



MoRoS

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1 Introduction

Validity range of the manual

The manual applies to the device MoRoS.

Purpose

This manual is directed primarily at technical staff, in particular:

- Programmers
- Implementers

Required basics

General knowledge regarding communication technologies is required.

Safety Instructions

This manual includes notes which must be observed in order to avoid material damage.

The warnings and cautions are described as follows:



Caution - Damage of components!

Not observing this note may result in destruction of the device.



Warning!

Failure to comply may result in malfunction.



Note

Notes contain important information which you should observe in particular.

Online availability

The manuals are available in German and English at <http://www.insys-tec.de>.

Additional documentation

Please find a complete overview of all AT commands of the communication modules in the documents: "AT Command Set for Modem" and "AT Command Set for ISDN".

The complete reference for the standard AT commands is available on request.

Technical support

Call technical support at:

- E-mail: insys@insys-tec.de
- 0941/560061

Repurchasing of legacy systems

According to the new WEEE guidelines, the repurchasing and recycling of legacy systems for our clients is regulated as follows:

Please send those legacy systems to the following address, carriage prepaid:

Frankenberg-Metalle
Gärtnersleite 8
D-96450 Coburg

2 Safety Instructions

**Warning!**

Fire hazard when improperly maintained or if the case is opened improperly!

All areas that can be opened are maintenance areas. Unauthorized and improper opening of a maintenance area as well as improper repairs may endanger the user, e.g. through a burnout of the device.

Only qualified personnel may maintain and open the device.

**Warning!**

Fire hazard when using an unsuitable power supply!

Using an unsuitable power supply unit could damage the MoRoS; in this event, the manufacturer will assume no liability. At worst, the device may burn down.

The device may only be operated with a suitable power supply.

**Caution!**

Danger of short-circuit!

The MoRoS may not be used in wet environments, damp rooms or close to water. Take care not to let liquids seep into the MoRoS as this may lead to short circuits.

The device may only be used in splash proof, dry environments.

**Warning!**

Device breakdown due to flaws in the supply circuit.

If a power failure occurs, the device will not be operational.

We recommend providing a separate circuit for the MoRoS. If other devices experience short circuits, the MoRoS will thus not be inoperative. We also recommend installing suitable overvoltage protection.

3 Scope Of Delivery

Before you start with the initial operation, please check if all accessories are included in the box.

- MoRoS Modem/ISDN
- 1 phone cord TAE-N at RJ12 (only for INSYS MoRoS Modem)
- 1 phone cord international (only for MoRos Modem)
- 1 ISDN phone cord S0 (only for INSYS MoRoS ISDN)
- 1 manual
- 1 quick installation guide

Please contact your supplier if the content is not complete. Please also check the MoRoS for shipping damage. Please also refer to your supplier if anything is damaged.

The scope of delivery does not include a power supply.

Please keep the packaging material for possible future shipping or storage.

4 Function Overview

The MoRoS is a router with an integrated communication device (analogue modem or ISDN-TA), and an integrated 4-port switch. It has a very compact design and a plastic housing according to IP40. The MoRoS has the following characteristics, which are described in detail in the following:

- Integrated configuration interface and help function
- Easy local or remote configuration
- 4-port switch with 10/100 MBit/s
- Integrated communication module (analogue modem or ISDN-TA)
- International country settings (up to 97 countries for the analogue modem)
- Dial-in and dial-out function
- Dynamic DNS update
- Callback function
- Port forwarding
- Dialing filter for dial-out
- Dial-in authentication for up to 10 users
- Authentication via PAP, CHAP, MS-CHAP, MS-CHAP 2
- DHCP server and client
- Firmware update (local and remote)
- 2 digital inputs and 2 digital outputs
- Buffered RTC (real time clock), NTP client
- Proxy server

The MoRoS partially uses Open Source software, which was published under the GNU GPL (GNU General Public Licence), the GNU LGPL (GNU Lesser General Public License), or the BSD licence.

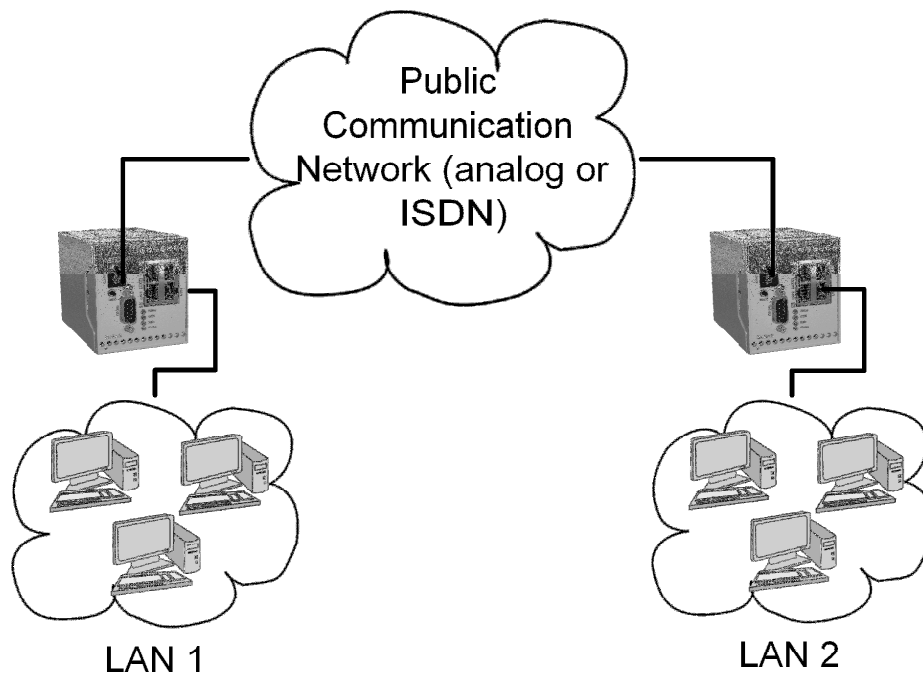
The according source codes can be obtained from INSYS on request.



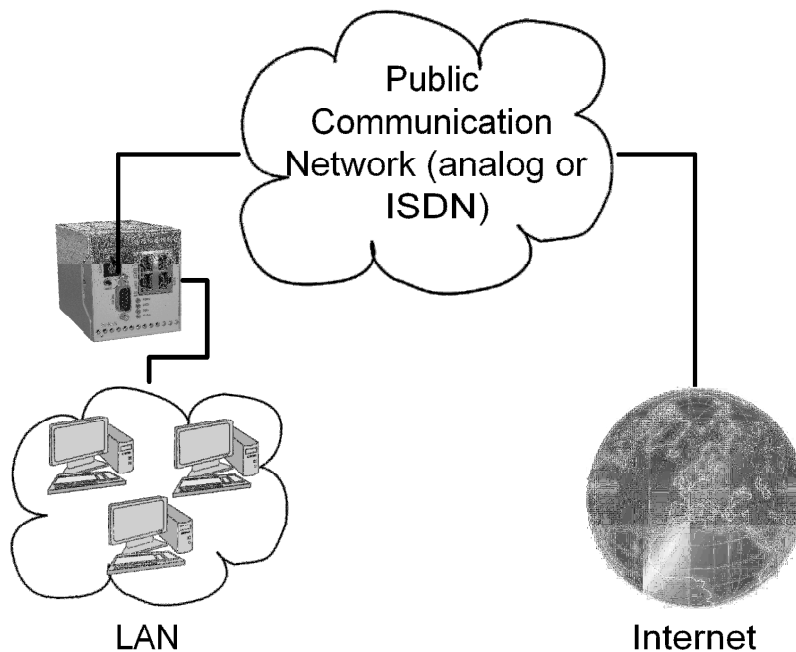
Caution - Device breakdown

However, if the MoRoS firmware is modified, or if any other firmware than the one released by INSYS is installed, the warranty for the device will expire.

Examples of Use:



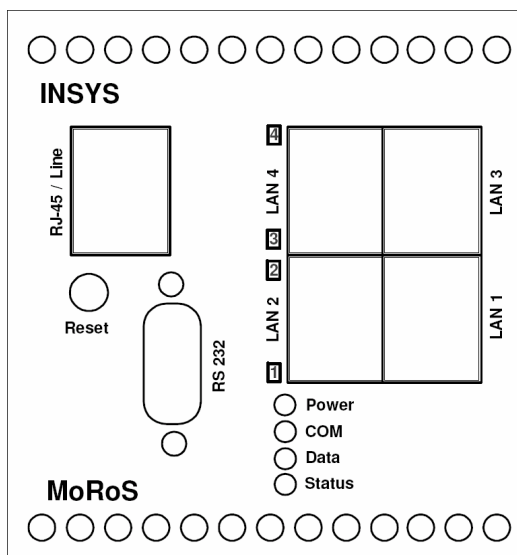
The MoRoS can connect two networks to allow each subscriber of one network to communicate with any subscriber of the other network. The MoRoS can automatically start to establish a connection from each network.



The MoRoS can also connect a network to the Internet. The connection setup takes place automatically, via local network queries.

5 Device Description

5.1 Front Panel



The MoRoS has LEDs to indicate the operating state:

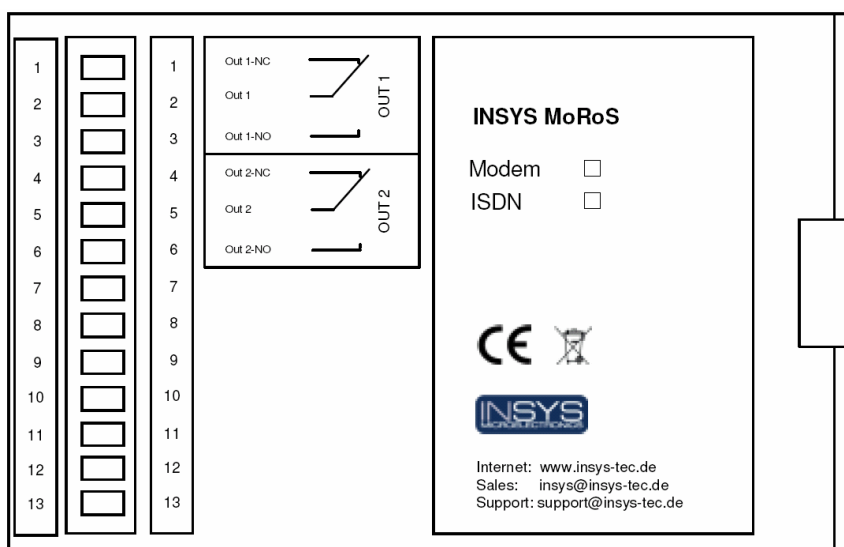
Name	Color	LED off	LED on
Power	Green	No supply voltage	Supply voltage available
COM	Green	MoRoS is offline.	MoRoS is hooked to the phone line, but there is no usable data connection yet (OH).
	Orange		MoRoS has established a usable data connection via the phone line (CONNECT).
Data	Yellow		A PPP data packet is transmitted via the phone line.
Status	Red	MoRoS is ready.	MoRoS is not ready (e.g. after being switched on or when restoring the standard settings).
1 2	Green	No LAN cable connected.	An LAN cable is connected and the port is set to 100 MBit/s. This LED blinks during data traffic.
	3 4		

The reset key has several functions:

- Pressing it for a short time (no longer than 1 second) initiates a soft reset. The MoRoS performs a restart; the integrated communication module is not restarted. The settings are maintained.
- Pressing it for a long time (more than 3 seconds) initiates a hard reset; the integrated communication module is also restarted. Regarding its effect, this equals a voltage failure. The settings are maintained.
- Pressing the reset key three times for a short time. Each keystroke may not last longer than 1 second. All three keystrokes must be performed within 2 seconds. The settings are reset to the factory defaults.

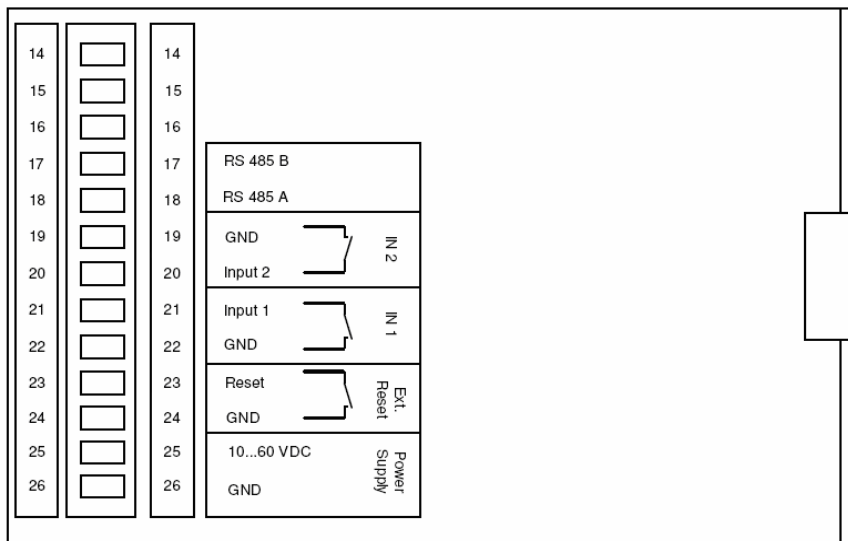
As soon as a function of the reset key becomes active, the “Status” LED lights up red. The RS232 interface has no function.

5.2 Top



	Terminal	Meaning
1	OUT 1-NC	Output 1 – normally open
2	OUT 1	Output 1
3	OUT 1-NO	Output 1 – normally open
4	OUT 2-NC	Output 2 – normally open
5	OUT 2	Output 2
6	OUT 2-NO	Output 2 – normally open

5.3 Bottom



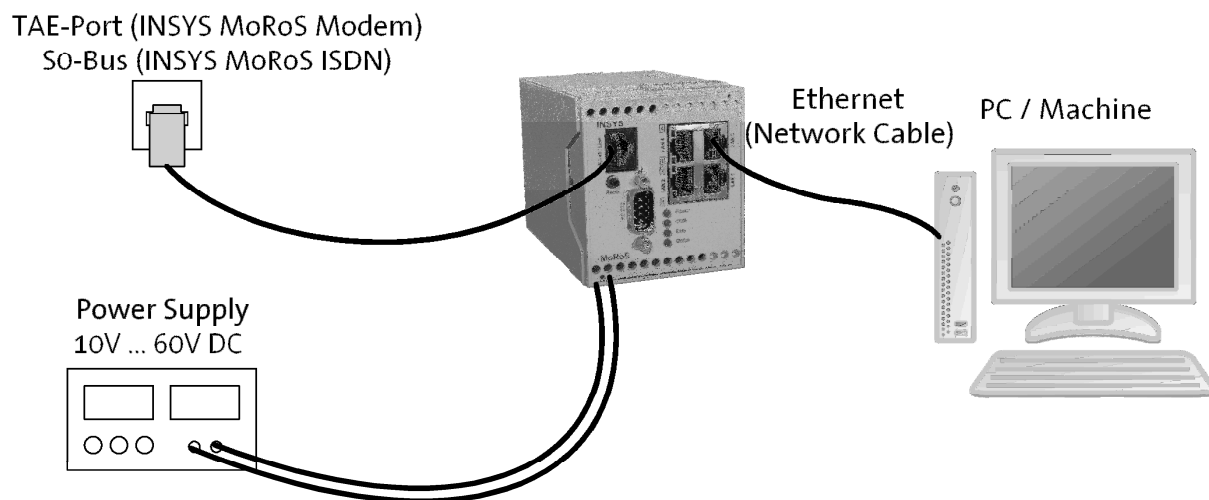
	Terminal	Meaning
17	RS 485 B	Reserved
18	RS 485 A	Reserved
19	GND	Ground
20	Input 2	Input 2
21	Input 1	Input 1
22	GND	Ground
23	Reset	Reset input
24	GND	Ground
25	10..60 VDC	Power supply 10V to 60V DC
26	GND	Ground

For the voltage supply, please use a power supply which has its own fuse and overvoltage protection and can supply at least 3W at a DC voltage of 10 V minimum and 60V maximum.

The reset terminals have the same function as the reset key.

Currently, the terminals for the RS485 interface have no function.

6 Installation



1. **Mounting on DIN rail**
2. **Connecting the power supply**
 - a) Connecting the ground connection
 - b) Connecting the power supply 10...60V DC



Caution - Damage of components!

**The minimum value is 10V DC.
The maximum value is 60V DC.**

3. **Switch on power supply**
The green "Power" LED lights up.
4. **Connection to the PC**
The network card of the PC must be connected to any one of the four MoRoS Ethernet ports, using the supplied network cable.
5. **Connection to the telephone network**
The "RJ45/Line" plug is connected as follows:
 - For the MoRoS Modem, via the supplied phone cord with the TAE (German telephone plug unit).
 - For the MoRoS ISDN, via the supplied ISDN cord with the ISDN S0 bus or with the internal S0 bus of an ISDN phone system.

7 Configuration

The configuration of the MoRoS takes place via a network connection between the MoRoS and a PC.

Configuration requirements:

- A PC with network card.
- An Internet browser (e.g. Mozilla Firefox, Opera, Konqueror or Internet Explorer).

The operating system of the PC is irrelevant for the configuration. The operating system must support TCP/IP, it must be possible to use the built-in network card, and a web browser must be installed.

After the configuration is completed, you can also access the web interface via a dial-up connection. The function dial-in must be activated for this action. For the remote configuration, the notes in the pertinent chapters regarding the individual configuration steps must absolutely be observed.

7.1 PC Setup

To enable the communication between the PC and the MoRoS, both devices must be present in the same network. Depending on the operating system, the steps for the network settings will differ.

The MoRoS has a DHCP server. It is activated by default. The network configuration should usually take place automatically.

If this automatic configuration doesn't work, the following chapters will help you to manually configure the network settings.

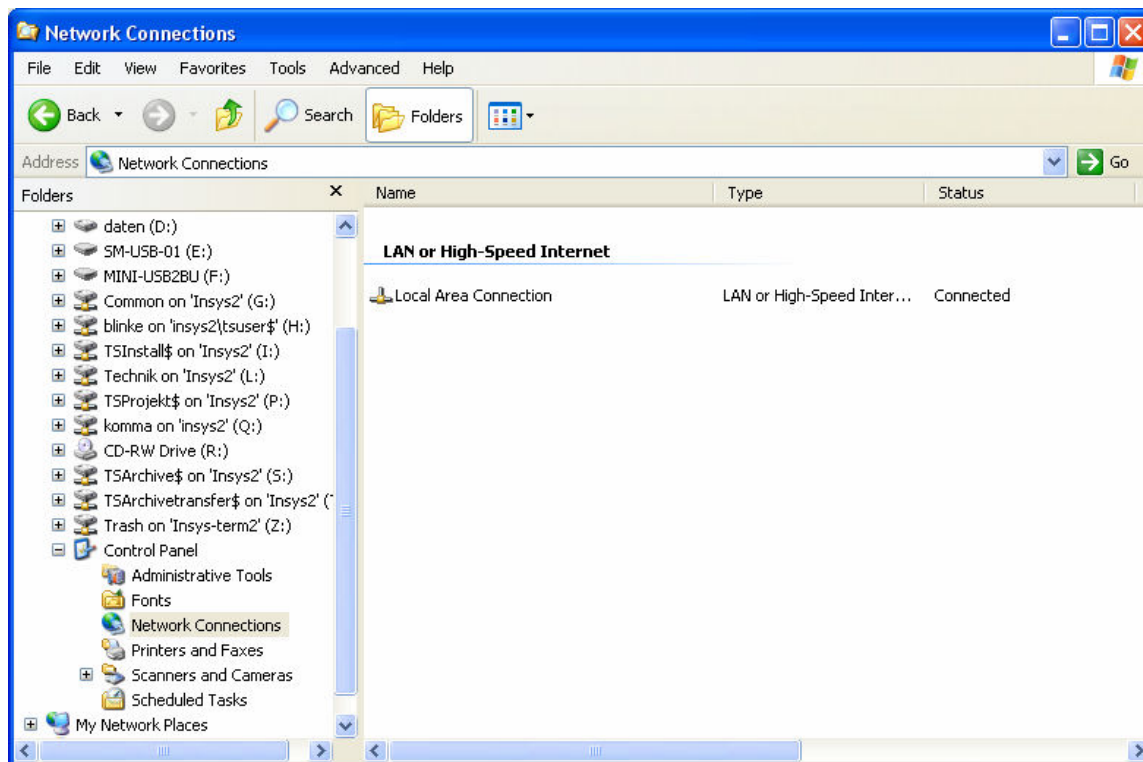
Summary PC settings:

1. The IP address must be in the network 192.168.1.X , for example 192.168.1.2; 192.168.1.1 is the IP address of the MoRoS and may not be used.
2. The network mask must read: 255.255.255.0
3. The gateway address must read: 192.168.1.1

The MoRoS may now be accessed via a browser at the IP address 192.168.1.1.

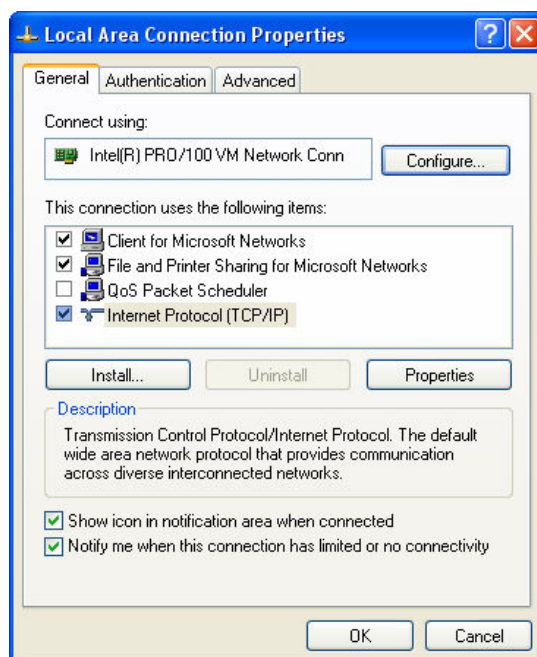
7.1.1 Windows XP

The Windows XP settings can be accessed via the Explorer (right mouse button on “Start” -> Explore).

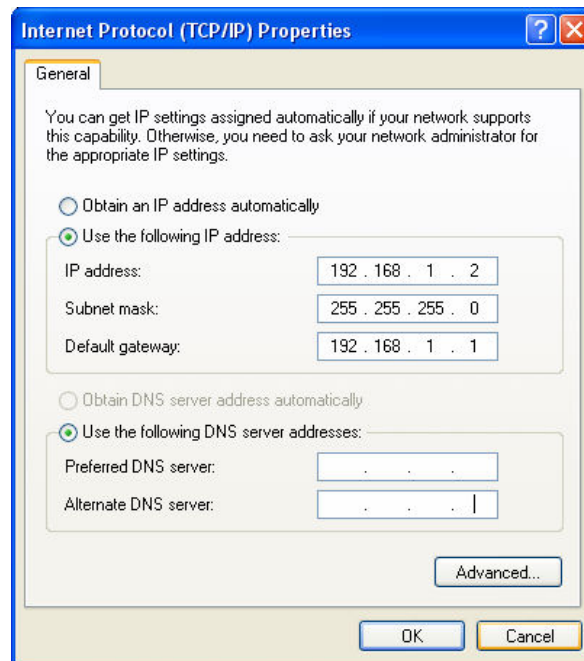


Under “Control Panel” you will find the menu item “Network Connections”. Under this item, you will find the entry “Local Area Connection”. If this entry is not available yet, you must first select the network installation assistant to activate the network card.

Right-click on the item “Local Area Connection” to go to “Local Area Connection Properties”.



Mark the option "Internet Protocol (TCP/IP)" and click on "Properties" to go to the settings to be configured.



Set the IP address in the new window. We recommend entering 192.168.1.2 as the IP address.

We recommend selecting "Obtain DNS server address automatically" for the DNS setting. All DNS queries which cannot be handled within the local network will be sent to the MoRoS. If the function "Dial-out" was activated, MoRoS will automatically establish a connection, and will handle the DNS query as soon as this connection is activated.

If there is already a DNS server in the local network, its IP address can be entered at this point.

The MoRoS has the IP address 192.168.1.1. This address must be set as standard gateway at the connected terminals.

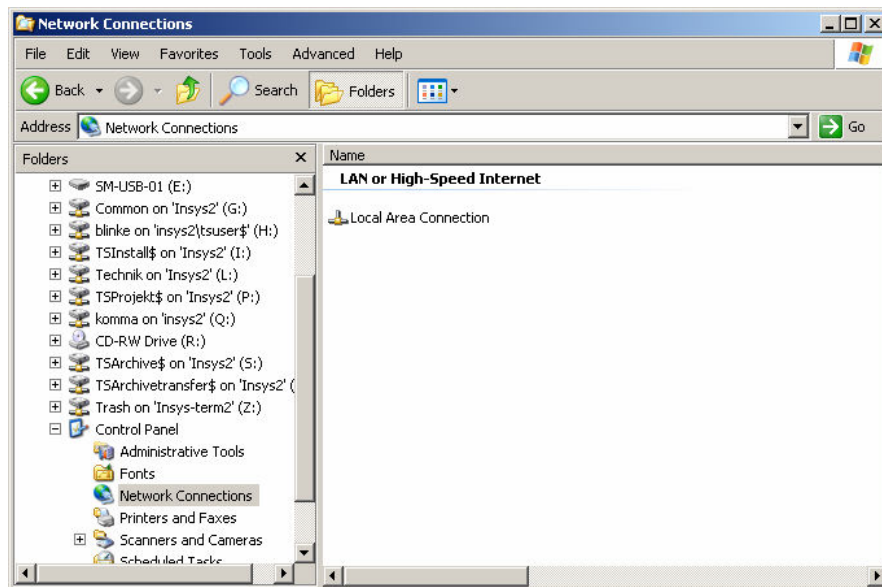
For the sub network mask, the number 255.255.255.0 must be entered.

The DNS server addresses can be entered optionally. It is required if domain names should be handled.

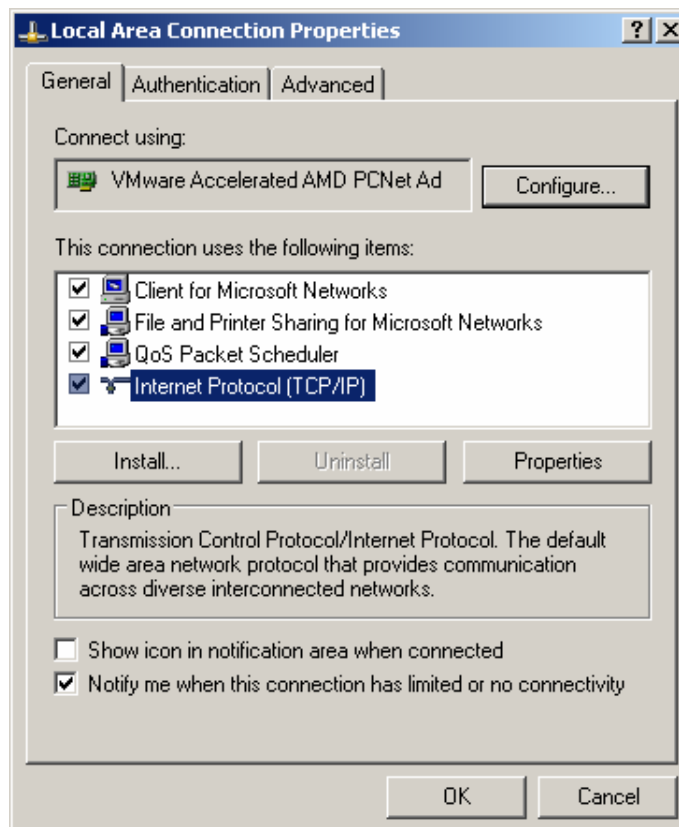
7.1.2 Windows 2000

The Windows 2000 configuration is similar to the Windows XP configuration.

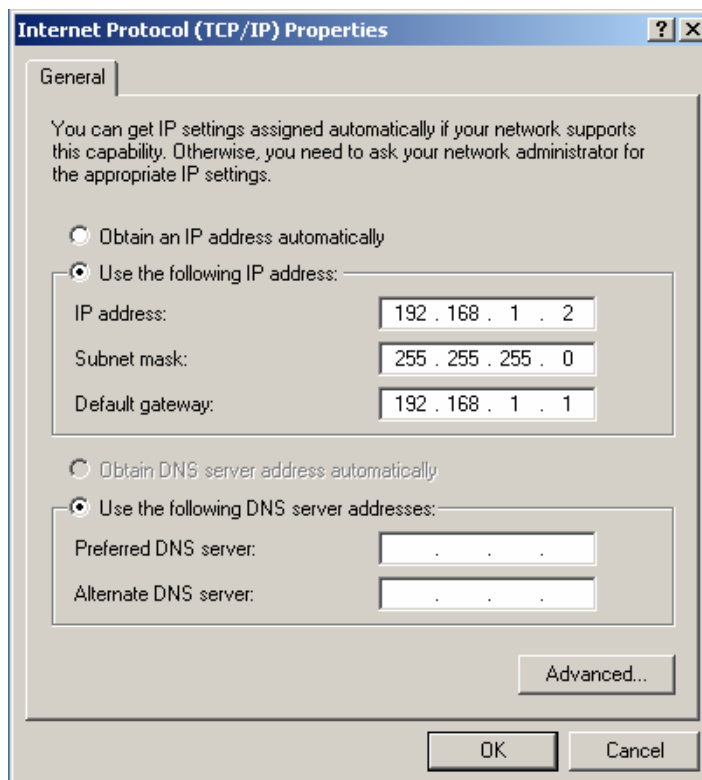
Right-click the “Start” key and then click on “Explore” to open the Explorer. The network connections are displayed under “System Control”.



Right-click on “Local Area Connections” and afterwards left-click “Properties” to open the Local Area Connection:



Click on “Internet Protocol (TCP/IP)” to mark the entry. One more click on the button “Properties” will open the next window:



Set the IP address in the new window. We recommend entering 192.168.1.2 as the IP address.

The MoRoS has the IP address 192.168.1.1. This address must be stated as the standard gateway.

We recommend selecting “Obtain DNS server address automatically” for the DNS setting. All DNS queries which cannot be handled within the local network will be sent to the MoRoS. If “Dial-out” was activated, MoRoS will automatically establish a connection, and will handle the DNS query as soon as this connection is activated.

If there is already a DNS server in the local network, its IP address can be entered at this point.

For the sub network mask, the number 255.255.255.0 must be entered.

The DNS server addresses can be entered optionally. It is required if domain names should be handled.

7.1.3 Linux

We cannot offer a detailed description for the configuration of the IP address in this manual. Linux distributors supply different tools. The exact steps for the Ethernet interface settings are usually explained in the online help or at so-called “Knowledge Portals”, or in “Forums” of the according distributor.

The basic steps for the configuration in a shell:

We assume that the network interface to be configured has the name “eth0”. This is in most cases the first (and only) network card in the computer. You need “Root rights” for the configuration.

The command `ifconfig eth0 192.168.1.2` sets the IP address for the network interface eth0 to 192.168.1.1. The command `route add default gw 192.168.1.1` sets MoRoS as the default gateway.

7.2 Initial Configuration

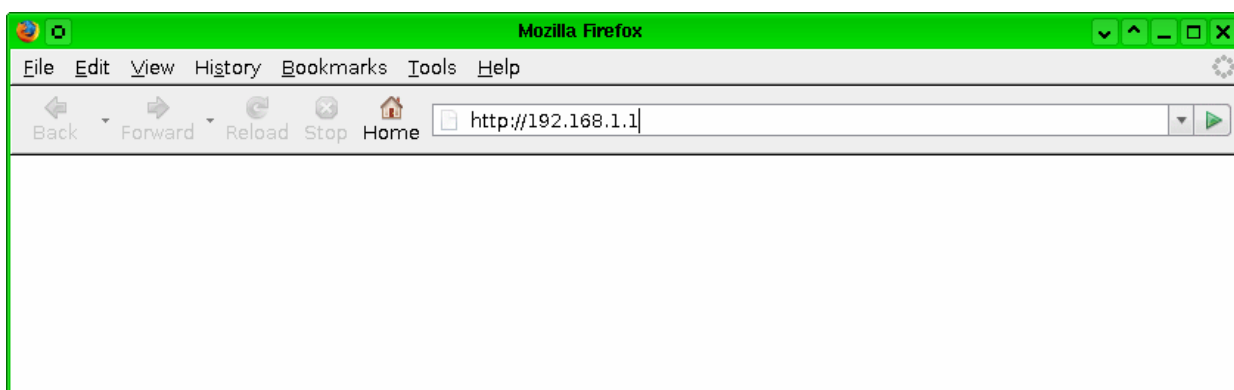
The configuration interface is displayed via a browser. Enter the URL “http://192.168.1.1” to access the interface. In this case, the browser “Mozilla Firefox” was used.



Caution

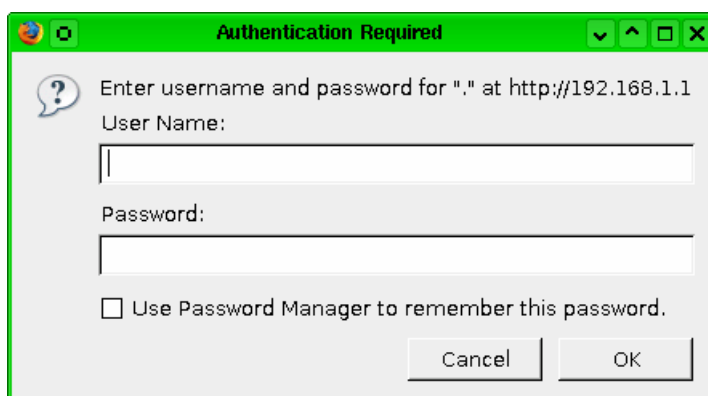
Browsers usually provide a button called “Reboot” or “Reload”. Avoid clicking this button under all circumstances (see also Chapter 10)!

To update a page, click on the according button in the content window of the browser. Alternatively, you may confirm the URL in the URL bar using the return key. This will reload the MoRoS start page.



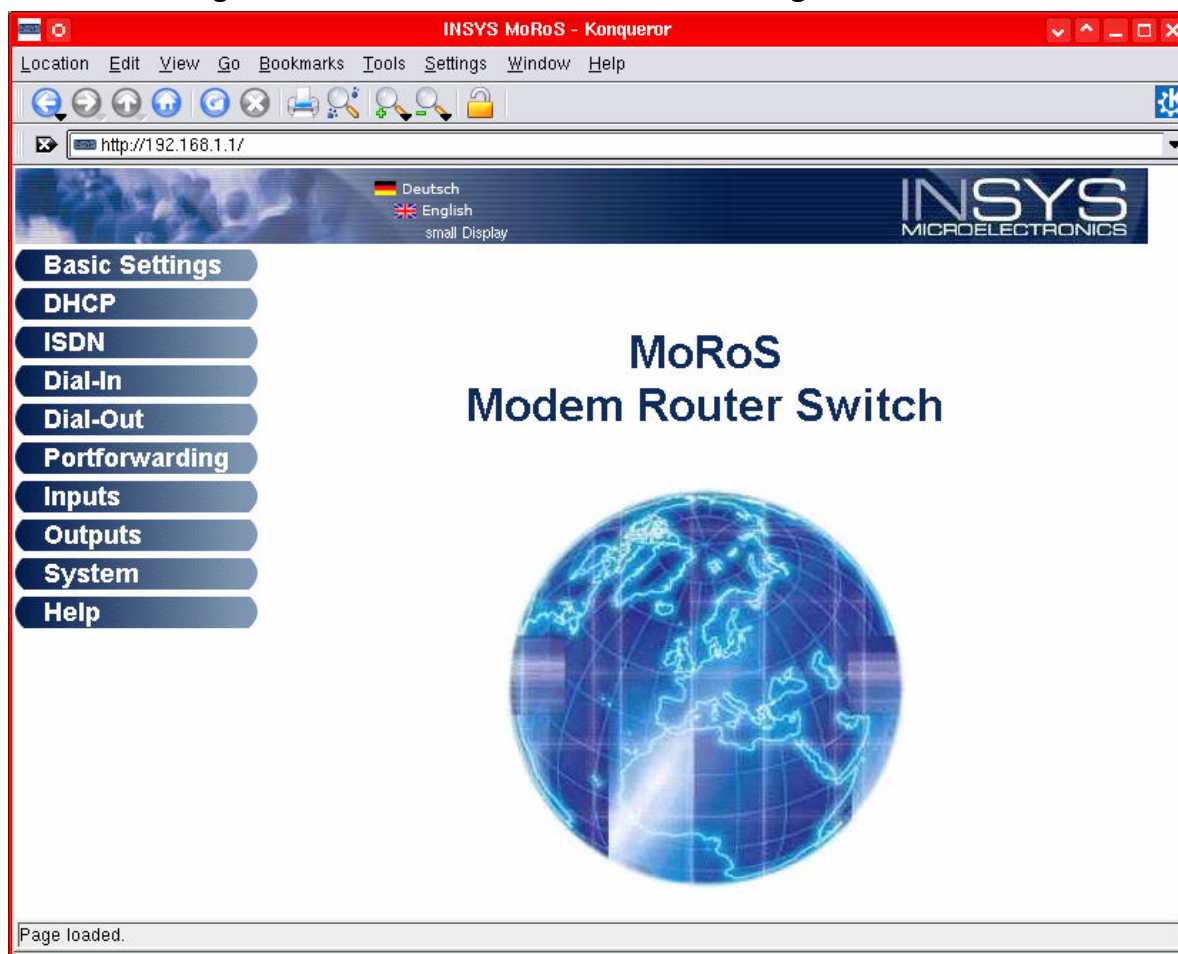
To prevent unauthorized access, you must provide the MoRoS with access controls. The standard settings are as follows:

- User name: insys
- Password: moros



After successful authentication, the start page of the configuration interface is displayed. The individual function blocks of the MoRoS can be selected from the buttons on

the left side. Basically, all settings are stored in the device after clicking “OK”. After a restart or a voltage failure, the MoRoS reloads those settings.



This is a summary of the possible configuration options of the buttons:

Button	Configuration
Basic settings	Authentication, Ethernet addresses DNS
DHCP	DHCP client, DHCP server
Modem or ISDN	Modem or ISDN-TA Configuration, Terminal
Dial-in	On/Off, Idle time, Authentication, IP address, Gateway
Dial-out	On/Off, Phone number, Idle time, Authentication, Dialing filter
Port forwarding	Port forwarding configuration
Inputs	Status display, dial-out at GND signal, text messages
Outputs	Status display, opening/closing of contacts
System	Time settings, restart, factory defaults, update, system data display
Help	Help page, no configuration

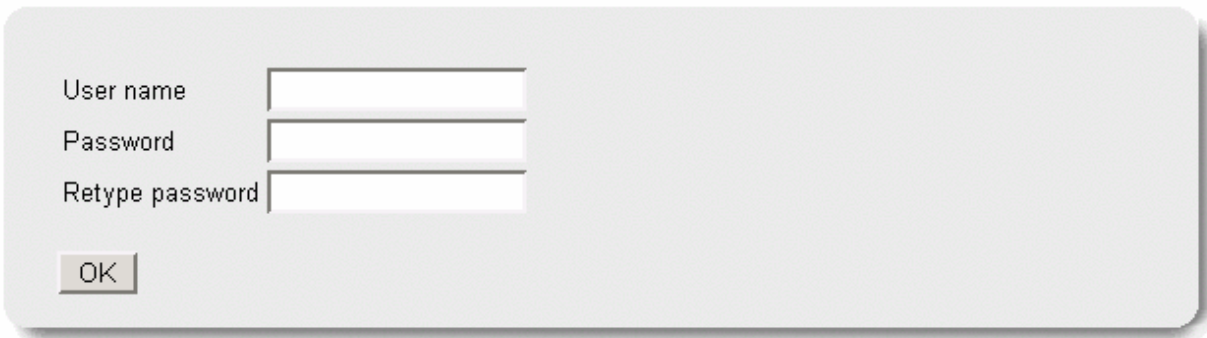
8 Functions

8.1 Basic settings

8.1.1 User name and password for configuration

Basic Settings

Authentication



User name	<input type="text"/>
Password	<input type="password"/>
Retype password	<input type="password"/>

The access to the MoRoS settings is protected from unauthorized access by a password query. The password is not displayed in plain text, but with asterisks.

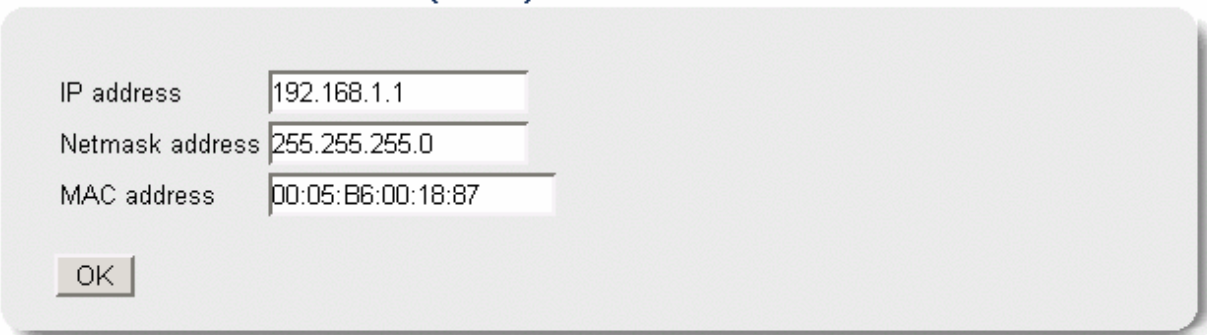
If the user name and the password can no longer be identified, a device reset of the MoRoS will reset it to factory defaults. Resetting the device will reset the standard user name and the standard password to their original state!

Caution!

When resetting the factory defaults, all settings will be lost, also the set IP address!

8.1.2 MoRoS IP address

Ethernet addresses (LAN)



IP address	<input type="text" value="192.168.1.1"/>
Netmask address	<input type="text" value="255.255.255.0"/>
MAC address	<input type="text" value="00:05:B6:00:18:87"/>

It is mandatory to enter an IP address and a network mask. The IP address is the address of the MoRoS in the Local Area Network.

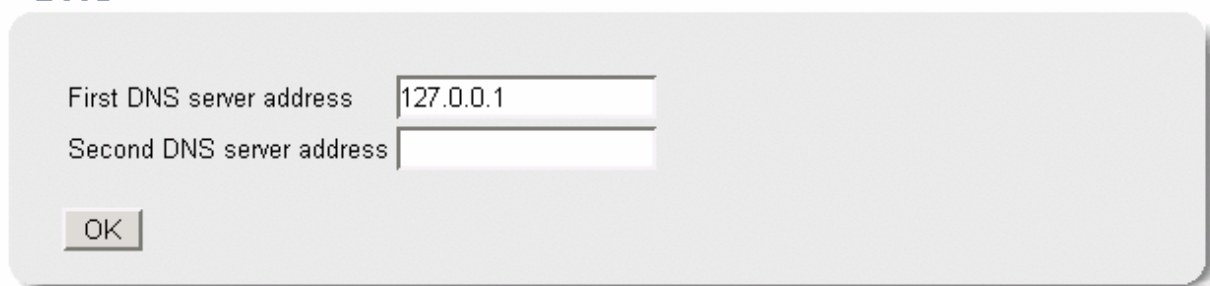
Caution!

After sending the changes to the MoRoS by clicking “OK”, the new addresses will be immediately valid. This will immediately terminate the connection to the MoRoS. To be able to continue with the configuration, the new IP address must be entered in the browser window!

The MAC address is unambiguous for each MoRoS. It may not be modified and is unique. It is merely shown for informational purposes.

8.1.3 Domain Name Service (DNS)

DNS



First DNS server address

Second DNS server address

The specification of the two IP addresses for a DNS server (Domain Name Service) is optional.

By default, for one of the two DNS servers, the IP address 127.0.0.1 is entered. MoRoS itself is not a DNS server, but it can forward DNS queries from the connected network to an external DNS server. To activate forwarding, the IP address 127.0.0.1 must be entered in at least one of the input fields. For the machines and computers which are connected to the local network and want to use DNS forwarding by MoRoS, the IP address of the MoRoS must be entered as DNS server address. By default, this is the IP address 192.168.1.1.

If the MoRoS has “Dial-out” activated, it will establish a connection to this destination, if required. After the connection has been established, the MoRoS will often receive one or two IP addresses for the DNS server. If the target computer specifies DNS servers, the MoRoS will save those addresses and in the future forward DNS queries to those servers.

If the MoRoS operates as a DHCP server, all DHCP clients will automatically receive the information about the IP addresses of the set DNS servers during login. If no DNS server is set, the IP address of an available DNS server must be set for each client.

8.1.4 DynDNS (Dynamic DNS Update)

Dynamic DNS update

Activate dynamic DNS update

DynDNS provider: DynDNS (www.dyndns.org)

DynDNS server:

Domain name:

User name:

Password:

OK

A DynDNS update offers the opportunity to allocate a fixed URL to the dynamic IP address of the MoRoS when dialing into the Internet (e.g. "samplecompany.dyndns.org"). The dynamic DNS update (DynDNS) can be set as an option.

After the connection has been established (e.g. to the Internet), the MoRoS will send the allocated IP address to the set service. It is thus possible to access the MoRoS and the devices in its LAN remotely without knowing the dynamic IP address. Use the check box to activate or deactivate this service.

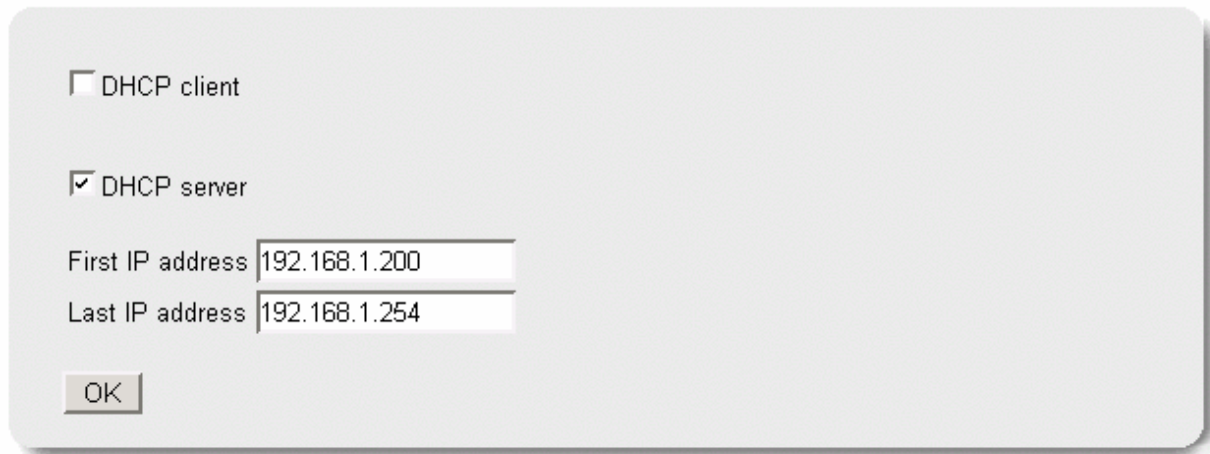
Several providers can be set for DynDNS. Each provider must register in advance. During the registration, a domain name such as "samplecompany.dyndns.org", a user name and a password are allocated. This data must be entered.

As an option, DynDNS providers that are not listed may be selected as well. In this case, the server of this provider must be entered in the line "DynDNS server". If a provider from the list is selected, the field "DynDNS server" must remain empty. The entered server must function according to the DynDNS update protocol. The according specifications are available at: <http://www.dyndns.com/developers/nicupdate-api.pdf>.

8.2 DHCP

The MoRoS can be operated as DHCP client or DHCP server.

DHCP



DHCP client

DHCP server

First IP address

Last IP address

Only one of the two services may be active simultaneously. Both services may be deactivated. These settings only apply to the local LAN.

Recommended settings:

- If no further network subscribers will be connected to the MoRoS after the initial installation, the DHCP client as well as the DHCP server should be deactivated. All network subscribers must be assigned a static IP address. These settings will ensure that all IP addresses remain unaltered.
- If more devices must be connected to the network after the initially installed devices, DHCP server operation is recommended. In this operational mode, it is not necessary to know the network settings for the connection of new devices such as a laptop for maintenance purposes. The newly connected devices (DHCP clients) will automatically be integrated into the network with this new setting. Here, also, it must be considered that all other network participants must receive static IP addresses to guarantee accessibility from outside.

MoRoS as DHCP client

The MoRoS can only be operated as DHCP client, if a DHCP server is operated in the adjacent Ethernet network. This server will assign an IP address to the MoRoS. If necessary, the server will assign a new IP address after the lease time has expired (the lease time is the time that a client is assigned or "leased" an IP address).

Caution!

When the MoRoS is assigned a new IP address from the DHCP server, the connection to the MoRoS is terminated. You may only address it via this IP address from now on. When the MoRoS receives its IP address dynamically as a DHCP client, you must make sure that its current address is known to the connected devices as gateway address.

MoRoS as DHCP server

If the MoRoS is operated as DHCP server, it will assign IP addresses to the connected network participants which are configured as DHCP clients on request. The MoRoS keeps its set IP address. When the MoRoS has assigned an IP address to a DHCP client, the lease times for the assigned IP addresses will be specified in the DHCP configuration.

Caution!

When operated as DHCP server, connected DHCP clients can only be assigned new IP addresses after at least half of the Lease Time (1 hour) has expired. The new address may differ from the old IP address.

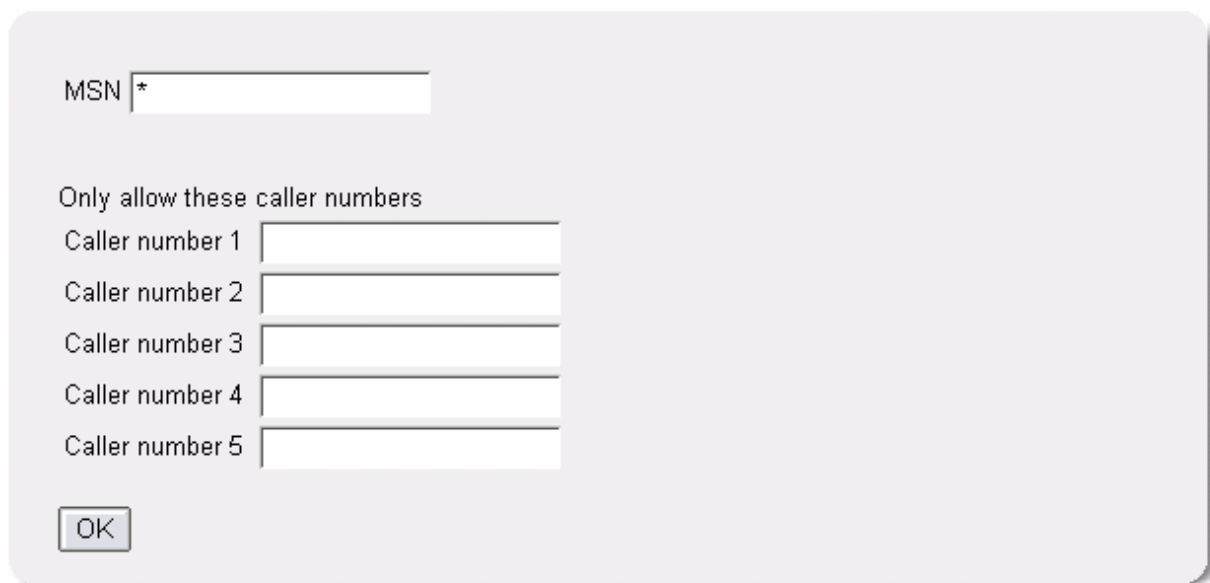
The Lease Time is the time, after which the MoRoS queries the connected DHCP client and checks if the device still responds after half the time has expired. If the device with that specific IP address has been replaced (different MAC address), a new IP address will be assigned, if necessary. Devices with a static IP address will not be included in the address distribution by the DHCP server. The DHCP server must be configured in a way that it doesn't assign addresses from its IP address pool („first IP address“ to „last IP address“), which haven't yet been statically set for other devices.

8.1 ISDN

This section describes the configuration of the integrated communication module ISDN-TA for the MoRoS ISDN.

8.1.1 MSN and authorized caller MSN

ISDN



MSN *

Only allow these caller numbers

Caller number 1

Caller number 2

Caller number 3

Caller number 4

Caller number 5

OK

Caution!

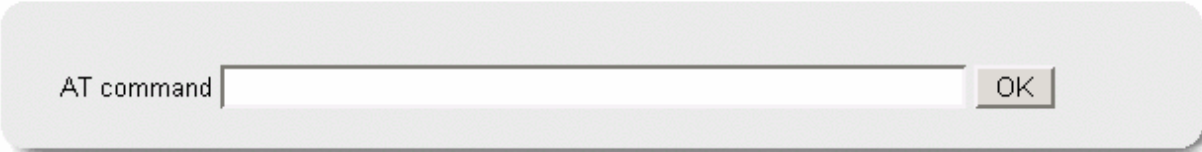
The configuration can only take place if neither Dial-in nor Dial-out are active. These functions must first be deactivated, if the configuration in the above section is supposed to be changed.

The MoRoS ISDN can be assigned a phone number in the field "MSN" (Multiple Subscriber Number). In the future, the ISDN-TA can then only be reached under this phone number. Alternatively, "*" may be entered. In this case, the ISDN-TA responds to all incoming calls. This is the standard setting. This setting, however, may result in problems with the other bus participants at the SO bus.

Further below, you can set which phone numbers are permitted to establish a connection to the MoRoS. The prerequisite is that the phone numbers are transferred during a call (CLIP). This requires the activation of the according service at the caller's phone provider. The calling device must communicate its phone number. If this is not the case, no connection can be established.

8.1.2 Send AT commands to ISDN-TA

Terminal


 A light gray rounded rectangular dialog box with a shadow. It contains a text input field on the left with the placeholder text "AT command" and a small "OK" button on the right.


AT commands may be entered in the field "Terminal". This command is sent directly to the ISDN-TA of the MoRoS. The reply of the ISDN-TA is displayed below the entry field.

8.2 Modem

This section only applies to the MoRoS Modem.

8.2.1 Country code/Wait for dial tone

MODEM


 A light gray rounded rectangular dialog box with a shadow. It contains a "Country code" label followed by a dropdown menu showing "Default (FD)". Below this is the "Wait for dialtone" label with two radio buttons: "Yes" (unselected) and "No" (selected). At the bottom left is an "OK" button.

Caution!

The configuration can only take place if neither Dial-in nor Dial-out are active. These functions must first be deactivated, if the configuration in the above section is supposed to be changed.

The country-specific settings of the modem are loaded in the field "Country code". Use the list box to select the required country. The country code is displayed in brackets behind the country name. The country code may be identical for several countries.

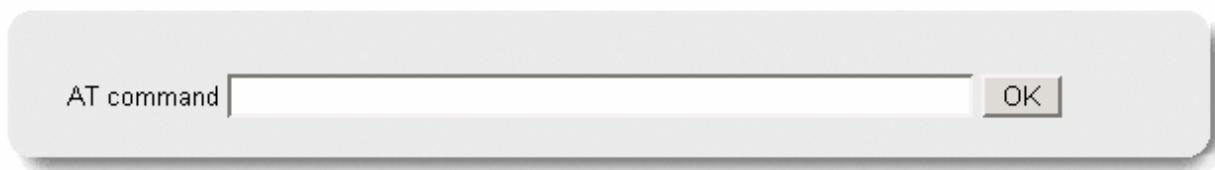
In the field "Wait for dial tone", you can set if the modem should wait for a dial tone before it initiates a call. It may be necessary to set this setting to "No", if the MoRoS is connected to a phone system. It is usually necessary to enter 0 as dialing code when entering the phone number. Further information about this topic can be found under "Dial-out" (Chapter 8.4).

Caution!

When changing the country code, all standard values for this country setting are automatically loaded, e.g. "Wait for dial tone" is reset to "No".

8.2.2 Send AT commands to the modem

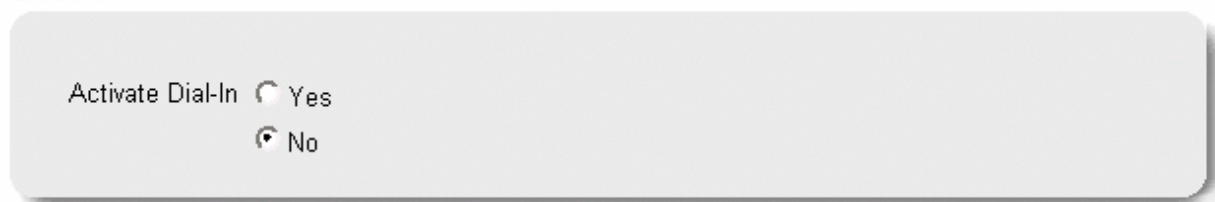
Terminal

A light gray rounded rectangular box containing a text input field with the placeholder text "AT command" and an "OK" button to its right.

AT commands may be entered in the field "Terminal". This command is sent directly to the analogue modem of the MoRoS. The reply of the modem is displayed below the entry field.

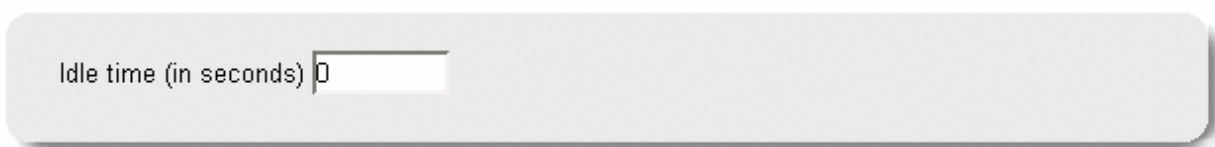
8.3 Dial-in

Dial-In

A light gray rounded rectangular box containing the text "Activate Dial-In" followed by two radio button options: "Yes" (unselected) and "No" (selected).

This setting activates the function "Dial-in". All other settings are ignored if "No" is selected at this point.

8.3.1 Idle time

A light gray rounded rectangular box containing the text "Idle time (in seconds)" followed by a text input field with the value "0".

Enter a value for "Idle time" to set the time after which a dial-in connection is automatically terminated, if no data is transmitted during the set time.

The setting "0" will prevent the automatic termination of the connection. In this case, a connection remains established until the remote terminal terminates the connection.

An automatic termination will only take place when no data is transferred during the entire set "Idle time". The time interval is reset and will restart as soon as one single data packet is transmitted.

8.3.2 User for dial-in

Authentication for Dial-In

User name	Password	Authentication with	
		PAP	CHAP
		<input checked="" type="radio"/>	<input type="radio"/>
		<input checked="" type="radio"/>	<input type="radio"/>
		<input checked="" type="radio"/>	<input type="radio"/>
		<input checked="" type="radio"/>	<input type="radio"/>
		<input checked="" type="radio"/>	<input type="radio"/>
		<input checked="" type="radio"/>	<input type="radio"/>
		<input checked="" type="radio"/>	<input type="radio"/>
		<input checked="" type="radio"/>	<input type="radio"/>
		<input checked="" type="radio"/>	<input type="radio"/>

In this field you can enter whether an authentication is required for dial-in. If "No" is selected, all persons who know the MoRoS phone number can dial-in.

This is also the place to set all user names and passwords which should be authorized for dial-in. Each user must be assigned the information whether he will login using the authentications PAP (Password Authentication Protocol) or CHAP (Challenge Handshake Authentication Protocol). The setting "CHAP" also includes the variants MS-CHAP and MS-CHAP v2.

8.3.3 IP address for PPP connection

Local IP address of PPP connection (WAN)

Remote IP address (WAN)

After a call is accepted, a PPP (Peer-to-Peer) connection is established. The MoRoS and the device that performs the dial-in form an individual network. The MoRoS assigns the IP address stored above to the remote terminal.

Caution!

The local IP address of the PPP connection and the IP address of the remote terminal of the PPP connection must be present in the same network and in another network than the devices behind the MoRoS.

Example:

IP address and network mask of the MoRoS in the LAN:

192,168,101.xxx / 255.255.255.0

Local IP address of the PPP connection (WAN):

192.168.102.xxx / 255.255.255.0

Remote terminal IP address (WAN):

192.168.102.xxx / 255.255.255.0

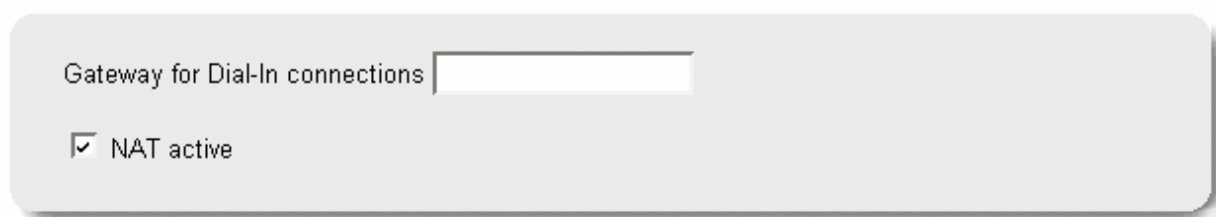
IP address and network mask of a computer MoRoS in the remote LAN:

192,168,103.xxx / 255.255.255.0

In most cases, the suggested addresses may be used.

If the device that is dialing in suggests IP addresses, they are selected from the MoRoS, independently from the above settings. It must be ensured that the assigned IP address is present in another network than the devices of the LAN.

8.3.4 Set gateway for dial-in connections



Gateway for Dial-In connections

NAT active

If another gateway must be used behind the MoRoS in the LAN, this is the place to enter the according IP address. One application could be a firewall between MoRoS and the local network. The incoming data are forwarded to the gateway address during an existing dial-in connection. Furthermore, all data packets from devices connected to the switch are being sent to the gateway. The gateway address is only used for existing dial-in connections.

Use the check box to activate NAT (Network Address Translation). This is set as a default. In some cases, it may make sense not to use NAT, but to set the routing via a default route. If this is requested, the IP address of the remote terminal (WAN) must be set as gateway address in the box above. In this case, all packets from the LAN are sent to the machine that is dialing in, if this machine is not directed to a destination within the LAN.

8.3.5 Automatic callback

The screenshot shows a configuration window with the following elements:

- A checkbox labeled "Activate callback" which is currently unchecked.
- Two radio button options:
 - The first option, "After successful PPP authentication", is selected.
 - The second option, "After a call from these caller IDs", is unselected.
- Five empty text input fields stacked vertically, intended for entering caller IDs.

An automatic callback can be set at this location. The connection established for the callback is configured in the menu item "Dial out". There are two options for triggering the callback:

- Automatic callback after successful PPP authentication: A connection to the MoRoS is established; the caller authenticates himself using his PPP user name and PPP password. After the authentication, the MoRoS will terminate the connection and initiate the callback. As data is exchanged, this connection is subject to costs.
- Automatic callback after a call from one of five fixed, defined phone numbers. The caller must have caller ID activated and send his phone number to the MoRoS. If this phone number is one of the stored phone numbers, the MoRoS will initiate a callback. The phone number will be transmitted after the first "Ring". The caller should terminate the call latest after the third "Ring". If the caller waits for more "Rings", the MoRoS will accept the call approximately after the fifth "Ring" and hang up after one second. This only applies to the MoRoS Modem. After the second "Ring", the MoRoS ISDN will indicate to the caller that he should hang up. For the MoRoS ISDN there will be no costs; for the MoRoS modem only if the caller did not hang up latest after the third "Ring".

The method "PPP authentication" is preferred if it needs to be guaranteed that only authorized persons are permitted to perform a callback. This is also the only possibility to carry out a callback if no phone number can be transmitted.

The screenshot shows a dialog box with a single button labeled "OK" and the text "Confirm all" next to it.

Click "OK" to store the settings.

8.4 Dial-out

This setting activates the function "Dial-out".

Dial-Out

Activate Dial-On-demand Yes
 No

All other settings are ignored if "No" is selected at this point. To enable the MoRoS to automatically establish a connection, the IP address of the MoRoS must be entered as standard gateway at the machines which should trigger a connection.

8.4.1 Phone number and provider data for dial-out

Telephone number
 User name
 Password
 Authentication PAP CHAP PAP or CHAP
 Idle time (in seconds)
 Maximal connect-time (in seconds)

If the MoRoS receives an Ethernet packet from the LAN which is directed to an IP address outside of the LAN, the MoRoS will start a dial-up connection. The phone number of the remote terminal must be entered. For connections to the Internet, the phone number of the ISP (Internet Service Provider) must be entered. The machines and PCs connected to the switch of the MoRoS must receive the IP address of the MoRoS as standard gateway.

If the MoRoS is connected to a phone system, it may be necessary to enter the prefix "0" and/or "," before the phone number.

For most dial-up connections, an authentication with the remote terminal is required. The user name, the password and the authentication type can be set at this point. Some ISP will not require a user name or a password. If the dial-up to the ISP is not working although these two fields were left empty, it is possible that the ISP does not require a particular user name and password, but is waiting for any text in these fields. In this case, any names can be entered in those fields.

For the MoRoS GMS/GPRS it is possible to establish regular GSM connections as well as GPRS connections. The phone number must be selected according to the requirements.

Please get more information from the according GSM/GPRS provider or read the manual. For a GPRS connection, an APN (Access Point Name) must be entered.

Enter a value for "Idle time" to set the time after which a dial-out connection is automatically terminated, if no data is transmitted during the set time.

Caution!

The connection is only terminated automatically, if no data packets are transmitted during the entire "Idle time". If a data packet is transmitted, the "Idle timer" starts counting from the beginning.

The setting "0" will prevent the automatic termination of the connection. In this case, a connection remains established until the remote terminal terminates the connection. As an option, a maximum connect time may be defined. After this period has expired, the connection is terminated regardless if data was transmitted or not. A set maximum connect time of 0 seconds will deactivate the forced termination. This function may be practical if the MoRoS dials into the Internet, as the MoRoS might receive undesired data packets. It may occur that the "Idle timer" is reset prior to its expiry, because search engine robots, misdirected queries, malicious programs or other data packets arrive at the MoRoS. The longer the setting for the "Idle timer" is, the more likely it will be reset from such a data packet. As a result, unintentionally high connection costs may occur.

8.4.2 Permanent connection

The screenshot shows a configuration window with the following elements:

- A checkbox labeled "Connect immediately and hold connection" which is currently unchecked.
- A text input field labeled "Interval for checking connection (in minutes)" containing the value "30".
- A section titled "Type to check the connection" with two radio button options:
 - "DNS request" (selected)
 - "Ping to" (unselected)
- A text input field next to the "Ping to" option containing the value "www.XYZ.xyz".

If it is required to establish a connection immediately and to maintain it permanently ("Flat rate operation"), this check box must be activated. The connection is checked according to the set time interval.

The type of checking can be selected:

- Checking using a DNS query: After the time interval has expired, the DNS server is queried for a preset domain name. It is assumed that the MoRoS has received at least one IP address of a DNS server during dialing in. If this query fails, the connection is terminated and re-established after one minute.
- The second checking method is performed using the Ping function. The phone number of the remote terminal must be set. This may be a domain name or an IP address. If this Ping fails (i.e. the remote terminal does not reply with a "Pong"), the connection is not terminated. This checking method, however, will automatically trigger a connection setup although there was never an established PPP connection.

The first checking method (DNS query) is practical, if the MoRoS has dialed into a network which has a DNS server and this server is allocated to the MoRoS during a connection setup (e.g. dialing into the Internet). The second checking method is practical, if the MoRoS dials into a network (or also into a single remote machine), which does not have a DNS server.

If it is determined that the established connection is not a regular connection, the check is repeated after one minute. If this fails again, the next check is performed after 5 minutes, then after 30 minutes, and then continuously after each hour. After each check with a negative result, a second attempt is performed after one minute. If a check is performed and has a positive result, the set checking interval will again become effective.

8.4.3 Packet filter for Dial-on-Demand resolution

Enable Dial-Out filters

Ports for Dial-On-demand rules

	Port 1	Port 2	Port 3
Allow packets from these ports to initiate dialing	<input type="text"/>	<input type="text"/>	<input type="text"/>
Deny packets from these ports to initiate dialing	<input type="text"/>	<input type="text"/>	<input type="text"/>
Allow dialing to these destination ports	<input type="text"/>	<input type="text"/>	<input type="text"/>
Deny dialing to these destination ports	<input type="text"/>	<input type="text"/>	<input type="text"/>

IP-Addresses for Dial-On-demand rules

	IP address 1	IP address 2	IP address 3
Allow these machines to initiate dialing	<input type="text"/>	<input type="text"/>	<input type="text"/>
Deny these machines to initiate dialing	<input type="text"/>	<input type="text"/>	<input type="text"/>
Allow dialing to these destination machines	<input type="text"/>	<input type="text"/>	<input type="text"/>
Deny dialing to these destination machines	<input type="text"/>	<input type="text"/>	<input type="text"/>

The MoRoS is equipped with a dialing filter which prevents certain data packets to immediately result in a connection setup and therefore costs. Deactivating the dialing filter directs each data packet that is aimed at an IP address outside of the LAN to a dial-in at the remote terminal. The dialing rules are that ports are entered in the first table, and IP addresses are entered in the second table.

Empty fields are also permitted, they will be ignored. Invalid entries (e.g. port 123a3 or IP address 192.168.1.2000) are automatically ignored and will not be entered into the configuration.

Ports for the Dial-On-Demand rules:

In the first line, all ports may be entered which are allowed to trigger a dial-up connection.

In the second line, all ports may be entered which are included in sender packets and may not trigger a dial-up connection.

Data packets sent to ports in the third row will result in a connection setup.

Data packets sent to ports in the fourth row will not result in a connection setup.

IP addresses for the Dial-On-Demand rules:

In the first line, all IP addresses of the machines may be entered which are allowed to trigger a dial-up connection.

In the second line, all IP addresses of the machines may be entered which are not allowed to trigger a dial-up connection.

Data packets sent to the IP addresses in the third line will result in a connection setup.

Data packets sent to IP addresses in the fourth line will not result in a connection setup.

Basically, the following applies:

- All rules allowing a connection are linked with "OR".
- All rules not allowing a connection are linked with "AND".
- If at least one line has a value, the rule for this line will come into effect. If no value is entered, the rule for this line is completely ignored.

For clarification, please find an example with ports: A dial-up connection is established, if

- The sender port is specified in a column in the first line
- AND is NOT displayed in a column in the second line
- OR the sender port is specified in a column in the third line
- AND is NOT displayed in a column in the fourth line.

For example, if a port is entered in the third line of the port table, connections to this destination port will be permitted. This explicit specification will now reject all connections to other ports. Vice versa applies as well: If a port is entered in the fourth line, all connections to this port are rejected; data packets at all other ports, however, will be permitted.

These settings must be considered in combination with each other. Very complex combinations are possible. We therefore recommend to thoroughly test the configuration for logical errors.


 A screenshot of a dialog box with a light gray background and rounded corners. It contains two buttons: 'OK' and 'Confirm all'. The 'OK' button is on the left and has a small square icon next to it. The 'Confirm all' button is on the right.

Click "OK" to store the above settings.

8.5 Port forwarding

Port forwarding rules may be defined at this location.

Portforwarding

Activate portforwarding

Use this check box to activate or deactivate all port forwarding rules.

8.5.1 Port forwarding rules

Create new portforwarding rule

Protocol	Source port	Destination IP address	Destination port
TCP	-	-	
Exposed host			

Use this location to create port forwarding rules.

First of all, the protocol must be selected. Port forwarding rules can be created for TCP, UDP or ICMP packets. Any number of TCP or UDP forwarding rules can be created. Only one ICMP forwarding is possible. A new ICMP port forwarding will replace the old one.

In the first text field, the sender port is set. This is the number of the port, at which the MoRoS received the packet. The packet is sent to the machine with the IP address set in the field "Destination IP address". The destination port must be entered in the last field of the line "Destination port".

To forward packets of the ICMP protocol, only the IP address of the destination machine must be entered as this protocol has neither a sender nor a destination port.

As "Exposed host", enter the IP address of a machine which will receive all packets that are not affected by previous port forwarding. If no "Exposed host" is entered or if it doesn't exist, all packets which have not been forwarded by previous port forwarding rules will be sent to a void.

For TCP or UDP port forwarding, entire IP or port areas can be entered for the port forwarding rules.

Forward several ports to a machine:

Example:

- Protocol: TCP
- Sender port: 1024-1100
- Destination IP address: 192.168.200.0
- Destination port: 1024

The ports from 1024 to 1100 are all forwarded to the machine with the IP address 192.168.200.0. In this case the destination ports are the same as the sender ports. The last port of the destination area (in the example: 1100) is automatically calculated by the MoRoS.

A series of ports can be distributed to several machines.

Example:

- Protocol: TCP
- Sender port: 2000-2004
- Destination IP address: 192.168.200.0-192.168.200.4
- Destination port: 2000

The ports will then be forwarded to the machines in succession:

Port 2000 to 192.168.200.0 Port 2000
Port 2001 to 192.168.200.1 Port 2001
Port 2002 to 192.168.200.2 Port 2002
Port 2003 to 192.168.200.3 Port 2003
Port 2004 to 192.168.200.4 Port 2004

The destination ports of the packets, however, does not need to correspond to the sender ports. The MoRoS can thus forward packets from port 80 to another IP address and another port (e.g. 65530). This way, the configuration page of the MoRoS can not be accessed from the outside as this query is immediately forwarded.

8.5.2 Edit port forwarding rules

active	delete	Protocol	Source port	Destination IP address	Destination port
<input checked="" type="checkbox"/>	<input type="checkbox"/>	TCP	1234	192.168.1.2	1234
<input checked="" type="checkbox"/>	<input type="checkbox"/>	ICMP	-	192.168.1.3	-

The already set forwarding rules are displayed. Use the check boxes "Active" or "Delete" to activate or delete forwarding rules when "OK" is clicked. If a forwarding rule is not active, it will not become effective during a connection, but it is not removed from the table.

Caution!

The port forwarding rules are not checked for logical errors!

The port forwarding rules are applied in the order in which they are displayed in the list. For example, if a packet with a rule in line 1 has already been processed and forwarded, the rule in line 2 will no longer apply to this packet. All packets, for which no rule from the previous line applies, will be forwarded to the machine with the IP address of the "Exposed host".

Confirm all

All settings in the above fields will be stored and saved.

8.6 Inputs

This shows all states of the digital MoRoS inputs.

Inputs

Input 1 : open
Input 2 : open

The button "Update" will reload the page and update the status display.

The inputs can be used to visualize testing the failure of a machine, for example.

8.6.1 Dial-out

Dial-Out

Dial-Out automatically if input IN2 gets LOW for at least 4 seconds

OK

If the check box is activated, a GND signal at the input IN2 that lasts at least four seconds will result in a dial-out. A GND signal will be caused, for example, if the terminal "IN2" is connected to the terminal "GND".

8.6.2 SMS dispatch

This function is only implemented in the MoRoS modem.

Sending SMS

Activate SMS transmission because of changes of input IN1

SCN (Service Centre Number)

Simple alarm Telephone number

Amount of pulses 1 Telephone number

Amount of pulses 2 Telephone number

The image shows a graphical user interface for configuring a MoRoS modem. It features two identical sections stacked vertically. Each section has a label 'Amount of pulses' followed by a value (9 and 10 respectively) and a label 'Telephone number' followed by an empty text input field. Below the second section, there is an 'OK' button and the text 'Confirm all'.

With its integrated modem, the MoRoS Modem can send text messages via the fixed network, when the state of the input IN1 changes. This function is only integrated in the MoRoS modem. The change can be represented by one of the following:

- A GND signal of at least four seconds.
- One to ten impulses of GND states.

These text messages are a maximum of 160 characters long and can represent the following:

- SMS to fixed network phone
- SMS to mobile phone
- E-mail
- Fax

Please ask your provider for more precise information regarding the sending of such text messages (see Chapter 12). An impulse is a GND signal with a duration of a minimum of 200ms and a maximum of 2 seconds. The following HIGH signal may also last between 200ms and 2 seconds.

Activate the sending of text messages by setting a check mark in the check box. A SCN (Service Center Number) must always be entered. This phone number depends on the provider. When a text message is sent, the yellow LED "Data" will light up. During the modem communication itself, the green LED "COM" will light up.

8.7 Outputs

This shows all states of the digital MoRoS outputs.

Outputs

Output 1 : closed

Output 2 : closed

Refresh

The button "Update" will reload the page and update the status display.

Switching Output 1 to closed

open

Switching Output 2 to closed

open

OK

Use the radio buttons to switch the digital outputs.

Click "OK" for an automatic update.

One application using this output would be the ability to remotely switch a device within the LAN on and off. This is often the only possibility for reactivating a device that does no longer respond to network commands.

8.8 System

8.8.1 Time

Use these fields to enter the system time and date.

System

Time

DD MM YYYY hh mm

Set system time to 18 . 01 . 2007 04 : 20

Timezone Europe/Regensburg

Clock synchronisation with pool.ntp.org

OK

Make sure to use the correct input format in these fields; otherwise, the entered values will not be accepted. “DD” is the calendar day, “MM” is the month, and “JJJJ” is the year (must be entered with four digits!), “hh” is the hour, and “mm” represents the minutes.

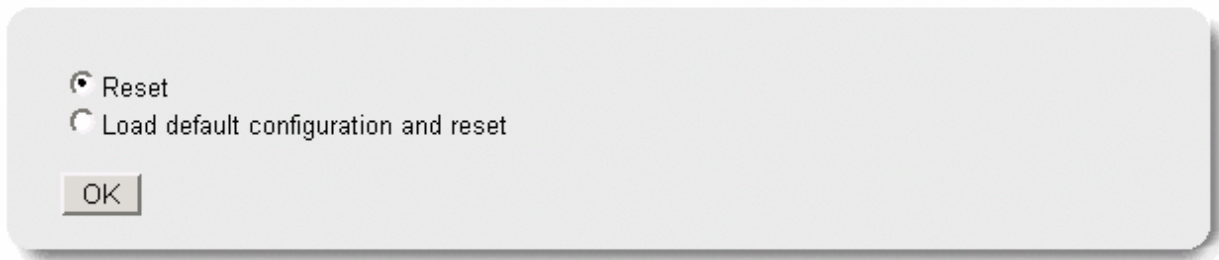
In the field "Time zone" you may enter the local time zone. In this field, the basic time zones such as UTC (Coordinated Universal Time) or GMT+X (Greenwich Mean Time + X hours) are available. Furthermore, there are specific country time zones, sorted by continent (e.g. Europe/Berlin). For the latter, the country-specific time settings will be considered, such as the daylight savings time in Germany.

The MoRoS has an NTP (Network Time Protocol) client. If the check box "Synchronize clock" is activated, after each connection setup (only dial-out) it is attempted to query the entered time server for the current time. If this query is successful, the system clock of the MoRoS is set to this time. This is recommended, as after an extended period without voltage the clock will lose its current data and will start with the date 1.1.1970 after the voltage returns. After the first successful query at the time server, the clock is automatically updated.

The settings are stored by clicking "OK".

8.8.2 Reset

Reset



Two reset types are available:

- Hard reset
 - By interrupting the supply voltage, or
 - By pressing the reset key for more than 3 seconds.

- Soft reset
 - By pressing the reset key for no longer than 1 second, or
 - Per reset via the configuration interface.

"OK" will initiate a restart or the loading of the basic settings plus restart. After a restart, it will take about 25 seconds until the MoRoS is again ready for operation. During the restart, the "Status" LED on the front panel of the housing lights up red. The MoRoS will be ready for operation after the LED goes out. After the basic settings have been loaded, it takes about one minute until the MoRoS is ready for operation.

Caution!

The loading of the basic settings results in all settings being reset to the factory defaults. This also concerns the user name and the password for the configuration interface. The IP address and the network mask are also reset to the factory defaults (see Chapter 8).

Resetting to the basic settings should be avoided when performing a remote configuration. The loading of the basic settings also means that Dial-out and Dial-in are deactivated. It will not be possible afterwards to remotely dial-in into the MoRoS. The configuration can then only be performed via a local connection!

You can also restart the MoRoS by pushing the Reset key on the front panel of the housing for a short time (maximum of 1 second).

The rewriting of the factory settings can also take place via the reset key. Press the reset key three times for a short time within 2 seconds. Afterwards, the LED "Status" lights up red.

8.8.3 Update

Update

Uploading a file can last several minutes.

You may now perform a software (firmware) update.

Caution!

This function should only be used with the utmost care. Do not perform an update if it is not absolutely necessary. In case of an error, the MoRoS may possibly not be started afterwards.

Before each update, you must under all circumstances follow the notes of the text file, which is supplied together with the update file. For some updates, it may be necessary to load two different files in succession. Afterwards, a restart is required to load the new system. Depending on the scope of the system changes due to the new files, the default settings may need to be restored. The text file supplied together with the update files will have all the required information.

The update will take place in two steps: First, the new firmware file is loaded into the nonvolatile memory. The new firmware is then checked for completeness and validity. If the new file turns out to be invalid or if it has errors, the update will be dismissed. In this case, the MoRoS will continue working with the previous settings.

The fileupload ended successfully.

Should the system really become overwritten by the uploaded file?

Updating the system can last up to a half minute.

If the update file is valid and error-free, the user will again be asked if the system should be updated with this file. When the user confirms by clicking on "Yes", the system will finally be overwritten with the new file. After the old system was overwritten with the new system, no automatic restart is performed. This means that the old system is still running.

Caution!

If the update takes place via a dial-up connection, you must see to it that the connection is not prematurely terminated due to an expired "Idle time".

As the writing of the update may take up to one minute, the values for the "Idle time" should read "0", because no data is transmitted during the writing process. The system update will be performed at the remote MoRoS despite a terminated connection. Any possible messages regarding the success or failure will not be displayed.

If an error took place during the overwriting of the old system, the update procedure may be repeated.

Caution!

In no case may the MoRoS perform a restart during an update procedure or after a failed update! If the reset key is pressed or a voltage failure occurs, the MoRoS will have no valid system and the device will not be able to start!

A restart of the MoRoS will load the new system. Before a restart is performed, it may be possible that the basic settings need to be restored first. This information can be taken from the text file, which is supplied together with the update file.

8.8.4 Download the configuration**Download configuration**

Download the current configuration of MoRoS.

The name of the latest uploaded configuration file was "default-configuration".

The MoRoS settings are written into a file and can be stored externally. Any file name can be selected to store this file. Use the field "Update" above to reinstall this file to the MoRoS. The MoRoS will recognize that this is a file with a configuration, regardless of the file name. The name of the installed file is stored separately and displayed. The downloaded file should therefore be stored using a meaningful file name (e.g. date, MoRoS location, etc.).

After the default settings have been reinstalled, "default configuration" will be displayed.

8.8.5 MoRoS port settings for web interface and proxy

Port settings of MoRoS

Port for web interface	<input type="text" value="80"/>
Port for proxy server	<input type="text" value="8888"/>
<input type="button" value="OK"/>	

This is used to configure the ports, which will be used to reach the web server for this web interface and the proxy server.



Caution – Function loss!

If the port for the web interface is not port 80, then the port must be entered in the browser after the IP address of the MoRoS, as browsers send their queries to port 80 by default. Example: 192.168.1.1:1025, if port 1025 was selected for the web interface.

8.8.6 Download system data / system messages

System data

Version 1.1
 Hardware revision 003
 Production date 10.08.2006 11:55
 Serial number 7
 First checksum A2DFA4FA
 Second checksum 920FB140



Download the latest system messages

Thu Jan 18 04:10:20 CET 2007
 No telephone line connected!

 Thu Jan 18 04:10:21 CET 2007
 No redundant communication device found!

This field has information regarding the currently running system. This information as well as the set IP address should be available when you get in contact with the INSYS support department.

You will also find the most current system messages at this location. The last 1,000 lines of the system messages can be downloaded and saved as .txt file with one click on the arrow.

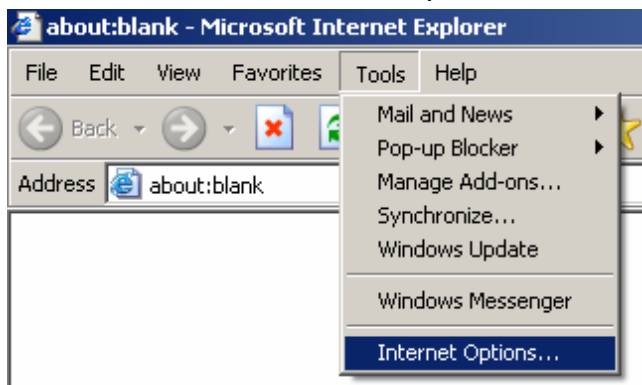
9 Proxy

The MoRoS has a proxy server. This proxy server buffers HTTP pages which were queried via a dial-out connection from the MoRoS from a remote network (Internet or other LAN). The usage of the proxy server is optional. If a PC is configured in a way that it uses the proxy server and performs a HTTP query, the MoRoS will buffer this requested page. This page will then be available as a copy from the MoRoS the next time this page is queried. The content of the page does not need to be loaded via the dial-up connection, which results in a noticeable speed benefit.

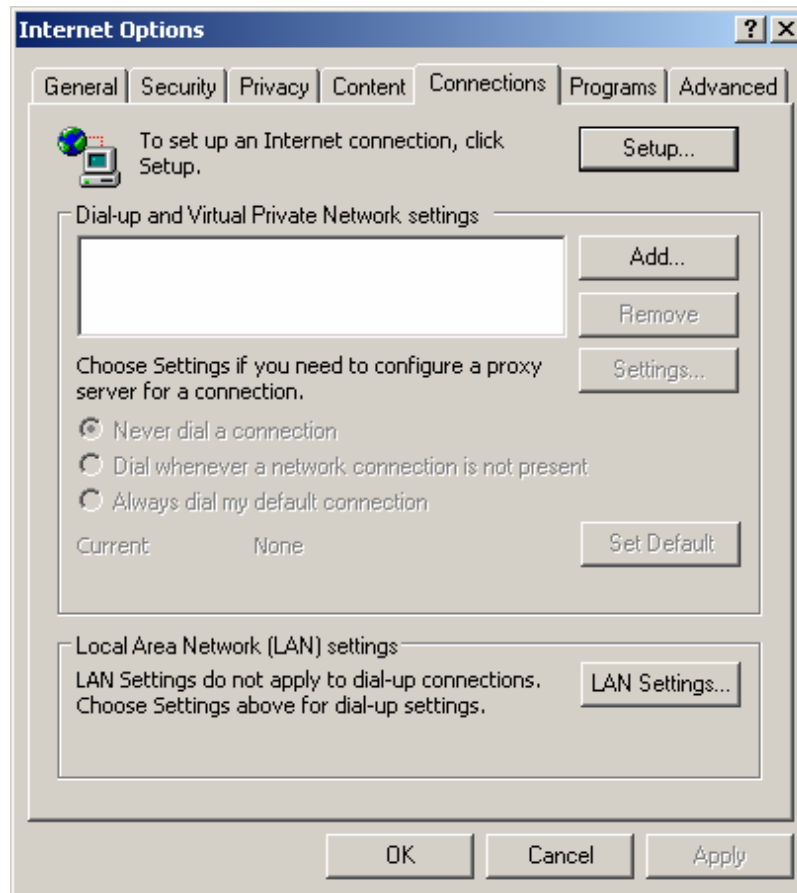
9.1 Basic Configuration

The proxy server accepts queries at port 8888. The port can be changed at the menu item "System", The following settings are meant for the Internet Explorer:

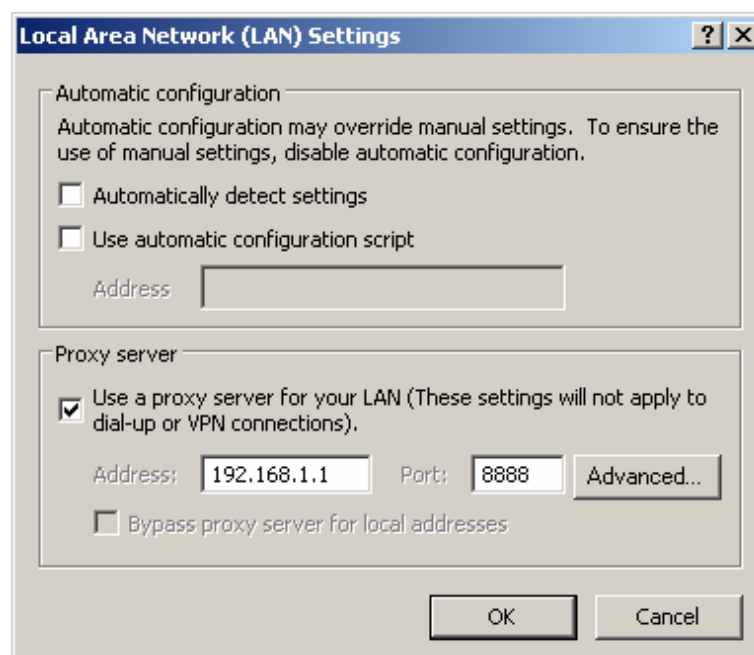
The menu item "Tools" has the sub item "Internet options":



Click on the button “Settings” in the box “Local Area Network Settings” to access the configuration.



In the box Proxy server you must enter the “Address” of the MoRoS IP Address. Enter “8888” as port. We recommend activating the checkbox “Bypass proxy server for local addresses”.

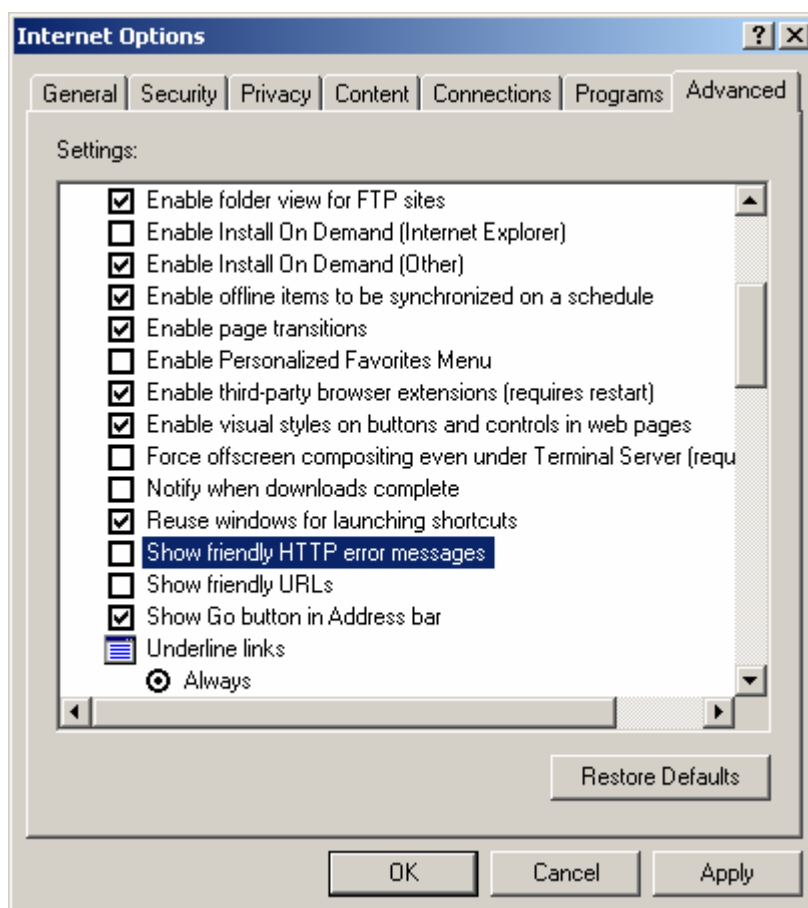


9.2 Reload Function

In case the MoRoS has currently no active dial-up connection and the function “Dial-out” is active, a query for a HTTP site will result in the MoRoS establishing a dial-up connection. For the MoRoS Modem, establishing this connection may take some time due to the technology. After some time, the browser will report that the page cannot be found. You must now attempt to restart the page using the reload function of the browser.

To avoid having to use the reload function, the MoRoS has an automatism which automatically retries to send the required data to the browser. For most of the browsers, this automatism works immediately after the proxy settings are completed.

For the Internet Explorer, one setting must be deactivated to be able to use this automatism. Re-open the window under “Tools” -> “Internet options”. Remove the checkmark from the checkbox "Show short HTTP error messages" on the tab "Advanced".



10 FAQ

In the following, some questions are described, which – from experience – may occur during the installation.

The configuration page of the MoRoS cannot be found The browser window shows an error message.

Possible causes:

- The network cable between MoRoS and the PC was not properly connected.
- The cables for the network and the modem or ISDN were exchanged.
- A wrong IP address was entered in the URL bar.
- The PC is not in the same network as the MoRoS.

If the MoRoS IP address is unknown, resetting to the factory defaults will result in the MoRoS being available at the IP address 192.168.1.1 again. Resetting, however, will reset all settings to the standard values.

If the MoRoS can still not be reached, this means that the PC is in another network than the MoRoS. In this case, the IP address and the sub network mask of the PC must be adjusted (see Chapter 0).

When no connection with the MoRoS can be established at the initial start-up, the network card must be checked for the configuration or function.

Dial-out doesn't work. A packet which needs to be picked up from another than the local network, will not result in an established connection. The "DATA" LED will light up green for a short time and will immediately go out again.

Notes regarding this problem can be found under the menu item "System" of the configuration surface. The box "System data" lists the last ten messages of the integrated communication module.

Possible causes:

- The configuration has errors. If the MoRoS is located behind a phone system, the dialing code "0" must possibly be dialed. Some systems require a comma after the „0“. This will delay the dialing procedure after the zero. It may in addition be necessary to set the modem settings option "Wait for dialing tone" to "No".
- Blacklisting: The remote terminal cannot establish a PPP connection and terminates the connection after a call. In this case, the MoRoS will constantly re-attempt to establish a connection. After the twelfth unsuccessful attempt, the integrated communication module is no longer allowed to call this phone number; the communication module is "blacklisted". In this case, the MoRoS can only try to

call this number after 2 hours. The status “blacklisted” can also be deleted by performing a hard reset (pressing the reset key more than 3 seconds).

- No user name and password was stored for dial-out. This may often be necessary although the providers do not require authentication. In this case, any text should be used as user name and password.

No connection between the MoRoS Modem and the MoRoS ISDN can be established.

This is not an error! A connection between analogue connections and ISDN connections is in general not possible anyways.

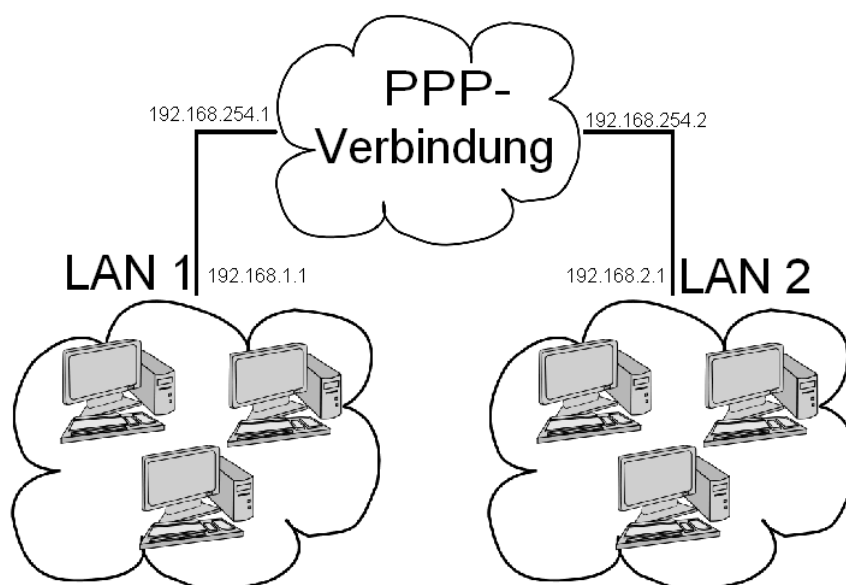
A connection to a remote LAN could be established, but the communication with a computer in the remote LAN is not possible.

Possible causes:

- The gateway address of the local computer is wrong.
- The DNS resolution is incorrect. This can be checked by using IP addresses instead of domain names for the communication.

A communication between a local computer and a computer from a remote LAN cannot be established if all IP addresses are located in the same network. The PPP connection consists of the two IP addresses of the PPP client and the PPP server. These two addresses form their own network. This PPP network may also not be the same as the network LAN 1 or LAN 2.

A model distribution of IP addresses in networks with the sub network masks 255.255.255.0:



As an alternative, the network of the PPP connection (consisting of the two addresses 192.168.254.1 and 192.168.254.2) may be resolved and the two addresses entered into the network of the according LAN. The address 192.168.254.1 could be changed to 192.168.1.254, and the address 192.168.254.2 could be changed to 192.168.2.254, for example.

The configuration interface acts "funny": The MoRoS does not accept the interface configuration.

Possible cause:

- After the configuration of a page, the button "Restart" or "Reload" in the browser was clicked to check if the configuration was accepted.

Please do not click this browser button at any time, as this key does not only update the content of the current window, but also repeats the entire previous configuration step. To update the display, the according button in the browser window must be clicked again.

11 Technical Data

11.1 Mechanical Features

	MoRoS
Weight	300 g
Dimensions (maximum)	w x d x h = 70 x 110 x 75 mm
Temperature range	0°C ..55°C
Protection class	Housing IP 40/ Terminal IP 20
Humidity	0 - 95% non-condensing

11.2 Power Supply

All specified technical data was measured with a nominal input voltage, full load, and an ambient temperature of 25°C. The threshold value tolerances are subject to the typical fluctuations.

To operate the MoRoS, a suitable device protection must be used.

Power supply: 10..60 V DC

Power input: approx. 3 W (during connection)

Input voltage	Current (closed circuit)	Current (connection)
10 V DC	200 mA	300 mA
24 V DC	85 mA	125 mA

Current consumption

11.3 Inputs and Outputs

The two digital outputs are potential-free relay switches.

Maximum switch voltage: 30 V (DC) / 42 V (AC)

Maximum current load: 1 A (DC) / 0.5 A (AC)

The digital inputs are designed as pull-up and are on HIGH in inactive, open state. The inputs are activated by connecting to ground.

LOW 0 .. 1 V

HIGH 4 .. 12 V

The input current from LOW to internal 3.3 V is typically 0.35 mA.

11.4 Integrated Switch

This is a switch, consisting of

- 4 ports
- 10 / 100 MBit/s for full and half duplex operation (Autosense)
- Automatic detection of patch cables/cross over cables

11.5 Integrated Communication Module

Depending on the MoRoS variant, the following can be integrated as communication module:

- Analogue modem, or
- ISDN terminal adapter

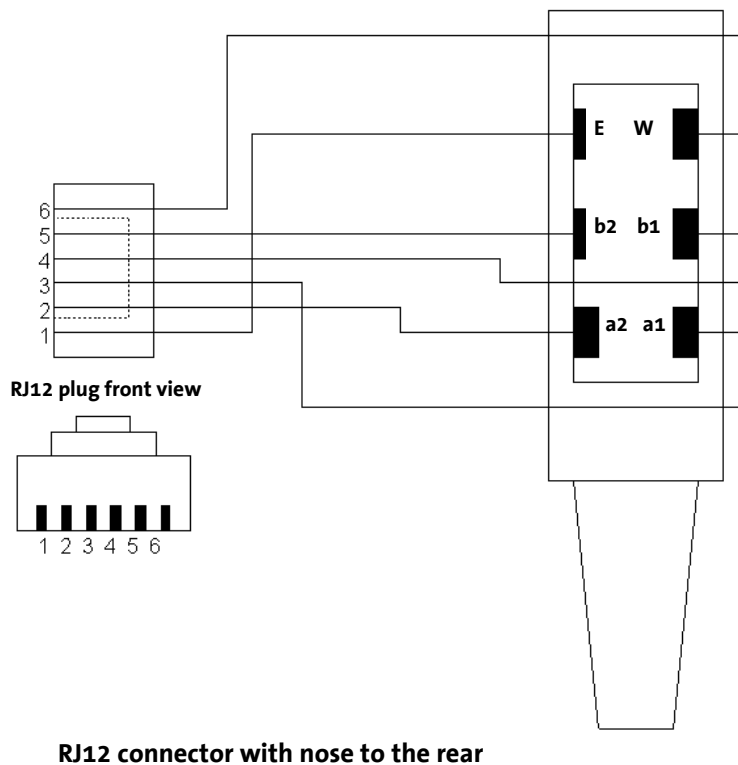
The analogue modem achieves a maximum data amount of 56kBit/s for connections to ISPs (Internet Service Providers). For connections into other private LANs, a maximum data amount of 33.6kBit/s can be achieved. The transmission speed, however, depends very strongly on the line quality. It may therefore occur that the theoretically achievable maximum transmission speed is slower.

The integrated communication module of the MoRoS is an i-modul Modem 56k PRO. The technical data and the entire AT command set are summarized in the "Designers Guide wired". This manual may be obtained free of cost from INSYS Microelectronics on request.

An i-modul ISDN-TA+HUT is integrated in the MoRoS ISDN. It achieves a maximum data transfer rate of 64 kBit/s. In contrast to the analogue modem, this value is fixed. All technical data regarding this topic are again summarized in the "Designers Guide wired" and may be obtained from INSYS Microelectronics free of cost.

11.6 Interface Communication Module

11.6.1 Phone interface (only for MoRoS Modem).



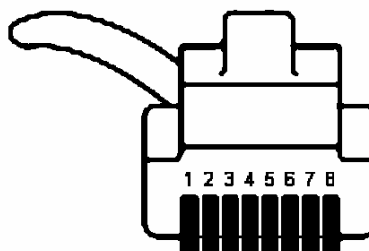
Pin	Description	Pin	Description
1	NC (alarm)	4	b1
2	a2	5	b2
3	b1	6	NC (ground)

Layout of the RJ12 Connector and the RJ45 Jack

Meaning of the signals:

- a1, b1: Incoming phone lines (e.g. exchange connection or PBX)
- a2, b2: They are used to connect a telephone in series. In idle state, a2 and b2 are connected with a1 and b1 via a loop current connector. a2 and b2 are disconnected as soon as the modem occupies the line.

11.6.2 S0 interface (only for MoRoS ISDN)



8-pin jack (front view)

Pin	Signal (S_0)
	not connected
	not connected
	STA (Transmit A)
	SRA (Receive A)
	SRB (Receive B)
	STB (Transmit B)
	not connected
	not connected

Layout of the RJ11 Connector and the RJ45 Jack

11.7 Directives

The MoRoS bears the CE symbol of conformity. This symbol is a declaration that with regard to its design and implementation, the MoRoS is in compliance with the currently valid versions of the following EC directives:

- R&TTE
- 89/336/EEC (EMC directive)
- 73/23/EEC (Low voltage directive)
- 91/263/EEC (Telecommunications devices directive)
- CTR 21 (Europe) for MoRoS Modem
- CTR 3 (Europe) only for MoRoS Modem

A conformity declaration for the MoRoS may be obtained on request from insys@insys-tec.de.

12 Settings for Text Messages

The sending time of an SMS from the sender to a recipient depends on the pertinent provider of the service number. Depending on the degree of utilization and the time of day, an SMS may be on the way for an extended period.

12.1 SMS to Mobile Telephone Network or Fixed Network

In the following, you will find an overview of the most important mobile providers in Germany, Austria, and Switzerland (2007). No responsibility is assumed for the correctness and completeness of this information. The given numbers may only be valid for particular contracts with the network provider.

Please find the current data for your SIM card in your contract documents.

Country	Provider	Network	SMS Service Center Number (SCN)	Fax Prefix	Number of the E-mail gateway
D	T-Mobile	T-D1	+49 171 076 0000 +49 171 209 2522	99 (German) 98 (English)	8000
D	Vodafone D2	D2 Vodafone	+49 172 227 0000 +49 172 227 0042 +49 172 227 0111 +49 172 227 0010 +49 172 227 0222 +49 172 227 0333	99	3400
D	E-Plus	E-Plus	+49 177 061 0000 +49 177 060 0000 +49 177 062 0000	1551	767 62 45
D	O2	O2	+49 176 0000 443 +49 176 0000 433	329	6245
A	max.mobil		+43 676 021	6762	6761
A	One (Connect)		+43 699 000 1999	-	-
CH	Orange	Orange	+41 78 777 7070		
CH	Swisscom	Swiss GSM	+41 79 499 900 0 +41 79 499 812 3		
CH	TDC	Sunrise	+41 76 598 0000		

12.2 SMS as Fax

Network Provider		Service center	Phone number format	SMS format	Example
T-COM	(Germany)	01930100	99+area code+ Phone number	This is a test	990941586920
A1	(Austria)	+43900664914	Area code+phone num- ber	This is a test	0941586920
Swisscom	(Switzerland)	+41794998123	Area code+phone num- ber	*FAX#This is a test	0941586920

12.3 SMS as E-Mail

Network Pro- vider	Service center	Phone number	SMS format	E-mail ad- dress	Example
T-COM (D)	1930100	8000	E-mail ad- dress+space+text	abc@defg.de	abc*defg.de This is a test
A1 (A)	+43900664914	E-mail address	Text		This is a test
Swisscom (Ch)	+41794998123	555	E-mail ad- dress+space+text	abc@defg.de	abc*defg.de This is a test

13 Glossary

This describes the most important terms and abbreviations of this manual.

- AT command:** Commands to devices such as modems to set up this device.
- CHAP:** *Challenge Handshake Authentication Protocol*; an authentication protocol often used for -> PPP connections.
- DHCP:** *Dynamic Host Configuration Protocol*; DHCP servers can dynamically design an IP address and other parameters to DHCP clients on request.
- Dial-in:** MoRoS can be called via a dial-in connection and then create a connection to the LAN.
- Dial-out:** MoRoS can use a Dial-up to make calls and to perform Internet connections, for example.
- Gateway:** This is a machine that works like a -> Router. In contrast to the router, a gateway can also route data packets from different hardware networks.
- ISP:** Internet Service Provider; an ISP can be called using a dial-up connection (e.g. with an analogue modem or ISDN-TA). The ISP will then provide access to the Internet via this dial-up connection.
- LAN:** *Local Area Network*; a network of computers which are located relatively close to each other.
- MAC address:** *Media Access Control Address*. A MAC is a part of an Ethernet interface. Each Ethernet interface has a unique global number, the MAC address.
- PAP:** *Password Authentication Protocol*; an authentication protocol often used for -> PPP connections.
- PPP:** *Point to Point Protocol*; a protocol, which connects two machines via a serial line to enable the exchange of TCP/IP packets between those two machines.
- Router:** This is a machine in a network, which is responsible for the incoming data of a protocol to be forwarded to the planned destination or sub network.
- Switch:** A device that can connect several machines with the Ethernet. In contrast to a hub, a switch will "think" by itself, i.e. it can remember the MAC addresses connected to a port and directs the traffic more efficiently to the individual ports.
- URL:** *Uniform Resource Locator*; this is the address used by a service to be found in the web browser. In this manual, an URL is mostly entered as the IP address of the MoRoS.
- WAN:** *Wide Area Network*; a network consisting of computers, which are located far away from each other.

14 GNU GPL (GNU Public Licence)

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Version 2, June 1991

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