the message with "OK" and create a new feeder. This operation is described in Section 4.2.1.

4.1.3 Close the Current Substation

To close an open substation, select the option "Close" in the menu "Substation". You will be asked to confirm your intention.



Digs042g

Fig. 4/10 Message output when closing the current substation



Select "Yes" if you really want to close the open substation.



Select "No" if you do not wish to close the substation.

If you have confirmed your intention with "Yes", the current substation is closed together with an open feeder and protection device, if applicable.

4.1.4 Modify Name, Address and Communication Settings of Opened Substation

In order to modify the name, address and communication settings of the opened substation, select the option "Modify" in the menu "Substation". The dialog box "Substation – modify" is then displayed.

The design of this dialog box is identical to the dialog box shown in Fig 4/3. The fields are filled by the current data. In order to modify these data, follow the procedure described in Section 4.1.1.

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4.1.5 Copy Data of Open Substation

You can copy the data of an open substation into another substation. You can select an existing substation, or also a new substation, as the destination substation.

If you wish to copy data into an existing substation, DIGSI first checks to make sure that various basic conditions are fulfilled.

All of the conditions for copying data into an existing substation are summarized in Appendix A.2. Before you copy the data of a substation for the first time, it is important that you should familiarize yourself with these conditions.

To copy the data from the open substation into another substation, select the option "Copy" in the menu "Substation". A dialog box is initially displayed to permit you to select the data types to be copied.



As an alternative to the menu option, you can also select the button displayed on the left in the toolbar.

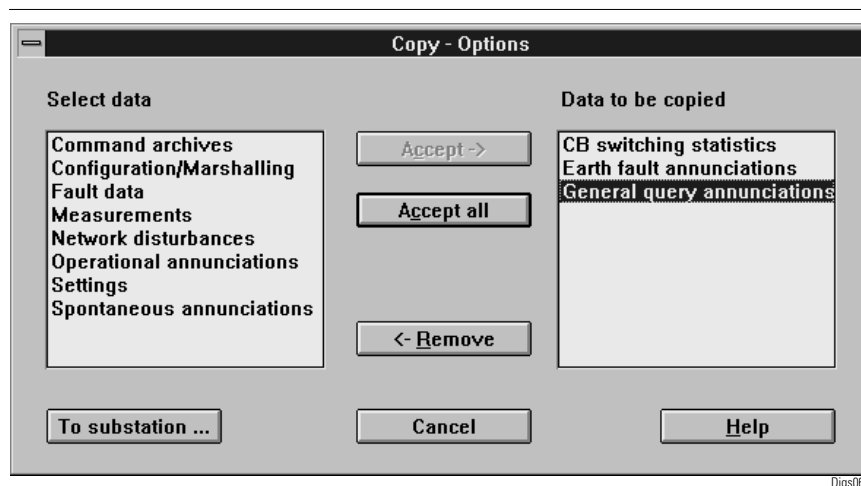
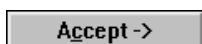


Fig. 4/11 Dialog box "Copy – options"

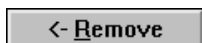
This dialog box permits you to copy different types of data separately. Mark the data types to be copied in the selection field "Select data".



Select "Accept" to transfer the selected data types to the field "Data to be copied". This option is only active if you have marked at least one data type in the selection field "Select data". You can also transfer a single data type to the field "Data to be copied" by double clicking the corresponding entry.



Select "Accept all" to transfer all data types to the field "Data to be copied".



Select "Remove" if you wish to transfer data types marked in the field "Data to be copied" to the field "Select data" again. This option is only active if at least one data type is marked.

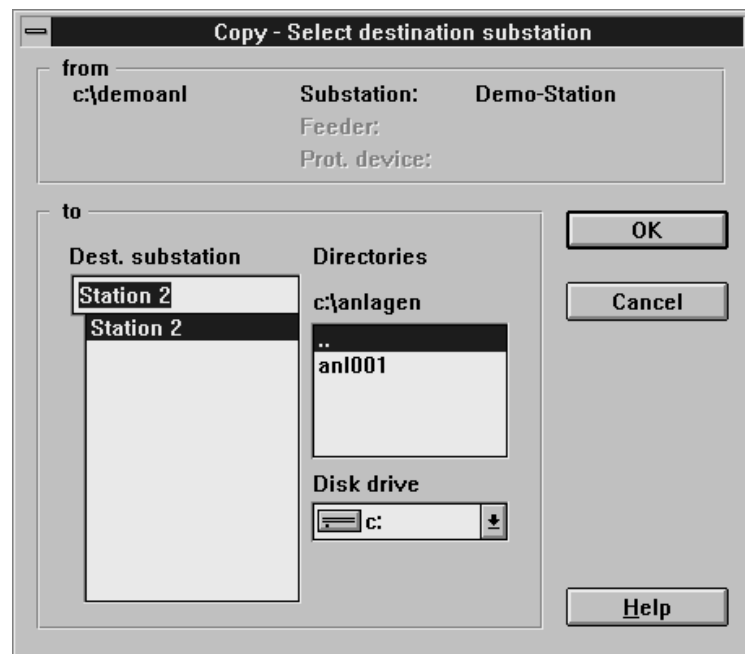
To substation ...

Select "To substation" if you wish to copy the data according to your selection. The current dialog box is then closed, and you branch automatically to a dialog box as shown in Fig. 4/12 for selection of a destination substation.

Cancel

Select "Cancel" if you do not wish to copy any data. The operation is then aborted, and the current dialog box is closed.

If you have confirmed your selection with "To substation", a dialog box is output as in Fig. 4/12. The current drive and the main directory, as well as the names of the source substation, feeder and protection device, are displayed in the top third of this dialog box. Underneath this are the fields "Directories" and "Destination substation".



Digs043g

Fig. 4/12 Dialog box "Copy – select destination substation"

Select directory

In the basic setting, DIGSI displays the root directory of the drive defined during the installation. In the selection field "Directories", select the directory in which the destination substation is stored. If the directory is present on a different drive, select this using the dropdown list "Disk drive".

Select substation

There is an input field at the top edge of the selection field "Substation". You can edit this input field directly. Enter the name of a new substation here. The substation is then created. The data are copied into this new substation.

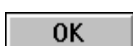
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You can also select an existing substation as the destination for the data to be copied. The names of all substations present in the selected directory appear in the selection field "Destination substation". Mark the desired substation in this selection field. The name of this substation is imported into the input field.

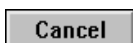


Caution!

As stated in the conditions in Appendix A.2 the names and addresses of the destination substation and the source substation must be identical.



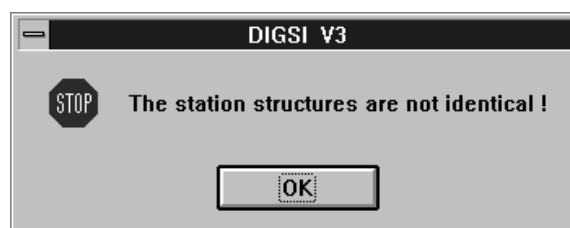
Select "OK" to copy the data into the destination substation. The current dialog box is then closed.



Select "Cancel" if you do not wish to select or create a destination substation. The operation is then aborted, and the current dialog box is closed.

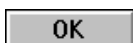
Checking the conditions

If you have confirmed your selection by clicking "OK", DIGSI checks to see whether the conditions described in Appendix A.2 have been fulfilled. If this is not the case, a message is displayed.



Digs141g

Fig. 4/13 Message displayed due to different substation structures

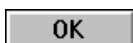


Select "OK" to confirm the message. A further message is then displayed.



Digs142g

Fig. 4/14 Message displayed due to error during Copy operation



Select "OK" to confirm this message as well.

Compare records

Check which of the conditions described in Appendix A.2 have or have not been complied with. Then start the Copy option again.

If all of the conditions have been fulfilled, the Copy operation is started. If data are to be copied into an existing substation, DIGSI compares the records in the source and destination substation during the Copy operation. The comparison is carried out on the basis of date and time, and also on the basis of the fault number in the case of fault data.

If two records are identical according to the comparison criteria, a security prompt is displayed. This allows you to decide whether the record in the destination substation is to be overwritten or not. All other source substation records are appended to the existing records of the destination substation.



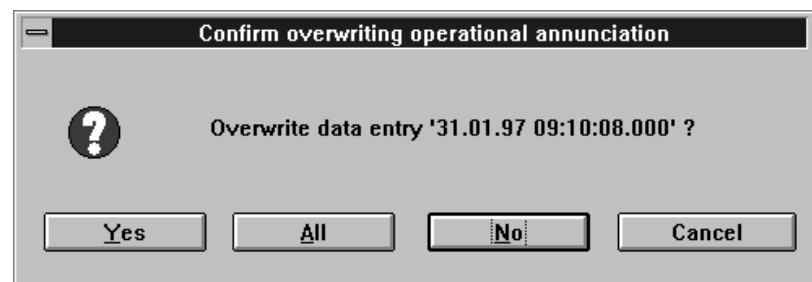
Caution!

If you copy data from protection devices operated with DOS–DIGSI, a security prompt never appears. The records are always stored in new files.



Careful!

Parameterization data are always overwritten, without prior security prompt! This applies for all protection devices!



Digs044g

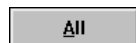
Fig. 4/15 Security prompt before overwriting a record



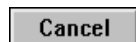
Select "Yes" if the given record is to be copied into the selected destination substation. The original destination substation record is overwritten.



Select "No" if the given record is not to be copied into the selected destination substation. The original destination substation record is preserved.



Select "All" if all records that are identical according to the comparison criteria are to be overwritten. The rest of these records are then overwritten without any prior security prompt.

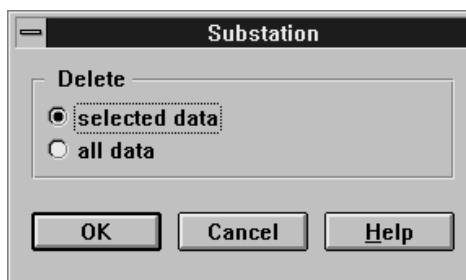


Select "Cancel" if you wish to abort the Copy operation.

4.1.6 Delete Data of Current Substation

In order to delete selected data or all data of the open substation, select the option "Delete" in the menu "Substation". A dialog box is then output to permit you to define the scope of the data to be deleted.

4 Substation Management



Digs045g

Fig. 4/16 Dialog box "Substation"

Selected data Mark this option if you only wish to delete some of the existing data. Once you have confirmed your intention with "OK", the data to be deleted can be selected in a further dialog box

All data Mark this option if you wish to delete all data of the open substation.



Select "OK" to delete the data according to the selected option. The current dialog box is then closed.

The deletion of selected data is described in Section 4.1.6.1. The deletion of all data is described in Section 4.1.6.2.

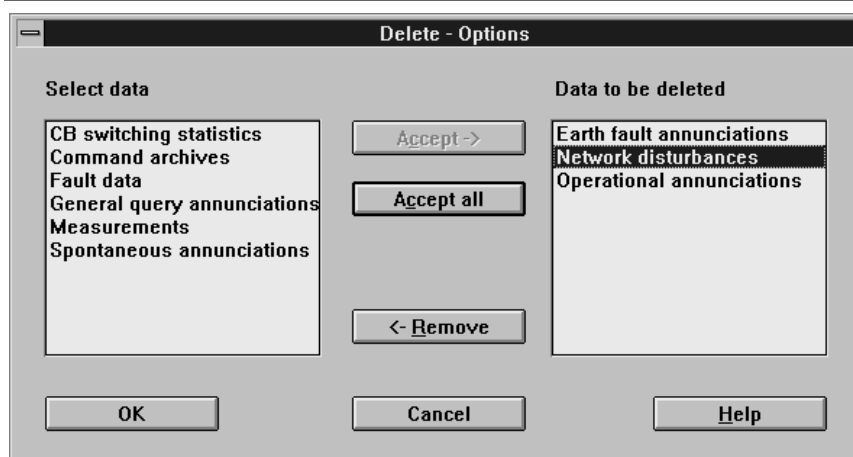


Select "Cancel" if you do not wish to delete any data. The operation is then aborted, and the current dialog box is closed.

4.1.6.1 Delete Selected Data

If you wish to delete selected data, another dialog box is displayed when you have confirmed the previous dialog box with "OK".

This dialog box permits you to delete different types of data separately.



Digs046g

Fig. 4/17 Dialog box "Delete – options"

Mark the data types to be deleted in the selection field "Select data".

Accept ->

Select "Accept" to transfer the selected data types to the field "Data to be deleted". This option is only active if you have marked at least one data type in the selection field "Select data". You can also transfer a single data type to the field "Data to be deleted" by double clicking the corresponding entry.

Accept all

Select "Accept all" to transfer all data types to the field "Data to be deleted".

<- Remove

Select "Remove" if you wish to transfer data types marked in the field "Data to be deleted" to the field "Select data" again. This option is only active if at least one data type is marked.

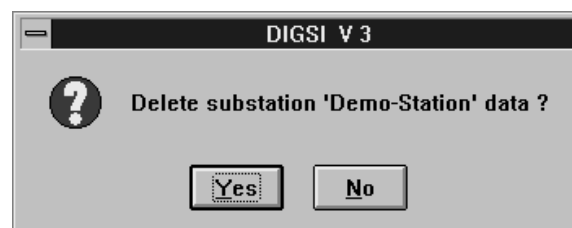
OK

Select "OK" to delete your selected data. The current dialog box is then closed.

Cancel

Select "Cancel" if you do not wish to delete any data. The operation is then aborted, and the current dialog box is closed.

If you have confirmed your selection with "OK", you will again be asked to confirm your intention.



Digs047g

Fig. 4/18 Message output before deleting data

Yes

Select "Yes" in order to delete the selected data. The selected data will then be deleted.

No

Select "No" if you do not wish to delete any data. The operation is then aborted, and you return to the previous dialog box.

4.1.6.2 Delete all Data

If you wish to delete all data, you will again be asked to confirm your intention as in Fig. 4/18 when you have confirmed the dialog box with "OK". Proceed as described there.

4 Substation Management

4.1.7 Archive substation data

DIGSI offers you a comfortable archiving option for substation data. All of the data relating to one substation are compressed and stored in a file. As required, the substation data can be extracted from this file and then processed in their original form again.

4.1.7.1 Compressing substation data

To save the data of a substation in compressed form in a file, the substation in question must be open. Select the "Compress" option in the "Substation" menu. You will see a dialog box where you can enter the file name with path.



As an alternative to the menu option, you can also select the button displayed on the left in the toolbar.

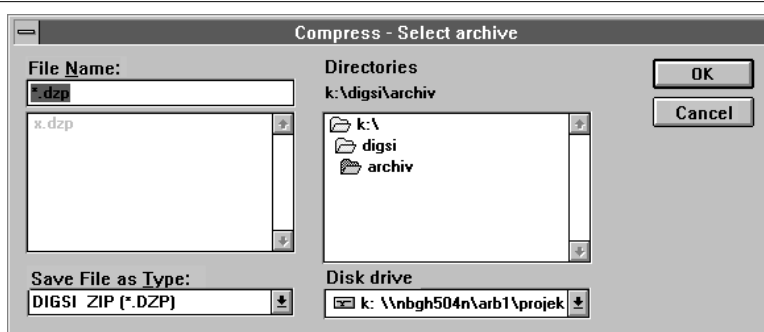


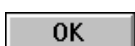
Fig. 4/19 Dialog box "Compress – Select archive"

Select directory

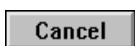
DIGSI shows the contents of the "archive" directory as the default setting. However, your compressed substation data may also be stored in a different directory. Select the appropriate directory in the "Directories" selection field. If the directory is on a different drive, select this drive from the dropdown list "Drive". You can also select a disk drive in order to save the compressed data on removable disks. Depending on the amount of substation data, several disks may be required. You will be asked to insert a new disk as required.

Set File Names

You can enter a new name for the archive in the appropriate input field. Please observe existing DOS conventions. However, you can also select an existing file and overwrite the contents. The file name extension for archives is "dzip".



Select "OK" to save the substation data in compressed form. The current dialog box is closed.



Select "Cancel" wenn die substation data are not to be saved in compressed form. The current dialog box is closed.

A message appears during compression of the substation data.

4.1.7.2 Decompressing substation data

To decompress the data of a substation, no substation may be open. Select the "Decompress" option in the "Substation" menu. A dialog box appears where you can select an archive.



As an alternative to the menu option, you can also select the button displayed on the left in the toolbar.

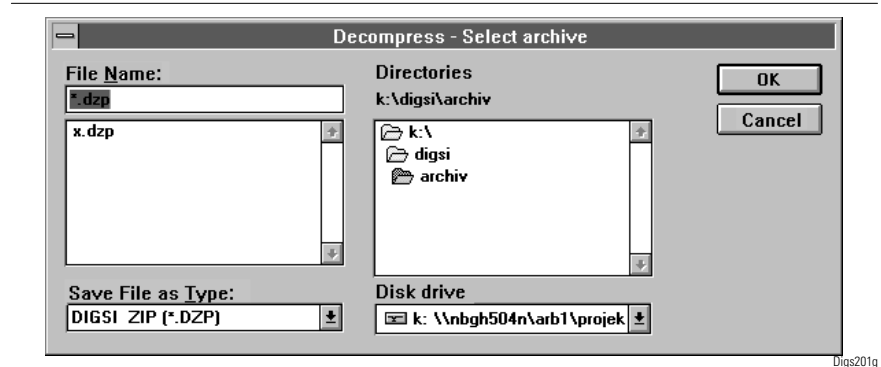


Fig. 4/20 Dialog box "Decompress – Select archive"

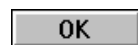
Select directory

DIGSI shows the contents of the "archive" directory as the default setting. You may have saved your archives within a different directory. In this case select the appropriate directory in the selection field "Directories".

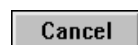
If the directory is on a different drive, select this drive from the dropdown list "Drive". You can also select a disk drive in order to decompress the compressed data to removable disks. If the compressed substation data are on several disks, you will be requested to insert the next disk as required.

Select archive

Highlight the name of an archive in the selection field. The file name extension for archives is ".dzp".



Select "OK" to decompress the substation data of the highlighted file. The current dialog box is closed.



Select "Cancel" if the substation data are not to be decompressed. The current dialog box is closed.

If you have selected "OK", you will see another dialog box. Define a destination directory for the decompressed substation data with the help of this box.



Caution!

Substation data can only ever be decompressed into a new directory. This procedure is necessary to ensure that existing substation data are not overwritten. It is therefore mandatory that a new directory name should be entered.

4 Substation Management

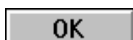


Digs202g

Fig. 4/21 Dialog box "Decompress – Enter destination path"

Select directory

Enter the name of the destination directory in the "New path" input field. This directory can also be a subdirectory of another directory. In this case select the required path in the "Directories" selection field. If the directory is on a different drive, select this drive from the dropdown list "Drive".



Select "OK" to start decompression. The current dialog box is closed.



Select "Cancel" if the substation data are not to be decompressed. The current dialog box is closed.

4.1.8 Print Substation Overview

You can obtain a summary of the current substation configuration using a substation overview. You can also output this overview on a printer or into a file. The substation overview contains information on the current substation including all existing feeders and protection devices.

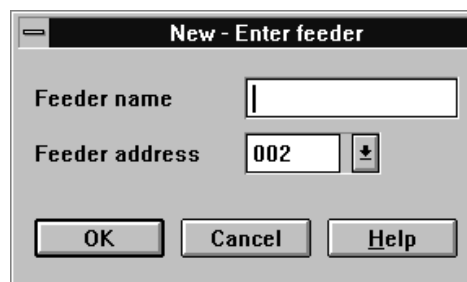
Select the option "Print overview" in the menu "Substation". The dialog box "Print" is then opened. The print functions and associated dialog boxes are described in Section 8.2.

4.2 Feeder-based Data

Underneath the level "Substation", DIGSI expects the definition of a feeder. Each feeder is identified by a name and address (see Appendix A.1). DIGSI supports the management of up to 254 feeders per substation.

4.2.1 Create a New Feeder

To create a new feeder, select the option "New" in the menu "Feeder". A dialog box is then displayed for input of the feeder name and address.



Digs048g

Fig. 4/22 Dialog box "New – enter feeder"

The dialog box has an input field for the feeder name and a dropdown list for selection of the feeder address.

Enter feeder name

The cursor is positioned in the input field "Feeder name". Enter a name with a maximum length of 15 characters.

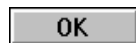
Enter feeder address

Select an address for the feeder from the dropdown list "Feeder address". Only addresses are displayed which have not yet been assigned to other feeders in the current substation. DIGSI suggests the lowest vacant address. You can alternatively manually enter an address between 1 and 254.



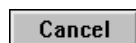
Caution!

The name and address must not yet exist within the selected substation. Upper-case and lower-case letters are interpreted as different characters.



OK

Select "OK" to accept the feeder name and address. The current dialog box is then closed.



Cancel

Select "Cancel" to abort the operation. The current dialog box is then closed.



Caution!

If you have confirmed your inputs with "OK", the feeder name and address will first be checked to see that they are unambiguous. A corresponding message is output if the name or address already exists.

4 Substation Management



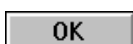
Digs049g

Fig. 4/23 Message if feeder name already exists



Digs050g

Fig. 4/24 Message if feeder address already exists



Acknowledge the message with "OK" to return to the last dialog box. Enter a new feeder name or address, or abort the operation.

If a feeder has been created correctly and is unambiguous, a further dialog box is displayed. This requests you to create a new protection device. This operation is described in Section 4.3.1.

4.2.2 Open an Existing Feeder

To select an existing feeder, select the option "Open" in the menu "Feeder".



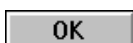
Caution!

The following message is output if a feeder has not yet been created in the current substation:



Digs041g

Fig. 4/25 Message before opening a feeder



Acknowledge the message with "OK" and create a new feeder according to Section 4.2.1.

If a feeder already exists, a dialog box is output as in Fig. 4/26. This is used to select a feeder and a protection device within the feeder.

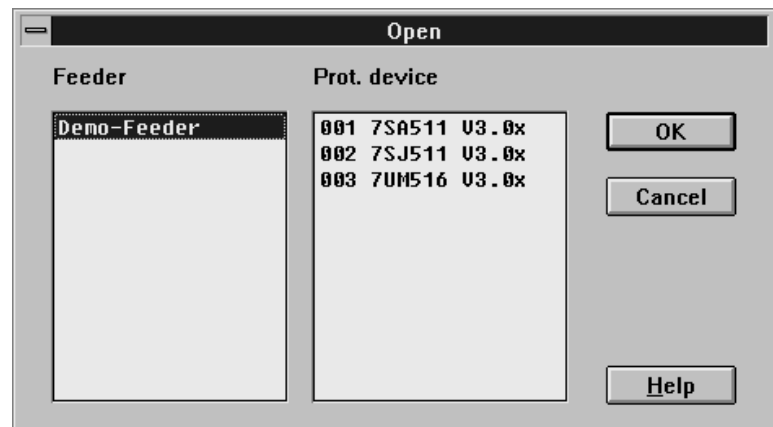


Fig. 4/26 Dialog box for selection of a feeder and protection device

Select feeder

The names of all feeders present in the current substation appear in the selection field "Feeder". Mark the desired feeder in this selection field.



Caution!

The following message is output if no protection devices have yet been created in the selected feeder:



Fig. 4/27 Message if no protection devices are present

OK

Acknowledge the message with "OK" and create a protection device as described in Section 4.3.1.

Select protection device

The dialog box permits you to simultaneously select a protection device. The names of all protection devices present for the selected feeder appear in the selection field "Protection device". Mark the desired protection device in this selection field. The selection of a protection device at this position is optional.

OK

Select "OK" to open the marked feeder or protection device. The current dialog box is then closed.

Cancel

Select "Cancel" if you do not wish to open a feeder. The operation is then aborted, and the current dialog box is closed.

4 Substation Management

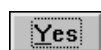
4.2.3 Close the Current Feeder

To close an open feeder, select the option "Close" in the menu "Feeder". You will be asked to confirm your intention.

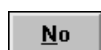


Digs054g

Fig. 4/28 Message output before closing the current feeder



Select "Yes" if you really want to close the open feeder.



Select "No" if you do not wish to close the feeder.

If you have confirmed your intention with "Yes", the current feeder is closed together with an open protection device, if applicable.

4.2.4 Modify Name and Address of Current Feeder

To modify the name and address of the open feeder, select the option "Modify" in the menu "Feeder". A dialog box is then displayed for modification of the feeder name and address.

This dialog box has an identical format to that shown in Fig. 4/22. The fields are preset to the current name and address.

In order to enter a new name and/or address, follow the operations as described in Section 4.2.1.

4.2.5 Copy Data of Open Feeder

The statements already made in the introduction to Section 4.1.5 also apply for copying the data of a feeder. Before you copy the data of a feeder for the first time, you should familiarize yourself with the conditions for copying data. In this context read Appendix A.2.

You can copy the data from the open feeder into another feeder in the same or in a different substation. Select the "Copy" option in the "Feeder" menu. You will first see a dialog box for selecting the data types to be copied.

This dialog box allows you to copy different types of data separately. Its structure and operation correspond to the dialog box in Fig. 4/11 in Section 4.1.5. For this reason, a detailed description of how to proceed is not regarded as necessary.

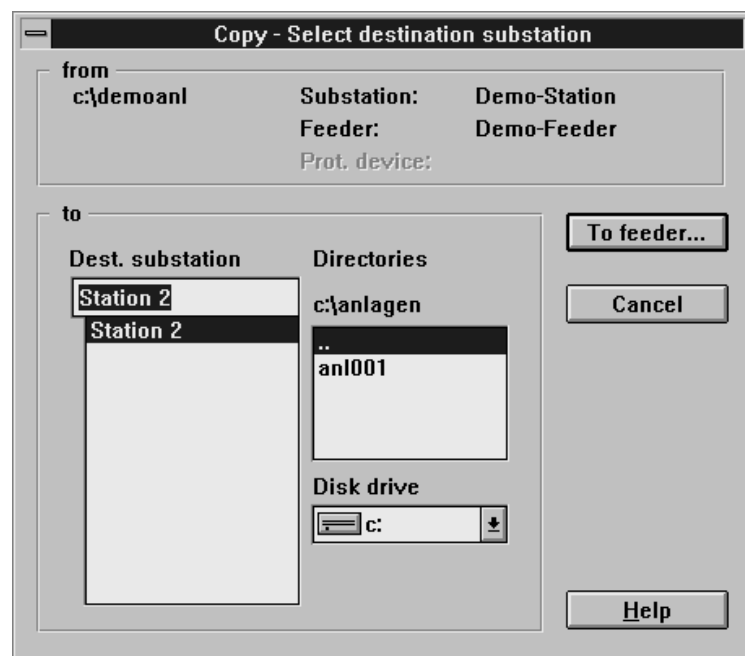
To substation ...

Select "To substation" if you wish to copy the data according to your selection. The current dialog box is then closed, and you branch automatically to a dialog box as shown in Fig. 4/29 for selection of a destination substation.

Cancel

Select "Cancel" if you do not wish to copy any data. The operation is then aborted, and the current dialog box is closed.

If you have confirmed your selection with "To substation", a dialog box is output.



Digs055g

Fig. 4/29 Dialog box "Copy – select destination substation"

The current drive and the main directory, as well as the names of the source substation and feeder, are displayed in the top third of the dialog box. Underneath this are the fields "Directories" and "Destination substation".

Select directory

In the basic setting, DIGSI displays the root directory of the drive defined during the installation. In the selection field "Directories", select the directory in which the destination substation is stored. If the directory is present on a different drive, select this using the dropdown list "Disk drive".

Select substation

There is an input field at the top edge of the selection field "Substation". You can edit this input field directly. Enter the name of a new substation here. The substation is then created. The data are copied into this new substation.

4 Substation Management

You can also select an existing substation as the destination for the data to be copied. The names of all substations present in the selected directory appear in the selection field "Destination substation". Mark the desired substation in this selection field. The name of this substation is imported into the input field.



Caution!

As stated in the conditions in Appendix A.2 the names and addresses of the destination substation and the source substation must be identical.

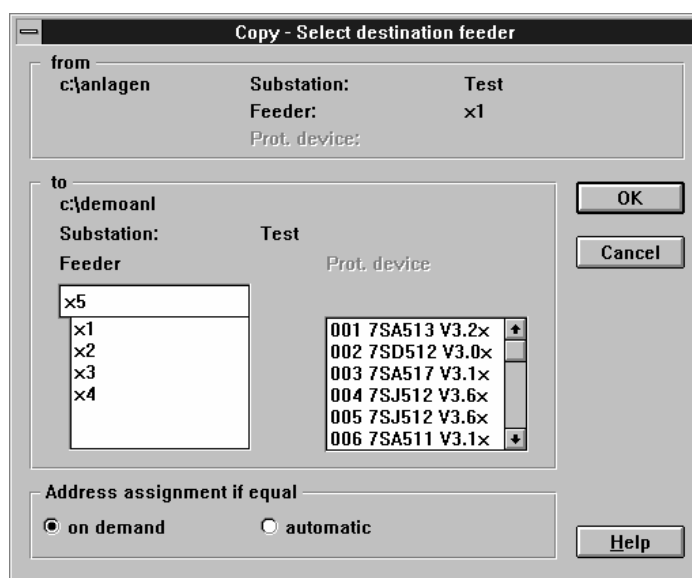
Cancel

Select "Cancel" if you do not wish to select a destination substation. The operation is then aborted, and the current dialog box is closed.

To feeder...

Select "To feeder" to define a feeder as the destination for the data to be copied. The selected destination substation is then accepted, and the dialog box is closed.

A further dialog box is opened to permit selection of a destination feeder.



Digs056g

Fig. 4/30 Dialog box "Copy – select destination feeder"

The current drive and the main directory, as well as the names of the source substation and feeder, are displayed in the top third of the dialog box. Underneath this are the fields "Feeder" and "Protection device".

Select feeder

There is an input field at the top edge of the selection field "Feeder". You can edit this input field directly. Enter the name of a new feeder here. The feeder is then created. The address of the feeder is assigned automatically by DIGSI. The data are copied into this new feeder.

**Caution!**

You can also select an existing feeder as the destination for the data to be copied. The names of all feeders present in the selected substation appear in the selection field "Feeder". Mark the desired feeder in this selection field. The name of this feeder is imported into the input field.

As stated in the conditions in Appendix A.2 the names and addresses of the destination feeder and the source feeder must be identical.

Select option for address assignment

The selection of one of the two options is only relevant if you have defined a new feeder in an existing substation. In this case, a check is then carried out to see whether the address of the source feeder is already in the destination substation. Also the addresses of the protection devices in the source feeder are compared with the addresses of the protection devices in the destination substation. If there are identical addresses, new addresses must be defined. Select the option "on demand" if you would like to set an address manually. Select the option "automatic" if a new address is to be defined automatically by DIGSI.

Display of protection devices

The names of all protection devices present in the selected feeder appear in the field "Protection device". This field is only for display, no selections can be made in it.


 OK

Select "OK" to copy the data of the source feeder into the selected destination feeder. The current dialog box is then closed.


 Cancel

Select "Cancel" if you do not wish to copy any data. The operation is aborted, and the current dialog box is closed.

Checking the conditions

If you have confirmed your selection by clicking "OK", DIGSI checks to see whether the conditions described in Appendix A.2 have been fulfilled. If this is not the case, you will see an appropriate message, as already described in Section 4.2.1. Confirm these messages and check what conditions you have not observed. Then start the Copy option again.

Checking the feeder address

If you have defined a new feeder as the destination feeder, DIGSI checks to see whether the address of the source feeder is already in the destination substation. If this is the case, a new address must be given for the destination feeder. If you have selected the option "automatic" in the dialog box in Fig. 4/30 for address assignment, DIGSI selects the next free feeder address. If, on the other hand, you have selected the option "on demand", you will be shown a dialog box for assigning a new feeder address.

Select feeder address

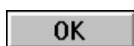
Select an address for the destination feeder from the "New Address" dropdown list. Only addresses that have not been assigned to other feeders in the destination substation are shown. DIGSI suggests the lowest free address. Alternatively, you can enter an address manually in the range from 1 to 254.

4 Substation Management

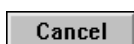


Digs057g

Fig. 4/31 Dialog box "Selecting a new feeder address"



Select "OK" to apply the feeder address. The current dialog box is closed.



Select "Cancel" if the operation is to be aborted. No data are copied. The current dialog box is closed.

Checking the protection device address

Are there any protection devices in the feeder to be copied, their addresses are compared with the addresses of protection devices in the source substation.

When you have confirmed your selection by clicking "OK", the Copy operation is started. The rest of the sequence is identical with that described in Section 4.1.5.

4.2.6 Delete Data of Current Feeder

In order to delete selected data or all data of the open feeder, select the option "Delete" in the menu "Feeder".

The deleting of feeder data is carried out in the same manner as the deleting of substation data (see Section 4.1.6). A further description is therefore omitted here.

4.3 Protection Device–based Data

The protection device is the lowest level in the address hierarchy. Each protection device is identified by a name and address (see Appendix A.1). DIGSI supports the management of several protection devices within a feeder.

4.3.1 Add a New Protection Device

To create a new protection device, select the option “New” in the menu “Protection device”. A dialog box is then displayed for input of the device name, device address, Order No. and channel name.

Digs058g

Fig. 4/32 Dialog box “New – enter protection device”

The dialog box has a selection field for the device name, a dropdown list for the device address, a display field for the ordering code (machine–readable product designation Cat. #) and an input field for the channel name.

Select device name

All available device names are displayed in the selection field. Mark the device name you require.

Select device address

Select an address for the protection device from the dropdown list “Device address”. Only addresses are displayed which have not yet been assigned to other protection devices in the current substation. DIGSI suggests the lowest vacant address. You can alternatively manually enter an address between 1 and 254.

4 Substation Management



Caution! The device address must not yet exist in the selected substation.

Enter channel name

Position the cursor in the input field "Channel". Enter the name of the channel of the channel multiplexer to which the protection device is connected. The name depends on the type and setting of the used channel multiplexer. Please refer to the respective device documentation. An input is only possible if

- ⊙ operation with channel multiplexer has been enabled for the current substation (see Section 4.1.1),
- ⊙ the setting "7XV55" has been selected (see Section 4.1.1) and
- ⊙ the standard settings have been made on the channel multiplexer (see Appendix A.8.3).

Cat. #...

The display field for the ordering code cannot be edited directly. To define the device version, select "Cat #". A dialog box with several dropdown lists is then displayed.

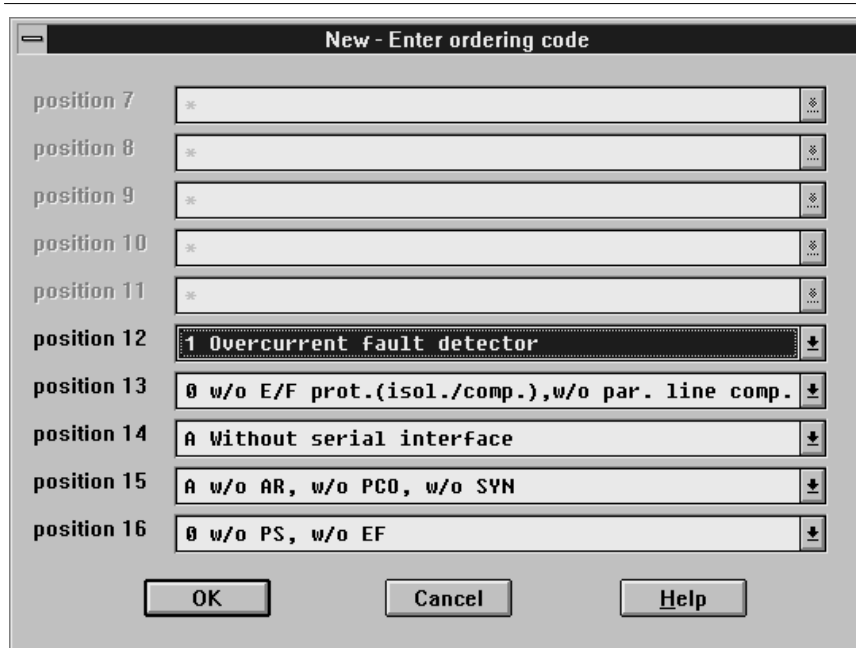
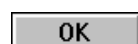


Fig. 4/33 Dialog box "New – enter ordering code"

Certain positions of the ordering code are set to question marks in the basic setting depending on the protection device. In order to define the version of the protection device in DIGSI, alphanumeric characters must be assigned to these dummy values.

Definition of ordering code

Only those dropdown lists are active which are relevant to the respective protection device. Define the device version in DIGSI using these dropdown lists, and thus the ordering code.

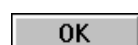


Select "OK" to accept the selected ordering code into the display field of the ordering code. The current dialog box is then closed, and you return to the previous one.

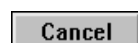


Select "Cancel" to reject the selected ordering code. The current dialog box is then closed, and you return to the previous one.

If you have confirmed your selection with "OK", the ordering code in the dialog box in Fig. 4/32 is updated.



Select "OK" to accept the device name and address as well as the ordering code. The current dialog box is then closed.



Select "Cancel" to abort the operation. The current dialog box is then closed.



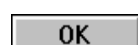
Caution!

If you have confirmed your inputs with "OK", the device address will first be checked to see that it is unambiguous. A corresponding message is output if the address already exists.



Digs050g

Fig. 4/34 Message when adding a protection device



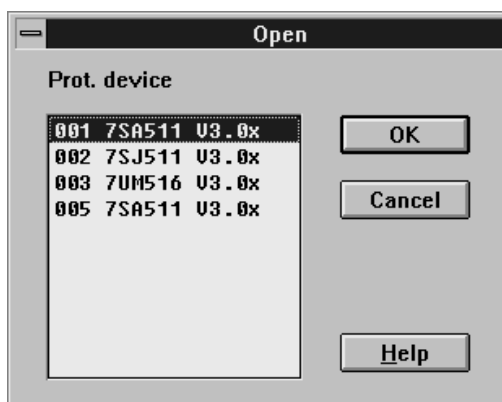
Acknowledge the message with "OK" to return to the last dialog box. Enter a new device address or abort the operation.

The address is also checked to see that it is within the permissible range. A message as in Fig. 4/5 is output if the range has been violated or if your inputs are incomplete. Proceed as described there.

4.3.2 Select an Existing Protection Device

To select an existing protection device, select the option "Open" in the menu "Protection device". A dialog box as in Fig. 4/35 is displayed if a protection device already exists. This permits you to select a protection device.

4 Substation Management

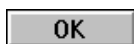


Digs062

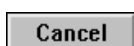
Fig. 4/35 Dialog box for selection of a protection device

Select protection device

The names of all protection devices present in the current feeder appear in the selection field "Protection device". The device address is displayed before each protection device. Mark the desired protection device in this selection field.



Select "OK" to open the marked protection device. The current dialog box is then closed.



Select "Cancel" if you do not wish to open a protection device. The operation is then aborted, and the current dialog box is closed.



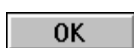
Caution!

The following message is output if no protection devices have yet been created in the current feeder:



Digs053g

Fig. 4/36 Message if no protection devices are present



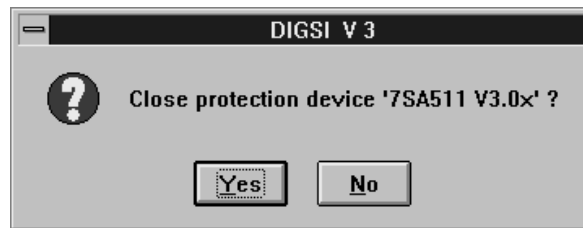
Acknowledge the message with "OK" and create a new protection device as described in Section 4.3.1.

4.3.3 Call the Last Open Protection Devices

An alternative to the procedure described in Section 4.3.2 is to call a protection device. In the menu "Substation", DIGSI offers the last five open protection devices including substation and feeder. When selecting one of these dynamic options, the associated protection device including substation and feeder is opened.

4.3.4 Close the Current Protection Device

To close an open protection device, select the option "Close" in the menu "Protection device". You will be asked to confirm your intention.



Digs063g

Fig. 4/37 Message output before closing a protection device



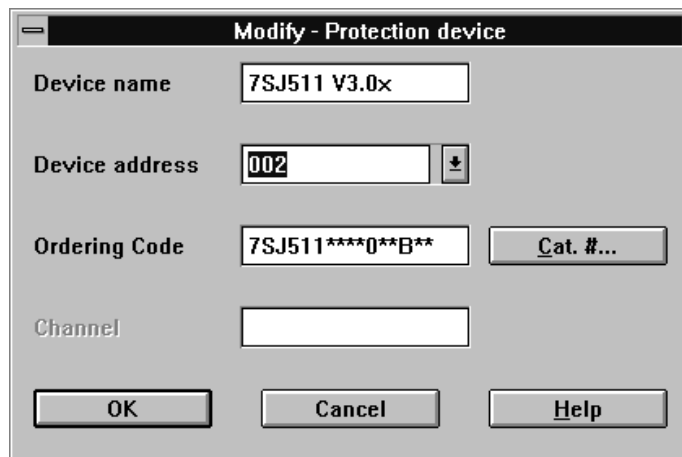
Select "Yes" if you really want to close the open protection device.



Select "No" if you do not wish to close the protection device.

4.3.5 Modify Name and Address of Current Protection Device

To modify the address and ordering code of the open protection device, select the option "Modify" in the menu "Protection device". A dialog box is then displayed for modification of the protection device data.



Digs061g

Fig. 4/38 Dialog box "Modify – protection device"

The fields of the dialog box show the current device data. In order to modify the current data, follow the procedure described in Section 4.3.1.

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4.3.6 Copy Data of Current Protection Device

The statements already made in the introduction to Section 4.1.5 also apply for copying the data of a protection device. Before you copy the data of a protection device for the first time, you should familiarize yourself with the conditions for copying data. In this context read Appendix A.2.

You can copy the data of the open protection device into another protection device. The destination device can be in a different feeder of the same or of a different substation. Select the "Copy" option in the "Protection Device" menu. You will first see a dialog box for selecting the data types to be copied.

This dialog box allows you to copy different types of data separately. Its structure and operation correspond to the dialog box in Fig. 4/11 in Section 4.1.5. For this reason, a detailed description of how to proceed is not regarded as necessary.

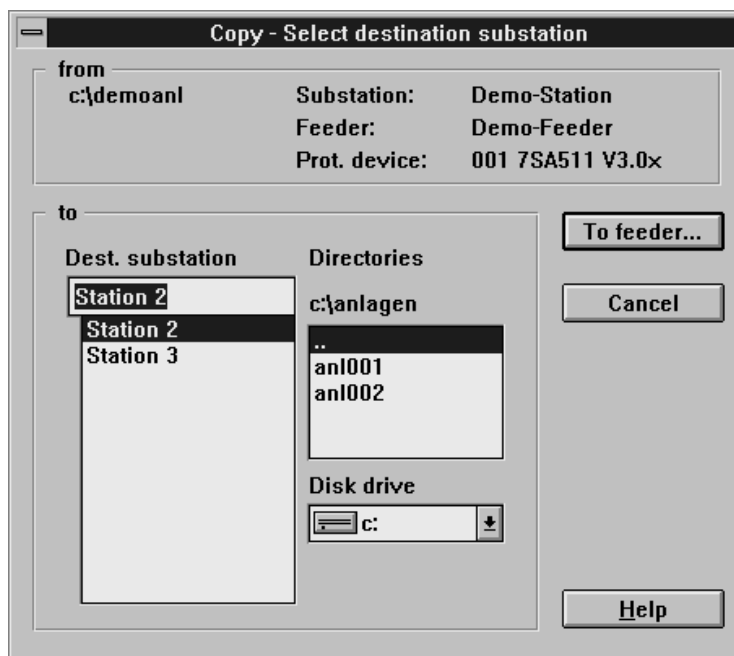
To substation ...

Select "To substation" if you wish to copy the data according to your selection. The current dialog box is then closed, and you branch automatically to a dialog box as shown in Fig. 4/39 for selection of a destination substation.

Cancel

Select "Cancel" if you do not wish to copy any data. The operation is then aborted, and the current dialog box is closed.

If you have confirmed your selection with "To substation", a dialog box is output as in Fig. 4/39.



Digs065g

Fig. 4/39 Dialog box "Copy – select destination substation"

The current drive and the main directory, as well as the names of the source substation, feeder and protection device, are displayed in the top third of this dialog box. Underneath this are the fields "Directories" and "Destination substation".

Select directory

In the basic setting, DIGSI displays the root directory of the drive defined during the installation. In the selection field "Directories", select the directory in which the destination substation is stored. If the directory is present on a different drive, select this using the dropdown list "Disk drive".

Select substation

There is an input field at the top edge of the selection field "Substation". You can edit this input field directly. Enter the name of a new substation here. The substation is then created. The data are copied into this new substation.

You can also select an existing substation as the destination for the data to be copied. The names of all substations present in the selected directory appear in the selection field "Destination substation". Mark the desired substation in this selection field. The name of this substation is imported into the input field.

**Caution!**

As stated in the conditions in Appendix A.2 the names and addresses of the destination substation and the source substation must be identical.

Cancel

Select "Cancel" if you do not wish to select a destination substation. The operation is then aborted, and the current dialog box is closed.

To feeder...

Select "To feeder" to define a feeder as the destination for the data to be copied. The selected destination substation is then accepted, and the dialog box is closed.

A further dialog box is opened to permit selection of a destination feeder and destination protection device (see Fig. 4/40).

The current drive and the main directory, as well as the names of the source substation, feeder and protection device, are displayed in the top third of the dialog box. Underneath this are the fields "Feeder" and "Protection device".

Select feeder

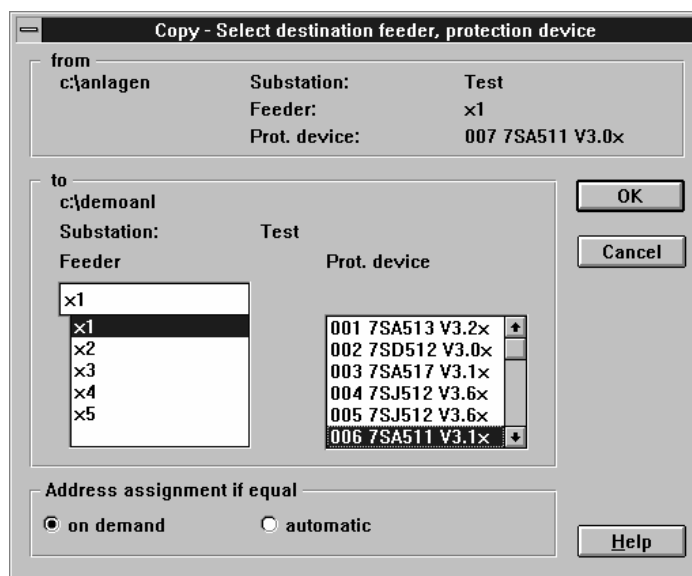
There is an input field at the top edge of the selection field "Feeder". You can edit this input field directly. Enter the name of a new feeder here. The feeder is then created. The address of the feeder is assigned automatically by DIGSI. The data are copied into this new feeder.

You can also select an existing feeder as the destination for the data to be copied. The names of all feeders present in the selected substation appear in the selection field "Feeder". Mark the desired feeder in this selection field. The name of this feeder is imported into the input field.

**Caution!**

As stated in the conditions in Appendix A.2 the names and addresses of the destination feeder and the source feeder must be identical.

4 Substation Management



Digs066g

Fig. 4/40 Dialog box "Copy – select destination feeder, protection device"

Select protection device

The names of all protection devices present in the selected feeder appear in the field "Protection device". Mark the desired protection device in this selection field. The name of the protection device is transferred to the display field at the top of the selection field.



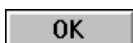
Caution!

As stated in the conditions in Appendix A.2 the firmware and address of the destination protection device and the source device must be identical.

In the case of a new feeder, a protection device type is generated in it according to the source protection device. The address of the protection device is assigned automatically by DIGSI.

Select option for address assignment

The selection of one of the two options is only relevant if you have defined a new protection device in an existing substation. In this case, a check is then carried out to see whether the address of the source device is already in the destination substation. If so, a new address must be defined. Select the option "on demand" if you would like to set an address manually. Select the option "automatic" if a new address is to be defined automatically by DIGSI.



Select "OK" to copy the data of the source protection device into the selected destination device. The current dialog box is then closed.



Select "Cancel" if you do not wish to copy any data. The operation is aborted, and the current dialog box is closed.

Check the conditions

If you have confirmed your selection by clicking "OK", DIGSI checks to see whether the conditions described in Appendix A.2 have been fulfilled. If this is not the case, you will see an appropriate message, as already described in Section 4.2.1. Confirm these messages and check what conditions you have not observed. Then start the Copy operation again.

Check the feeder address

If you have defined a new destination device in an existing substation, DIGSI checks to see whether the address of the protection device is already in the destination substation. If this is the case, a new address must be defined. If you have selected the option "automatic" in the dialog box in Fig. 4/40 for address assignment, DIGSI automatically selects a new address. If you have selected the option "on demand", you must carry out the necessary address assignment with the help of a dialog. How to proceed is described in Section 4.2.5.

If all of the conditions have been fulfilled, the Copy operation is started. The rest of the sequence is identical with that described in Section 4.1.5.

4.3.7 Delete Data of Current Protection Device

In order to delete selected data or all data of the open protection device, select the option "Delete" in the menu "Protection device".

The deleting of protection device data is carried out in the same manner as the deleting of substation data (see Section 4.1.6). A further description is therefore omitted here.

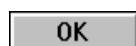
4.3.8 Modifying the Firmware

In order to adapt the release version to a later version, select the option "Modify firmware" in the menu "Protection device". The current version can only be modified if a later version is available. A corresponding message is output if this is not the case.



Digs073g

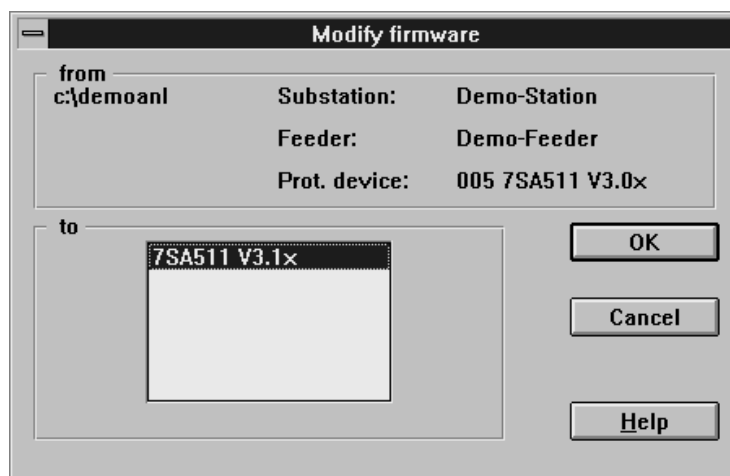
Fig. 4/41 Message if a firmware modification is not possible



Acknowledge the message with "OK". The release version of the firmware cannot be modified.

If at least one later version is available, a dialog box is output to permit a selection.

4 Substation Management



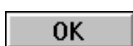
Digs068g

Fig. 4/42 Dialog box "Modify firmware"

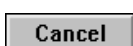
The current drive and the main directory are displayed in the top third of the dialog box. To the right is information on the substation and feeder names as well as the current type of protection device including firmware version. Underneath this is a selection field showing all available firmware versions.

Select firmware version

In the selection field, mark the firmware version into which the current version is to be converted.

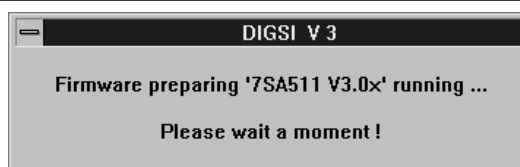


Select "OK" to accept the marked firmware version. The current dialog box is then closed.



Select "Cancel" if you do not wish to modify the current firmware version. The operation is then aborted, and the current dialog box is closed.

A message is output if you have confirmed your selection with "OK".



Digs069g

Fig. 4/43 Message output while preparing firmware

A comparison of parameters between the old and new firmware is carried out during the preparation.

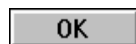


Fig. 4/44 Dialog box "Modify firmware <Protection device type>"

The dialog box shows those parameters which are not present either in the old or the new firmware.



Select "Print" to output the displayed differences on a printer or into a file. Printer functions and associated dialog boxes are described in Section 8.2.



Select "OK" to modify the firmware of the protection device. The current dialog box is then closed.



Select "Cancel" if you do not wish to modify the firmware. The operation is then aborted, and the dialog box is closed.



Fig. 4/45 Message for confirmation of intention before modifying the firmware



Select "Yes" to finally accept the new firmware. The original protection device data are then overwritten.



Select "No" if you do not wish to assign a new firmware version to the protection device. The operation is then aborted.

The following message is output if you have confirmed your intention with "Yes".

4

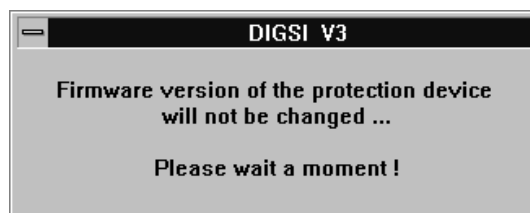
Substation Management



Digs072g

Fig. 4/46 Message output during modification of firmware version

The following message is output if you have confirmed your intention with "No".



Digs088g

Fig. 4/47 Message output if the firmware version is not modified

5 Dialog

The dialog in DIGSI integrates the following topics:

- ⊙ Parameterization: configuration, marshalling and settings
- ⊙ Control
- ⊙ Annunciations and measurements
- ⊙ Fault processing
- ⊙ Test.

5.1 Starting the Dialog

To start the dialog, select the menu "Dialog" in the DIGSI window "Substation management". Following selection of the dialog mode in interactive mode you gain access to the DIGSI window "Dialog". The DOS–DIGSI module may be opened depending on the currently open protection device.

5.1.1 Selection of Dialog Mode

DIGSI differentiates between three dialog modes:

- ⊙ With file
- ⊙ With protection device direct
- ⊙ With protection device via modem, channel multiplexer and/or star coupler.

With file In dialog mode "With file" you do not require a connection to the protection device. You can

- ⊙ Edit configuration, marshalling and setting parameters
- ⊙ Edit control parameters
- ⊙ Initiate fault processing.

With protection device In dialog modes "With protection device direct" and "With protection device via" you communicate with a connected protection device. In these modes you can

- ⊙ Edit configuration, marshalling and setting parameters
- ⊙ Edit control parameters
- ⊙ Transmit all types of parameters directly or from a file into the protection device
- ⊙ Transmit all types of parameters from the protection device into a file
- ⊙ Compare all types of parameters in a file with those in the protection device
- ⊙ Use control functions
- ⊙ Read out annunciations and measurements from the protection device

5 Dialog

- Ⓞ Initiate fault processing
- Ⓞ Carry out tests.



Digs075g

Fig. 5/1 Dialog box "Dialog"

Select dialog mode

You can use the dialog box "Dialog" to define a dialog mode for the current dialog.

With file

Select the option "With file" in order to work without a connected protection device.

With protection device direct

Select the option "With protection device direct" in order to communicate with a protection device which has a direct physical connection to the computer.

With protection device via

Select the option "With protection device via ..." in order to communicate with a protection device which is connected to the computer via modems, channel multiplexer and/or star coupler. Mark at least one of the three available control fields in addition. A control field can only be marked if the associated equipment for the opened substation has been enabled (see Section 4.1.1).

OK

Select "OK" to carry out the dialog with the selected dialog mode. The current dialog box is then closed, and the dialog initiated.

Cancel

Select "Cancel" if you do not wish to continue the dialog. The current dialog box is then closed.

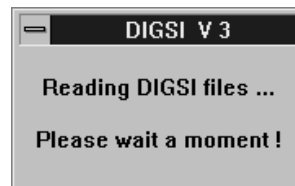


Caution!

The selected dialog mode can no longer be modified during the dialog. In order to modify the dialog mode you must terminate the dialog and subsequently restart it.

5.1.1.1 Editing in Dialog Mode "With File"

The required files are read in if you have acknowledged the dialog mode "With file" in the dialog box in Fig. 5/1. A corresponding message is displayed.



Digs085g

Fig. 5/2 Message displayed when reading in files

The DIGSI window "Dialog" is opened following successful transmission of the files.

5.1.1.2 Editing in one of Dialog Modes "With Protection Device ..."

A dialog in mode "With protection device direct" is possible with or without a substation. A check is therefore first carried out to see whether a substation is open.

Dialog without substation

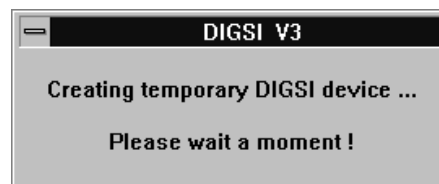
DIGSI permits you to carry out a dialog without an open substation. You can then directly exchange information with a protection device without having prepared corresponding files (substation, feeder etc.).

DIGSI creates temporary substations for this type of dialog. These substations are saved in the DIGSI root directory in the following form:

...\ANLnnn\ABZxxx\GERxxx

The lowest substation number which is still unused is assigned to the dummy value "nnn". DIGSI creates a maximum of five temporary substations simultaneously and subsequently overwrites the existing ones.

A corresponding message is displayed whilst a temporary substation is being created.



Digs076g

Fig. 5/3 Message displayed during creation of temporary substations

Once a temporary substation has been created, the further procedure is identical to a dialog with substation.

5 Dialog

Dialog with substation A connection to the protection device is initially established. The establishment of the connection depends on the dialog mode and additional equipment such as modems, channel multiplexer and star coupler. You can find an exact description of all procedures when establishing a connection in Section 6.

5.1.2 Automatic Start of DOS-DIGSI

If you have opened a protection device according to the ASCII standard, the DOS-DIGSI module is automatically started for further editing. You cannot work simultaneously with DIGSI and DOS-DIGSI. Terminate DOS-DIGSI in order to return to DIGSI. You can find detailed information on DOS-DIGSI in Section 11.



Digs274g

Fig. 5/4 Message displayed during dialog with DOS-DIGSI

5.2 Parameterization

The parameterization of a protection device comprises the three topic areas "Configuration", "Marshalling" and "Settings".

Topics The **Configuration** defines the functions of the protection device. This refers to both the protection function and to integrated additional functions.

Configuration parameters have an influence on the visibility and the possible settings of other parameters. It must be guaranteed that processing is carried out on the basis of the relevant data set. This is achieved in that configuration parameters

- ⊙ are always read in following establishment of the connection in dialog mode "With protection device" and
- ⊙ updated when accessing the configuration in the internal memory of the computer.

Marshalling is the word used to describe the assignment of logical functions to physical elements such as:

- ⊙ Trip and command relays (binary outputs)
- ⊙ Inputs of opto isolators (binary inputs)
- ⊙ Display LEDs.

The topic “**Settings**” comprises the parameterization of protection device functions and additional functions.

Basic consideration Apart from the fundamental configuration topics, all parameters and functions described below are device-specific. They should therefore only be understood as examples. The following explanations for these parameters and functions refer to the protection device type 7SA511 V3.0x.

Procedure The input procedure is comparable for all three topics. For this reason only the topic “Configuration” will be handled in detail. The topics “Marshalling” and “Settings” will only be explained where they differ. It is recommendable to commence parameterization with the setting of the configuration parameters.

5.2.1 Configuration

Configuration is accessed using five configuration topics which are independent of the selected type of protection device:

- ⊙ Integrated operation
- ⊙ Configuration of PC/system interfaces
- ⊙ Fault recordings
- ⊙ Scope of functions
- ⊙ Device configuration.

Each topic comprises several device-specific parameters. The setting of these parameters also has an influence on the visibility and the settings possible for other data, for example in the fields of annunciations and measurements.

5.2.1.1 Editing of Configuration Parameters

In order to edit configuration parameters, select the option “Edit” in the extension menu “Configuration”. A dialog box is then output to permit you to select the above-mentioned configuration topics.

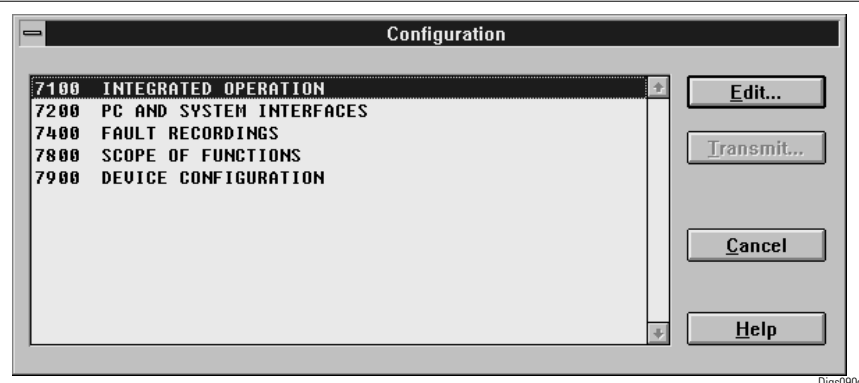


Fig. 5/5 Dialog box “Configuration”

5 Dialog

Select topic Individual topic-specific configuration parameters are combined in each topic. In order to edit these configuration parameters, you must first mark a topic. In the displayed example, this is the topic "Integrated operation".

Edit..

Select "Edit" to gain access to the associated topic-specific configuration parameters

Cancel

Select "Cancel" if you do not wish to edit the configuration parameters. The current dialog box is then closed.

Transmit..

Select "Transmit" in order to transfer modified configuration parameters to the protection device. This option is only active if you have modified at least one setting in the subsequent operations.

If you have confirmed your selection using "Edit", a further dialog box is displayed to permit you to select configuration parameters.

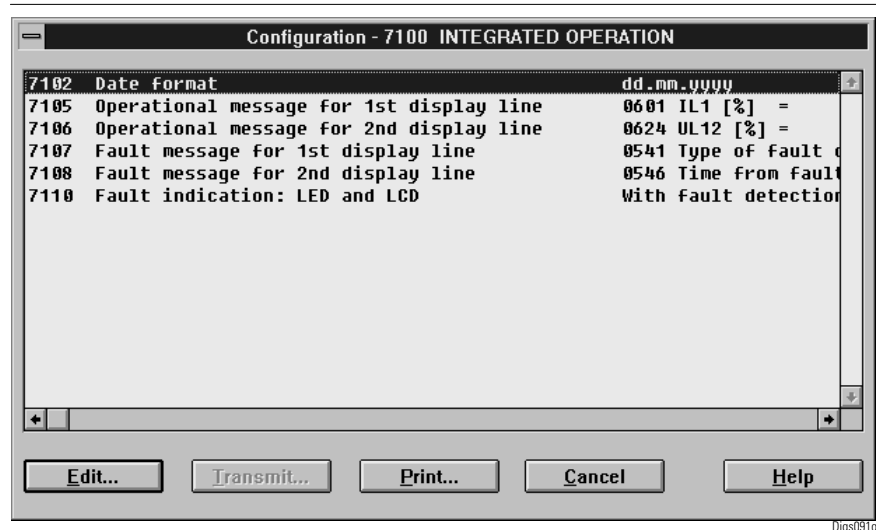


Fig. 5/6 Dialog box "Configuration – <Topic>"

Select configuration parameters Different settings are possible for each configuration parameter. In order to define one of these settings, you must first mark a configuration parameter. In our example this is the configuration parameter "Date format".

Edit..

Select "Edit" to define a different setting for the selected configuration parameter.

Cancel

Select "Cancel" if you do not wish to define a different setting for the configuration parameter. The current setting is retained. The current dialog box is then closed, and you return to the previous dialog box.

If you have confirmed your selection using "Edit", a further dialog box is displayed to permit you to define the setting for a configuration parameter.

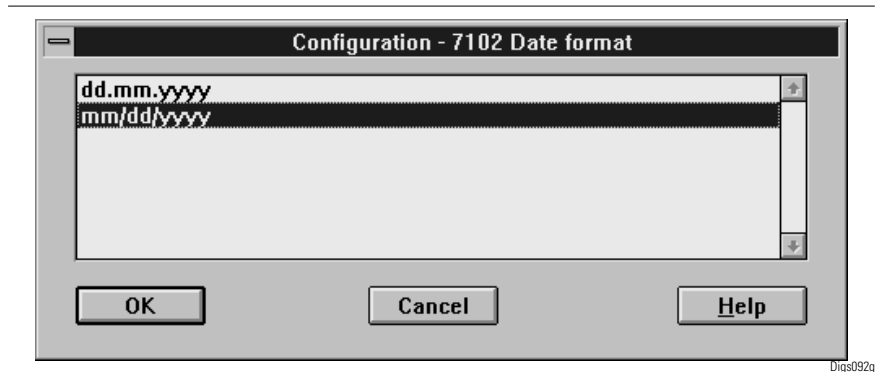
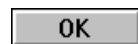


Fig. 5/7 Dialog box "Configuration – <Parameter>" for selection of a setting

This dialog box shows you all possible settings of the selected configuration parameter. In the shown example, these are the two formats of the date display "DD.MM.YYYY" and "MM/DD/YYYY".

Select setting

Mark the setting you wish to define for the parameter. In the shown example, this is the format "MM/DD/YYYY".



Select "OK" to accept the setting for the selected configuration parameter. The current dialog box is then closed, and you return to the previous dialog box.



Select "Cancel" if you do not wish to define any setting for the configuration parameter. The current setting is retained. The current dialog box is then closed, and you return to the previous dialog box.

You must enter values directly for certain parameters. In such cases a dialog box is displayed comparable to that in Fig. 5/8.

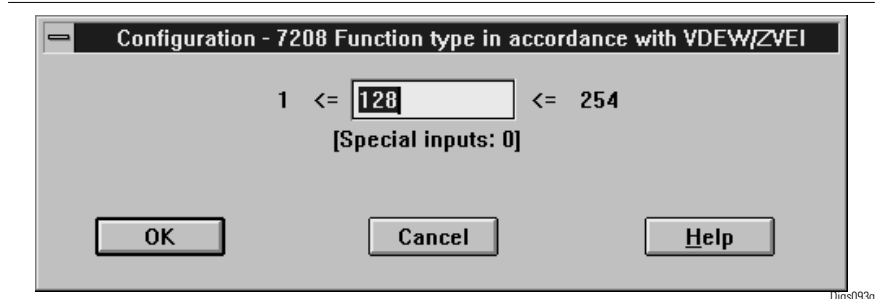


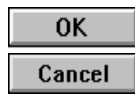
Fig. 5/8 Dialog box "Configuration – <Parameter>" for input of a parameter value

There is an input field in the top half of the dialog box. The permissible minimum and maximum values of the parameter are displayed on the left and right of this field. A special input outside the permissible range is possible in certain cases. Such a special input is displayed underneath the input field.

Enter a parameter value

Enter a value within the displayed permissible range in the input field, or according to the special input.

5 Dialog



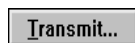
Select "OK" to confirm the value. The current dialog box is then closed.

Select "Cancel" if you do not wish to enter a new value. The current dialog box is then closed, and the original value is retained.

If you have confirmed your selection with "OK", the display of the dialog box in Fig. 5/7 is updated.



Select "Edit" in order to define further settings for selected configuration parameters. Proceed as in the above example.

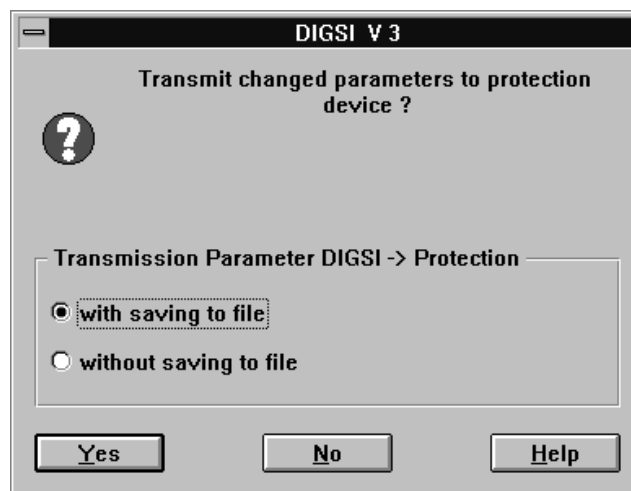


Select "Transmit" to transfer modified configuration parameters to the protection device. This option is only active if you have changed at least one setting. The option is only relevant if individual parameters are to be modified directly without leaving the edit function.



Careful!

Before configuration parameters are transmitted, they can first be saved in the substation you have opened or in the temporary substation. The data already present there are overwritten in the process! You will be asked to confirm your intention before the configuration parameters are transmitted.



Digs098g

Fig. 5/9 Message before the configuration parameters are transmitted

Decide whether you wish to save the modified parameters in the protection device before transmission or not. You can select the options "With saving to file" and "Without saving to file". The option which was defined as the basic setting according to Section 5.8.1 is already preselected.



Caution!

You will only be asked to confirm your intention as in Fig. 5/9 if you are working in one of the dialog modes "With protection device direct" or "With protection device via ...". If you have selected the dialog mode "With file", confirmation of your intention is simpler.

Select transmission option

Select the option "With saving to file" if the modified parameters are to be saved in the corresponding files prior to the transmission. Alternatively select the option "Without saving to file" if the you do not wish to save the modified parameters prior to the transmission.



Select "Yes" if the configuration parameters are to be transmitted to the protection device. They are saved first or not depending on the selected option. Existing configuration data are overwritten during the save operation.

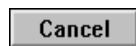


Select "No" if you do not wish to save the configuration parameters or transmit them to the protection device. The existing configuration data remain unchanged.

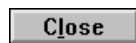
If you have confirmed your intention with "Yes", the label of the button "Close" changes to "Cancel".



Select "Print" to output the current configuration parameters on a printer or into a file. Print functions and associated dialog boxes are described in Section 8.2.



Select "Cancel" if you do wish to define any further settings. The current dialog box is then closed, and you return to the previous dialog box. This button is only visible if you have not made any modifications or if the modifications have already been transmitted.



Select "Close" if the modifications you have made are not to be transmitted yet. The settings you have made are initially retained. The current dialog box is then closed, and you return to the previous dialog box. This button is only visible if you have made modifications which have not yet been transmitted.

If you have confirmed your intention with "Close", the button "Cancel" of the dialog box in Fig. 5/5 also changes its label into "Close". This indicates to you that modified configuration parameters have not yet been saved and transmitted.

Select "Close" to leave the configuration function. You will be asked to confirm your intention.



Careful!

Before configuration parameters are transmitted, they can first be saved in the substation you have opened or in the temporary substation. The data already present there are overwritten in the process!

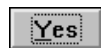
5 Dialog



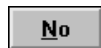
Digs096g

Fig. 5/10 Message prior to leaving the configuration function

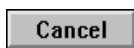
Also select one of the two available options here.



Select "Yes" if you want to transmit the configuration parameters to the protection device. They are saved first or not depending on the selected option. Existing configuration data are overwritten during the save operation. The dialog box in Fig. 5/5 is then closed.



Select "No" if you do not wish to save the configuration parameters or transmit them to the protection device. The existing configuration data remain unchanged. The dialog box in Fig. 5/5 is then closed.



Select "Cancel" if you do not wish to save or reject the modified configuration parameters. The dialog box in Fig. 5/5 remains open.

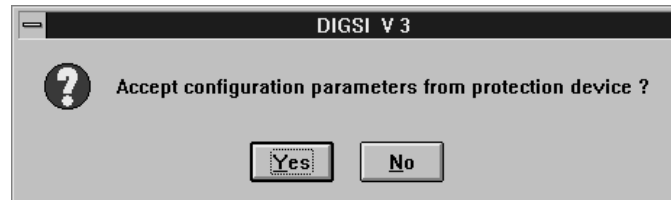
5.2.1.2 Transfer Configuration Parameters from the Protection Device into a File

You can transmit configuration parameters from the protection device into a file. Select the option "Protection device -> file" in the extension menu "Configuration". You will be asked to confirm your intention.



Careful!

The configuration parameters of the substation are overwritten when transmitting!



Digs097g

Fig. 5/11 Message prior to transmission of configuration parameters



Select "Yes" if the configuration parameters are to be transmitted from the protection device into the file. Existing configuration data are overwritten in the process.



Select "No" if you do not wish to transmit configuration parameters from the protection device into the file. The existing configuration data remain unchanged.

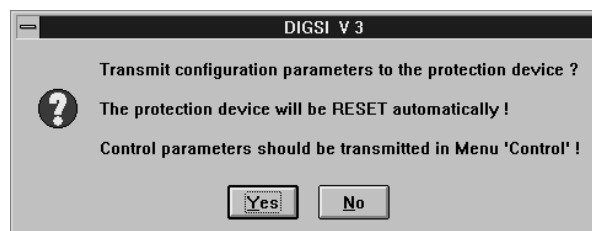
5.2.1.3 Transfer Configuration Parameters from a File into the Protection Device

You can transmit configuration parameters from a file into the protection device. Select the option "File -> protection device" in the extension menu "Configuration". You will be asked to confirm your intention.



Careful!

The configuration parameters in the protection device are overwritten when transmitting! A reset is carried out in the protection device following the transmission.



Digs098g

Fig. 5/12 Message prior to transmission of configuration parameters



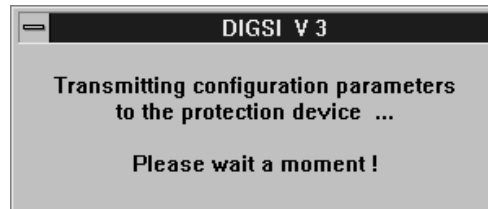
Select "Yes" if the configuration parameters are to be transmitted from the file into the protection device. Existing protection device data of the same type are overwritten in the process.



Select "No" if you do not wish to transmit configuration parameters from the file into the protection device. The existing protection device data then remain unchanged.

If you have confirmed your intention with "Yes", a corresponding message is output.

5 Dialog



Digs099g

Fig. 5/13 Message prior to transmission of configuration parameters

A reset is carried out in the protection device following the transmission. A corresponding message is also output.

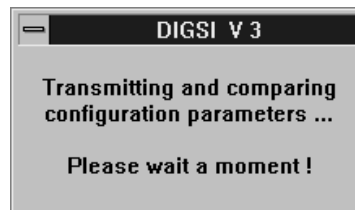
5.2.1.4 Comparison of Configuration Parameters in a File and Protection Device

You can compare configuration parameters in a file with those in the protection device. Select the option "Protection device -> file" in the extension menu "Configuration". A corresponding message is output.



Caution!

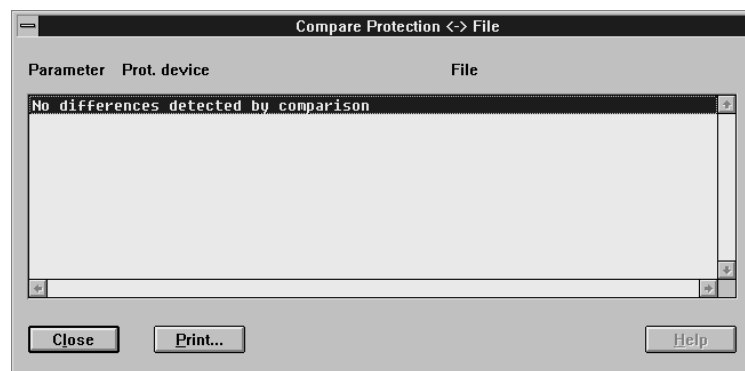
The configuration parameters from the protection device are transmitted into a temporary memory area. The configuration data in the file are not modified in the process.



Digs100g

Fig. 5/14 Message during transmission and comparison of configuration parameters

At the end of the transmission and comparison, the result is displayed in a dialog box.



Digs101g

Fig. 5/15 Dialog box "Compare Protection <-> File"

Close

Select "Close" once you have checked the displayed results. The current dialog box is then closed.

Print...

Select "Print" to output the displayed results on a printer or into a file. Print functions and associated dialog boxes are described in Section 8.2.

5.2.1.5 Print Configuration Parameters

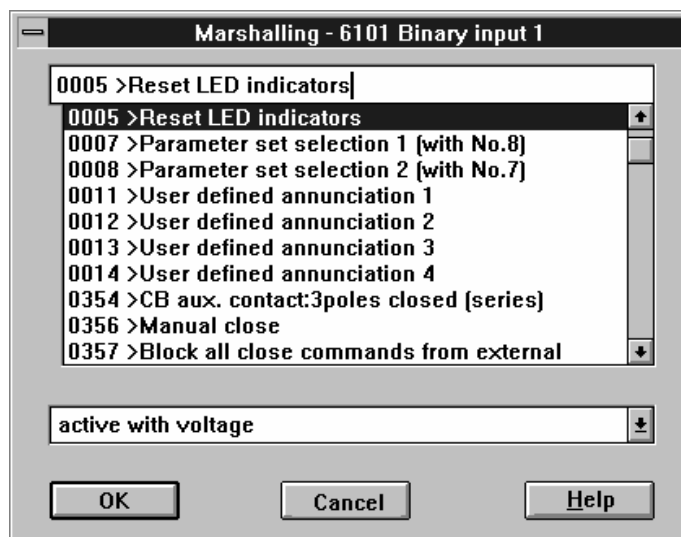
Select the option "Print" in the extension menu "Configuration" in order to output all configuration parameters on a printer or into a file. Print functions and associated dialog boxes are described in Section 8.2.

5.2.1.6 ASCII Export of Configuration Parameters

Select the option "ASCII export" from the extension menu "Configuration" in order to export all configuration parameters in ASCII format. Export functions and associated dialog boxes are described in Section 8.1.

5.2.2 Marshalling

The editing, transfer and comparison of marshalling parameters are analogous to the configuration functions described (see Section 5.2.1). An explanation of those functions is therefore omitted here. However, when setting certain marshalling parameters a dialog box for multiple selection is displayed which has not yet been explained.



Digs102g

Fig. 5/16 Dialog box for multiple selection

This dialog box shows you all possible settings of the selected marshalling parameter. You can define an additional setting using a dropdown list below the selection field.

5 Dialog

Select setting You have two options for selecting a setting. On the one hand, you can highlight a setting as usual within the display area. However, you can also enter the annunciation number of a parameter setting in the input field above the display area. As you are entering the number the appropriate setting is selected in the display area. Press one of the keys \uparrow or \downarrow to enter the selected setting in the input field.

Select additional setting An additional setting is available for some settings. If this is the case, select the desired additional setting using the dropdown list.



Select "OK" to accept both settings for the selected marshalling parameter. The current dialog box is then closed, and you return to the previous dialog box.



Select "Cancel" if you do not wish to define a setting for the marshalling parameter. The current setting is retained. The current dialog box is then closed, and you return to the previous dialog box.

5.2.3 Settings

The editing, transfer and comparison of setting parameters are analogous to the configuration functions described (see Section 5.2.1). An explanation of those functions is therefore omitted here.

5.2.3.1 Selection of Parameter Set

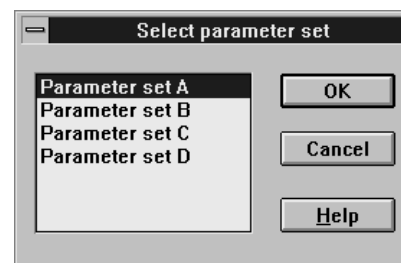
In addition to the configuration functions, the extension menu "Settings" provides the option "Select parameter set". Most protection devices support four independent parameter sets. One of the sets is always active. This option permits you to select a parameter set for editing. This option is not available if the parameter change-over is deactivated.



Caution!

This function does not define the active parameter set. The active set is selected using the menu "Control" (see Section 5.3).

Select the option "Select parameter set" in the extension menu "Settings". A dialog box is then displayed to permit you to select a parameter set.

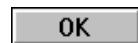


Digs103g

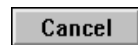
Fig. 5/17 Dialog box "Select parameter set"

Selection of a parameter set

The dialog box shows you the four parameter sets A, B, C and D in the selection field. Mark the parameter set you require.



Select "OK" to select the marked parameter set for editing. The current dialog box is then closed.



Select "Cancel" if you do not wish to select the marked parameter set for editing. The previous parameter set then remains open for editing, and the current dialog box is closed.

5.2.3.2 OMICRON Export of Setting Parameters

Select the option "OMICRON export" in the extension menu "Settings" in order to export setting parameters in the OMICRON format. Export functions and associated dialog boxes are described in Section 8.1.

5.2.3.3 Display of Zone Characteristics

Select the option "Zone characteristics" in the extension menu "Settings" in order to obtain a graph of the zone characteristics of the selected distance/impedance protection. Detailed information on the zone characteristics can be found in Section 5.7.

5.2.4 Global Parameter Functions

You can print the totality of configuration, marshalling setting **and control** parameters, export them in ASCII format, compare them, and transmit them bidirectionally between the computer and protection device. The required options can be found in the menu "Parameters". The procedure is identical to that described for configuration parameters (see Section 5.2.1).

5 Dialog

5.3 Control

The menu "Control" permits you to access various operating functions and control parameters. These functions are divided amongst the options "Protection device" and "Power switches" according to the destinations.

5.3.1 Editing and Executing Protection Device-based Control Parameters and Functions

The option "Edit" in the extension menu "Protection device" permits you to gain access to various protection device-based control parameters and functions. For example, the parameter change-over belongs to the group of parameters. The deletion of buffers in the protection device belongs to the control functions.

The scope of functions and parameters available depends on

- ⊙ the selected type of protection device,
- ⊙ the selected dialog mode,
- ⊙ parameter settings defined using the extension menu "Configuration".

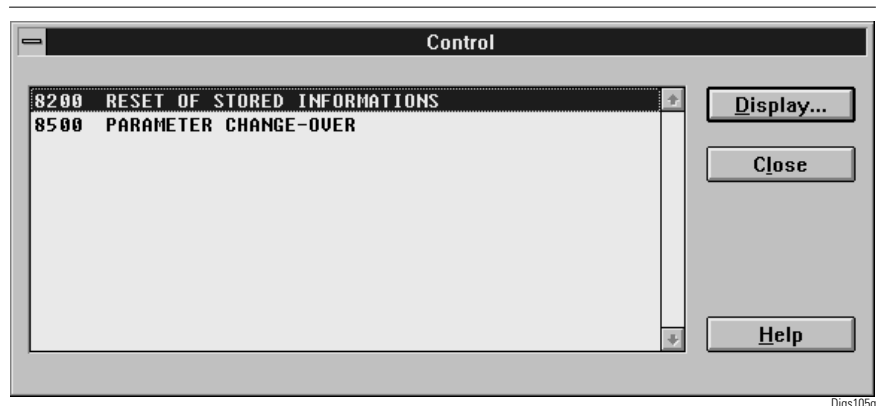


Fig. 5/18 Dialog box "Control"

Select function/parameter group

Display...

Close

Each function/parameter group comprises related functions or parameters. You must mark a function/parameter group before you can execute functions or edit parameters.

Select "Display" to gain access to the associated functions and parameters of the marked function/parameter group.

Select "Close" if you do not wish to execute functions or edit parameters. The current dialog box is then closed.

Another dialog box is displayed if you have confirmed your selection with "Display". This dialog box shows you all individual functions and parameters which are combined in the marked function/parameter group.

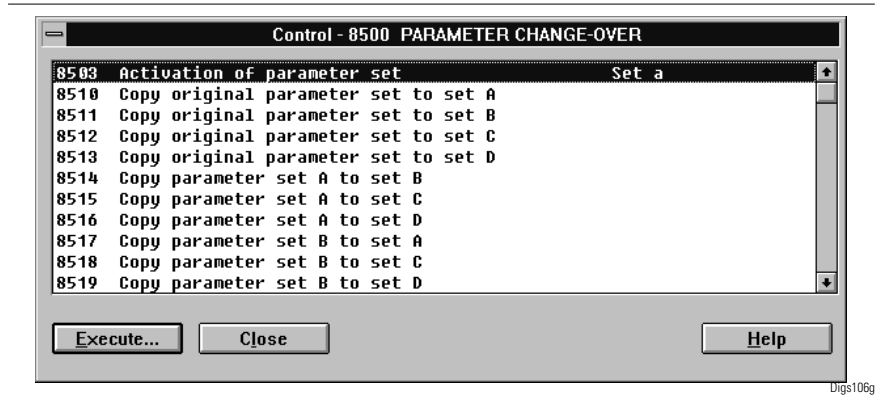


Fig. 5/19 Dialog box "Control – <Function/parameter group>"

Use the dialog box "Control – <Function/parameter group>" to execute functions or to select parameters for editing. Mark the associated function or parameter.



Select "Execute". A function is then executed if its name has been marked. You will be asked to confirm your intention. If the name of a parameter has been marked, you will be able to select from the possible settings.



Select "Close" if you do not wish to execute functions or edit parameters. The current dialog box is then closed and you return to the previous dialog box.

The following dialog box is opened if you have selected the parameter "Activation of parameter set" for editing.

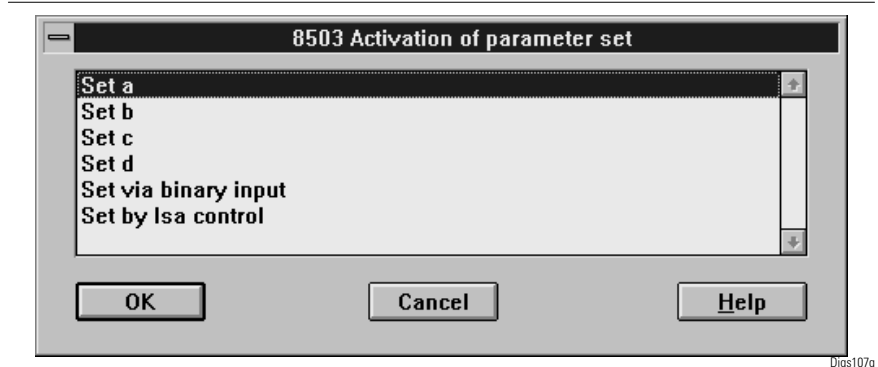
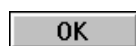
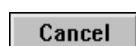


Fig. 5/20 Dialog box "Activation of parameter set"

Mark one of the possible settings for this parameter.



Select "OK" to assign the marked setting to the selected parameter. The current dialog box is then closed, and you return to the previous dialog box.



Select "Cancel" if you do not wish to modify the current setting of the selected parameter. The current dialog box is then closed, and you return to the previous dialog box.

5 Dialog

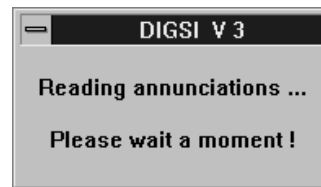
5.3.2 Printing, Export, Comparison and Transfer of Protection Device-based Control Parameters

You can print control parameters, export them in ASCII format, compare them, and transmit them bidirectionally between the computer and protection device. The required options can be found in the extension menu "Protection device". The procedure is identical to that described for configuration parameters (see Section 5.2.1).

5.3.3 Controlling a Power Switch

The option "Power switches" in the menu "Control" permits you to display disconnecter and circuit breaker positions and to control circuit breaker positions. This option is only active in dialog modes "With protection device direct" or "With protection device via ...".

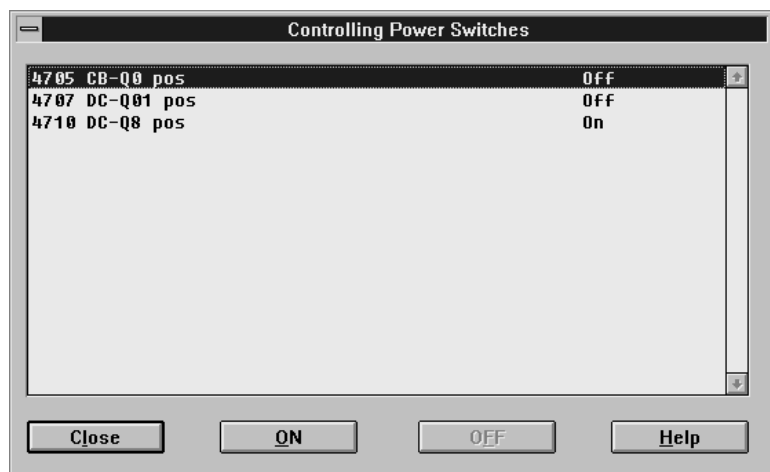
Following selection of this option, the current disconnecter and circuit breaker positions are initially transmitted to DIGSI. A corresponding message is output.



Digs113g

Fig. 5/21 Message during transmission of the disconnecter and circuit breaker positions

As soon as the required information has been read in by DIGSI, it is displayed in a dialog box.



Digs108g

Fig. 5/22 Dialog box "Controlling power switches"

The individual status displays are sorted according to the equipment addresses. In addition to the address, a status display contains the designation of the disconnector or circuit breaker and the current position. A circuit breaker is abbreviated to "CB", a disconnector to "DC".

Controlling a circuit breaker

Only circuit breakers can be controlled. Mark the circuit breaker you wish to switch on or off.

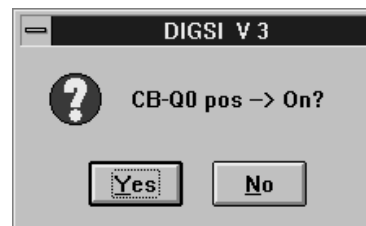


Select "ON" to switch on a marked circuit breaker. This command is only active if the marked circuit breaker is switched off or if its position is uncertain.



Select "OFF" to switch off a marked circuit breaker. This command is only active if the marked circuit breaker is switched on or if its position is uncertain.

You will be asked to confirm your intention according to the triggered command. The display shown in Fig. 5/23 is output if you wish to switch on a circuit breaker.



Digs109g

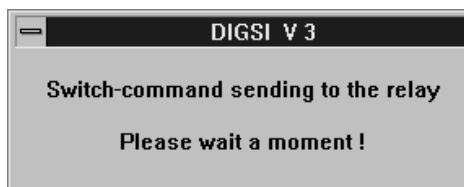
Fig. 5/23 Message prior to switching-on of a circuit breaker



Select "Yes" if the marked circuit breaker is to be switched on.

Select "No" if you do not wish to switch on the marked circuit breaker.

If you have confirmed your intention with "Yes", a message is output during transmission of the switching command.



Digs110g

Fig. 5/24 Message during transmission of the switching command

The display in the dialog box in Fig. 5/22 is updated following execution of the switching command.



Select "Close" if you do not wish to trigger any further switching commands. The current dialog box is then closed.

5.4 Annunciations and Measurements

Using the menu "Annunciation" you can gain access to the following information from the protection device:

- ⊙ Annunciations including statistical values
- ⊙ Measurements.

5.4.1 Annunciations

Annunciations are generated in the protection device or initiated by the connected peripherals. They are generated by the protection device at the time the event occurs. An annunciation can be assigned to several categories:

- ⊙ Operational annunciations
- ⊙ Network disturbances
- ⊙ Earth fault annunciations
- ⊙ Spontaneous annunciations
- ⊙ General query annunciations
- ⊙ CB switching statistics.

Operational annunciations, network disturbances and earth fault annunciations are provided with a time stamp in the protection device when they occur and then saved.

The status of annunciations which are subject to a general query (**General query annunciations**) are not saved in the protection device. They are transmitted to the computer when requested by it. They can be displayed and saved there.

Some of the annunciations can be transmitted spontaneously. Such **Spontaneous annunciations** are transmitted to the computer without being specifically requested and saved or updated there. The number of spontaneous annunciations which have arrived is displayed on the right in the status line.

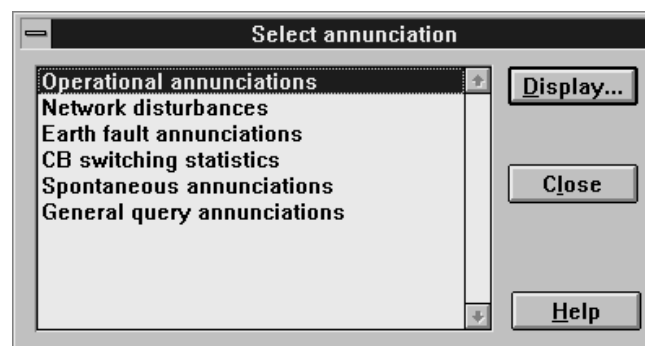
Each annunciation is identified by a number specific to the protection device. This number is displayed in the dialog boxes as a prefix to the alphanumeric annunciation text.

The scope of the displayed annunciations depends on

- ⊙ the type and Order No. of the protection device,
- ⊙ parameter settings which have been defined using the extension menu "Configuration".

5.4.1.1 Editing of Annunciations

You can display, update, save and print annunciations. To do this, select the option "Edit" in the extension menu "Annunciations". A dialog box is then displayed to permit you to select an annunciation category.



Digs112g

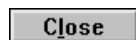
Fig. 5/25 Dialog box "Select annunciation"

Select annunciation category

Each annunciation category comprises the annunciations which belong to this category. In order to display these annunciations, you must first mark an annunciation category. This is the category "Operational annunciations" in the shown example.



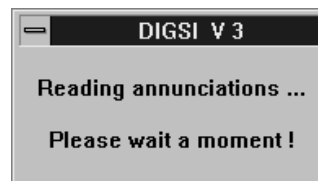
Select "Display" to gain access to the associated annunciations of the marked category.



Select "Close" if you do not wish to display any annunciations. The current dialog box is then closed.

If you have confirmed your selection using "Display", either a message or a further dialog box will be displayed depending on the current dialog mode.

If you are working in one of the dialog modes "With protection device direct" or "With protection device via ...", the current annunciations must be transmitted from the protection device to the computer. A corresponding message is displayed.



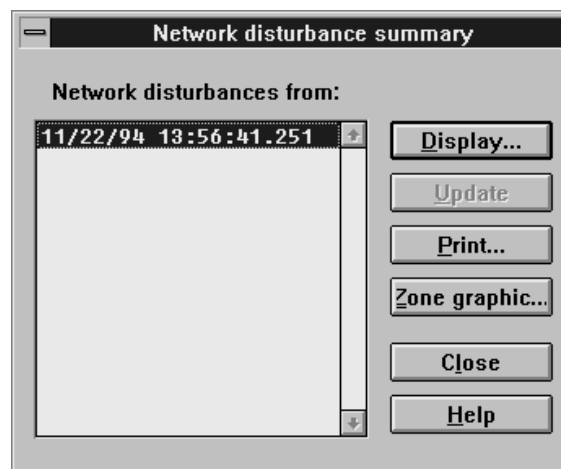
Digs113g

Fig. 5/26 Message displayed during the transmission of operational annunciations

The further sequence depends on the selected dialog mode and the parameterized scope of devices. For example, for earth fault

5 Dialog

annunciations and network disturbances you initially obtain a dialog box similar to that in Fig. 5/27 for all dialog modes. With operational annunciations, this dialog box is only available in dialog mode "With file". In dialog modes "With protection device direct" and "With protection device via ...", you obtain a dialog box corresponding to Fig. 5/28 for this type of annunciation.



Digs114g

Fig. 5/27 Dialog box "Network disturbance summary"

The dialog box in Fig. 5/27 provides a summary of the network disturbance files which have already been saved. The files are assigned a date and time and sorted in ascending order. The time refers to the transmission of annunciations from the protection device to the computer.

Select annunciation file

Each annunciation file contains the annunciations present at the time of transmission. In order to display these annunciations, you must first mark an annunciation file.

Display...

Select "Display" to gain access to the associated annunciations of the marked file.

Update

Select "Update" in order to update the display. This button is not active in the dialog mode "With file" and is only relevant during the display of network disturbances and earth fault annunciations.

Zone graphic...

Select "Zone graphic" to obtain a display of the fault locations of **all** displayed network disturbances as zone characteristics. This type of graph with the associated options is described in Section 5.7. This button is only available for network disturbances, and only then if the protection device permits measurement of the fault location.

Close

Select "Close" if you not wish to display any annunciations. The current dialog box is then closed.

Print...


Select "Print" to output the displayed summary on a printer or into a file. Print functions and associated dialog boxes are described in Section 8.2.


If you have confirmed your selection using "Display", a further dialog box will be displayed as in Fig. 5/28.


Annunciation	Value	Date/Time
0301 Fault in the power system	1 com	11/22/94 13:56:41.251
0302 Fault event with consecutive number	1 com	11/22/94 13:56:41.251
3688 Dist.: Fault detection phase L3,E	coming	0 ms
3805 Dist.: Trip 3pole	coming	1 ms
3703 Dist.: Loop L3E selected forward	coming	1 ms
0521 Interrupted current: Phase L1 (I/In)	0.0	7 ms
0522 Interrupted current: Phase L2 (I/In)	0.0	7 ms
0523 Interrupted current: Phase L3 (I/In)	10.0	7 ms
2785 AR: Auto-reclose is dynamically blocked	coming	9 ms
1116 Loop used for calculation: Loop L3-E		19 ms
1119 Distance to fault in km	0.9 km	19 ms
1120 Distance to fault in %	0.9 %	19 ms
1118 Fault reactance, Ohm sec.	0.48 Ohm	19 ms
1117 Fault resistance, Ohm sec.	0.04 Ohm	19 ms
1115 Fault reactance, Ohm prim.	0.52 Ohm	19 ms
1114 Fault resistance, Ohm prim.	0.04 Ohm	19 ms


Fig. 5/28 Dialog box "Network disturbances"


This dialog box shows you all accumulated network disturbances in the sequence in which they occurred. You can print, save and update these annunciations.

- 

Select "Close" to leave the dialog box. The current dialog box is then closed.
- 

Select "Print" to output the displayed annunciations on a printer or into a file. Print functions and associated dialog boxes are described in Section 8.2.
- 

Select "Save" to save the displayed annunciations in a file. This button is only active in dialog modes "With protection device direct" and "With protection device via ...".
- 

Select "Zone graphic" to obtain a display of all fault locations of the displayed network disturbances as zone characteristics. This type of graph with the associated options is described in Section 5.7. This button is only available for network disturbances, and only then if the protection device permits measurement of the fault location.
- 

Select "Update" to read in new annunciations and to update the display. This button is not active in dialog mode "With file".

If you are working in one of the dialog modes "With protection device direct" or "With protection device via ...", you will be requested to confirm your intention to save the annunciations in the following cases:

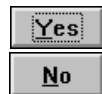
- ⊙ You have selected "Close", but the displayed annunciations have not yet been saved.
- ⊙ You have selected "Update", but the displayed annunciations have not yet been saved.

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Digs116g

Fig. 5/29 Message prior to saving of annunciations, example of operational annunciations



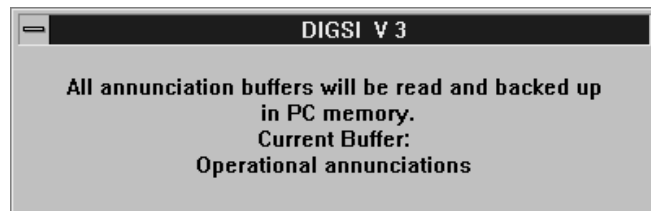
Select "Yes" if the displayed annunciations are to be saved.

Select "No" if you do not wish to save the displayed annunciations.

5.4.1.2 Transfer Annunciations from the Protection Device to the Computer

You can also transmit annunciations directly from the protection device into the computer. The annunciations are transmitted and saved separately for each category. All categories apart from "Spontaneous annunciations" are transmitted.

Select the option "Protection device -> file" in the extension menu "Annunciations". You obtain a separate message for the transmission of each category.



Digs117g

Fig. 5/30 Message displayed during the transmission of annunciations, example of operational annunciations

5.4.2 Measurements

The protection device obtains measurements as voltage and current rms values, as well as frequency values, from the connected transformers. Linked measurements can be generated in the protection device from the received measurements. The resulting measurements are combined in different categories specific to the protection devices:

- ⊙ Operational measurements
- ⊙ Earth fault measurements
- ⊙ Overload measurements.

Each measurement is identified by an address. This address is output in the corresponding dialog boxes as a prefix to the alphanumeric measurement text. If you are working in one of the dialog modes "With protection device direct" or "With protection device via ...", the display of the measurements in the dialog box is updated every 2 seconds.

The scope of the displayed measurement categories depends

- ⊙ on the type and Order No. of the protection device,
- ⊙ on parameter settings defined using the extension menu "Configuration".

5.4.2.1 Editing of Measurements

You can display, save and print measurements. To do this, select the option "Edit" in the extension menu "Measurements". A dialog box is then displayed to permit you to select a measurement category.

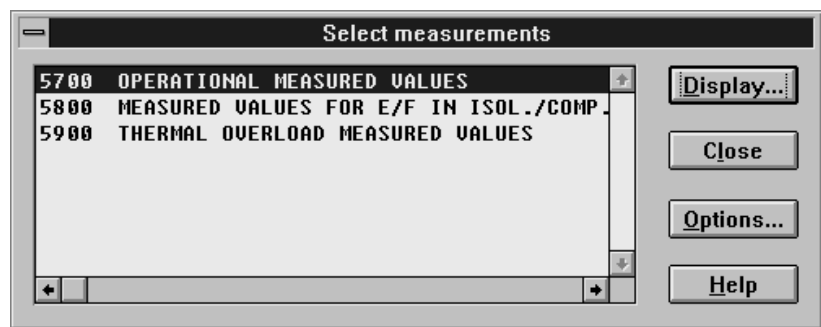


Fig. 5/31 Dialog box "Select measurements"

Select measurement category

The measurements belonging to each category are combined in that particular category. In order to display these measurements, you must first mark a measurement category.

Display...

Select "Display" to gain access to the associated measurements of the marked measurement category.

Close

Select "Close" if you do not wish to display any measurements. The current dialog box is then closed.

Options...

Select "Options" to define the save mode for the cyclically transmitted measurement sets. This button is only active if you are working in one of the dialog modes "With protection device direct" or "With protection device via ...". A dialog box is then displayed to permit you to define the save mode.

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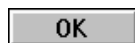
Digs119g

Fig. 5/32 Dialog box "Options"

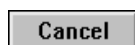
Manual Select this option if measurement sets are to be saved when requested manually. The button "Save" in the dialog box in Fig. 5/35 is then activated.

All incoming message frames Select this option if all incoming measurement sets are to be saved automatically. The button "Save" in the dialog box in Fig. 5/35 is then deactivated.

Every x min Select this option if measurement sets are to be saved automatically at cyclic intervals. Enter the desired cycle time in the associated input field. The button "Save" in the dialog box in Fig. 5/35 is then deactivated.



Select "OK" to accept the selected option. The current dialog box is then closed, and you return to the previous dialog box.

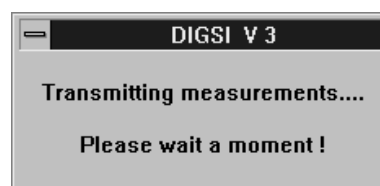


Select "Cancel" if you do not wish to select the marked option. The originally set option is retained. The current dialog box is then closed, and you return to the previous dialog box.

If you have confirmed the dialog box in Fig. 5/31 with "Display", a message or a further dialog box is displayed depending on the current dialog mode.

Dialog modes "With protection device direct/via ..."

If you are working in one of these dialog modes, you must first transmit the current measurements from the protection device into the computer. A corresponding message is displayed.



Digs120g

Fig. 5/33 Message during transmission of operational measurements

Once the transmission of the operational measurements has been terminated, a further dialog box as in Fig. 5/35 is displayed.

Dialog mode "With file"

If you are working in this dialog mode, you first obtain a dialog box to permit you to select the measurement set.

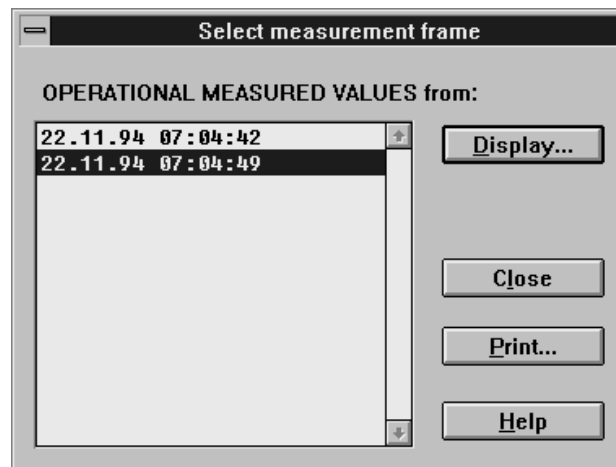


Fig. 5/34 Dialog box "Select measurement set"

The dialog box provides a summary of operational measurement files which have already been saved. The files are assigned a date and time and sorted in ascending order. The time refers to the transmission of measurements from the protection device to the computer.

Select operational measurement file

The operational measurements present at the time of transmission are combined in each operational measurement file. In order to display these measurements, you must first mark an operational measurement file.

Display...

Select "Display" to gain access to the associated measurements of the marked file.

Close

Select "Close" if you do not wish to display any measurements. The current dialog box is then closed.

Print...

Select "Print" to output the displayed summary on a printer or into a file. Print functions and associated dialog boxes are described in Section 8.2.

If you have confirmed your selection with "Display", a further dialog box is displayed as in Fig. 5/35.

This dialog box shows all operational measurements in the order in which they occurred. The display is updated every 2 seconds. You can print these operational measurements, or also manually save them if you have selected this option.

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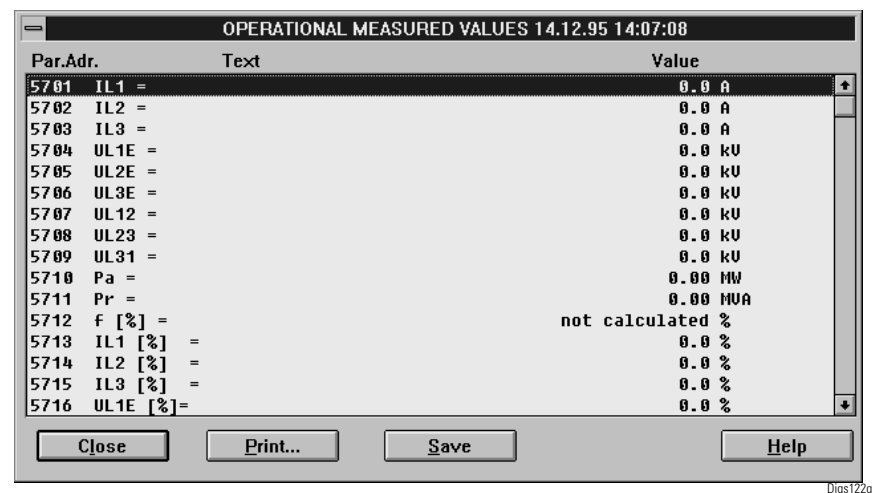
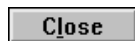


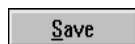
Fig. 5/35 Dialog box "Operational measurements"



Select "Close" to leave the dialog box. The current dialog box is then closed.



Select "Print" to output the displayed operational measurements on a printer or into a file. Print functions and associated dialog boxes are described in Section 8.2.



Select "Save" to save the displayed operational measurements in a file. This button is only active in dialog modes "With protection device direct" and "With protection device via ..." and with the option "Manual save" active.

Automatic save

If you have selected one of these options, the measurements are saved either when they arrive or in the defined cycle.

Manual save

With manual saving, you will be asked to confirm your intention in the following cases in the dialog modes "With protection device direct" or "With protection device via ...":

- ⊙ You have selected "Close", but the displayed operational measurements have not yet been saved.
- ⊙ You have selected "Save".

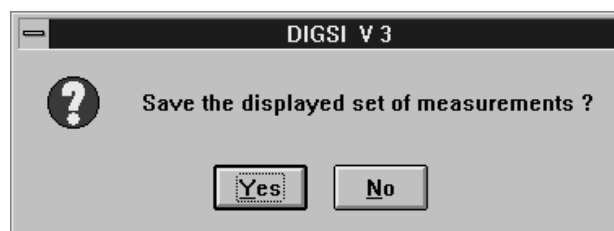


Fig. 5/36 Message displayed when saving operational measurements



Select "Yes" if the displayed operational measurements are to be saved.

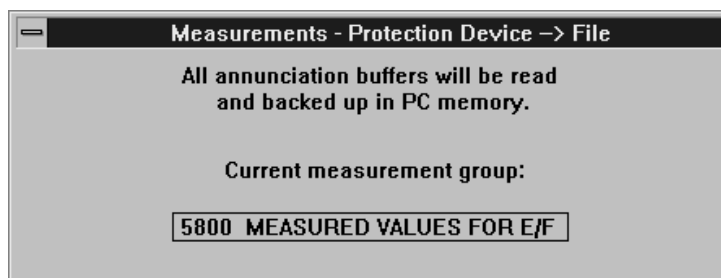


Select "No" if you do not wish to save the displayed operational measurements.

5.4.2.2 Transfer Measurements from the Protection Device to the Computer

You can also transmit measurements directly from the protection device into the computer. The measurements are transmitted and saved separately for each category.

Select the option "Protection device -> file" in the extension menu "Measurements". A separate message is displayed for the transmission of each category.



Digs124g

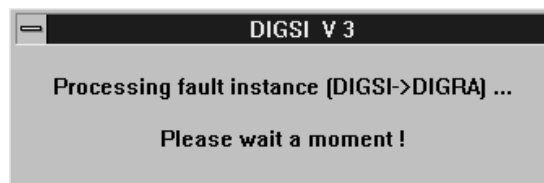
Fig. 5/37 Message displayed during the transmission of measurements

5.5 Fault Processing

DIGSI supports the archiving and analysis of faults. The analysis is carried out by the separate DIGRA program. Operation of this module is described in Section 10.

5.5.1 Fault Recording

In order to process faults using the DIGRA program, select the option "Fault recording" in the menu "Fault processing". A fault summary is then read in. A corresponding message is displayed.



Digs125g

Fig. 5/38 Message displayed during the transmission of a fault summary

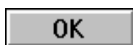
5 Dialog

If you are working in the dialog mode "With file", the fault summary is read from a file. A message is output if no faults are present in the file.



Digs126g

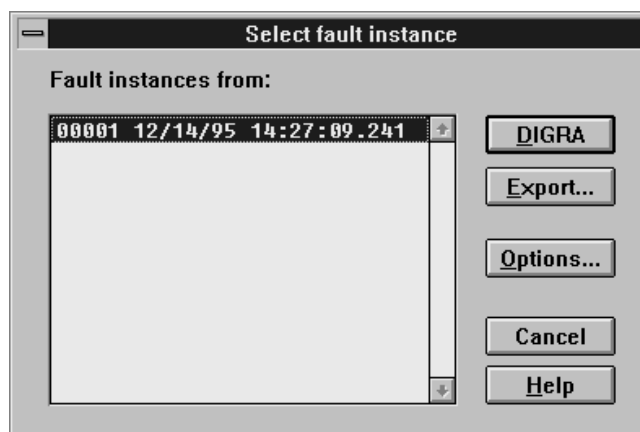
Fig. 5/39 Message if no faults are present



Acknowledge this message with "OK".

If you are working in one of the dialog modes "With protection device direct" or "With protection device via ...", the fault summary is read from the protection device. A message is output analogous to Fig. 5/39 if no faults are present in the protection device.

If faults are present, a dialog box is displayed to permit you to select a fault.



Digs127g

Fig. 5/40 Dialog box "Select fault instance"

The dialog box provides a summary of all existing faults. A number is assigned to the faults. Faults which have been read in using an earlier version of DIGSI are identified by the string "xxxxx". The faults are sorted in ascending order according to the date and time of their occurrence.

Select faults

Each fault is described by a large number of current values. You must first mark a fault in order to analyze these current values.



Select "DIGRA" in order to process the marked fault. The current dialog box is then closed.

Export...

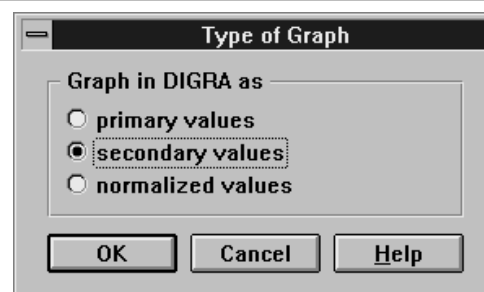
Select "Export" in order to export the marked fault in the COMTRADE format. All export functions available in DIGSI are described in Section 8.1.

Cancel

Select "Cancel" if you do not wish to process a fault. The current dialog box is then closed.

Options...

Select "Options" to define the type of graph in the DIGRA module. The type of graph can no longer be changed during processing. A dialog box is displayed to permit you to define the type of graph.



Digs128

Fig. 5/41 Dialog box "Type of graph"

Primary values

Select this option if you require a graph as primary values.

Secondary values

Select this option if you require a graph as secondary values.

Normalized values

Select this option if you require a graph as normalized values.

OK

Select "OK" to accept the selected option. The current dialog box is then closed, and you return to the previous dialog box.

Cancel

Select "Cancel" if you do not wish to select the marked option. The originally set option is retained. The current dialog box is then closed, and you return to the previous dialog box.

If you have confirmed the dialog box in Fig. 5/40 with "OK", the selected fault data are read in.

Dialog mode "With file"

When working in dialog mode "With file", the fault data are read in from a file. Once reading-in has been finished, the DIGRA program is opened and the read data are loaded into the module.

Dialog modes "With protection device direct/via ..."

When working in one of these dialog modes, the fault data are read in from the protection device. A comparison is carried out to establish whether the selected fault is already present as a file in the computer. A message is output if this is the case.

5 Dialog



Digs129g

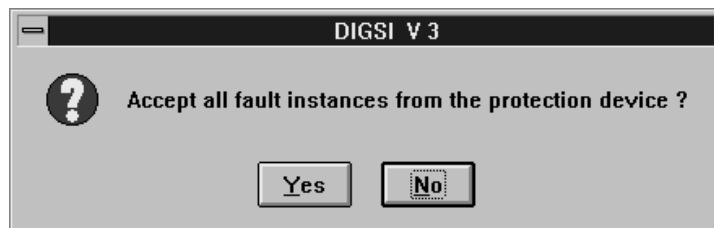
Fig. 5/42 Message displayed if a fault is already present in a file



Acknowledge the message with "OK". The DIGRA program is then opened, and the data which already exist are loaded into the program.

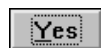
5.5.2 Transfer Faults from the Protection Device to the Computer

You can completely transmit all faults present in the protection device to the computer. Each fault is saved in a separate file. Select the option "PD -> File" in the menu "Fault". You will be asked to confirm your intention.

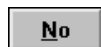


Digs130g

Fig. 5/43 Message displayed prior to transmitting faults



Select "Yes" if you wish to transmit all faults from the protection device into the computer.



Select "No" if you do not wish to transmit any faults from the protection device into the computer.

If you have confirmed your selection with "Yes", a message will be output during the transmission.



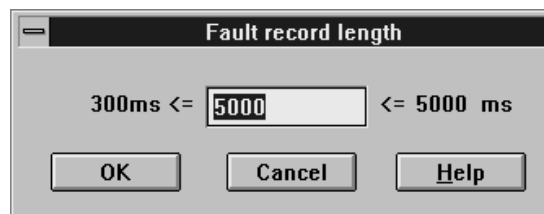
Digs131g

Fig. 5/44 Message displayed during the transmission of a fault

5.5.3 Initiate Fault Record

For test purposes, DIGSI provides a function for manual initiation of a fault record. This function is only available following the establishment of a connection.

Select the option "Initiate fault record" in the extension menu of the menu "Options". A dialog box is then displayed to permit you to enter the fault record length.

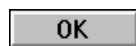


Digs173g

Fig. 5/45 Dialog box "Fault record length"

Input of fault record length

A fault length must be defined because a natural abort criterion is not effective. The displayed value corresponds to the currently set fault record length in milliseconds. To change this, enter an integer between 300 and 5000.



Select "OK" to initiate a fault record with the defined length. The fault record is then initiated, and the current dialog box is closed.



Select "Cancel" if you do not wish to initiate a fault record. The previously set fault record length then remains unchanged, and the current dialog box is closed.

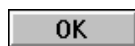
A fault record is initiated if you confirm your inputs with "OK". A corresponding message is output.

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Digs174g

Fig. 5/46 Message indicating initiated fault record



Acknowledge the message with "OK".

5.6 Test

DIGSI permits you to select and start test routines implemented in the protection device. This facility is only available, however, if you are working in the dialog mode "With protection device". The scope of available test routines depends

- ⊙ on the selected type of protection device,
- ⊙ on parameter settings defined using the extension menu "Configuration".

The test routines are combined into various test categories:

- ⊙ direction and impedance verification,
- ⊙ circuit breaker tests Trip/Close cycles,
- ⊙ circuit breaker tests Live Trip.

The test routines in "Direction and impedance verification" are executed without any further security prompts. For reasons of security, the test routines of the two other categories are only enabled after a password has been entered.

Test categories and routines are identified by addresses. These addresses are also specific to the protection device. The address is output in the dialog boxes as a prefix to the alphanumeric test text.

Select the menu "Test". This menu does not contain any further options. A dialog box is directly displayed to permit you to select a test routine.

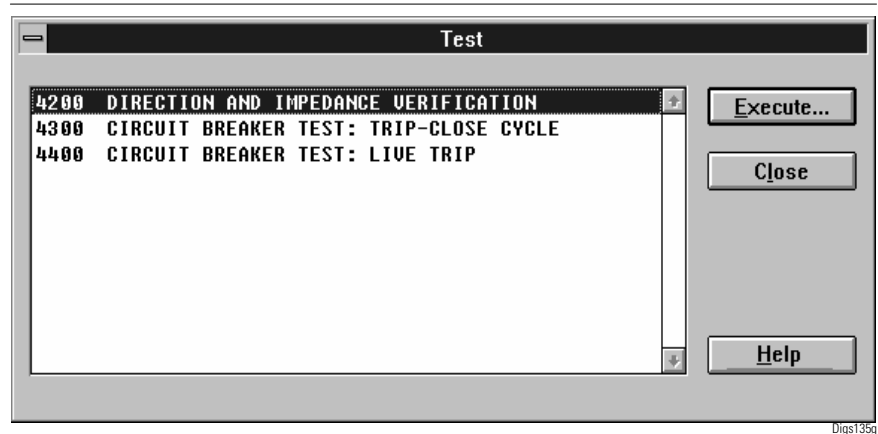


Fig. 5/47 Dialog box "Test"

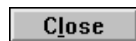
The dialog box provides a summary of all existing test categories. These are sorted in ascending order according to the addresses.

Select test category

Each test category comprises several test routines. In order to initiate these test routines, you must first mark a test category.



Select "Execute" to gain access to the associated test routines of the marked category.



Select "Close" if you do not wish to carry out any tests. The current dialog box is then closed.

When you have confirmed your selection by clicking "Execute", a further dialog box appears. How to proceed from here now depends on which test category you have selected.

5.6.1 Direction and Impedance Verification

If you had highlighted the category "Direction and Impedance Verification" before selecting the "Execute" button, all tests and measurements are carried out successively. When all individual measurements have been completed, you will now see the dialog box shown in Fig. 5/48. The results are displayed within the display area. You can print out the displayed values as required.

Cyclic measurements

After a preset time of 6 seconds, all tests and measurements are carried out successively again. The time per cycle of 6 seconds may be adapted to your requirements by steps of milliseconds. To do this, change the value of the appropriate entry in the DIGSI.INI file (see Appendix A.10.7).

5 Dialog

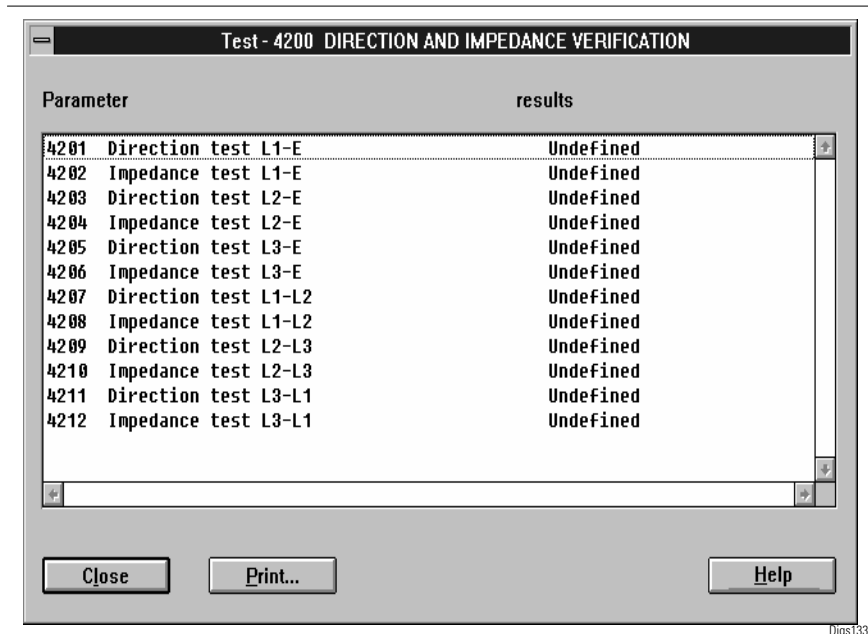


Fig. 5/48 Dialog box "Direction and impedance verification"



Select "Close" if no further tests or measurements are to be carried out. The current dialog box is then closed and you return to the previous dialog box.



Select "Print" to output the displayed results on a printer or to a file. Print functions and the appropriate dialog boxes are described in Section 8.2.

5.6.2 Circuit breaker tests

If you had highlighted one of the two categories of circuit breaker tests before selecting the button "Execute", you will, for example, be shown the dialog box in Fig. 5/49.

The sequence of operations is basically identical for both categories. The category "Circuit breaker test: Trip-Close Cycle" has been selected here as an example.

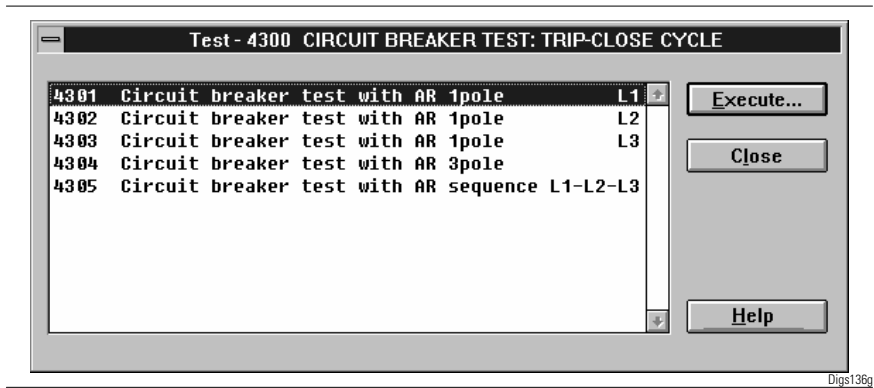


Fig. 5/49 Dialog box "Circuit breaker test: Trip–Close cycle"

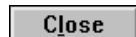
The dialog box provides a summary of all existing test routines. These are also sorted in ascending order according to the addresses.

Select test routine

You must first highlight a test routine before you can initiate it.



Select "Execute" to activate the test routine.



Select "Close" if you do not wish to activate a test routine. The current dialog box is then closed.

If you have selected "Execute" to confirm your intention, you must enter a password for security reasons. An interactive dialog helps you.

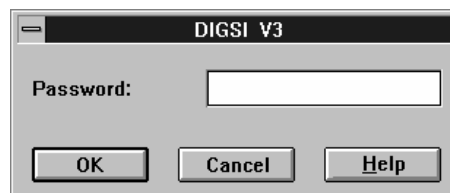
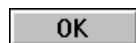


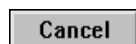
Fig. 5/50 Dialog box for entering a password before a circuit breaker test

Enter password

Enter six "0"s into the input field. This string is predefined as a password and cannot be changed.



Select "OK" to confirm the password you have just entered. The current dialog box is then closed.



Select "Cancel" if you do not wish to enter a password. The current dialog box is then closed.

If you have selected "OK" to confirm your intention, your input is checked. If your input is not correct, the following message appears.

5 Dialog



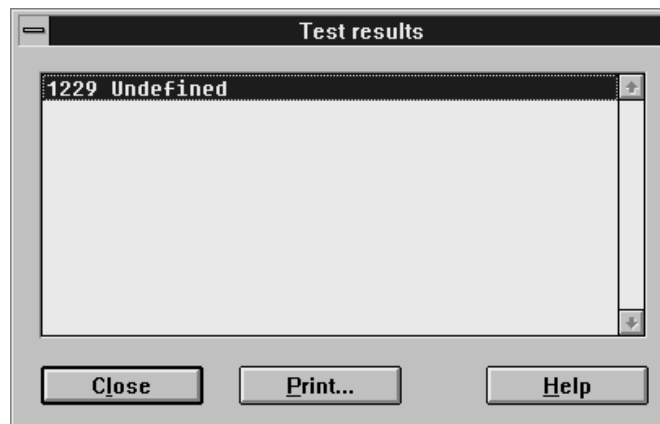
Digs138g

Fig. 5/51 Message indicating that the wrong password has been entered



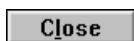
Select "OK" to confirm the message. This brings you back to the previous dialog box. Enter the correct password or abort the process.

After the correct password has been entered, the marked test routine is activated. After completion of the test routine, you will be shown the test results in a dialog box.



Digs139g

Fig. 5/52 Dialog box "Test results"



Select "Close" when you have checked the displayed results. The current dialog box is then closed, and you return to the previous dialog box.



Select "Print" to output the displayed results on a printer or into a file. Print functions and associated dialog boxes are described in Section 8.2.

5.7 Zone Characteristics

The zone characteristics is a graphic display of the selected distance/impedance protection. As additional information, fault locations can be entered in the zone characteristics. The source of these fault locations is network disturbances of the protection device.

You can access the zone characteristics in three different manners:

1. Select the option "Annunciation" in the menu "Annunciations". A dialog box is then opened to permit you to select annunciations (see Fig. 5/25). Select the annunciation category "Network disturbances" to obtain a dialog box for the network disturbance overview (see Fig. 5/27). Select the button "Zone characteristics". You then obtain the dialog box "Zone characteristics" from Fig. 5/53. The dialog box contains a display area for the characteristics, a selection field for the available fault locations and several buttons.
2. Initially proceed as in "1.". However, mark a network disturbance in the dialog box from Fig. 5/27 and select the button "Display". The dialog box from Fig. 5/28 is then opened. Select the button "Zone characteristics". You then obtain the dialog box "Zone characteristics" from Fig. 5/53. The dialog box contains a display area for the characteristics, a selection field for the available fault locations and several buttons.
3. Select the option "Zone characteristics" in the extension menu "Settings". You then obtain a dialog box "Zone characteristics" similar to Fig. 5/53. However, this dialog box does not contain a selection field for fault locations. It is therefore impossible to enter fault locations into the characteristics with this display.

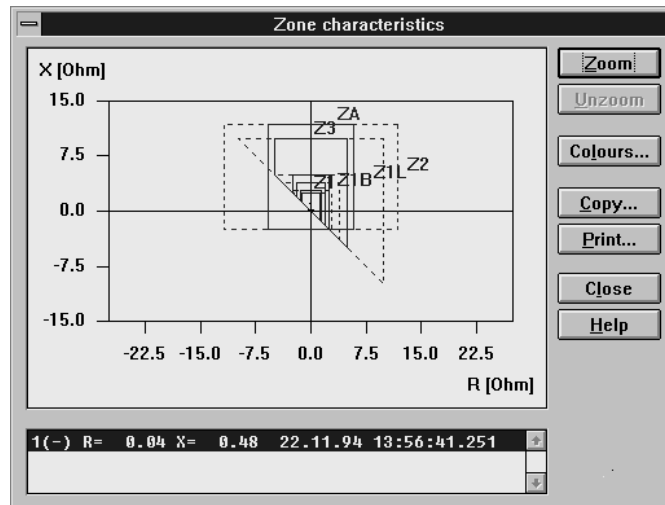
Zone characteristics

The zone characteristics is determined by tripping and trigger zones. These in turn are determined by phase and earth faults. The phase faults of a zone are displayed by a continuous line, the earth faults by a dashed line. Trigger zones are displayed in red in the standard setting, tripping zones in blue.

Fault locations

Fault locations can be entered as additional information in the zone characteristics. This is only possible, however, if you have called the zone characteristics using the dialog box in Fig. 5/27. A dialog box is then displayed for the zone characteristics as in Fig. 5/53.

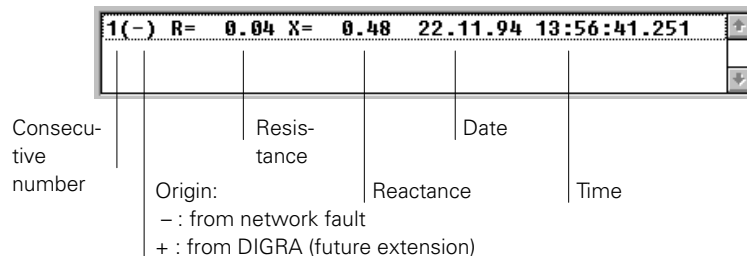
5 Dialog



Digs157g

Fig. 5/53 Dialog box "Zone characteristics"

At the bottom of the dialog box there is a selection field with all available fault locations. A fault location is defined unambiguously by several items of data:



Digs156g

Fig. 5/54 Data on fault location

In order to enter a fault location in the zone characteristics, mark it in the selection field. It is entered into the zone characteristics immediately it is marked. The fault location is identified in the zone characteristics by its consecutive number. You can mark any number of the available fault locations and thus enter them in the zone characteristics. A fault location is removed from the zone characteristics when you deselect it.

Changing the window size

The dialog box "Zone characteristics" can be scaled. Position the mouse pointer on the edge of the dialog box. Hold the left mouse button pressed and pull the dialog box to the desired size. You cannot go below a minimum size. You can obtain the maximum size by positioning the mouse pointer to the title bar and double clicking the left mouse button. Double clicking again reduces the size of the dialog box to its previously set size.

Modifying the display

You can display or suppress individual zones of the zone characteristics. The size of the display of the remaining zones is then changed. Use the commands "Zoom" and "Unzoom" to do this. In addition, you can modify the standard settings for the colours of the individual zones. Use the command "Colours" to do this.

Zoom

Select "Zoom" to suppress the largest current zone. The remaining zones are then increased in size. This button is not active if only one zone is displayed.

Unzoom

Select "Unzoom" to redisplay the last suppressed zone. The complete display of the zones is then reduced in size. This button is not active if all zones are displayed.

Colours...

Select "Colours" to change the colours for the individual zones. Setting of the colours is carried out in interactive mode.



Digs158g

Fig. 5/55 Dialog box "Zone colours"

The dialog box contains dropdown lists for the individual zones and the available colours. On the right of the dropdown list for selection of the colours, a display field provides a preview of the currently selected colour.

Assign colour to zone

In the top dropdown list, select the zone for which you wish to change the colour. The name of the colour currently set for this zone is output in the display field of the bottom dropdown list. Select the new colour from this dropdown list. Proceed in the same manner for all other zones for which you wish to change the colour.

OK

Select "OK" to accept all assigned colours. The current dialog box is then closed.

Cancel

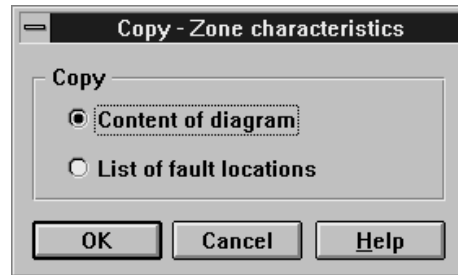
Select "Cancel" if you do not wish to accept the assignments. The original settings then remain unchanged, and the current dialog box is closed.

If you have confirmed your settings with "OK", the display of the zone characteristics from Fig. 5/53 is then updated.

Copy...

Select "Copy" to copy contents of the zone characteristics into the clipboard. A dialog box is displayed to permit you to select the contents.

5 Dialog



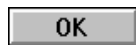
Digs159g

Fig. 5/56 Dialog box "Copy – zone characteristics"

You can copy either the diagram or the list of fault locations into the clipboard. The second option is only available, however, if a fault list is displayed in the dialog box for the zone characteristics. The diagram is stored as a bitmap in the clipboard. The list of fault locations is copied as text into the clipboard.

Select contents

Select one of the options "Content of diagram" or "List of fault locations".



Select "OK" to copy the selected information into the clipboard. The current dialog box is then closed.

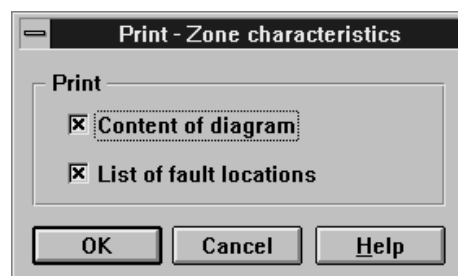


Select "Cancel" to abort the copy operation. The current dialog box is then closed.



You return to the dialog box in Fig. 5/53 irrespective of your selection.

Select "Print" to output the contents of the zone characteristics on a printer or into a file. A dialog box is displayed to permit you to select the contents.



Digs160g

Fig. 5/57 Dialog box "Print – zone characteristics"

You can output both the diagram and the list of fault locations. The second check field is only available, however, if a fault list is displayed in the dialog box for the zone characteristics. The contents of the diagram can only be printed, and not routed into a file.

Select contents

Mark one or both of the check fields "Content of diagram" and "List of fault locations".

- OK
 Select "OK" to output the selected information. The current dialog box is then closed, and a further dialog box is displayed to permit you to specify the output medium. You can find a description of this in Section 8.2.
- Cancel
 Select "Cancel" if you not wish to print. Your selection is then rejected, and the current dialog box is closed.
- You return to the dialog box in Fig. 5/53 irrespective of your selection.
- Close
 Select "Close" in order to close the dialog box "Zone characteristics".

5.8 Options in Context of Dialog

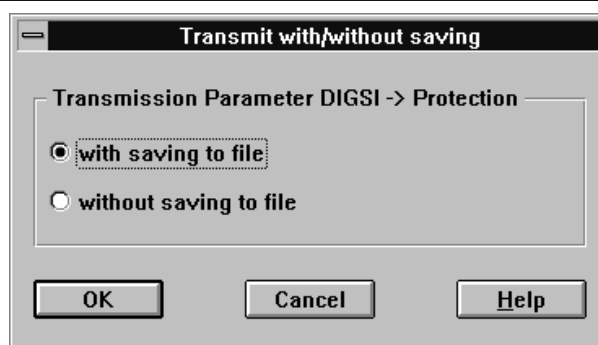
The extension menu "Protection device" of the menu "Options" provides you with a number of functions which are relevant in the context of the dialog.

5.8.1 Transmit Parameters with and without Saving

You will be asked to confirm your intention each time before parameters are transmitted to the protection device. You can then decide whether the modified parameters are to be saved before transmitting or not.

The options "With saving to file" and "Without saving to file" are available (see Section 5.2.1.1). You can define one of the options as the basic setting. The selected option is then already preset when you are asked to confirm your intention again.

Select the option "Transmit with/without saving" in the extension menu "Protection device". A dialog box is then displayed to permit you to select a transmission option as the basic setting.



DIGS275g

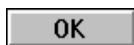
Fig. 5/58 Dialog box "Transmit with/without saving"

The selected option is only a presetting. You can decide individually before each transmission whether you wish to save the modified parameters or not.

5 Dialog

With saving to file Select this option if you usually want to save the modified parameters before transmitting. This option is then preselected when you are asked to confirm your intention in the future.

Without saving to file Select this option if you not usually want to save the modified parameters before transmitting. This option is then preselected when you are asked to confirm your intention in the future.



Click "OK" to accept the selected option as the basic setting. The current dialog box is then closed.



Click "Cancel" if you do not wish to modify the current basic setting. The current dialog box is then closed.

5.8.2 Delete Protection Device Files

You can delete selected protection device files either individually or in groups. Select the option "Delete protection device files" in the extension menu "Protection device". A dialog box is then displayed for selecting various file groups.

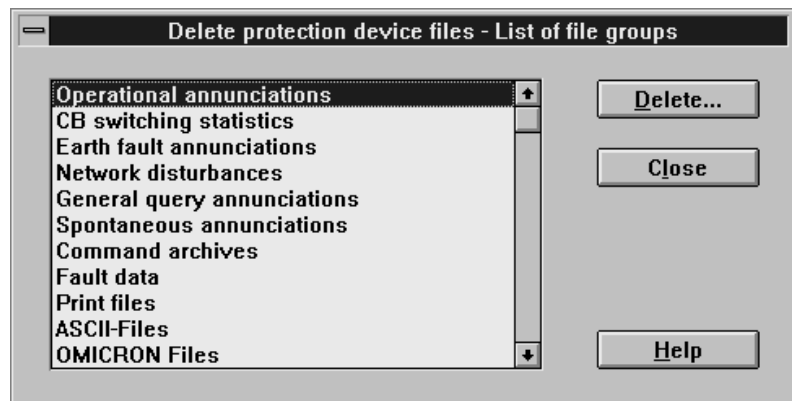
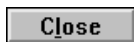


Fig. 5/59 Dialog box "Delete protection device files – list of file groups"

File groups The dialog box permits you to delete various file groups separately. Mark the file group to be deleted.



Select "Delete" to continue the procedure. Depending on the file group, you either branch into a further dialog box (Fig. 5/60) or you will be directly asked to confirm your intention (Fig. 5/61).



Select "Close" if you do not wish to select any file group. The procedure is aborted, and the dialog box closed.

If a further dialog box is displayed when you select "Delete", you can select individual files of the selected group. The selection is made according to the moment a file has been saved on the computer.

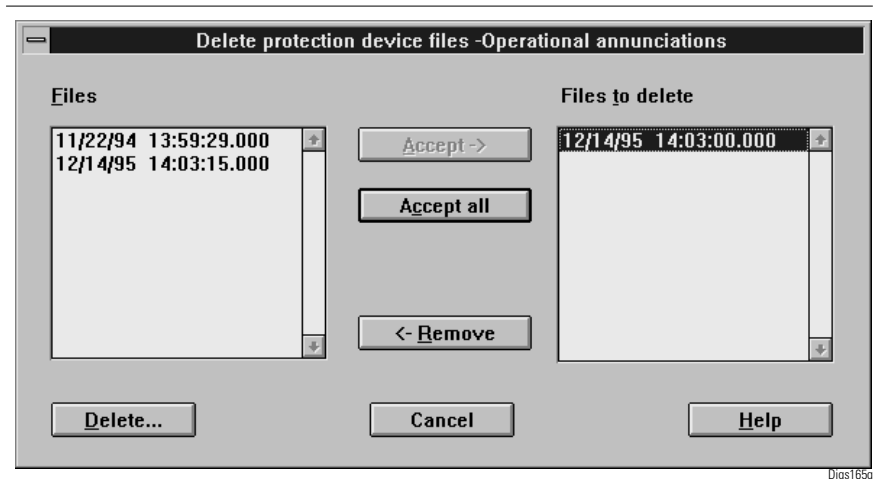
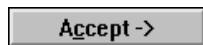


Fig. 5/60 Dialog box "Delete protection device files – <File group>"

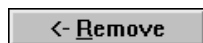
Mark the files to be deleted in the selection field "Files".



Select "Accept" to transfer the selected files into the field "Files to delete". This option is only active if you have marked at least one file in the selection field "Files". You can also transfer a single file to the field "Files to delete" by double clicking the file name.



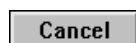
Select "Accept all" to transfer all files to the field "Files to delete".



Select "Remove" if you wish to transfer files marked in the field "Files to delete" back to the field "Files". This option is only active is at least one file is marked.



Select "Delete" if you wish to delete the files according to your selection.



Select "Cancel" if you do not wish to delete any files. The procedure is then aborted, and you return to the previous dialog box.

If you select "Delete" following selection of the files, you will be asked to confirm your intention.

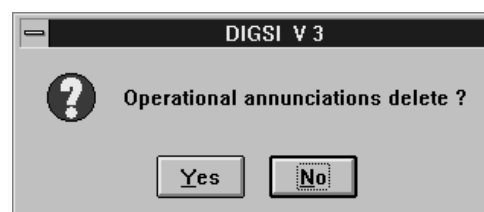
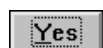


Fig. 5/61 Message prior to deleting files

5 Dialog



Select "Yes" if you wish to delete the selected files. The selected files are then deleted, and the current dialog box remains open.



Select "No" if you do not wish to delete the selected files. No files are then deleted, and the current dialog box remains open.

5.8.3 Setting the Protection Device Date/Time

DIGSI permits you to set the date and time for the protection device. You can enter the values in interactive mode or accept the system time and date of the computer. The date and time can only be set after a connection has been established.



Caution!

This option should not be used if the protection device is communicating with devices from the substation control and protection system.

Select the option "Date/time" in the extension menu "Protection device". A dialog box is then displayed to permit you to set the date and time.



Digs171g

Fig. 5/62 Dialog box "Protection device date/time"

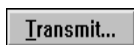
The displayed values correspond to the current date and time.

Manual setting

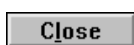
You can enter the date and time manually by editing the corresponding input fields.

Use of system values

You can also use the system date and time of the computer. To do this, mark the provided check field. The input fields are then cancelled and cannot be entered as long as this check field is marked.



Select "Transmit" if you wish to accept the set values of the system values. The previous values are then modified, and the current dialog box is closed.



Select "Close" if you do not wish to use the values. The previously set values then remain unchanged, and the current dialog box is closed.

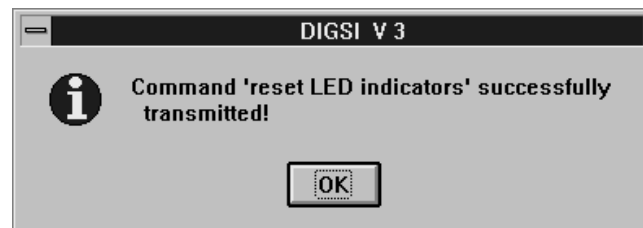
5.8.4 Reset Protection Device LEDs

DIGSI permits you to reset the protection device LEDs from the computer. You can only access this function following establishment of a connection.

Select the option "Reset LEDs" in the extension menu "Device" (Options). Selection of this option directly triggers the desired action. A corresponding message is output.



As an alternative to the menu option, you can also select the button displayed on the left in the toolbar.

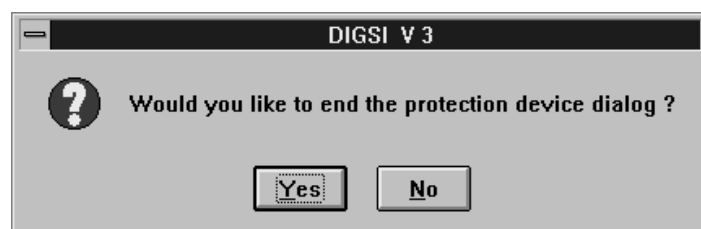


Digs172g

Fig. 5/63 Message when resetting the LEDs

5.9 Terminating the Dialog

In order to terminate the dialog, select the menu "Stop". This menu does not contain any further options. You will be directly asked to confirm your intention.



Digs140g

Fig. 5/64 Message prior to termination of the dialog



Select "Yes" to terminate the dialog. The DIGSI window "Dialog" is then closed, and you return to the DIGSI window "Substation management".



Select "No" if you do not wish to terminate the dialog. The DIGSI window "Dialog" then remains open.

Please refer to Section 6 for individual procedures during the cancellation of a connection.

6 Higher-level Communication

Various types of connection are available to permit you to communicate with a protection device:

- ⊙ Direct connection between computer and protection device
- ⊙ Connection via modems
(one office modem and one substation modem)
- ⊙ Connection via a channel multiplexer
- ⊙ Connection via a star coupler
- ⊙ Connection via a combination of modems, channel multiplexers and star couplers

The corresponding settings must be made in DIGSI depending on the existing hardware configuration. Please also read the Appendix A.8.

6.1 Definition of Terms

This Section explains a number of important terms from the fields "Hardware components", "Transmission procedures" and "Modem parameters".

Office and substation modems

In order to carry out remote control and data transmission via the telephone network, it is possible to establish a modem connection between the computer and protection device. You require at least one modem at your workstation. This modem is referred to as the office modem. You additionally require one modem per substation with which you wish to establish a connection. Such a modem is referred to as a substation modem. You can make different settings for office and substation modems, save them, and transmit them as required to the associated modem.

Channel multiplexer

Protection devices according to the ASCII standard **cannot** be selected using a device address. You require a channel multiplexer in order to nevertheless address such protection devices via a common physical connection. This channel multiplexer is informed of the name of the channel (port) to which the protection device is connected. The channel multiplexer then establishes a connection between the computer and the protection device.

Star coupler

A star coupler can be used to operate several addressable protection devices according to the VDEW standard via a common physical connection. All protection devices connected to the star coupler are always listening. However, only the respectively addressed device can be operated and also replies. Automatic adjustment of addresses is not possible when operating with star couplers. All protection devices must therefore be connected to the system interface since this does not permit adjustment of addresses. The operation of non-addressable protection devices (ASCII standard) is not possible via a star coupler.

6 Higher-level Communication

- Callback procedure** In conjunction with the establishment of a modem connection, the callback procedure provides increased protection against unauthorized access. You will be asked to enter a logon password and a callback password once the connection has been established from the office modem to the substation modem. The substation modem interrupts the existing connection following reception of the passwords. The substation modem then calls back the office modem. The required telephone number is stored in the substation modem with a reference to the received callback password. A callback is not carried out if a non-registered callback password has been received. Further information can be found in Appendix A.8.6.
- Timeout** A timeout is generated as an error message if data transmission is not possible. A differentiation is made between:
- ⊙ **Timeout when transmitting:**
This timeout occurs, for example, as a result of an error in the Windows configuration
 - ⊙ **Timeout when receiving:**
This problem occurs, for example, as a result of an incorrect cable, an incorrect interface setting in DIGSI or in the protection device.
- Transmission format** Two different transmission formats are available for the computer interfaces:
- ⊙ Format 8E1: 8 data bits, even parity, 1 stop bit (to IEC 870-5)
 - ⊙ Format 8N1: 8 data bits, no parity, 1 stop bit
- DIGSI operates as standard with the format 8E1. This format provides an increased transmission reliability and should therefore be retained if possible. The format 8N1 must be selected when connecting modems which do not accept a parity bit.
- Initialization string** The initialization string contains various instructions for the substation modem. These are relevant during communication with an office modem. The formulation of the individual instructions is specific to the modem. Further information on the format of an initialization string can be found in Appendix A.8.5.
- Read command** A read command to the substation or office modem can be used to scan various information from the respective modem. The individual read commands are specific to the modem. Refer to the documentation of your substation or office modem for the read commands which are relevant for you. You can find examples of various read commands in Appendix A.8.7.
- Initial value for baud rate** Synchronization of the baud rate on the serial interface is necessary for communication between the computer and modem or protection device. A baud rate must be set for the serial interface of the computer before an attempt is made to establish a connection to the modem or protection device. DIGSI initially attempts to establish a connection with the preset baud rate. If this attempt is unsuccessful, a new attempt is made with a different, permissible baud rate. This procedure is repeated until a connection has been successfully established or the initial value at the baud rate has been reached again.

6.2 Preparations for Establishment of Connection

The following checklist provides a summary of all preparations necessary for the correct establishment of a connection between the computer and protection device. If problems occur when establishing a connection, first check that all necessary preparations have been made. Also refer to the setting information in Appendix A.8.3 and A.8.4.

Physical connections	Establish all physical connections between computer, protection device as well as modems, channel multiplexers and star couplers (see Appendix A.5 and A.8.2).
Data specific to substations	Check that you have considered the following points when defining the data specific to substations (see Section 4.1.1 and 4.1.4): <ul style="list-style-type: none"> ⊙ The connections which you require via modem, channel multiplexer and star coupler must always be enabled. ⊙ When enabling operation with a channel multiplexer, an appropriate setting must have been made for selection of this equipment. You can choose between automatic and manual selection depending on the channel multiplexer used. ⊙ When enabling operation with a modem, an office modem and a substation modem must be selected. A telephone number must be defined for the substation modem.
DICOMM mode	Before initial communication with a protection device, you must select a DICOMM mode. This regulates the type of access to the serial interfaces used (see Section 6.2.1).
Channel multiplexer	Before initial operation with a channel multiplexer, you must define some settings for it (see Section 6.2.2).
Office modem	You must define all settings required for the office modem before establishing a modem connection. These must be transmitted to the office modem by means of an initialization procedure (see Section 6.2.5).
Substation modem	You must define all settings required for the substation modem before establishing a modem connection. These must be transmitted to the substation modem by means of an initialization procedure (see Section 6.2.6).
Hang up mode	In order to cancel an existing modem connection, define a hang up mode. You have the choice between a purely manual hang up or a combination of time-controlled and manual hang up (see Section 6.2.7).
Interface to protection device	The computer interface to the protection device must be configured before establishing a direct connection to the latter (see Section 6.2.8).
Protection device response time	The protection device response time must be set for communication with the protection device (see Section 6.2.9).

6

Higher-level Communication

6.2.1 Configuration of DICOMM

The communication functions of the VDEW protocol are implemented for DIGSI in the "dicomm.dll" program file. Before initial communication with a protection device you must configure this program file in two stages. First enter the operating system you are using. Then select one of two DICOMM modes.

Select the option "DICOMM" from the "Options" menu. A dialog box appears where you can define the operating system and select a DICOMM mode.

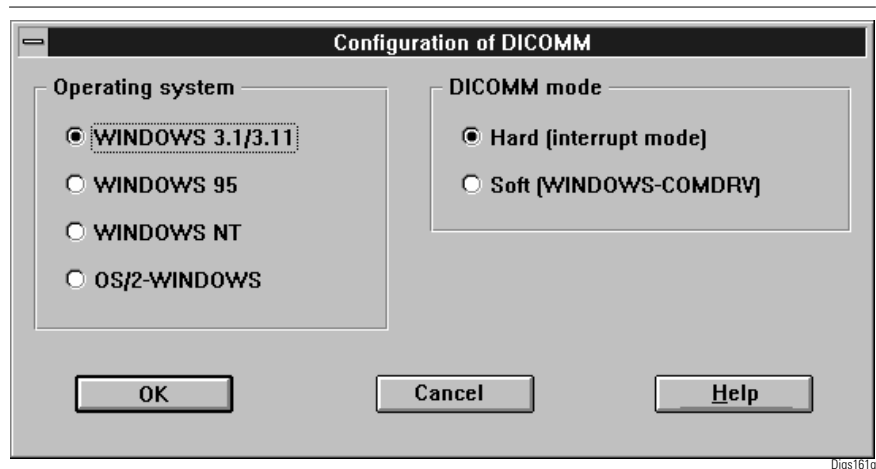


Fig. 6/1 Dialog box "Configuration of DICOMM"

The selected DICOMM mode regulates the way in which the serial interfaces may be accessed. There are a Hard and a Soft mode to choose from.

- | | |
|------------------|--|
| Hard mode | In Hard mode, an interrupt controlled driver directly accesses the Windows device drivers "VCD" and "VPICD". |
| Advantage | Regardless of the current system load, compliance with defined time frames is guaranteed. In particular, this also applies when using DIGSI under Windows 3.1x. |
| Disadvantages | <ul style="list-style-type: none">⊙ Applications occasionally replace the above-mentioned drivers "VCD" and "VPICD" with their own drivers with the same names during installation. In such a case, fault-free communication can no longer be realized. The error message "Timeout during transmission", for example, may then be displayed.⊙ Only the standard settings of the serial interfaces are supported. This means that the ports COM1 and COM3, or COM2 and COM4 cannot be used by different applications at the same time. |

Soft mode Drivers based on the communications functions of Windows are used in Soft mode.

- Advantages
- ⊙ Since the drivers "VCD" and "VPICD" are not accessed directly, communication is not influenced by the replacement of these drivers.
 - ⊙ The settings made within Windows for ports COM1 to COM4 are taken into account.

Disadvantage Compliance with defined time frames, particularly under Windows 3.1x, is not guaranteed. Instead, time behaviour depends on the current system load. This can cause the protection device to drop out. The consequence of this is that a new connection must be established to the protection device.

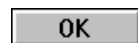
Availability of a mode Depending on the operating system used, either both or only one of the two DICOMM modes is available. Table 6/1 shows the possible combinations.

Table 6/1 Combinations of operating system/DICOMM mode

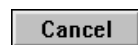
Operating system	Hard mode	Soft mode
Windows 3.1x	x	x
Windows 95	x	x
Windows NT 3.51		x
OS/2-Windows 3.0	x	

Select operating system In the selection box "Operating systems", highlight the name of the operating system under which you have installed DIGSI.

Select DICOMM mode Highlight one of the two possible modes in the "DICOMM mode" selection box. If you have already highlighted one of the operating systems "Windows NT" or "OS/2", a mode is predefined.



Select "OK" to confirm your selection. The current dialog box is then closed.



Select "Cancel" to cancel the selection. The settings entered for the operating system and DICOMM mode remain unchanged. The current dialog box is then closed.

6 Higher-level Communication

6.2.2 Configure channel multiplexer

If you use non-addressable protection devices (ASCII character transfer) in your substation configuration, you may require a channel multiplexer.

As a rule, such a channel multiplexer must be configured before initial startup. We shall show you how to proceed using the 7XV55 channel multiplexer as an example. You will find the concrete settings in Appendix A.8.3.

Preparations are carried out in ten stages:

1. Connect the PC to the channel multiplexer (see Appendix A.8.3.1).
2. Set the data format of the local interface at the channel multiplexer (see Appendix A.8.3.2).
3. Set the data format of the I/O interface at the channel multiplexer (see Appendix A.8.3.3).
4. Carry out a master reset at the channel multiplexer (see Appendix A.8.3.4).
5. Call up the overview in DIGSI of the possible commands (see Section 6.2.2.1).
6. With the interactive help of DIGSI, set the interfaces of the protection devices (for general instructions on how to proceed see Section 6.2.2.2, for concrete settings Appendix A.8.3.5 and A.8.3.6)
7. Select a drop-out time for the channel multiplexer (see Section 6.2.3).
8. Save all settings and exit the configuration (see Section 6.2.4).
9. Connect the protection devices to the channel multiplexer (see Appendix A.8.3.7).
10. Connect the modem to the channel multiplexer (see Appendix A.8.3.8).

After you have gone through all of the steps, you can establish a connection using the channel multiplexer (see Section 6.3.5).

6.2.2.1 Call up command overview

You can use DIGSI to show you an overview of commands with the help of which you can, for example, configure the interfaces of a channel multiplexer.

First start the dialog, as described in Section 5.1. Select the option "With protection device via:" in the dialog box "Dialog mode" in Fig. 5/1. Highlight the check box "Channel multiplexer" as well. Select "OK". The current dialog box is then closed and the dialog is initiated. The dialog box "Select channel multiplexer" is then opened.

The display area of the dialog box is initially empty. Press the button . The note "Local>" is displayed. Enter the letter "h" and confirm this by pressing . An overview of the available commands is then displayed.



Fig. 6/2 Overview of commands



Select "Ready" to close the current dialog box.

However, if you wish to set the interfaces of the channel multiplexer, leave the dialog box open.

6.2.2.2 Set the interfaces of the protection devices

To set the interfaces of the protection devices, the dialog box "Select channel multiplexer" must be open (see Section 6.2.2.1).



Caution!

Start configuration

The channel multiplexer must be connected to your DIGSI computer ready for operation.

As a prompt you will see "Local>". Now enter the letter "p" and confirm your input by pressing . "p" stands for the command "Program Port".

Next you will see the prompt "Port #". You must now enter which of the existing channel multiplexer interfaces you would like to set. To do this, enter the number of the interface concerned and confirm your input by pressing . In the example shown the settings are to be defined for interface 2.

6 Higher-level Communication

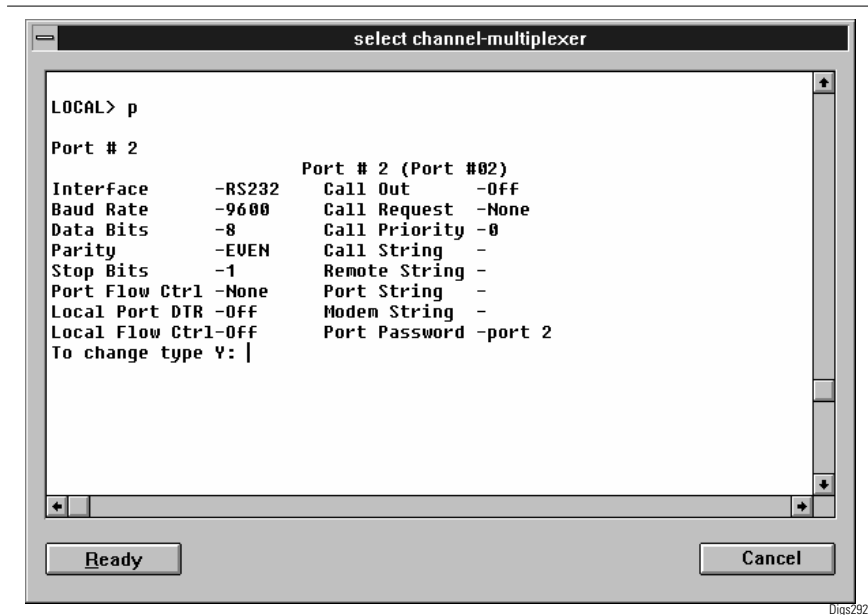


Fig. 6/3 Overview of the current settings of the selected interface

After you have entered and confirmed the interface number, you will be shown an overview of the current settings for the selected interface. To make changes enter "y" and confirm your input by pressing .

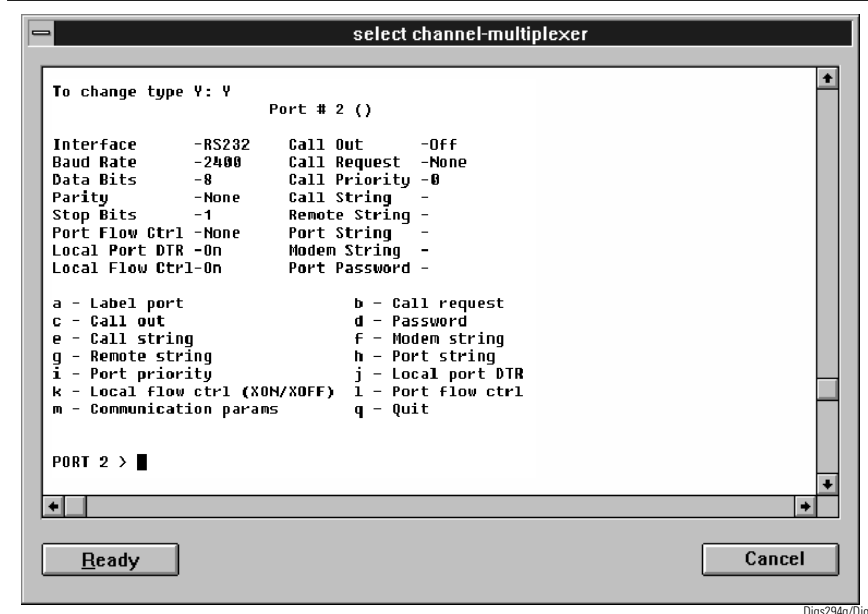


Fig. 6/4 Overview of current settings and commands

In addition to the current settings a list of commands is displayed. These are required to modify the individual settings. If these commands are not visible at first, use the vertical scroll bars to make them visible.

Enter general settings

General settings are ones that are valid for all connected protection devices, regardless of the version number. We shall show you how to carry out general settings, using a change in an interface name as an example. All other setting options, with the respective values, are summarized in tabular form in Appendix A.8.3.5.

A name (e.g. destination device) can be assigned to each channel of the channel multiplexer. However, up to 30 characters can be given as a name.

1. Enter the letter "a" for "Label port". Confirm your input by pressing . The following message is then displayed:

Old label was <old label>
Please enter new label, up to 30 characters._

Instead of the placeholder <old label> the current name of the channel is displayed. If no name has been assigned to the channel so far, no name is displayed.

2. Enter a new name using any random characters. Upper and lower case letters are interpreted as different characters. Confirm your input by pressing .

Enter protection device-specific settings

Protection device-specific settings are settings that need adapting to the protection device connected. Here we shall show you the basic steps of how to enter protection device-specific settings. All concrete protection device-specific setting values are summarized in tabular form in Appendix A.8.3.6.

1. Enter the letter "m" for "Communication params". Confirm your input by pressing . The following text is then displayed:
Baud: 0 = 300 2 = 1200 3 = 4800 4 = 9600 5 = 19200:_
2. To set a specific baud rate, enter the key number. Confirm your input by pressing . The following text is then displayed:
Bits: 7 or 8:_
3. To define the number of data bits, enter either "7" or "8". Confirm your input by pressing . The following text is then displayed:
Parity: 0 = none 1 = even 2 = odd:_
4. To set the parity, enter the key number. Confirm your input by pressing . The following text is then displayed:
Stop Bits: 1 or 2:_
5. To define the number of stop bits, enter either "1" or "2".

Complete configuration of an interface

When you have carried out all of the necessary settings for an interface, quit the current processing level. Enter the letter "q" for "Quit". Confirm your input by pressing . "Local>" is then displayed as a prompt.

You can now enter settings for further interfaces. When all interfaces have been configured, you can save the settings you have entered. Of course you can buffer your data as protection against unforeseen loss of data.

6 Higher-level Communication

6.2.3 Drop-out time of channel multiplexer

If the channel multiplexer doesn't receive data within a selected time, it will drop out automatically. This time is called "drop-out time". After a master reset, this time is set to 600 ms. Working with DOS-DIGSI, no data is transmitted to the protection device during pauses in operation. In this case the selected value may be too low.

To increase the value of the drop-out time, enter the letter "c" for "Config" while "Local>" is displayed as a prompt. Press the button . The menu "Config" is displayed. Select the parameter "pt" and enter a new value. Leave the menu by entering "q" and confirming with .

6.2.4 Save settings and exit configuration

Save settings Enter the letter "s" for "Save changes". Confirm your input by pressing . The following query then appears:

Are you sure? (Y/N):_

To save the settings you have made, enter "Y". Confirm your input by pressing . The following message then appears:

Please wait

When the Save operation is finished, "Local>" appears as a prompt.

Exit configuration Enter the letter "q" for "Quit". Confirm your input by pressing . "PL" appears in the display of the channel multiplexer. The channel multiplexer is now ready to communicate with the connected protection devices.

6.2.5 Configure Office Modems

In order to establish a connection to an office modem it is first necessary to configure this. You can carry out all necessary settings in DIGSI in interactive mode, and store them together with a selectable modem name.

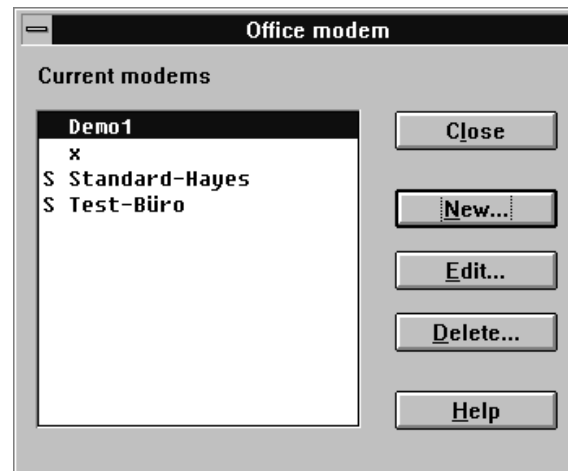
The various modem names are registered in a list. You can select an office modem from the list using its name, delete it if applicable, or edit the associated settings. This list can only be accessed before establishing a connection.



Caution!

The file which contains this list is stored in the DIGSI program directory. It may therefore occur that modem names displayed in the list are not available following the copying of substations onto another computer. An error message is then output.

Select the option "Office modem" in the extension menu "Modem". A dialog box is then opened which informs you of all available office modems.



Digs266g

Fig. 6/5 Dialog box "Office modem"

The dialog box shows you the names of all registered office modems in the selection field "Current modems". These need not necessarily be the names of actually existing office modems. It is the case that a modem configuration consisting of a large number of settings is stored for each modem name.

You can generate new configurations and store them under selectable modem names. These are added to the list. You can also edit or delete existing configurations. You can then select a configuration from the list matching a connected office modem.

Generate modem configuration



You can generate new modem configurations and store them under a selectable modem name. This name is added to the list of current office modems.

Click "New" in order to generate a new configuration for an office modem. A dialog box is then displayed for definition of the required settings. Refer to Section 6.2.5.1.

Edit modem configuration



Caution!

You can edit the settings of an existing modem configuration. Mark in the selection field "Current modems" a modem name whose associated configuration you wish to edit.

Some office modems are identified by the letter "S" in the left column of the list. These are standard modems. The configurations of such standard modems can be used as the basis for generating new configurations. However, they **cannot** be directly edited.



Click "Edit" in order to edit the configuration associated with the marked name. A dialog box is then displayed for editing the associated settings. Refer to Section 6.2.5.2.

Delete modem name

You can delete a modem name present in the list including the associated configuration. Mark the associated modem name in the selection field "Current modems".

6 Higher-level Communication

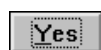


Click "Delete" in order to delete the marked modem name including the associated configuration. You will be asked to confirm your intention.

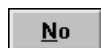


Digs269g

Fig. 6/6 Message displayed prior to deletion of modem configuration

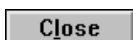


Click "Yes" if you want to delete the marked modem name including the associated configuration.



Click "No" if you do not wish to delete the marked modem name together with the associated configuration.

Terminate editing



You can terminate editing once you have made all desired modifications.

Click "Close" to terminate the editing. The current dialog box is then closed.

6.2.5.1 Generation of a new Configuration for an Office Modem

You can use the dialog box "New office modem" to define all settings for the configuration of a new office modem. The possible settings can be divided into three categories:

- ⊙ Modem name
- ⊙ Modem parameters
- ⊙ Settings for computer interface

It is essential in this context to also refer to the information in Appendix A.8.

Enter modem name

The input field "Modem name" is empty in the basic setting; the cursor is positioned to this input field when the dialog box is opened. Enter a name for the new modem to be configured. The name may have a maximum length of 19 characters. Choose a meaningful name which has a relationship to the real modem.

Define modem parameters

Select preset value

The next step is to define all modem-specific settings.

You can use existing configurations as the basis for generating a new configuration. The existing configurations comprise those which you have generated as well as several standard configurations. These are installed together with DIGSI.

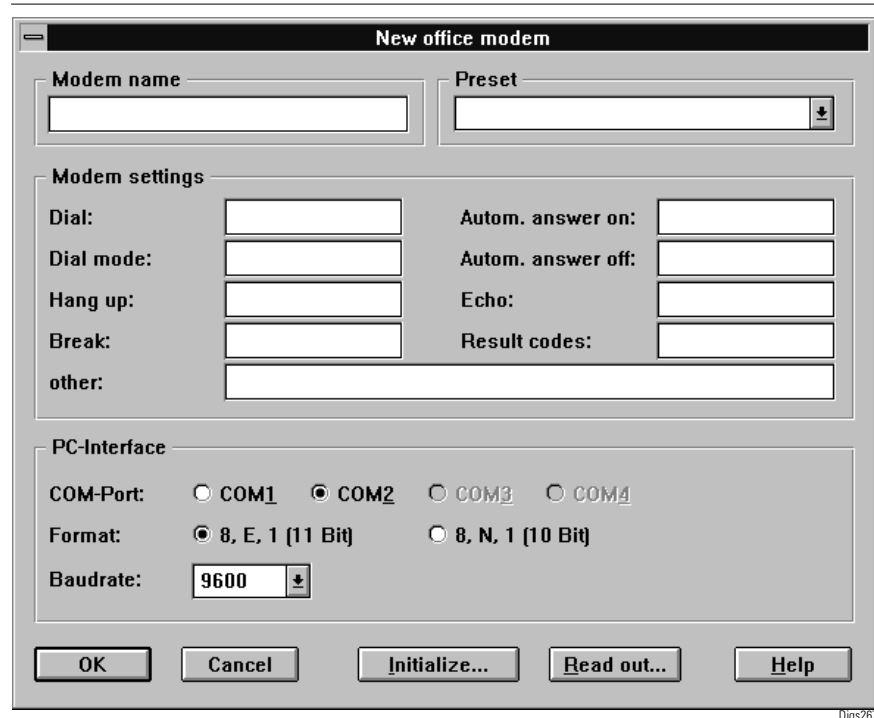


Fig. 6/7 Dialog box "New office modem"

From the dropdown list "Preset", select the name of an office modem whose configuration appears to be a suitable basis. All inputs possible within the dialog box are then preset according to the selected configuration.

Enter modem parameters

Position the cursor in succession to the input fields for the various modem parameters. Apart from the parameter "Other", values must be entered for all parameters. Enter the parameter values according to the requirements of your office modem. Since the various values for the parameters depend on the modem type, no further details can be provided here.

Configure computer interface in DIGSI

Select COM port

Before transmitting settings to the office modem it is necessary to specify data in DIGSI concerning the computer interface to be used.

Select one of the options "COM port" (1 to 4). The designation of the selected option must correspond to the serial computer port to which the office modem is connected. You can only select options for physically present interfaces.

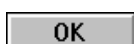
Select transmission format

Select one of the options "Format". The selected transmission format must correspond to the previously selected interface.

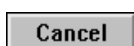
Select initial value for baud rate

Select an initial value for the baud rate from the dropdown list "Baud rate". The displayed value corresponds to the currently set initial value of the baud rate in the computer. The various values are fixed and cannot be edited. This option does not influence the baud rate set in the modem.

6 Higher-level Communication



Click "OK" to accept all settings and to store them under the new modem name. The current dialog box is then closed.



Click "Cancel" to reject all settings. The current dialog box is then closed.



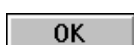
Caution!

If you have confirmed your inputs with "OK", these are initially checked to establish that they are unambiguous and complete. A corresponding message is output if the entered modem name already exists.



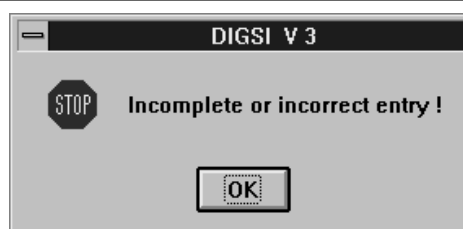
Digs286g

Fig. 6/8 Message displayed if modem name already exists



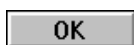
Acknowledge the message with "OK" to return to the last dialog box. Enter a new modem name or cancel the procedure.

A message is also displayed if your inputs are incomplete.



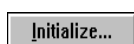
Digs039g

Fig. 6/9 Message displayed if inputs are incomplete



Acknowledge the message with "OK" in order to return to the last dialog box. Complete your inputs.

Transmit settings to office modem



Click "Initialize" to transmit the currently displayed settings to the connected office modem.



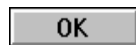
Caution!

DIGSI does not check whether the transmission has been carried out correctly. You should check this by subsequently reading out the settings from the modem. The following message is always displayed.



Digs259g

Fig. 6/10 Message following transmission of initialization text



Acknowledge the message with "OK".

Read out settings of office modem

You can read out various settings from the currently connected office modem. Make sure first that the office modem is connected to your computer via the interface defined in DIGSI.



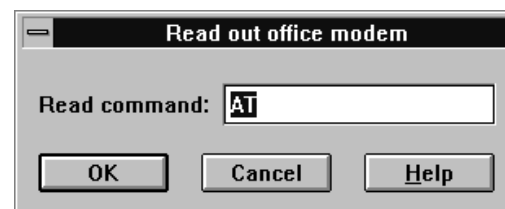
Click "Read out" to initiate the read procedure. Refer to Section 6.2.5.3.

6.2.5.2 Editing the Configuration of an Office Modem

You can use the dialog box "Edit office modem" to edit all settings of the configuration of an office modem. The design of this dialog box is identical to the dialog box "New substation modem" in Fig. 6/7. Editing of the settings is also comparable to the procedure described in Section 6.2.5.1. A further description is therefore not provided here.

6.2.5.3 Read out the Settings of an Office Modem

You can use the dialog box "Read out office modem" to send read commands to the office modem in order to obtain information on its current settings. The office modem must be connected to the computer.





Digs278g

Fig. 6/11 Dialog box "Read out office modem"

Enter read command

The cursor is positioned in the input field "Read command". The input field is preset to the read command "AT". Supplement this command or replace it by a new one.

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-  Click "OK" to transmit the entered read command to the office modem. The current dialog box is then closed.
-  Click "Cancel" to terminate the procedure. The entered read command is then rejected, and the current dialog box closed.

If you have confirmed your input with "OK", DIGSI attempts to transmit the read command to the office modem. A message is output if the modem does not reply within a defined time.

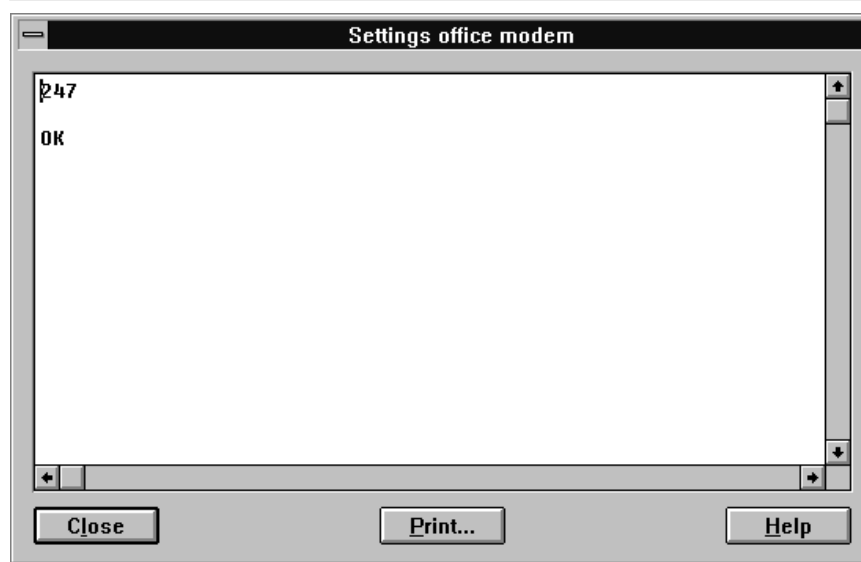


Digs270g

Fig. 6/12 Message resulting from a possible connection error

-  Acknowledge the message with "OK". Check the connection between the computer and modem as well as the settings for the computer interface. Subsequently try to send a read command again to the office modem.

A further dialog box is displayed when the read command has been transmitted successfully. This displays the requested settings.



Digs281g

Fig. 6/13 Dialog box "Settings office modem"

Close

Click "Close" when you have checked the displayed settings. The current dialog box is then closed, and you return to the previous one.

Print...

Click "Print" to output the displayed settings on a printer or into a file. The print functions and associated dialog boxes are described in Section 8.2.

6.2.6 Configuring of Substation Modems

In order to make a connection to a substation modem, it is first necessary to configure this. You can carry out all necessary settings in DIGSI in interactive mode, and store them together with a selectable modem name.

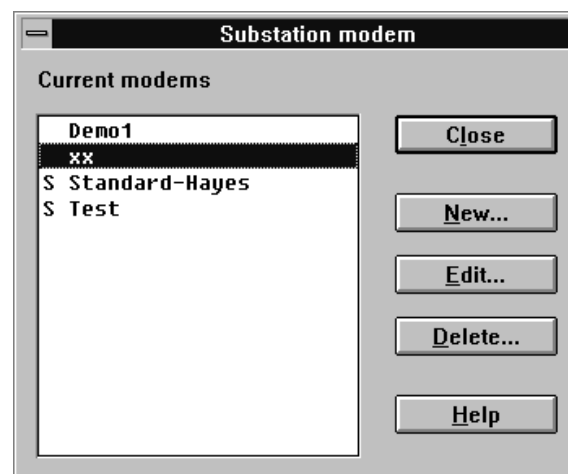
The various modem names are registered in a list. You can select a substation modem from the list using its name, delete it if applicable, or edit the associated settings. This list can only be accessed prior to the establishment of a connection.



Caution!

The file which contains this list is stored in the DIGSI program directory. It may therefore occur following the copying of substations onto another computer that modem names displayed in the list are not available. An error message is then displayed.

Select the option "Substation modem" in the extension menu "Modem". A dialog box is then displayed which informs you of the currently available substation modems.



Digs257g

Fig. 6/14 Dialog box "Substation modem"

The dialog box shows you the names of all registered substation modems in the selection field "Current modems". These need not necessarily be the names of actually existing substation modems. It is the case that a modem configuration consisting of a large number of settings is stored for each modem name.

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Generate modem configuration



You can generate new configurations and store them under selectable modem names. These are added to the list. You can also edit or delete existing configurations. You can then select a configuration from the list matching a connected substation modem.

You can generate new modem configurations and save them under a modem name. This name is then added to the list of current substation modems.

Click "New" to generate a new configuration for a substation modem. A dialog box is then displayed for defining the required settings. Refer to Section 6.2.6.1.

Edit modem configuration



Caution!

You can edit the settings of an existing modem configuration. Mark a modem name in the selection field "Current modems" whose associated configuration you wish to edit.

Some substation modems are identified by the letter "S" in the left column of the list. These are standard modems. The configurations of such standard modems can be used as the basis for generating new configurations. However, they **cannot** be edited directly.



Click "Edit" to edit the configuration associated with the marked name. A dialog box is then displayed for editing the associated settings. Refer to Section 6.2.6.2.

Delete modem name



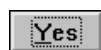
You can delete a modem name including the associated configuration from the list. Mark the associated modem name in the selection field "Current modems".

Click "Delete" to delete the marked modem name including the configuration. You will be asked to confirm your intention.

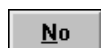


Digs269g

Fig. 6/15 Message displayed prior to deletion of a modem configuration

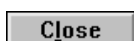


Click "Yes" if you wish to delete the marked modem name including the associated configuration.



Click "No" if you do not wish to delete the marked modem name together with the associated configuration.

Terminate editing



You can terminate editing once you have carried out all required modifications.

Click "Close" to terminate editing. The current dialog box is then closed.

6.2.6.1 Generate a new Configuration for a Substation Modem

Use the dialog box “New substation modem” to define all settings for the configuration of a new substation modem. The possible settings can be divided into three categories:

- ⊙ Modem name
- ⊙ Modem parameters
- ⊙ Settings for computer interface

It is essential in this context that you also refer to the information in Appendix A.8.

Enter modem name

The input field “Modem name” is empty in the basic setting; the cursor is positioned in this input field when opening the dialog box. Enter a name for the modem to be configured. The name may have a maximum length of 19 characters. Choose a meaningful name which has a relationship to the real modem.

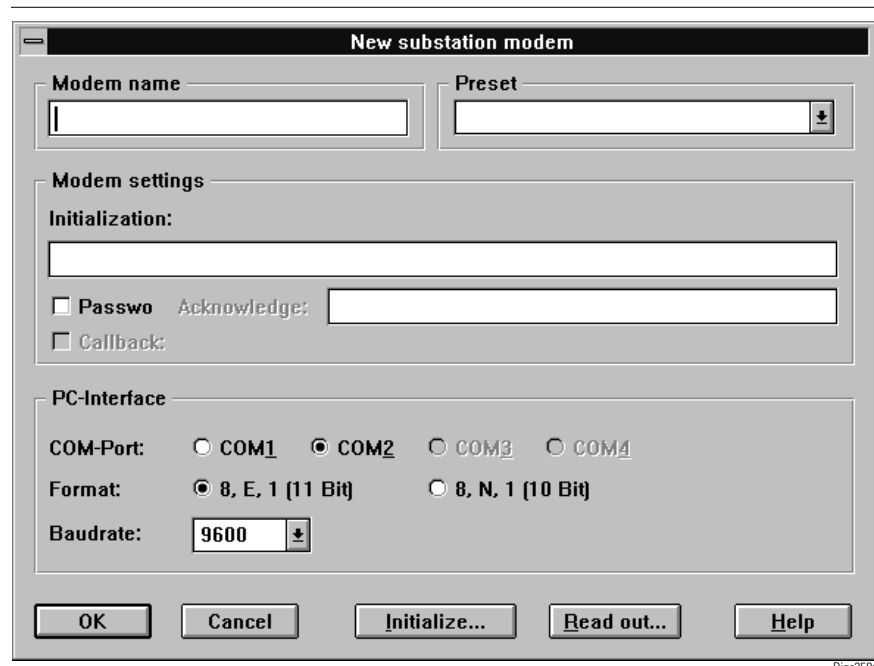


Fig. 6/16 Dialog box “New substation modem”

Define modem parameters

Select presettings

Define all modem-specific settings in the next step.

You can use existing configurations as the basis for setting a new configuration. The existing configurations comprise those which you have generated as well as several standard configurations. These are installed together with DIGSI.

From the dropdown list “Preset”, select the name of a substation modem whose configuration appears to be a suitable basis. All inputs possible within the dialog box are then preset according to the selected configuration.

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- Enter initialization string Position the cursor to the input field "Initialization". An initialization string is already assigned to this field if you have selected a presetting. Use this string, or adapt it to the requirements of your substation modem.
- Activate password protection Mark the control field "Password" if you wish to protect the establishment of connection by a password.
- Activate callback procedure Mark the control field "Callback" in order to additionally protect the establishment of connection by the callback procedure. This control field can only be marked if the control field "Password" is marked.
- Enter acknowledgement text If you have only marked the control field "Password" you **must** enter an acknowledgement text. Position the cursor in the input field "Acknowledge", and enter an acknowledgement text with a maximum length of 49 characters. An input is not possible if the control field "Callback" is also marked.
- Configure computer interface in DIGSI**
 - Select COM port Data concerning the computer interface must be specified in DIGSI before transmitting settings to the substation modem. Select one of the options "COM port" (1 to 4). The designation of the selected option must correspond to the serial computer port to which the substation modem is connected. You can only select options for physically present interfaces.
 - Select transmission format Select one of the options "Format". The selected transmission format must correspond to the previously selected interface.
 - Select initial value for baud rate Select an initial value for the baud rate from the dropdown list "Baud rate". The displayed value corresponds to the currently set initial value of the baud rate in the computer. The various values are fixed and cannot be edited. This option does not influence the baud rate set in the modem.

OK

Click "OK" to accept all settings and to save them under the new modem name. The current dialog box is then closed.

Cancel

Click "Cancel" to reject all settings. The current dialog box is then closed.



Caution!

If you have confirmed your inputs with "OK", a check is initially carried out to establish that they are unambiguous and complete. A corresponding message is displayed if the entered modem name already exists.



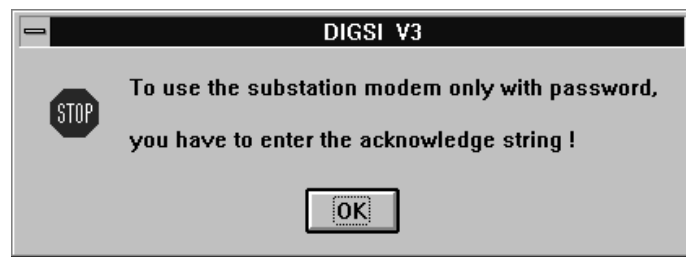
Digs286g

Fig. 6/17 Message displayed if modem name already exists

OK

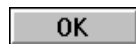
Acknowledge the message with "OK" in order to return to the last dialog box. Enter a new modem name or abort the procedure.

If you have marked the control field "Password" but not the control field "Callback", DIGSI checks whether an associated acknowledgement text has been entered. A message is displayed if this is not the case.



Digs287g

Fig. 6/18 Message displayed if acknowledgement text is missing



Acknowledge the message with "OK" in order to return to the last dialog box. Enter a new modem name or abort the procedure.

Transmit settings to the substation modem

Once all settings have been defined, they can be transmitted to the substation modem using an initialization procedure. First check that the substation modem is connected to your computer at the port defined in DIGSI.



Click "Initialize" to transmit the currently displayed settings to the connected substation modem.



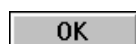
Caution!

DIGSI does not check whether the transmission has been carried out successfully. Check the transmission by subsequently reading out the settings from the modem. The following message is always displayed.



Digs259g

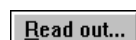
Fig. 6/19 Message following transmission of an initialization text



Acknowledge the message with "OK".

Read out settings of substation modem

You can read various settings from the currently connected substation modem. First check that the substation modem is connected to your computer at the port defined in DIGSI.



Click "Read out" to initiate the read procedure. Refer to Section 6.2.6.3.

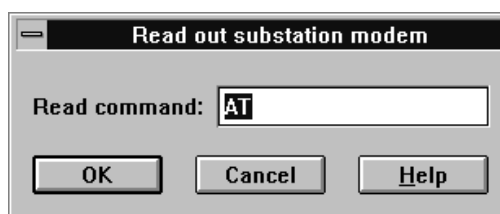
6 Higher-level Communication

6.2.6.2 Edit Configuration of a Substation Modem

You can use the dialog box "Edit substation modem" to edit all settings of the configuration of a substation modem. The format of this dialog box is identical to the dialog box "New substation modem" in Fig. 6/16. The editing of the settings is also comparable with the procedure described in Section 6.2.6.1. A further description is therefore omitted here.

6.2.6.3 Read Out the Settings of a Substation Modem

You can use the dialog box "Read out substation modem" to send read commands to the substation modem in order to obtain information on its current settings. The substation modem must be connected to the computer.

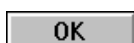


Digs264

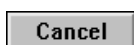
Fig. 6/20 Dialog box "Read out substation modem"

Enter read command

The cursor is positioned in the input field "Read command". The input field is preset to the read command "AT". Supplement this command or replace it by a new one.



Click "OK" to transmit the entered read command to the substation modem. The current dialog box is then closed.



Click "Cancel" to terminate the procedure. The entered read command is then rejected, and the current dialog box closed.

If you have confirmed your input with "OK", DIGSI attempts to transmit the read command to the substation modem. A message is output if the modem does not reply within a defined time.



Digs270g

Fig. 6/21 Message resulting from a possible connection error

OK

Acknowledge the message with "OK". Check the connection between the computer and modem as well as the settings for the computer interface. Subsequently try to send a read command again to the substation modem.

A further dialog box is displayed when the read command has been transmitted successfully. This displays the requested settings.

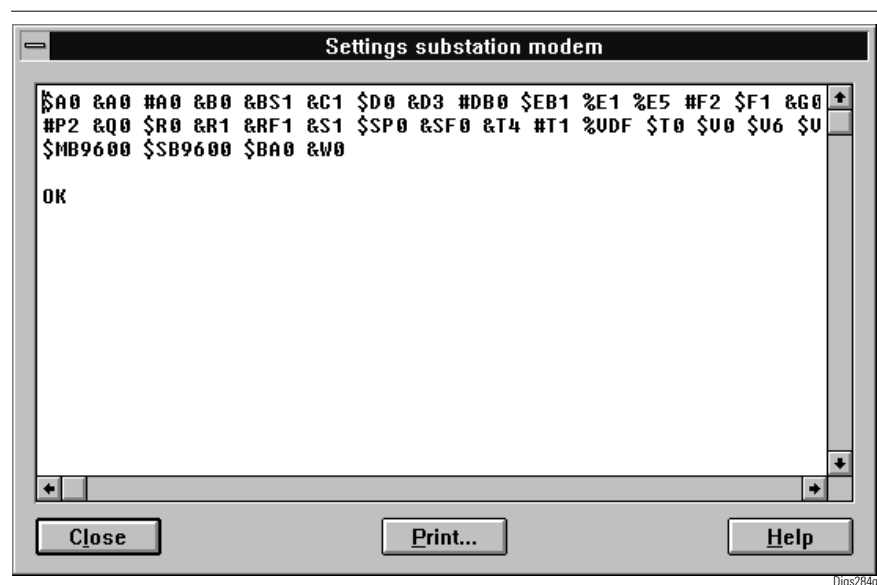


Fig. 6/22 Dialog box "Settings substation modem"

Close

Click "Close" when you have checked the displayed settings. The current dialog box is then closed, and you return to the previous one.

Print..

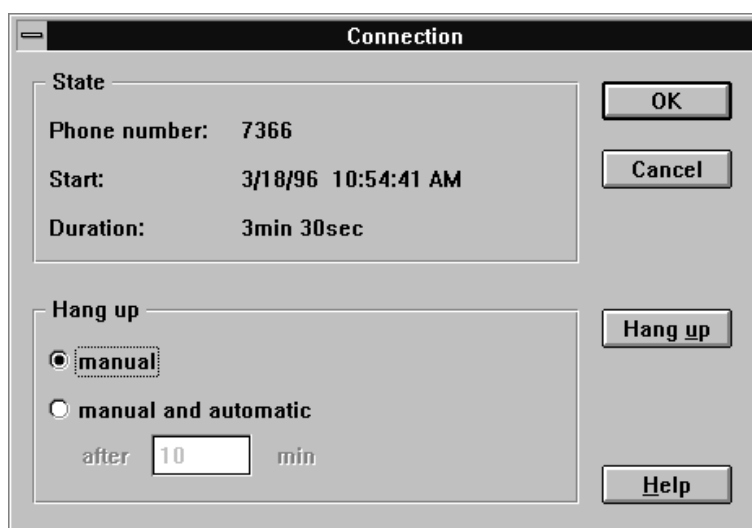
Click "Print" to output the displayed settings on a printer or into a file. The print functions and associated dialog boxes are described in Section 8.2.

6.2.7 Select Hang up Mode

You can initially retain an existing modem connection when you leave the dialog. The modem connection can be cancelled manually or automatically at a later date. You can define the desired hang up mode.

Select the option "Connection" in the extension menu "Modem". A dialog box for selection of a hang up mode is then displayed.

6 Higher-level Communication



Digs256g

Fig. 6/23 Dialog box "Connection"

The top area of the dialog box informs you of

- ⊙ the telephone number of the selected substation modem,
- ⊙ the date and time of the start of connection and
- ⊙ the duration of the connection in minutes and seconds (updated every second).

Select hang up mode

Manual

Select an option for cancelling an existing modem connection.

Select this option if you wish to only cancel an existing connection manually.

Manual and automatic

Select this option if an existing connection is to be automatically cancelled following expiry of a defined period. In addition, the connection can be cancelled manually before this period has expired.

Enter duration

If you have selected the option "Manual and automatic" enter a value between 1 and 999 in the input field "After ... min.". Values with a decimal component are automatically rounded up or down. The entered value represents the number of minutes after which an existing connection is automatically cancelled.

Hang up

Click "Hang up" in order to cancel an existing modem connection. This button is only active if a modem connection exists.

OK

Click "OK" to accept the selected hang up mode. The current dialog box is then closed.

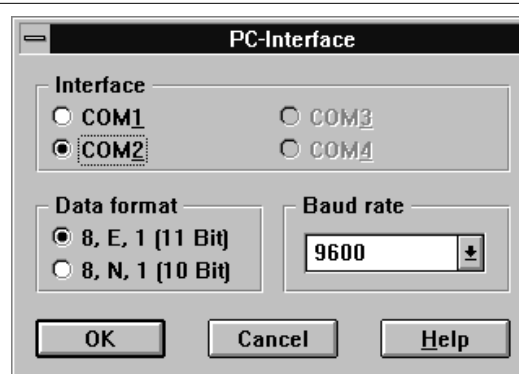
Cancel

Click "Cancel" to reject the selection. The previously set hang up mode remains unchanged. The current dialog box is then closed.

6.2.8 Configure Interface to Protection Device in DIGSI

Before a connection is established, you must provide DIGSI with information on the communication interfaces of your computer.

Select the option "Interface" in the extension menu "Protection device". A dialog box is displayed for defining the interface, transmission format and initial value of the baud rate.



Digs169g

Fig. 6/24 Dialog box "PC interface"

Select COM port

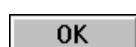
Select one of the options "COM port" (1 to 4) in the selection field "Interface". The designation of the selected option must correspond to the serial computer port to which the protection device is connected. You can only select options for physically present interfaces.

Select data format

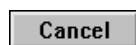
Select one of the options in the selection field "Data format". The selected data format must correspond to the previously selected interface.

Select initial value for baud rate

Select an initial value for the baud rate from the dropdown list "Baud rate". The displayed value corresponds to the currently set initial value of the baud rate in the computer. The various values are fixed and cannot be edited.



Click "OK" to accept the selected settings. The previous settings are modified, and the current dialog box is then closed.



Click "Cancel" to reject the settings. The previous settings then remain unchanged, and the current dialog box is closed.



Caution!

You must also set the interface and the transmission format on the protection device. Refer to Appendix A.7. The option "Baud rate" does not influence the baud rates for the protection device interfaces. To change these, select the option "Edit" in the extension menu "Configuration" (see Section 5.2) or the option "Modify baud rate" in the extension menu "Protection device" (see Section 6.5).

6 Higher-level Communication

6.2.9 Set the Protection Device Response Time

The protection device response time is monitored by the computer during telegram transfer. You can define a maximum protection device response time within defined limits. The response time must be set before a connection is established.

Select the option "Response time" in the extension menu "Protection device". A dialog box for entering the response time is then displayed.



Digs170g

Fig. 6/25 Dialog box "Protection device response time"

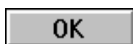
Enter response time

The displayed value corresponds to the currently set response time in milliseconds. To change this, enter an integral value between 50 and 10000.



Caution!

The preset value should not usually be changed. A modification is only meaningful if a timeout frequently occurs during the dialog.



Select "OK" to accept the selected response time. The previous response time is then changed, and the current dialog box is closed.



Select "Cancel" to reject the setting. The previous response time remains unchanged, and the current dialog box is closed.

6.3 Establishment of Connection

The establishment of a connection is initiated following selection of one of the dialog modes "With protection device direct" or "With protection device via ..." (see Section 5.1.1).

6.3.1 Global Error Messages During Establishment of Connection

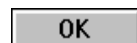
There are a number of reasons why an error may occur when establishing the connection. Such reasons can also be of a physical nature. An example is an incorrect connection between computer, modems and protection device. The following message, for example, is output if it is not possible to establish a correct connection.



Digs078g

Fig. 6/26 Message as resulting of timeout when receiving

The error message shown in Fig. 6/26 indicates a timeout when receiving a telegram.



Acknowledge the message with "OK" and attempt to eliminate the cause of the error.



Digs079g

Fig. 6/27 Message as result of error during establishment of connection



Select "Yes" to attempt to establish the connection again.



Select "No" if you do not wish to attempt to establish the connection again.

6 Higher-level Communication

6.3.2 Adjustment of Address, Version and Type of Protection Device

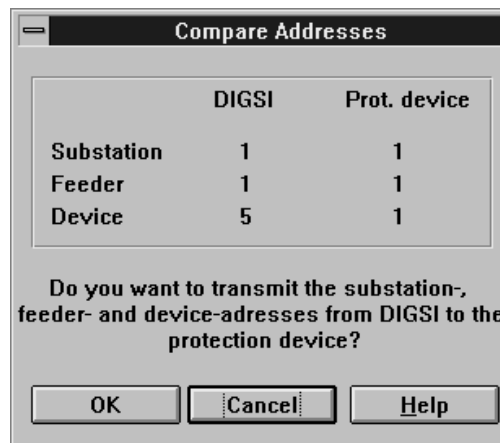


Caution!

Inconsistent addresses

Adjustment of address, version and type is not possible in conjunction with a star coupler and / or the I/O-Interface.

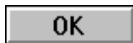
Communication between DIGSI and a connected protection device is only possible if the substation, feeder and protection device addresses agree. A message is displayed if this is not the case.



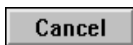
Digs086g

Fig. 6/28 Message as result of inconsistent addresses

In the shown example, the device addresses are different in DIGSI and in the protection device. The two addresses must be adapted to permit communication.

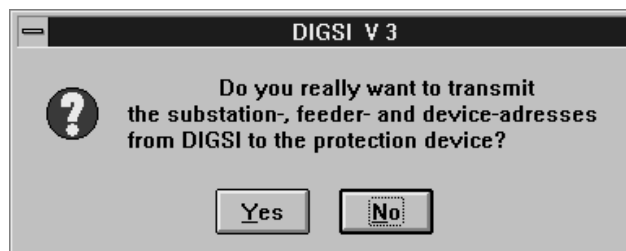


Select "OK" to transmit all addresses set in DIGSI to the protection device.



Select "Cancel" if you do not wish to adjust the addresses. The current dialog box is then closed, and establishment of the connection is aborted.

If you have acknowledged the message with "OK", you will be asked to confirm your intention.



Digs080g

Fig. 6/29 Message displayed when transmitting addresses

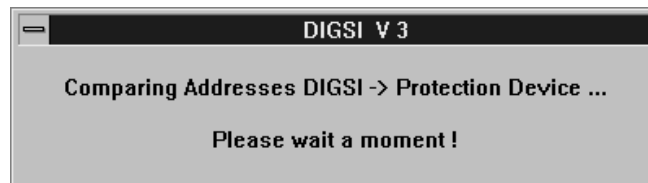


Select "Yes" to transmit the substation, feeder and protection device address from DIGSI to the protection device. Existing protection device addresses are overwritten in the process.

No

Select “No” if no addresses are to be transmitted to the protection device. The addresses set in the protection device remain unchanged.

A message is displayed if you have confirmed your intention with “Yes”.



Digs081g

Fig. 6/30 Message displayed when transmitting addresses

A reset is carried out in the protection device once the addresses have been transmitted. A corresponding message is output.



Digs082g

Fig. 6/31 Message when transmitting addresses

Following a reset, the configuration parameters, and possibly also the control parameters, must be transmitted again from DIGSI to the protection device.

Inconsistent protection device types

A message is displayed if the protection device type opened in DIGSI does not agree with the connected type of protection device.



Digs083g

Fig. 6/32 Message displayed if protection device types are inconsistent

OK

Acknowledge the message with “OK” and adapt the protection device type in DIGSI accordingly (see Section 4.3.5).

6 Higher-level Communication

6.3.3 Establishment of a Direct Connection

In the simplest case, there is a direct physical connection between the computer and protection device. You are then working in dialog mode "With protection device direct" (see Section 5.1.1). A message is output during establishment of the connection.



Digs077g

Fig. 6/33 Message displayed during establishment of connection

Cancel

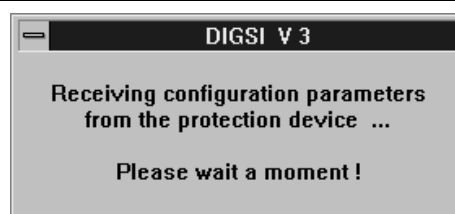
You can cancel establishment of the connection at any time. Click "Cancel" in order to terminate establishment of the connection.

Checking of device address, type and version

During establishment of the connection, the device addresses, types and versions are checked in DIGSI and the connected protection device for consistency. If inconsistencies occur, it is necessary to adjust the addresses or to adjust the device type and version (see Section 6.3.2).

Transmission of configuration parameters

Following successful establishment of the connection, the configuration parameters are transmitted from the protection device to the computer. These parameters are saved in a temporary memory area. The configuration data in the computer are not changed by this. This operation is also indicated by a message.



Digs084g

Fig. 6/34 Message displayed when transmitting the configuration parameters

Control parameters are also transmitted if you have activated the parameter change-over. A message similar to that in Fig. 6/34 is output. The DIGSI window "Dialog" is opened following successful transmission of the parameters (see Section 3.2).

6.3.4 Establishment of Connection via Modems

In order to carry out remote control and data transmission via the telephone network, it is possible to establish a modem connection between the computer and protection device. In the simplest case, you require an office modem and a substation modem. During communication via a modem connection, you are working in dialog mode "With protection device via modem" (see Section 5.1.1).

The modem connection is established automatically. However, you can monitor the procedure and repeat it if necessary. A dialog box is displayed for this.

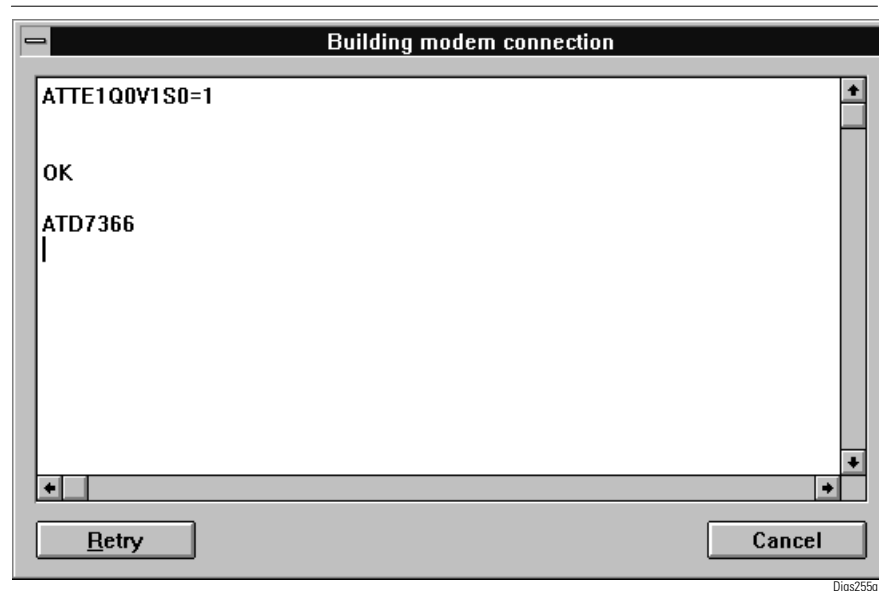


Fig. 6/35 Dialog box "Building modem connection"

If a modem connection does not yet exist, this dialog box is opened directly when you confirm the mode selection "With protection device via modem". Establishment of the modem connection is then initiated automatically. Status messages specific to the modem will be output, and also input requests as necessary.




Caution!

Please note that the dialog during the establishment can be different depending on the used modem. You should read the documentation for your specific modem. The following description is applicable for the settings shown in Appendix A.8.6.


Dialling

DIGSI initialises the office modem. This dials the telephone number of the substation modem. If the number dialled is not busy, a connection is established. When the office modem and the substation modem have negotiated a baud rate, a message appears, for example "CONNECT 28800".

6 Higher-level Communication

Password query The substation modem checks whether a password has to be entered. If so, the prompt "PASSWORD>" appears. Enter the preset registration password in accordance with Appendix A.8.6.3. Confirm your input by pressing the  key.

Connection without callback procedure If you have not parameterised any callback procedure, the establishment of the modem connection is thus completed. The current dialog box is closed automatically.

Connection with callback procedure If you have parameterised the establishment of the connection with callback procedure, the prompt "DB>" appears. Enter the appropriate callback password, in accordance with Appendix A.8.6.3, which is assigned to the telephone number of your office modem. Confirm your input by pressing the  key.


After the correct callback password has been entered and confirmed, the existing connection is interrupted. After approx. 30 seconds the substation modem tries to establish a connection to the office modem on the basis of the callback number referenced to the callback password received. During the establishment of the connection, various characters may appear in the display area of the open dialog box. These are of no importance in this context.

When the connection has been re-established, a new message appears, for example "CONNECT 28800". This feedback is recognised by DIGSI as a registered acknowledgement text and the connection to the selected protection device is established. The current dialog box is closed automatically.

Next step If you have marked the control field "Channel multiplexer" when selecting the mode, a channel multiplexer port (see Section 6.3.5) is selected following successful establishment of the modem connection. If this control field has not been marked, the further establishment of connection is as already described in Section 6.3.3.

Unsuccessful establishment of connection It is possible that a modem connection is not established at the first attempt. A reason may be that the substation modem is already occupied by a different connection. A message specific to the modem is then output in the display area of the dialog box, for example "BUSY".

 Retry

 Cancel

Click "Retry" to re-initiate establishment of the modem connection.

Click "Cancel" if a modem connection cannot be established even following several attempts. Check whether all preparations necessary for such a connection have been made correctly.

6.3.5 Establishment of Connection via Channel Multiplexer

The connection via a channel multiplexer is established automatically or manually. You can only select automatic establishment of connection if you are working with a channel multiplexer of type 7XV55. Only manual establishment of a connection is possible for channel multiplexers of a different type. A dialog box is output in both cases.

Initial start-up

When using a remote control link for the first time, operation of the channel multiplexer should always be carried out manually. Any difficulties which may occur can be located more easily in this manner.



Fig. 6/36 Dialog box "Select channel multiplexer"

The dialog box is opened directly when you confirm the mode selection "With protection device via channel multiplexer". If you have additionally marked the control field "Modem", the modem connection may be established first. Depending on the selected setting, the channel multiplexer connection is established automatically or manually.



Caution!


Please note that the messages which appear during establishment of the connection, and the required inputs, depend on the type of channel multiplexer used. Thus no generally applicable comments can be made. The basic sequence for establishment of a connection is described. All information on messages and inputs are examples, and specific to a channel multiplexer of type 7XV55.

6 Higher-level Communication

Automatic establishment

- The most important procedures during the automatic establishment of a channel multiplexer connection are described below.
- Establishment of connection DIGSI establishes the connection to the channel multiplexer. This replies with a message specific to the type of multiplexer.
- Transmission of channel name DIGSI transmits the name of the channel (port) to which the protection device is connected.
- Connection of channel The channel multiplexer connects the selected channel, and confirms this by a message. Establishment of the channel multiplexer connection has been completed if this is successful. The current dialog box is then closed automatically.

Manual establishment

- The most important procedures during the manual establishment of a channel multiplexer connection are described below.
- Starting establishment of connection The input/display area of the dialog box "Select channel multiplexer" is initially empty. Pressing the  key is usually expected as the first input for starting establishment of the connection.
- Output of ready message If the channel multiplexer was completely deselected, you usually receive a ready message from it. You may be asked to acknowledge this message.
- Enter channel name Enter the name of the channel (port) as soon as you are requested by the channel multiplexer to do so. You may be asked to confirm your input.
- Connection of channel A message is usually output once the selected channel has been switched through. The channel multiplexer may also indicate a command for cancelling the connection.



Click "Ready" to close the current dialog box following successful manual establishment of the channel multiplexer connection.

Next step

Following successful establishment of the channel multiplexer connection, the further procedure for establishment of the connection is as has already been described in Section 6.3.3.

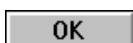
Unsuccessful establishment of connection

It is possible that a channel multiplexer connection is not established at the first attempt. The following message is then output.



Digs250

Fig. 6/37 Message output if channel multiplexer could not be connected



Acknowledge the message with "OK" and check the physical aspects of the connection.



Click "Retry" to re-initiate the establishment of the channel multiplexer connection. This button is only available during automatic establishment of the connection.



Click "Cancel" if a channel multiplexer connection cannot be established even following several attempts. Check whether all preparations necessary for such a connection have been made correctly.

6.3.6 Establishment of Connection via Star Coupler

You require a star coupler in order to operate several addressable devices via a common physical connection. During communication via a star coupler you are working in dialog mode "With protection device via star coupler" (see Section 5.1.1).

The establishment of a connection via star coupler is exactly as already described in Section 6.3.3. Automatic adjustment of addresses is not possible, however.

6.3.7 Establishment of Connection using Combined Equipment

Modems, channel multiplexers and star couplers can also be used together in any combination. The information provided for the individual units also applies when using them together.

If modems are used together with a channel multiplexer in your system configuration, the modem connection is established first and the channel multiplexer port is then selected.

6.4 Cancellation of Connection

The cancellation of a connection is initiated independent of the type of connection by terminating the dialog. You can still retain a modem connection for example, when you leave the dialog.

6.4.1 Cancellation of Direct Connection

Following termination of the dialog, a direct connection is cancelled without further messages or the request for confirmation.

6 Higher-level Communication

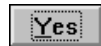
6.4.2 Cancellation of Connection via Modems

A modem connection can also be retained following termination of the dialog. You can then cancel this manually at a later date or automatically following a defined time (see Section 6.2.7). You will therefore be asked to confirm your intention before the modem connection is cancelled.

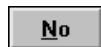


Digs254

Fig. 6/38 Message output prior to cancellation of modem connection

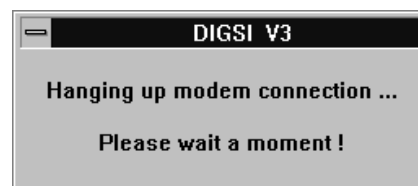


Click "Yes" if you wish to cancel the existing modem connection.



Click "No" if you wish to retain the existing modem connection.

If you have confirmed your intention with "Yes", the modem connection is cancelled. A message is output during this procedure.



Digs262

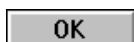
Fig. 6/39 Message output during cancellation of modem connection

A message also informs you of the successful cancellation of the modem connection.



Digs263g

Fig. 6/40 Message following successful cancellation of modem connection



Acknowledge the message with "OK".

6.4.3 Cancellation of Modem Connection via Channel Multiplexer

A connection via a channel multiplexer can be cancelled either automatically or manually. However, automatic cancelling of a connection is only possible if you are working with a channel multiplexer of type 7XV55 and if the standard settings have been made on this according to Appendix A.8.3. Only manual cancelling of the connection is possible for channel multiplexers of a different type. A dialog box is displayed in both cases.



Fig. 6/41 Dialog box "Deselect channel multiplexer"

The dialog box is opened directly when you terminate the dialog. Depending on the selected setting, the cancellation of the channel multiplexer connection is triggered automatically or carried out manually by you.



Caution!

Please note that the messages which appear during cancellation of the connection, and the required inputs, depend on the type of channel multiplexer used. Thus no generally applicable comments can be made. The basic sequence for cancellation of a connection is described. All information on messages and inputs are examples, and specific to a channel multiplexer of type 7XV55.

Automatic cancellation

The most important procedures during the automatic establishment of a channel multiplexer connection are described below.

Sending the cancel command

DIGSI sends the command for cancellation of the connection to the channel multiplexer.

Cancelling the connection

The channel multiplexer cancels the existing connection and confirms this by a message. The cancellation of the channel multiplexer connection has been terminated if this is successful. The current dialog box is then closed automatically.

6 Higher-level Communication

Manual cancellation

The most important procedures during the manual establishment of a channel multiplexer connection are described below.

Starting cancellation of connection

The input/display area of the dialog box "Deselect channel multiplexer" is initially empty. A command for cancellation of the connection is usually expected as the first input.

Message indicating deselected channel

A message is usually output that the channel has been deselected. The channel multiplexer remains selected, however.

Completely deselect channel multiplexer

In order to completely deselect the channel multiplexer, you must enter a corresponding command. A message is then output indicating that the channel multiplexer has been completely deselected.



Click "Ready" to close the current dialog box following the successful manual cancellation of the channel multiplexer connection.

Next step

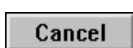
Perhaps you have communicated with the protection device via a modem connection. In this case, the existing modem connection is cancelled following successful cancellation of the channel multiplexer connection (see Section 6.4.2).

Unsuccessful cancellation of connection

It is possible that a channel multiplexer connection is not cancelled at the first attempt.



Click "Retry" to re-initiate the cancellation of the channel multiplexer connection. This button is only available during automatic cancellation of the connection.



Click "Cancel" in order to stop cancellation of the channel multiplexer connection.

6.4.4 Cancellation of Connection via Star Coupler

Following termination of the dialog, a connection via a star coupler is cancelled without further messages or the request for confirmation.

6.4.5 Cancellation of Connection via Combined Equipment

Modems, channel multiplexers and star couplers can also be used together. The information provided for the individual units also applies when using them together.

If modems are used together with a channel multiplexer in your system configuration, the channel multiplexer is deselected first and the modem connection is then cancelled.

6.5 Modify Baud Rate

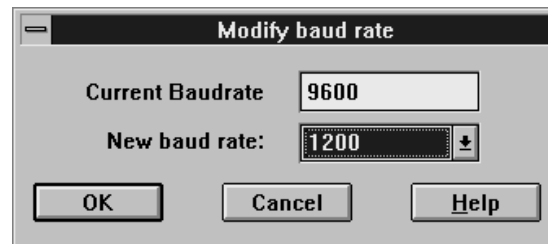
You can modify the baud rate of the protection device interfaces following establishment of the connection. A requirement is that you are working in dialog mode "With protection device direct".



Caution!

This option only temporarily influences the baud rates for the interfaces of the protection device. It does not change any parameters, and only has an effect up to the next reset of the protection device.

Select the menu option "Modify baud rate". A dialog box is then displayed to permit you to modify the baud rate.

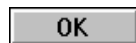


Digs168g

Fig. 6/42 Dialog box "Modify baud rate"

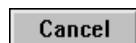
Setting a new baud rate

The displayed value corresponds to the currently set baud rate in the computer. To change this, select a new baud rate using the dropdown list. The individual values are fixed. The baud rate cannot be edited directly!



OK

Select "OK" to accept the selected baud rate. The baud rate is then changed, and the current dialog box closed.



Cancel

Select "Cancel" to reject the setting. The previously set baud rate remains unchanged. The current dialog box is then closed.

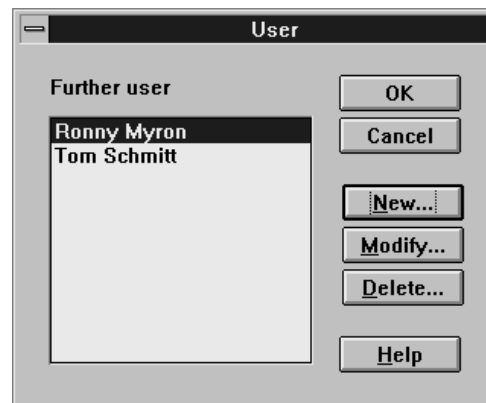
7 User-oriented Functions

Certain functions permit the user-oriented adaptation of DIGSI. These functions include the registration of user names and the assignment of a user password. Input of the latter permits access to the superuser mode. In this mode, DIGSI provides a further function to permit the control of access operations on various parameters.

7.1 Registration of User Names

When calling the program, you will be requested to enter or select a user name in a dialog box (see Section 2.1). The user names are stored in the program. DIGSI provides a number of functions for editing this list. Editing is only possible prior to establishment of a connection.

Select the option "User" in the extension menu "DIGSI". A dialog box is then displayed with the current users.



Digs175g

Fig. 7/1 Dialog box "User"

The dialog box shows all registered user names in the selection field "Further user". The name of the current user is not included in the list. His name must be neither modified nor deleted since his actions still have to be recorded.



Caution!

All modifications to the list of user names are initially temporary. The modifications only become effective when you confirm the dialog box in Fig. 7/1 with "OK".

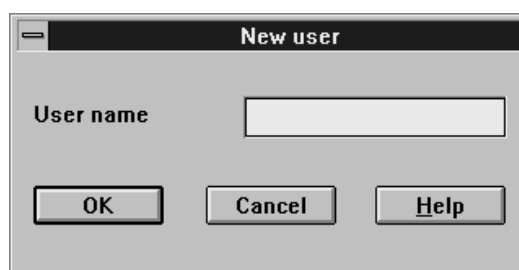
Enter new user name

You can add a new name to the displayed list.



Select "New" to add a new name to the list. A dialog box is displayed to permit you to enter a name.

7 User-oriented Functions



Digs176g

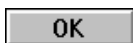
Fig. 7/2 Dialog box "New user"

The input field is empty in the basic setting; the cursor is positioned in the input field. Enter a name here with a maximum length of 19 characters.

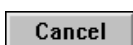


Caution!

If the name already exists, it is not transferred into the list. Upper-case and lower-case letters are interpreted as different characters.



Select "OK" to accept the user name into the list. The current dialog box is then closed.



Select "Cancel" if you do not wish to enter the user name into the list. The current dialog box is then closed.

If you have confirmed your input with "OK", the selection field "Further user" is updated in the dialog box in Fig. 7/1.

Modify user name

You can modify a name contained in the list. Mark this first in the selection field "Further user".



Select "Modify" to modify the marked user name. A dialog box is then displayed whose format is identical to that of Fig. 7/2.

The input field of the dialog box contains the marked name. To modify the user name, proceed in the same manner as when entering a new name.

If you have confirmed your input with "OK", the selection field "Further user" is updated in the dialog box in Fig. 7/1.

Delete user name

You can delete a name present in the list. First mark the name in the selection field "Further user".



Select "Delete" in order to delete the marked user name. You will be asked to confirm your intention.



Digs177g

Fig. 7/3 Message when deleting a user name



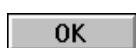
Select "Yes" if you wish to delete the marked user name. The name is then deleted.



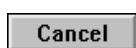
Select "No" if you do not wish to delete the marked user name. The name is not deleted.

Terminate editing

You can terminate editing once you have carried out all desired modifications. All modifications either then become effective or are rejected.



Select "OK" to accept all modifications. The current dialog box is then closed.



Select "Cancel" to reject the modifications. The current dialog box is then closed.

7.2 Access to Superuser Mode

You can regulate the access privileges to various functions (see Section 7.4). However, this is only possible following input of the user password.

Select the option "Password" in the extension menu "DIGSI". A dialog box is displayed which requests you to enter the user password.



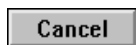
Digs178g

Fig. 7/4 Dialog box "User password request"

The input field is empty in the basic position; the cursor is positioned in this field. Enter the user password here. A star is displayed for each entered character.



Select "OK" to confirm your input. The current dialog box is then closed. The menu option "Access privilege" is only available if your input is identical to the registered user password.



Select "Cancel" if you do not wish to enter a user password. The current dialog box is then closed, and the menu option "Access privilege" remains inactive.

A requirement for activation of the menu option "Access privilege" is that you are in the DIGSI window "Substation management". Correct input of the user password activates the menu option "Access privilege", and the option "Password" is marked by an arrow. The option "Access privilege" is deactivated by selecting the option "Password" again. The marking of the option "Password" is removed again.

7 User-oriented Functions

7.3 Modification of User Password

You can replace the current user password by a new one. To do this, select the option "Modify password" in the extension menu "DIGSI". A dialog box is then displayed as in Fig. 7/4 and requests the valid user password. Proceed as described in Section 7.2 .

Following input and confirmation of the correct user password, a dialog box is displayed as in Fig. 2/1 in Section 2.1. This requests you to enter a new user password. Proceed as described in Section 2.1.

7.4 Access Privileges

DIGSI permits you to control access to address groups, block addresses and single addresses by assigning attributes.

Access privileges can only be assigned with knowledge of the user password. This function is therefore usually only available to the superuser. By assigning attributes, the superuser can protect important settings and functions from access by third parties. The attributes "Read/write", "Read only" and "Protected" are available.

The attribute "Read only" can only be assigned at the level of single addresses. The other two attributes can be assigned in all levels.

The access privileges can be influenced for the following address groups:

- ⊙ Settings
- ⊙ Test
- ⊙ Marshalling
- ⊙ Configuration
- ⊙ Control of protection device.

The scope of entries in the levels "Block addresses" and "Single addresses" depends on the selected protection device firmware.

Select the menu option "Access privilege". A dialog box is then displayed for selection of the protection device firmware.



Caution!

You can only select this menu option if you have previously activated it by entering the user password (see Section 7.2).



Digs180g

Fig. 7/5 Dialog box "Access privileges – firmware"

The dialog box shows you all available firmware versions in the selection field. Mark the version you require.

OK

Select "OK" to accept the marked firmware version. The current dialog box is then closed.

Cancel

Select "Cancel" if you do not wish to assign access privileges. The current dialog box is then closed, and the procedure is aborted.

The corresponding protection device files are opened if you have confirmed your selection with "OK". A corresponding message is output.

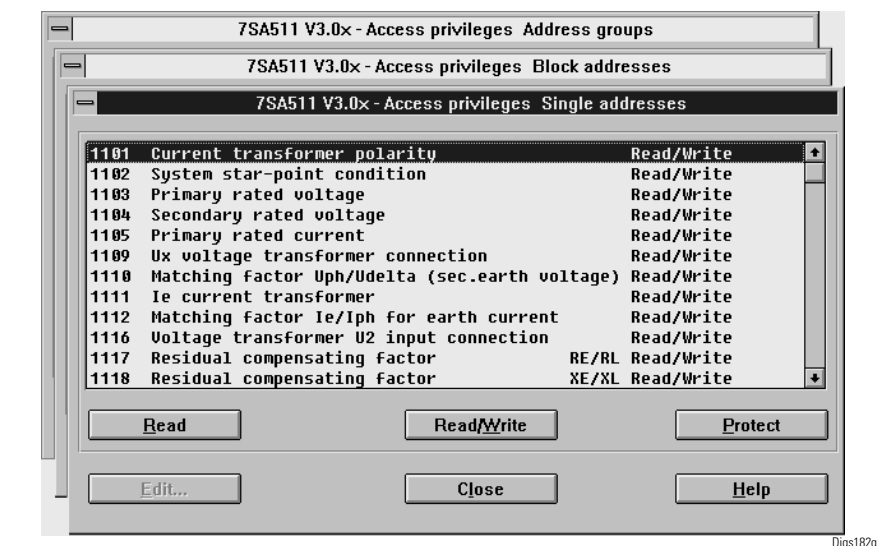


Fig. 7/6 Dialog boxes for controlling access privileges

After opening the protection device files, a dialog box is first displayed for distribution of the access privileges for address groups. A further dialog box with the corresponding block addresses is opened when you select an address group. Selection of a block address leads to the dialog box with the associated individual addresses.

Modifying an attribute

First mark the entry whose attribute you wish to modify.

Read

Select "Read" if you wish to set the attribute of the marked entry to "Read only". This attribute can only be assigned in the level "Single addresses".

Read/Write

Select "Read/write" if you wish to permit both read and write operations for the marked entry.

Protect

Select "Protect" if you wish to set the attribute of the marked entry to "Protected". Both read and write operations on this entry are then prevented.

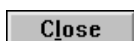
7 User-oriented Functions

Modifying the level

First mark the entry whose lower level you wish to edit.



Select "Edit" to access the lower level of the marked entry. This command is not available in the level "Single addresses".



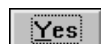
Select "Close" to access the higher level. If you are already in the level "Address groups", this command causes you to leave editing of the access privileges.

If you have modified the attribute of at least one entry, you will be asked to confirm your intention before the editing is terminated.

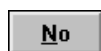


Digs184g

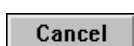
Fig. 7/7 Message prior to termination of editing of access privileges



Select "Yes" if you wish to store the modified access privileges. The current dialog box is then closed.



Select "No" if you do not wish to store the modified access privileges. The current dialog box is then closed.



Select "Cancel" if you do not wish to terminate editing of the access privileges. The current dialog box then remains open.

8 Output Functions

DIGSI permits you to make data available to other applications. Several **Export functions** are available for this. In order to permit logging and saving, the **Print function** permits the output of data on a printer or into a print file.

8.1 Export Functions

Data of specific files can be exported in other formats. The ASCII and OMICRON formats are supported.

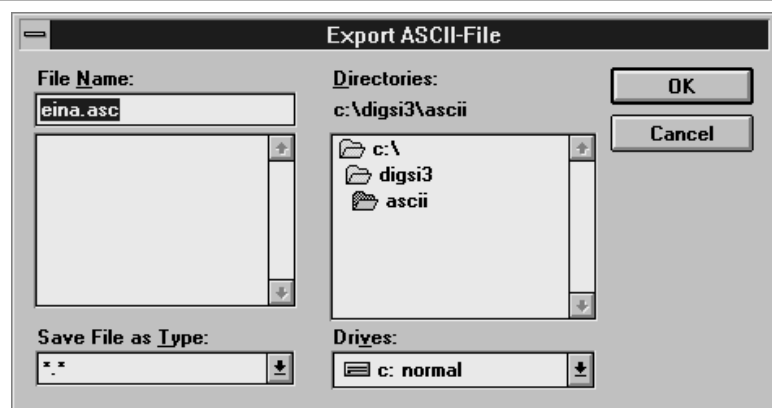
8.1.1 ASCII Export

Export in the standardized ASCII format is possible for the following types of file:

- ⊙ Configuration parameters
- ⊙ Marshalling parameters
- ⊙ Setting parameters
- ⊙ Control parameters

The export function is called using the menu option "ASCII export". This option is present

- ⊙ in the menu "Parameters",
- ⊙ in the extension menu "Configuration",
- ⊙ in the extension menu "Marshalling",
- ⊙ in the extension menu "Settings" and
- ⊙ in the extension menu "Protection device" of the menu "Control".



Digs150g

Fig. 8/1 Dialog box "Export ASCII file"

8

Output Functions

In the basic setting, a file name and a path are suggested. You can edit both the name and path. You must observe the existing DOS conventions.



Select "OK" to save the file under the defined name in the specified path. The current dialog box is then closed.



Select "Cancel" if you do not wish to carry out an ASCII export. The current dialog box is then closed.

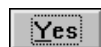
A corresponding message is output if you violated the DOS conventions when entering, or if the path or drive does not exist.

If the entered file name already exists in the defined path, you will be asked to confirm your intention.

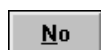


Digs192g

Fig. 8/2 Message prior to overwriting of a file

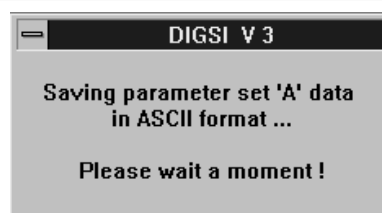


Select "Yes" to overwrite the selected file. The selected file is then deleted, and the current dialog box is closed.



Select "No" if you do not wish to overwrite the selected file. The current dialog box remains open.

The data are exported in ASCII format if all entries are correct. A message is output during this process.



Digs193g

Fig. 8/3 Message during ASCII export

8.1.2 Export of Fault Data

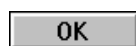
Fault data can be exported in the COMTRADE format (Common Format for Transient Data Exchange) and then made available for other analysis programs. This export function is accessible in the context of fault processing via the dialog box "Select fault" in Fig. 5/40. A dialog box is first displayed to permit you to select a format for the saved file.



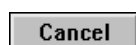
Digs190g

Fig. 8/4 Dialog box "Fault export"

The data can be saved in ASCII or binary format. Mark the option you require.



Select "OK" to accept the marked option as the save format. The current dialog box is then closed.



Select "Cancel" if you do not wish to export fault data. The current dialog box is then closed.

If you have confirmed your selection with "OK", a dialog box is displayed to permit you to enter a file name including the path. The dialog box is similar to that in Fig. 8/1. Proceed as described in Section 8.1.1.

8 Output Functions

8.1.3 OMICRON Export

DIGSI can export data in the OMICRON format to support use of the test unit 7VP15 from the company of OMICRON. In contrast to the ASCII export, only setting parameters can be exported.

The export function is called using the menu option "OMICRON export". This option can be found in the menu "Settings" in the DIGSI window "Dialog" (see Section 3.2). A dialog box is then displayed to permit you to enter a file name including the path. The dialog box is similar to that in Fig. 8/1. Proceed initially as described in Section 8.1.1.

Following correct input of the drive, path and file name, a dialog box is displayed to permit you to set OMICRON-specific parameters. These parameters are described in the manuals of the respective OMICRON test units.

Parameter	Value	Unit
RATING	100.000	V
MAX	120.000	V
I>>	1.800	
TOL-T	1.000	%
TOL-Z	5.000	%
RE/RL	1.000	
KS	0.000	R
ZS	0.000	R/Ohm
TIME0MAX	0.000	s
CURRGROUND	LINE	
	1.000	A
	10.000	A
IE>>	0.500	
	0.100	
	0.100	
XE/XL	1.000	
	0.000	X
	0.000	X/Ohm
LINEANGLE	75.000	°C
IMPCORR	FALSE	

Fig. 8/5 Dialog box "Enter general data"

OK

Select "OK" to accept the set parameters for the OMICRON export. The OMICRON export is then carried out, and the current dialog box is closed.

Cancel

Select "Cancel" if you wish to reject the set parameters. The current dialog box is then closed, and you return to the previous dialog box.

8.2 Printing

DIGSI permits you to output data on a printer or into a file prepared for printing. The following types of file can be printed:

- ⊙ Configuration parameters
- ⊙ Marshalling parameters
- ⊙ Setting parameters
- ⊙ Control parameters
- ⊙ Annunciations
- ⊙ Measurements
- ⊙ Diagram contents from DIGRA
- ⊙ Modem settings
- ⊙ Modification and fault messages
- ⊙ Contents from the zone characteristics.

The print function is called via the menu option "Print". This option is present

- ⊙ in the menu "Parameters",
- ⊙ in the extension menu "Configuration",
- ⊙ in the extension menu "Marshalling",
- ⊙ in the extension menu "Settings" and
- ⊙ in the extension menu "Protection device" of the menu "Control".

Some dialog boxes also have a corresponding option for activating the print function. A dialog box to permit you to define the print parameters is displayed when you call the option "Print".

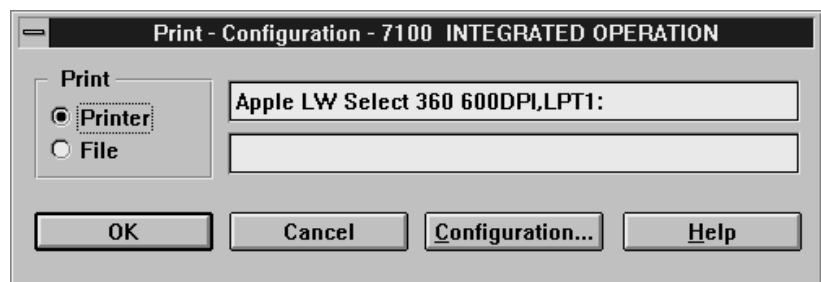


Fig. 8/6 Dialog box for definition of print parameters

Printer The option "Printer" is selected as the basic setting. The current standard printer and the selected parallel port are output in the display field to the right of the option field. The output device or the parallel port can only be changed using the system controller of the operating system.

File If you wish to route the data into a file, select the option "File". You must then enter a drive, path and file name in the input field to the right of the option field. Observe the DOS conventions.

Configuration...

Select "Configuration" to access a printer-specific dialog box for setting further parameters.

8

Output Functions

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OK

Select "OK" to output the data on the printer or into a file. The current dialog box is then closed.

Cancel

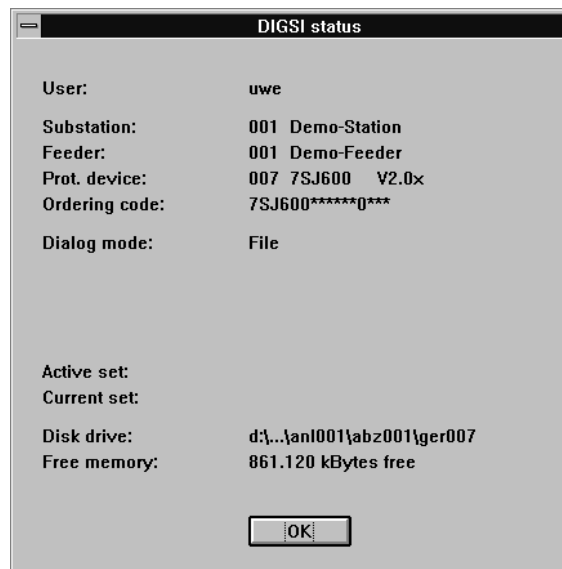
Select "Cancel" if you do not wish to make an output. The current dialog box is then closed.

9 Supplementary Functions

The DIGSI operating and analysis software provides several supplementary functions. This are combined in this chapter.

9.1 DIGSI Status

You can call information specific to the program and system in DIGSI. Select the option "DIGSI status" in the extension menu "DIGSI".



Digs163g

Fig. 9/1 Information box "DIGSI status"

User	Current user of program
Substation	Name of selected substation including the substation address
Feeder	Name of selected feeder including the feeder address
Protection device	Type of selected protection device including the device address
Ordering code	Version of selected protection device
Dialog mode	Set dialog mode ("With file", "With protection device direct", "With protection device via ...")
Active set	Active parameter set (not displayed in dialog mode "With file")
Current set	Parameter set selected for editing
Disk drive	Drive including complete path down to the protection device level
Free memory	Vacant memory space on the specified drive

9 Supplementary Functions

9.2 Request for Modification

If you have discovered program errors, or if you have modification wishes or proposals for improvement, you can pass these on to your responsible Siemens office. DIGSI will support you when producing a corresponding request for modification.

Select the option "Request for modification" in the extension menu "DIGSI". A dialog box is then displayed to permit you to enter data associated with the problem and user.

The dialog box "Request for modification" contains the following fields and controls:

- Sender:**
 - Company: uwe
 - User: uwe
 - City: []
 - Tel.-No.: []
 - License-No.: []
 - Department: []
 - Postcode: []
 - Street: []
 - Fax-No.: []
- care of SIEMENS-distr.:**
 - User: []
 - Location: []
 - Department: []
- Order:**
 - Mistake
 - Wish
- Buttons:** Print..., Cancel, Help, Write down...

Fig. 9/2 Dialog box "Request for modification"

You can formulate your error descriptions and proposals in interactive mode, and supplement these by your user-specific data. You can subsequently print out the complete request for modification.

Enter user-oriented data

All input fields are empty in the basic setting. If you already entered the requested data at an earlier date in time, these are displayed. Position the cursor to the existing fields in succession. Enter the required data. All inputs are important for printing the request for modification apart from the data for your department and fax number.

Select type of request

Select the option "Mistake" if your request for modification concerns an error description. Alternatively select the option "Wish" if you have a modification wish or a proposal for improvement. The type of option selected will be recorded on your request for modification. Please always produce separate requests for modification in the case of error descriptions and modification wishes!

Write down...

Select "Write down". A dialog box is then displayed to permit you to produce a description of errors or modification wishes.

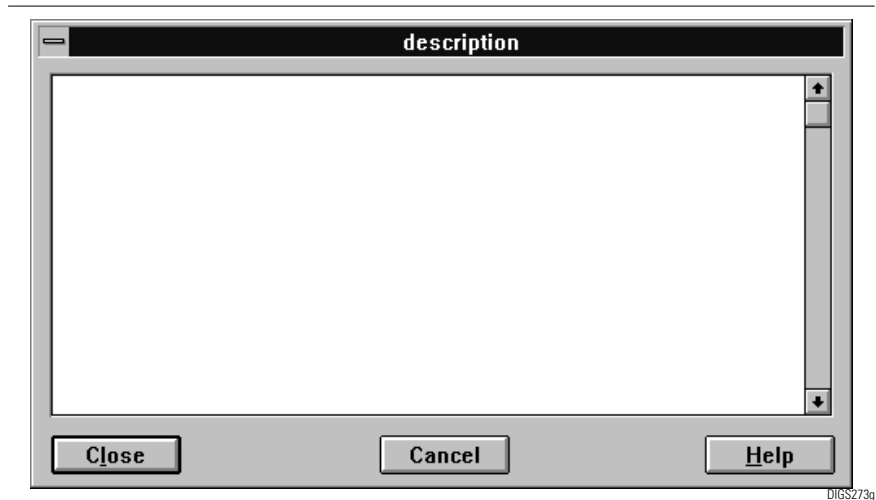


Fig. 9/3 Dialog box "Description"

Use the dialog box "Description" to produce a description of program errors or modification wishes. Fundamental functions are available to support you when editing your description.

Close

Select "Close" to transfer the entered text into your request for modification. The current dialog box is then closed, and you return to the previous dialog box.

Cancel

Select "Cancel" to reject the entered text. The current dialog box is then closed, and you return to the previous dialog box.

Print request for modification

Print...

You can print the request for modification once all inputs have been made.

Select "Print" to output the request for modification on a printer or into a file. Print functions and associated dialog boxes are described in Section 8.2.

All inputs are important for printing the request for modification apart from the data for your department and fax number. A corresponding message is output if the data are incomplete.



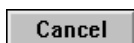
Fig. 9/4 Message displayed if data are incomplete

OK

Acknowledge the message with "OK" and then supplement the missing data.

9 Supplementary Functions

Terminate editing You can terminate editing after you have output your request for modification. All user-oriented data are then stored and are available again for a further setting. However, an entered description is deleted when you close the dialog box "Request for modification".



Select "Cancel" to terminate editing. The current dialog box is then closed.

10 Fault Processing with DIGRA

DIGRA is a program for analyzing fault data and for the graphic output of fault data. You can select different types of graphs and types of analysis. This chapter describes the most important operating functions of DIGRA.

10.1 Starting and Terminating DIGRA

You can start and terminate DIGRA in different manners.

Starting

The DIGRA program can be started from DIGSI. You must first access the DIGSI window "Dialog". Select the option "Fault record" in the menu "Fault".



To visualize imported COMTRADE files, you can also directly start the DIGRA program using its program icon. You can find this icon in the DIGSI program group. Start DIGRA by double clicking the icon.

As an alternative to this, you can also start DIGRA using the option "Run" in the menu "File" of the program manager.

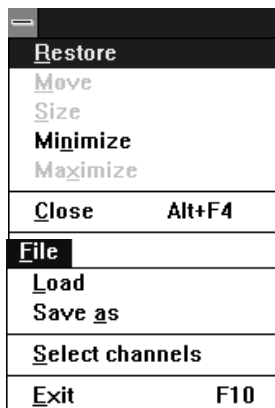


Caution!

You cannot start DIGRA if you have opened the KONVERT program!

Terminating

You can terminate DIGRA in various manners:



Click the box in the top left corner of the title bar. A menu with basic functions is then opened. Select the option "Close". It is faster to double click the box. The menu is not opened in this case.

These two operations are only effective if no dialog boxes or message boxes are open. You must therefore first close all open boxes.

The third possibility is to open the menu "File". Then select the option "Exit".

As an alternative to mouse operations, DIGRA can also be terminated using the key combination **Alt** + **F4**.

10 Fault Processing with DIGRA

10.2 Loading and Saving Data

DIGRA supports the loading and saving of data in the COMTRADE format. You can access the required functions using the menu "File" in the DIGRA window.

Load file If you have called DIGRA using the menu option "Fault record", the selected fault file is loaded automatically. If you have started DIGRA independently, select the option "Open" in the menu "File". A dialog box is then displayed to permit you to select the directory and file.

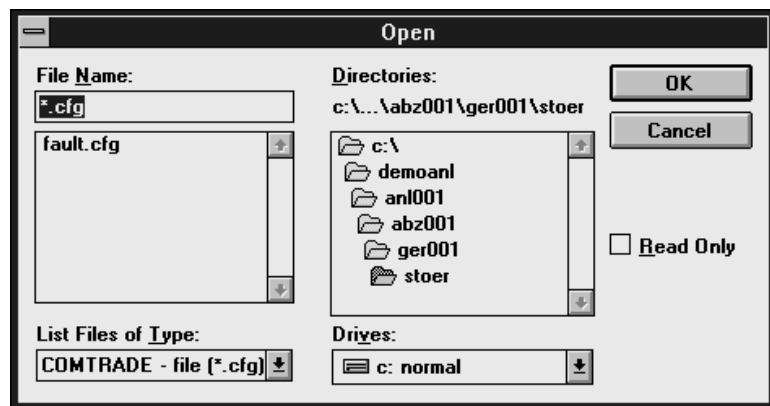
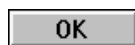


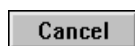
Fig. 10/1 Dialog box "Open"

Select directory Select the directory "fault" in the field "Directories". This directory contains all available fault files. If you have saved fault files in a different directory, select this directory. If the directory is on a different drive, select this drive in the dropdown list "Drives".

Select file The names of all files in the COMTRADE format in the selected directory appear in the selection field "File name". Mark the desired file in this selection field. Mark "Read only" if you wish to open the marked file as a read-only file.



Select "OK" to open the marked file. The current dialog box is then closed.



Select "Cancel" if you do not wish to open a file. The procedure is then aborted, and the current dialog box is closed.

Save file In order to save a file, select the option "Save as" in the menu "File". A dialog box is displayed similar to that in Fig. 10/1. Proceed in an analogous manner to when loading files. The DOS conventions must be observed when assigning the file name.

10.3 Selection of Display

Display	
<u>A</u> nalog curves	F2
✓ <u>O</u> verview window	F3

DIGRA permits the fault data to be displayed in two manners: as an overview and as analog curves. A separate window with its own menu is assigned to each display. The two windows may be open simultaneously, and their size and position can be changed. The type of display is selected in the menu "Display" in the DIGRA window. The scope of the display can be adapted for both versions. See Section 10.4.

Analog curves

This type of display shows the real-time response of the faults in the form of analog and binary recordings.

Overview

This type of display shows the rms values of the analog and binary signals over the complete recording period. The display is extended by output of the associated voltage and current values.

10.3.1 Analog Curve Display

Select the option "Analog curves" in the menu "Display", or press the **F2** key. The window "Analog and binary recordings" is then opened. You can close this window again by selecting the same option again.

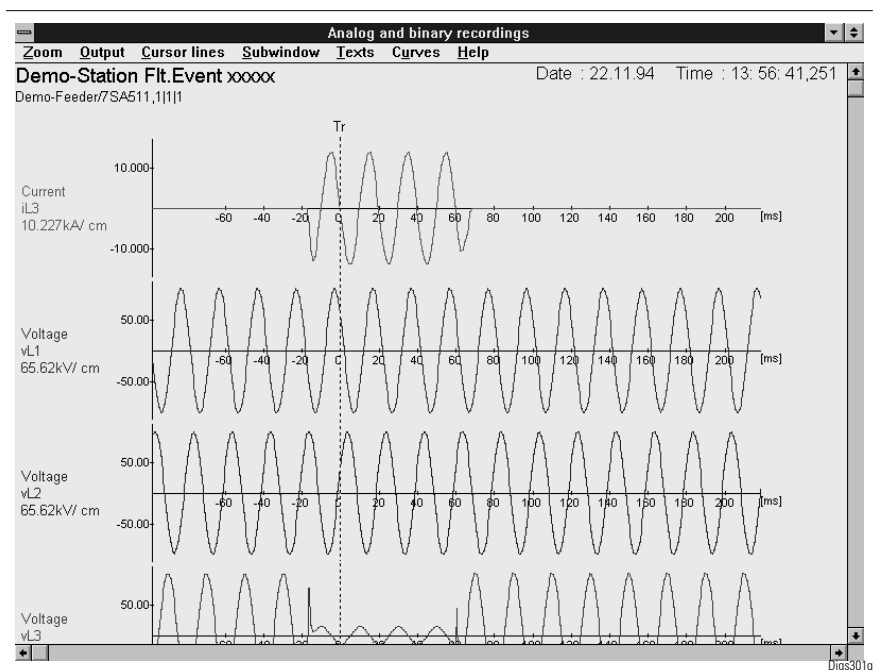


Fig. 10/2 Window "Analog and binary recordings"

Fault specification

Substation, feeder and protection device names, as well as the date and time of the fault, are displayed at the top of the window.

Display scroll bars

The screen contents can be shifted vertically and horizontally using scroll bars on the right and at the bottom of the window.

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10.3.2 Overview Window

Select the option "Overview window" in the menu "Display", or press the **F3** key. The window "Overview window" is then opened. You can close this window again by selecting the same option again.



Fig. 10/3 Window "Overview window"

Fault specification Substation, feeder and protection device names, as well as the date and time of the fault, are displayed at the top of the window.

Display scroll bars The screen contents can be shifted vertically and horizontally using scroll bars on the right and at the bottom of the window.

10.4 Adaptation of Display

Different functions for adaptation of the contents and form of the display can be selected depending on the selected display.

10.4.1 Channel Selection

A channel is assigned to each analog curve or to every eight binary recordings. Every channel can be displayed or suppressed as desired. The channel selection made has an effect on both types of display. Select the option "Select channels" in the menu "File" of the DIGRA window. A dialog box is then displayed to permit you to select the channel.

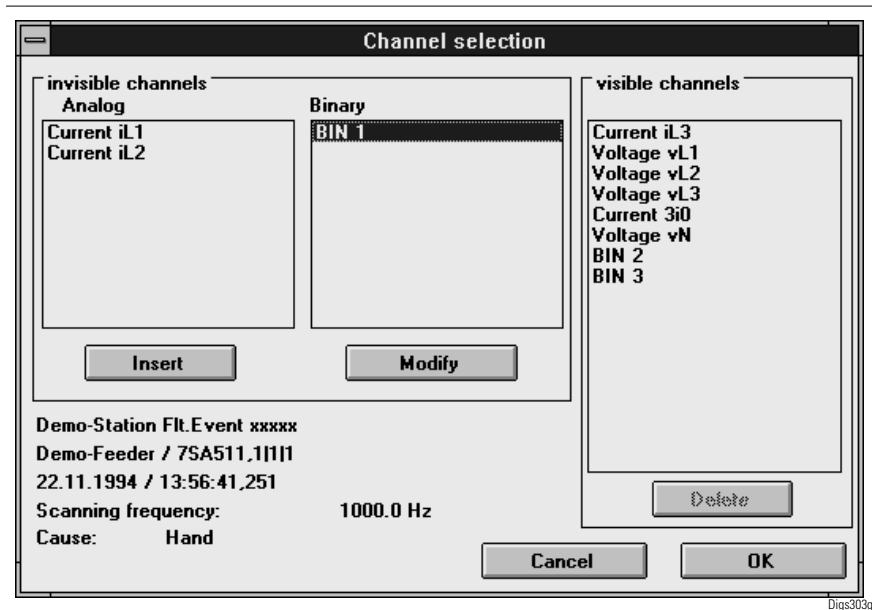



Fig. 10/4 Dialog box "Channel selection"

The names of the currently visible and invisible channels are displayed in separate selection fields. The display of the invisible channels is additionally divided into analog and binary channels.

Select channels

Mark the names of the channels you wish to set to visible or invisible in the corresponding selection fields. You can mark several channels simultaneously in one selection field. To do this, hold the  key pressed when marking with the mouse.



Select "Insert" to shift the marked channels in the fields "Invisible channels" into the field "Visible channels".



Select "Delete" to shift the marked channels in the field "Visible channels" into the fields "Invisible channels".



Select "Modify" to edit the data of a marked channel in the field "Invisible channels". A dialog box is then displayed to permit you to modify the channel data.



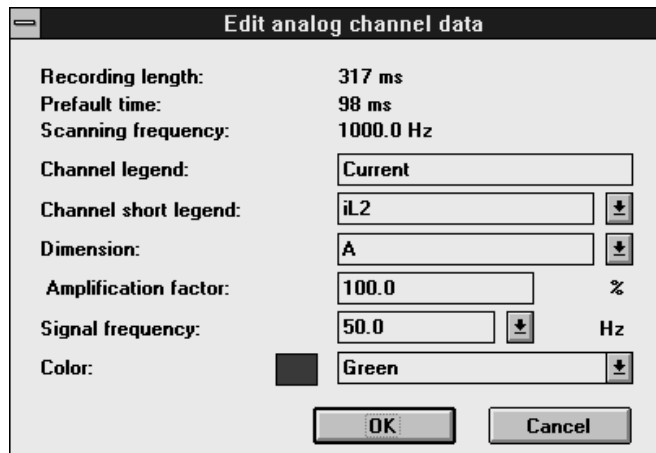
Caution!

This option is only active if exactly one channel is marked in one of the three selection fields.

Fig. 10/5 shows the dialog box for editing the analog channel data. The dialog box for editing binary channel data is similar in format and operation.

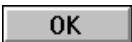

The dialog box provides information on the recording length, prehistory and scanning frequency. The input area is located below this information.

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Digs304g

Fig. 10/5 Dialog box "Edit analog channel data"

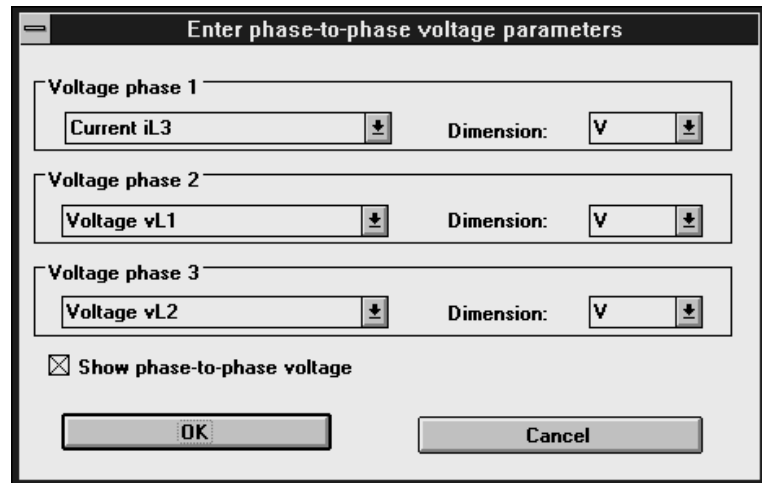
- | | |
|---|---|
| Channel legend | In this input field, enter a suitable text to designate the channel. |
| Channel short legend | From the dropdown list, select a short text for the channel. |
| Dimension | Select a dimension from the dropdown list. |
| Amplification factor | In this input field, enter a suitable amplification factor for display of the channel. |
| Signal frequency | From the dropdown list, select a signal frequency for the time axis. |
| Color | From the dropdown list, select a color in which the associated curve is to be displayed. |
|  | Select "OK" to accept all settings. The current dialog box is then closed, and you return to the previous dialog box. |
|  | Select "Cancel" to reject the selected settings. The original settings are then retained, and the current dialog box is closed. |

10.4.2 Set Phase-to-phase Voltages

The phase-to-phase voltages U_{L12} , U_{L23} and U_{L31} are not recorded by the protection device. However, DIGRA can calculate them from the conductor voltages and then display them. The required settings have an effect on both types of display.

Phase-to-phase voltage
Parameter input

Select the option "Parameter input" in the menu "Phase-to-phase voltage" in the DIGRA window. A dialog box is then displayed to permit you to set the phase-to-phase voltage parameters.



Digs305g

Fig. 10/6 Dialog box "Enter phase-to-phase voltage parameters"

Logical phase linking

Using dropdown lists, any measurement channels can be assigned to the logically linked phases 1, 2 and 3. The associated dimensions are also selected using dropdown lists.

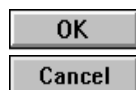


Caution!

The preset assignment is correct in the normal case. You should avoid changing this setting!

Display phase-to-phase voltages

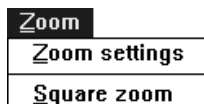
Mark "Show phase-to-phase voltages" if the calculated voltages are to be displayed in the windows "Overview" and "Analog and binary recordings". The display is output at the end of the display area of each window.



Select "OK" to accept all settings. The current dialog box is then closed.

Select "Cancel" to reject the selected settings. The original settings are then retained, and the current dialog box is closed.

10.4.3 Zoom Functions



The menu "Zoom" in the window "Analog and binary recordings" contains the options "Zoom settings" and "Square zoom". These options are available for discrete or visual scaling.

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Zoom settings Select the option "Zoom settings" in the menu "Zoom". A dialog box is then displayed to permit you to scale the display in discrete steps.

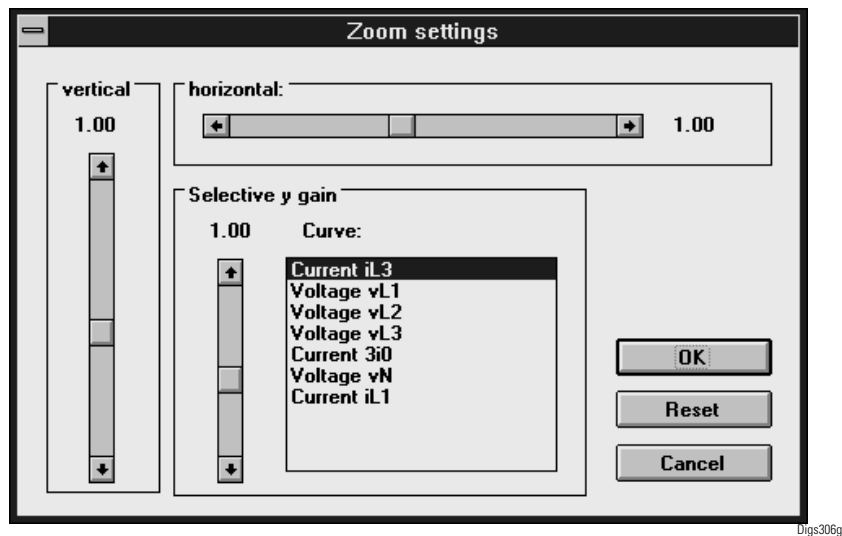
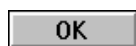


Fig. 10/7 Dialog box "Zoom settings"

- Vertical** Use the slider "Vertical" to set a scaling factor for the measurement scale in the y-direction. This setting has an effect on all curves.
- Horizontal** Use the slider "Horizontal" to set a scaling factor for the measurement scale in the x-direction. This setting has an effect on all curves.
- Selective y-gain** The division of the measurement scale is adapted to the currents and voltages occurring during a fault. As a result of this measure, the display of a low, non-faulty nominal value is in the vicinity of the zero line. By increasing the selective y-gain, the nominal values in non-faulty mode are displayed optically magnified. The absolute measurements remain the same, however.

First mark a voltage or current curve in the selection field "Curve". Then select a gain factor using the slider.



Select "OK" to accept the selected zoom settings. The current dialog box is then closed.



Select "Reset" in order to reset all zoom settings to their preset values.



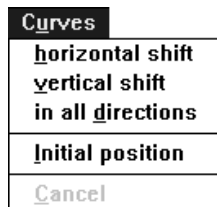
Select "Cancel" to reject the selected zoom settings. The original settings are then retained, and the current dialog box is closed.

Square zoom This function permits you to define and zoom a curve section using the mouse. Select the option "Square zoom" in the menu "Zoom". The mouse pointer is then displayed as a magnifying glass.

Position the mouse pointer to the top left corner of the area to be zoomed. Hold the left mouse button pressed, and pull the mouse pointer down to the bottom right. A rectangle is then drawn which encloses the section of the curve to be zoomed. The marked area is zoomed when you release the mouse button.

To return to the normal screen display, select the option "Zoom settings" in the menu "Zoom". A dialog box is displayed as in Fig. 10/7. Select "Reset" and confirm with "OK".

10.4.4 Shift Analog Curves and Binary Recordings



In special cases it is meaningful to shift analog curves and binary recordings. DIGSI provides a number of functions for this.

Binary recordings can only be shifted vertically. Analog curves can be shifted vertically, horizontally or as desired in all directions.

The menu "Curves" contains the required options. This menu is only available in the window "Analog and binary recordings".

Shifting

Select the desired option for shifting an object. The mouse pointer is then displayed as a graticule cross.

Position the mouse pointer on the time axis of an analog curve or binary recording. Click the left mouse button once. A cross appears which defines the origin of the shifting operation. Move the mouse pointer to the desired destination. Click the left mouse button again. The object is then repositioned.

You can also shift an object using the arrow keys. First define the origin as described above. Shift the object to the desired position using the \leftarrow , \rightarrow , \uparrow or \downarrow keys. Then select the option "Cancel" in the menu "Curves".

Initial position

You can return the analog curves and binary recordings to their original positions. To do this, select the option "Initial position" in the menu "Curves". All objects are reset to their original positions.

10.4.5 Edit Texts



Texts can be entered at any positions in the window "Analog and binary recordings". Up to ten individual texts can be edited and deleted again individually. The text width and thus also the line justification cannot be changed.

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Edit text Select the option "Edit texts" in the menu "Texts". The mouse pointer is then displayed as a graticule cross. Position the pointer to the desired text input position. Click the left mouse button once. A flashing cursor appears. You can now enter your text.

Delete text Select the option "Edit texts" in the menu "Texts". The mouse pointer is then displayed as a graticule cross. Position the pointer to the text to be deleted. Mark the text by clicking the left mouse button. Subsequently select the option "Delete texts" in the menu "Texts". The marked text is then deleted.

10.5 Display and Analysis of Electrical Characteristics

Subwindow

Values window

Electrical characteristics 1

Electrical characteristics 2

DIGRA provides a large number of display and analysis functions for fault data. These functions are combined in the menu "Subwindow" in the window "Analog and binary recordings". All analyses are carried out in conjunction with this window.

You can set vertical cursor lines. Using these cursor lines, the current values of the analog recordings can be determined as a function of the time of measurement. In addition, it is possible to calculate time differences between the individual cursor lines.

These data are displayed in tabular form in a value window. They additionally serve as a basis for further calculations.

You can obtain detailed information on the analysis functions via the DIGSI help system. This section provides you with a summary of the important operating functions in this context.

10.5.1 Set, Shift and Delete Cursor Lines

You can set up to eight vertical cursor lines (C1 to C8) and subsequently shift them horizontally. Each cursor line can be deleted separately.

Set cursor line Position the mouse pointer to the desired position of a time axis. Double click with the left mouse button. The cursor line is then set to the desired position.

Shift cursor line Position the mouse pointer to the cursor line to be shifted. Hold the left mouse button pressed, and shift the cursor line in the horizontal direction. The cursor line remains in the current position when you release the mouse button.

Activate cursor line You can define an active cursor line. The values determined by this line are emphasized in the value table. Position the mouse pointer to the cursor line to be activated, and click the left mouse button once. The cursor line is then marked in red.

Delete cursor line Position the mouse pointer to the cursor line to be deleted. Double click with the left mouse button. The cursor line is then deleted. You can also remove the active cursor using the menu "Cursor". To do this, select the option "Delete" in this menu.

10.5.2 Values Window

The current values of the analog recordings are determined for each displayed analog curve depending on the position of the cursor lines and the trigger line Tr. The trigger line Tr identifies the point in time at which the protection device detected a fault.

The values in the window are displayed in tabular form. The value table is supplemented by data on the time differences of the cursor lines C1 to C3 and the trigger line Tr.

Select the option "Values window" in the menu "Subwindow". The values window is then displayed.

Output	C4	Tr	C1	C2	C3
t - t(Tr), ms	106.34	0.00	42.28	-47.19	159.91
t - t(C1), ms	64.06	-42.28	0.00	-89.47	117.63
t - t(C2), ms	153.53	47.19	89.47	0.00	207.10
t - t(C3), ms	-53.57	-159.91	-117.63	-207.10	0.00
iL3 / kA	0.017	-3.967	-10.995	-0.009	0.009
vL1 / kV	-100.80	39.52	-24.22	52.58	64.75
vL2 / kV	56.82	61.28	96.34	-99.57	36.28
vL3 / kV	45.99	-15.07	-11.05	48.89	-100.58
3i0 / kA	-0.026	3.827	10.926	0.000	-0.026
vN / kV	1.12	49.45	35.28	1.12	0.22
iL1 / kA	-0.009	-0.009	-0.009	-0.009	-0.009

Fig. 10/8 Values window

Division of table

The first four lines of the table are reserved for time difference values. The remaining lines are assigned to the current values.

The first column of the table always shows the values at the position of the activated cursor line. This column is empty if a cursor line is not activated. The second column contains the values at the position of the trigger line Tr. The remaining columns are assigned to all existing cursor lines in ascending order.



Caution!

The values are not displayed at the cursor position in the case of a curve shifted in the horizontal direction. The displayed value always refers to the initial position of a curve.

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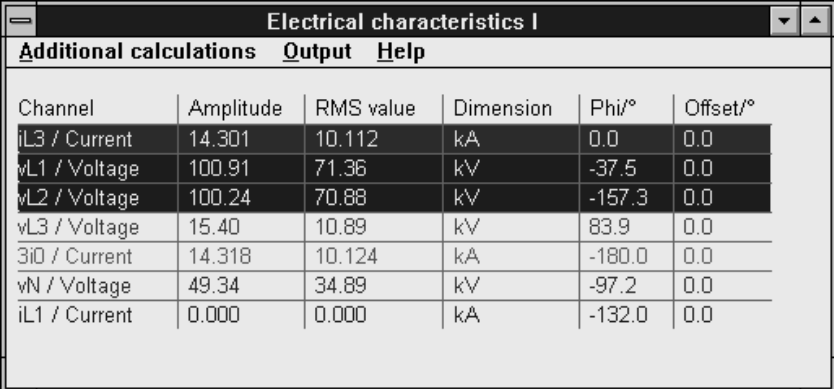
- Copying of values** The values can be copied from the table into the display area. Position the mouse cursor to the desired value. Keep the right mouse button pressed, and pull the value to the desired position in the display area. The value is anchored at the current position when you release the mouse button. The value can be deleted again by double clicking.
- Updating of values** The values are updated directly if you add, shift or delete cursor lines with the values window open. Values copied into the display area are not updated.
- Close window** Close the values window by double clicking with the mouse on the top left corner of the title bar.

10.5.3 Electrical Characteristics 1

The window "Electrical characteristics 1" shows a tabular summary of amplitude (with dimension), phase angle and offset for all selected channels. The calculation basis for the displayed values is the position of the cursor line C1 and a selectable reference channel.

In addition, the menu of this window provides options for displaying a vector diagram and for the calculation of impedances.

Select the option "Electrical characteristics 1" in the menu "Subwindow" of the window "Analog and binary recordings". The corresponding window is then displayed.



The screenshot shows a window titled "Electrical characteristics 1" with a menu bar containing "Additional calculations", "Output", and "Help". Below the menu bar is a table with the following data:

Channel	Amplitude	RMS value	Dimension	Phi/°	Offset/°
iL3 / Current	14.301	10.112	kA	0.0	0.0
vL1 / Voltage	100.91	71.36	kV	-37.5	0.0
vL2 / Voltage	100.24	70.88	kV	-157.3	0.0
vL3 / Voltage	15.40	10.89	kV	83.9	0.0
3I0 / Current	14.318	10.124	kA	-180.0	0.0
vN / Voltage	49.34	34.89	kV	-97.2	0.0
iL1 / Current	0.000	0.000	kA	-132.0	0.0

Fig. 10/9 Window "Electrical characteristics 1"

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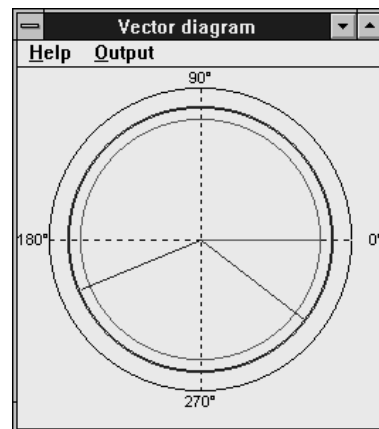
- Division of table** The number of lines in the table is determined by the number of selected channels.
- The first column in the table contains the channel legend and the channel short legend. The other columns display the values for amplitude, dimension, phase angle and offset.
- Amplitude** The amplitude values of the channels are displayed at the position of the cursor line C1. The next column indicates the associated dimensions.
- Phase angle** A reference channel must be selected in order to calculate the phase angle (see "Select channel"). The phase differences between the reference channel and the other channels at the position of the cursor line C1 result in the values for the phase angle.
- Offset** An offset is displayed for curves which have been shifted horizontally. The calculated phase differences refer to the shifted positions.
- Copying of values** The values can be copied from the table into the display area. The procedure is identical to that described in Section 10.5.2.
- Select channel** You must select channels for both the calculation of the phase angle and for the display in the vector diagram. The status of a channel can be recognized by the colour of the associated line.

- White:** The channel is not selected
Blue: The channel is selected for the vector diagram
Red: The channel is selected as the reference channel

To select a channel, click the associated line with the mouse. A reference channel cannot be deselected directly. You must first define another reference channel.

Subwindow
Vector diagram
Impedances

The window "Electrical characteristics 1" contains the options "Vector diagram" and "Impedances" in the menu "Subwindow". These permit you to display the values as a vector diagram or to calculate impedances.



Digs309g

Fig. 10/10 Window with vector diagram

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- Vector diagram** First select all channels to be displayed in the vector diagram as described above. The selected reference channel defines the angle position 0 in the vector diagram.
- Select the option "Vector diagram" in the menu "Subwindow" of the window "Electrical characteristics 1". The window shown in Fig. 10/10 is then obtained.
- Impedances** The calculation of impedances assumes that the current protection device can record currents and voltages. In order to calculate an impedance, the calculation loop must first be defined. Select the option "Impedances" in the menu "Subwindow" of the window "Electrical characteristics 1". A dialog box is then displayed to permit you to select the loop.

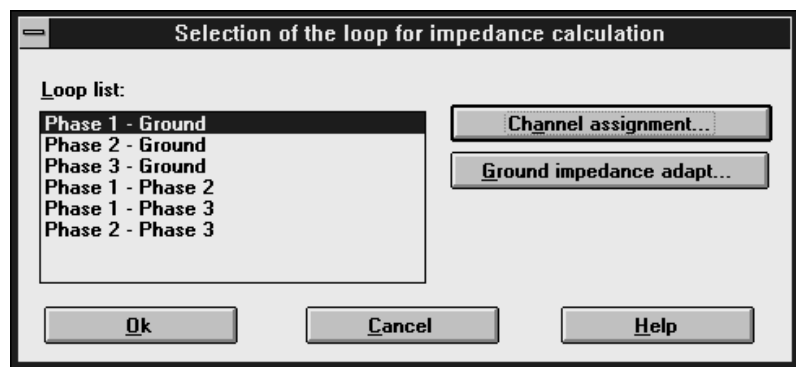
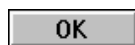


Fig. 10/11 Dialog box "Selection of the loop for impedance calculation"

All possible loops are present in the selection field "Loop list". Voltages and currents are preselected for the components "Phase 1 to 3" and "Ground". Mark a loop in the corresponding selection field.



Select "OK" to start the impedance calculation for the marked loop. The current dialog box is then closed, and you return to the previous dialog box.



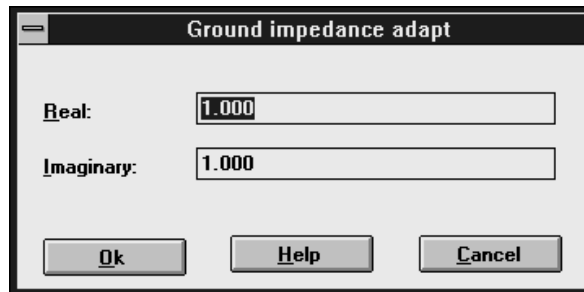
Select "Cancel" if you do not wish to carry out an impedance calculation. The current dialog box is then closed.



Select "Ground impedance adapt" to set the resistance ratio R_E/R_L and the reactance ratio X_E/X_L . A corresponding dialog box is then displayed.

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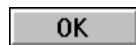
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Digs311g

Fig. 10/12 Dialog box "Ground impedance adapt"

Enter values for the real and imaginary components into the input fields.



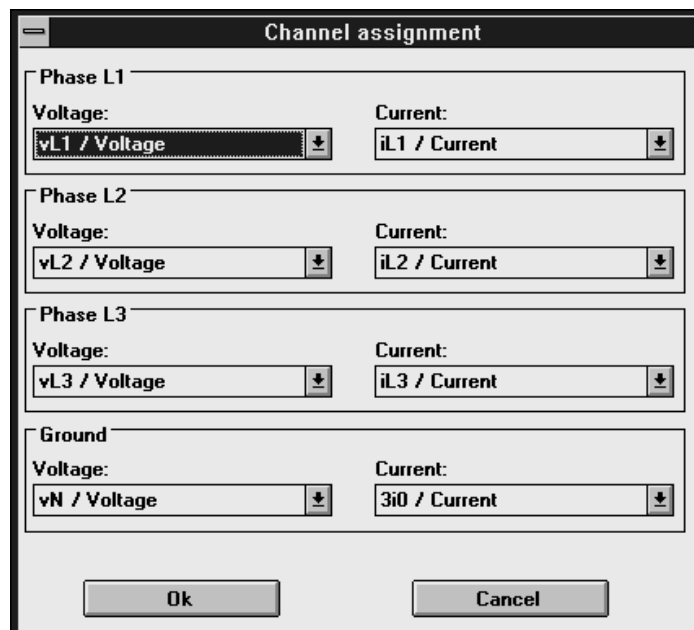
Select "OK" to accept the values for the ground impedance adaptation. The current dialog box is then closed.



Select "Cancel" to reject the values for the ground impedance adaptation. The original values are retained, and the current dialog box is closed.



Select "Channel assignment" to modify the assignments for the components "Phase 1 to 3" and "Ground". A dialog box is displayed to permit you to enter the channel assignment.



Digs312g

Fig. 10/13 Dialog box "Channel assignment"

Dropdown lists can be used to assign voltage and current channels to the components "Phase 1 to 3" and "Ground".

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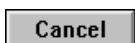


Caution!

The preset assignment is correct in the normal case. You should avoid changing this setting!



Select "OK" to accept all settings. The current dialog box is then closed, and you return to the previous dialog box.



Select "Cancel" to reject the selected settings. The original settings are then retained, and the current dialog box is closed.

Close window

Close the window "Electrical characteristics 1" by double clicking the top left corner of the title bar using the mouse.

10.5.4 Electrical Characteristics 2

The window "Electrical characteristics 2" displays a tabular summary of the rms value, DC component, distortion factor and Fourier coefficients for all selected channels. The individual values are calculated for this. In addition, the menu of this window provides options for setting parameters for the mode of calculation and the tabular display.

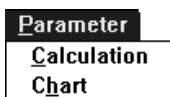
Select the option "Electrical characteristics 2" in the menu "Subwindow" of the window "Analog and binary recordings". The corresponding window is then displayed.

Short leg.	Rms value	DC	FC no.1	FC no.2	FC no.3	FC no.4	FC no.5	FC no.6	FC no.7	FC no.8	FC no.9	FC no.10
iL3												
vL1												
vL2												
vL3												
3I0												
vN												
iL1												
iL2												

Fig. 10/14 Window "Electrical characteristics 2"

The window initially displays an empty table. The number of lines in the table is identical to the number of selected channels.

The first column contains the channel short legends. The second column is provided for the rms values, and the third column contains the values of the DC component. The following columns are reserved for the rms values of the harmonics (FC nos. 1 to 10). The last column is used to display the distortion factors.



The window "Electrical characteristics 2" contains the options "Calculation diagram" and "Chart" in the menu "Subwindow". These permit you to adapt the mode of calculation and the tabular display.

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Calculation parameters

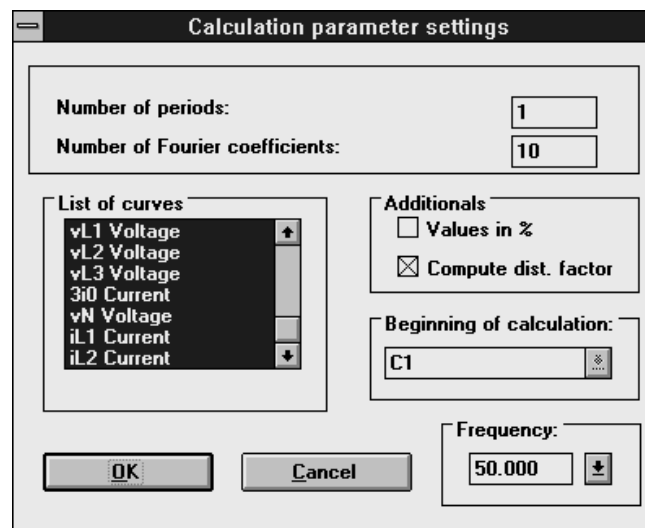
Select the option "Calculation" in the menu "Parameters". The dialog box shown in Fig. 10/15 is then displayed in which you can set the calculation parameters.

Number of periods Enter the number of periods to be considered in this input field. A value greater than "1" results in averaging of the calculated values over the defined periods.

Number of Fourier coefficients Enter the number of Fourier coefficients to be considered in this input field. The maximum value is "21". Note, however, that the maximum number of Fourier coefficients which can actually be considered depends on the number of sampling points per period.

List of curves Mark all curves here for which a calculation is to be carried out.

Additional Mark the options "Values in %" and "Compute distortion factor" as required.



Digs314g

Fig. 10/15 Dialog box "Calculation parameter settings"

Beginning of calculation The beginning of the calculation is fixed at "C1".

Signal frequency Select the signal frequency of the curve from the dropdown list.

OK

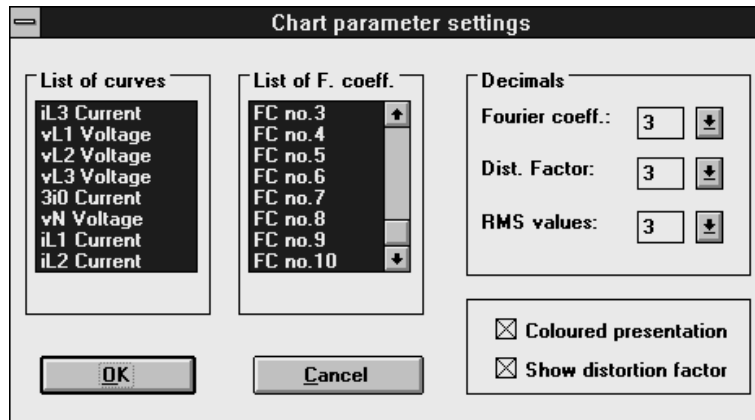
Select "OK" to accept all settings. The current dialog box is then closed.

Cancel

Select "Cancel" to reject the selected settings. The original settings are then retained, and the current dialog box is closed.



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Chart parameters Select the option "Chart" in the menu "Parameters". A dialog box is then displayed to permit you to set the chart (table) parameters.



Digs315g

Fig. 10/16 Dialog box "Chart parameter settings"

- List of curves Mark all curves here which are to be displayed in the chart.
- List of Fourier coefficients Mark all Fourier coefficients here which are to be displayed in the chart.
- Decimals Select the number of decimal places for Fourier coefficients, distortion factors and rms values using the dropdown lists.
- Additional Mark the options "Coloured presentation" and "Show distortion factor" as required.
-  Select "OK" to accept all settings. The current dialog box is then closed, and the chart display is changed according to the settings.
-  Select "Cancel" to reject the selected settings. The original settings are then retained, and the current dialog box is closed.

Calculation
Start computing

You can start the calculation once you have adapted the mode of calculation and the tabular display to your requirements. Select the option "Start computing" in the menu "Calculation". The individual values are then calculated and entered into the table.

Short leg.	Rms value	DC	FC no.1	FC no.2	Dist.f.
iL3	10.115	-0.042	10.113	0.009	0.093
iL1	0.009	-0.009	0.000	0.000	0.000
iL2	0.009	-0.009	0.000	0.000	0.000

Digs316g

Fig. 10/17 Table following calculation of values

Close window Close the window "Electrical characteristics 2" by double clicking the top left corner of the title bar using the mouse.

10.6 Printing

Output
Print layout Print all
Settings for PrintAll Standard printer settings
Preview Layout Preview PrintAll

The two windows "Analog and binary recordings" and "Overview" have almost identical menus with print options. The option "Preview layout" is only present in the window "Analog and binary recordings".

Certain other windows and dialog boxes also provide facilities for printing. These facilities will not be dealt with here.

Preview layout

Select the option "Preview layout" to obtain a preview of the layout when printing.

Preview printall

Select the option "Preview printall" to obtain a preview of the complete print.

Print layout

Select the option "Print layout" to print the visible section of the display.

Print all

Select the option "Print all" to print all displayed curves.

Standard printer settings

Select the option "Standard printer settings" to set the parameters for the connected printer. A dialog box specific to the printer is then displayed.

Settings for printall

Select the option "Settings for printall" to set the parameters for the total print. A dialog box is then displayed to permit you to set print parameters.

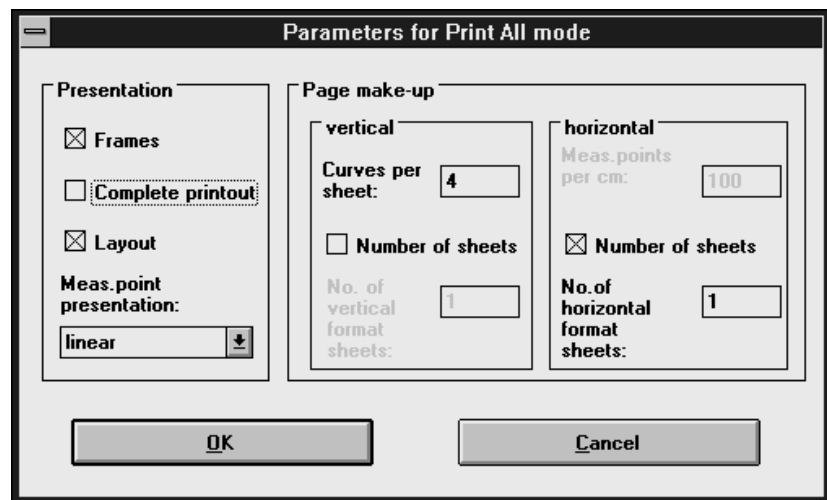


Fig. 10/18 Dialog box "Parameters for print all mode"

10 Fault Processing with DIGRA

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Presentation Mark the options "Frames", "Complete printout" and "Layout" as required. Select a suitable measuring point presentation from the dropdown list.

Page make-up Mark the options for the vertical and horizontal page make-up as required.

OK

Select "OK" to accept all settings. The current dialog box is then closed.

Cancel

Select "Cancel" to reject the selected settings. The original settings are then retained, and the current dialog box is closed.

11 Working with DOS–DIGSI

The DOS–DIGSI module is used for a dialog in conjunction with protection devices according to the ASCII standard. DOS–DIGSI is also used to edit protection device files which have been created using DIGSI V 2.x. The associated files must first be copied into the current DIGSI file structure using the DIGV2V3 program.

11.1 Starting and Terminating DOS–DIGSI

Starting DOS–DIGSI

DOS–DIGSI is a module implemented in DIGSI. It cannot be started on its own, it must always be started from DIGSI.

Manually

You can start DOS–DIGSI manually in order to execute a number of functions specific to protection devices or DOS–DIGSI. Select the option “DOS–DIGSI” from the extension menu “DIGSI”. You then access the DOS–DIGSI menu as in Fig. 11/1.

Automatically

DOS–DIGSI is started automatically if you have opened a protection device according to the ASCII standard and change to the dialog. Following selection of a dialog mode, you access the DOS–DIGSI menu as in Fig. 11/8.

Terminating DOS–DIGSI

Change to the menu “DIGSI” (Fig. 11/1) or to the device main menu (Fig. 11/8). Press the **F8** key. DOS–DIGSI is then terminated, and you return to DIGSI.

11.2 Operation

Screen division

The screen is divided into windows when working with DOS–DIGSI. Figs. 11/1 and 11/5 show two typical examples. The screen is divided as in Fig. 11/1 on the main branches of the tree structure of DOS–DIGSI.

Display of general information

The top window contains the information which is usually constantly visible. The top line contains the DIGSI version number. This is followed by:

- directory
- protection relay type
- relay ID
- dialog
- substation
- feeder
- free disk space
- active parameter set

The DOS name of the file currently being used is shown in the square brackets at the bottom of this window. This is the case at all operational levels.

11 Working with DOS–DIGSI

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Working area The second window is the actual working window. The menu items which can be selected from the currently active operational level are listed here. The selected menu item (using the **F1** and **F2** keys) appears in inverted graphics. The current operating level is displayed in the top margin of this window in pointed brackets. The assignments of the eight function keys are displayed below the working window.

Additional windows A different example of the screen format is shown in Fig. 11/5. In this case a third window has been opened by pressing function key **F3** 'Start'. A further selection must be made here.

Function key assignments

Program execution is mainly controlled by the function keys. These are shown at the bottom of the screen. The assignments of the function keys are **almost** identical for all operating levels. An exception is the assignment of the function keys during the graphic display of fault records. Please refer to Sections 11.4.3.2 and 11.4.3.6 for these.

F1 **F2** The menu items present in the working window can be selected using **F1** (either "Cursor up" or "Previous parameter") and **F2** (either "Cursor down" or "Next parameter"). The selected menu item is displayed in inverted graphics.

F3 The selected option is then started by pressing **F3** (either "start" or "change param."). The next operational level is then displayed or a third window opened.

F4 Function key **F4** (delete) is assigned when parameters are to be entered. This allows, in conjunction with **F1** and **F2** (cursor left and cursor right), input errors to be corrected. The same applies to the 'New directory' function in the 'Select/Create a directory' menu.

F5 Pressing **F5** opens a window containing a calculator. The four basic arithmetic operations (+, -, *, /), the square (X^2), the square root ($\sqrt{\quad}$), the inverse ($1/X$), and the sine, cosine and inverse tangent functions are available. Numbers and functions can be entered both from the keyboard and using the mouse. Your input is displayed in the second line of the calculator 'display', with the numbers shown to the right and the keyboard code for the selected function to the left of the vertical line.

Example "Square root function" The square root of 25 is found by entering 25 V. The result is displayed in the first line of the calculator 'display'.

When entering from the keyboard, the letter for the required function is to be entered in upper case, for example, for '1/X' a 'D', for the 'square root' function a 'V' (as in the example above) and for 'the square of' an 'X'. Entering 'C' erases the calculator's memory. As with all other operational levels, the calculator can be terminated by pressing **F8**.

F6 The **F6** (hardcopy) option enables you to dump the current screen display to your printer whenever you want. Representation of, for example, window frames depends on what character set your printer is using. If possible, set up your printer to use the IBM character set.

Shift **F6** The key combination **Shift** **F6** (hardcopy to file) enables the current screen display to be 'photographed'. These 'photos' are held in files, which can be printed later (e.g. when a printer is available again or on

your return to the office). The substation and feeder must be specified before selecting this function. The files created in the working directory during this process are given the following names:

- ANL*.HCY, '*' will be replaced by the substation/feeder specific number. This file may contain more than one 'photo'. Printing of the file is performed from the DOS level (copy or print).
- ANL*.H01 – ANL*.H99 <=> If the function is executed while process values are being displayed, a file will be created that will just contain this one picture. Up to 99 such files can be created for each feeder. These can then be displayed again from the 'show hardcopy' menu option.

F7 The key **F7** displays a Help text.

F8 The key **F8** (return) returns you to the previous operating level and eventually out of the program. You will be prompted to confirm that you really want to quit the program.

11 Working with DOS-DIGSI

11.3 Options

If you have started DOS-DIGSI manually, you gain access to the menu "DIGSI" according to Fig. 11/1. The two menu items "Delete files" and "Change fault resp. annunciations designation" are only available if you have opened a protection device before starting DOS-DIGSI.

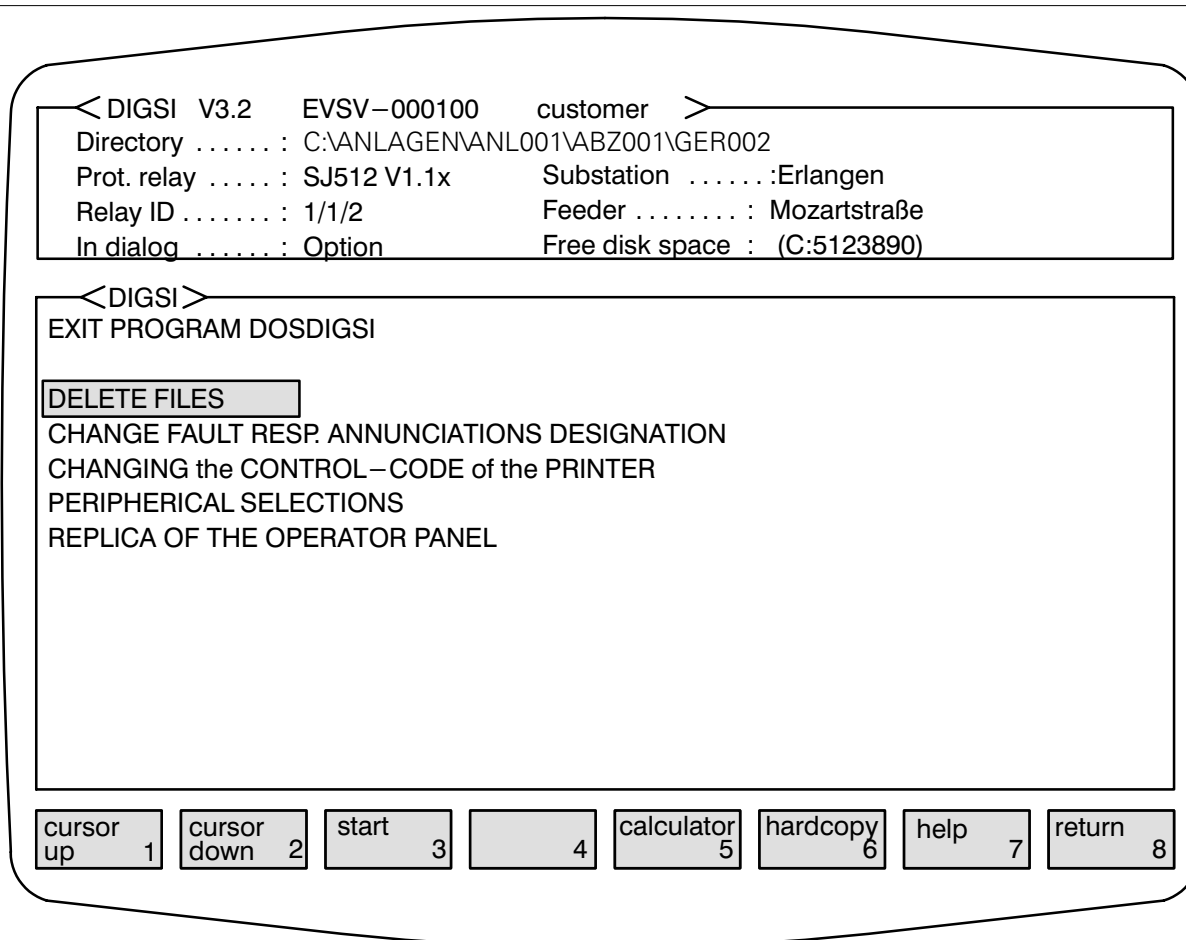


Fig. 11/1 Menu "DIGSI"

The available menu items are explained in the following sections. To leave DOS-DIGSI again, select the menu item "Exit program DOSDIGSI" or the **F8** key.

11.3.1 Deleting Files

Selection of the menu item "Delete files" in Fig. 11/1 opens the associated menu "Delete files" (Fig. 11/2). In order to delete files, move the selection bar to the associated menu item and then press the key.

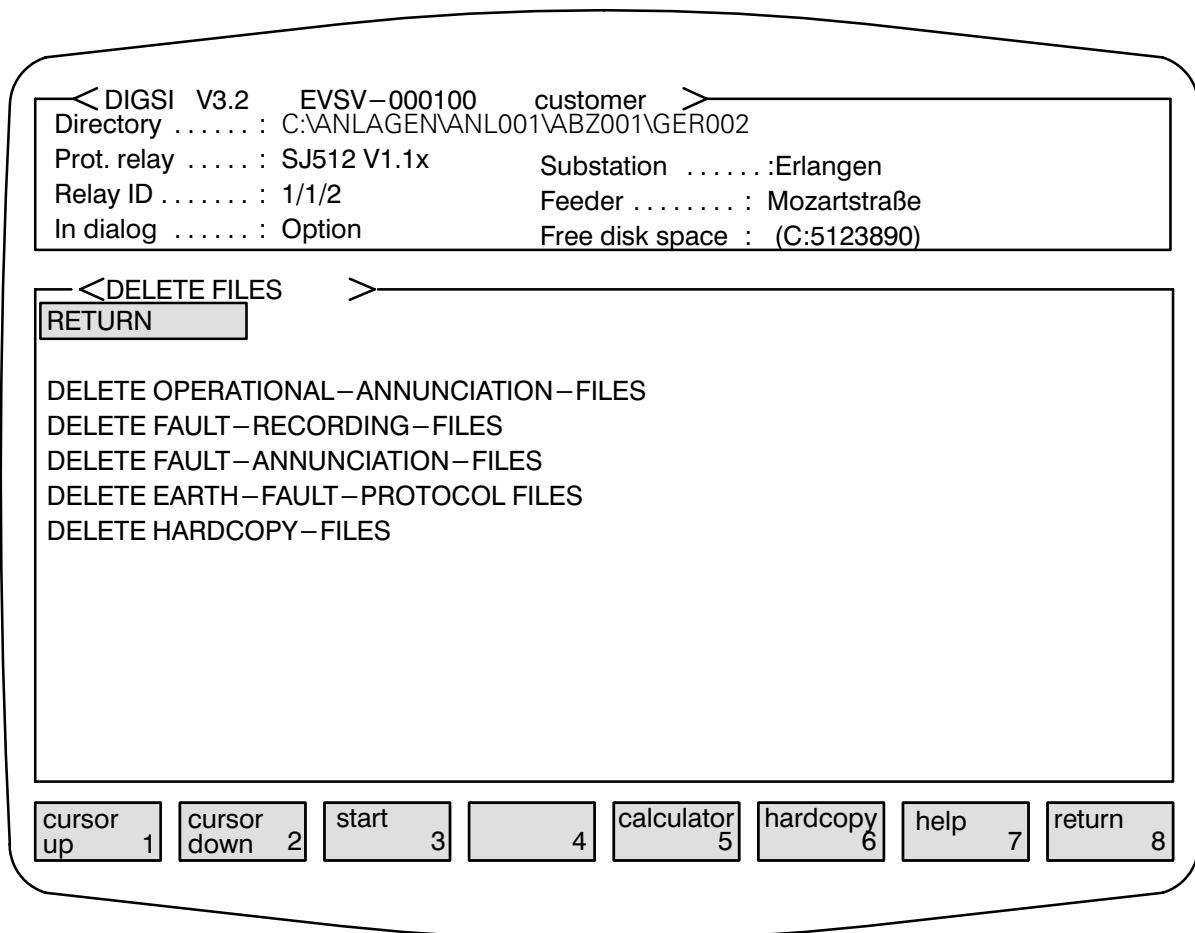



Fig. 11/2 Menu "Delete files"

To leave this menu again, select the menu item "Return" or the key. You then return to the menu "DIGSI".

11 Working with DOS-DIGSI

11.3.2 Changing Fault and Annunciation Designations

Selection of the menu item "Change fault resp. annunciations designation" in Fig. 11/1 opens the associated menu "Change fault resp. annunciations designation" (Fig. 11/3). In order to change designations, move the selection bar to the associated menu item and then press the  key.

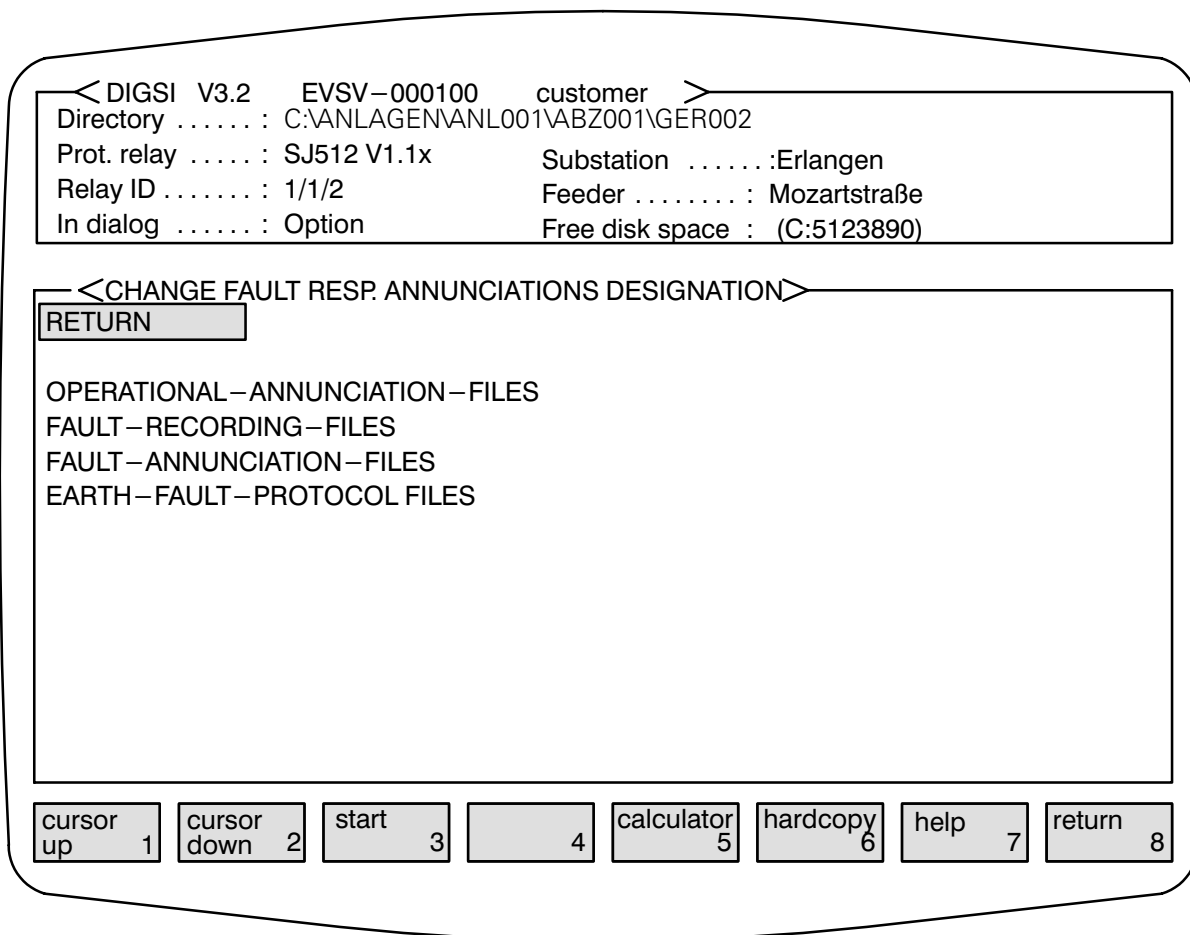



Fig. 11/3 Menu "Change fault resp. annunciations designation"

To leave this menu again, select the menu item "Return" or the  key. You then return to the menu "DIGSI".

11.3.3 Changing the Printer Control Codes

Selection of the menu item "Changing the control code of the printer" in Fig. 11/1 opens the associated menu "Changing the control code of the printer" (Fig. 11/4). In the input area, enter a control code corresponding to the requirements of your printer.

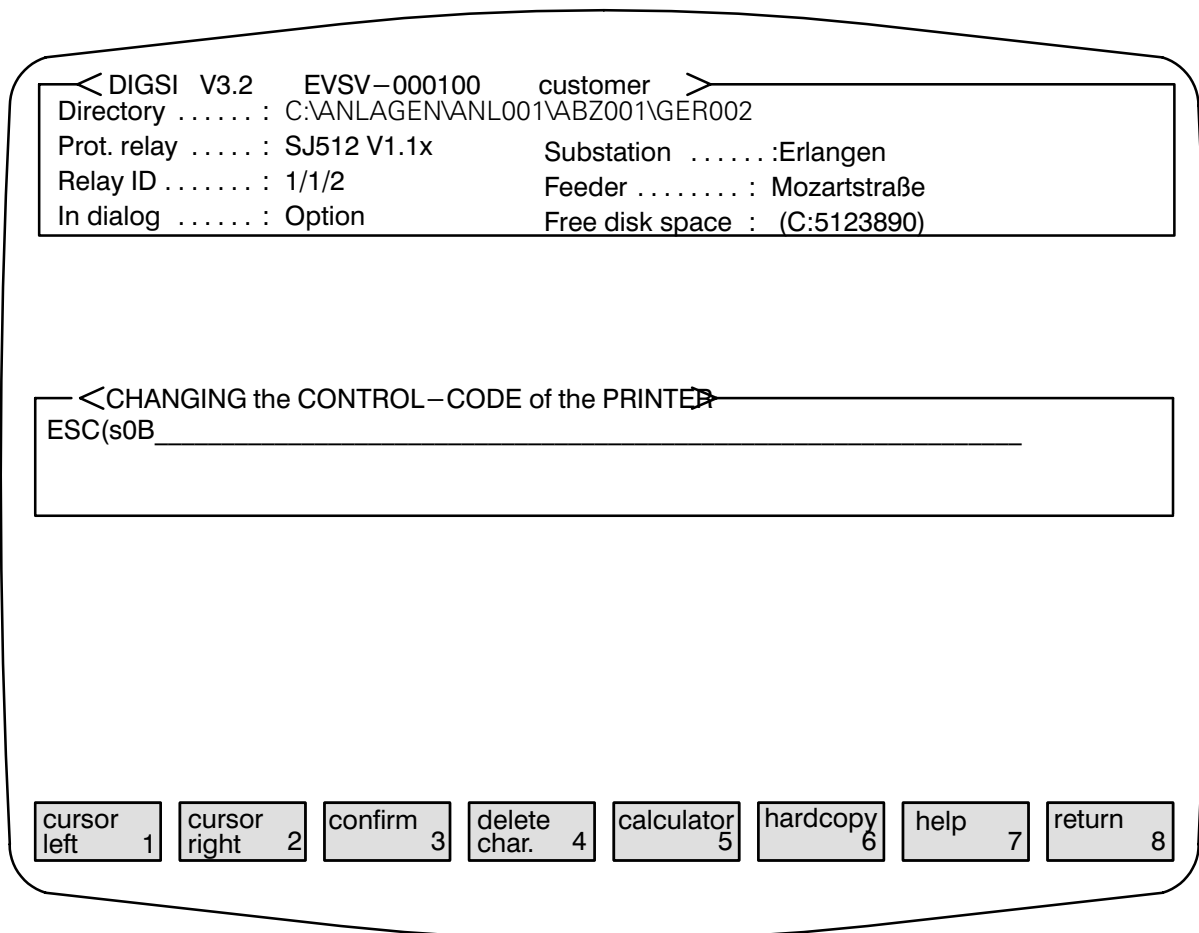


Fig. 11/4 Menu "Changing the control code of the printer"

To leave this menu again, select the menu item "Return" or the F8 key. You then return to the menu "DIGSI".

11 Working with DOS-DIGSI

11.3.4 Select peripherals

The menu option, 'Select peripherals', is of particular significance during your first DOS-DIGSI session, as you will have to specify the basic parameters for your analysis system (Fig. 11/5).

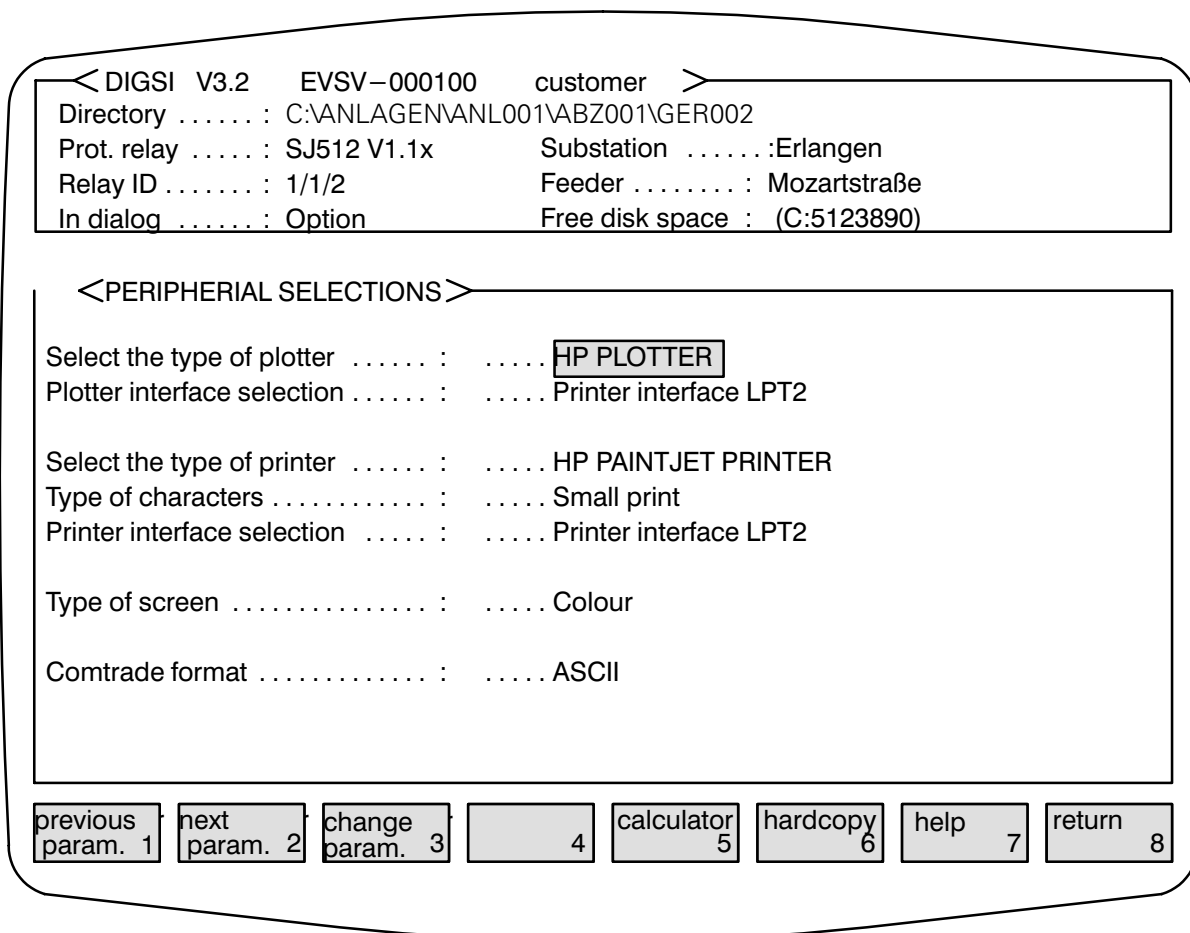


Fig. 11/5 Menu "Select peripherals"

Select plotter You will be given a number of alternatives when you select this menu option. To output graphics on an HPGL compatible plotter, select the menu option 'HP plotter via...'

Plotting via an interface Specify the interface through which the graphics are to be output.

Printer type DOS-DIGSI supports the printers shown in this list. Select the printer you will be using. If your printer is not listed, it may still be possible that one of the printer drivers shown will support your printer.

Printer format You can choose between large format (DIN A3) and small format (DIN A4).

Printing via an interface Specify the interface to which your printer is connected.

Monitor DOS-DIGSI also supports colour monitors. The output of fault records in particular is made much clearer by the use of colour. Indicate whether a colour or monochrome monitor is connected to your computer.

These parameters need only be set once (first working session) or if a change is made to the peripherals.

11.3.5 Emulation of Operator Panel

Selection of the menu item "Replica of the operator panel" in Fig. 11/1 opens the associated menu "Replica of the operator panel" (Fig. 11/6).

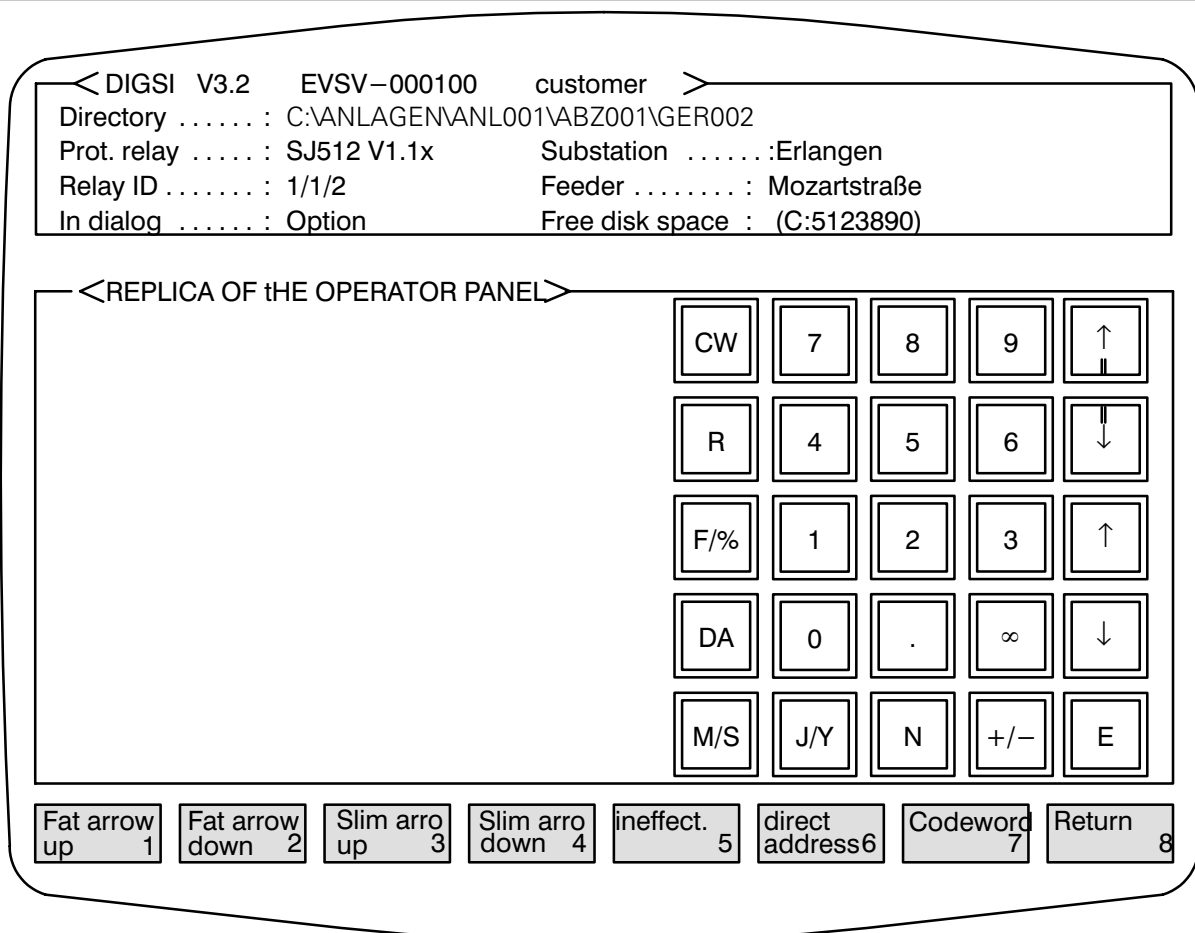


Fig. 11/6 Menu "Replica of the operator panel"

11 Working with DOS–DIGSI

11.4 Protection Dialog

The menu options described in chapter 11.3, and their functions, apply to all types of protection relay. The lower-level menus that are called up from the 'protection dialog' menu option differ according to the type of protection relay and its functionality (e.g. fault recording present/not present; zone settings and their graphical representation; type and number of parameter values). In addition, differences will also be evident as a result of the decision taken in the 'DIGSI' opening menu as to whether the dialog is to be with a 'relay' or a 'file'. These will be looked at in more detail where necessary. In the diagrams that are being used as examples, 'protection relay' functions are indicated by an asterisk '*'.

The type of protection relay has no effect on the ways in which, for example,

- parameter values are retrieved,
- parameters are entered, or
- fault records are retrieved and analysed.

The following chapters have therefore been kept as general as possible. The examples shown, e.g. the user interfaces displayed on the screen, are all taken from the 7SA500 protection relay (overcurrent starting).

At the moment, there are some interdependencies between various parameter blocks in three types of protection relay, i.e. depending on the particular setting of certain parameters, certain functions (which can be found in other parameter blocks) will or will not be visible.

7UT51 The number of transformer windings that can be protected by the 7UT51 depends on its hardware. This number ('Parameters' menu, 'General data') must also be passed on to the operating and analysis program so that it can modify other parameter blocks ('Parameters' menu, 'Winding data') accordingly.

7SA500 The number of I/O modules affects the number of parameters that can be assigned a value. Therefore: It is recommended that the marshalling configuration is parameterised first, followed by the other parameters and settings. The parameters should also be transferred to the protection relay in this sequence.

7SA511 The functionality of the 7SA511 is distinguished in two ways:

- by the order number
- by the parameter blocks 'Relay scope' and 'Relay configuration'.

The functionality of the relay can be varied to a certain extent through these parameter blocks, regardless of the total functionality as encoded in the order number. This is done in the 'Configuring/ Marshalling/ Planning' menu by calling up the menu option 'Relay scope/configuration', which has the effect of displaying (or not displaying) the corresponding menu options in the 'Parameters' menu. As with the 7SA500, it is recommended:

- to parameterise and transfer 'Configuration/ Marshalling/ Planning' first,
- and only then to parameterise and transfer the 'parameters and settings'.

7SJ511, 7SA511

Relays with parameter set changeover require the appropriate presetting before processing the set. A set A to D should first be chosen using the menu option PARAMETERS/PARAMETER SET PROCESSING. The activation of a parameter set is performed using the menu option SETTING UP OF PROTECTION FUNCTION.../ACTIVATE PARAMETER SET.



Caution!

The retrieval of data, such as parameters, marshalling data, planning data as well as annunciations and fault records, from the protection relay is handled separately. In other words, retrieving a fault record from the protection relay does not, for example, update the parameters at the same time. If these are also to be updated on file, this must be done in a separate program step.

When starting the dialog you initially access the main menu (Fig. 11/7).

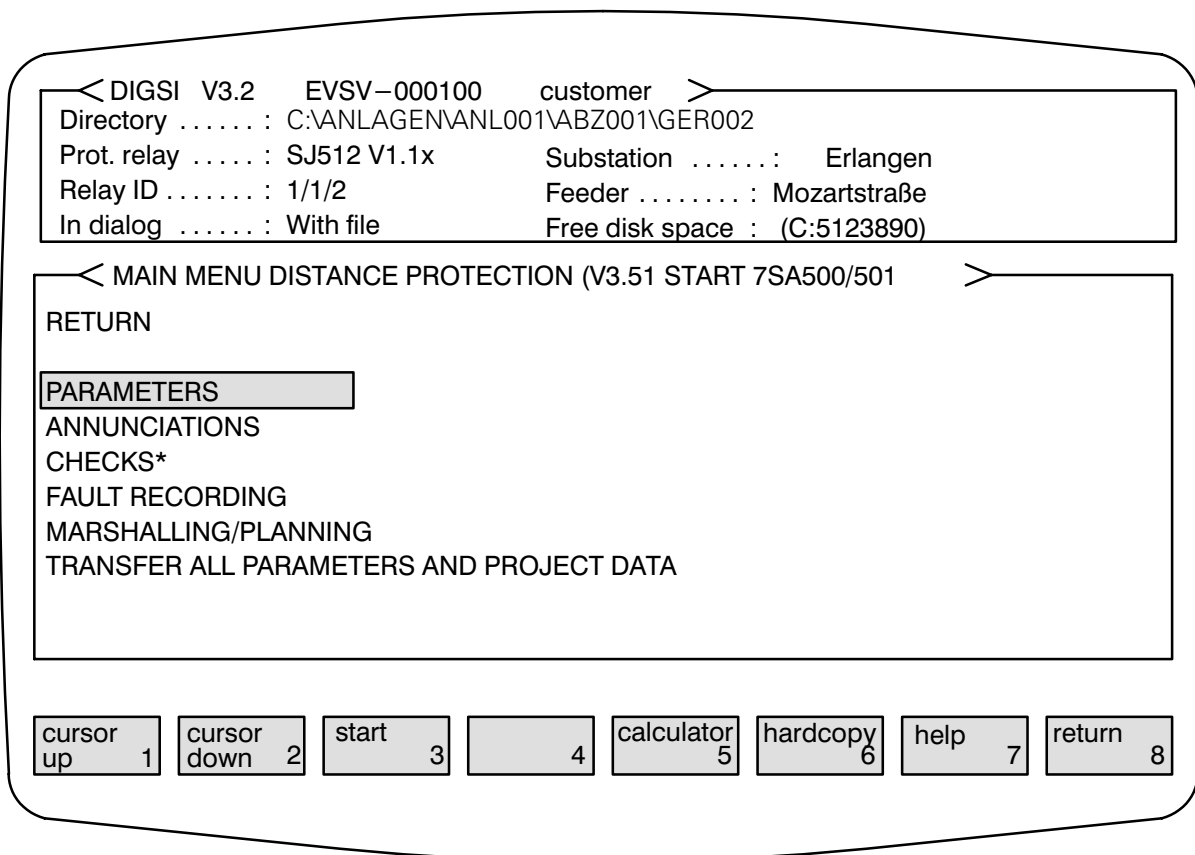


Fig. 11/7 Main menu

Dialog mode “With protection device” The values displayed have just been retrieved from the protection relay so reflect the actual status of the relay.

11.4.1.2 Parameterisation; changing the parameters

Dialog mode “With file” Use **F1** and **F2** to select the parameter you want to modify and then press **F3** (Fig. 11/8). A new window appears on the screen (Fig. 11/9). Again, use **F1**, **F2** and **F3** to make your selection, or use the numeric keypad to enter a value in the appropriate field. The screen is updated and the modifications incorporated in the ‘main’ window as well.

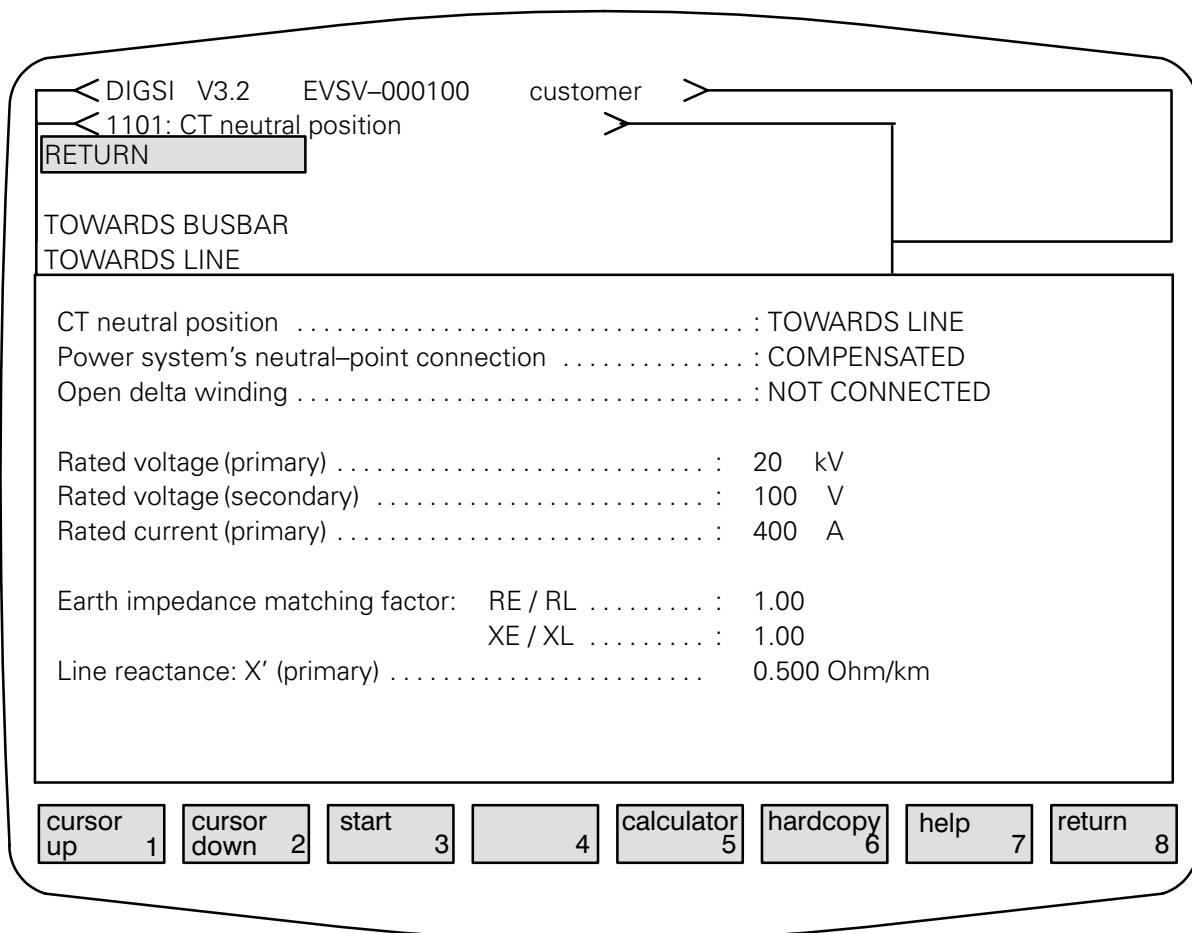


Fig. 11/9 Menu “General data”; changing the parameters

The file will not yet have been updated with this modification. This is done when you either

- quit the main relay menu by pressing **F8**, or
- select one of the menu options ‘Fault Recording’ or ‘Marshalling/Planning’ from the main relay menu.

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You will then be asked whether you want to save the changes. Reply 'Yes' or 'No' (Fig. 11/10).

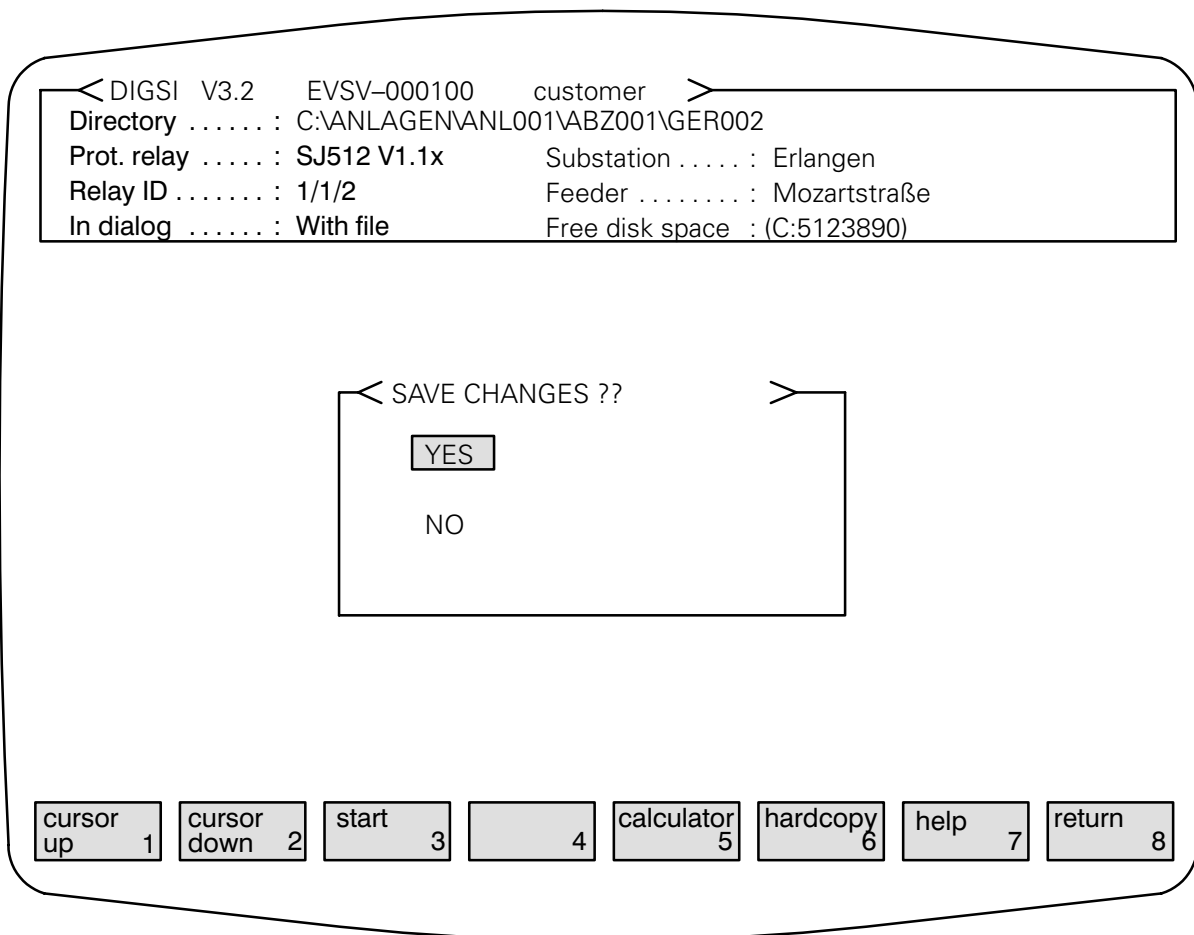


Fig. 11/10 Question "Save changes"

Having completed your modifications, they can then all be transferred to the protection relay in a single operation. To do this, select the 'Transfer parameters' option from the 'Parameters' menu, followed by 'Parameters from file to relay'. The transfer operation begins after the password prompt (Fig. 11/11) and a check, performed automatically, that the protection relay you selected is the same type as the one that is actually connected.

The password is checked twice:

- once by DOS-DIGSI
- and once by the protection relay itself.

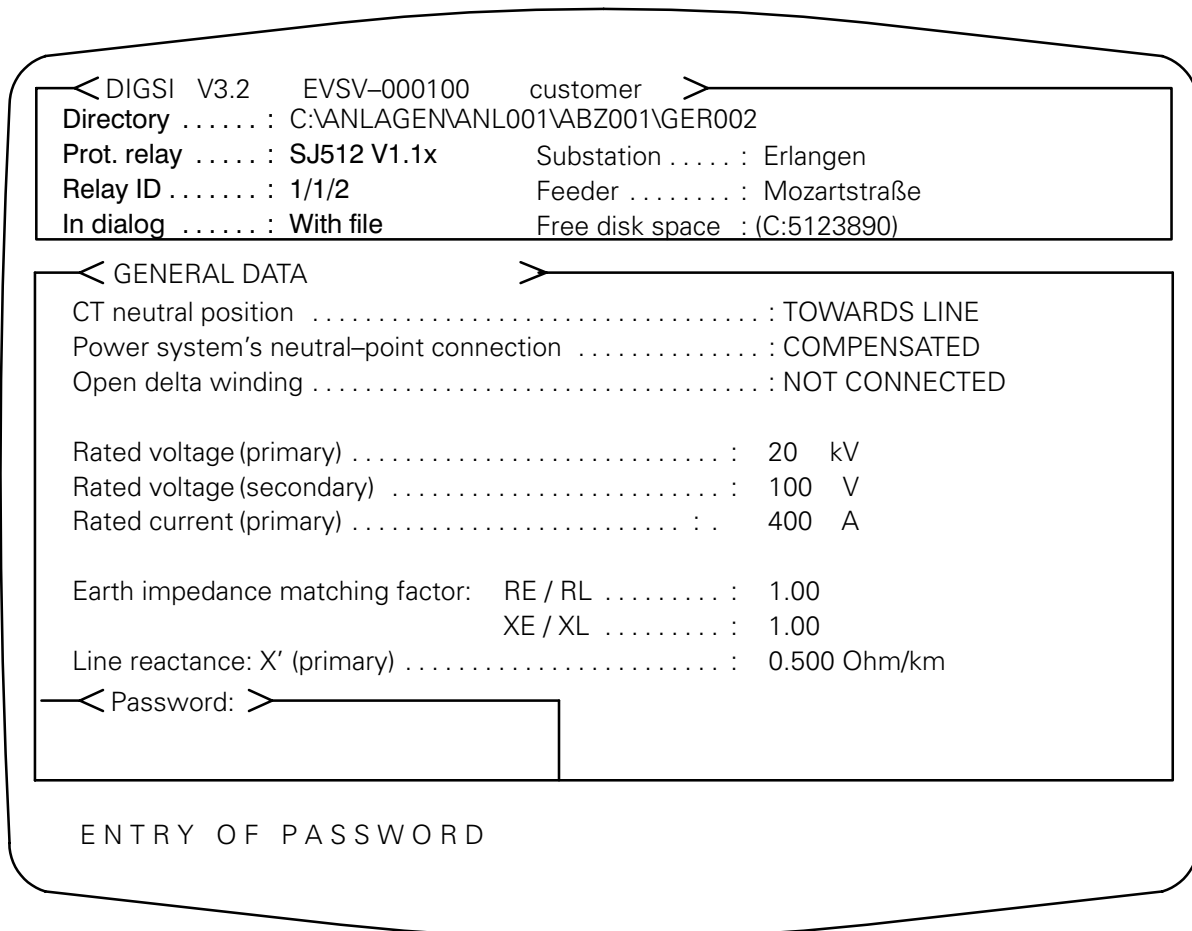


Fig. 11/11 Menu "General data": entry of password

Dialog mode "With protection device"

Modifications can be transferred to the relay in two ways:

- explicitly, by pressing **F4** 'Send to relay'; you will still be in the same menu after the transfer has been performed. If you want to reassure yourself that the relay has been parameterised correctly, press **Shift F4** to update the displayed parameters (the parameters are uploaded again from the relay to the PC).
- by returning to the 'Parameters' menu by pressing **F8**.



Caution!

On returning to the main relay menu when in this mode, you will not be asked whether the modifications are also to be saved to file. Neither are the modifications saved automatically. It is recommended, however, that this is done 'manually' so the file always has an up to date version of the relay parameters.

Suggestion: after parameterising the relay, save the parameters to file using 'Parameters from relay to file' (Fig. 11/12).

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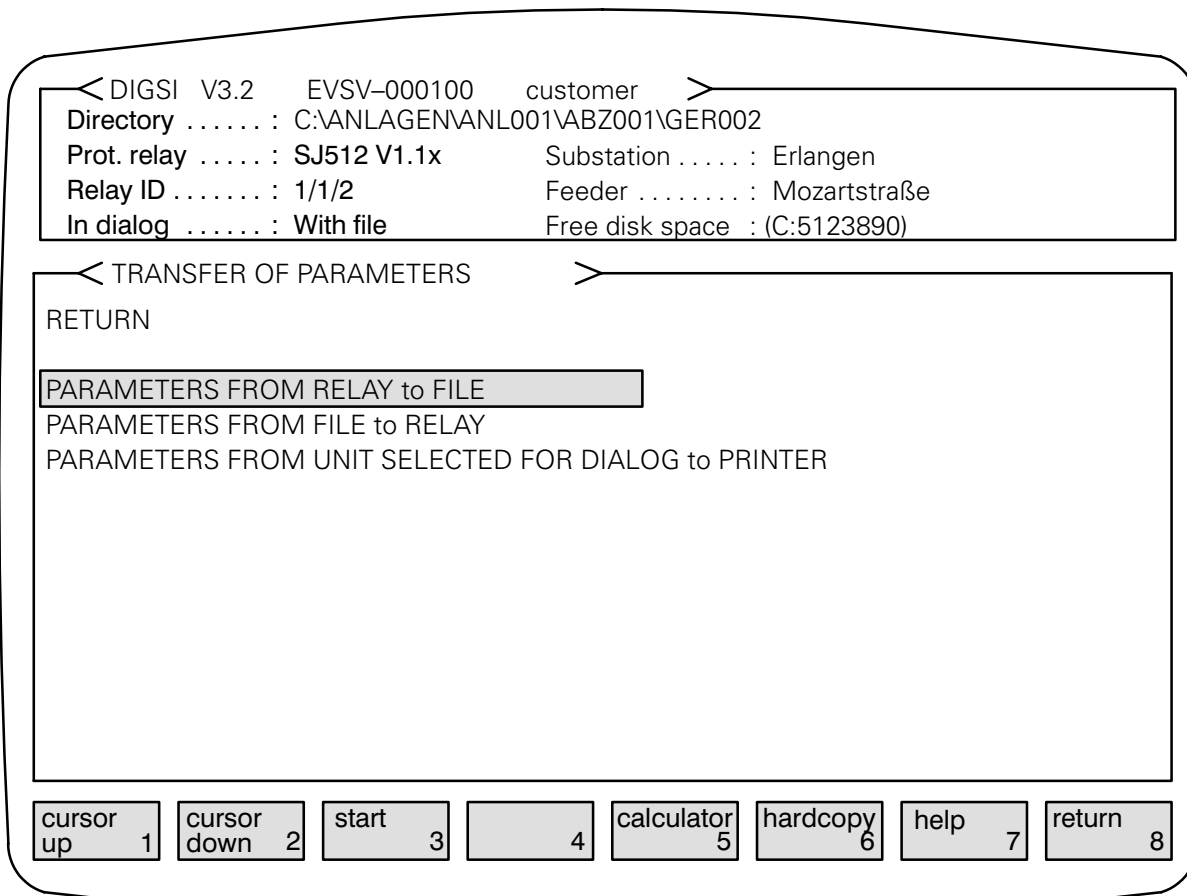


Fig. 11/12 Menu "Transfer of parameters"

11.4.1.3 Printing of parameters

To document the parameters for a protection relay, a print-out of the parameters can be produced using the function 'Parameters from unit selected for dialog to printer' (Fig. 11/12).

Depending on the dialog mode in use, the appropriate file is printed or the parameters first retrieved from the relay and then printed.

The print-out has the following format:

PAGE : 1

```

User ID ..... :          DATE ..... : Fr. 03.05.91 09:14
HENDERSON          Substation ..... : Erlangen
Prot. relay .. : 7SA500 V3.51   Feeder ..... : Mozartstraße
Relay ID ..... : 001
D:ANL00107.EIN
  GENERAL DATA
1101 CT neutral position ..... : TOWARDS LINE
1102 Power system's neutral-point connection ..... : COMPENSATED
1107 Open delta winding ..... : NOT CONNECTED
1103 Rated voltage (primary) ..... : 20 kV
1104 Rated voltage (secondary) ..... : 100 V
1105 Rated current (primary) ..... : 400 A
1201 Earth impedance matching factor: RE / RL ..... : 1.00
1202 . XE / XL ..... : 1.00
1205 Line reactance: X' (primary) ..... : 0.500 Ohm/km
.
.
.
    
```

Fig. 11/13 Extract of a printer list

Lines 2 – 4 are for identification purposes. The name of the file (in DOS format) is shown in line 5. The parameters are printed block by block. The names of these blocks correspond to the names of the individual DOS-DIGSI parameterisation menus.

The address under which each parameter can be accessed from the integral control panel is printed at the beginning of each line.

More information about these addresses and the parameters can be found in the relevant relay descriptions.

11.4.1.4 Graphical display of zone settings (e.g. 7SA500, 502, 506, 511, 513)

The distance zones I, II and III defined in the 'Zone settings' menu (e.g. for 7SA500, Fig. 11/14), as well as the distance zones W1 (e.g. for triggering with subsequent reclosure) and W2 (for triggering with subsequent LU) can be displayed graphically using this function.

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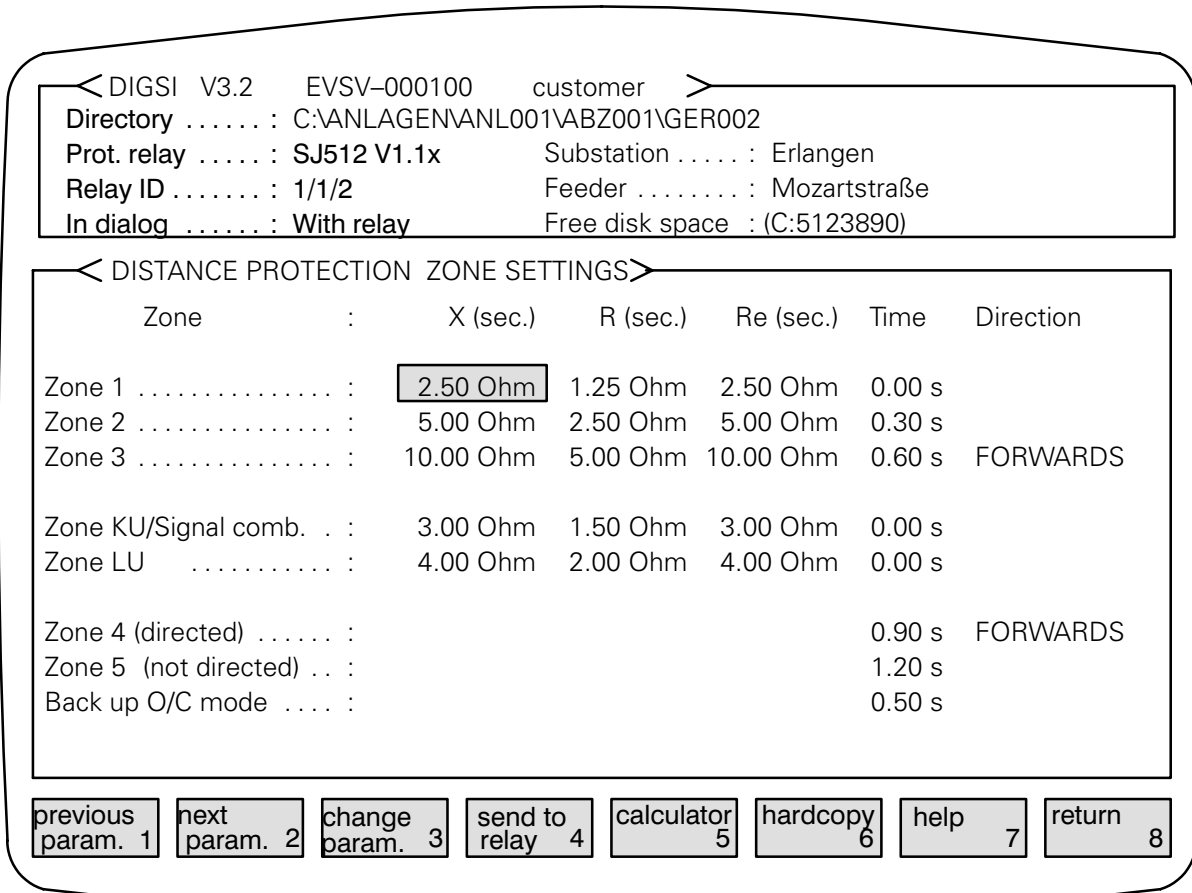


Fig. 11/14 Menu "Distance protection zone settings"

For relays of the 7SA5 range without parameter set changeover, the impedances of up to three stored faults can be entered. Fig. 11/15 is displayed after the appropriate menu option has been selected. If you go straight to the 'Graphical display of zone settings' menu option without first selecting 'First fault',... , just the zones will be displayed.

The faults to be entered are selected by repeatedly selecting the 'First fault', ... menu option.

Dialog mode "With file"

The three most recent faults stored in the protection relay are retrieved and displayed (if this facility is provided for this relay).

Dialog mode "With protection device"

An overview of the faults stored on file (hard disk or diskette) is displayed for each of the three menu options ('First fault', ...). One of these can be selected in each case.

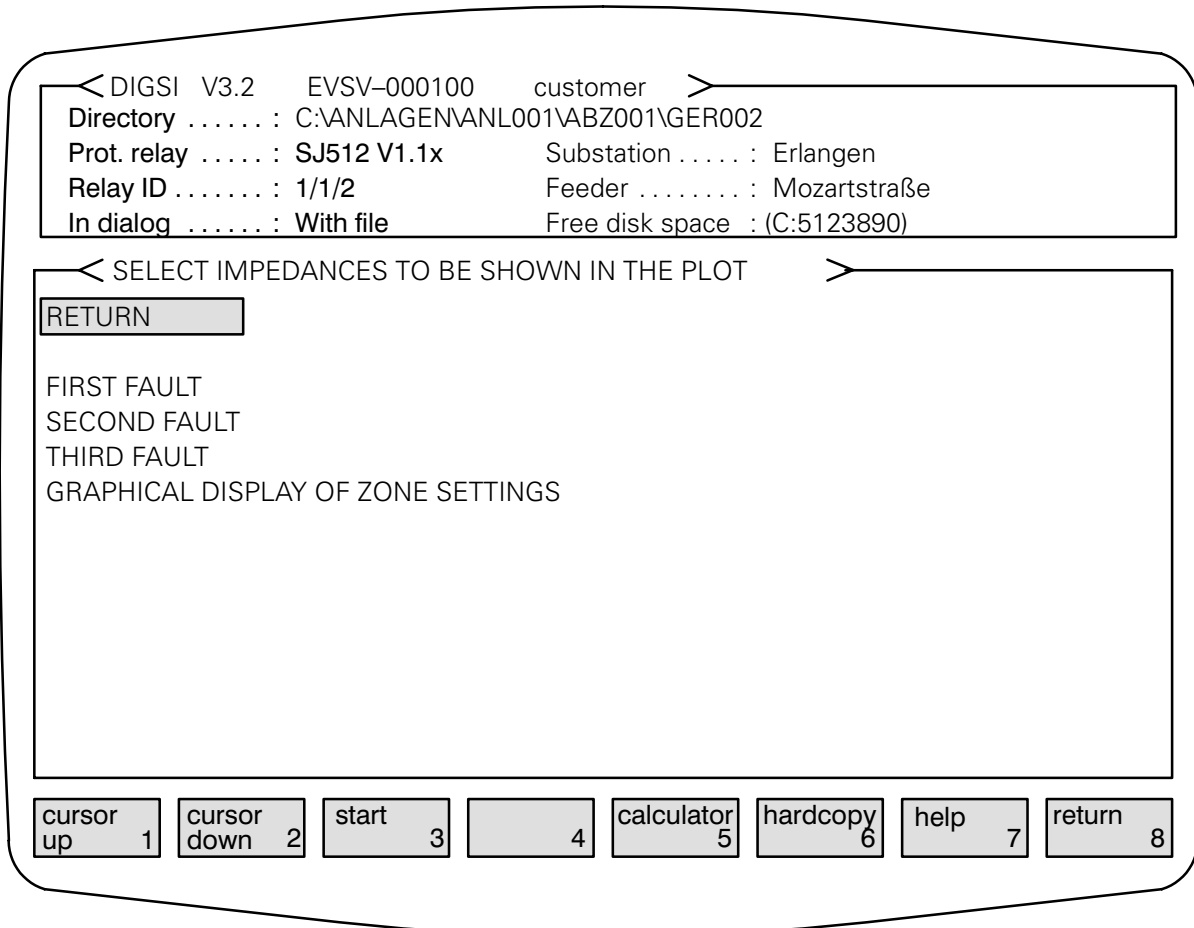


Fig. 11/15 Menu "Select impedances to be shown in the plot"

Before switching into graphics mode, you will be given the chance to enter a name (Fig. 11/16) that will subsequently appear on screen as well as on any plotted or graphical output.



Caution!

In 'relay' mode, the fault reports to be entered in the graphic and which have been retrieved from the protection relay are not automatically saved to file when you quit the menu! If you want to save these reports, proceed as described in chapter 11.4.2.

Fig. 11/17 shows function key assignments while in graphics mode.



Zone off

It can be useful, particularly when fault impedances have been included, not to display certain zones. The remaining zones are then usually shown at a higher magnification. The largest currently visible distance zone is 'hidden' each time **F1** is pressed.



Zone on

Displays again zones that were hidden by pressing **F1**.

11 Working with DOS-DIGSI

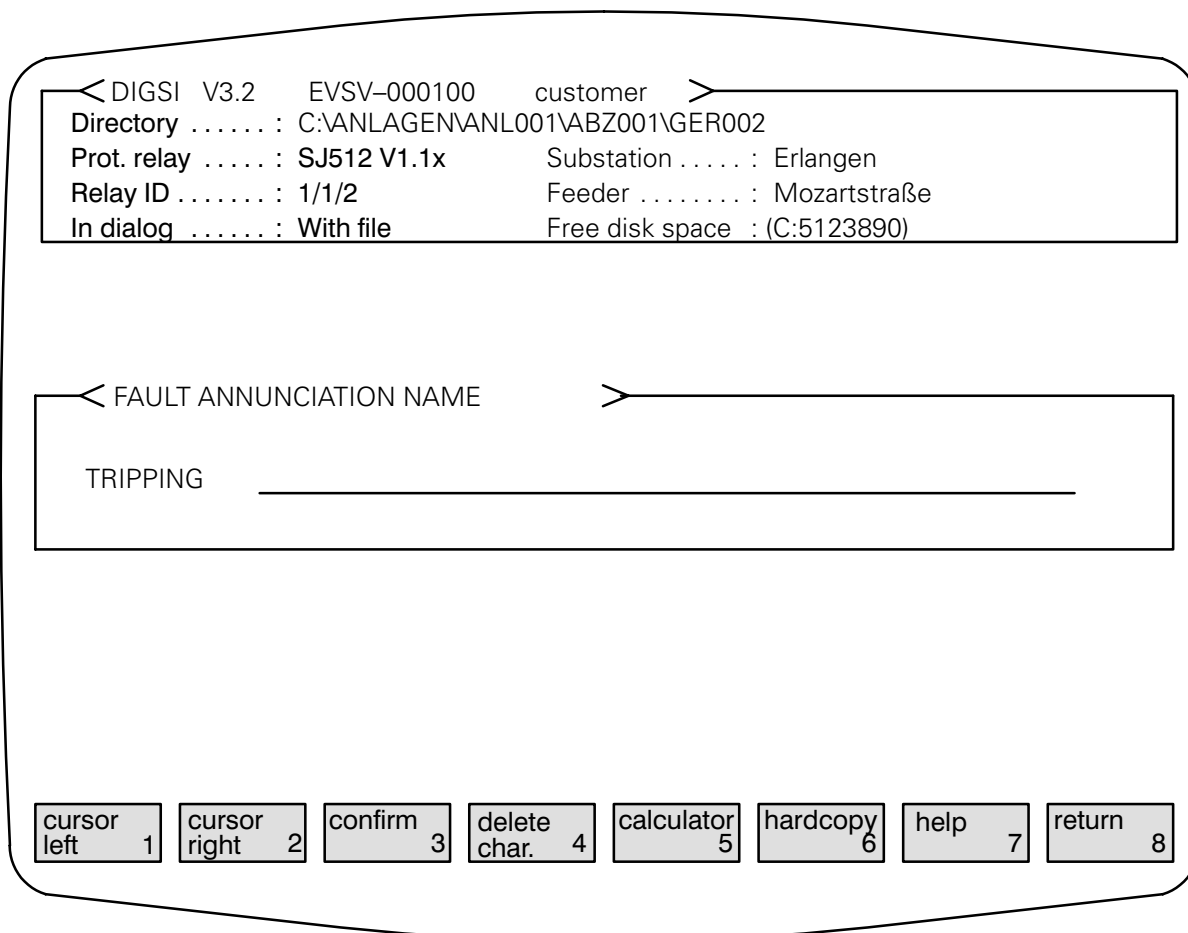


Fig. 11/16 Menu "Fault annunciation name"

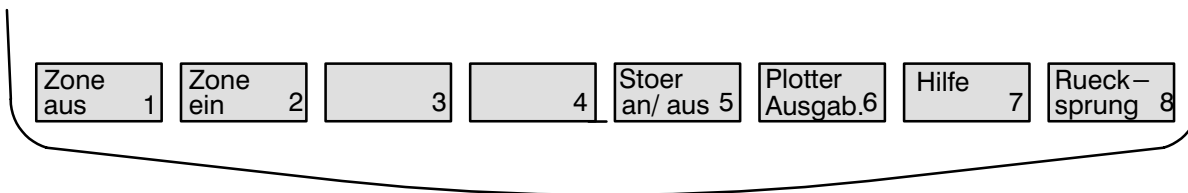


Fig. 11/17 Function key assignments during the graphic display of zone values

F5 Fault on/off

The following information about the displayed faults can be output in an additional window (info box) by pressing **F5**:

- fault number
- fault detection between phase .. and phase ..
- R and X values.

F6 **Plotter out.**

The graphics are output on the selected peripheral (printer or plotter; see 11.3.4, 'Select peripherals', 'Select Plotter'). The text describing the displayed fault is always displayed on the plot/print-out, regardless of the status of **F5**.

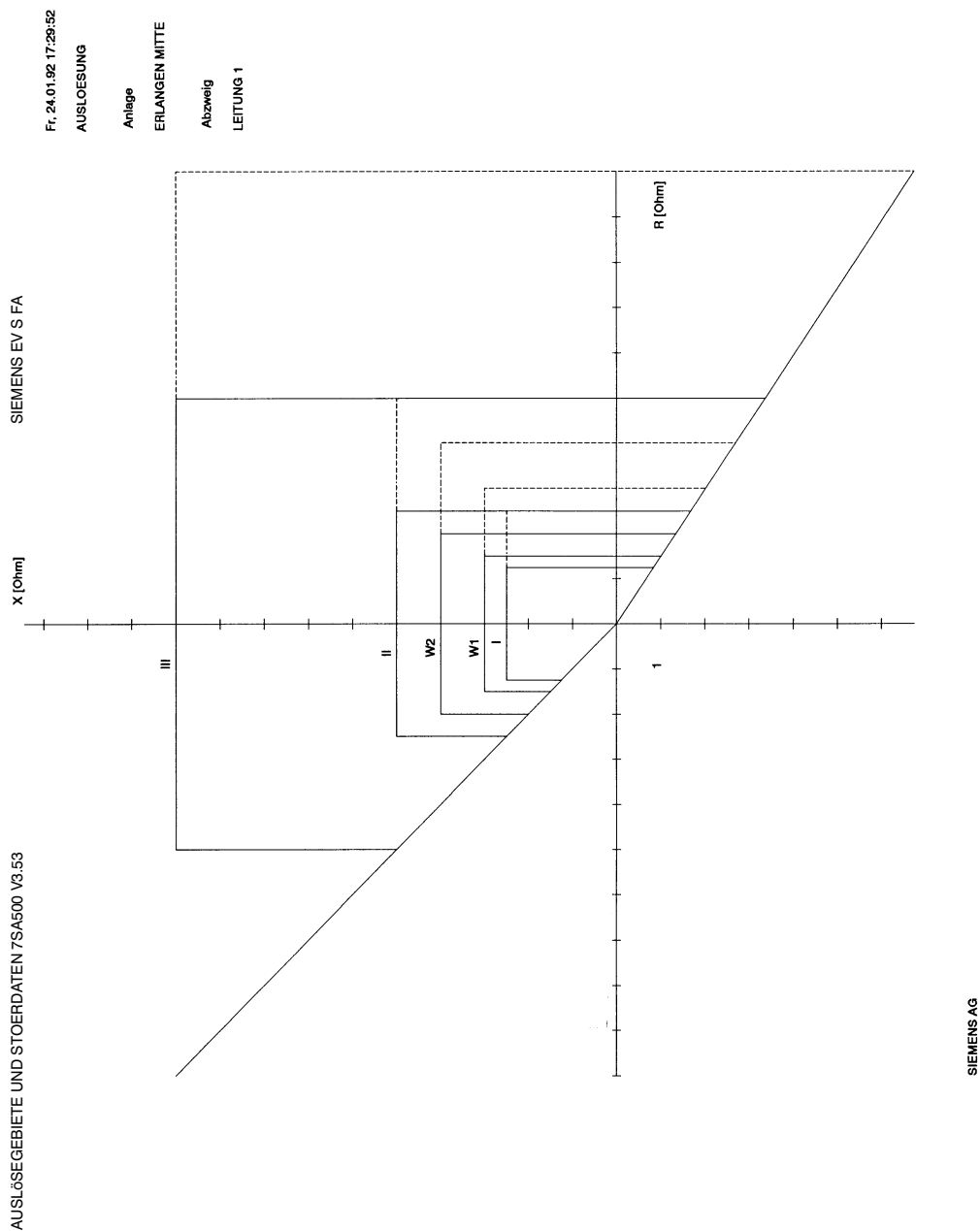


Fig. 11/18 Example of a graphic printout of the distance zones (original size DIN A4).

11 Working with DOS-DIGSI

Additional data shown in the output (Fig. 11/18) is:

- Trip and fault data, relay name including software version number
- Name of customer
- Date (date plot/print-out output)
- Fault annunciation name
- Substation and feeder.

The scale along the axes (in Ohms) is derived from the value of the largest impedance to give optimum utilisation of the visible screen.

11.4.2 Annunciations

The functions shown in Fig. 11/19 are available from this menu.

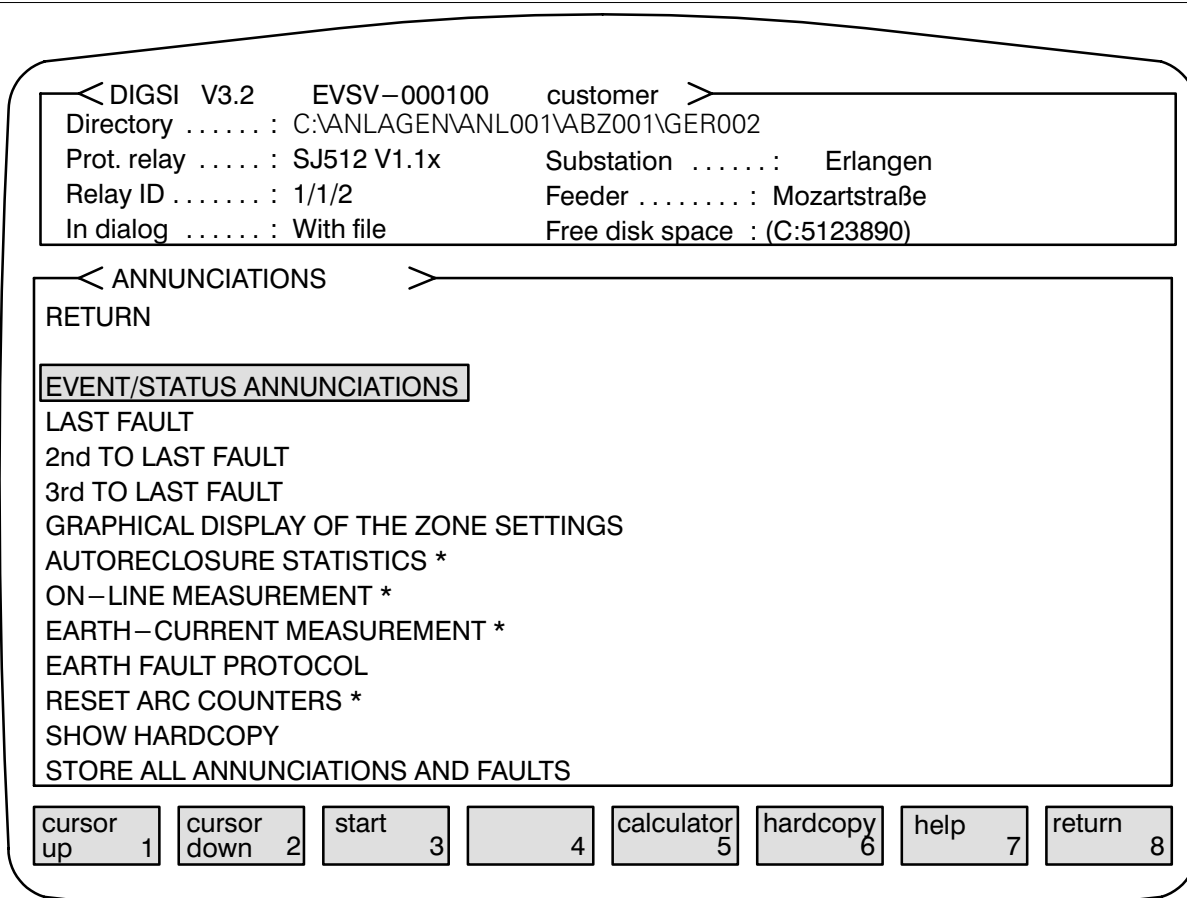


Fig. 11/19 Menu 'Annunciations'

Dialog mode "With protection device"

Data from the following memories of the connected protection relay can be retrieved:

- Memory containing 'Event/Status Annunciations'
- Three memories each containing a fault protocol:
'Last fault'
'2nd to last fault'
'3rd to last fault'
- Memory containing 'Earth fault protocol' (if present)

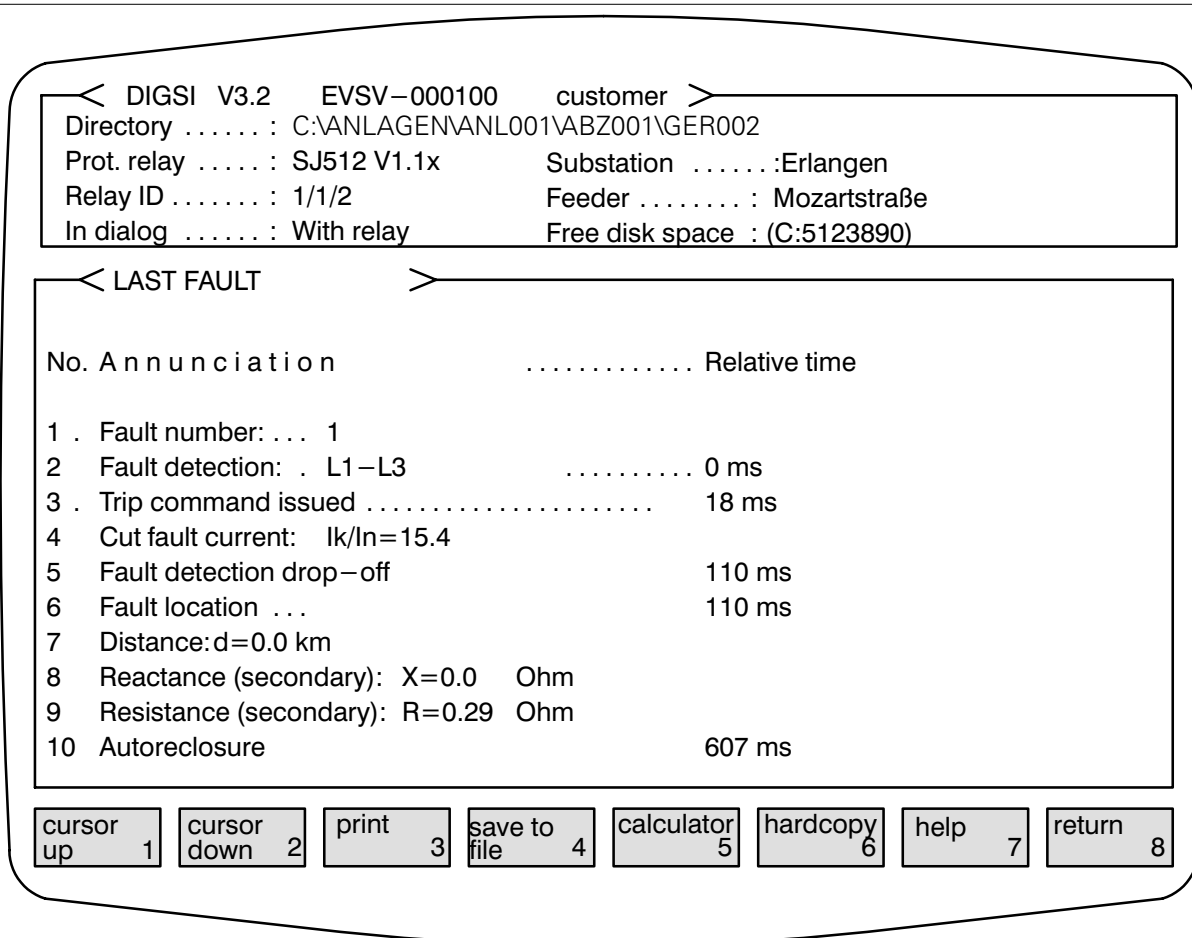


Fig. 11/20 Menu "Last fault"

The retrieved annunciations are displayed immediately on screen. They can, if required, be saved to file by pressing **F4** 'Save to file' (Fig. 11/20). Note that the 'Save' operation will only succeed if Substation and Feeder were selected before starting to communicate with the protection relay. In addition to the protection data, the current date and time (not the time the fault occurred!) and the name you gave the fault annunciation are also saved.

11 Working with DOS–DIGSI

The annunciations currently on screen can be printed by pressing **F3** 'Print'. The header for this print–out is identical to the one for the parameter listing shown in chapter 11.4.1; the name of the annunciation is printed at the beginning of the 5th line.

The user interface for the 'Last fault' menu option, which is representative of all annunciations, is shown in Fig. 11/20.

The function 'All annunciations, faults from relay to file' enables the memories described above to be retrieved from the relay, transferred and saved to file (disk/diskette) in one operation.

Functions only available in 'relay' mode:

- Autoreclosure counter, Fig. 11/21
- On–line measurements, Fig. 11/22
The values are retrieved cyclically from the relay and displayed on screen in real–time.
- Earth fault measurement, Fig. 11/23
- Reset counters
Autoreclosure statistics (Fig. 11/21) can be set to zero again using this function following the input of a password.

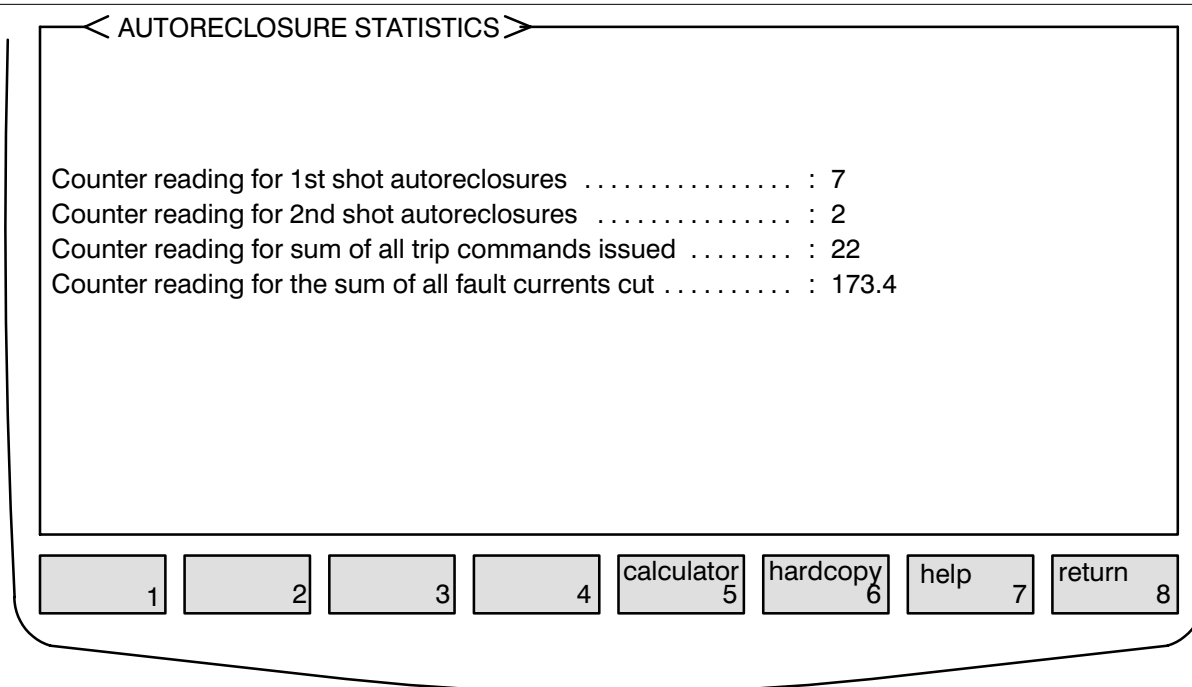


Fig. 11/21 Menu "Autoreclosure statistics"

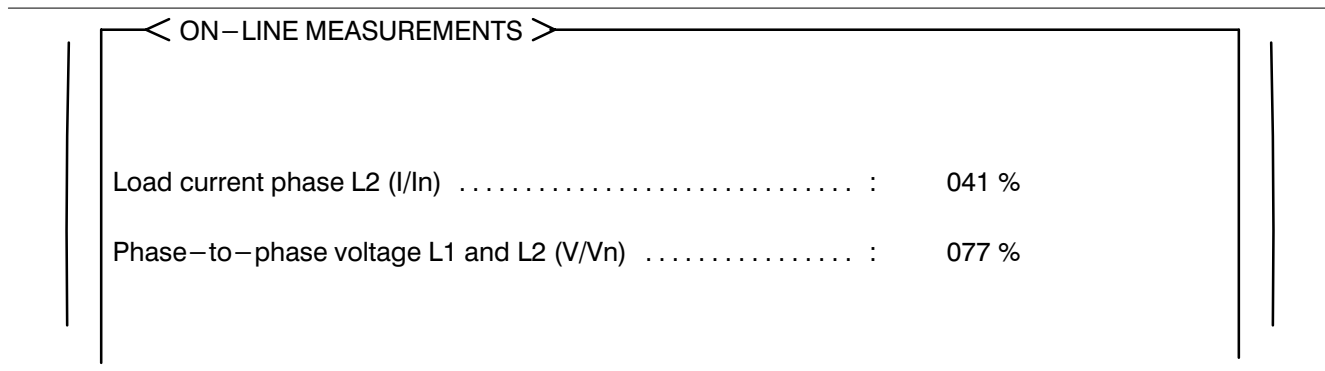


Fig. 11/22 Menu "On-line measurements" (only main window)

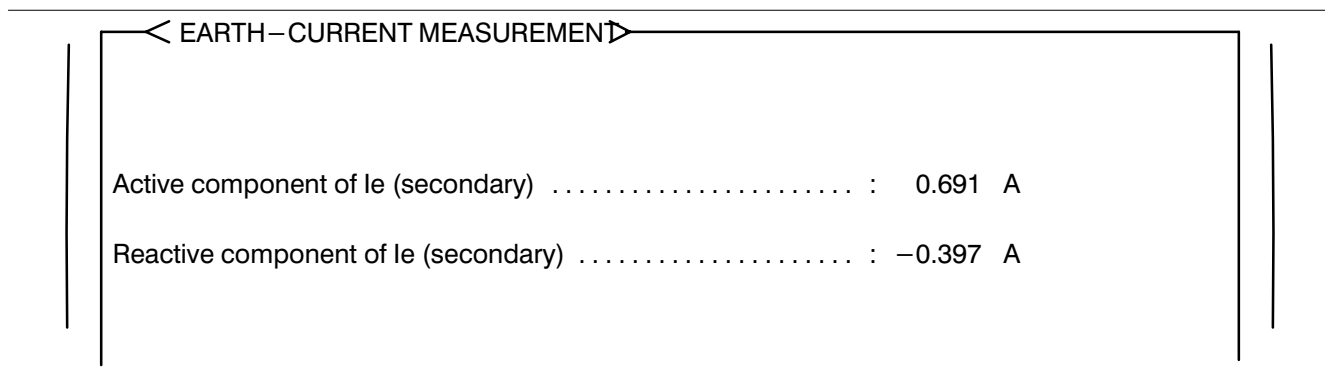


Fig. 11/23 Menu "Earth current measurement" (only main window)

On-line readings displayed on screen during a dialog with the relay can be 'photographed' by pressing **[Shift]** **[F6]** (hardcopy to file). Up to 99 such 'photos' can be stored for each feeder. They can be displayed on screen again and printed by selecting the 'show hardcopy' menu option (Fig. 11/19), even during a dialog with a file.

Dialog mode "With file"

The contents of a protection relay's memories can each be stored up to 99 times. Data stored in files can be recalled using the criteria specified above (time, date) and the name of the fault annunciation.

The fault protocols stored on file can be accessed using the 'Last fault' menu option. A list of the protocols on file is displayed when you select this option. One of the protocols can now be selected and displayed using the **[F1]**, **[F2]**, **[F3]** function keys. This also applies when working with the 'Event/status annunciations' and 'Earth fault protocol' menu options.

In terms of their function, the '2nd to last fault' and '3rd to last fault' menu options are identical to the 'Last fault' when in 'file' mode. The user will therefore not get any additional information by selecting them. They do serve their purpose, however, in cases where, even though 'file' mode is selected, data in a connected protection relay is being uploaded by the 'Save all annunciations/faults' function. They then ensure that the

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data in the second and third fault protocol buffers of the relay is retrieved correctly.

Function key **F4** 'Save to file' (see Fig. 11/20) is not assigned when in 'file' mode. How to use the 'Graphical display of zone settings' menu option is described in section 11.4.1.4.

11.4.3 Fault Record

What is understood by fault values are the instantaneous values of currents and voltages recorded by numerical protection relays over a fixed period before and after a short-circuit occurs.

The time period, the sampling rate of the instantaneous values and the input variables recorded depend on the type of protection relay. The values for the 7SA500 are shown below as an example:

Table 11/1 Characteristic values for fault record

Numerical protection	Input variables	Sampling rate	Number of values	Recording duration at 50 Hz following error detection
7SA500	$i_{L1}, i_{L2}, i_{L3}, i_E,$ $u_{L1}, u_{L2}, u_{L3}, u_E$	1 kHz	660	–60 ... 599 ms

The values relating to a fault incident remain stored in the 7SA500 protection relay until

- they are retrieved or
- the fault record buffer is released.

Exactly one fault record with a duration of 660 ms (7SA500) can be stored. The fault record can be either

- retrieved by DOS–DIGSI via the interface on the front of the relay or
- transferred to an LZG master unit via the LSA interface.

The decision via which interface to retrieve the fault record is made in the 'Parameters' menu, using the 'Signal transmission procedure' option. In the case of the 7SA500, it is also possible to assign a digital contact in such a way that the 'fault record buffer' can be 'released' without having to retrieve the fault record. This is done using the 'Input relay' option in the 'Marshalling' menu. The functions shown in Fig. 11/24 become available when you select the 'Fault recording' option from the 'Main relay menu'. The 'Fault recording' menu (if present) is, with the exception of the 'Graphical display of R/X values' option, identical for all protection relays.

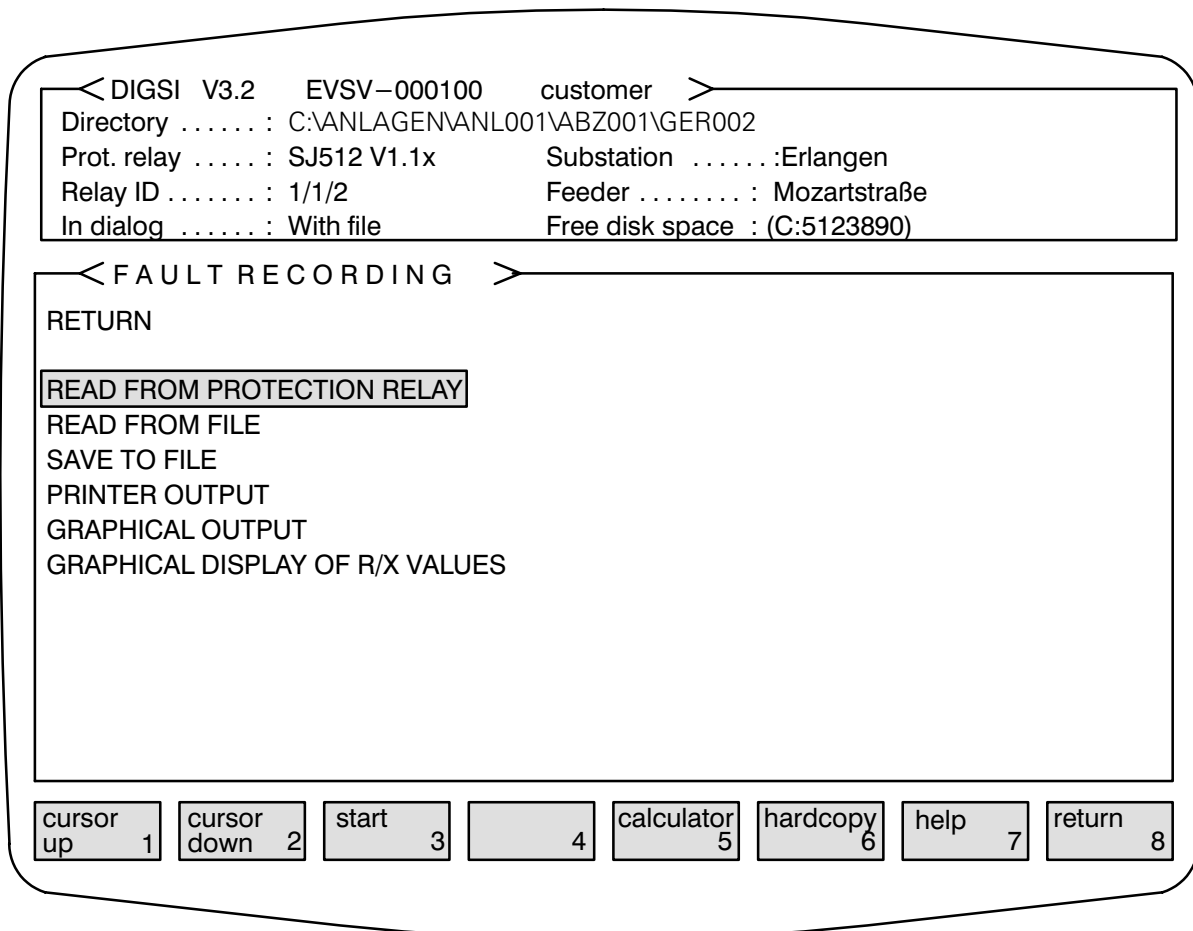


Fig. 11/24 Menu "Fault recording"

11.4.3.1 Reading in the Fault Data

Dialog mode "With protection device"

The fault values stored in the fault record buffer are retrieved and uploaded to the PC using the 'Read from protection relay' function. Once they have been uploaded, the buffer is erased and can then be used to log values from the next fault incident.

During the retrieval process, a counter is displayed on the screen to indicate that it is progressing satisfactorily. The counter counts down from an initial value to zero (Countdown, Fig. 11/25).

You will be prompted to enter a name for the fault record once the retrieval and upload process is complete (Fig. 11/26). This name will then be displayed on screen during graphical output, on the plot and on graphics output, and on any print-outs.

The 'Save to file' option writes the retrieved fault values, which are now in the PC's memory, to hard disk or diskette, where they can later be accessed for further analysis.

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Caution!

If you have not saved the uploaded fault record, you will be asked if you want to do so when you press **F8** 'Return' to quit the 'Main relay menu'.

Dialog mode "With file"

Select the 'Read from file' option (Fig. 11/24). All fault records for a particular relay that have been saved up to this point are made available. The selection of a particular incident is simplified by entering the name you gave the annunciation, together with the date and time the data was retrieved from the relay.

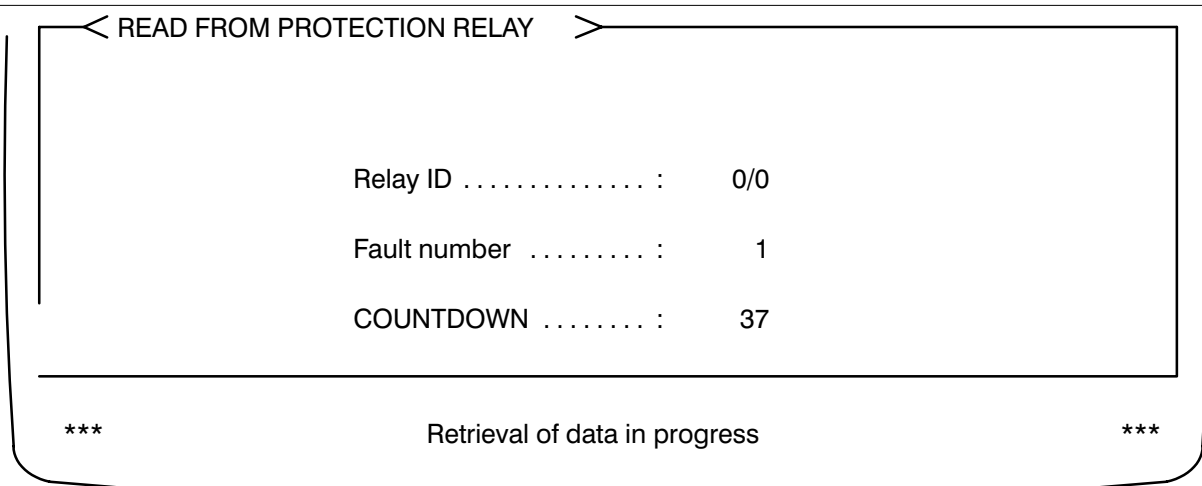


Fig. 11/25 Menu "Read from protection relay" (countdown)

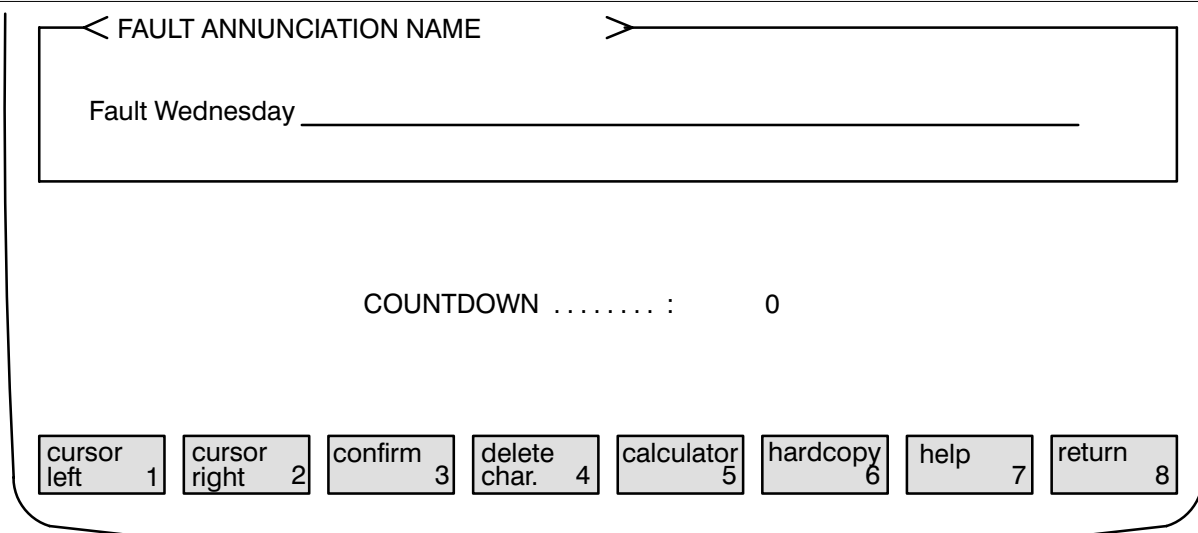


Fig. 11/26 Menu "Fault annunciation name" (countdown)

11.4.3.2 Graphical output

The fault record read into PC memory using the 'Read from protection relay' or 'Read from file' function is displayed on screen in its entirety when the 'Graphical output' menu option is selected. In the case of the 7SA500, this means that the current and voltage values of all three phases, plus the zero voltage and current, over the entire recording period are displayed. At a sampling rate of 1kHz for this relay, this represents exactly 660 ms.

Each curve is shown in its own separate window. As can be seen from Fig. 11/29, each line current and its respective voltage is shown separately. The following general data is displayed in the field above the current and voltage windows:

- Fault number
- Fault annunciation name
- Date and time of data retrieval
- Substation and feeder
- Maximum instantaneous value for voltage in units of V_{rated} (r.m.s. value)

$$V_{max} = (f_v \cdot \sqrt{2} / \sqrt{3}) \cdot V_{rated}$$

The factor F_v shown in the diagram (example in Fig. 11/29: $F_v = 1.03$) is equal to the product of $(f_v \cdot \sqrt{2} / \sqrt{3})$

- Maximum instantaneous value for current in units of I_{rated} (r.m.s. value)

$$I_{max} = (f_I \cdot \sqrt{2}) \cdot I_{rated}$$

The factor F_I shown in the diagram (example in Fig. 11/29: $F_I = 22.92$) is equal to the product of $(f_I \cdot \sqrt{2})$

The following points should also be noted:

- Current curves shown as red/solid lines (colour/monochrome monitor)
- Voltage curves shown as blue/dotted lines (colour/monochrome monitor)
- Time axis graded in steps of 10 ms
- The reference value for currents and voltages is the secondary rated value of the converter
- Identical scaling for all currents/voltages based on the maximum secondary current/voltage value (instantaneous value)
- The following events are indicated:
 - fault detection
 - trip command issued
 - fault drop-off

The last two events are only displayed if they occurred within the relevant period
- The maximum possible zoom factor is one period.

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The time axis is displayed as a bar between the bottom of the window and the function keys (Fig. 11/27). The shaded area of this axis is used as a cursor in conjunction with the zoom function described below.

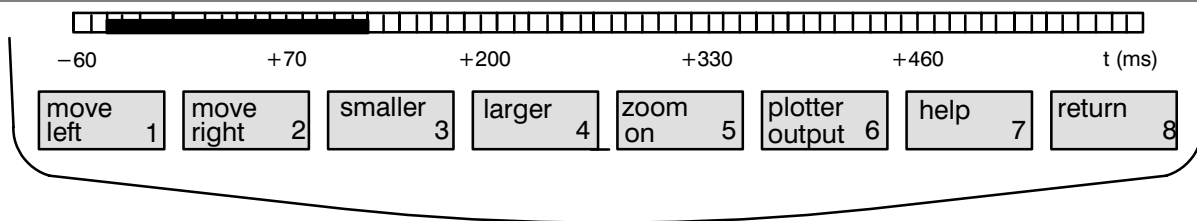


Fig. 11/27 Function key assignments during the graphic display of the fault record

Zoom function

The size of a selected time segment can be defined using the bar shown on the time axis.

After selecting the graphics level, the bar is positioned at the start of the short-circuit at the time the fault was detected.

The position and size of the bar can be altered using keys **F1**/**F2** and **F3**/**F4** respectively. More precise positioning (in steps of milliseconds) can be achieved by pressing the **Shift** key and either **F1** or **F2** simultaneously.

The segment selected by manipulation of this bar is displayed separately on the screen by pressing **F5** (Fig. 11/30). The assignment for this key changes at the same time to "ZOOM OFF" so that the zoom function can be disabled when required.

While the zoom function is active, the function keys are assigned as follows:

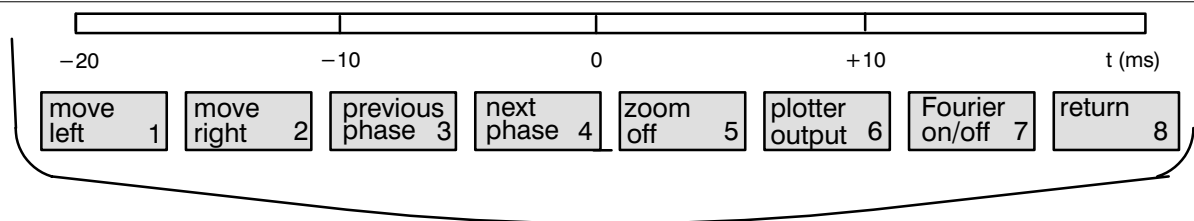


Fig. 11/28 Function key assignments during the graphic display of the fault record and activation of the zoom function

This menu also allows you to display the phases individually on screen using function keys **F3** and **F4** (Fig. 11/31).

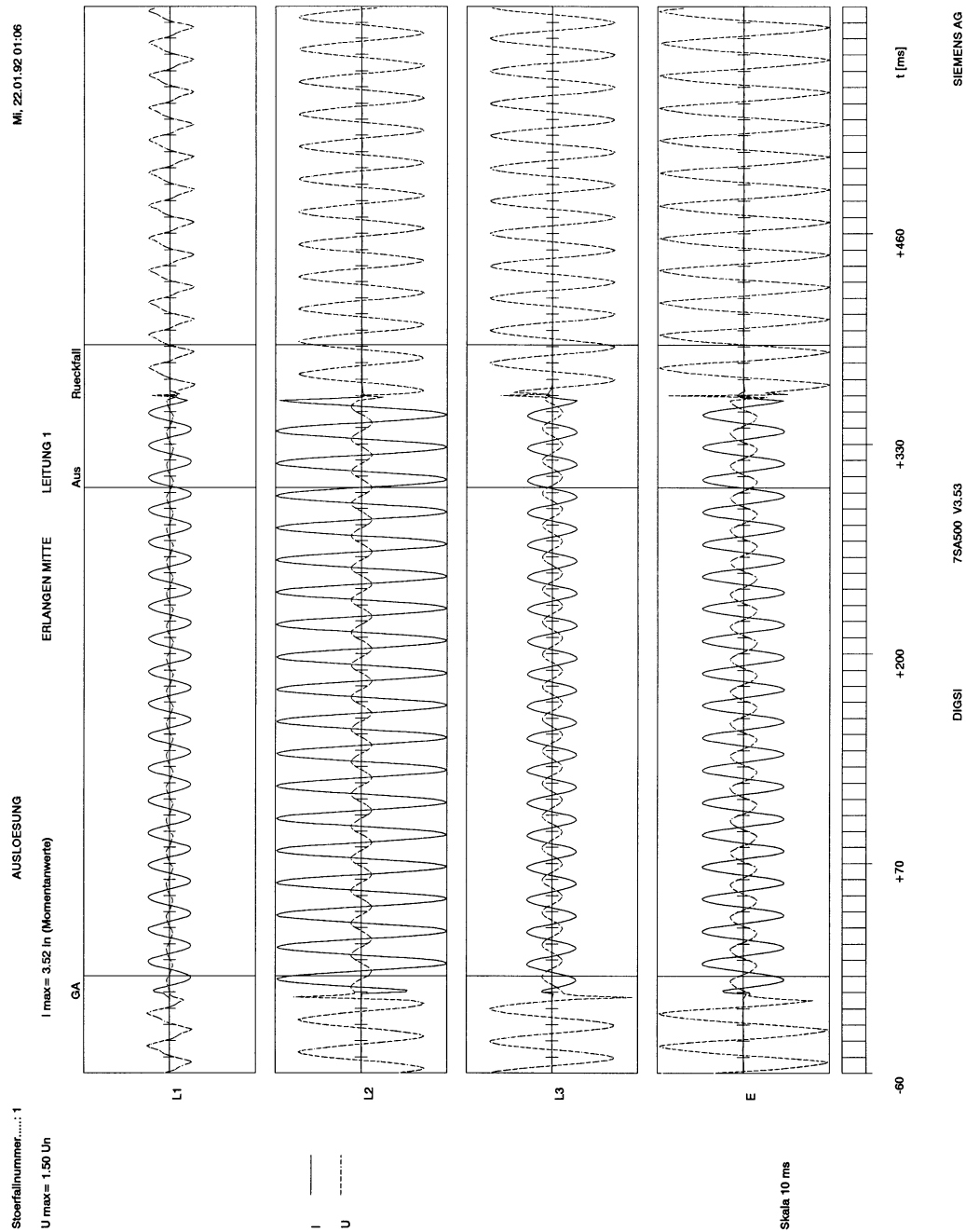


Fig. 11/29 Graphic display of a fault record (graphic printout, original size DIN A4)

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Analysis of harmonics (Fourier analysis)

The fault records can be analysed according to their harmonic content. This function is activated by **F7** ('Fourier on/off'). When the zoom function is active, this analysis can be performed on all four phases (Fig. 11/31) and on individual ones (by pressing **F3** or **F4**, Fig. 11/32). The ordinate is scaled in percent. The highest frequency that occurred is given the value 100% and all other frequencies assigned the appropriate percentage values accordingly.



Caution!

The DFT algorithm is used for calculating the amplitudes. Although this algorithm is not particularly fast, it generates amplitudes as integer multiples of the basic harmonic (particularly to exactly 50 Hz) in respect of the time segment. The magnitude of the frequencies for which amplitudes are to be calculated depends on the time window selected (**F3** and **F4** in Fig. 11/27).

Example

The time window selected is 40 ms long. The lowest frequency (ignoring the dc component) for which an amplitude is to be calculated is 25 Hz ($f = 1 / 0.040$ secs.). The remaining frequencies for which calculations will be performed are integer multiples of this lowest frequency: 50, 75, 100, 125, ...

In principle, it is also possible to perform a harmonics analysis across the whole fault record. This is done by enlarging the time window using **F4** 'larger' (Fig. 11/27) until the whole record is covered. Then press **F5** 'zoom on' followed by **F7** 'Fourier on/off' (Fig. 11/28).

In the case of zoom windows up to 140 ms long, the calculated amplitudes are displayed separately (see Fig. 11/31). In these displays, the voltage amplitudes are shifted marginally to the right to improve readability. If the selected time window is longer than 140 ms, the amplitude values are displayed continuously (see Fig. 11/32).

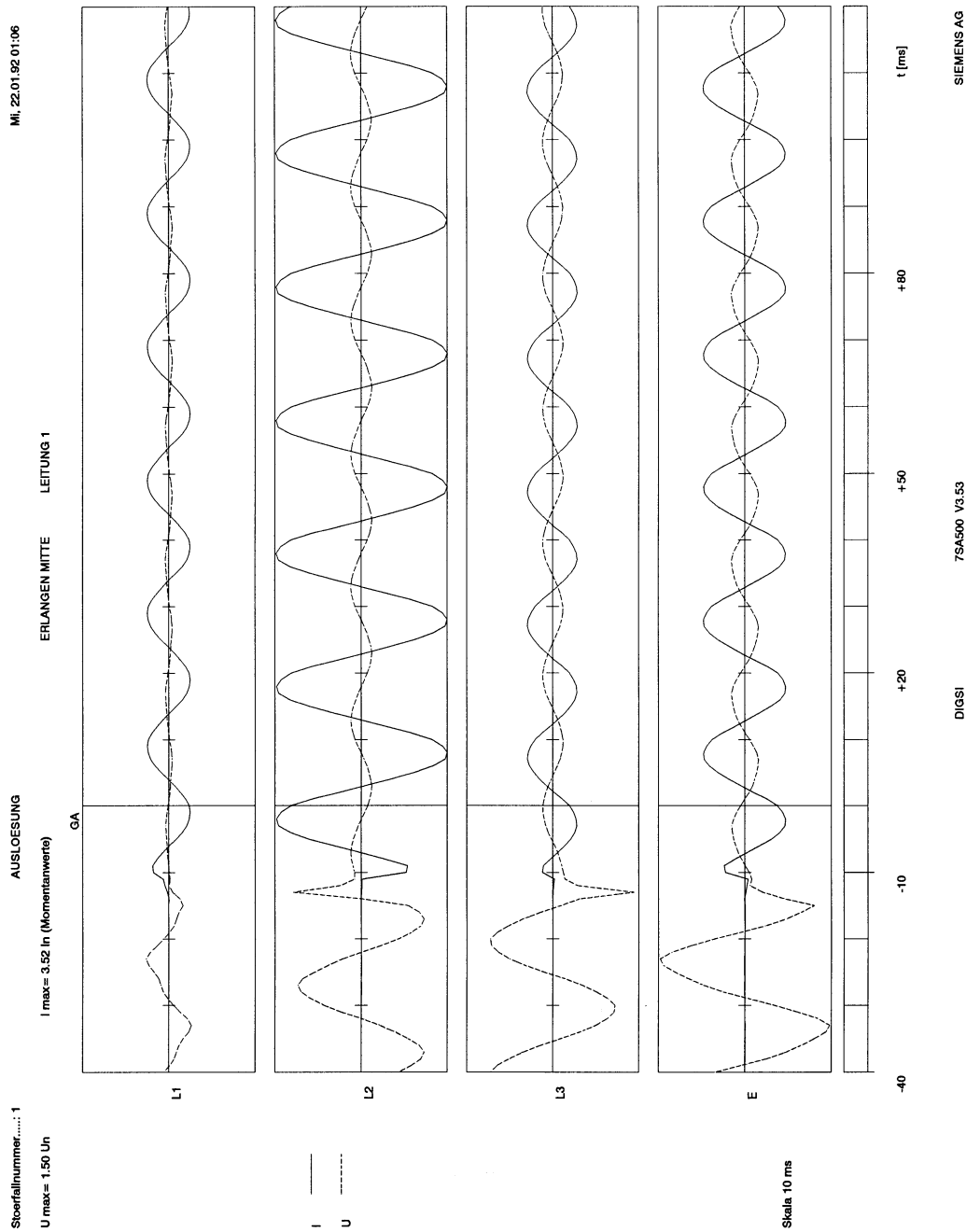


Fig. 11/30 Graphic display of the fault record following switching on of the zoom function (Time scale from -40 ms to 120 ms; graphic printout, original size DIN A4)

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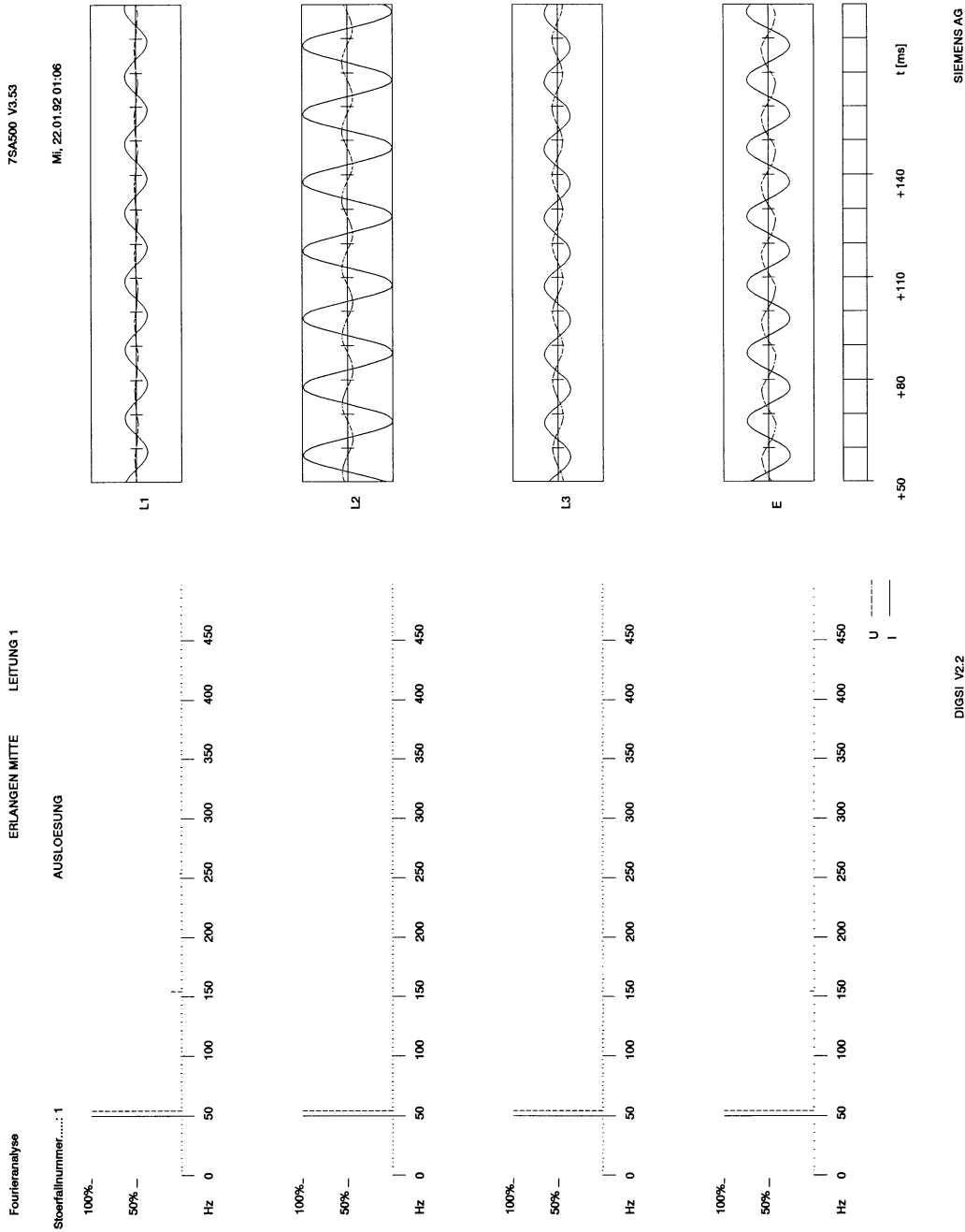


Fig. 11/31 Graphic display following activation of Fourier analysis (graphic output, original size DIN A4)

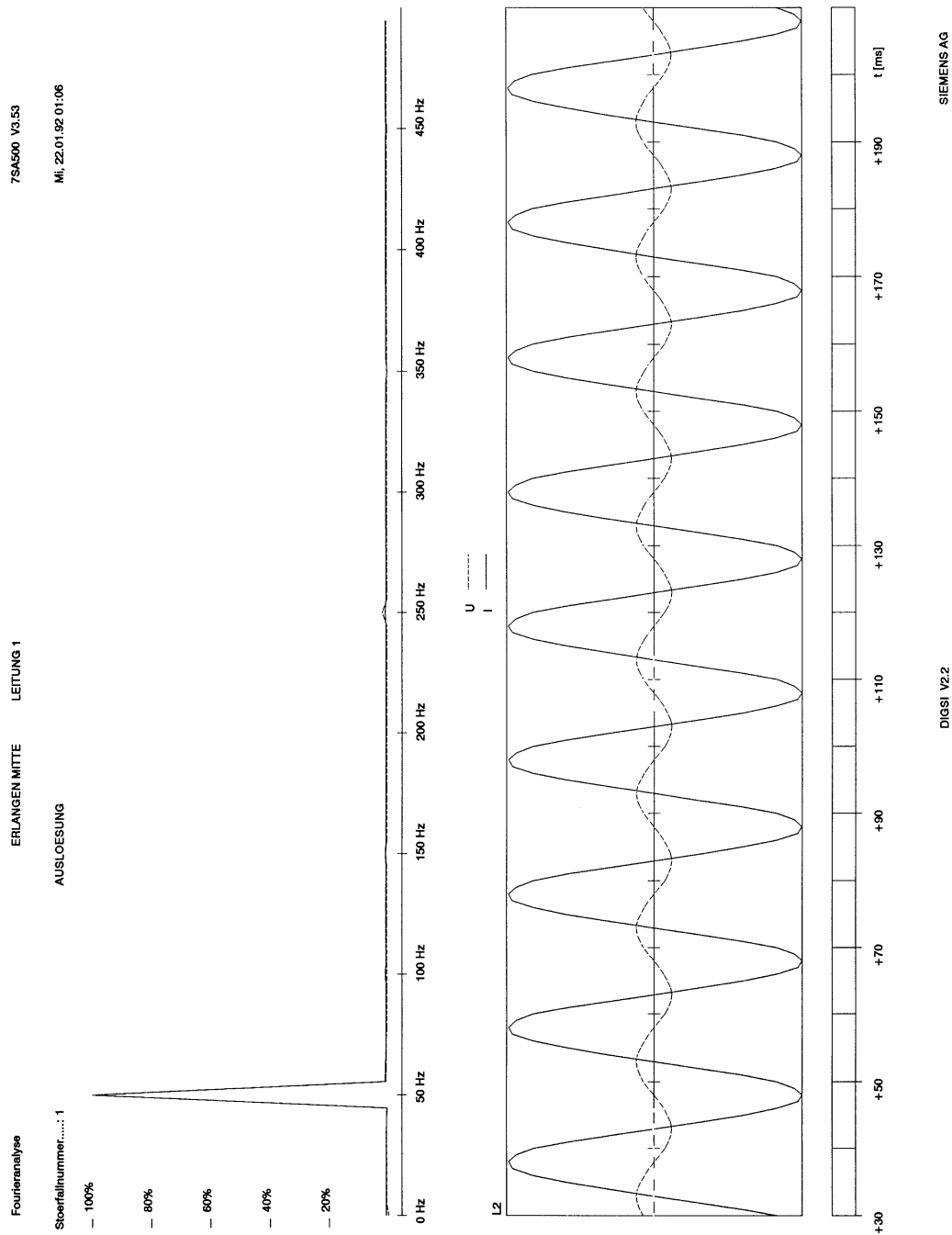


Fig. 11/32 Graphic display following activation of Fourier analysis and selection of a phase (graphic output, original size DIN A4)

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11.4.3.3 Printer output

A print-out of the current and voltage values during a fault can be generated. To do this, select 'Printer output' (Fig. 11/24). All fault records stored up to now will be displayed. The selection of a particular record is simplified by entering the name you gave the annunciation, together with the date and time the data was retrieved from the relay. After selecting a record (Fig. 11/33), you can

- specify the time period for which the print-out is to be produced
- enter the primary rated current and voltage.

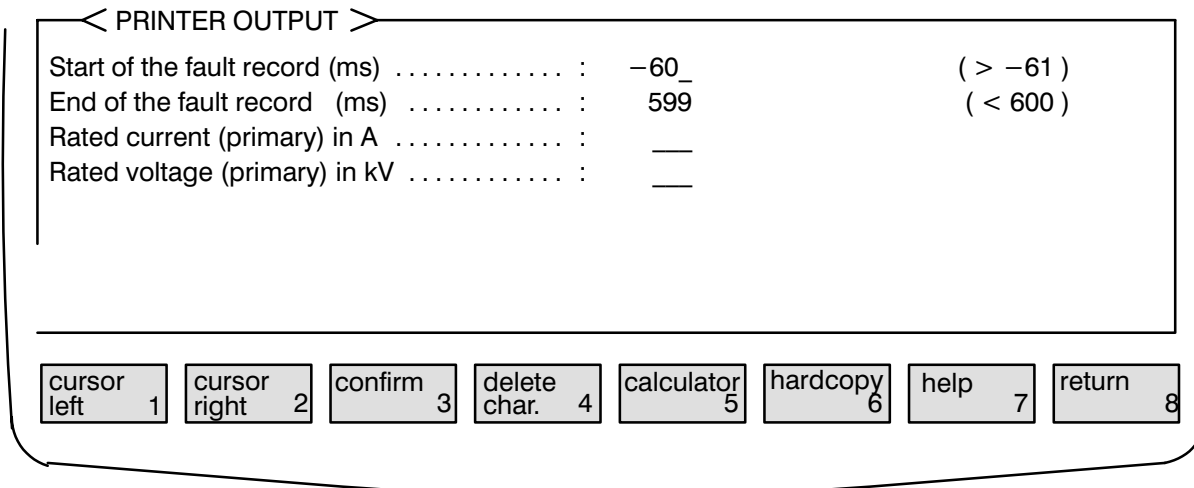


Fig. 11/33 Menu "Printer output"

PAGE : 1

```

User ID ..... : HENDERSON      DATE ..... : Fr. 03.05.91 09:14
Prot. relay .. : 7SA500 V3.51    Substation ..... : Erlangen
Relay ID ..... : 001           Feeder ..... : Mozartstraße
Distance
Distance
Fault number ..... : 1
Relay ID ..... : 0/0

(ms)          I1    I2    I3    Ie    U1    U2    U3    Ue
-----
-60.00        0     0     0     0     71    9    -84   53
-59.00 ....
    
```

Fig. 11/34 List output by printer

The fault annunciation name is output on the fourth and sixth lines (in this case: Distance). The current and voltage values shown have been rounded and are in units of amps and kV respectively.

11.4.3.4 COMTRADE File

By selecting this menu item you can export fault data in the COMTRADE format (Common Format for Transient Data Exchange). The data can be saved in ASCII or binary format.

11.4.3.5 Interface File (only 7SA511, 513, 517, 500, 502)

Select this menu item to save the fault record in the OMICRON TRF format.

11.4.3.6 Graphical display of R/X values (7SA500, 502, 511, 513 only)

This function enables the R and X values, the direction, and the r.m.s. current values to be calculated from the fault record and displayed graphically.

To calculate these values, DIGSI uses an algorithm whose dynamic response is different from the one used in the three protection relays mentioned above.

A fault record must be retrieved before executing the 'Graphical display of R/X values' menu option. Which error loop the calculation is to be performed for must then be specified in a further menu. The calculated values are then displayed graphically on screen (see 11/35).

The function key assignments are more or less the same as for the graphical display of the fault record.

Differences to the graphical display of the fault record are listed below:

- when the zoom function is on (key **F5**), function key **F7** is assigned 'average on/off' instead of 'help'. Average on: the average of the values in the specified time window is calculated and displayed on screen.
- **Shift F5**: by pressing these two keys simultaneously, the scale is changed from the default value for the R/X values window (fault detect zone * factor) to a scale based on the values in the first zone (* factor).
- default zoom window: the time window in which I_{eff} is larger than the parameterised minimum current threshold for the impedance.

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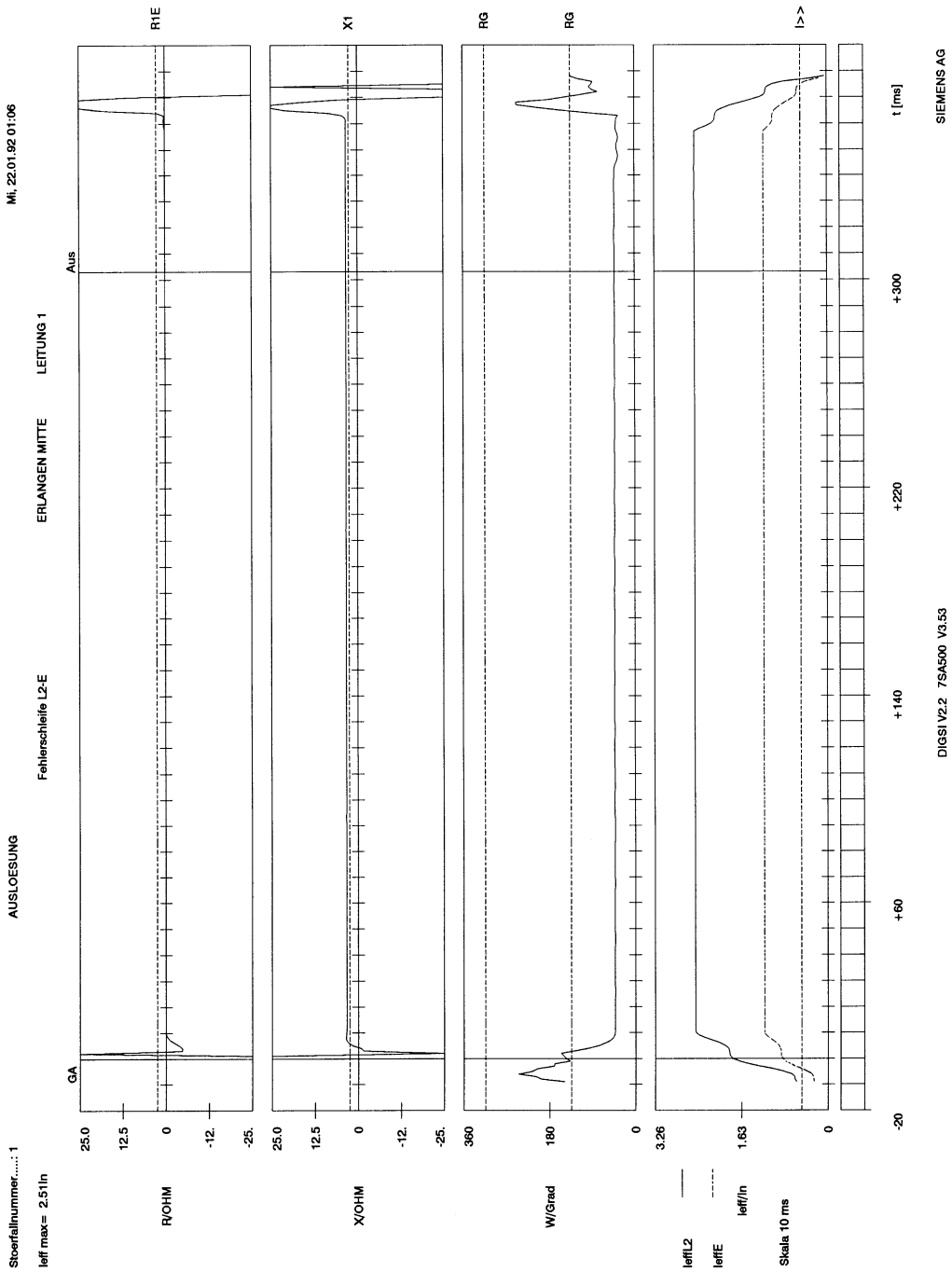


Fig. 11/35 Graphic R/X (graphic printout, original size DIN A4)

11.4.4 Project planning, configuring, marshalling

For many relays, the functional scope (relay function), the indication functions, the assignment of the input/output modules and cell and component addresses can be set using operating parameters. Examples of these are shown in this section.

Where the appropriate relays are being used, the assignment of inputs and outputs and of LEDs can be modified from the 'Marshalling' menu. The input signals or annunciations that may occur during a particular stage are displayed in a menu on screen, from where they can be selected.

As far as

- dialog with a relay or file, or
- printing of the marshalling data

is concerned, the procedure is the same as described in chapter 11.4.1 'Parameters'.

The marshalling menu is shown below (Fig. 11/36):

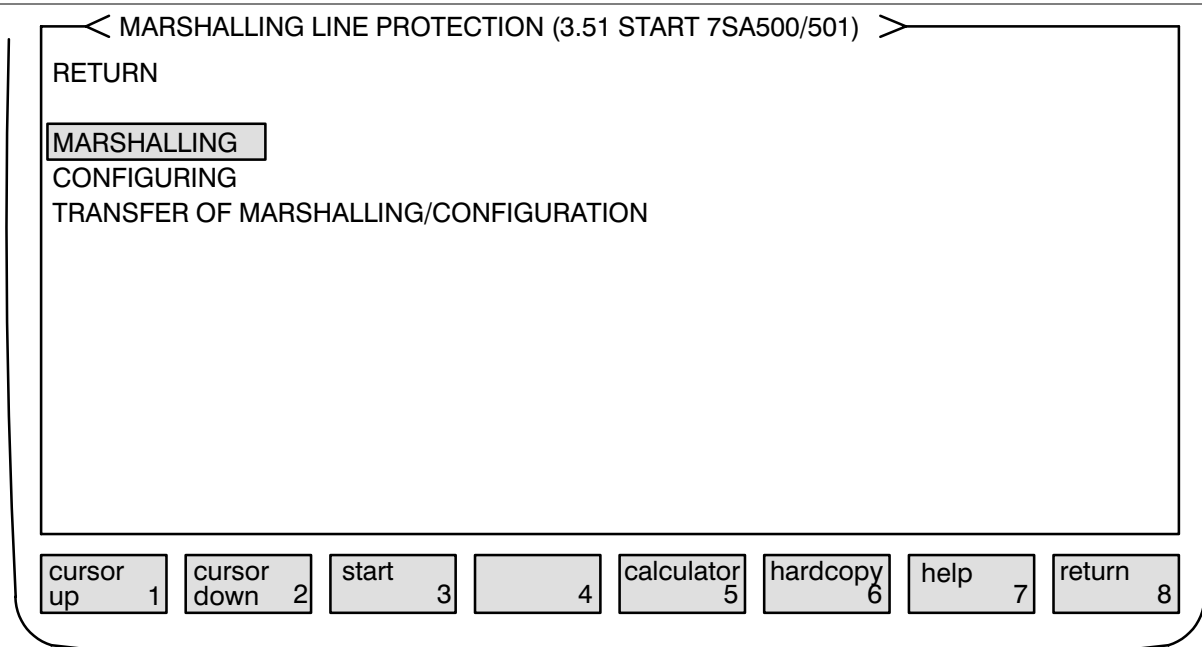


Fig. 11/36 Menu "Marshalling/Configuring"

Parameters for the LSA interface can be specified using the menu option 'Configuring'.

The function 'Group annunciation' from the 'Marshalling' menu (Fig. 11/37) is described in detail below.

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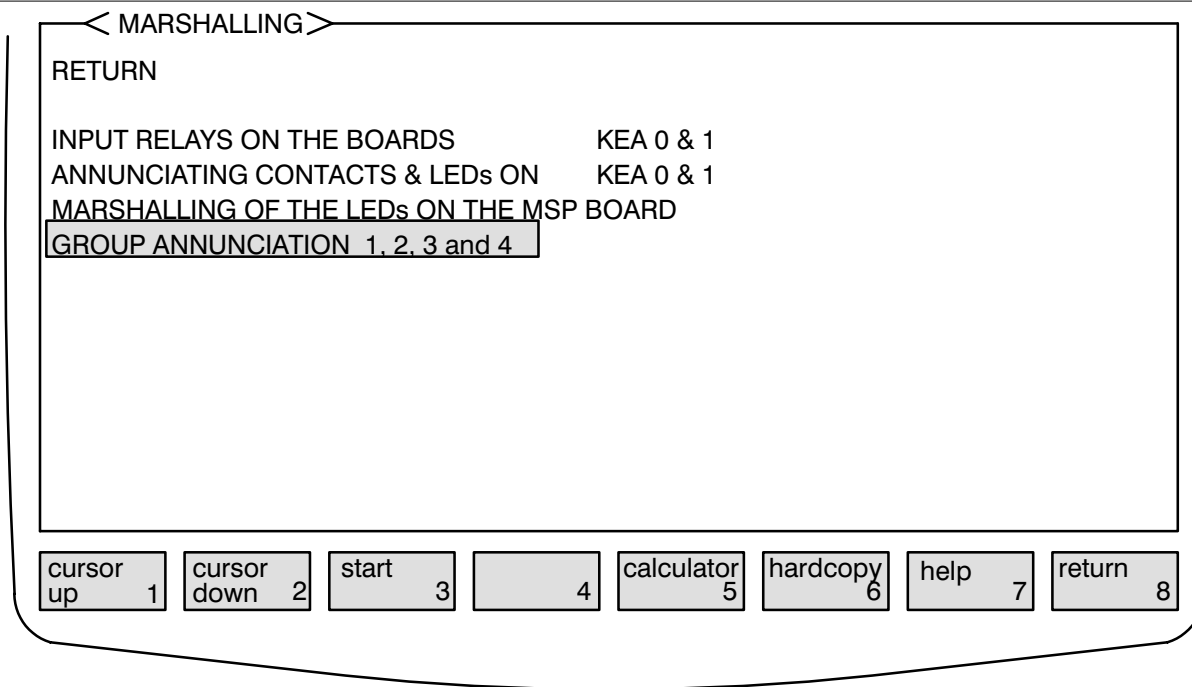


Fig. 11/37 Menu "Marshalling"

11.4.4.1 Group annunciations

Two ways of establishing group annunciations exist (depending on the type of protection relay). Different relays are used to illustrate each method.

Example for 7SA500 (Fig. 11/38)

A list of all annunciations is displayed in the left half of the screen. To the right are four columns corresponding to the four possible groups of annunciations. The contents of these four columns are modified

- by moving to the appropriate position using function keys **F3** and **F4**
- and then adding or removing the cross by pressing **F5** 'change annunc.'

Up to 20 annunciations can be allocated to each group (in other words, each column can contain up to 20 crosses). As it is not possible to display all annunciations on the screen at once, the list can be paged through using **F1** and **F2**.

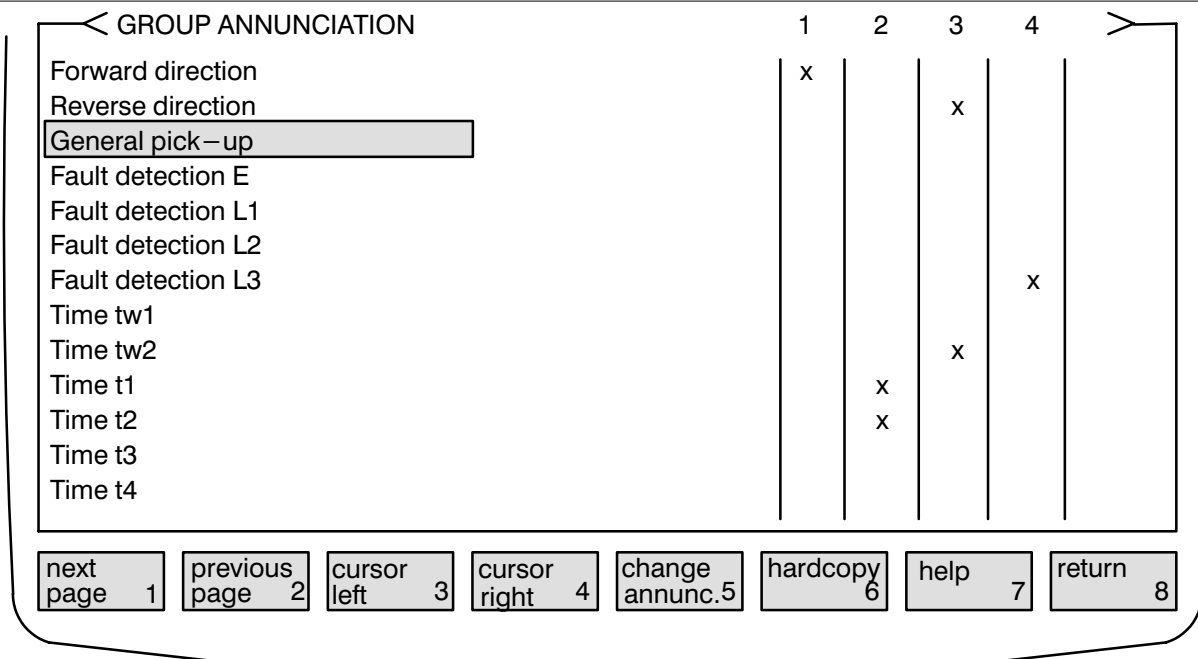


Fig. 11/38 Menu "Group annunciation" (7SA500)

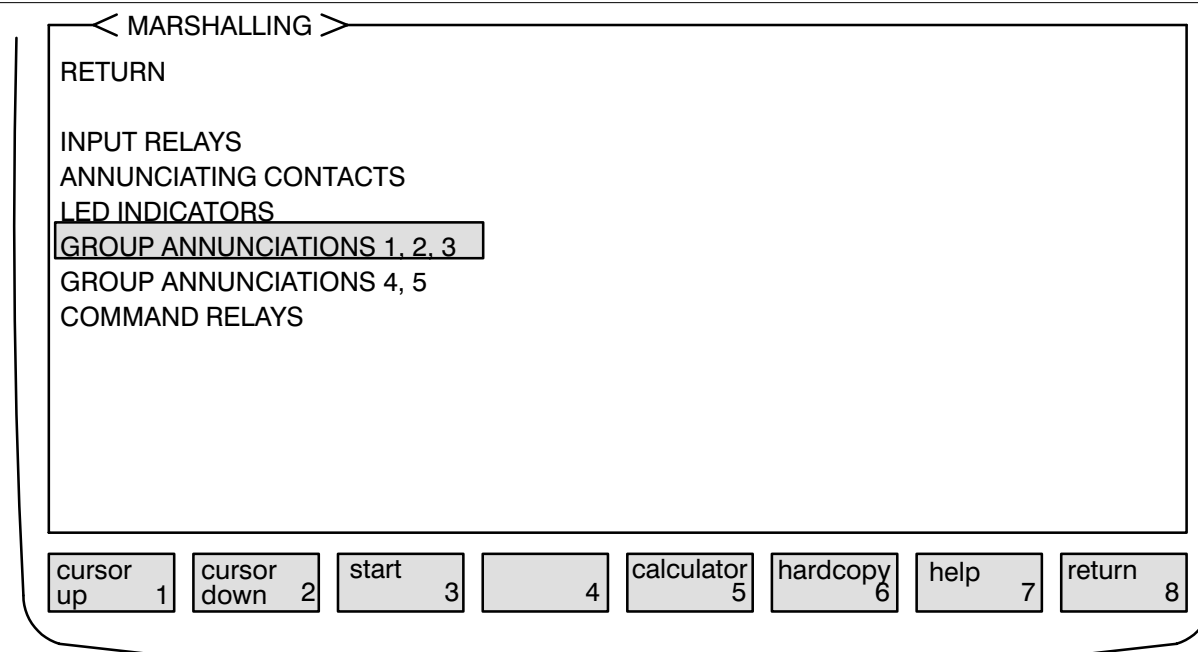


Fig. 11/39 Menu "Marshalling" (example 7SD51)

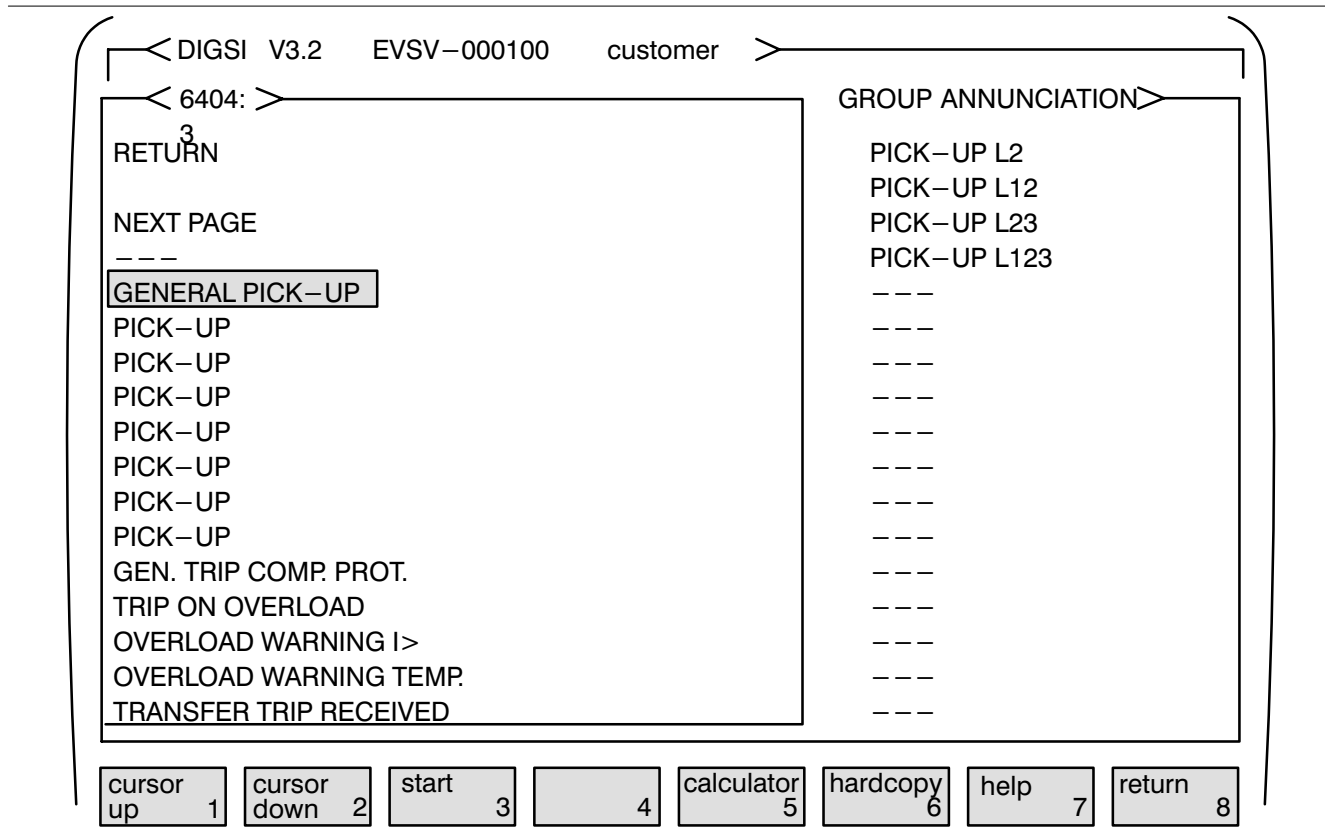


Fig. 11/41 Menu "Group annunciation 1, 2, 3" (example 7SD51) following selection of "Change parameter"

11.4.4.2 Multiple annunciations

Multiple annunciations, i.e. annunciations that are to be output to several relays or LEDs, do not need any special treatment in cases where DOS-DIGSI is being used. Multiple annunciations are recognised during the marshalling process and automatically treated as such in the protection relay.

11.4.5 Exporting data

For certain relays, DIGSI V2 supports postprocessing by external programs by creating ASCII files for this purpose. The following examples show how the exporting of data to the relay test instrument 7VP15 (CMC-56 as of software version V2.2) is supported.

The menu option PARAMETERS/TRANSFER OF PARAMETERS/INTERFACE FILE FOR OMICRON TEST INSTRUMENT

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enables a file (ANLOOXOY.RIO) to be created from the relay parameters (held in file ANLOOXOY.EIN) . This file is used to transfer the setpoint parameters to the test piece file in the CMC software. This simplifies the testing of the relay with its own individual parameters.

If fault data from a relay is stored by DIGSI in the file ANLOOXOY.SOZ , a "transient file" STOER.DAT.TRF can be created by selecting the menu option FAULT RECORDING/CREATE INTERFACE FILE FOR OMICRON. This file enables a dynamic test which reproduces the recorded network fault sequence to be carried out with the 7VP15 test instrument.

11.4.6 Checks

In 'dialog with relay' mode, DOS-DIGSI provides a further function that enables any necessary checks to be performed (this depends on the type of protection relay connected). Fig. 11/42. is displayed when this option is selected.

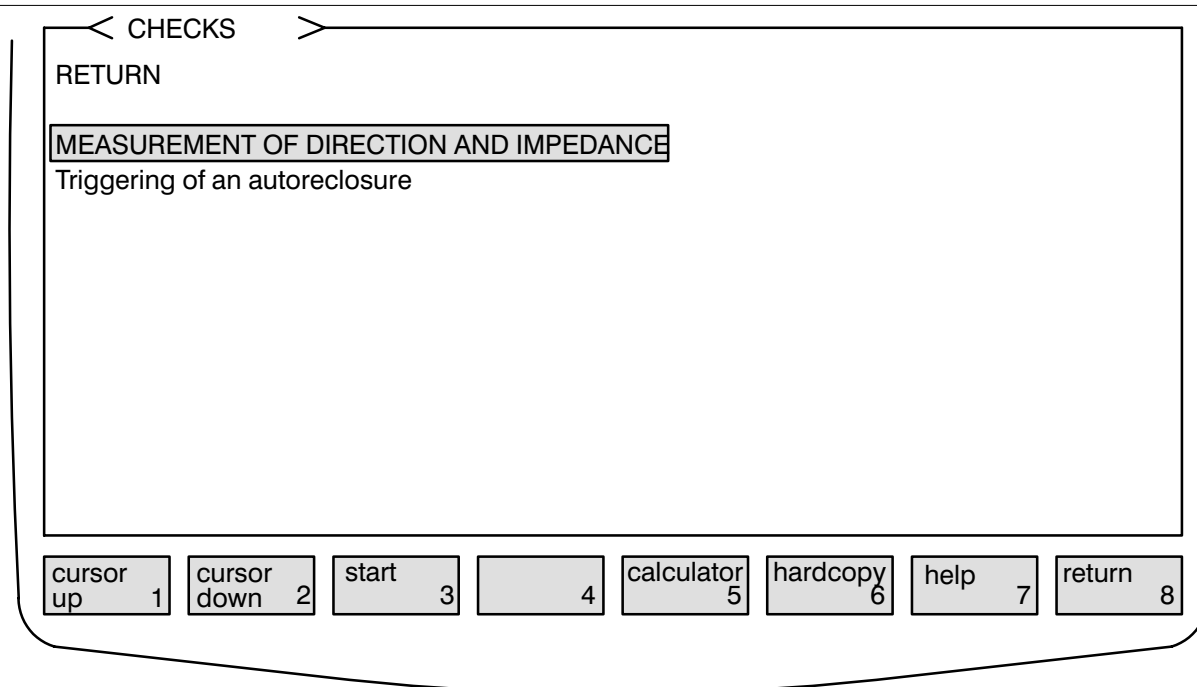


Fig. 11/42 Menu "Checks" (7SA500)

The password must be entered before the check function is carried out by the protection device.

Converting Substations with KONVERT 12

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12 Converting Substations with KONVERT

KONVERT is a program for converting parameters from DOS–DIGSI substations into WIN–DIGSI substations. This is only possible for certain types of protection devices. Manual reprocessing is usually necessary following the conversion.

This chapter describes all measures necessary to convert a DOS–DIGSI substation into a WIN–DIGSI substation.



Caution!

Please note that you cannot create substations with KONVERT. WIN–DIGSI substations which are required for conversion should therefore first be created using DIGSI.

12.1 Starting and Terminating KONVERT

You can start and terminate KONVERT in different manners.

Starting

Under the MS–Windows operating system, programs, and possibly also files, are represented by specific icons.



The program icon for KONVERT is shown on the left. You can find this icon in the DIGSI program group. Start KONVERT by double clicking the icon.

As an alternative to this, you can also start KONVERT using the option "Run" in the menu "File" of the program manager.



Caution!

You cannot start KONVERT if you have opened the DIGSI program!

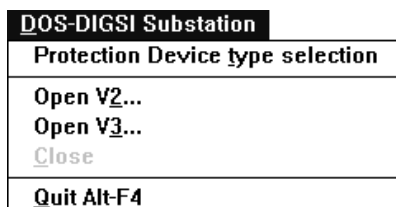
Terminating

You can terminate KONVERT in various manners:



Click the box in the top left corner of the title bar. A menu with basic functions is then opened. Select the option "Close". It is faster to double click the box. The menu is not opened in this case.

These two operations are only effective if no dialog boxes or message boxes are open. You must therefore first close all open boxes.



The third possibility is to open the menu "Substation". Then select the option "Quit".

As an alternative to mouse operations, KONVERT can also be terminated using the key combination **Alt** + **F4**.

12 Converting Substations with KONVERT

12.2 The KONVERT Window

After calling the program, you automatically access the KONVERT window. This window is divided into four areas: title bar, menu bar, working area and status bar.



Fig. 12/1 The KONVERT window

Title bar The top line in the KONVERT window is the title bar. It contains the following elements from left to right:

- ⊙ The button for the menu of basic functions
- ⊙ The program name including the version number
- ⊙ The button for reducing the window to symbol size
- ⊙ The button for changing the window size.

Menu bar The menu bar contains all menus required for working in the KONVERT window including their options.

Working area The working area is the largest part of the screen. It is used on the one hand to display dialog and message boxes. These can be shifted and positioned as desired within the area. In addition, information specific to actions is displayed in this area. Such information concerns the opened substations and the result of a conversion.

Display bar A display bar is present on the right of the screen. You can use this to scroll the working area up and down. This is necessary if the displayed information is larger than the working area.

Converting Substations with KONVERT 12

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Status bar The bottom line in the KONVERT window is the status line. The following information is displayed in this from left to right depending on the working status:

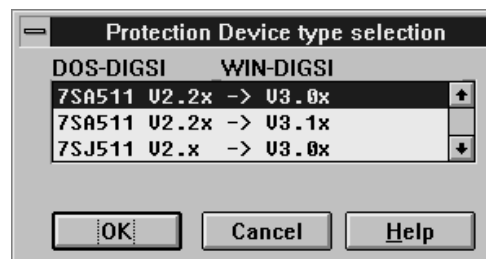
- ⊙ Firmware version of source and destination protection devices
- ⊙ Name of opened DOS substation (source substation)
- ⊙ Name of opened DOS feeder (source feeder)
- ⊙ Name of opened WINDOWS substation (destination substation)
- ⊙ Name of opened WINDOWS feeder (destination feeder).

12.3 Selection of Type of Protection Device

DOS-DIGSI Substation
Protection Device type selection
Open V ₂ ...
Open V ₃ ...
Close
Quit Alt-F4

As the first step for preparing the conversion you must define a type of protection device for your DOS substation.

Select the option "Protection device type selection" in the menu "DOS-DIGSI substation". A dialog box is then displayed to permit you to enter a type of protection device.



Digs401g

Fig. 12/2 Dialog box "Protection device type selection"

The dialog box shows you the two types of protection device "7SA511" and "7SJ511" as an example for selecting.

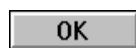
Selection of type of protection device

Mark the type of protection device for which the existing DOS-DIGSI files are to be converted into WIN-DIGSI files.



Caution!

At least one source device and one destination device of the same type must be present in the source substation and destination substation!



OK

Select "OK" to convert files of the marked type of protection device. The current protection device is then closed.



Cancel

Select "Cancel" if you do not wish to select a type of protection device. The originally defined type of protection device is then retained, and the current dialog box is closed.



Caution!

You must define a type of protection device when opening the dialog box for the first time after starting the program. Otherwise you cannot access the option "Open" in the menu "DOS-DIGSI substation".

12 Converting Substations with KONVERT

12.4 Opening and Closing Substations

The second step is to define one DOS-DIGSI and one WIN-DIGSI substation as the source and destination for the conversion.



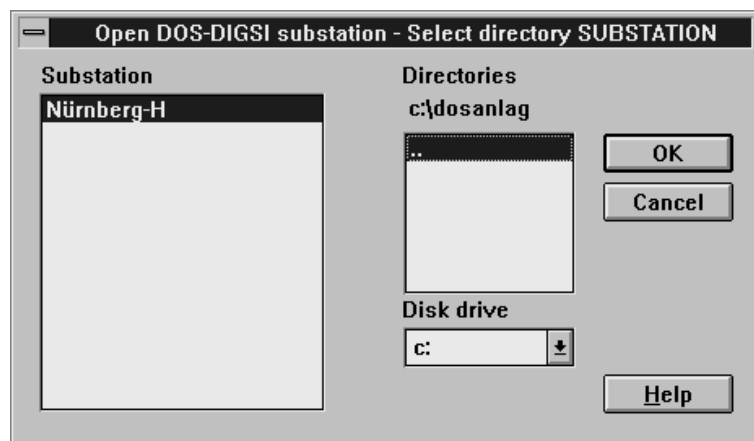
Caution!

It is essential to select a type of protection device before you can open a DOS-DIGSI file (see Section 12.3).

First open the DOS-DIGSI substation and then the WIN-DIGSI substation. When closing, proceed in the reverse order or close only the DOS-DIGSI substation. The WIN-DIGSI substation is then also closed.

Select the option "Open" in the menu "DOS-DIGSI substation". A dialog box is then displayed to permit you to select a directory and a substation.

DOS-DIGSI Substation
Protection Device type selection
Open V ₂ ...
Open V ₃ ...
Close
Quit Alt-F4



Digs402g

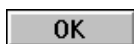
Fig. 12/3 Dialog box "Open DOS-DIGSI substation – select directory SUBSTATION"

Select directory

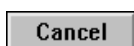
When opening the dialog box for the first time, KONVERT displays the root directory of the installation drive. In the field "Directories", select the directory in which your DOS substation files are stored. If the directory is present on a different drive, select this using the dropdown list "Disk drive". The directory "dosanlag" has been selected in the shown example.

Select substation

The names of all substations present in the selected directory appear in the selection field "Substation". Mark the desired substation in this selection field. The substation in the example is called "Nürnberg-H".



Select "OK" to open the marked substation. The current dialog box is then closed.

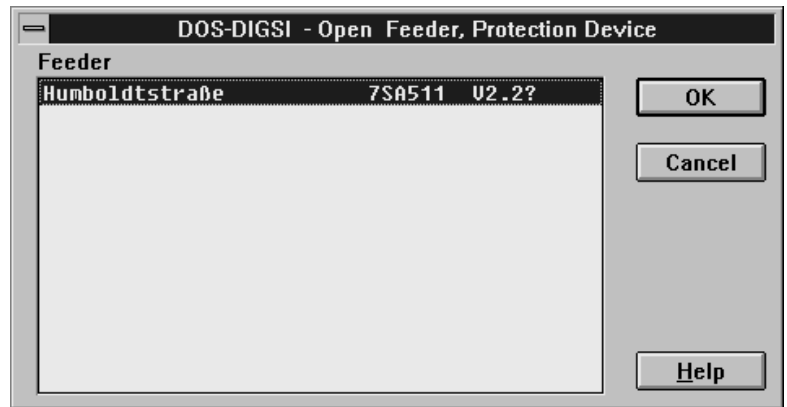


Select "Cancel" if you do not wish to open a file. The procedure is then aborted, and the current dialog box is closed.

A further dialog box is displayed if you have selected a substation. This requests you to select a feeder and a protection device.

Converting Substations with KONVERT 12

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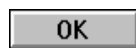


Digs403g

Fig. 12/4 Dialog box "DOS-DIGSI – open feeder, protection device"

Select feeder

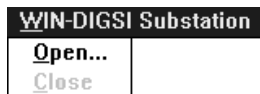
Feeders with the associated protection devices are displayed in the selection field "Feeder". The display depends on the firmware version which was defined as in Section 12.3. Mark the desired feeder in this selection field. The feeder in the example substation has the name "Humboldtstraße".



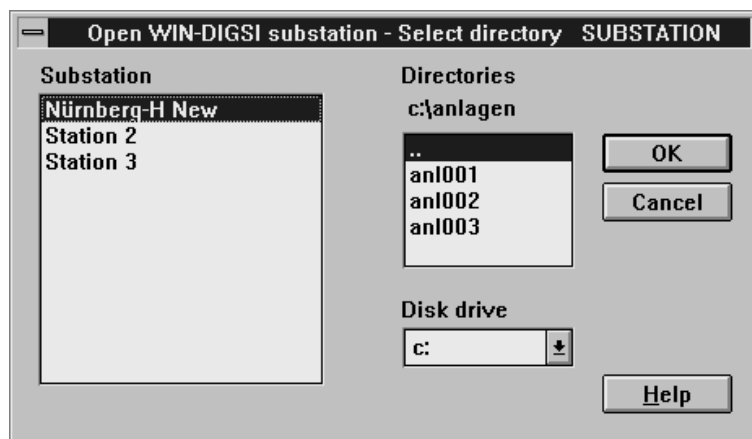
Select "OK" to open the marked feeder. The current dialog box is then closed.



Select "Cancel" if you do not wish to open the feeder. The procedure is then aborted, and the current dialog box closed.



As the next step, open a WIN-DIGSI substation as the destination of the conversion. Select the option "Open" in the menu "WIN-DIGSI substation". A dialog box is then displayed to permit you to select a directory and substation.



Digs404g

Fig. 12/5 Dialog box "Open WIN-DIGSI substation – select directory SUBSTATION"

12 Converting Substations with KONVERT



Caution! The destination substation must already have been created. If necessary, create a new substation with DIGSI as in Section 4.1.1.



Careful! Convertible device files in a destination substation which already exists are overwritten during the conversion.

Select directory When opening the dialog box for the first time, KONVERT displays the root directory of the installation drive. In the field "Directories", select the directory in which your WIN substation files are stored. If the directory is present on a different drive, select this using the dropdown list "Disk drive". The directory "anlagen" has been selected in the shown example.

Select substation The names of all substations present in the selected directory appear in the selection field "Substation". Mark the desired substation in this selection field. The substation in the example is called "Nürnberg-H New".

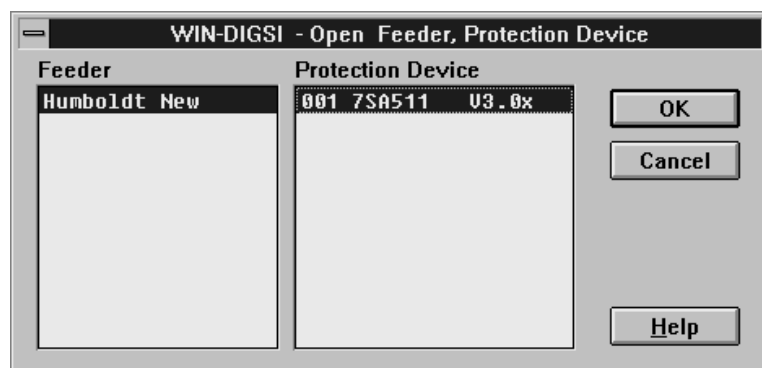


Select "OK" to open the marked substation. The current dialog box is then closed.



Select "Cancel" if you do not wish to open a substation. The procedure is then aborted, and the current dialog box is closed.

A further dialog box (Fig. 12/6) is displayed if you have selected a substation. This requests you to select a feeder and a protection device.



Digs405g

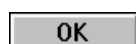
Fig. 12/6 Dialog box "WIN-DIGSI – open feeder, protection device"

Select feeder All feeders of the opened substation are displayed in the selection field "Feeder". Mark the desired feeder in this selection field. The feeder in the example substation has the name "Humboldt New".

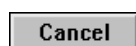
Select protection device The protection devices of the marked feeder are displayed in the selection field "Protection device". The display depends on the firmware version which was defined as in Section 12.3. Mark the protection device in this selection field which is to be defined as the destination for the conversion. The protection device with the address "001" is marked in the example.

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Select "OK" to open the marked feeder with the marked protection device. The current dialog box is then closed.



Select "Cancel" if you do not wish to open a feeder. The procedure is then aborted, and the current dialog box is closed.

```
c:\dosanlag\ani00101
Nürnberg-H
Humboldtstraße 7SA511 V2.2?
*****
c:\anlagen\ani003\abz001\ger001\param\
Nürnberg-H New
Humboldt New 7SA511 V3.0x
*****
```

Digs406g

Fig. 12/7 Section of the working area following the opening of the substations

Display in the KONVERT window

Following opening of the files, the working area of the KONVERT window informs you of the selected source and destination substations. In addition, the name and addresses of the two substations are displayed in the status line.

You can now carry out the conversion of the DOS–DIGSI substation. Please refer to Section 12.5.

Closing the substations

You can close the substations after termination of the conversion. If you only wish to close the WIN–DIGSI substation, select the option "Close" in the menu "WIN–DIGSI substation". If you wish to close both substations, select the option "Close" in the menu "DOS–DIGSI substation".

12.5 Converting Substations

Convert

In order to convert a DOS–DIGSI substation into a WIN–DIGSI substation, select the menu "Convert". This menu does not contain any further options. It triggers the desired action directly.



Caution!

The menu "Convert" is only active if you have opened both a DOS–DIGSI substation and a WIN–DIGSI substation (see Section 12.4). A message is output when you select the menu "Convert".

```
DIGSIKVT 3
Convert from
d:\demoan\ani001\abz001\ger004\param\dosdigs
to
d:\demoan\ani001\abz001\ger001\param\
Demo-Station
running Demo-Station
```

Digs407g

Fig. 12/8 Message displayed during conversion

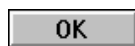
During the conversion, information on the progress is written in the working area of the KONVERT window. Another message is displayed when the conversion has been completed.

12 Converting Substations with KONVERT



Digs408g

Fig. 12/9 Message following completion of conversion



Acknowledge this message with "OK"

Display in the KONVERT window

Following completion of the conversion, the results are summarized in the working area of the KONVERT window.

```
6405 012 nicht rangiert This marshalling will be changed to 'not allocated'
6405 013 nicht rangiert This marshalling will be changed to 'not allocated'
6405 014 nicht rangiert This marshalling will be changed to 'not allocated'
6405 015 nicht rangiert This marshalling will be changed to 'not allocated'
6405 016 nicht rangiert This marshalling will be changed to 'not allocated'
6405 017 nicht rangiert This marshalling will be changed to 'not allocated'
6405 018 nicht rangiert This marshalling will be changed to 'not allocated'
6405 019 nicht rangiert This marshalling will be changed to 'not allocated'
6405 020 nicht rangiert This marshalling will be changed to 'not allocated'
c:\dosanlag\anl00101.paa Conversion of parameters A
```

Press HELP for more information on the conversation of this protection device.

All Convertible parameters accepted !

Digs408g

Fig. 12/10 Section of working area following conversion

Information is output

- ⊙ on the extent to which parameters were converted,
- ⊙ on which annunciations could not be marshalled.



Caution!

It is essential that you check the result of the conversion. Subsequent manual processing is usually necessary.

For more detailed information, select the option "Index" in the menu "Help" and then the topic "Conversion <Protection device type> to V3.0x".

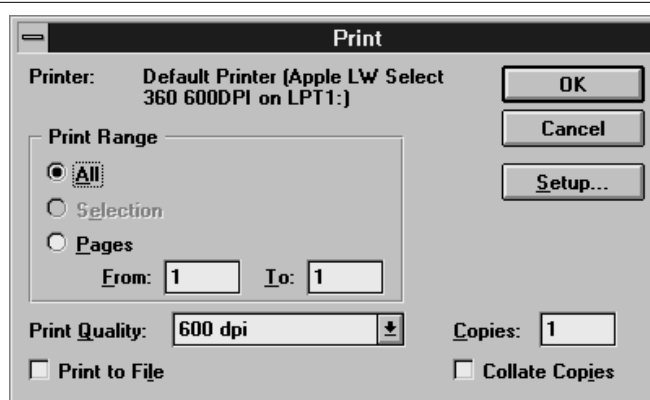
Converting Substations with KONVERT 12

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12.6 Printing




Print

KONVERT permits you to output the contents of the working area on a printer or into a file prepared for printing. Select the menu "Print". This menu does not contain any further options. A dialog box is displayed to permit you to define the print parameters.



Digs410g

Fig. 12/11 Dialog box "Print"

- | | |
|---|--|
| Print range – All | Select "Print range – All" if you wish to print all displayed information. |
| Print range – Selection | Select "Print range – Selection" if you only wish to print a marked area of the text. This function has not yet been implemented. |
| Print range – Pages | Select "Print range – Pages" if you only wish to print a certain range of the displayed information. Define the first and last pages of the range in the input fields. |
| Print quality | Use the dropdown list to select the desired print quality. The available selection depends on the current printer drivers. |
| Copies | Define the desired number of printed copies in the input field "Copies". The default setting is "1". |
| Collate copies | Select "Collate copies" if the printed copies are to be sorted in the correct order. |
| Print to file | Select "Print to file" if the printer data are to be routed into a file. |
|  | Select "OK" to output the data on the printer or into a file. The current dialog box is then closed. |
|  | Select "Cancel" if you do not wish to output the data. The current dialog box is then closed. |
|  | Select "Setup" to access a printer-specific dialog box for setting further parameters. |

12.7 Request Help

The comments on the DIGSI help system basically also apply to the help system of KONVERT. Please refer to Section 1.4.

13 Copying Device Files with DIGV2V3

The DIGV2V3 program can be used to copy device files from substations in the DOS–DIGSI format into substations in the current WIN–DIGSI format. All device files with parameters, annunciations, fault records and measurements are saved according to the current WIN–DIGSI directory structure. In contrast to conversion using the KONVERT program, the data themselves remain unchanged. Adaptation to a more recent firmware version does **not** take place. This means that a dialog with such copied substations is carried out using the DOS–DIGSI module.

You can copy the device files from all existing feeders of a selected substation. Alternatively, you can copy only the device files of a single feeder of a selected substation. This chapter describes all measures required to copy device files from substations in the DOS–DIGSI format into substations in the WIN–DIGSI format.



Caution!

Please note that you cannot create any substations with DIGV2V3. You should therefore first create WIN–DIGSI substations required for the copying procedure using DIGSI.

13.1 Starting and Terminating DIGV2V3

You can start and terminate DIGV2V3 in different manners.

Start

With the MS–Windows operating system, programs and possibly also files are represented by specific icons.



The program icon for DIGV2V3 is shown on the left. You will find this icon in the DIGSI program group. Double click the icon to start DIGV2V3.

You can alternatively start DIGV2V3 using the option “Run” in the menu “File” of the program manager.



Caution!

You cannot start DIGV2V3 if you have already opened either the DIGSI or KONVERT applications!

Terminate

You can terminate DIGV2V3 in different manners:



Click the box in the top left corner of the title bar. A menu with basic functions is then opened. Select the option “Close”. It is faster to double click the box. The menu is not opened in this case.

The two procedures only have an effect, however, if no dialog or message boxes are open. You should therefore first close all opened boxes.

13 Copying Device Files with DIGV2V3



The third possibility for terminating is to open the menu "Substation". Then select the option "Quit".

As an alternative to mouse operations, DIGV2V3 can also be terminated using the key combination **Alt** + **F4**.

13.2 The DIGV2V3 Window

After calling the program, you automatically access the DIGV2V3 window. This window is divided into four areas: title bar, menu bar, working area and status bar.

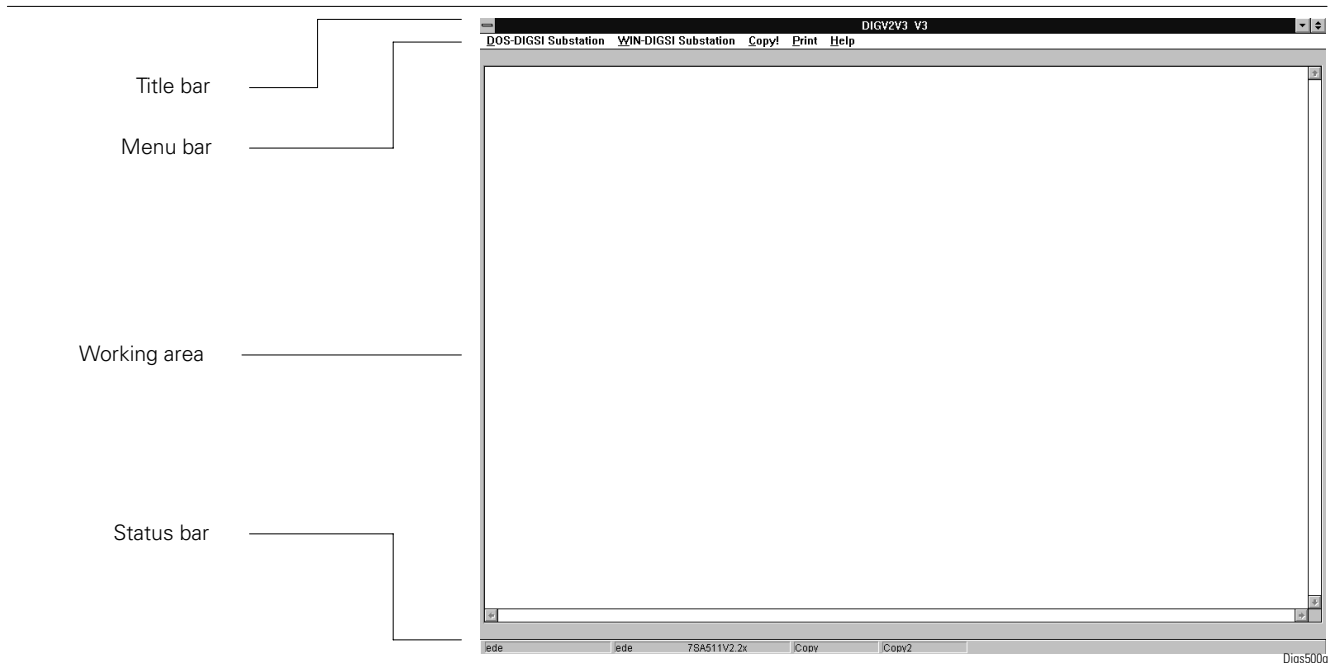


Fig. 13/1 The DIGV2V3 window

Title bar The top line in the DIGV2V3 window is the title bar. It contains the following elements from left to right:

- ⊙ The button for the menu of basic functions
- ⊙ The program name including the version number
- ⊙ The button for reducing the window to symbol size
- ⊙ The button for changing the window size.

Menu bar The menu bar contains all menus required for working in the DIGV2V3 window including their options.

Working area The working area is the largest part of the screen. It is used on the one hand to display dialog and message boxes. These can be shifted and positioned as desired within the area. Information on the current copying procedure is also displayed in this area.

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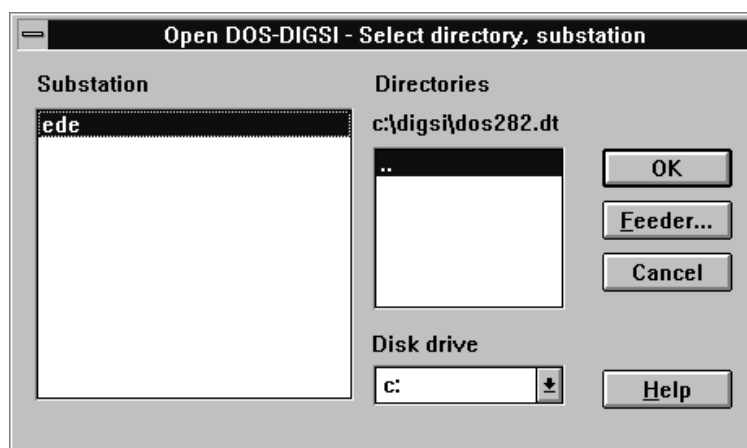
- Scroll bar** There is a scroll bar on the right of the window. You can use this to shift the display area up or down. This is necessary if the displayed information is larger than the working area.
- Status bar** The bottom line in the DIGV2V3 window is the status line. The following information is displayed in this from left to right depending on the current operation:
- ⊙ Name of opened DOS substation (source substation)
 - ⊙ Name of opened DOS feeder (source feeder) or "All feeders" if you have not opened a single feeder
 - ⊙ Name of opened WINDOWS substation (destination substation)
 - ⊙ Name of opened WINDOWS feeder (destination feeder) or "All feeders" if you have not opened a single feeder.

13.3 Opening and Closing Substations and Feeders

The first step is to define a DOS–DIGSI substation and a WIN–DIGSI substation as the source and destination of the copy procedure. The sequence when opening the substations is optional.

When opening the substations you must decide whether the device files are to be copied from the complete substation or from only one feeder of a substation. In the latter case you must select a specific feeder in addition to the substation. The selection "Complete substation" or "Single feeder" must be the same for the source and destination.

Select the option "Open" from the menu "DOS–DIGSI substation". A dialog box is then displayed to permit you to select a directory and substation.



Digs502g

Fig. 13/2 Dialog box "Open DOS–DIGSI – select directory, substation"

13 Copying Device Files with DIGV2V3

Select directory When opening the dialog box for the first time, DIGV2V3 shows the root directory of the installation drive. In the selection field "Directories", select the directory in which you have created your DOS substations. If the directory is on a different drive, select this using the dropdown list "Disk drive".

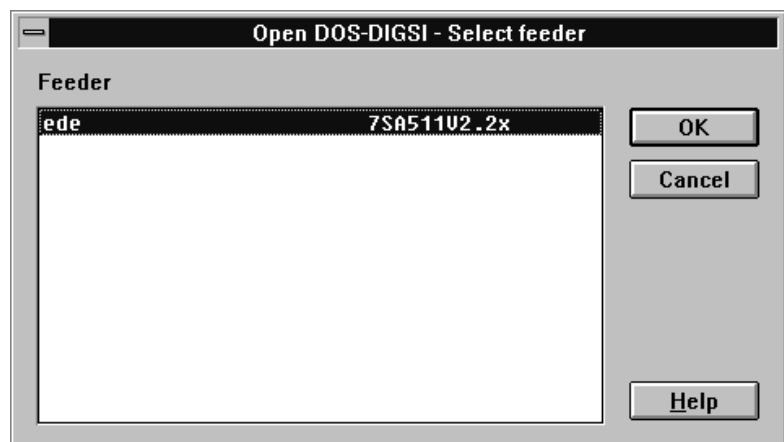
Select substation The names of all substations present in the selected directory appear in the selection field "Substation". Mark the desired substation in this selection field.

OK Select "OK" to open the marked substation. All device files present in the selected substation will then be copied, and the current dialog box is subsequently closed.

Feeder... Select "Feeder" to select exactly one feeder. Only the device files present in this feeder will then be copied, and the current dialog box is subsequently closed.

Cancel Select "Cancel" if you do not wish to open a substation. The procedure is then aborted, and the current dialog box closed.

A further dialog box is displayed to permit you to select a single feeder.



Digs503g

Fig. 13/3 Dialog box "Open DOS-DIGSI – select feeder"

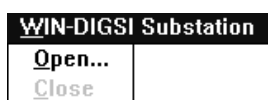
Select feeder All feeders present in the selected substation are displayed in the selection field "Feeder" together with the associated protection devices. Mark the desired feeder in this selection field.

OK Select "OK" if you wish to open the marked feeder. The current dialog box is then closed.

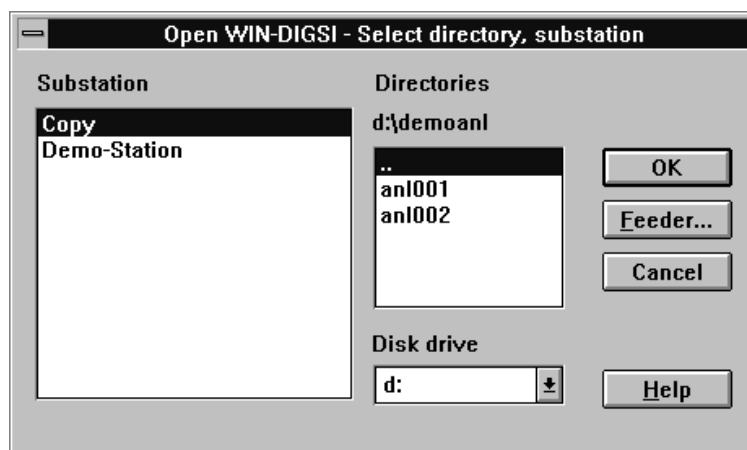
Cancel Select "Cancel" if you do not wish to open a feeder. The procedure is then aborted, and the current dialog box closed. You return to the previous dialog box.

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As the next step, open a WIN-DIGSI substation as the destination of the copy procedure. Select the option "Open" in the menu "WIN-DIGSI substation". A dialog box is then displayed to permit you to select a directory and a substation.



Digs504g

Fig. 13/4 Dialog box "Open WIN-DIGSI – select directory, substation"



Caution!

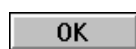
The destination substation must already have been created. If you wish to copy the device files from exactly one feeder, the destination substation must contain at least one feeder. If you wish to copy all device files from a source substation, the corresponding destination feeders are automatically created during the copy procedure.

Select directory

When opening the dialog box for the first time, DIGV2V3 shows the root directory of the installation drive. In the selection field "Directories", select the directory in which you have created your WIN substations. If the directory is on a different drive, select this using the dropdown list "Disk drive".

Select substation

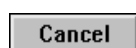
The names of all substations present in the selected directory appear in the selection field "Substation". Mark the desired substation in this selection field.



Select "OK" to open the marked substation. All device files of a DOS-DIGSI substation will then be copied into this WIN-DIGSI substation, and the current dialog box is subsequently closed.



Select "Feeder" to select exactly one feeder. Only the device files of a single feeder can then be copied, and the current dialog box is subsequently closed.



Select "Cancel" if you do not wish to open a substation. The procedure is then aborted, and the current dialog box closed.

A further dialog box is displayed to permit you to select a single feeder.

13 Copying Device Files with DIGV2V3

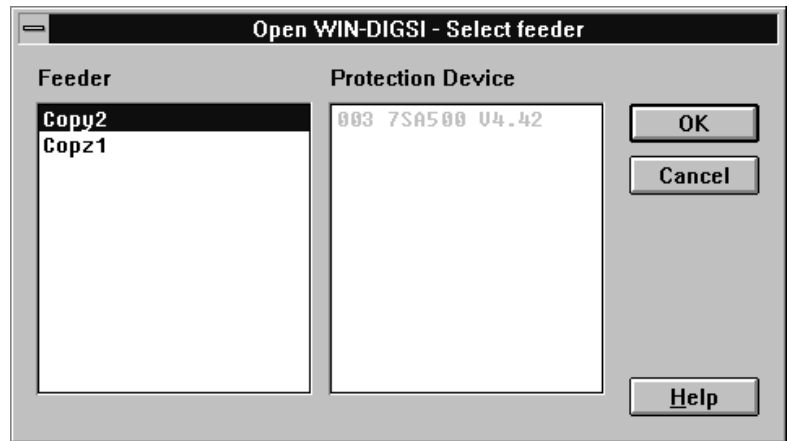


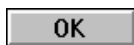
Fig. 13/5 Dialog box "Open WIN-DIGSI – select feeder"

Select feeder

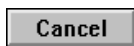
All feeders of the opened substation are displayed in the selection field "Feeder". Mark the desired feeder in this selection field.

Display of protection devices

The protection devices of the marked feeder are displayed in the display field "Protection device". This display is only present for information reasons. A selection cannot be made.



Select "OK" to open the marked feeder. The current dialog box is then closed.



Select "Cancel" if you do not wish to open a feeder. The procedure is then aborted, and the current dialog box closed. You return to the previous dialog box.

Close substation

You can now start the copy procedure. Please refer to Section 13.4.

You can close the substation following the copy procedure. Select the option "Close" in the menu "DOS-DIGSI substation" or in the menu "WIN-DIGSI substation".

13.4 Starting the Copy Procedure

Copy!

Select the menu "Copy" to start the copy procedure. This menu does not contain any further options, it directly triggers the desired action.



Caution!

The menu "Copy" is only active if you have opened both a DOS-DIGSI substation and a WIN-DIGSI substation (see Section 13.3). A further condition is that you must have selected either all feeders or only one feeder for both substations.

Information on the progress of the copy procedure is output in the display area of the DIGV2V3 window.

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Illegal or previously assigned feeder address

It is possible that a feeder to be copied has an illegal address or one which has already been assigned in the destination substation. If this is the case, a dialog box is displayed to permit you to change the feeder address.



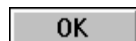
Digs506g

Fig. 13/6 Dialog box "Change feeder address"

The dialog box informs you of the illegal address of the feeder to be copied. Select a new address for this feeder.

Select feeder address

Select a new address for the feeder to be copied from the dropdown list "New feeder address". Only addresses are displayed which have not been assigned to other feeders in the current substation.



Select "OK" to accept the new address. The current dialog box is then closed.



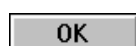
Select "Cancel" if you wish to terminate the copy procedure. The current dialog box is then closed.

You can alternatively enter a new address directly. A message is output if this is identical to an address which already exists.



Digs507g

Fig. 13/7 Message output if a feeder address already exists

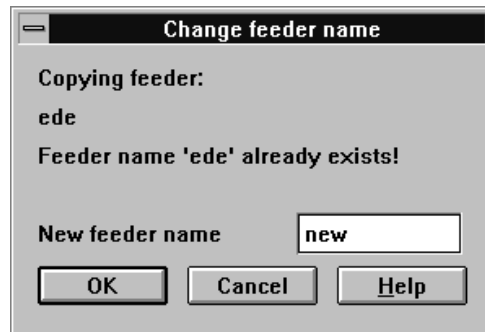


Acknowledge this message with "OK" to return to the last dialog box. Select a different feeder address, or cancel the procedure.

Previously assigned feeder name

If a feeder to be copied has a name which has already been assigned in the destination substation, a dialog box is displayed to permit you to change this name.

13 Copying Device Files with DIGV2V3



DIGS501g

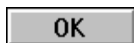
Fig. 13/8 Dialog box "Change feeder name"

Enter feeder name

The dialog box informs you of the name of the feeder to be copied which has already been assigned. Enter a new name for this feeder.

The cursor is positioned in the input field "New feeder name". Enter a name here with a maximum length of 15 characters.

The name must not yet exist in the current destination substation. Upper-case and lower-case letters are interpreted as different characters.



Select "OK" to accept the new name. The current dialog box is then closed.



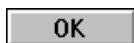
Select "Cancel" if you wish to terminate the copy procedure. The current dialog box is then closed.

A message is output if the entered name is identical to a name which already exists.



DIGS511g

Fig. 13/9 Message output if a feeder name already exists



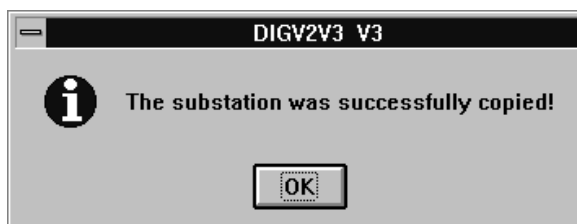
Acknowledge this message with "OK" to return to the last dialog box. Select a different feeder name, or cancel the procedure.

Illegal or previously assigned device address

If a protection device to be copied has an address which has already been assigned in the destination substation, a dialog box is displayed to permit you to change this address. Proceed in a manner analogous to the description for changing the feeder address.

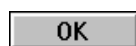
A corresponding message informs you of when the copy procedure is finished.

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Digs508g

Fig. 13/10 Message output at end of copy procedure



Acknowledge this message with "OK"

Display in DIGV2V3 window

The working area of the DIGV2V3 window combines all messages which occurred during the copy procedure.

Information comparable with the following Fig. is displayed if you have copied the device files of **all feeders**.

```
*** Copying station
from
c:\digs\dos282.d\ANL001
ede
to
d:\demoan\ANL002
Copy

*** Copying feeder/device
from
c:\digs\dos282.d\ANL00101
ede      7SA511V2.2? 7SA511?????22CG3
to
*** Feeder name 'ede' already exists!
*** The new feeder name is 'newfeeder'.
*** Feeder address 0 is invalid
*** The new feeder address is 4.
*** Device address 0 is invalid!
*** The new device address is 5.
d:\demoan\ANL002\ABZ004\GER005
004 newfeeder
005 7SA511 V2.2x

c:\digs\dos282.d\ANL00101.AUS -> d:\demoan\ANL002\ABZ004\GER005\PARAM\DOSDIGSI.AUS
c:\digs\dos282.d\ANL00101.EIN -> d:\demoan\ANL002\ABZ004\GER005\PARAM\DOSDIGSI.EIN
c:\digs\dos282.d\ANL00101.RAN -> d:\demoan\ANL002\ABZ004\GER005\PARAM\DOSDIGSI.RAN
c:\digs\dos282.d\ANL00101.PAA -> d:\demoan\ANL002\ABZ004\GER005\PARAM\DOSDIGSI.PAA
```

Digs509g

Fig. 13/11 Messages output in the working area following the copying of the device files of all feeders

13 Copying Device Files with DIGV2V3

Information comparable with the following Fig. is displayed if you have copied the device files of only **one feeder**.

```
*** Copying feeder/device
from
c:\digs\dos282.d\ANL00101
ede 7SA511V2.2? 7SA511?????22CG3
to
*** Device address 0 is invalid!
*** The new device address is 4.
d:\demoan\ANL002\ABZ002\GER004
002 Copy2
004 7SA511 V2.2x

c:\digs\dos282.d\ANL00101.AUS -> d:\demoan\ANL002\ABZ002\GER004\PARAM\DOSDIGSI.AUS
c:\digs\dos282.d\ANL00101.EIN -> d:\demoan\ANL002\ABZ002\GER004\PARAM\DOSDIGSI.EIN
c:\digs\dos282.d\ANL00101.RAN -> d:\demoan\ANL002\ABZ002\GER004\PARAM\DOSDIGSI.RAN
c:\digs\dos282.d\ANL00101.PAA -> d:\demoan\ANL002\ABZ002\GER004\PARAM\DOSDIGSI.PAA
```

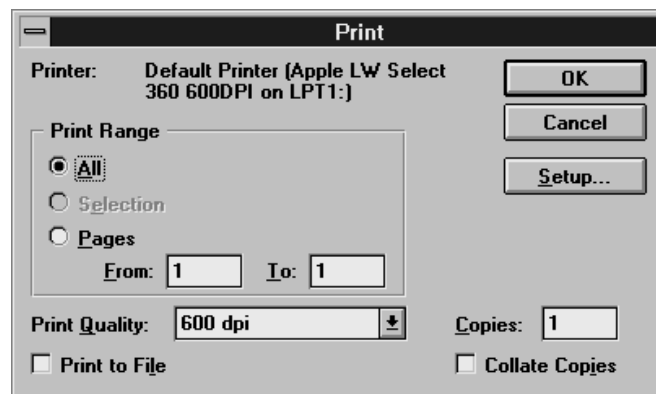
Digs510g

Fig. 13/12 Messages output in the working area following the copying of the device files of one feeder

13.5 Printing

Print

DIGV2V3 permits you to output the contents of the working area on a printer or into a file. Select the menu "Print". This menu does not contain any other options. A dialog box is displayed to permit you to define the print parameters.






Digs410g

Fig. 13/13 Dialog box "Print"

- Print all** Select "Print range – all" if you wish to print all displayed information.
- Print selection** Select "Print range – selection" if you wish to print a selected text area. This function has not yet been implemented.
- Print pages** Select "Print range – pages" if you wish to print only a certain area of the displayed information. Define the first and last pages of the area in the input fields.

Copying Device Files with DIGV2V3 13

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- Print quality** Select the desired print quality from the dropdown list. The possible selection depends on the current printer driver.
- Copies** Define the desired number of copies in the input field "Copies". The default setting is "1".
- Collate copies** Select "Collate copies" if the individual printed copies are to be output in the correct order.
- Print to file** Select "Print to file" if the printer data are to be routed into a file.
-  Select "OK" to output the data on the printer or into a file. The current dialog box is then closed.
-  Select "Cancel" if you do not wish to carry out the output. The current dialog box is then closed.
-  Select "Setup" to access a printer-specific dialog box for setting further parameters.

13.6 Call Help

The information provided for the DIGSI help system also basically applies to the help system of DIGV2V3. Please refer to Section 1.4.

14 The DIGSI Mailbox

The DIGSI Mailbox is available to all registered users of DIGSI. Among other things, it allows you to download up-to-date information on the subject of DIGSI. As the most important service, it is possible to download drivers for new versions of protection device firmware, for example, or to load other updated program files directly into your computer.

To be able to use the services of the DIGSI Mailbox, you require a modem and a terminal program. Generally speaking, you can use any modem together with any terminal program. For the following explanations, a modem by Multitech was used together with the terminal software TrioFax DataComm.

14.1 Configuration

Before you dial the DIGSI Mailbox for the first time, some settings have to be carried out. As a rule, these settings only have to be made once, unless the general technical conditions change.

Specifically, settings are necessary for

- ⊙ the modem,
- ⊙ the connection,
- ⊙ the download directory and
- ⊙ the DIGSI Mailbox

14.1.1 Set modem parameters

Carry out all of the specific settings in the terminal software for the modem used. You should also remember the tone dialling system that is used as well as possible operation with a PABX.

Tone dialling If your modem is connected to a digital network, for example ISDN, the modem must establish a connection with the help of tone dialling. In this case the string in the "Dial" input box must contain the letter "T". For example: "ATDT".

PABX If your modem is connected to a PABX, you must remember the following settings:

- ⊙ the number for an outside line, e.g. "0";
- ⊙ the time to wait between dialling the outside line prefix and dialling the remaining numbers; each second is represented by a comma, the character "w" means that the modem waits until the dialling tone is heard;
- ⊙ the configuration of the modem; the strings "W1X1" or "W1X4" are possible.

14 The DIGSI Mailbox

14.1.2 Enter connection parameters

Some connection parameters must be set regardless of the type of modem used. The value for the baud rate is a recommendation, all other settings are mandatory.

Baud rate	Select an initial value of 19200. After you have successfully reached the DIGSI Mailbox you can raise this value as an experiment.
Parity	Select the setting "NONE".
Data bits	Select 8 data bits as the valid setting.
Stop bits	The number of stop bits must be set to "1".

14.1.3 Define download path

An important advantage of the DIGSI Mailbox is the option of being able to copy new or updated program files from the DIGSI Mailbox computer to your own computer. This process is described as "downloading".

Before the first download of files, a directory into which the files are to be copied must be defined on the target computer.

14.1.4 Define settings for the DIGSI Mailbox

Before you dial the DIGSI Mailbox, some mailbox-specific settings must be defined. The name is a recommendation, all other settings are mandatory.

Name	Select the name "DIGSI Mailbox".
Telephone number	The complete number of the DIGSI Mailbox is: 09114337950.
Country	Select "Deutschland".
Terminal	Select "ANSIBBS".
Protocol	Select "Zmodem".

14.2 Dial DIGSI Mailbox

Before you dial the DIGSI Mailbox for the first time, you should ensure once more that all of the necessary preparations have been made

- ⊙ Is the modem connected and ready for operation?
- ⊙ Have the modem-specific parameters been set correctly (Section 14.1.1)?
- ⊙ Have the connection parameters been correctly set (Section 14.1.2)?
- ⊙ Have all settings for the DIGSI Mailbox been entered correctly (Section 14.1.4)?
- ⊙ Has a directory been defined for downloading files (Section 14.1.3)?

Try to establish a connection to the DIGSI Mailbox with the help of the terminal program. If this does not succeed at once, try dialling again after a short time. The connection to the Mailbox may simply be occupied by another user.

If you do not succeed in establishing a connection, even after several attempts, you should check all of the necessary connections once more. Try varying some of the parameter settings such as baud rate, modem preparation and wait time if you are using a PABX. Read the information in the manuals of the modem and of the terminal software.

14.3 User identification and initial information

After a connection has successfully been established, the startup screen of the DIGSI Mailbox appears on the display screen of your terminal software.



Fig. 14/1 Startup screen of the DIGSI Mailbox

To check your access authorization, you are requested in a dialog to sign yourself on as a registered user of DIGSI. This is done by entering your user name and your password. Both can be found on the registration card or in the letterhead of your last DIGSI update.

You can also sign on as a guest using any name. In this case, however, you only have access to current information.

14 The DIGSI Mailbox

Sign on as a registered user

Carry out each of the following steps in order to sign on as a registered user:

1. Enter your personal user name in the form of "Dlxxxxxx". Each "x" represents a digit. Confirm your input by pressing .
2. Check your input. If it is correct, enter the letter "j" and confirm by pressing . If it is not correct, enter "n" and confirm by pressing to return to step 1.
3. Enter your personal password in **upper-case letters**. An asterisk appears for each character you enter. Confirm your input by pressing .

After the password has been entered correctly, the startup screen appears. Press .

View current information

If there is any current information, your attention is now drawn to it. You can view this information immediately or at a later point in time. If you decide to take the second option, enter the letter "n". Then press . If you would rather read the information immediately, enter the letter "j". Then press . The current information will now be displayed.

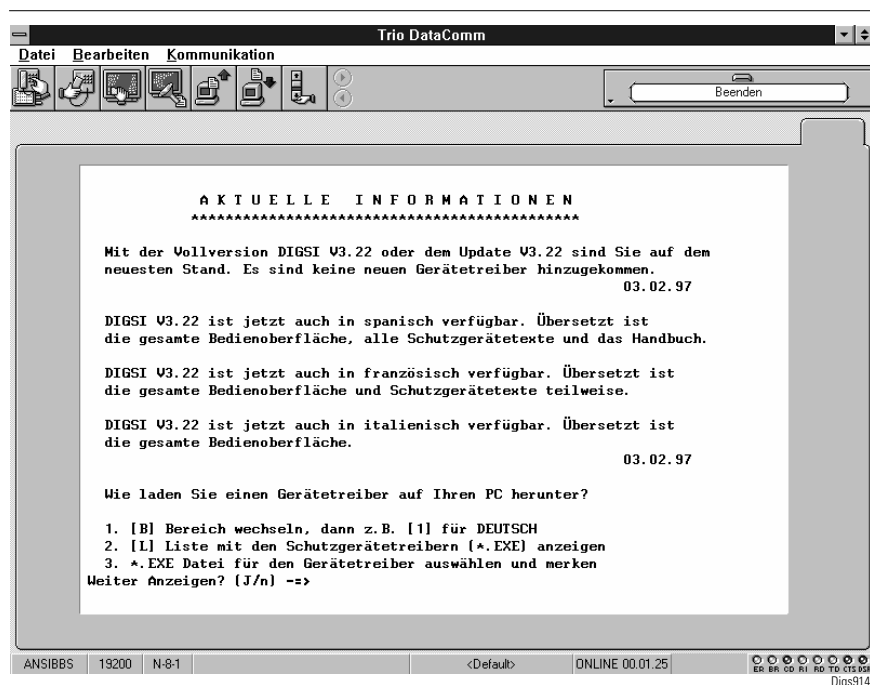


Fig. 14/2 Current information display

All information is shown with date and is displayed in chronological order. You will find the latest message in the first position, and the oldest message in last position. Should there be any other information, you can view this too. Enter the letter "j" and confirm your input by pressing . When you have received all of the available information, press , to switch to the Select menu of the DIGSI Mailbox.

14.4 The Select menu of the DIGSI Mailbox

The DIGSI Mailbox provides a Select menu for accessing the individual functions. Not all menu options displayed are relevant for working with the DIGSI Mailbox. Some options are also disabled. The labels of such disabled options are marked by a coloured highlight.

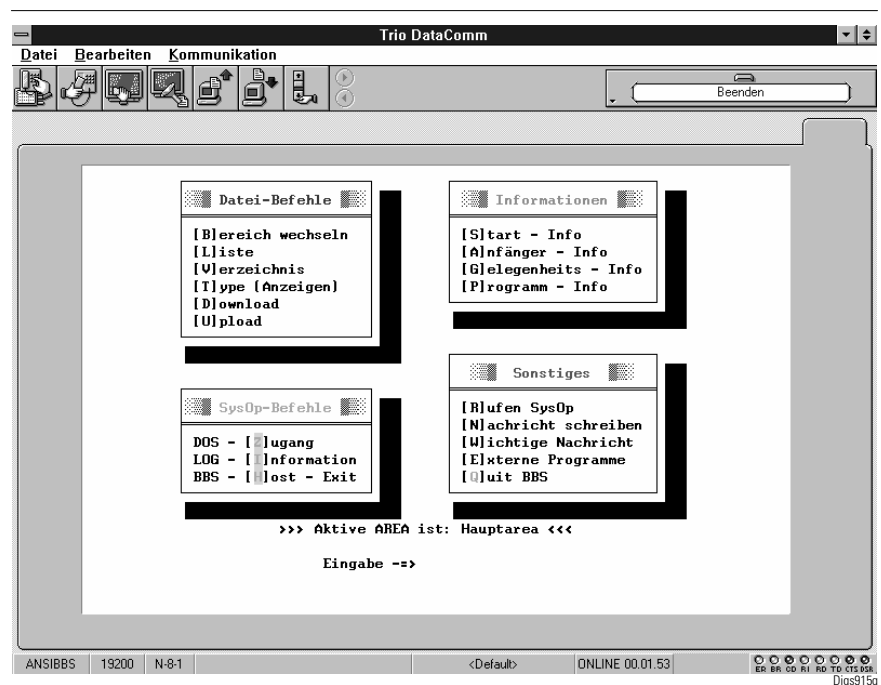


Fig. 14/3 DIGSI Mailbox Select menu

Select an option Select an option by first entering the letter in square brackets. Then confirm your input by pressing .

Relevant options Seven of the options displayed are relevant for working with the DIGSI Mailbox:

- ⊙ Anfängerinfo
- ⊙ Gelegenheitsinfo
- ⊙ Wichtige Nachricht
- ⊙ Bereich wechseln
- ⊙ Liste
- ⊙ Download
- ⊙ Quit BBS

14 The DIGSI Mailbox

14.4.1 Anfängerinfo (Beginner's info)

After you enter and confirm the letter "A" for the option "Anfängerinfo" you are shown a brief explanation of all menu options. This also applies for menu options that are not relevant or even disabled.



Fig. 14/4 Overview and brief explanation of the Mailbox options

Press , to return to the Select menu.

14.4.2 Gelegenheitsinfo (Occasional info)

After you enter and confirm the letter "G" for the option "Gelegenheitsinfo" any general information that is available is displayed.

Press , to return to the Select menu.

14.4.3 Wichtige Nachricht (Important news)

After you enter and confirm the letter "W" for the option "Wichtige Nachricht", current information is displayed. This is the same information you were initially requested to view (see Section 14.3 and Fig. 14/2).

Press , to return to the Select menu.

14.4.4 Bereich wechseln (Switch area)

The option "Bereich wechseln" is relevant for you if you would like to download files from the DIGSI Mailbox to your computer. With the help of this option you can select the language version of the files to match the language version of your DIGSI software.

As a rule, you will download the English files for an English version of DIGSI; for a German program version you will download the German files, and so on.



Caution!

Selecting an area does not show any change in the language of the user interface within the Mailbox. At the moment, all texts are available in German only.

Enter the letter "B" and confirm your input by pressing . The menu for switching areas then appears.



Fig. 14/5 Display of the menu "Bereich wechseln"

Enter the key digit for the area you require. Confirm your input by pressing . You will see a message indicating that the area switch is being carried out. The program then returns to the Select menu.

14.4.5 Liste (List)

After you have entered and confirmed the letter "L" for the option "Liste" you will see a list of all files available for downloading. At the same time, this list is for selecting the files to be downloaded onto your computer.

14 The DIGSI Mailbox

How to work with this list within the framework of a download is described in Section 14.5.1.

Enter the letter "n" and confirm your input by pressing . The program then returns to the Select menu.

14.4.6 Download

After you have entered and confirmed the letter "D" for the option "Download" you will see a list of all files marked for downloading. You can still edit this list and then start the download.

How to work with this list and start a download is described in Section 14.5.2.

Enter the letter "n" and confirm your input by pressing . The program then returns to the Select menu.

14.4.7 Quit BBS

You can leave the Mailbox by entering and confirming the letter "Q" for the option "Quit BBS". For further information please refer to Section 14.6.

Enter the letter "n" and confirm your input by pressing . The program then returns to the Select menu.

14.5 Download files

The DIGSI Mailbox allows you to download new or updated program files onto your computer. These may be drivers, help texts or other types of files.

For an overview of the available files please refer to the file "Liste.txt". For this reason we recommend that you download this file first. Then exit the DIGSI Mailbox and open this file using any text editor. You can print out the file overview and take your time to decide which files you require.

All files, with the exception of the file "Liste.txt", are compressed. As a rule, such a compressed file also contains several individual files. You can read about how to deal with downloaded files in Section 14.7.

Please remember the following as well: If you install a new or updated driver, you must always have the relevant protection device texts as well. All available protection device texts are compiled in the file "Text-pool.exe". For this reason, you should always download and install this file as well.

14.5.1 Select files from list

First select the option "Liste" from the Select menu. Enter the letter "L" and confirm your input by pressing .

The list of files, with all files available for downloading, appears in the display area. The information displayed depends on the type of file. For example, if they are drivers for special firmware versions, the list would contain the following information:

- ⊙ the name of the file;
- ⊙ the size of the file in bits;
- ⊙ the type of protection device for which the drivers are intended, e.g. distance protection;
- ⊙ the type of protection device, e.g. 7SA500;
- ⊙ the protection device versions for which drivers are contained in the compressed file.

The names of all files that are to be downloaded must first be highlighted. All highlighted file names are automatically entered in a highlight list. This highlight list can be checked and edited, if required, before it is downloaded.

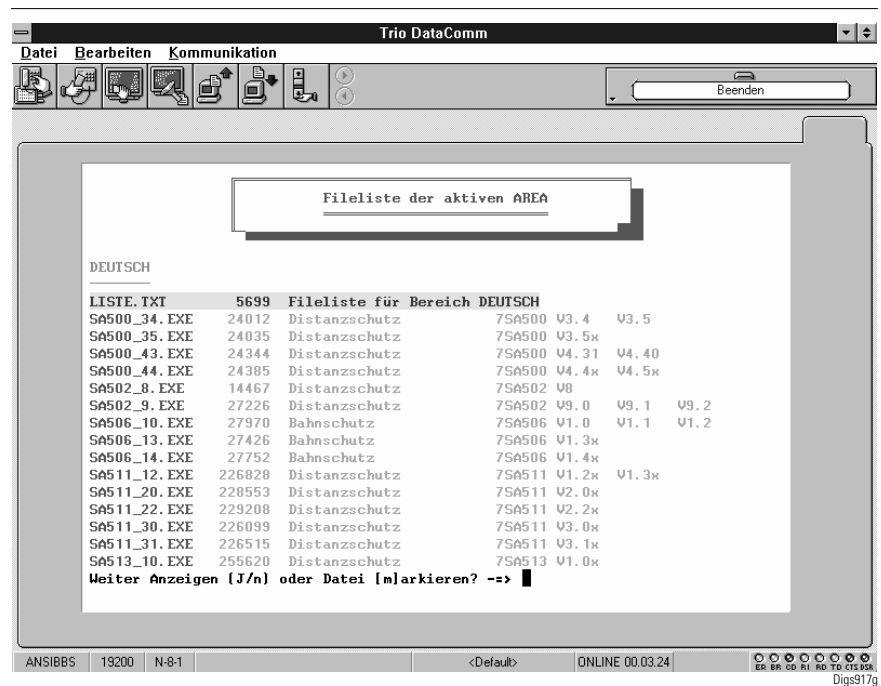


Fig. 14/6 List of available files

14 The DIGSI Mailbox

A limited number of file names is always offered at the same time for selection in the display area. You now have three options:

1. You wish to view further file names. Enter the letter "j" and confirm this by pressing .
2. You wish to highlight one or more of the displayed file names. In this case enter the letter "m" and then press .
3. You do not wish to view or highlight any further file names. Enter the letter "n" and then press .

Highlight file names

To highlight a file name, first enter the letter "m" and confirm your input by pressing . You are now requested to enter the name of the file to be highlighted for downloading. Enter the file name and confirm your input by pressing .

Use wildcards

When entering file names you can also use so-called wildcards such as "*" or "?". For example, the input "SA511*.*" highlights the names of **all** available files for the distance protection device 7SA511. The input "SA511_?4.EXE", however, only marks the name whose last character is a "4".

If you have marked the file name relevant for you in the list of file names, you can have more file names displayed. Enter the letter "j" and confirm this by pressing . On the other hand, enter the letter "n" if you do not wish to view or highlight any other file names. Then press .

14.5.2 Start download

After you have marked the names of all of the files relevant for you, you can download them onto your computer.

Select the option "Download" from the Select menu. Enter the letter "D" and confirm your input by pressing . The highlight list appears in the display area with the names of all files selected for downloading.

Edit highlight list

Check this list to make sure it is complete and correct. Make sure that the file "Textpool.exe" is also listed. Here you can still delete individual file names from the list, or delete the entire list.

Delete individual file names

To delete individual file names from the highlight list, go through the following stages:

1. Enter the letter "e" and confirm your input by pressing .
2. You are asked the number of the file name to be deleted from the list. Enter the appropriate leading number. Confirm your input by pressing .
3. A message appears indicating that the file name in question has been deleted. The remaining file names are then renumbered.
4. Repeat steps 1 to 3 if you wish to delete further file names.

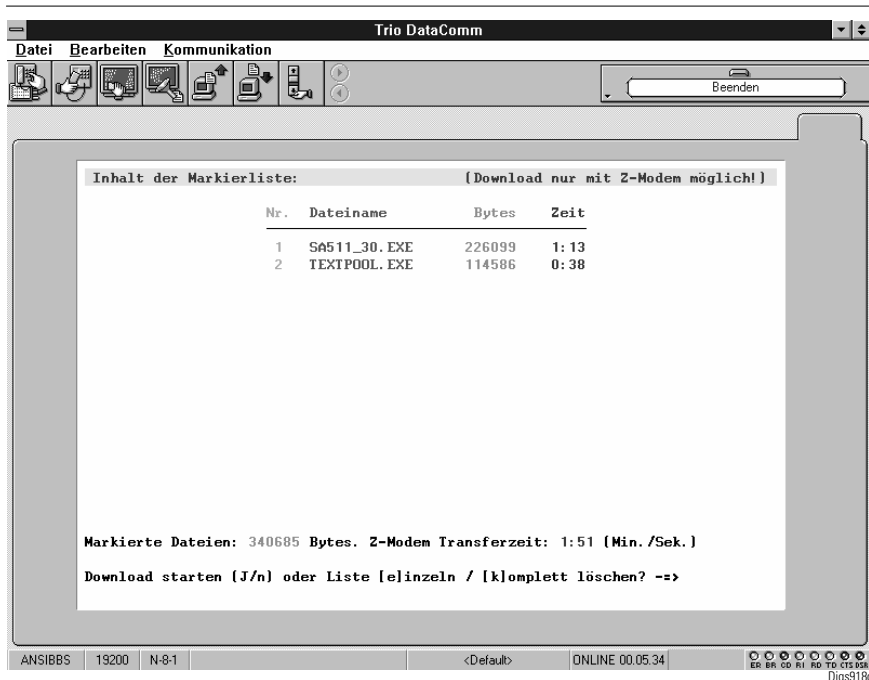


Fig. 14/7 Highlight list

Delete complete list

To delete the complete highlight list, enter the letter "k". Confirm your input by pressing .



Caution!

No further security prompts appear! The list is deleted immediately after you confirm by pressing !

If you do not wish to change the list any further, start downloading the files. Enter the letter "j" and confirm your input by pressing . Downloading of the files begins.

Automatic interruption of the connection

A message appears after successful transmission of all files. If no further input is made within the next 30 seconds, the connection to the DIGSI Mailbox is automatically interrupted. If you do not wish to exit the Mailbox yet, confirm this by pressing .

14.6 Exit the DIGSI Mailbox

Automatic interruption of the connection

The DIGSI Mailbox is automatically disconnected if no input is made within a defined period of time. During normal operation, this period is 3 minutes. After files have been successfully downloaded, this period is only 30 seconds. If no further input is made within the given period, the connection to the DIGSI Mailbox is interrupted.

Manual interruption of the connection

However, you can also exit the DIGSI Mailbox manually as long as the Select menu is displayed. Enter the letter "Q" and confirm your input by pressing .

14 The DIGSI Mailbox

The highlight list may contain the names of files that have not yet been downloaded onto your computer. In this case a message appears.

A security prompt appears before you finally leave the Mailbox. Enter the letter "j" if you really want to exit the Mailbox. Enter the letter "n" if you wish to maintain the connection to the Mailbox. In both cases, confirm your input by pressing .

If you have entered "ja" at the security prompt, confirm once more by pressing . The connection to the DIGSI Mailbox is then interrupted for good.

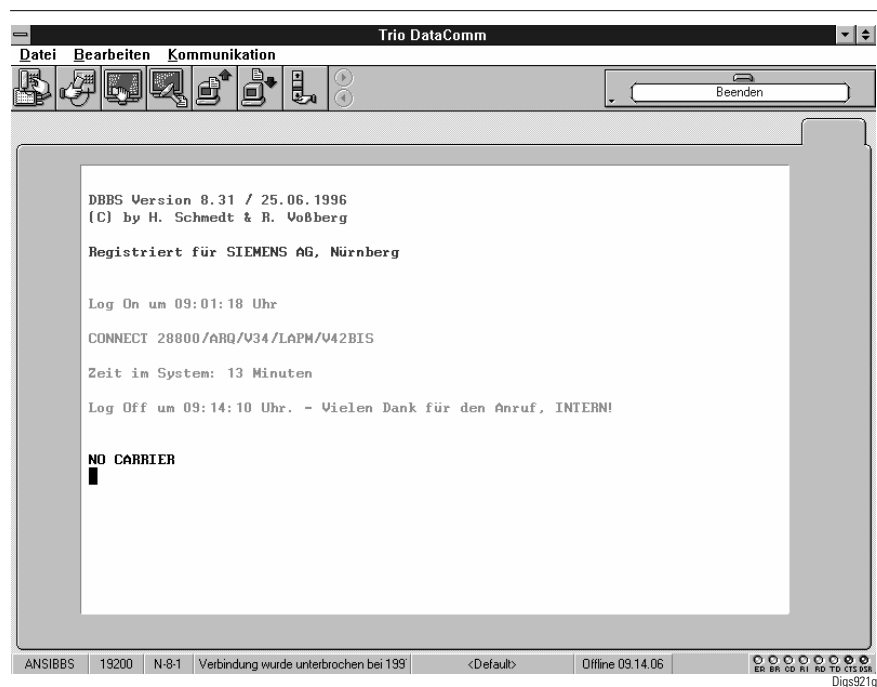


Fig. 14/8 Display after exiting the DIGSI Mailbox

If the connection to the DIGSI Mailbox has been successfully interrupted, you will see some messages corresponding to Fig. 14/8.

14.7 Decompression and subsequent installation of compressed files

Before you can install downloaded files in DIGSI, they must first be unpacked, that is, decompressed. Proceed as follows:

1. Switch to the File Manager. Open a window for the drive where the directory with the downloaded files is located. Open the relevant directory.
2. Create a separate directory for each file. In each case, give the directory the same name as the relevant file, but without file name extension. Then copy each file into its corresponding directory.
3. Switch to one of the newly created directories. Start automatic decompression of a file by double-clicking the appropriate entry. The individual files in the packed file are extracted. The display switches briefly to text mode. After decompression you will find a further directory within the open directory. As a rule this has the name "Disk001". Make a backup copy of the contents of this directory, preferably on a floppy disk.
4. Repeat step 3 until all files are decompressed, and then continue with step 5.
5. Start the installation program of DIGSI and confirm the first dialog box by clicking on "OK".
6. Enter the complete path of the individual files in the input field of the dialog box "Select directory".
This could be, for example: c:\download\sa500_31\disk001
Then select the button "Weiter".
7. Confirm the dialog box "Komponentenauswahl" by selecting the button "Weiter".
8. If the files to be installed are drivers for new firmware releases, you will be shown the dialog box "Select Firmware". In the lower selection box, highlight the firmware releases to be installed. Select the button "Weiter".
9. The drivers for the highlighted firmware releases are then installed. Repeat steps 6 to 8 for all firmware releases to be installed. Remember that step 8 is not required for the installation of the textpool.

You can read the detailed instructions for subsequent installation in Section 1.3.2.

A.1 Management of Substation Data

This Section describes the hierarchical management of the substation data and their conversion into a directory structure.

DIGSI supports the management of substation-specific data by means of a tree-type directory structure according to the hierarchy:

Substation → Feeder → Protection device.

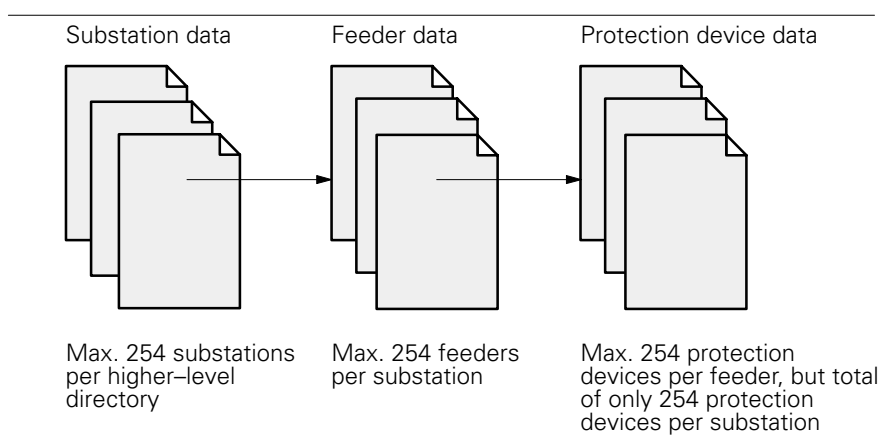


Fig. A.1 Hierarchy: Substation → Feeder → Protection device

The specific data for a substation including all components comprise a large number of individual items of information. The substation is the highest level in the hierarchy. It is identified by a name and address.

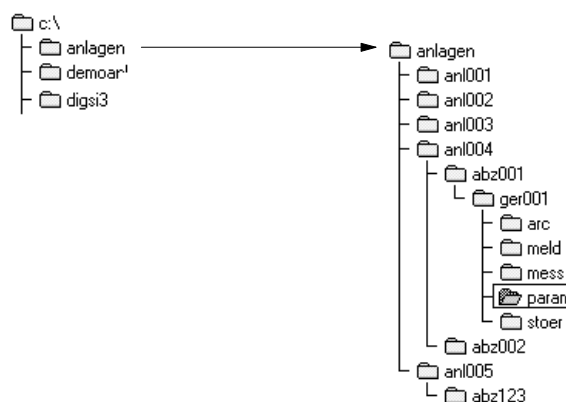
A certain number of feeders can be subordinate to each substation. Each feeder is identified by a name and address. The totality of this information is the **Substation data**.

A certain number of protection devices can be subordinate to each feeder. Each protection device is identified by a type and address. The totality of this information is the **Feeder data**.

A large number of parameters, annunciations, measurements etc. are assigned to each protection device. The totality of this information is the **Protection device data**.

The substations are managed by creating an appropriate directory structure. Fig. A.2 provides an initial summary of this directory structure.

A Appendix



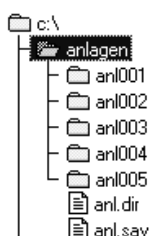
Digs210g

Fig. A.2 Directory structure of substation management

A series of subdirectories reflects the hierarchy in the substation management. The individual directories and the information present in them are explained below.

Substation directories

DIGSI creates a separate directory for each substation which you create. The opening or closing of a substation thus also means the opening and closing of a directory.



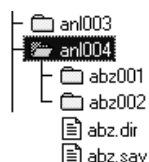
The name of each substation directory commences with the abbreviation "anl" for the German word for "Substation". The name is assigned a three-digit number to be unambiguous. The numbers are assigned continuously in ascending order starting at "001".

All substation directories are combined in a higher-level directory. You can define the name of this directory when installing DIGSI. The installation program suggests the name "anlagen". In our example, this name has been accepted for the directory.

The directory "anlagen" also contains the file "anl.dir". This file contains a list of all existing substation directories with references to the associated substation names. The substation address is not relevant in this context, and is not stored. The file "anl.sav" in the same directory is a backup copy of the file "anl.dir".

Feeder directories

DIGSI creates a separate directory for each feeder which you create within a substation. The opening or closing of a feeder thus also means the opening and closing of a directory.

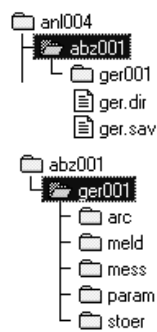


The name of each feeder directory commences with the abbreviation "abz" for the German word for "Feeder". The name is assigned a three-digit number to be unambiguous. This number corresponds to the feeder address you have assigned.

All feeder directories are combined in the higher-level substation directory. This directory also contains the file "abz.dir". This file contains a list of all existing feeder directories with references to the associated feeder names. The file "abz.sav" in the same directory is a backup copy of the file "abz.dir".

Protection device directories






DIGSI creates a separate directory for each protection device which you create within a feeder. The opening or closing of a protection device thus also means the opening and closing of a directory.



The name of each protection device directory commences with the abbreviation "ger" for the German word for "Device". The name is assigned a three-digit number to be unambiguous. This number corresponds to the protection device address you have assigned.

All protection device directories are combined in the higher-level feeder directory. This directory also contains the file "ger.dir". This file contains a list of all existing protection device directories with references to the associated protection device types. The file "ger.sav" in the same directory is a backup copy of the file "ger.dir".

Each protection device directory contains individual data for the respective device. These data are combined in various subdirectories according to the type of information:

- | | | |
|---|-------|---|
|  | arc | The directory "arc" contains command archive files. Such files document modifications on the protection device. This function has not yet been implemented in the protection devices. |
| <hr/> | | |
|  | meld | The directory "meld" contains files with recorded annunciations. Annunciations are stored in separate files according to their type and partly also according to the time of saving. |
| <hr/> | | |
|  | mess | The directory "mess" contains files with recorded measurements. Measurements are stored in separate files according to their type and according to the time of saving. |
| <hr/> | | |
|  | param | The directory "param" contains files with current parameter data specific to the protection devices. These data include configuration, marshalling and setting parameters. |
| <hr/> | | |
|  | stoer | The directory "stoer" contains files with fault data. |

A.2 Copy data of substation, feeder and protection device

You can copy substation, feeder and protection device data in DIGSI. As destination you can also select existing substations, feeders or protection devices. In this case, the statements made in this Section apply.

Structure Comparison

Before the Copy operation, DIGSI checks the structures of source and destination. Both structures must be identical. The structure is determined by name and address at substation and feeder level. At protection device level, the structure is defined by firmware release and address. Three conditions can be formulated from this:

1. Copying at protection device level is only possible if the firmware releases and addresses of the source and destination devices are identical.
2. Copying at feeder level is only possible if the names and addresses of the source and destination feeders are identical. At the same time, condition 1 must be complied with.
3. Copying at substation level is only possible if the names and addresses of the source and destination substations are identical. At the same time, conditions 1 and 2 must be complied with.

If one of the conditions is not complied with in a given case, the data cannot be copied.

Data management

Depending on the type of data, the destination data are overwritten during copying or the source data are appended to the destination data.

Records of the following data types are **always overwritten** during the Copy operation:

- ⊙ Configuration parameters
- ⊙ Marshalling parameters
- ⊙ Setting parameters

Records of the following data types are **appended to the destination data**:

- ⊙ Operational annunciations
- ⊙ Earth fault annunciations
- ⊙ Network disturbances
- ⊙ Spontaneous annunciations
- ⊙ General query annunciations
- ⊙ Measured values
- ⊙ CB Switching statistics
- ⊙ Fault data

Compare records

Before a record is copied, however, a comparison is carried out with the destination records of the same type. The comparison is carried out on the basis of the date and time of the records. In the case of fault records, the fault number is also included for comparison. If these features are identical, DIGSI presumes that the contents of the source and destination records are also identical. You are now given an option to decide interactively whether the destination record concerned is to be overwritten by the source record. The relevant dialog box is described in Section 4/15.

Protection devices that can be operated with DOS–DIGSI

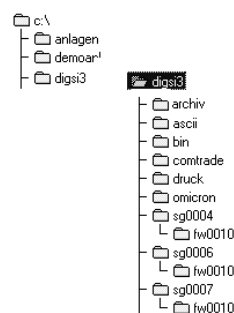
Records of protective devices operated with DOS–DIGSI are not appended to existing data. You therefore do not obtain the query described above when such data are being copied. Any records that may be identical are saved in the destination substation under different file names after the Copy operation. However, this also applies for devices: Parameterization data are always overwritten!

A.3 General File Management

The general file management coordinates all information relevant to execution of the program. This includes, *inter alia*:

- ⊙ Executable and supplementary program files
- ⊙ Files independent of the protection device
- ⊙ Global firmware files
- ⊙ Firmware-specific files
- ⊙ Export files
- ⊙ Print files
- ⊙ Supplementary files with different information contents.

Fig. A.3 provides an initial summary of this directory structure.



Digs211g










Fig. A.3 Directory structure for general file management



Caution!

The names and structures of the subdirectories of "digsi3" must **not** be changed. However, you can shift the directories "digsi3" and "anlagen". Make sure that the directory depth does not violate the **maximum permissible path length of 79 characters** according to the DOS conventions!

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	digsi3	This directory is the DIGSI root directory. It contains the following files and directories. You can define the names of these directories during the installation. The installation program suggests the name "DIGSI3".
	*.dir	Files with this extension contain references to e.g. directories, firmware versions, user names etc.
	digsi.ver	This file contains information on the current version of DIGSI.
	dosdigsi.ger	This file contains information on the protection devices according to the ASCII standard which can be operated with DOS-DIGSI.
<hr/>		
	archiv	This directory contains compressed substation data. The files have the extension ".dzp".
<hr/>		
	ascii	This directory contains files in ASCII format. The files have the extension ".asc".
<hr/>		
	bin	This directory contains executable files, text files and library files as well as help files.
	*.exe	Files with this extension are executable files. These are the program files for DIGSI, DIGRA, INSTALL, DIGV2V3 and KONVERT.
	*.dll	Files with this extension are library files. Such files contain e.g. information on dialog boxes and control elements.
	*.hlp	Files with this extension are help files. These are the help files for DIGSI/DIGRA, INSTALL, DIGV2V3 and KONVERT.
<hr/>		
	comtrade	This directory contains fault data which have been exported into the COMTRADE format.
<hr/>		
	druck	This directory contains files in ASCII format which are provided for further processing in text programs. The files have the extension ".txt" as standard. However, this extension can be changed.
<hr/>		
	omicon	This directory contains files which have been exported into the OMICRON format. The files contain the extension ".rio".
<hr/>		
	sgtext	This directory contains global protection device files. Such files are text and index files.
<hr/>		
	sgxxxx	A directory "sgxxxx" is created for each installed type of protection device. The string "xxxx" is replaced by a defined number. Directories of



fwxxxx

this type contain global firmware files. These include, for example, the help file DIGSISG.HLP specific to the protection device, and the firmware file DIGSIFW.DIR. The information in these files is valid for the respective protection device independent of a special firmware version.

Each directory "sgxxxx" contains a subdirectory of the type fwxxxx. Firmware-specific files are stored in this subdirectory. The string "xxxx" is replaced by a number which has been defined for the selected firmware version.

Temporary substations

Temporary substations can be used for the communication with the protection device (see Section 5.1.1.2). The corresponding directories and files are also created in the root directory of DIGSI.

A.4 Ordering Data for Software

Table A.1 provides a summary of the available software versions with their Order Nos.

Table A.1 Ordering Data for Software

Description	Order No.
DIGSI V3 including 3 years update for 10 computers, full version (german)	7XS5020–0AA00
DIGSI V3 , demo version (german)	7XS5021–0AA00
DIGSI V3 including 3 years update for 10 computers, full version (english)	7XS5020–1AA00
DIGSI V3 , demo version (english)	7XS5021–1AA00
DIGSI V3 upgrade from DOS–DIGSI V2.x full version (german)	7XS5022–0AA00
DIGSI V3 upgrade from DOS–DIGSI V2.x full version (english)	7XS5022–1AA00
DIGSI–LIGHT V3 for 7SJ60 (german)	7XS5120–0AA0
DIGSI–LIGHT V3 for 7SJ60 (english)	7XS5120–1AA0
DIGRA update installation for DIGSI–LIGHT V3 (german)	7XS5130–0AA0
DIGRA update installation for DIGSI–LIGHT V3 (english)	7XS5130–1AA0
WINDIMOD update installation modem for DIGSI / DIGSI–LIGHT V3.2 or higher (language–independant)	7XS5140–0AA0

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A.5 Ordering Data for Accessories

Various cables are available for connecting the individual hardware components. Copper or fiber-optic cables are offered depending on the requirements. Star couplers and converter modules of various designs are available as additional accessories. Tables A.2, A.3 and A.4 provide a summary of the available cables together with their Order Nos. Table A.5 provides a summary of the available star couplers including their Order Nos. Table A.6 provides a summary of the available converters including their Order Nos.

Table A.2 Ordering data for copper cables

Description	Order No.
Computer/PG685 (25-cont. socket) – protection (25-cont. plug)	7XV5100-0
PG750 (25-cont. plug) – protection (25-cont. plug)	7XV5100-1
Computer (9-cont. socket) – protection (25-cont. plug)	7XV5100-2
PG750 (9-cont. socket) – plotter (25-cont. plug)	7XV5100-3
Computer (9-cont. socket) – protection / star coupler (9-cont. plug)	7XV5100-4
Computer (9-cont. socket) – channel multiplexer (9-cont. plug)	7XV5100-4A
Computer (25-cont. socket) – protection / star coupler (9-cont. plug)	7XV5100-5
RS485 converter (25-cont. socket) – protection (ring cable lug)	7XV5100-7

Table A.3 Ordering data for optical cables

Description	Order No.
Computer (9-cont. socket) – protection (25-cont. plug); 2 m long	7XV5100-6B
Computer (9-cont. socket) – protection (25-cont. plug); 5 m long	7XV5100-6C
Computer (9-cont. socket) – protection (9-cont. plug); 2 m long	7XV5100-6D
Computer (9-cont. socket) – protection (9-cont. plug); 5 m long	7XV5100-6E

Table A.4 Ordering data for optical duplex cables (indoor cable)

Description	Order No.
Plastic 980/1000 μm , prefabricated, FSMA plugs at each end, 3 m long	6XV8100-0DC21-0AD0
PCF 200/230 μm , prefabricated, FSMA plugs at each end, various lengths (xxxx)	6XV8100-0EA21-xxxx
Glass 62.5/125 μm , prefabricated, FSMA plugs at each end, various lengths (xxxx)	6XV8100-0BC21-xxxx

Table A.5 Ordering data for star couplers

Description	Order No.
Modular star coupler in 19" frame, various numbers of output modules (x)	7XV5300–0xA00
Without	A
Up to 3 protection devices	B
Up to 6 protection devices	C
Up to 9 protection devices	D
Up to 12 protection devices	E
Up to 15 protection devices	F
Up to 18 protection devices	G
Up to 21 protection devices	H
Up to 24 protection devices	J
Up to 27 protection devices	K
Up to 30 protection devices	L
Mini star coupler (can be cascaded) for 4 protection devices	7XV540x–0AA00
For wall mounting	0
For mounting on C–type rails	1

Table A.6 Ordering data for converters

Description	Order No.
Plug module RS232<–>RS485 (electric) for 7SJ600, delivery with ext. plug–in power supply unit and cable 7XV5100–7 Note: the cable required from the computer to the converter (7XV5100–0/BB or 7XV5100–2) must be ordered separately.	7XV5700–0AA00
Fiber–optic<–>RS485 for 7SJ600 with integrated power supply 18–250 V DC and 110/220 V AC (without conversion), For wall mounting	7XV560x–0AA00 0
For mounting on C–type rails	1
Plug module Fiber–optic 850 nm <–> RS232 digital protection (25–cont. plug), supply voltage via pin 9 or psu, delivery without psu	7XV5101–0A
Plug module Fiber–optic 850 nm <–> RS232 modem (25–cont. plug), supply voltage via pin 9 or power supply unit, delivery with plug–in power supply unit 220 V AC	7XV5101–0B
Plug module Fiber optic 850 nm <–> RS 232 channel multiplexer to PC/modem (25–cont. socket), power supply via pin 9	7XV5101–1A
Plug module Fiber optic 850 nm <–> RS232 computer (25–cont. socket), supply voltage via pin 9 or power supply unit, delivery with plug–in power supply unit 220 V AC	7XV5101–1B
Plug module Fiber optic 850 nm <–> RS 232 channel multiplexer 7XV55 (9–cont. socket), power supply via pin 9	7XV5101–3A
Plug module Fiber optic 850 nm <–> RS 232 notebook (9–cont. socket), power supply via DIN–plug at notebook	7XV5101–3C

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A.6 Connection Diagrams with Cables

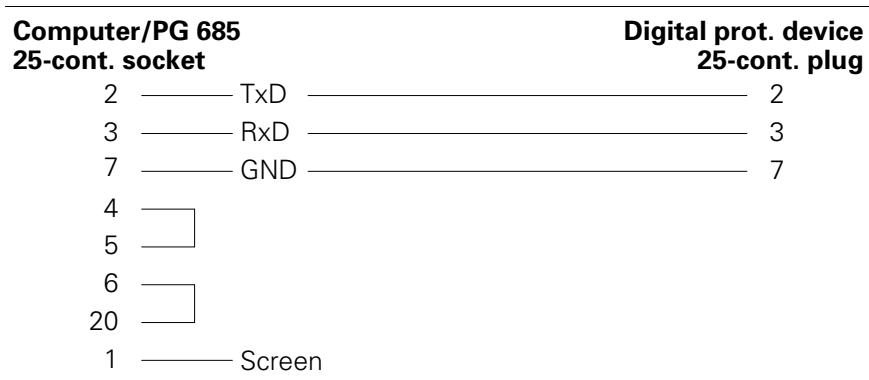
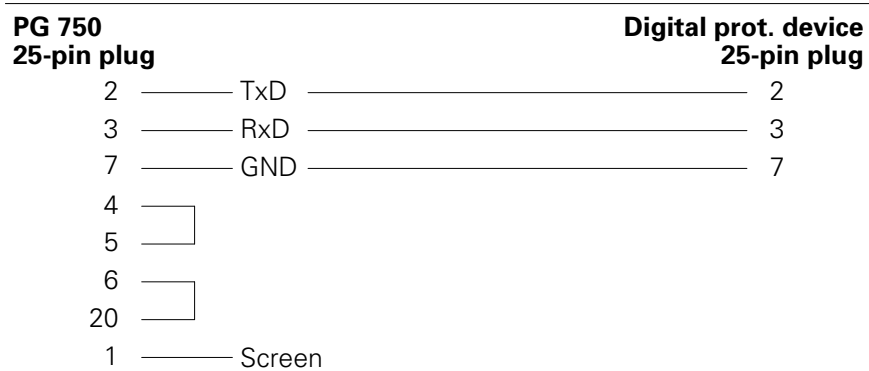
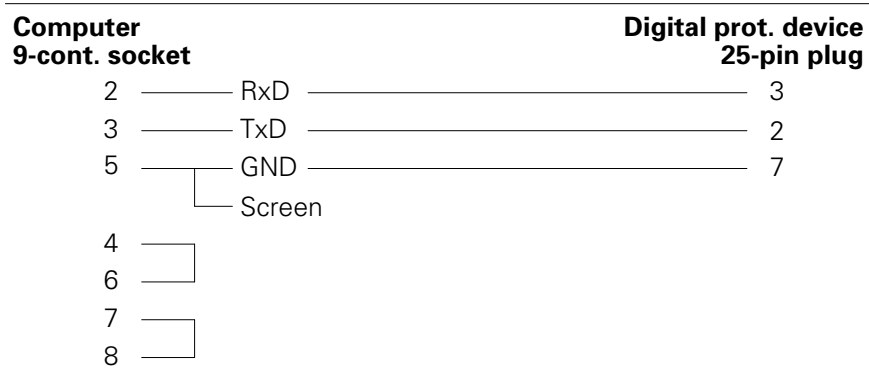


Fig. A.4 Contact assignments for cable 7XV5100-0/BB



Digs201g

Fig. A.5 Contact assignments for cable 7XV5100-1



Digs202g

Fig. A.6 Contact assignments for cable 7XV5100-2

Appendix A

DIGSI V 3.3 Operating and Analysis Software – Instruction Manual Order No. E50410–B0000–U500–A4–7691

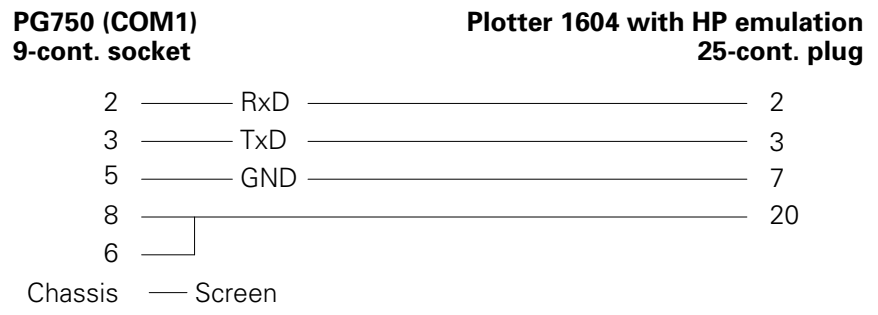


Fig. A.7 Contact assignments for cable 7XV5100–3

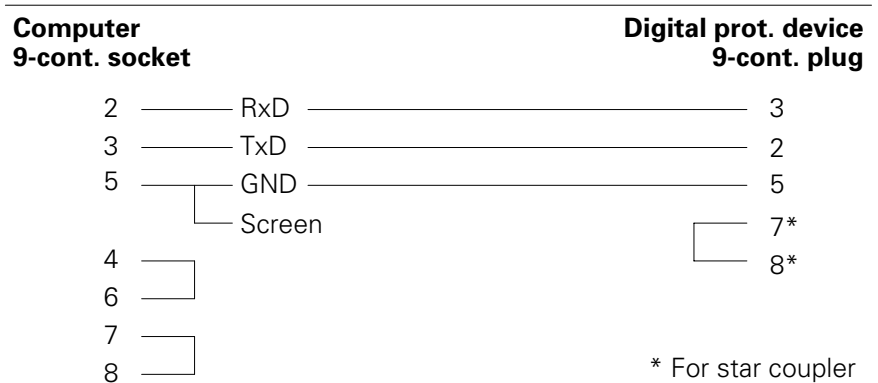


Fig. A.8 Contact assignments for cable 7XV5100–4

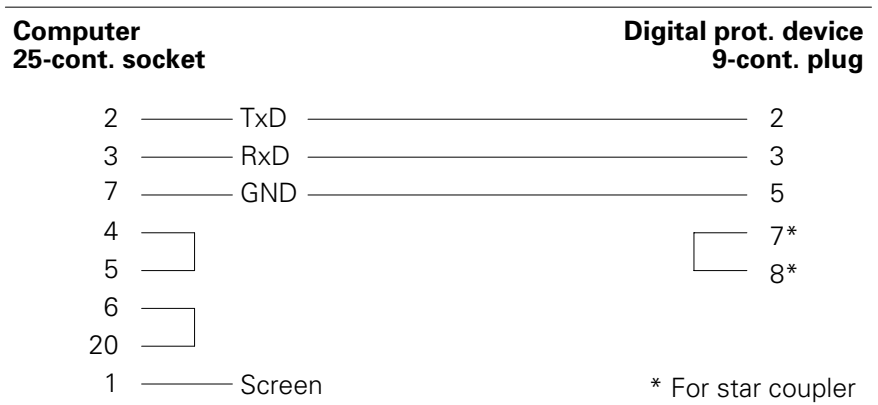


Fig. A.9 Contact assignments for cable 7XV5100–5

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Computer 9-cont. socket		Channel multiplexer 7XV55 9-pin plug
1	DCD	1
2	RxD	2
3	TxD	3
4	DTR	4
5	GND	5
6	DSR	6
7	RTS	7
8	CTS	8
		9

Fig. A.10 Contact assignments for cable 7XV5100-4A

Opto-electronic converter modules are integrated in the plugs and sockets of the optical cables. The cables are suitable for V.24 data transmission over short distances. The power supply is obtained from the data circuit.

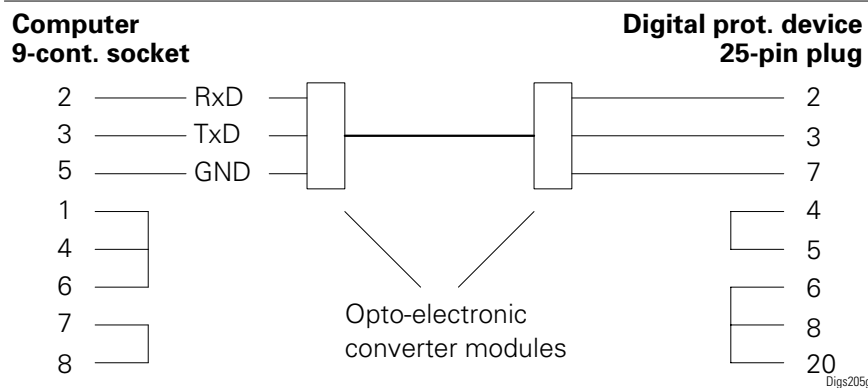


Fig. A.11 Contact assignments for cable 7XV5100-6B/6C

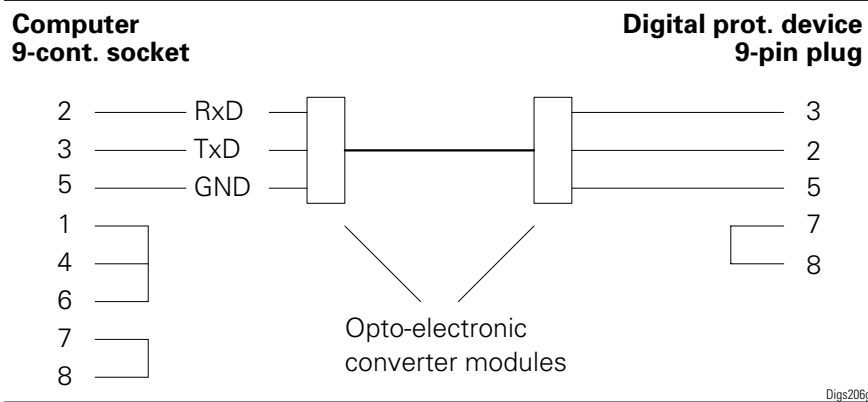


Fig. A.12 Contact assignments for cable 7XV5100-6D/6E

A.7 Settings on the Protection Device

You must carry out a number of settings on the protection device before establishing the connection between DIGSI and such a device. These depend on the interface selected on the protection device and on the current dialog mode. These settings are summarized in Tables A.7 to A.9.

Table A.7 Settings on protection device
with operation via PC interface

Address	Meaning	Setting
7211	PC interface	DIGSI V3
7215	PC baud rate	_____
7216	PC parity	DIGSI V3

Table A.8 Settings on protection device
with operation via system interface

Address	Meaning	Setting
7221	System interface	DIGSI V3
7225	System baud rate	_____
7226	System parity	DIGSI V3
7235	Parameterization permissible via system interface	Yes
7201	Device address	(as set in DIGSI)
7202	Feeder address	(as set in DIGSI)
7203	Substation address	(as set in DIGSI)

Table A.9 Settings on protection device
with dialog mode "... via star coupler"

Address	Meaning	Setting
7201	Device address	(as set in DIGSI)
7202	Feeder address	(as set in DIGSI)
7203	Substation address	(as set in DIGSI)

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Appendix

A.8 Communication

The following sections provide special information and examples on the topic "Communication".

A.8.1 Protection Devices to ASCII and VDEW Standards

Two types of protection devices can be operated with DIGSI:

- ⊙ Protection devices according to the ASCII standard
- ⊙ Protection devices according to the VDEW standard

ASCII standard

The first type includes (older) devices which are operated with the DOS-DIGSI module by replacing data in ASCII format. In principle, the keyboard and display functions of the protection device are accessible on the computer via the serial interface. Data are only transmitted when the operator uses the computer keyboard to trigger corresponding actions.

VDEW standard

The second type is the family of (newer) protection devices according to the VDEW standard. Communication is on the basis of the VDEW protocol which has been standardized by the VDEW/ZVEI especially for this purpose. The standard comprises the **physical interfaces**, the **fundamental transmission services**, the **data structure** and the **complex procedures**. The latter include, for example, the triggering and acknowledgement of commands (command procedure) or the transmission of fault data (fault data transmission procedure).

The standards for the physical interfaces and the fundamental transmission services are used in DIGSI without change. On the other hand, the data structures have been specially designed taking into account the corresponding VDEW specifications.

Addressing of protection devices

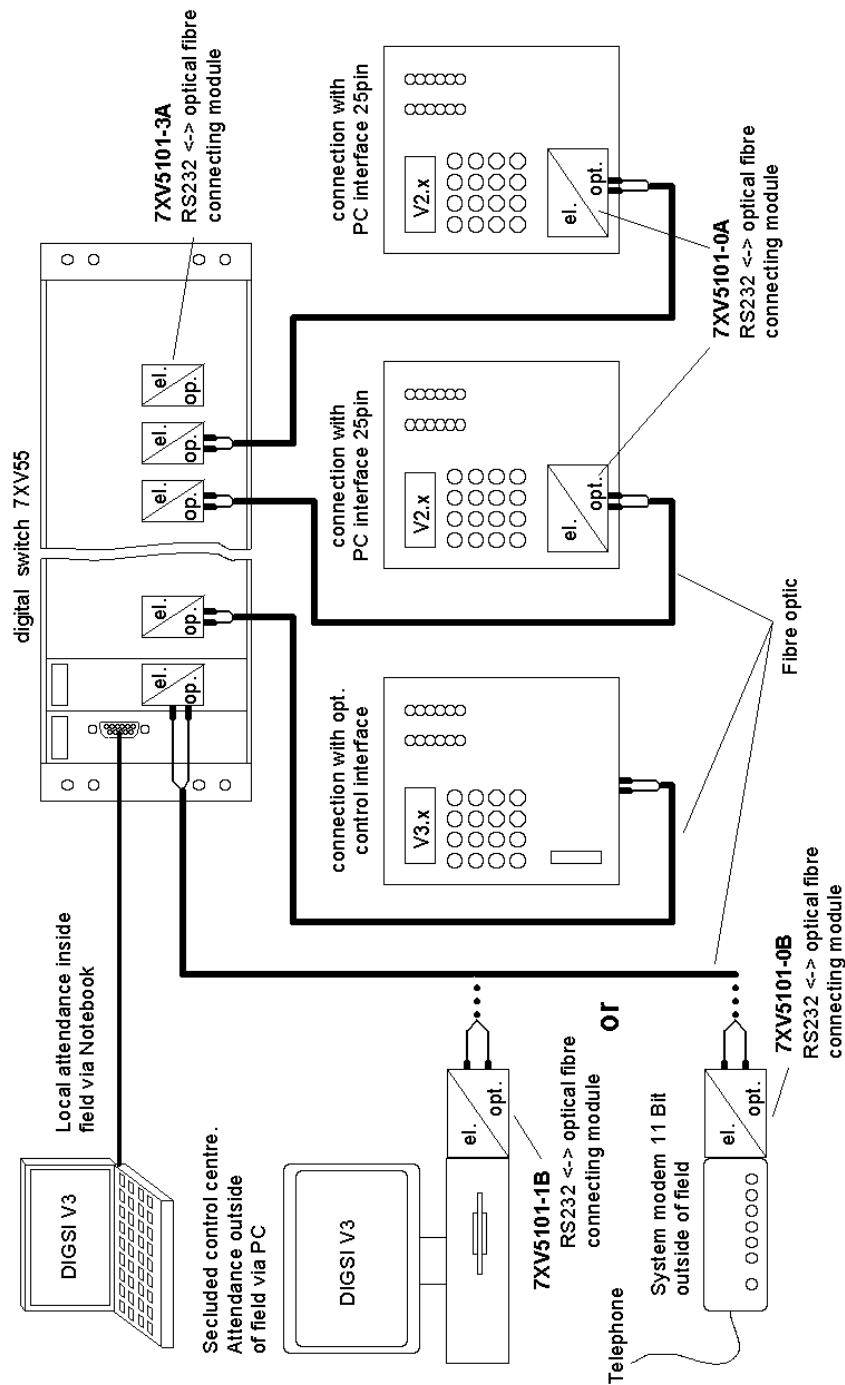
An important feature of the VDEW protocol is that the protection devices can be addressed. A protection device only replies if it is addressed appropriately. Thus several protection devices can be connected to one computer interface via a star coupler. This is not possible for protection devices according to the ASCII standard.

An exception in the addressing is the address "0". The protection device always answers in this case by returning its own address. This procedure is used by DIGSI if a connection is established to a temporary protection device or if the establishment of a connection with the defined address is initially unsuccessful.

Permanent data transfer

A further feature of the VDEW protocol is the permanent data transfer following establishment of the connection, even if no actions are carried out by the operator. Therefore a physical connection from the computer to the protection device must be permanently present during the dialog.

A.8.2 Example Configurations for Operation with Additional Equipment



Digs283g

Fig. A.13 Example of configuration for operation with channel multiplexer

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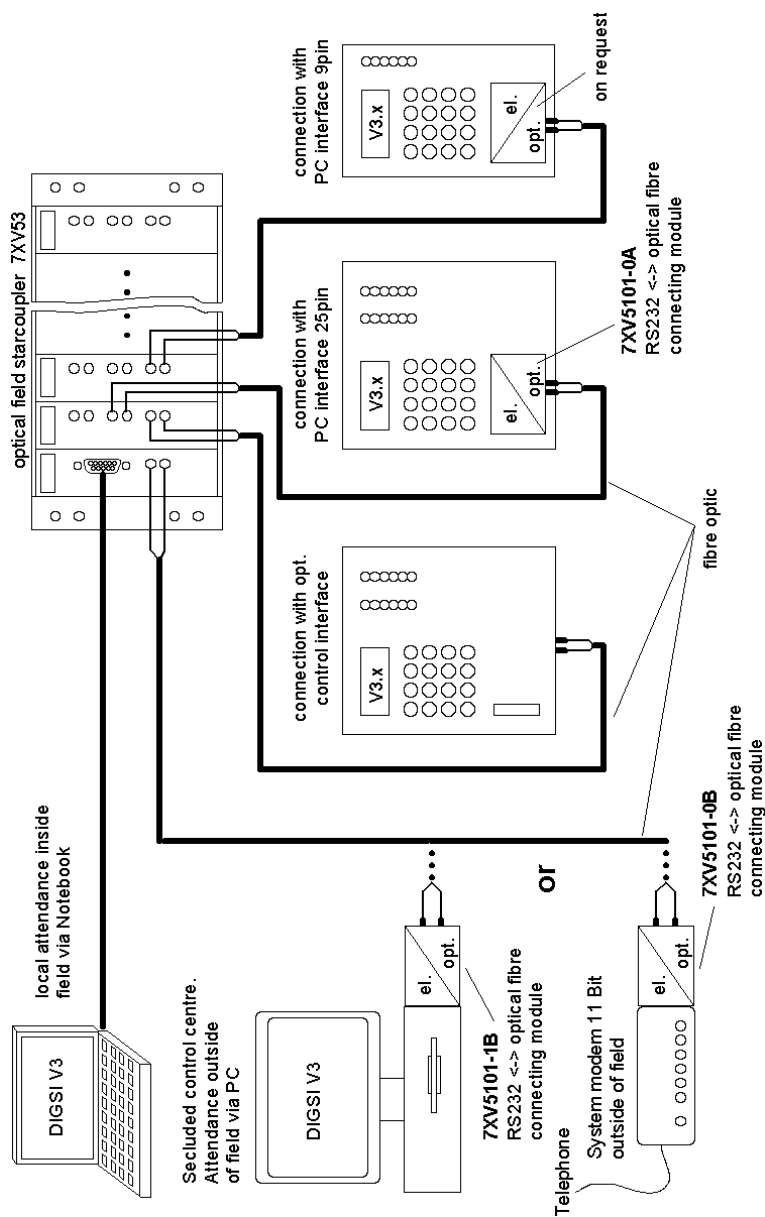


Fig. A.14 Example of configuration for operation with star coupler

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A.8.3 Operation with Channel Multiplexer 7XV55

A channel multiplexer is always required if protection devices according to the ASCII standard are to be remote-controlled in addition to VDEW devices. Each ASCII device must be connected to a separate channel of the multiplexer. The access operations "I/O-interface" and "Local interface" are supported by DIGSI.

Handling Handling of the multiplexer itself is relatively non-critical provided you have carefully set the individual channels to the protection device transmission parameters. In Section 6.2.2 you will find the general procedure for influencing the general settings at the interfaces to the protection devices. Here you will find the concrete settings for all relevant parameters.

Internal modem The channel multiplexer can be fitted and operated with an internal modem. However, since this modem does not support operation with parity, we recommend that you use the multiplexer in conjunction with a modem connected to the I/O-interface

A.8.3.1 Connect the PC to the channel multiplexer

Connect the PC to the channel multiplexer via the front local interface. Use a copper cable for this.

A.8.3.2 Set data format for local interface

The data format of the local interface is set with the help of DIL switches S1-1 to S1-4. These switches are located on the front panel of the channel multiplexer.

You can configure the channel multiplexer and its interfaces to the protection devices via DIGSI. For this purpose, the following settings must be selected for the data format of the local interface:

Baud rate	9600
Data bits	8
Parity	even
Stop bits	1

These settings are implemented by the following switch settings:

S1-1	S1-2	S1-3	S1-4
OFF	OFF	OFF	ON

"OFF" corresponds to switch position "up".
 "ON" corresponds to switch position "down".

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A.8.3.3 Set data format for I/O interface

The data format of the I/O interface is set with the help of DIL switches S3-1 to S3-7. These switches are located on the main board of the channel multiplexer.

To guarantee reliable operation even with an 11-bit modem at 14400 baud, the following settings have proved to be favourable:

Baud rate	9600
Data bits	8
Parity	even
Stop bits	1

These settings are implemented by the following switch settings:

S3-1	S3-2	S3-3	S3-4	S3-5	S3-6	S3-7
OFF	OFF	ON	OFF	OFF	ON	ON

"OFF" corresponds to switch position "up".

"ON" corresponds to switch position "down".

A.8.3.4 Master reset

A master reset should be carried out before initial commissioning and in particular **before configuration** of the channel multiplexer. This resets all settings to a defined status.



Careful!

A master reset deletes all settings, including interface parameters such as baud rate or data flow control. You should therefore carry out a master reset **before** you enter individual settings.

1. Switch the channel multiplexer off.
2. Keep the "Remote Local" button pressed and switch the channel multiplexer on again.
3. Observe the status display of the channel multiplexer. After 2 seconds the message "**rC**" appears in the display. This means that the password is being reset. Then the message "**00**" appears. This means that the password has been reset. If you only wish to reset the password, release the "Remote Local" button now. Continue with step 5.
4. To reset all configuration parameters, keep the "Remote Local" button pressed. After 8 seconds the message "**rP**" appears in the display. This means that all configuration parameters are being reset. The following message "**00**" means that all configuration parameters have been reset.
5. When the channel multiplexer has successfully completed the reset routine, this is confirmed in the status display by the message "**PL**".

The channel multiplexer is now idle, and scans the local and I/O interfaces for a possible connection. Since the password is also reset during a master reset, access authorization may have to be reissued.

A.8.3.5 General settings for interfaces to the protection devices

In Section 6.2.2 you will find the general procedure for influencing the general settings at the interfaces to the protection devices. Here you will find the concrete settings for all relevant parameters.

Enter name of interface A name (e.g. destination device) can be entered for each interface of the channel multiplexer. In DIGSI, this name is assigned to the appropriate connected protection device.

Parameter	Label Port
Meaning	Name of interface
Access	"a" and <input type="button" value="↵"/>
Message/default setting	Old label was <alter Name> >Please enter new label, up to 30 characters
Input	Enter a name with a maximum of 30 random characters. Confirm your input by pressing <input type="button" value="↵"/> .

Define password for interface A password can be entered for each interface of the channel multiplexer. In practice, however, this must not happen, since otherwise it is not possible to operate the protection devices via DIGSI.

Parameter	Password
Meaning	Password for interface
Access	"d" and <input type="button" value="↵"/>
Message/default setting	<empty>
Input	This setting must not be changed.

Set internal modem and callback The optional internal modem of the channel multiplexer and its callback are not supported by DIGSI. The appropriate parameters must therefore retain the factory settings.

Parameter	Call request
Meaning	Parameter for callback
Access	"b" and <input type="button" value="↵"/>
Message/default setting	None
Input	This setting must not be changed.

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Parameter	Call out
Meaning	Parameter for callback
Access	"c" and <input type="checkbox"/>
Message/default setting	Off
Input	This setting must not be changed.

Parameter	Call string
Meaning	Parameter for callback
Access	"e" and <input type="checkbox"/>
Message/default setting	<empty>
Input	This setting must not be changed.

Parameter	Modem string
Meaning	Parameter for internal modem
Access	"f" and <input type="checkbox"/>
Message/default setting	<empty>
Input	This setting must not be changed.

Parameter	Remote string
Meaning	Parameter for internal modem
Access	"g" and <input type="checkbox"/>
Message/default setting	<empty>
Input	This setting must not be changed.

Parameter	Port string
Meaning	Parameter for internal modem
Access	"h" and <input type="checkbox"/>
Message/default setting	<empty>
Input	This setting must not be changed.

Parameter	Port priority
Meaning	Parameter for callback
Access	"i" and <input type="checkbox"/>
Message/default setting	<empty>
Input	This setting must not be changed.

Set data flow control for local interface

Transmission of the signals via the two available optical fibre cables is not possible. For this reason, data flow control is not supported by DIGSI or the protection devices.

Parameter	Local Port DTR: – On
Meaning	Parameter for data flow control
Access	“i” and <input type="button" value="↵"/>
Message/default setting	Monitor Local Port DTR {Y/N} [Y]:_
Input	“N” and confirmation by pressing <input type="button" value="↵"/>

Parameter	Local Port DTR: – On
Meaning	Parameter for data flow control
Access	“k” and <input type="button" value="↵"/>
Message/default setting	Enable XON/XOFF at Modem & Local [Y]:_
Input	“N” and confirmation by pressing <input type="button" value="↵"/>

Parameter	Local Port DTR: – On
Meaning	Parameter for data flow control
Access	“L” and <input type="button" value="↵"/>
Message/default setting	0 None >1 RTS/CTS >2 DSR/DTR >3 XON/XOFF
Input	“0” and confirmation by pressing <input type="button" value="↵"/>

A.8.3.6 Device-specific settings for interfaces to the protection devices

In Section 6.2.2 you will find the general procedure for influencing the device-specific settings at the interfaces to the protection devices. Here you will find out the concrete settings, depending on the protection device version used.

V2 devices	Version V2 protection devices with communication in the form of ASCII character transfer should be operated with the following settings:
Baud rate	1200
Data bits	8
Parity	none
Stop bits	2

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V3 devices Version V3 protection devices with communication according to the VDEW protocol should be operated with the following settings:

Baud rate	9600
Data bits	8
Parity	even
Stop bits	1

A.8.3.7 Connect the protection devices to the channel multiplexer

Regardless of type, the protective devices are connected to the rear ports of the channel multiplexer. To do this, use 7XV5101-3A optical fibre connecting modules and 6XV81 fibre optic cables.

V2 devices Connect up the Version V2 protection devices using their front operating interface. Use the 7XV5101-0A optical fibre connecting modules and the 7XV5101-8x right-angle connector.

V3 devices If possible, connect up the Version V3 protection devices using their optical fibre system interfaces. Alternatively, you can also connect up these protection devices using their front operating interface. Use the 7XV5101-0A optical fibre connecting modules and the 7XV5101-8x right-angle connector.

A.8.3.8 Connect the modem to the channel multiplexer

Establish the connection to the modem via the rear I/O interface of the channel multiplexer. You require the 7XV5101-1A optical fibre connecting module for connection to the I/O interface and the 6XV81 cable. For connection to the modem, you require the 7XV5101-0B optical fibre connecting module.

A.8.4 Operation with Modem

The starting-up of a modem link from the computer to protection device may present problems in certain cases. You should therefore always follow the advice presented below.

Parity The VDEW protocol achieves a very high transmission reliability by using, *inter alia*, an even parity, but this is supported by only a few modems. If you wish to use modems without parity, you must switch off the parity bit both on the protection device and in DIGSI. This of course results in a corresponding reduction in the transmission reliability.

Data compression and error correction

Data compression and error correction are usually used nowadays for data transmission between modems. Both procedures result in the generation of gaps in the data stream; these are not permitted within a telegram according to VDEW. The first generation of VDEW protection devices is therefore not "gap-tolerant", and the data compression and error correction must therefore be switched off in this case. In newer devices, the gap tolerance is taken into account by a parameter.

Minimum acceptable data quantity

Since protection devices cannot handle handshake signals, the modem must be able to accept at least 256 bytes. This corresponds to the maximum permissible telegram length. With some modems, the size of the buffer is matched to the internal block size of the data packets, and is therefore dependent on the quality of the transmission link. This option must therefore be deactivated.

Setting the baud rates

The transmission links between modem and computer as well as modem and protection device must operate with fixed baud rates. At the computer interface, a modem can usually adapt itself to the baud rate which is defined by the computer with the first modem command. However, it must be suppressed that the modem automatically changes the baud rate if the quality of the transmission link permits a higher data throughput. At the protection device end, the modem must be parameterized such that the baud rate is already set to a fixed value when it is switched on. This is necessary since the protection device does not transmit on its own accord, and an automatic adaptation is therefore impossible.

When using protection devices which are not "gap-tolerant" we recommend that you set fixed baud rates of 2400 or 9600 for the complete transmission link computer-modem-modem-protection device depending on the network quality. When using gap-tolerant protection devices we recommend 9600 baud for the transmission links computer-modem and protection device-modem, and 2400 baud for the links between the modems in conjunction with error correction and data compression.

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Setting instructions for office modem

The following rules should be observed when setting the office modem:

- ⊙ DSR signal permanently ON (DIGSI uses this to check the readiness of the modem)
- ⊙ DTR signal from PC results in cancellation of connection
- ⊙ Echo and feedbacks in text form ON
- ⊙ CD signal of modem indicates carrier signal
- ⊙ Do not change baud rate on PC interface
- ⊙ Switch off data compression and error correction when using protection devices which are not "gap-tolerant"

Setting instructions for substation modem

The following rules should be observed when setting the substation modem:

- ⊙ DSR signal permanently ON
- ⊙ DTR signal permanently ON
- ⊙ Echo and feedbacks off
- ⊙ Fixed baud rate and data format following switching on
- ⊙ Switch off data compression and error correction when using protection devices which are not "gap-tolerant"

A.8.5 Notes on modem configuration

To establish and clear a connection by modem, DIGSI requires some individual commands for the office modem. These are identical for practically all modems with a Hayes-compatible instruction set. They can be edited in the dialog for configuring the office modem, or read in by means of a preset option.

The office modem is initialized by Digsig at the beginning of each connection. The modem settings of the office modem therefore do not have to be stored permanently.

All settings not covered by the individual commands, or all settings of the substation modem (individual commands are not required here) can be entered under "Other" (office modem) or "Initialization" (substation modem).

The substation modem is initialized once and the settings are saved in the non-volatile memory, so that they are available every time the substation modem is switched on.

The hardware handshake signals (CTS/RTS) should be switched off in the office as well as in the substation modem. They are not required for the VDEW protocol (message length < 256 bytes) and are not served by DIGSI or the protection device.

To terminate a modem connection, DIGSI gives the Cancel and Hangup commands to the modem and resets the DTR signal. If only VDEW protection devices are served, the evaluation of the DTR signals in the office modem should be configured to hang up (initialization command: &D2).

Since DOS–DIGSI does not support the DTR signal, the DTR signal must be ignored by the modem – if ASCII protection devices are also to be served (initialization command: &D0 and/or DIP switch).

Only the settings entered under “Other” or “Initialization” are explained in the following.

A.8.5.1 Standard Hayes

This contains the modem settings that can be carried out by means of standard AT commands. Select these as defaults if you are using a modem other than those listed below but still Hayes–compatible. Supplement these with the additional settings required.

Office modem	AT &D2	for DTR signal switch HIGH→LOW: hang up, command mode
	&C1	DCD signal indicates connection (normal processing)
Substation modem	AT &D0	DTR signal is set internally to constant HIGH
	Q1	Acknowledgements off
	E0	Echo off
	S0=1	automatic reception after first call tone
	&W	save setting in non–volatile memory

A.8.5.2 Siemens #8345–1 (identical with MT 1432 BG)

Setting with even parity, fixed transmission speed, without error correction, without data compression. Specially for VDEW protection devices that are not “gap–tolerant”, transmission security is guaranteed through the use of parity. Settings are also valid for MT 2834.

Office modem	AT &F	Factory setting
	&D2	for DTR signal switch HIGH→LOW:hang up, command mode
	\$EB1	11–bit data frame
	#P2	even parity
	\$SB9600	Interface speed PC–modem 9600 baud fixed
	\$MB9600	connection speed 9600 bit/s fixed
	&E0	without error correction
	&E3	without data flow control (handshake) from modem
	&E12	without data flow control (handshake) from PC
	&E14	without data compression
	&SF1	DSR signal independent of DCD signal
	&S0	DSR signal always on

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Substation modem	AT &F	Factory setting
	AT &D0	DTR signal is set internally to constant HIGH
	\$EB1	11-bit data frame
	#P2	even parity
	\$SB9600	Interface speed protection device–modem 9600 baud fixed
	\$MB9600	connection speed 9600 bit/s fixed
	&E0	without error correction
	&E3	without data flow control (handshake) from modem
	&E12	without data flow control (handshake) from protection device
	&E14	without data compression
	E0	Echo off
	Q1	Acknowledgements off
	S0=1	automatic reception after first call tone
	&W	save setting in non-volatile memory

A.8.5.3 Siemens #8345-1/ARQ (identical with MT 1432 BG)

Setting with even parity, error correction and data compression. You can only use this setting in conjunction with "gap-tolerant" VDEW protection devices. The connection speed between the modems of 2400 bit/s reduces the demands made on the transmission link and is matched to the interface speed between PC/protection device and modem through data compression. Settings are also valid for MT 2834.

Office modem	AT &F	Factory setting
	&D2	for DTR signal switch HIGH->LOW: hang up, command mode
	\$EB1	11-bit data frame
	#P2	even parity
	\$SB9600	Interface speed PC–modem 9600 baud fixed
	\$MB9600	connection speed 2400 bit/s fixed
	&E1	automatic error correction
	&E3	without data flow control (handshake) from modem
	&E12	without data flow control (handshake) from PC
	&E15	with data compression
	&SF1	DSR signal independent of DCD signal
	&S0	DSR signal always on

Substation modem	AT &F	Factory setting
	AT &D0	DTR signal is set internally to constant HIGH
	\$EB1	11-bit data frame
	#P2	even parity
	\$SB9600	Interface speed protection device–modem 9600 baud fixed
	\$MB9600	connection speed 2400 bit/s fixed
	&E1	automatic error correction

Substation modem (continued)	&E3 &E12 &E15 E0 Q1 S0=1 &W	without data flow control (handshake) from modem without data flow control (handshake) from protection device with data compression Echo off Acknowledgements off automatic reception after first call tone save setting in non-volatile memory
-------------------------------------	---	---

A.8.5.4 US Robotics Courier

Setting without error correction and without data compression. Specially for VDEW protection devices that are not "gap-tolerant". Since this modem cannot transmit an 11-bit data frame and thus no parity bit, transmission reliability is adversely affected.

Office modem	AT &F1 &D2 &C1 \$MB9600 &K0 &M0 X5 &R0 S57=1	Default 1 for DTR signal switch HIGH->LOW: hang up, command mode DCD signal indicates connection (normal processing) connection speed 9600 bit/s fixed Data compression off Error correction off Answer mode "no dial tone" off (for PABX) CTS signal for DOSDIGSI (?) Redial after 30s pause
Substation modem	AT &F1 AT &D0 &C1 &N6 &K0 &M0 &R1 S0=1 E0 Q1 &W	Default 1 DTR signal is set internally to constant HIGH DCD signal indicates connection (normal processing) connection speed 9600 bit/s fixed Data compression off Error correction off no handshake for received data automatic reception after first call tone Echo off Acknowledgements off save setting in non-volatile memory

A.8.5.5 US Robotics C/ARQ

Setting with even parity, error correction and data compression. You can only use this setting in conjunction with "gap-tolerant" VDEW protection devices.

The connection speed between the modems of 2400 bit/s reduces the demands made on the transmission link and is matched to the interface speed between PC/protection device and modem again through data compression.

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Office modem	AT	&F1	Default 1
		&D2	for DTR signal switch HIGH→LOW: hang up, command mode
		&C1	DCD signal indicates connection (normal processing)
		&N3	connection speed 2400 bit/s fixed
		X5	Answer mode "no dial tone" off (for PABX)
		&R0	CTS signal for DOSDIGSI (?)
Substation modem	S57=1		Redial after 30s pause
	AT	&F1	Default 1
	AT	&D0	DTR signal is set internally to constant HIGH
		&C1	DCD signal indicates connection (normal processing)
		&N3	connection speed 2400 bit/s fixed
		S0=1	automatic reception after first call tone
		&R1	no handshake for received data
		E0	Echo off
		Q1	Acknowledgements off
		&W	save setting in non-volatile memory

A.8.6 Preparations for operation using callback procedure

In conjunction with the establishment of a modem connection, the callback procedure provides increased protection against unauthorised access. Before operation using callback procedure, however, some preparations are required. These can be divided into three sections:

1. Configuring the office modem in DIGSI and then initialising the office modem.
2. Configuring the substation modem in DIGSI and then initialising the substation modem.
3. Setting and saving the callback parameters in the substation modem.

All of the settings shown in the following are applicable for the modems MT1432BG, MT2834BLG and MT2834LTI.

A.8.6.1 Configuring and initialising the office modem

Open the dialog box "Office Modem New" as shown in Fig. 6/7. Enter a description for the office modem in the "Modem Description" input box. The best idea is to use the type designation of the modem, for example "MT2843BLG". Select the setting "S Siemens #8345-1" from the "Preset" dropdown list.

After the preset has been selected, an initialisation string is shown in the "Other" input box. Change this string by deleting the command "\$MB9600". The initialisation string must now be as follows:

Initialisation string

```
AT &F &D2 $EB1 #P2 $SB9600 &E0 &E3 &E14 &SF1 &S0
```

The effect of the change is to ensure that the office and the substation modems can agree on a random baud rate when the connection is being established. If this were not possible, no connection could be established during the callback of the substation modem. The remaining modem parameters remain unchanged.

Initialising the office modem

Initialise the connected office modem using the preset parameters. Section 6.2.5.1 describes how to do this. After initialisation click on the "OK" button to close the current dialog box.

A.8.6.2 Configuring and initialising the substation modem

Open the dialog box "New Substation Modem" as shown in Fig. 6/16. Enter a description for the substation modem in the "Modem Description" input box. The best idea is to use the type designation of the modem, for example "MT2843BLG". Select the setting "S Siemens #8345-1" from the "Preset" dropdown list.

After the preset has been selected, an initialisation string is shown in the "Initialisation" input box. Change this string by deleting the command "\$MB9600". Then change the command "E0" to "E1" and the command "Q1" to "Q2". The initialisation string must now be as follows:

Initialisation string for first initialisation

```
AT &F &D0 $EB1 #P2 $SB19200 &E0 &E3 &E12 &E14 E1 Q2 S0=1 &W
```

The effect of deleting "\$MB9600" is to ensure that the office and the substation modems can agree on a random baud rate when the connection is being established. If this were not possible, no connection could be established during the callback of the substation modem.

The changes in the "E0" and "Q1" commands allow the input and feedback to be read while the callback parameters are being set in the substation modem (see next chapter).

The effect of the command "&F" within the initialisation string is to ensure that the settings in the substation modem have a defined status. All callback parameter settings already entered are deleted. It is therefore essential that the command "&F" should be removed after the first initialisation of the substation modem.

Initialising the substation modem

Initialise the connected substation modem using the preset parameters. Section 6.2.6.1 describes how to do this. Now delete the command "&F" from the initialisation string. The initialisation string must now be as follows:

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Initialisation string for further initialisation operations

```
AT &D0 $EB1 #P2 $SB19200 &E0 &E3 &E12 &E14 E1 Q2 S0=1 &W
```

Mark the "Password" control box to protect the establishment of a connection by a password. Then enter "CONNECT" in the "Acknowledgement Text" input box. Then mark the "Callback" control box to additionally protect the establishment of the connection using the callback procedure.

Leave the current dialog box open for the time being so that you can carry out the callback parameter settings in the substation modem.

A.8.6.3 Setting and Saving the Callback Parameters in the Substation Modem

The substation modem still requires the information about what telephone number it should use for the callback, depending on the password received. The callback password as well as the callback number are stored in the internal modem memory. Up to thirty such matching parameter pairs can be stored in the substation modem.

To transmit the required information to the substation modem, use the DIGSI "Read out" function. This function allows you to transmit individual commands and settings successively to the substation modem.

Basic Procedure

In the "New Substation Modem" dialog box as shown in Fig. 6/16 click the "Read out" button. The "Read out substation modem" dialog box is opened, as in Fig. 6/20. Enter the required command in the "Read command" input box. Confirm your input by clicking on "OK". The command is transmitted to the substation modem.

When the command has been transmitted successfully, the "Settings substation modem" dialog box as shown in Fig. 6/22 is opened. "OK" appears in the display area of this dialog box as an acknowledgement that the command has been transmitted. Select the "Close" button to return to the "New Substation Modem" dialog box. Repeat this operation for all commands and settings that have to be transmitted to the substation modem. When all of the necessary information has been transmitted, you can close the "New Substation Modem" dialog box. To do this, click on "OK".

Overview of commands and settings

The following commands and settings are transmitted successively to the substation modem in the order shown. **Before carrying out any settings for the first time, it is essential that you should read the notes at the end of this overview.**

Enter logon password	AT#IMULTI–TECH (or modified logon password)
Enter setup password	AT#SMODEMSETUP (or modified setup password)
Modify logon password (optional)	AT#I=new logon password
Modify setup password (optional)	AT#S=new setup password
Enter callback authorisation	AT#DB1
Enter first callback password	AT#CBN0password 1
Enter first callback number	ATxxxxxxxN0
Enter second callback password (optional)	AT#CBN0password 2
Enter second callback number (optional)	ATxxxxxxxN1
Enter thirtieth callback password (optional)	AT#CBN0password 30
Enter thirtieth callback number (optional)	ATxxxxxxxN29
Show list of settings (optional)	ATL
Save settings	AT&W

Notes on overview

First enter the logon password to the substation modem and then the setup password. Both passwords can be changed.



Caution!

Be sure to remember changed passwords. Only after both passwords have been entered can any settings be changed!

The next step is to transmit the callback authorisation #DB1 to the substation modem. From this point on, changes can only be made by entering the logon and setup passwords.



Caution!

Transmitting the #DB1 command deletes all callback passwords and numbers stored in the substation modem. Now transmit the first callback password and then the corresponding callback number to the substation modem. Replace the string "xxxxxxx" with the telephone number. You must also consider whether the callback is to be made from an extension line and whether tone or pulse dialling is used.

If your modem is connected to a digital network, for example ISDN, the modem must establish the connection using tone dialling. In this case the characters "DT" must be added to the telephone number. If, on the other hand, pulse dialling is used, the characters "DP" must be added to the telephone number.

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If your modem is connected to an extension line, you must remember the following settings:

- ⊙ the number for obtaining an outside line, e.g. "0";
- ⊙ the time to wait after the outside line number has been dialled before dialling the rest of the number; each second is represented by a comma, whereas the character "w" means that the modem waits until it hears the dialling tone;
- ⊙ preparation of the modem; the character combinations "X3" or "X4" are possible.

For example, the string "**ATX3DT0,,1234567**" has the following meaning:

- ⊙ the modem uses tone dialling (DT),
- ⊙ it is connected to an extension line (preparation with X3),
- ⊙ the number "0" is used to obtain an outside line,
- ⊙ there is to be a pause of 2 seconds before the rest of the number is dialled (,,),
- ⊙ the telephone number is "1234567".

Repeat the operation for further callback passwords and callback numbers as required. Check your input by listing your settings. Then save these settings. After they have been saved, they can only be changed again by first entering the logon and setup passwords.

A.8.7 Examples of Read Commands

Read commands are specific to the modem. Below is an example of read commands for the modem "Courier Dual Standard V.34/V.FC with Fax":

Table A.10 Examples of read commands

Command	Meaning
AT13	Duration of call
AT14	Current settings
AT15	NVRAM settings
AT16	Summary of connection diagnosis

Refer to the documentation of your substation or office modem for the relevant read commands.

A.8.8 DICOMM Error Messages

The communication functions of the VDEW protocol are implemented for DIGSI in the program file DICOMM.DLL. The functions are divided into three layers. Errors which occur in DICOMM are indicated by the error text "DICOMM/x: <error text>". The dummy value "x" represents the layer in which the error was detected (1, 2 or 7).

In addition to this, DICOMM.DLL provides direct access to the serial interfaces of the computer. This direct access is required, for example, to set the modem or channel multiplexer. The functions of the serial interface are thus decoupled from the operating system and the computer hardware.

The VDEW protocol contains a number of specifications which require real-time capability in certain areas. DICOMM.DLL therefore uses the facilities provided by WINDOWS components which, under certain circumstances, may no longer be available if the WINDOWS configuration has been changed. This is usually evident in that the error message "DICOMM/2: timeout when sending" is output. Contact the DIGSI hotline in such a case to obtain information on how to eliminate this error (see Appendix A.12).

A summary of certain DICOMM errors is provided below together with information on troubleshooting. If the measures described are unsuccessful, please contact the DIGSI hotline.

- © **DICOMM/1: Error in assignment of COM port**
An attempt has been made to use a COM port which is occupied by WINDOWS for another purpose. Check whether other applications are already using the port set under DIGSI. Note with modem operation that the port setting is stored in the modem configuration of the used office modem.
- © **DICOMM/2: Timeout when sending**
The WINDOWS configuration on your computer is not compatible with DICOMM. This error is often caused by preinstalled software which changes settings in the SYSTEM.INI file of WINDOWS. In particular, the virtual driver "vcd" of WINDOWS must not be replaced by other drivers (entry: "device = *vcd" in the group [386Enh]). It is advisable to contact the DIGSI hotline for troubleshooting.
- © **DICOMM/2: Timeout when receiving**
DIGSI could not receive an answer from the protection device within the response time even after three repeats. The reasons for this error extend from a non-connected cable up to incorrect parameterization of the interface in the protection device. A simple break-out box may be helpful for troubleshooting. This should be equipped with at least one LED pair each (red and green) for the transmit and receive lines. The box can be connected in between at various positions in the connection.

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In the idle state, the transmit and receive lines must be at Low level (green LED). If only one LED is lit, either the signal from one device is missing or the transmit and receive lines have been interchanged. During operation you can recognize the DIGSI requests by brief lighting up of the corresponding red LED, and the replies of the protection device on the other LED. The red protection device LED remains off if the replies are missing.

If this error occurs sporadically when the connection has already been established, it might be useful to increase the response time if the set value is less than 3000 ms. Higher values are not usually meaningful, the error then probably has a different reason.

⊙ **DICOMM/2: DFC bit does not go to 0**

The protection device is not ready to receive data from DIGSI. If you are working with a DIGSI version \leq V3.1x and if this error occurs when transmitting marshallings, you can increase the response time to a maximum of 5000 ms. Otherwise please contact the DIGSI hotline.

⊙ **DICOMM/7: Protection device does not work**

This error occurs if DIGSI has to wait for the reply to data requests for longer than 6 minutes. Communication is taking place, but the protection device replies to every request with "No data available". VDEW protection devices of the first generation occasionally generate this error following the transmission of parameters or when terminating the DIGSI session.

If the error has already been signalled, the protection device should be ready again after approx. 20 s. If DIGSI is still in the wait phase, you can provoke an intentional timeout by opening up the connection (disconnect plug from COM port) and reestablish the connection after 20 s.

⊙ **DICOMM/7: Layer 7 occupied**

DICOMM/1: Coord. error in layer 1: layer 1 occupied

DICOMM/2: Coord. error in layer 2: layer 2 occupied

This error should only occur in operation with a modem. The reason may be an unfavourable ratio between the set protection device response time and the value of the parameter "Gap tolerance" specific to the protection device. Extremely different baud rates in DIGSI and the protection device may also play a role. Set the baud rates according to the recommended values. Select the basic setting for the response time.

A.9 Computation formulae for DIGRA

In the following you will find all computation formulae used in DIGRA.

RMS values of voltages U1 to U4

N = sampling points per period,
e.g. 100 at 5000 Hz or 20 at 1000 Hz,
each at a signal frequency of 50 Hz

$$U_{x_eff} = \sqrt{\frac{1}{N} \sum_{n=1}^N u_x^2(n)}$$

Digs330g

Fig. A.15 Computation of RMS values of voltages U1 to U4

RMS values of currents I1 to I4

N = sampling points per period,
e.g. 100 at 5000 Hz or 20 at 1000 Hz,
each at a signal frequency of 50 Hz

$$I_{x_eff} = \sqrt{\frac{1}{N} \sum_{n=1}^N i_x^2(n)}$$

Digs331g

Fig. A.16 Computation of RMS values of currents I1 to I4

Active power P1 to P3 → in star-type network

N = sampling points per period,
e.g. 100 at 5000 Hz or 20 at 1000 Hz,
each at a signal frequency of 50 Hz

$$P_x = \frac{1}{N} \sum_{n=1}^N u_x(n) i_x(n)$$

Digs332g

Fig. A.17 Computation of the active power P1 to P3 → in star-type network

Reactive power Q1 to Q3 → in star-type network

N = sampling points per period,
e.g. 100 at 5000 Hz or 20 at 1000 Hz,
each at a signal frequency of 50 Hz

$$Q_x = \frac{1}{N} \sum_{n=1}^N u_x(n - \frac{\pi}{2}) i_x(n)$$

Digs334g

Fig. A.18 Computation of reactive power Q1 to Q3 → in star-type network

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Active power → in delta-type network

N = sampling points per period,
e.g. 100 at 5000 Hz or 20 at 1000 Hz,
each at a signal frequency of 50 Hz

$$P_{\Sigma} = \frac{1}{N} \sum_{n=1}^N [u_{23}(n)i_2(n) + u_{13}(n)i_1(n)]$$

Digs335g

Fig. A.19 Computation of the active power → in delta-type network

Reactive power → in delta-type network

N = sampling points per period,
e.g. 100 at 5000 Hz or 20 at 1000 Hz,
each at a signal frequency of 50 Hz

$$Q_{\Sigma} = \frac{1}{N} \sum_{n=1}^N \left[u_{23} \left(n - \frac{\Pi}{2} \right) i_2(n) + u_{13} \left(n - \frac{\Pi}{2} \right) i_1(n) \right]$$

Digs336g

Fig. A.20 Computation of reactive power → in delta-type network

Power factor cos φ

$$\cos \varphi = \frac{1}{\sqrt{1 + \tan^2 \varphi}}$$

Digs338g

Fig. A.21 Computation of power factor cos φ

Harmonic distortion

N = Number of Fourier coefficients used for computation.
This can be set in the program module "Evaluate" in the sub-window "Electrical characteristics II".

h(n) = Index for the nth harmonic of U or I.

$$k_U = \frac{\sqrt{\frac{1}{N} \sum_{n=2}^N U_{h(n)}^2}}{U_{h(1)}}$$

Digs334g

Fig. A.22 Computation of the harmonic distortion k_U

$$k_I = \frac{\sqrt{\frac{1}{N} \sum_{n=2}^N I_{h(n)}^2}}{I_{h(1)}}$$

Digs345g

Fig. A.23 Computation of the harmonic distortion k_I

$$U_{h(n)eff} = \sum_{k=1}^N \sqrt{\left(u(k) * \sin\left(\frac{2 \pi kn}{N} - \frac{\pi}{2}\right) \right)^2 + \left(u(k) * \cos\left(\frac{2 \pi kn}{N} - \frac{\pi}{2}\right) \right)^2}$$

Digs346g

Fig. A.24 Computation of the voltage RMS value in relation to k_U

$$I_{h(n)eff} = \sum_{k=1}^M \sqrt{\left(i(k) * \sin\left(\frac{2 \pi kn}{N} - \frac{\pi}{2}\right) \right)^2 + \left(i(k) * \cos\left(\frac{2 \pi kn}{N} - \frac{\pi}{2}\right) \right)^2}$$

Digs348g

Fig. A.25 Computation of the current RMS value in relation to k_I

Voltage asymmetry → in star-type network

Figures in %

$$SYM = \frac{U_{Geff}}{U_{Meff}} * 100$$

Digs339g

Fig. A.26 Computation of the voltage asymmetry → in star-type network

$$U_G = \frac{1}{3} \left[U_{L1} + U_{L2} \left(-\frac{2}{3\pi} \right) + U_{L3} \left(-\frac{4}{3\pi} \right) \right]$$

Digs340g

Fig. A.27 Computation of U_G in relation to voltage asymmetry

$$U_M = \frac{1}{3} \left[U_{L1} + U_{L2} \left(-\frac{4}{3\pi} \right) + U_{L3} \left(-\frac{2}{3\pi} \right) \right]$$

Digs341g

Fig. A.28 Computation of U_M in relation to voltage asymmetry

$$U_{Geff} = \sqrt{\frac{1}{n} \sum_1^n U_G^2}$$

Digs342g

Fig. A.29 Computation of U_{Geff} in relation to voltage asymmetry

$$U_{Meff} = \sqrt{\frac{1}{n} \sum_1^n U_M^2}$$

Digs343g

Fig. A.30 Computation of U_{Meff} in relation to voltage asymmetry

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Complex voltage and current values

$$U_{\text{Real}} = \sum_{k=1}^N u_{x(k)} * \cos\left(\frac{2\pi k}{N} - \frac{\pi}{2}\right)$$

Digs351g

Fig. A.31 Computation of the real part of the voltage

$$I_{\text{Real}} = \sum_{k=1}^N i_{x(k)} * \cos\left(\frac{2\pi k}{N} - \frac{\pi}{2}\right)$$

Digs352g

Fig. A.32 Computation of the real part of the complex current

$$U_{\text{Imag.}} = \sum_{k=1}^N u_{x(k)} * \sin\left(\frac{2\pi k}{N} - \frac{\pi}{2}\right)$$

Digs353g

Fig. A.33 Computation of the imaginary part of the complex voltage

$$I_{\text{Imag.}} = \sum_{k=1}^N i_{x(k)} * \sin\left(\frac{2\pi k}{N} - \frac{\pi}{2}\right)$$

Digs354g

Fig. A.34 Computation of the imaginary part of the complex current

A.10 The DIGSI.INI File

The initialization file DIGSI.INI contains necessary program settings. The file is generated during the installation and saved in the Windows directory. The initialization file is called when DIGSI is started, and its entries are used. Some of the entries can be modified by the user in interactive mode. Changes are saved in the initialization file when DIGSI is terminated.

The format of the initialization file corresponds to the Windows conventions. The various entries are described below. The explanations comprise the significance of the entry, an example or the presetting as well as explanatory remarks.

A.10.1 Group [settings]

customer= Customer name
 Example EWAG Nuremberg
 Remarks This entry is defined during the installation.

path= Directory of substations
 Example \anlagen
 Remarks This entry is defined during the installation.

drive= Substation drive
 Example c:
 Remarks This entry is defined during the installation.

rate= Baud rate of protection device
 Preset 9600
 Possible settings 1200, 2400, 4800, 9600, 19200, 38400
 Remarks This entry is defined using the dialog box "PC interface"
 (see Section 6.2.8).

com= Communication interface of the PC
 Preset 2
 Permissible range 1 ... 4
 Remarks This entry is defined using the dialog box "PC interface"
 (see Section 6.2.8).

rtime= Protection device response time
 Preset 2000
 Permissible range 50 ... 10000 [ms]
 Remarks This entry is defined using the dialog box "Protection device response
 time" (see Section 6.2.9).

minrate= Smallest possible baud rate
 Preset 1200
 Remarks This entry must not be changed.

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maxrate=	Largest possible baud rate
Preset	38400
Remarks	This entry must not be changed.
<hr/>	
repeat=	Number of repeats with which DIGSI attempts to receive a reply from the protection device.
Preset	3
Remarks	This entry must not be changed.
<hr/>	
lifebit=	Sign-of-life interval
Preset	20000
Remarks	This entry must not be changed.
<hr/>	
freqclass1=	Updating frequency for class 1 data (spontaneous annunciations)
Preset	1000
Remarks	This entry must not be changed.
<hr/>	
freqclass2=	Updating frequency for class 2 data (measurements)
Preset	2000
Remarks	This entry must not be changed.
<hr/>	
digra=	Type of graph for DIGRA
Preset	2
Possible settings	1 (primary), 2 (secondary), 3 (normalized)
Remarks	This entry is defined using the dialog box "Type of graph" (see Section 5.5.1).
<hr/>	
meamode=	Type of measurement storage
Preset	0
Possible settings	0 (manual), 1 (all incoming measurement sets), 2 (interval)
Remarks	This entry is defined using the dialog box "Options" (see Section 5.4.2.1).

meatime=	Interval of measurement storage Preset 0 Permissible range Remarks This entry is defined using the dialog box "Options" (see Section 5.4.2.1).
user=	User name Example Ronald Hume Remarks This entry is defined during the installation or using the dialog box "User" in the menu "Options" (see Section 7.1).
digpath=	Root directory of DIGSI Example c:\digsiv3 Remarks This entry is defined during the installation.
parity=	Setting with or without parity Preset 1 Possible settings 0 (without parity), 1 (with parity) Remarks This entry is defined using the dialog box "PC interface" (see Section 6.2.8)
workmode=	Last selected dialog mode Preset 1 Possible settings 1 (with file), 2 (with protection device direct), 3 (with protection device via) Remarks This entry is defined using the dialog box "Dialog" (see Section 5.1.1).
parammode=	Transmission mode with/without saving Preset TRUE Possible settings TRUE (with saving), FALSE (without saving) Remarks This entry is defined using the dialog box "Transmit with/without saving" (see Section 5.8.1).

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Appendix

A.10.2 Group [font]

name=	Font name (e.g. ARIAL)
size=	Font size (e.g. 12)
bold=	Bold or normal type
Preset	None of the entries of the group [font] are preset.
Remarks	DIGSI uses the Windows system font as standard. In rare cases there may be problems in the representation of characters due to the hardware configuration. For example, individual menu options are too large and are therefore not displayed completely. It is necessary to change the size and possibly also the font in such cases. The modifications must be made manually in the DIGSI.INI file. You should preferably use a special editor for .ini files. You can also use a normal text editor. It is essential to then save the modified DIGSI.INI file in pure text format without any formatting commands. You should always produce a backup of the DIGSI.INI file before you carry out any modifications to it.

A.10.3 Group [zone]

<Zone name>=, e.g. Z1B=	Colour setting of a zone in the zone characteristics (total entries)
Preset	Blue and red
Remarks	These entries are defined using the dialog box "Zone colours" (see Section 5.7).

A.10.4 Group [modem]

breakmode=	Manual or manual/automatic hang up
Preset	0
Possible settings	0 (manual), 1 (manual/automatic)
Remarks	This entry is defined using the dialog box "Connection" (see Section 6.2.7).
<hr/>	
breaktime=	Time up to hang up
Preset	10 [min]
Permissible range	0 ... 999 [min]
Remarks	This entry is defined using the dialog box "Connection" (see Section 6.2.7).

atime= Timeout for direct serial inputs/outputs
 Preset 1000 [ms]
 Remarks This entry must not be changed.

rtime= Additional protection device response time with modem mode (is added to the value of "rtime" in the group [settings])
 Preset 3000 [ms]
 Remarks This entry must not be changed.

A.10.5 Group [change request]

plz= Postal code of sender
 Remarks This entry is defined using the dialog box "Request for modification" (see Section 9.2).

town= Town of sender
 Remarks This entry is defined using the dialog box "Request for modification" (see Section 9.2).

street= Street of sender
 Remarks This entry is defined using the dialog box "Request for modification" (see Section 9.2).

dep= Department of sender
 Remarks This entry is defined using the dialog box "Request for modification" (see Section 9.2).

tel= Phone number of sender
 Remarks This entry is defined using the dialog box "Request for modification" (see Section 9.2).

fax= Fax number of sender
 Remarks This entry is defined using the dialog box "Request for modification" (see Section 9.2).

regist Nr= License number of DIGSI version
 Remarks This entry is defined using the dialog box "Request for modification" (see Section 9.2).

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sc operator= Siemens operator
Remarks This entry is defined using the dialog box "Request for modification" (see Section 9.2).

sc town= Town of Siemens office
Remarks This entry is defined using the dialog box "Request for modification" (see Section 9.2).

sc dep= Siemens department
Remarks This entry is defined using the dialog box "Request for modification" (see Section 9.2).

A.10.6 Group [Recent list]



Caution! All entries within this group are made automatically by DIGSI and must not be changed.

RecentListLen= Number of entries in the menu "Substation" for direct calling of a protection device; each entry comprises 7 elements.

Example 3

0= Substation name of 1st entry

Example Fuerth

1= Substation address of 1st entry

Example 1

2= Feeder name of 1st entry

Example Breslauer Str.

3= Feeder address of 1st entry

Example 1

4= Protection device and version of 1st entry

Example 7VV512 V1.0x

5= Protection device address of 1st entry
 Example 20

6= Root directory of substation of 1st entry
 Example c:\anlagen

10= Substation name of 2nd entry
 Example Nürnberg

11= Substation address of 2nd entry
 Example 2

A.10.7 Group [testing]

testtime= Cycle time
 Preset 6000 [ms]

A.10.8 Group [DICOMM]

operatingsystem= Operating system
 Preset 1 (Windows 3.1x)
 Possible settings 1 (Windows 3.1x), 2 (Windows 95), 3 (Windows NT), 4 (OS/2)
 Remarks This entry is defined using the dialog box "Configuration of DICOMM" (see Section 6.2.1).

mode= DICOMM mode
 Preset 1 (soft mode)
 Possible settings 1 (soft mode), 2 (hard mode)
 Remarks This entry is defined using the dialog box "Configuration of DICOMM" (see Section 6.2.1).

A Appendix

A.11 References

The basis for effective working with DIGSI is exact knowledge of the functions of the protection devices used. You can find detailed information in the respective device manuals. Please contact your local Siemens office or representative for information on the Order Nos. of these manuals and where to order them.

A.12 Service

Users of a licensed DIGSI full version receive three (3) years of technical support free of charge, starting with the purchase data. You can request technical support by telephone, fax or in writing.

Telephone inquiries

A hotline is available should you have urgent problems with DIGSI. You can reach the support from Monday to Thursday between 9 a.m. and 12 a.m. In Germany you can reach the technical support by telephone under number **0911/433–8292**.

When calling the DIGSI support you should be at your computer. Have your DIGSI manual and the manuals for your protection devices at hand. The following information should also be available:

- ⊙ The serial number of your DIGSI copy (you can find this in your registration documents).
- ⊙ The DIGSI version you are using.
- ⊙ Your system configuration.
- ⊙ The exact wording of any error messages which have appeared.
- ⊙ What happened, and what you were doing when the problem occurred.
- ⊙ What you attempted to eliminate the problem.

Inquiries by fax

In Germany you can reach the technical support by fax under number **0911/433–8301**.

Inquiries by letter

You can also pass on a problem to the DIGSI support by letter. Please address your problem to the following address:

SIEMENS AG
DIGSI Support
EV SV 13
Postfach 4806
D–90026 Nürnberg

The written description of possible program errors and modification wishes is facilitated by a function integrated in DIGSI (see Section 9.2).

Updates by Mailbox

Registered users of DIGSI can, in conjunction with a password and a user name, download updated drivers from the DIGSI Mailbox, for example. You can reach the Mailbox under the telephone number **0911/433–7950**. For detailed information on the DIGSI Mailbox please refer to Chapter 14.

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