Operating Programs

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DIGSI 4,
An Operating Software for all SIPROTEC Protection Relays

Description

The PC operating program DIGSI 4 is the user interface to the SIPROTEC devices, regardless of their version. It is designed with a modern, intuitive user interface. With DIGSI 4, SIPROTEC devices are configured and evaluated – it is the tailored program for industrial and energy distribution systems.
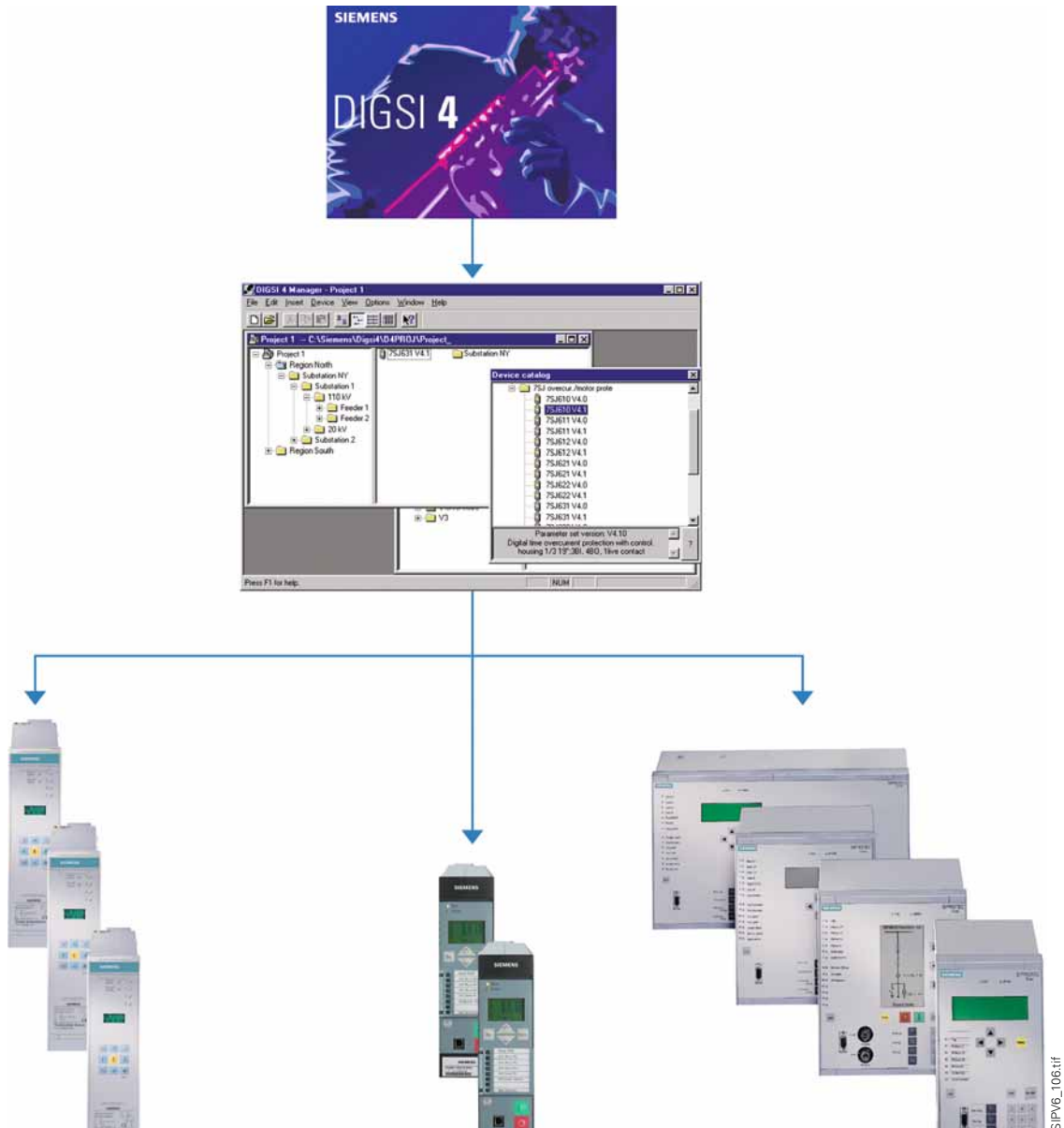

Fig. 3/1   DIGSI 4 operating program

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Functions

Simple protection setting

From the numerous protection functions it is possible to easily select only those which are really required (see Fig. 3/2). This increases the clearness of the other menus.

Device setting with primary or secondary values

The settings can be entered and displayed as primary or secondary values. Switching over between primary and secondary values is done with one mouse click in the tool bar (see Fig. 3/2).

Assignment matrix

The DIGSI 4 matrix shows the user the complete configuration of the device at a glance (Fig. 3/3). For example, the assignment of the LEDs, the binary inputs and the output relays are displayed in one image. With one click, the assignment can be changed.

IEC 61850 system configurator

The IEC 61850 system configurator, which is started out of the system manager, is used to determine the IEC 61850 network structure as well as the extent of data exchange between the participants of an IEC 61850 station. To do this, subnets are added in the "network" working area – if required -, available participants are assigned to the subnets, and addressing is defined. The "assignment" working area is used to link data objects between the participants, e.g., the starting message of the *V*/inverse-time overcurrent protection *I*> -function of feeder 1, which is transferred to the incoming supply in order to prompt the reverse interlocking of the *V*/inverse-time overcurrent protection *I*>> function there (see Fig. 3/4).
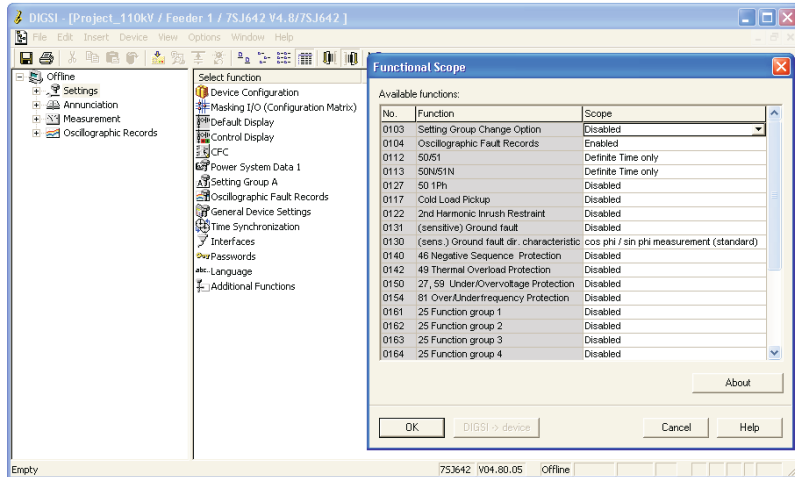

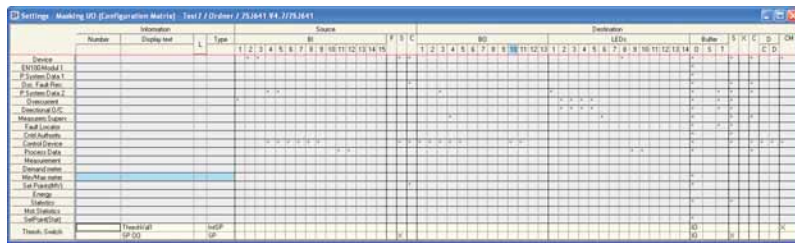**Fig. 3/2**   DIGSI 4, main menu, selection of protection functions

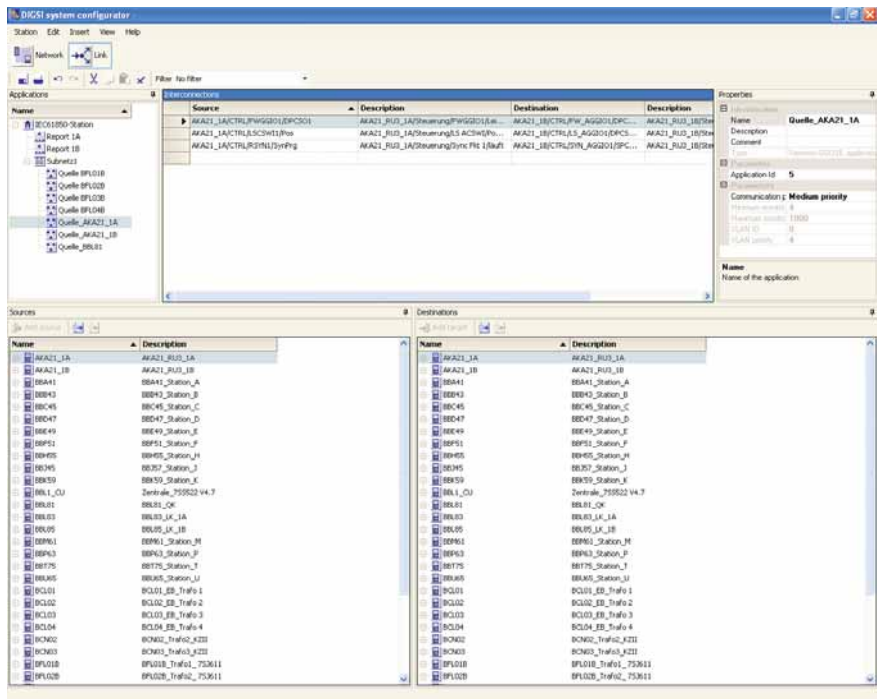**Fig. 3/3**   DIGSI 4, assignment matrix

Fig. 3/4   DIGSI 4, IEC 61850 system configurator

Functions

CFC: Projecting the logic instead of programming

With the CFC (continuous function chart), it is possible to link and derive information without software knowledge by simply drawing technical processes, interlocks and operating sequences.

Logical elements such as AND, OR, timers, etc., as well as limit value requests of measured values are available (Fig. 3/5).

Commissioning

Special attention has been paid to commissioning. All binary inputs and outputs can be set and read out in targeted way. Thus, a very simple wiring test is possible. Messages can be sent to the serial interface deliberately for test purposes.
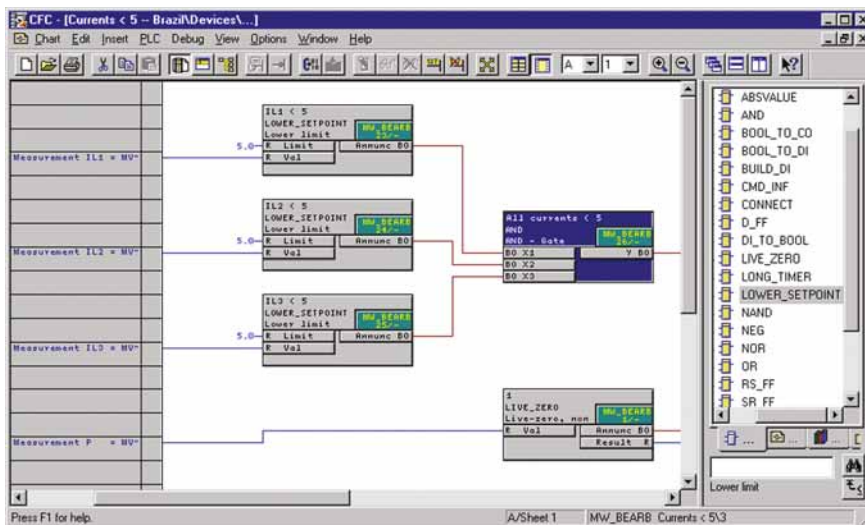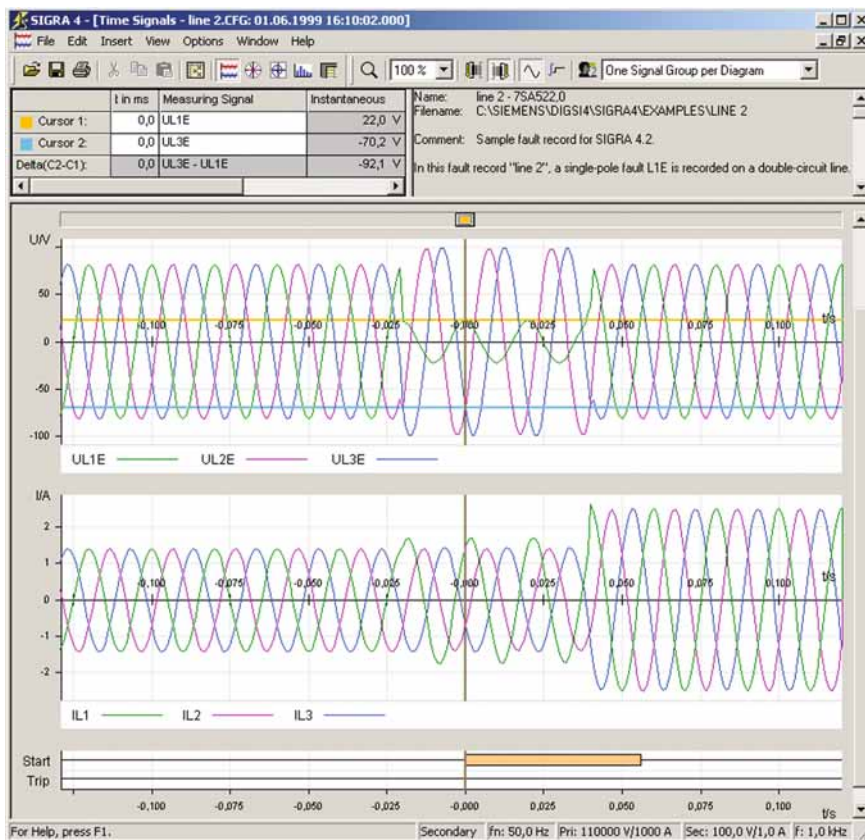

Fig. 3/5   CFC plan

Fig. 3/6   Typical time-signal representation

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Variants	Order No.

DIGSI 4

Software for projecting and usage of all Siemens protection devices is running under MS Windows XP Prof. /
MS Windows Server 2003, MS Windows 7 Professional and Ultimate/Enterprise.
See product information for supported Service packs of operating systems.
Incl. device templates, online manual and DIGSI cable: for all device types.
Start Up manual (paper)
Incl. service (upgrade, update, hotline)
Operator language: German, English, French, Spanish, Italian, Chinese, Russian, Turkish are included.
Delivery on DVD-ROM

Basic

Basic version with license for 10 computers (authorisation by serial number)   7XS5400-0AA00

Professional

Basic version and additionally SIGRA (Fault record analysis), CFC Editor (Logic editor),
Display Editor (Editor for control displays) and DIGSI 4 Remote (Remote operation)
with license for 10 computers (authorisation by serial number)   7XS5402-0AA00

DIGSI 4 Professional + IEC 61850

Professional version and IEC 61850
System Configurator with license for 10 computers (authorisation by serial number)   7XS5403-0AA00

Upgrade from DIGSI 4 Basis to DIGSI 4 Professional	7XS5407-0AA00
Upgrade from DIGSI 4 Basis to DIGSI 4 Professional + IEC61850	7XS5408-0AA00

SIPROTEC 4 Tutorial

Multimedia information and training for:
SIPROTEC 4, DIGSI 4, SIGRA 4 and IEC 61850
Incl. trial software, manuals and catalogs   E50001-U310-D21-X-7100

DIGSI 4 Basic + RecProtec

DIGSI 4 Basic and additionally RecProtec
(cyclic retrieval and archiving of fault records from SIPROTEC 4 devices)
with license for 10 computers (DIGSI 4) and for 1 computer (RecProtec).
Authorisation for DIGSI 4 by serial number, for RecProtec by floppydisk.   7XS5400-0AA01

DIGSI 4 Professional + RecProtec

DIGSI 4 Professional and additionally RecProtec
(cyclic retrieval and archiving of fault records, from SIPROTEC 4 devices)
with license for 10 computers (DIGSI 4) and for 1 computer (RecProtec).
Authorisation for DIGSI 4 by serial number, for RecProtec by floppydisk.   7XS5402-0AA01

DIGSI 4 Trial

like DIGSI 4 Professional + IEC 61850,
but <u>only</u> valid for 30 days (test version)
(no authorisation required)   7XS5401-1AA00

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Selection and ordering data	Variants	Order No.

DIGSI 4 Scientific

like DIGSI 4 Professional + IEC 61850, only for university-level institutions
with license for 10 PCs (authorisation by serial number) — 7XS5402-2AA00

DIGSI 4 DVD Update

Latest version of DIGSI 4
DVD includes DIGSI 4 and
IEC 61850 System Configurator and SIGRA
Incl. the latest Service packs.
Current content of DIGSI 4 Update
DVD can be found at www.siemens.com/siprotec — 7XS5490-0AA00

IEC 61850 System Configurator

Software for configuration of substations via IEC 61850-communication
is running under MS Windows XP Prof./MS Windows Vista Home Premium,
Business and Ultimate/MS Windows Server 2003.
See product information for supported
Service packs of operating systems
Incl. electronic help
Incl. service (update, hotline)
Operator language:
German, English, French, Spanish, Italian, Chinese, Russian, Turkish are included.

IEC 61850 System Configurator for DIGSI 4 Professional

Upgrade from DIGSI 4 Prof. to DIGSI 4 Prof. + IEC 61850
version with license for 10 computers (authorisation by serial number)
For ordering the specification of a DIGSI 4 license number is required. — 7XS5460-0AA00

IEC 61850 System Configurator for Reyrolle devices

for System Configuration if no DIGSI 4
Prof. + IEC 61850 license is available
Requires installed Reydisp Manager
version with license for 10 computers
(authorization by serial number)
Delivery on DVD-ROM — 7XS5461-0AA00

GOOSE Inspector for IEC 61850 Ethernet station bus with license for 1 PC

PC-tool for online-monitoring of IEC 61850 GOOSE-telegrams
Checking of all GOOSE connections on the station bus and validation with
the configured connections in the system configurator (SCD)
Contains installation CD with USB-dongle
Recommended system requirements:
Windows XP, 32 Bit, SP2 or SP3
Duo CPU at least 1.6 GHz; RAM 2 GB
Network interface (Ethernet LAN, TCP/IP)
Supported languages: English, German — 7XS5900-0AA00

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3

SIGRA 4
Powerful Analysis of all Protection Fault Records

Fig. 3/7

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Function overview

- 6 types of diagrams: time signal representation (usual), circle diagram (e.g. for R/X), vector diagram (reading of angles), bar charts (e.g. for visualization of harmonics), table (lists values of several signals at the same instant) and fault locator (shows the location of a fault)

- Calculate additional values such as positive impedances, r.m.s. values, symmetric components, vectors, etc.

- Two measurement cursors, synchronized in each view

- Powerful zoom function

- User-friendly configuration via drag & drop

- Innovative signal configuration in a clearly-structured matrix

- Time-saving user profiles, which can be assigned to individual relay types or series

- Addition of other fault records to the existing fault record

- Synchronization of several fault records to a common time basis

- Easy documentation by copying diagrams to documents of other MS Windows programs

- Offline fault localization

Description

lt is of crucial importance after a line fault that the fault is quickly and fully analyzed so that the proper measures can be immediately derived from the evaluation of the cause. As a result, the original line condition can be quickly restored and the downtime reduced to an absolute minimum. lt is possible with SIGRA 4 to display records from digital protection units and fault recorders in various views and measure them, as required, depending on the relevant task.

In addition to the usual time-signal display of the measured variables record, it is also designed to display vector diagrams, circle diagrams, bar charts for indicating the harmonics and data tables. From the measured values which have been recorded in the fault records, SIGRA 4 calculates further values, such as: absent quantities in the three-wire system, impedances, outputs, symmetrical components, etc. By means of two measuring cursors, it is possible to evaluate the fault trace simply and conveniently. With SIGRA, however, you can add additional fault records. The signals of another fault record (e.g. from the opposite end of the line) are added to the current signal pattern by means of Drag & Drop. SIGRA 4 offers the possibility to display signals from various fault records in one diagram and fully automatically synchronize these signals to a common time base. In addition to finding out the details of the line fault, the localization of the fault is of special interest.

A precise determination of the fault location will save time that can be used for the on-site inspection of the fault. This aspect is also supported by SIGRA 4 – with its "offline fault localization" feature.

SIGRA 4 can be used for all fault records using the COMTRADE file format.

The functional features and advantages of SIGRA 4 can, however, only be optimally shown on the product itself. For this reason, it is possible to test SIGRA 4 for 30 days with the trial version.

Hardware requirements

- Pentium 4 with 1-GHz processor or similar

- 1 GB of RAM (2 GB recommended)

- Graphic display with a resolution of 1024 x 768 (1280 x 1024 recommended)

- 50 MB free storage space on the hard disk

- DVD-ROM drive

- Keyboard and mouse

Software requirements

- MS Windows XP Professional

- MS Windows Vista Home Premium, Business and Ultimate

- MS Windows Server 2003 Standard Edition with Service Pack 2 used as a Workstation computer

- MS Windows 7 Professional and Enterprise Ultimate

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Functions

Different views of a fault record

In addition to the standard time signal representation, SIGRA 4 also supports the display of circle diagrams (e.g. R/X diagrams), vectors, which enable reading of angles, and bar charts (e.g. for visualization of harmonics). To do this, SIGRA uses the values recorded in the fault record to calculate additional values such as positive impedances, r.m.s. values, symmetric components, vectors, etc.

Measurement of a fault record

Two measurement cursors enable fast and convenient measurement of the fault record. The measured values of the cursor positions and their differences are presented in tables. The cursors operate interactively and across all views, whereby all cursor movement is synchronized in each view: In this manner, the cursor line enables simultaneous "intersection" of a fault occurrence in both a time signal characteristic and circle diagram characteristic. And of course a powerful zoom function ensures that you do not lose track of even the tiniest detail. The views of SIGRA 4 can accommodate any number of diagrams and in each diagram any number of signals.

Operational features

The main aim of the developers of SIGRA 4, who were assisted by ergonomic and design experts, was to produce a system that was simple, intuitive and user-friendly:

- The colours of all the lines have been defined so that they are clear and easily distinguishable. However, the colour, as well as the line style, the scale and other surface features, can be adjusted to suit individual requirements.
- Pop-up menus for each situation offer customized functionality – thus eliminating the need to browse through numerous menu levels (total operational efficiency).
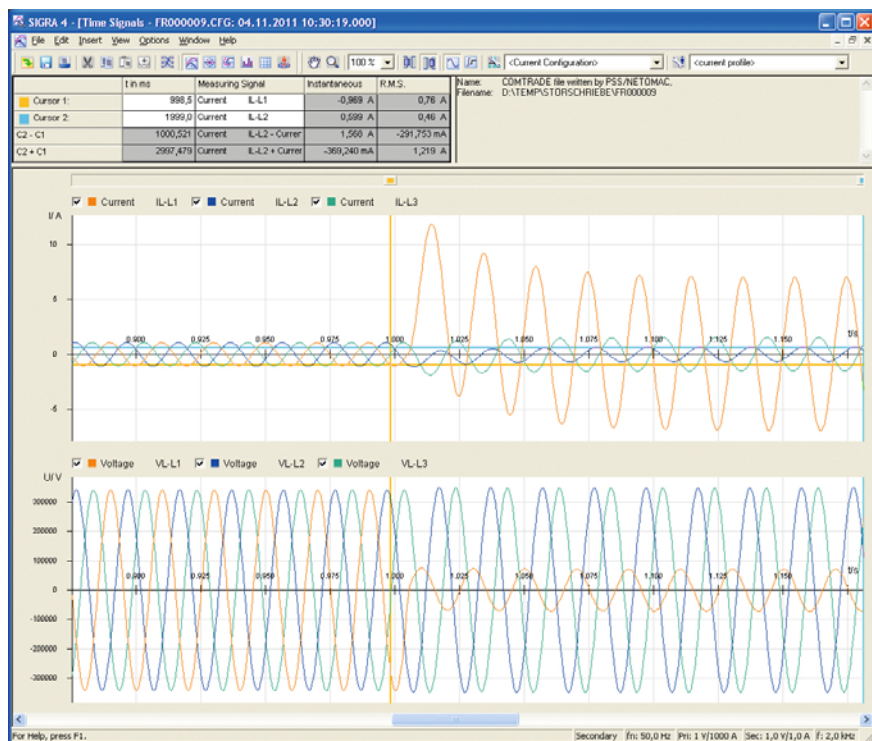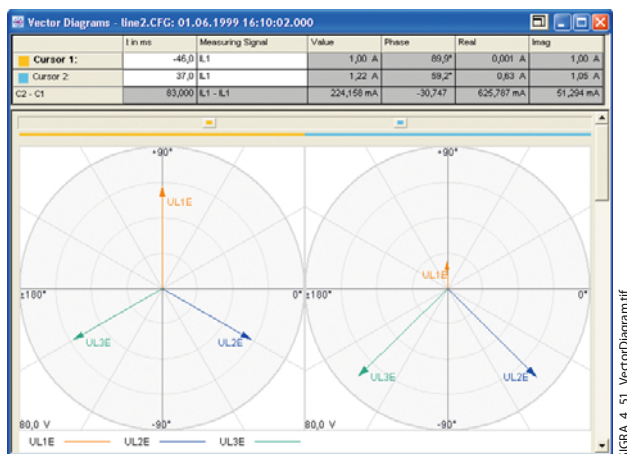

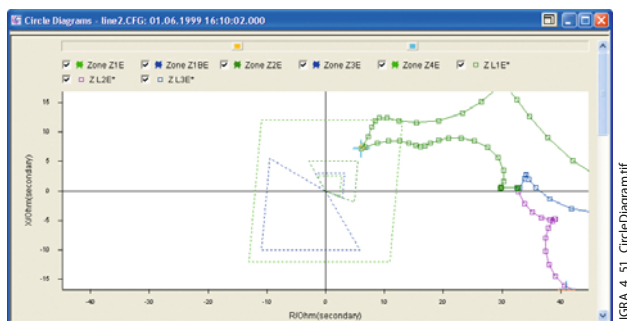**Fig. 3/8** Typical time signal representation

Fig. 3/9 Vector diagrams

Fig. 3/10 Circle diagram

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Functions

- Configuration of the individual diagrams is simple and intuitive: object-oriented, measured variables can be simply dragged and dropped from one diagram to another (also diagrams of different types).
- "Snap-to-grid" and "snap-to-object" movement of the cursor lines for easy and accurate placement.
- Redundancy: Most user tasks can be achieved via up to five different operational methods, thus ensuring quick and easy familiarization with the analysis software.
- Utilization of the available screen space is automatically optimized by an intelligent function that, like the "synchronous mouse cursors", has since been patented.

User friendly tools support you in your daily work:

- Storage of user defined views (e.g zoom, size), in so-called user profiles and to assign them to individual relay types or series. Then simply select from the toolbar and you can display each fault record quickly and easily as required. No need to waste time scrolling, zooming or resizing and moving windows.
- Additional fault records, e.g. from the other end of a line, can be added to existing records.
- A special function allows several fault records to be synchronized on a mutual time basis, thus considerably improving the quality of fault analysis.
- Fault localization with data from one line end the fault record data (current and voltage measurement) values are imported from the numerical protection unit into SIGRA 4. The fault localisator in SIGRA 4 is then started by the user and the result represented in % or in km of the line length, depending on the parameters assigned.
- Fault localization with data from both line ends. The algorithm of the implemented fault location does not need a zero-phase sequence system. Thus, measuring errors due to earth impedance or interference with the zero current of the parallel line are ruled out. Errors with contact resistance on lines with infeed from both ends are also correctly recorded. The above influences are eliminated due to the import of fault record data from both line ends into SIGRA. For this purpose, the imported data are synchronized in SIGRA and the calculation of the fault

Fig. 3/11 Concise matrix for assigning signals to diagrams

Fig. 3/12 Table with values at a definite time

location is then started. Consequently, fault localization is independent from the zero-phase sequence system and the line infeed conditions and produces precise results to allow as fast an inspection of the fault location as possible.

- So-called marks, which users can insert at various instants as required, enable suitable commentary of the fault record. Each individual diagram can be copied to a

document of another MS Windows program via the "clipboard": documenting fault records really could not be easier.

Scope of delivery

The software product is quick and easy to install from a CD-ROM. It has a comprehensive "help" system. An user-friendly and practical manual offers easy step-by-step instructions on how to use SIGRA.

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Variants	Order No.

SIGRA 4

Software for graphic visualisation, analysis and evaluation of fault and measurement records is running under MS Windows XP Prof./MS Windows Vista Home Premium, Business and Ultimate/MS Windows Server 2003, MS Windows 7 Professional and Ultimate/Enterprise.
See product information for supported Service packs of operating systems.
Incl. templates, online manual
Incl. service (upgrade, update, hotline)
Operator language:
German, English, French, Spanish, Italian, Chinese, Russian, Turkish are included.
Incl. multimedia tutorial on separate CD.
Delivery on DVD-ROM

SIGRA 4 for DIGSI

with license for 10 PCs (authorisation by serial number)
For ordering the specification of a DIGSI 4 serial number is required. *7XS5410-0AA00*

SIGRA 4 Stand Alone

with license for 10 PCs. Installation without DIGSI 4
(authorisation by serial number) *7XS5416-0AA00*

SIGRA 4 Scientific

Installation without DIGSI 4 only for university-level institutions
with license for 10 PCs (authorisation by serial number) *7XS5416-1AA00*

SIGRA 4 Trial

like SIGRA 4 Stand Alone, but only valid for 30 days (test version)
(no authorisation required) *7XS5411-1AA00*

Upgrade SIGRA 4 Trial to SIGRA 4 Stand Alone

like SIGRA 4 Stand Alone.
For customers who want to unlock their trail version.
With license for 10 PC *7XS5416-2AA00*