S5toMPI
user manual

(english)

Art.Nr. 9352-S5-OP

16.05.2019

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Content

1 Description

The S5toMPI-cable connects a S5 with a S7 controller for the purpose of exchanging data blocks

The control of this function on the PLC side. It is in one or two controllers requires a communication DB in which source and destination data blocks are defined. The data is transmitted as soon as possible. This feature is compatible with the PLC option at Telelink (same structure).

2 Installation

2.1 Hardware

S5toMPI-cable is connected with the short side to the S7 controller and with the long side to a TTY-RS232-converter. On correct mass potentials on both sides is to look for. It must be connected at least the following pins on the RS232 side:

Pin number:	Designation
2	Transmit data from S5toMPI-cable to the TTY-RS232-converter
3	Receive data from the TTY-RS232-converter to the S5toMPI-cable
5	signal mass

2.2 Software

To configure the S5toMPI cable, you can use optionally the S5toMPI configurator. The installation is described in the chapter " S5toMPI Configurator installation ".

3 Control elements

3.1 Keys

Key	Name	Description
	ENTER	Change menu and confirm input.
	LEFT	Go one menu level back. Cancel input (Input will not be saved).
	RIGHT	Select sub menu.

| | UP | Navigate upwards. Enhancement a value. |

| | DOWN | Navigate downwards. Depreciation a value. |

3.2 Display

first line $\genfrac{}{}{0pt}{}{=}{>}$ S500S708

second line $\genfrac{}{}{0pt}{}{=}{>}$ 010S>010

explanation of display from left to right:

first line

S5xx => „S5" followed by a 2-digit, decimal CPU number
(00 = directly connected S5 controller, 1 = .30 networked
via 4-wired line S5 controller, path selection)

S7xx => „S7" followed by a 2-digit, decimal number station

second line:

010 => 3 digits, decimal / the last used data block number on the S5

S> => ID which is running at the moment

ID	Description
S>	Transmission job the S5 controller into the S7
F<	Fetch order the S5 controller of the S7
<S	Transmission job the S7 controller into the S5
>F	Fetch-order the S7 controller of the S5
Empty	Order ready

010 => 3 digits, decimal / the last used data block number on the S7 controller

4 Implementing

4.1 Initial Configuration

keys	display indication	description
	#01P? !02AG	Press in the start screen the Enter key (see in chapter controls)

	MENU Config	Navigate with the up / down buttons to the "Config" menu and press Enter.
	Config S5toMPI	Look for the menu "S5toMPI" and go into it by pressing Enter.
	S5toMPI Operation	Press the Enter key to configure the "Operating mode".
	Operation OFF	By Up / Down can be selected the following modes :

Operating mode	Description
OFF	The S5ToMPI cable works like a MPI-II Cable (no bridging function)
S5 -> S7	The S5 controller specifies the data blocks to be transmitted in communication DB
S7 -> S5	The S7 controller specifies the data blocks to be transmitted in communication DB
S5 < > S7	Both S5 and S7 controllers can boost the data transmission

With LEFT you leave this sub-menu to change to the parent menu "S5toMPI". When you press ENTER, this setting is entered permanently in flash memory. After a reset immediately started checking the PLC memory (see below).

! It is advisable to make this setting as the last !

	S5toMPI S7Config	Search for the entry "S7Config" and press Enter. Following menu items can be selected:

Menu items	Description
CPU	setting the S7 station number is communicated with
MPI Bus	configuration of the MPI bus
SPS memory	configuration of the command / status word
commDB	configuring the communication DB's

	S7Config CPU	Enter the menu item "CPU" with the Enter key. Following menu items can be selected:

Menu item	Description
StatNumr	Setting the station number of the S7 controller
Slot	Slot location configuration of S7CPU
Function	Define function number

	S7 CPU StatNumr	Call the menu StatNumr by pressing Enter

By Up / Down the station number will increase / decreased by one. The station number is displayed in 3 digits and decimal and has a value range of 000 to 126 By default, the 002 is set.

Press ENTER to save the entry or with LEFT this configuration is aborted and the menu "S7 CPU" changed back. |
| | S7 CPU SlotNr | Configure the SlotNr by calling the menu by pressing Enter.

By up / down the slot number (slot) is increased / decreased by one. The slot number is displayed with 2 digits and decimal and has a value range from 00 to 31.

Press ENTER to save the entry or with LEFT this configuration is aborted and the menu "S7 CPU" changed back.

Press ENTER to save the entry or with LEFT this configuration is aborted and the menu "S7 CPU" changed back. |
| | S7 CPU Function | Configure the function by calling the menu by pressing Enter.

By Up / Down function number will increase by one / decreased. The function number is shown and has a 2-digit decimal and values ranging from 00 to 03. By default, the 02 is set.

This setting should only be changed in very specific cases. The default setting is functioning completely normally.

Press ENTER to save the entry or with LEFT this configuration is aborted and the menu "S7 CPU" changed back. |

	S7Config MPI Bus	Return again to the "S7Config" back and navigate to "MPI bus" and then press Enter.

Following menu items can be selected: |

Menu item	Description
Adress	local station address of the S5toMPI cable
Profile	setting the time profile of the MPI / DP bus

	MPI Bus Adress	Configure the address by going to the menu by pressing Enter.

By Up / Down the address is increased / decreasedby one. The address is displayed decimal and 3 digits and has a value range of 000 to 127.

By default is set the 001. This is the station number of the cable. |

Press ENTER to save the entry or with LEFT this configuration is aborted and the menu "MPI bus" changed back.

| | MPI Bus Profile | Configure the profile by going to the menu by pressing Enter. |

By Up / Down the following menu items can be selected:

Menu item	Description
MPI	MPI Bus
DP	Profibus, Profile DP
UNI	Profibus, Profile Universell (DP/FMS)
Standard	Profibus, Profile Standard

Press ENTER to save the entry or with LEFT this configuration is aborted and the menu "MPI bus" changed back.

| | S7Config SPS memory | Return back again to the "S7Config" and navigate to "SPS memory" and press Enter. |

By Up / Down the address is increased / decreased by one. The address is displayed decimal and and 6 digits has a value between 00000 to 65534.

The default is 000254. This is the command and status flag word. There are only even numbered flag words words possible.

Press ENTER to save the entry or with LEFT this configuration is aborted and the menu "MPI bus" changed back.

| | S7Config Comm DB | Navigate to "Comm DB" and then press Enter. |

By Up / Down the data block number of the communication data block is increased by / decreased by one. It is represented 6-digit decimal and has a value between 00000 to 65534.

The default is 000254.

Press ENTER to save the entry or with LEFT this configuration is aborted and the menu "MPI bus" changed back.

| | S5toMPI S5Config | Return to the menu "S5toMPI" back and navigate to "S5Config" and press Enter. |

Following menu items can be selected:

Menu item	Description
S5 CPU	S5 controller be communicated with
SPS memory	configuration of the command / status word
CommDB	configuration of communication DBs

	S5Config S5 CPU	Configure the CPU number by going to the menu by pressing Enter.

S5Config S5 CPU

Configure the CPU number by going to the menu by pressing Enter.

By Up / Down the S5 CPU number is increased by / decreased by one.

If the CPU number is 0, the S5 controller is addressed directly. At CPU numbers between 1 and 30 on PG-Path selection a connection is established..

The CPU number is represented in decimal with 2 digits and has a value range of 00 to 30. By default, the 00 is set.

Press ENTER to save the entry or with LEFT this configuration is aborted and the menu "MPI bus" changed back.

S5Config SPS memory

Configure the PLC memory by calling the menu by pressing Enter.

By Up / Down the address is increased by one / decreased. The address is displayed in decimal 3 digits and has a value range of 000 and 254

The default is 000254. This is the command and status flag word. There are only even numbered flag words words possible.

Press ENTER to save the entry or with LEFT this configuration is aborted and the menu "MPI bus" changed back.

S5Config Comm DB

Configure the command data block by calling the menu by pressing Enter.

By Up / Down the data block number of the communication data block is increased / decreased by by one, it will displayed 3 digits in decimal and has a value range of 000 and 254.

The default is 000254.

Press ENTER to save the entry or with LEFT this configuration is aborted and the menu "MPI bus" changed back.

The cable is now configured. Return to the "message" is to see the status.

4.1.1 The SPS memory

Over the PLC memory, the communication between the controllers is triggered and status information will be returned. The PLC flag word must be even numbered. The upper byte of the word, the command byte in the lower byte of the word is the status.

Example: MW12 = MB12 (command byte) + MB13 (status)

The command byte:

This byte defines whether and in which direction the data is transferred.

00h   no job perform

01h	Send order, i.e. the source block is written on the opposite partner in the target block
02h	Fetch order, i.e. The source module is read from the opposite partner written to a data block in the PLC
04h	trigger the reset of the cable

All other values are not allowed. The order will be executed only if the status byte is a 00h

The status byte

In this byte from S5ToMPI cable the status of the transfer registered.
For the start of the next transmission, the controller must set this byte to 00h as an acknowledgment.

00h	Start of transmission, S5toMPI cable has not detected yet the start or acknowledgment the last order
01h	Transfer has been completed successfully
02h	Transfer is still here is to check for TIMEOUT, the transfer should be done after max. 45 seconds
03h	The source data block does not exist or is too short
04h	The target data block does not exist or is too short
05h	general error, repeat order
06h	Communication DB does not exist or is too short
07h	Parameter error in communication DB
08h	Partners PLC can not be addressed

4.1.2 The communication data module

In a correctly detected the configured communication command byte data block is read by the controller and interpreted.

The structure of this data block for S7:

Adress	Format	Description
000	CHAR	2 characters source type 'DB'
001	CHAR	
002	UINT	source data block number
004	UINT	beginning word
006	UINT	length in words
008	CHAR	2 characters objective type 'DB'
009	CHAR	
010	UINT	destination data block number
012	UINT	beginning word
014	UINT	length in words

The structure of the data block for the S5:

Adress	Format	Description
000	KC	2 characters source type 'DB'
001	KF	Source data block number
002	KF	beginning word
003	KF	length in words

004	KC	2 characters objective type 'DB'
005	KF	target data block number
006	KF	beginning word
007	KF	length in words

Source / Target Type	At the moment only 'DB' is allowed, it will be only transmitted data blocks (DX not for S5!)
Source / Target DB	When S5 DB 001 to 255 is allowed Allows Case of S7 DB 00001 to 65534
Beginning DW	When S5 DW 000 to DW 254 is allowed Allows Case of S7 DW 00001 to 65534
Length	A maximum of 256 words, no 0 is allowed Both length specifications must match

If an error occurs in the status byte of the error code 07h = parameter error is displayed.

Please note when you edit the communication DBs in S7 that you entered the DB again look in the "Data View". It often occurs on the problem that the "Declaration of view" differentiate "Data View", so it can lead to error messages or negative operating!

5 Configuration

5.1 Keys and Display

The menu message is explained in the chapter "Control elements" Further is assumed, that you are close to the handling with the MPI-LAN cable. If this not the case, please go back to the chapter"Control elements".

5.1.1 Graphical Description

With enter you will get in the menu of the cable. This menu has the following structure:

MENU Message	⬆	MENU Config	⬆	MENU Bus	⬆	MENU Info
Standard display (Status)		Configuration		BUS display		Cable information
	↵	Config Mode		↵	Bus Address	↵ Info Version
		Cable Mode			Bus Address	Operating System Version
	⬆	Config Password				
		Configurations password				

	Config Reset

Cable reset

	Config Set Def.

Set the configuration to
default

	Config Language

Language

	Config Protocol

Protocol which is used on
the bus

	Config PD/PC

PD interface settings

	Config MPI-BUS

MPI interface settings

	Config USBCurrent

Change the current of the
cable

	Config Data

Un-/locks configuration send
by the computer

5.1.2 Config

o Mode
o Password
o Reset
o Default settings
o Language
o Protocol
o PD/PC
o MPI-BUS
o USBCurrent
o Data

• Mode:

Choose this menu to configure the cable mode.

mode	meaning
MPI SER	MPI-communication over RS232-interface
MPI USB	MPI-communication with PLCVCom/Step7-driver over USB-interface
PPI 9K6	PPI-communication with 9600 baud over RS232-interface
PPI 19K2	PPI-communication with 19200 baud over RS232-interface
PPIUSB96	PPI-communication only with PLCVCom and 9600 baud over USB-interface
SPEC SER	Specialmode RS232 (complies RS232-RS485-converter, interface-parameter must be separately parameterized)
SPEC USB	Specialmode USB (complies RS232-RS485-converter with PLCVCom, interface-parameter must be separately parameterized)
PPIUSB19	PPI-communication only with PLCVCom and 19200 baud over USB-interface
PPIMulti	PPI-communication (MultiMaster 9K6 - 187,5K) over RS232- or USB-interface (with PLCVCom)

HINT: „MPI SER", „SOND SER", „PPI 19K2" and „PPI 9K6" doesn't fit with the MPI-USB cable (Ord. No. 9352 USB).

• Password:

Choose this menu to change the configuration password. (Standard: „0")

• Reset:

The cable reset.

• Default settings:

Press the enter-keyto change the cable configuration to default.

• Language:

In this menu you can choose the language of your choice. Choose between „German" and „English".

• Protocol:

Change the protocol version.

Choose „Auto" if you want that the cable takes the configuration from the PG.

If you experience any trouble on the bus with the protocol version „V 5.1" set the configuration to „V5.0 Old". The 5.0 version is more stable but slower than the „V 5.1" protocol version.

• **PD/PC:**

In this menu you can change the connection speed between the programming device and the computer.

This works only by using a MPI – II (Ord. No. 9352) cable with the serial device connected to the computer.

Available baud rates: „2400", „4800", „9.6k", „19.2k", „38.4k", „57.6k", „115.2k".

If you are using the cable takes the PD configuration.

• **MPI-BUS:**

You have to choose between these sub menus.

  - Baudrate
  - Master
  - lokalNo
  - HSA

- Baudrate

Change the speed of the MPI - Bus.

Available baud rates: „Auto", „19,2k", „45,45k", „93,75k", „187,5k", „500k", „1,5M", „3M", „6M", „12M"

 HINT: The baud rates„3M", „6M" and „12M" can only be configured by cable. These higher baud rates (from "3M") will be overwritten by the PC. To get sure that this will not happen configure (in the cables menu) „Lock" in the sub menu „Data". (This sub menu is also described at the bottom of the next page)

- Master

In the case that the cable is connected with only one passive station, configure „Master" to the cable to determine that the cable is configuring itself. In all other cases please configure „Multimaster" to the cable

- lokal no.

To change the station number of the cable. Hexadecimal values of „00" to „7E" are possible.

- HSA

HSA stands for "Highest Station Address". Configure the highest station number to the cable which is connected to the MPI bus. Possible values: „15", „31", „63", „126".

The setting „from PC&#8220 means, that the cable takes the settings from the PC.
(If the HSA high, the performance is low!)

• USBCurrent:

When connecting the cable with the USB interface from the PC the cable tells the PC how much power it takes. With this menu you can change this configuration (in special cases).

000mA => Only for MPI - II. Because this cable take its power out of the PLC.

360mA => Default value. The cable takes power out of the USB interface.

Some computers are blocking the drivers for the communication if the USB HUB cannot provide enough power.

HINT: In any case the MPI-USB cable takes 360mA. Change the USB current on your own risk. (The USB device of your PC can be overloaded!)

• Data

Change to „Lock" if you want that configuration data coming of the computer will be ignored

(only important if you are using „3M" or higher baud rates

The maximum baud rate of the PC driver is used if you „Unlock" this option.

5.1.3 Bus

Select the menu „Bus" to choose, by pressing the Enter – Key, the sub menu „Address". With the Up/Down – Keys you can display the connected stations.

The menu „Address":
Address
DA 020

The letters in the second line are describing the station:

Letter	Description
D	The MPI cable is directly connected to the PLC.
A	This station is active in the bus.
P	This station is passive in the bus, for e.g. some OP's, FM – blocks also MPI Bus – Slaves.

5.1.4 Info

Select the menu „Info" to choose, by pressing the Enter-Key, the sub menu „Version" This menu shows you the operating system version of the cable.

6 S5toMPI configurator

6.1 Installation

1. Please download from the you known web-site the "S5anMPI-configurator" and save the file on your PC.

2. Run the file and follow the instructions.

3. After selecting the language, the installation will start in the selected language and the welcome screen appears.

Click "Continue" to be able to select the installation path.
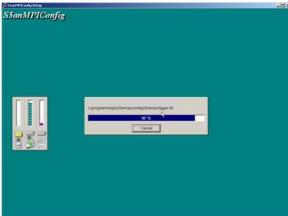
Click "Browse" to change the installation path.

Confirm by clicking "Next."

4. Select in this dialog the program folder for the PLC - VCOM startup entries.

Then click on "Next" to start the installation.

5. Now the installation is started. This may take several minutes on older computers.

6. The installation is done with a click on "Finish."

6.2 operation

This program helps when configuring a S5toMPI cable. You can also save the configuration data to a file and read back later if necessary.

After the start will be displayed the dialog language selection.

6.2.1 Language

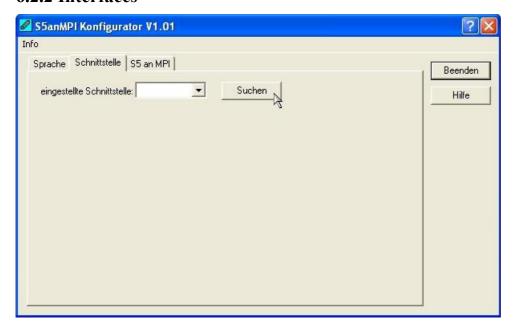In this dialog you can choose the language to use. There are the following options:

German
English

Click on one of the selection handles to change the language
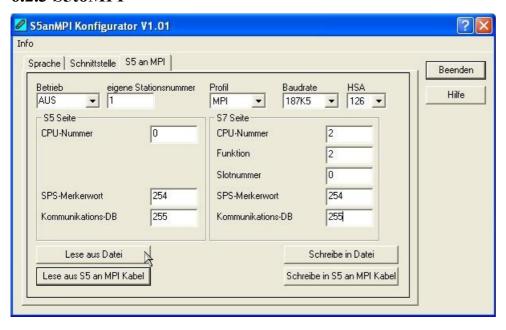
6.2.2 Interfaces

Here, the communication interface is set to S5toMPI cable.

Only the existing and usable communication interface in the list are displayed.

When pressing the "Search" button all 16 possible COM ports will be checked whether there is connected a S5toMPI cable and if the cable should be found, then the first one found is registered in the communication interface.

6.2.3 S5toMPI

Operation

It is the way the S5toMPI cable is adjusted. The following settings are possible:

operating
mode   designation

OFF	The S5ToMPI cable works like a MPI-II cable (no bridging function)
S5 -> S7	The S5 controller specifies the data of the transmitted blocks in communication DB
S7 -> S5	The S7 controller specifies the data of the transmitted blocks in communication DB
S5 < > S7	Both S5 and S7 controllers can boost the data transfer

Own station number:

The station number of the S5toMPI cable in the MPI / Profibus. This number must be unique and within the HSA of all stations. The value range is between 0 and 126. Please note that programming devices often use the station address 0, operator terminals usually 1 or 3.

Profile:

Specifies the bus profile on the MPI / Profibus is to work with the cable. It are possible these profiles:

- MPI: MPI-bus parameters
- DP: Profibus DP bus parameters
- STD: Profibus DP / Standard bus parameters
- UNI: Profibus DP / Universel bus parameters

Baud rate:

Is the bus speed.

Possible values are: 9k6, 19k2, 45k45, 93k75, 187k5, 500k, 750k, 1M5, 3M, 6M, 12M

AUTO: Automatic baud rate detection bus parameters. This function must be supported by the controller.

HSA:

Highest station address in MPI / Profibus. The following values are possible: 15, 31, 63, 126

6.2.3.1 S5 page

CPU number

Currently not used, please leave at 0.

SPS flag word

The PLC flag word has a value range of 0 to 65534.
As standard is set 254.
This is the command and status flag word.
There are only even numbered flag words possible.

Communication DB:

This is the data block number of the communication data block.
It has a value range of 0 to 65534. As standard is set 255.

6.2.3.2 S7 page

CPU number:

Station number of the S7 CPU can have values between 0 and 126. Default is 2.

Function: The function number can have the following values:

0 Function not pretend

1 PG/PC
2 OP / operator unit
3 Step7 basic communication

slot number The slot number has a value range of 0 to 31. By default is set to 0 (with some double-width CPU cards must be registered here 3).

SPS flag word: The SPS flag word has a range value of 0 to 65534. As standard the 254 is set. This is the command and status flag word. There are only even numbered flag words possible.

Communication DB: This is the data block number of the communication data block. It has a value range of 0 to 65534. As standard the 255 is set.

6.2.3.3 Control buttons

Reading from file:

With this button it is possible to read previously saved configurations of S5toMPI again. These can then be further processed or stored under a new name or transmitted in the cable.

Writing in file:

With this button, the configuration data is written to a file for later use. The suggested file name includes the date and time. This can also be overridden.

Reading from the S5toMP cable:

The configuration data are read and displayed from a connected S5toMPI cable.

Writing in S5toMPI cable:

The illustrated configuration data is transmitted to a connected S5toMPI cable and stored there permanently.

7 S7-Interface Configurator Help

Language selection
User interface
Bus configuration
Network settings
Parameterize TELEService
Index "Network"
Index "Modem"
Index "Serial Parameter"
Index "Access Protection"
Index "GSM/ISDN/SMS"
Index "Internet/Mail"
Tuning
Factory defaults
PPI Boot off
Emergency-Loader

7.1 Language selection:

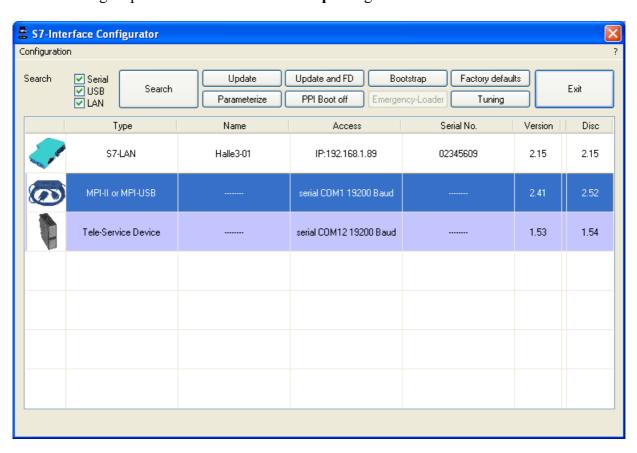Select the menu **Configuration** to change the language permanently:

7.2 User interface:

Select near **Search** which interfaces are searched permanently for devices.
You could choose:

• Serial All existing COM-Ports are scanned for devices

• USB   Search devices which are connected by USB

• LAN   Search devices on all network-cards

The button **Search** starts a parallel search on all selected interfaces.
After selecting a updateable device the button **Update** gets available.

Below the buttons is a list of the found devices. In each line an image, the type of the device, name (if existing), interface, serial number (if possible) and the OS-version of the device is displayed. On the rightmost position the actual OS-version on the harddisk is displayed.

The background of the lines could use the following colours:
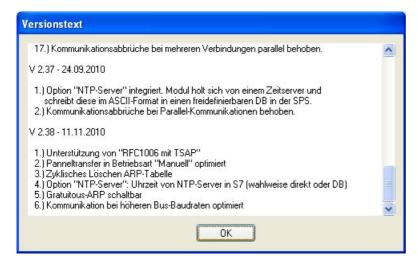
- White The OS of the device is up-to-date
- Light blue The OS of the device is not up-to-date, the device could be updated
- Red An error occured by accessing the device
- Yellow Update is in progress for this device
- Dark blue Selected device

Double click onto a device which could be updated shows the version-documentation of the device (only available in German):

The button **Update with FD** updates the OS of the device and sets the factory default.

The button **Bootstrap** sets the firmware/configuration to factory default.

The button **Factory defaults** sets the configuration to factory default.

The button **Parameterize** activates a dialog regarding to the device:

Overview:

Device	Dialog
TELEService MPI / PPI - Profibusmodem	Parameterize TELEService
MPI/PPI	Parameterize TELEService
MPI-II MPI-USB	*Choices:* Bus configuration Parameterize TELEService
S7-USB	Bus configuration
S7-LAN MPI-LAN	*Choices:* Bus configuration Network settings

The button **PPI Boot off** disables the PPI boot option of a serial connected device.

The button **Emergency-Loader** tries to repair LAN products which are in emergency-loader mode.
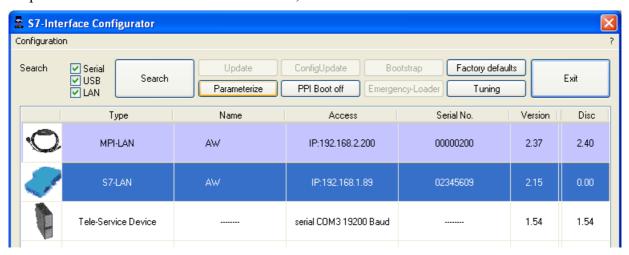
The button **Tuning** activates a dialog for special parameters.

The button **Exit** leaves the application.
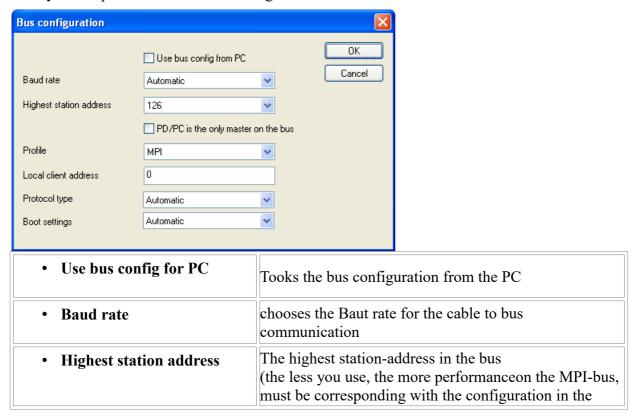
7.3 Bus configuration

To parameterize the connection to the device, select a device and click "**Parameterize**".

Regarding to the device you maybe have to click on the button **Bus configuration** (see parameterize table).

Here you can parameterize the following:

• **Use bus config for PC**	Tooks the bus configuration from the PC
• **Baud rate**	chooses the Baut rate for the cable to bus communication
• **Highest station address**	The highest station-address in the bus (the less you use, the more performanceon the MPI-bus, must be corresponding with the configuration in the

	CPU's)
• **PD/PC is the only master on the bus**	The TS-Adapter is the one and only master in the MPI-bus (adapter hast to speak to all passive clients)
• **Profile**	Bustype of the connection
• **Local client address**	Which local station-address is used for the TS-Adapter. Please consider that a programming device has normally the number 0, operator panel have 1, CPU's use 2, FM/CP's 3 etc. **Please**: Never use the same station-number for 2 different stations!
• **Protocol type**	Protocol type of the connection
• **Boot settings**	Boot setting of the connection

7.4 Network settings

Here you can set the network configuration of the selected device:

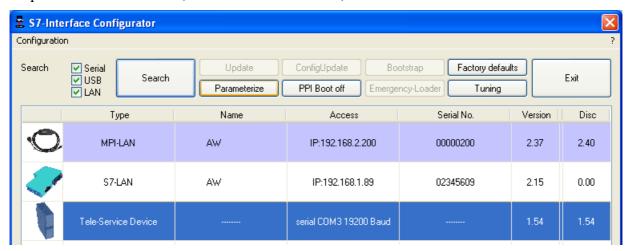| • Factory default | This button sets all over the network reachable devices to factory default. |
• DHCP-client active	When set the device acts as DHCP-client.
• IP address	Here you could enter the IP Address over which the device is accessed in the network.
• Subnetmask	Here you could enter the Subnetmask of your network.
• Gateway address	Here you could enter the IP address of your Gateway. Usual a router address.
• Device name	Here you could change the device name.

Factory default:

| • DHCP-client active | *not set* |

- IP Address   192.168.1.56
- Subnetmask   255.255.255.0
- Gateway address   0.0.0.0
- Device name   *empty*
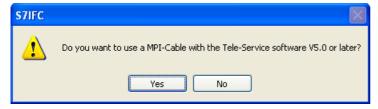
7.5 Parameterize TELEService

To parameterize the device, first click on the device, after that on "**Parameterize**".

Regarding to the device, you maybe have to click on the **TELEService** button.

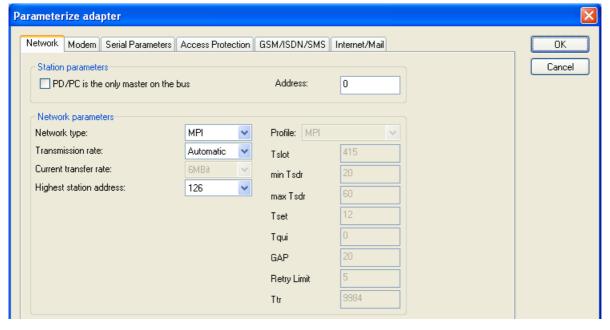After clicking on "**TELEService**" a message will show up:

Depending on the version of your TELEService software choose **Yes** or **No**.

The regular parameters can be changed manually in the following categories:

7.5.1 Index "Network":

Here you can configurate following:

Station related:

• **PD/PC is the only master on the bus**	The TS-Adapter is the only master on the MPI-bus (adapter must speak to all passive clients)
• **Address**	Which local station-address is used for the TS-Adapter. Please consider that a programming device has normally the number 0, operator panel have 1, CPU's use 2, FM/CP's 3 etc. **Remind**: Never use the same station-number for 2 different stations!

Network related:

• **Network type**	The network type MPI or PROFIBUS
• **Transmission rate**	The transmission speed on the MPI bus
• **Current transfer rate**	Shows the current transfer rate of the device
• **Highest station address**	The highest station address in the bus (the less you use, the more performance on the MPI bus, must be corresponding with the configuration in the PLC's)

7.5.2 Index "Modem":

In this dialog you could configure the modem related setup.

Modem Settings:

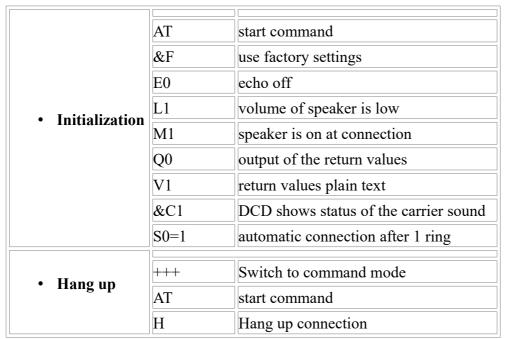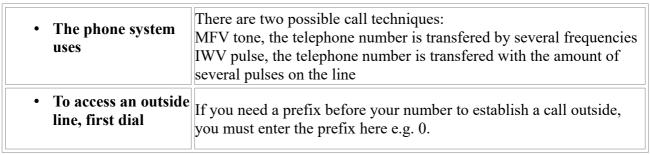|		
• **Initialization**	AT	start command
	&F	use factory settings
	E0	echo off
	L1	volume of speaker is low
	M1	speaker is on at connection
	Q0	output of the return values
	V1	return values plain text
	&C1	DCD shows status of the carrier sound
	S0=1	automatic connection after 1 ring
• **Hang up**	+++	Switch to command mode
	AT	start command
	H	Hang up connection

Location:

• **The phone system uses**	There are two possible call techniques: MFV tone, the telephone number is transfered by several frequencies IWV pulse, the telephone number is transfered with the amount of several pulses on the line
• **To access an outside line, first dial**	If you need a prefix before your number to establish a call outside, you must enter the prefix here e.g. 0.

Call Preferences:

• **Wait for dial tone before dialing**	In case the modem should wait for a free line, you should set the corresponding checkbox.
• **Number of redial attempts**	At number of retries you could configure the number of retries for a connection before the call is stopped.
• **Redial after**	Using a retry you could enter the seconds the application should wait between calls.

7.5.3 Index "Serial parameter":

In this dialog the transfer rate between modem and TS-Adapter is selected.

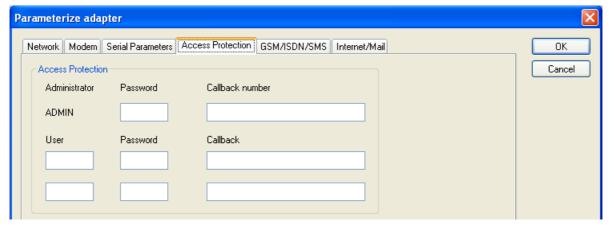**Connection Preferences**:

• **Transfer rate**	The transfer-rate could choosen between the follwing values: 2400, 4800, 9600, 19.2k, 38.4k, 57.6k and 115.2kBaud
• **Parity**	The parity could be choosen, but this is modem dependend because some modems could not handle the parity bit: None: (There is no parity testing) Odd: (The amount of bits set to 1 is odd) Even: (The amount of bits set to 1 is even)

7.5.4 Index "Access Protection":

The access over a telephone line could be configured in this dialog.
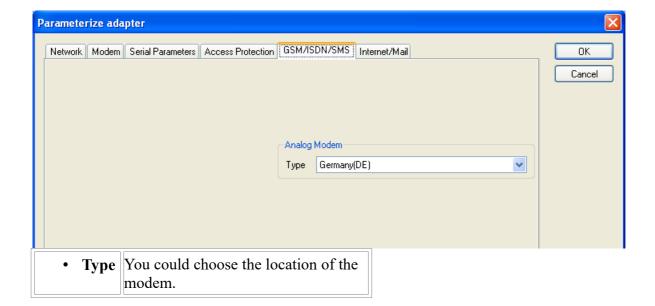
Access Protection:

- The administrator can change the configuration over a telephone line.
- The two user accounts can not change the configuration.

- The username is maximal 8 characters long.
- Every user and the administrator should use a password which is used to login in the TELEService over a telephone-line.

- After three failed retries the connection is hanged up, so you must call again (not like the original TS-adapter).

- After changing the password for a user/administrator you must re-type it again correctly.

- You can enter a callback number which is used for a callback from the TS-adapter. After you dialed the number of the TS-adapter, you are asked for username and password. In case the username and password is valid, the connection is hang up and the TS-adapter calls back the configured callback number.
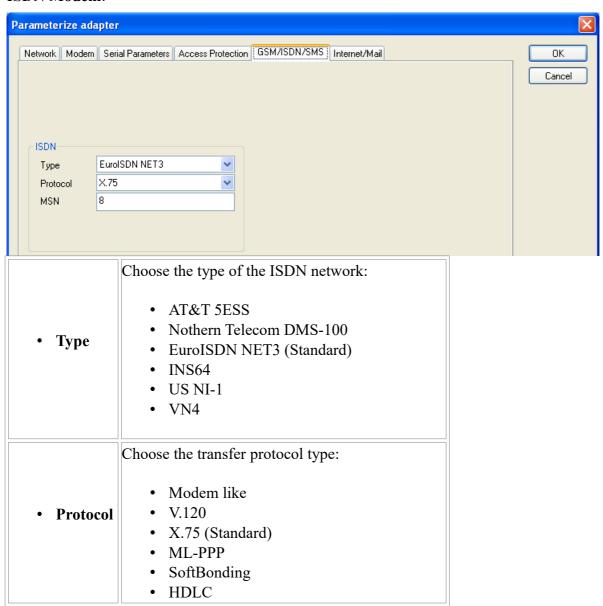
7.5.5 Index "GSM/ISDN/SMS":

Information about the three different devices:

Analog Modem::

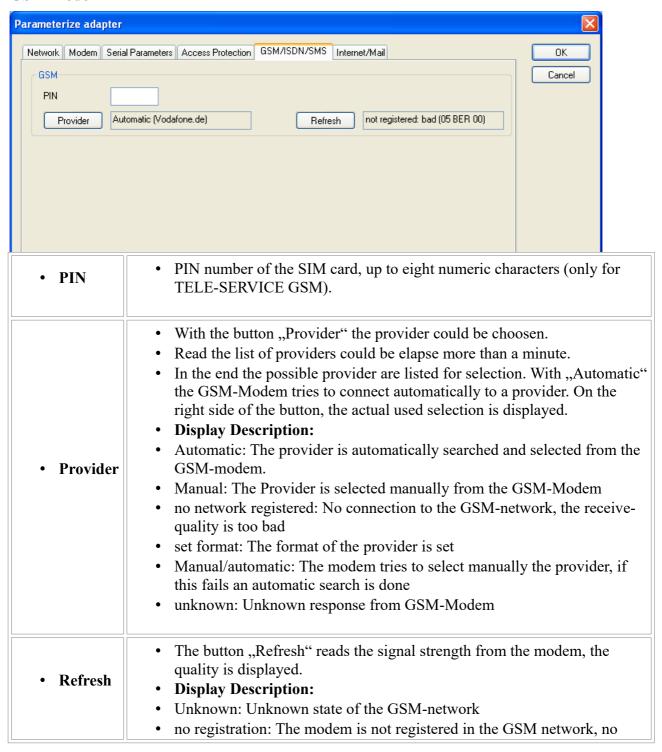|	
• **Type**	You could choose the location of the modem.

ISDN Modem:

• **Type**	Choose the type of the ISDN network: • AT&T 5ESS • Nothern Telecom DMS-100 • EuroISDN NET3 (Standard) • INS64 • US NI-1 • VN4
• **Protocol**	Choose the transfer protocol type: • Modem like • V.120 • X.75 (Standard) • ML-PPP • SoftBonding • HDLC

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	• CLEAR
• **MSN**	• Multiple Subscriber Number is used for all ISDN channels. • If empty no MSN is used.

GSM Modem:
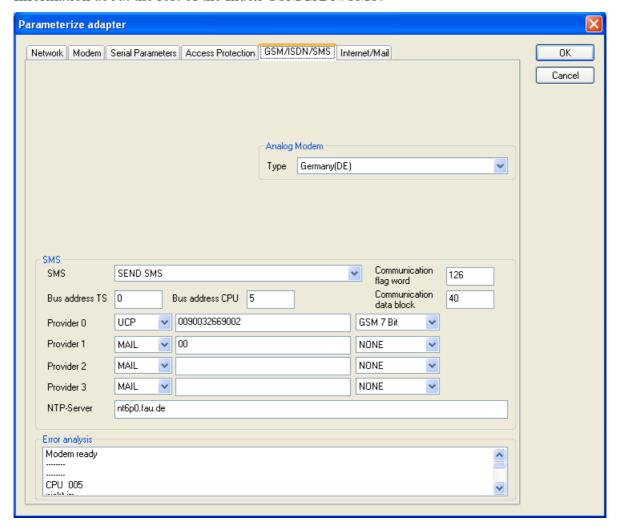

• **PIN**	• PIN number of the SIM card, up to eight numeric characters (only for TELE-SERVICE GSM).
• **Provider**	• With the button „Provider" the provider could be choosen. • Read the list of providers could be elapse more than a minute. • In the end the possible provider are listed for selection. With „Automatic" the GSM-Modem tries to connect automatically to a provider. On the right side of the button, the actual used selection is displayed. • **Display Description:** • Automatic: The provider is automatically searched and selected from the GSM-modem. • Manual: The Provider is selected manually from the GSM-Modem • no network registered: No connection to the GSM-network, the receive-quality is too bad • set format: The format of the provider is set • Manual/automatic: The modem tries to select manually the provider, if this fails an automatic search is done • unknown: Unknown response from GSM-Modem
• **Refresh**	• The button „Refresh" reads the signal strength from the modem, the quality is displayed. • **Display Description:** • Unknown: Unknown state of the GSM-network • no registration: The modem is not registered in the GSM network, no

	provider found • registration denied: Registration in the GSM-network is denied • Search network: In Search for a GSM-Provider • GSM: Attached to GSM • GSM(ROAMING): Attached to GSM, but with a Roaming-Partner. This could lead to high costs! • The radio quality is displayed, together with the bit-error-rate. **Value Description:** • 99 No network, no receive • 00 Very, very bad receive-quality • 01 Very bad receive-quality • 02 to 09 Bad receive-quality • 10 to 17 Medium receive-quality • 18 to 25 Normal receive-quality • 26 to 30 Good receive-quality • 31 Best receive-quality

Information about the rest of the Index GSM/ISDN/SMS:

SMS:

• **SMS**	Switches: • NO • SEND SMS • RECEIVE SMS • SEND+RECEIVE SMS • DMTF CONFIRMATION • SEND SMS+DTMF CONFIRMATION • RECEIVE SMS+DTMF CONFIRMATION • SEND+RECEIVE+DTMF CONFIRMATION • SEND MAIL • SEND MAIL+SEND SMS • SEND MAIL+RECEIVE SMS • SEND MAIL+SEND+RECEIVE SMS • SEND MAIL+DTMF CONFIRMATION • SEND MAIL+SEND SMS+DTMF CONFIRMATION • SEND MAIL+RECEIVE SMS+DTMF QUITTUNG • SEND MAIL+SEND+RECEIVE+DTMF CONFIRMATION • **Attention**: before setting ON check configuration, after activating the device will go on the MPI bus and tries to connect to the defined PLC. Receive of SMS only with TELEService-GSM Receive of DTMF only with TELEService GSM
• **Bus address TS**	local station address (should not be used twice in the MPI/Profibus!)
• **Bus address CPU**	from this station address the flag word and data block is accessed for communication
• **Communication flag word**	communication-flagword (the first byte is the command, the second is the state). Use even operand-addresses.
• **Communication data block**	Address of the CPU in the Bus
• **Provider 0/1/2/3**	Configure the SMS-Provider to use, including type, phone-number and char-code. 1. First Input: Choose a type of the transmission. 2. Second Input: Telephone number or email address. 3. Third Input: Choose a character encoding.
• **NTP-Server**	Input for an Network Time Protocoll - Server

Error analysis::

The possible error conditions for the modem, mpi bus problems or other problems are displayed in this text-field.

First the modem-related information is shown:

Message
- Modem ready
- Modem error
- No answer from modem
- Modem detects ring
- End of connection
- connected via modem line
- No dialtone detected
- Phone-line or telephone busy
- Phone-number is blacklisted in modem
- Phone-number delayed. Access denied for 1 minute.
- Fax-call detected
- Data-call detected
- unknown error
- The selected direct-access-number not configured
- The configured PIN-Number is wrong for the inserted SIM-Card
- The SIM-Card is not or wrong inserted or the SIM-Card is a 5V Type

Possible MPI-Bus error-messages

MPI/Profibus-Configuration erroneous

Timeout at MPI/Profibus detach from device.

The local station-address is used twice in the MPI/Profibus.

A20/M20/TC35 Modem operation

The MPI/Profibus is not correctly configured

The HSA is not configured optimal

The MPI/Profibus-Baudrate is not detectable

Overflow in the internal MPI-Readbuffer

Overflow in the internal LAN-Readbuffer

Overflow in the serial Buffer

The selected MPI/Profibus-Baudrate is wrong

Overflow in internal LAN-Writebuffer

LAN-Recieve-Error

LAN-Send-Error

The PD-Numberr is wrong

The transferred SAP is wrong/unknown

ErrCode 01: The Destination address (XXX) of a State protocol > 127 detected. In the MPI/Profibus-Bus there are no stations possible which station number is greater than 127.

(FC=YYh)

ErrCode 02: At state-protocol the Source-Address is detected as 127. This is the Broadcast-address which is not possible.

ErrCode 03: The received State protocols destination address (XXX respectively YYY) does not exist in the MPI-Bus. (FC=ZZh)

ErrCode 04: The function-code (YYh) of the received State protocol from XXX is incorrect. The 7th Bit is High, but according to the specification the Bit has to be low.

ErrCode 05: A State protocol has been received. But the function-code (YYh) means that the participant is not ready to enter the bus.

ErrCode 06: The function-code in the State-protocol received from XXX is unknown (FC=YYh)

ErrCode 11: The sender (XXX) of the received data-protocol is unknown. To send data the participant must get the Token. (SSAP=YYh, FC=ZZh, length=UUU)

ErrCode 12: Data-protocol with Source-address 255 (Broadcast) is useless. (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)

ErrCode 13: The sender (XXX) of the received data-protocol is unknown. To send data the participant must get the Token. (SSAP=YYh, FC=ZZh, length=UUU)

ErrCode 14: The 7th Bit of the function-code is High, but according to the specification the Bit has to be low. (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)

ErrCode 15: The upper 4 Bit of the Function-code are wrong/unknown)
(CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)

ErrCode 16: Unknown function-code has been transmitted to the cable. (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)

ErrCode 17: Destination-SAP are defined till 3Fh in data-protocols. (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)

ErrCode 18: Source-SAP are defined till 3Fh in data-protocols. (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)

ErrCode 19: Received a data-protocol with destination-SAP=0, Connection request from another bus-participant with our cable. (CPU=XXX,SSAP=YYh,FC=ZZh,DSAP=UUh)

ErrCode 1A: Participants are sending data to our cable with source-SAP = 0, which means that the participant has not made a connection establishment or has lost the negotiated SAP. (CPU=XXX,SSAP=YYh,FC=ZZh,DSAP=UUh)

ErrCode 1B: Data-protocol with unknown data-function-code received. (CPU=XXX,SSAP=YYh,FC=ZZh,DFC=UUh)

ErrCode 1C Data-protocol with unknown data-function-code received. (CPU=XXX,SSAP=YYh,FC=ZZh,DFC=UUh)

ErrCode 1D: Received a state-protocol with error-code. (CPU=XXX,FPGA=YYh,RAM=ZZh)

ErrCode 1E: FPGA has caused an interrupt although no data present. (SD1=XXh,SD1=YYh,CPU=ZZZ,FC=UUh)
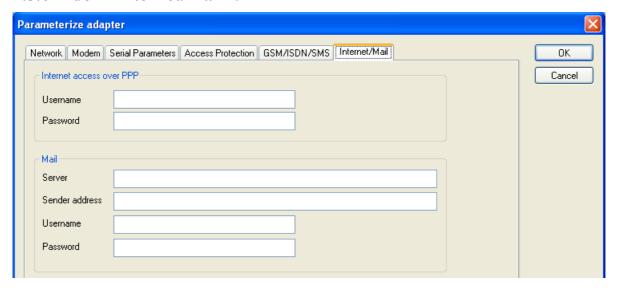
ErrCode 20: Unknown protocol at PPIMultimaster-Mode. (FC=XXh,Länge=YYY)

ErrCode 21: Unknown baud-rate at PPIMultimaster-Mode. (Baudrate=XXh)

After that additional hints are displayed.

7.5.6 Index "Internet/Mail":

The internet connection is configured by PPP, often a username and password is needed. Define them in "Internet access over PPP".
Attention: This is NOT the username and password of your E-Mail-account!

In the next section "Mail" the E-Mail-account is defined:

Internet access over PPP:

• **Username**	Username for the Internet access
• **Password**	Userpassword for the Internet access

Mail:

• **Server**	Name of the SMTP-Email-Servers, which is used to send the E-Mail.
• **Mail from**	Source-E-Mail-Address (should be from the same Free-mailer, instead a delivery is often not possible)
• **Username**	Name of the User-account (often the E-Mail-address or Customer-number)
• **Password**	Password for the E-Mail-Account

7.6 Tuning

This menu is only used in some special cases.
Select the device and click the button **"Tuning"** and after that the following dialog is displayed:

The following configuration is possible, it will be transferred to the Cable by pressing the button „OK".
The configuration is saved permanently in the Flash-ROM:

• **Delay before send**	At ProTool RT the communication could break down, because the MPI-Cable is transferring the answer-protocol to fast. In this case you could insert a time in 0.1ms ticks. Insert at first 300, to great values are preventing the communication.
• **HMI-Cable version**	Some Touch-panels has the problem, that when they get a wrong version-information they never retry to connect (and then the correct version is transferred). In this case the HMI-version-information could be transferred immediately.
• **A20-Terminal**	When using the A20 or M20-Terminal, the control-lines on the serial port are not used. In that case the TELEService-function is not working. With this property the control-lines are no longer used and therefore the A20/M20 can communicate over TELEservice.
• **Show ErrCode messages in display**	Shows error messages on the display of the connected device

Boot settings:

Normally the MPI-Cable automatically selects the correct bus type, no changes are needed. In special-cases the MPI-Bus could be selected as PPI.

For example: This application and the PLC are powered on at the same time. The application is communicating immediately with the cable, the PLC is booting, in this case the MPI-Bus is not running. The MPI-Bus is erroneous, so no communication is starting. If this occurs you could choose, that the cable is working as MPI-Adapter only.

Language:

You could select the language which is used on the cable (German or English).

S5 on MPI mode off:

Deactivates temporary the "S5 on MPI" function, the cable doesn't poll the bus anymore.

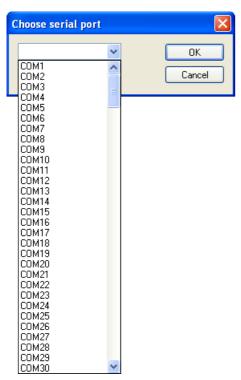**send reset to cable**:

Send reset to cable.

Console:

Shows some information about the status of the connection.

7.7 Factory defaults

This button sets the configuration of the selected device to factory defaults.
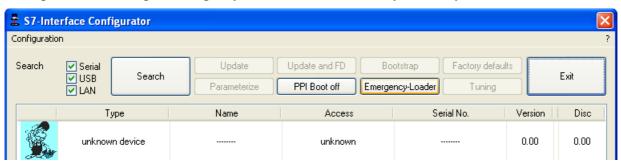
7.8 PPI Boot off

In PPI boot mode S7IFC cannot communicate with the cable. To disable the PPI boot mode, click on the button PPI Boot off. In the following dialog you must select the serial port where the cable is connected:

7.9 Emergency-Loader

LAN products running in emergency-loader are automatically found by S7IFC:

After a click on **Emergency-Loader** the following dialog appears:

On a click on **Yes** the emergency-loader tries to run the main program of the firmware.
On a click on **No** the emergency-loader tries to rewrite the complete firmware.

8 Technical data

Supply voltage:	24V DC +/- 20%
Power consumption:	2,5 watt
Display:	double lined LCD-display
Handling/Configuration:	Kabelmanager-Software keypad on the back
Interfaces:	to the PLC: PPI/MPI/Profibus interface: 9,6 KBd - 12 MBd to the PD/PC: RS232: 9,6 KBd - 115,2 KBd USB 1.1 for cable type A <-> A
Operating temperature:	0 - 55°C
Case:	ABS-plastic case
Dimensions:	146 x 41 x 29 mm
Scope of delivery:	
	S5anMPI-cable Power connector 2pins small

8.1 Pin assignment RS232

Pin number	Short form	Designation	Direction
1	DCD	receive line signal detected	input
2	TXD	transmit data	output
3	RXD	receive data	input
4	DSR	transmission means is ready	output
5	GND	signal mass	
6	DTR	data device ready	input
7	CTS	clear to send	output
8	RTS	request to send	input
9	RI	ring tone	input

The cable is designed so that it can be directly connected to the PC. Optionally the end of the cable can be extended with a 1:1 extension cable up to 15m. A good quality of the extension cord must be respected.

8.2 Pin assignment

Pin No.	Notation	Signalname	Direction (of cable)
1	NC	Not Connected	
2	M24V	Ground of the 24V	In
3	Ltg_B	Data line B	BiDir.
4	RTS-AS	Request to Send from the PLC	In
5	M5V	Ground of the 5V	IN
6	P5V	5V output	Out
7	P24V	24V Supply input	IN
8	Ltg_A	Data line A	BiDi
9	RTS-PG	Request to Send to the PLC	Out

Note

The shield is attached with the MPI/PPI connector via the shield of the adapter casing. To find directly attended PLC´s , RTS-AS and M5V must be connected in the cable. P5V means a output of the cable and works only as an output for a bus-termination with resistors. This 5V output doesn't drive any load and have a 100R resistor inside his direction.

observe:

Don't lengthen the connection by a 1:1 cable to the PLC, because there are 24V and 5V inside of the cable. The quality of the bus-signal will be risen down!

To lengthen the connection, please use a MPI-NETZ-Adapter and connect only the signals Ltg_A and Ltg_B 1:1 and the shield at both sides of the metal-casing at the SUB-D connector

For an extension of the cable please supply the cable with external power and only prolong the signals Ltg_A and Ltg_B 1:1. Connect the shield on the SUB-D connector, possibly include a termination resistors (on the bus-END).

9 Troubleshooting

9.1 Error messages

In addition to the chapter "Controls" information described in the error case in the bottom line supplementary information (error is also entered in the status byte of the PLC flag word):

Display	Designation
? AG	Not a registered fetch or send command in commnado byte.
MWS5noRD	PLC flag word could not be read from the S5
MWS7noRD	PLC flag word could not be read from the S7
K<DBNr>S5Er	Communication DB is not available in the S5 controller or too short.
K<DBNr>S7Er	Communication DB is not available in the S7 controller or too short.
S5ParmEr	Parameterization error in communication DB of the S5 PLC, can not process request.

S7ParmEr	Parameterization error in communication DB of the S7 PLC, can not process request.
Q<DBNr>S5Er	At the transmission order of the S5 is the source DB not available in the S5 controller or too short.
Q<DBNr>S7Er	At the transmission order of the S7 is the source DB not available in the S5 controller or too short.
Z<DBNr>S5Er	At a transmitting order of the S5 is the target DB not available in the S7 controller or too short.
Z<DBNr>S7Er	At a transmitting order of the S7 is the target DB not available in the S5 controller or too short.
Q<DBNr>F5Er	In a Fetch order of the S5 is the source DB not available in the S7 controller or too short.
Q<DBNr>F7Er	In a Fetch order of the S7 is the source DB not available in the S5 controller or too short.
Z<DBNr>F5Er	In a Fetch order of the S5 is the target DB not available in the S5 controller or too short.
Z<DBNr>F7Er	In a Fetch order of the S7 is the target DB not available in the S7 controller or too short.