XP Power Digital Programming Instruction Manual

Contents

XP Power Digital Programming

Product Information

Specifications

- **Version:** 1.0
- **Options:**
  - IEEE488
  - LAN Ethernet (LANI 21/22)
  - ProfibusDP
  - RS232/RS422
  - RS485
  - USB

IEEE488
The IEEE488 interface allows for communication with devices connected to an IEEE-488 bus system.

Interface Setup Information
To quickly set up the interface, adjust the GPIB primary address using switches 1…5. Keep switches 6…8 in the OFF position.

Interface Converter LED Indicators

- **LED ADDR:** Indicates whether the converter is in listener addressed state or talker addressed state.
- **LED1 SRQ:** Indicates when the converter asserts the SRQ line. After a serial poll, the LED goes out.

GPIB Primary Address (PA)
The GPIB primary address (PA) is used to identify units connected to the IEEE-488 bus system. Each unit must have a unique PA assigned. The controlling PC typically has PA=0, and connected units usually have addresses from 4 upwards. The default PA for FuG power supplies is PA=8. To adjust the PA, locate the configuration switches on the back panel of the device's IEEE-488 interface converter module. No need to open the power supply. After changing a configuration switch, turn off the power supply for 5 seconds and then turn it on again to

apply the change. The switches follow the binary system for addressing. For example, to set the address to 9, switch 1 has a value of 1, switch 2 has a value of 2, switch 3 has a value of 4, switch 4 has a value of 8, and switch 5 has a value of 16. The sum of the values of the switches in the ON position gives the address. Addresses in the range 0…31 are possible.

Compatibility Mode Probus IV
If compatibility with a former Probus IV system is required, the interface converter can be set to a special compatibility mode (Mode 1). However, this mode is not recommended for new designs. The full efficiency of the new Probus V system can only be achieved in standard mode.

LAN Ethernet (LANI 21/22)
When programming a new device control application, it is recommended to use TCP/IP for communication. TCP/IP eliminates the need for additional drivers.

Ethernet

- 10/100 Base-T
- RJ-45 connector

Fiber Optic Transmitter (Tx)

- LED indicator link

Fiber Optic Receiver (Rx)

- LED indicator activity

FAQ

- **How do I adjust the primary address (PA) of the device?**
  To adjust the primary address, locate the configuration switches on the back panel of the device's IEEE-488 interface converter module. Set the switches according to the binary system, where each switch has a specific value. The sum of the values of the switches in the ON position gives the address. Turn off the power supply for 5 seconds and then turn it on again to apply the change.
- **What is the default primary address (PA) for FuG power supplies?**
  The default primary address for FuG power supplies is PA=8.
- **How can I achieve compatibility with a former Probus IV system?**
  To achieve compatibility with a former Probus IV system, set the interface converter to compatibility mode (Mode 1). However, it is not recommended for new designs as the full efficiency of the new Probus V system can only be achieved in standard mode.

OVERVIEW

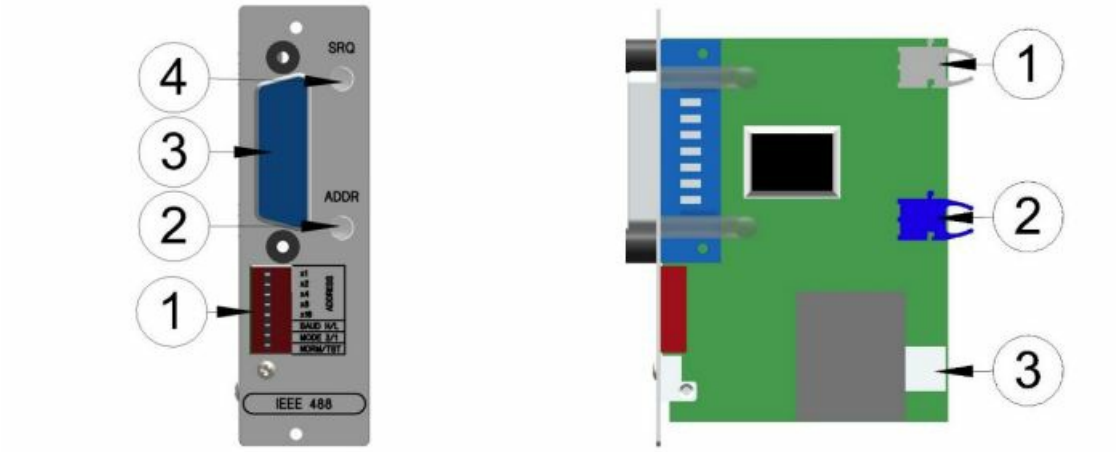
- The ADDAT 30/31 module is an AD/DA interface for controlling power supplies via fiber optics using serial data transmission. The ADDAT extension board is mounted directly to the device electronics.
- The converter for converting the interface signal to a fibre optics signal mounted at the back panel. To reach highest possible noise immunity, the signal converter can be operated as an external module outside of the

power supply. In that case the data transmission outside of the power supply also happens via fibre optics.

This manual was created by: XP Power FuG, Am Eschengrund 11, D-83135 Schechen, Germany

IEEE488

Pin assignment – IEEE488



1	Configuration switches
2	Interface Addressed LED
3	IEEE-488 connector
4	Service Request LED

1	Fiber optic transmitter (Tx)
2	Fiber optic receiver (Rx)
3	Mains connection

Interface setup information

TIP: For quick setup: Usually, only the GPIB primary address has to be adjusted on the switches 1…5. The other switches 6…8 remain in OFF position.

Interface Converter LED Indicators

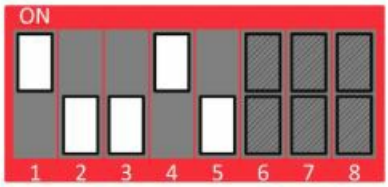
- **LED ADDR**

  This LED is on, while the converter is either in listener addressed state or talker addressed state.
- **LED1 SRQ**

  This LED is on, while the converter asserts the SRQ line. After a serial poll, the LED goes out.

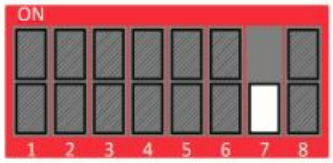
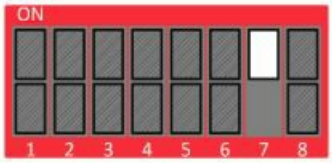
GPIB Primary Address (PA)

- The GPIB primary address (PA) enables identification of all units connected to an IEEE-488 bus system.
- Therefore, a unique PA must be assigned to each unit on the bus.
- The controlling PC usually has PA=0 and the connected units usually have addresses from 4 upwards. In general, the delivery state of FuG power supplies is PA=8.
- Adjustment of the PA is done on the back panel of the device on the IEEE-488 interface converter module. It is not necessary to open the power supply.
- After changing a configuration switch, the power supply must be switched off for 5 seconds and switched on again to apply the change.

Adjustment of primary address	
 Example address = 9 (1*1 + 0*2 + 0*4 + 1*8 + 0*16 = 9).	Setting of the switches follows the binary system: Switch 1 has value 1 Switch 2 has value 2 Switch 3 has value 4 Switch 4 has value 8 Switch 5 has value 16 The addition of the values of the switches in ON position gives the address. Addresses in the range 0...31 are possible.

Compatibility Mode Probus IV

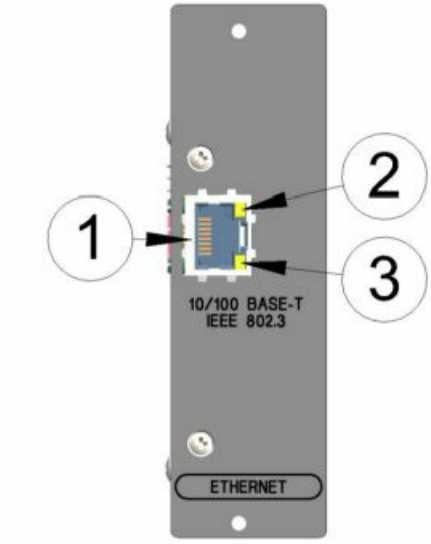
- If compatibility to a former Probus IV system is necessary, the interface converter can be set to a special compatibility mode (Mode 1).
- This mode is not recommended for new designs.
- The full efficiency of the new Probus V system can only be achieved in standard mode!

Probus V Mode Standard setting	Compatibility mode (behaviour of system like Probus IV)
	

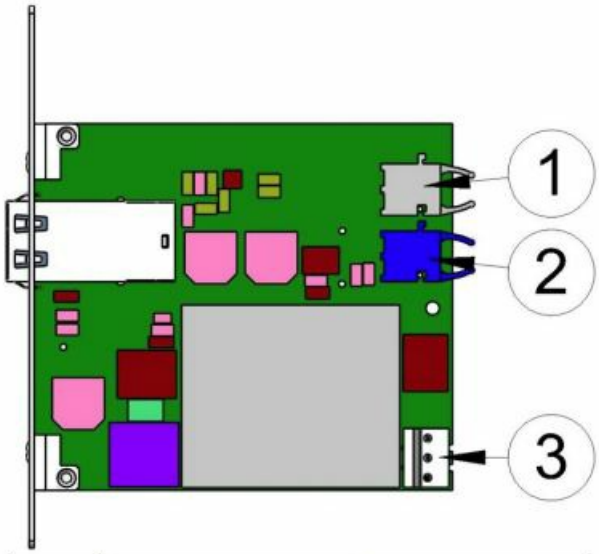
LAN Ethernet (LANI 21/22)

In case of programming a new device control application it is recommended to use TCP/IP for communication. By using TCP/IP, no additional drivers are needed.

Pin assignment – LAN Ethernet (LANI 21/22)



1	Ethernet 10/100 Base-T, RJ-45
2	LED indicator link
3	LED indicator activity



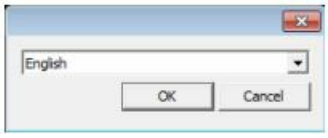
1	Fiber optic transmitter (Tx)
2	Fiber optic receiver (Rx)
3	Mains connection

Direct control via TCP/IP

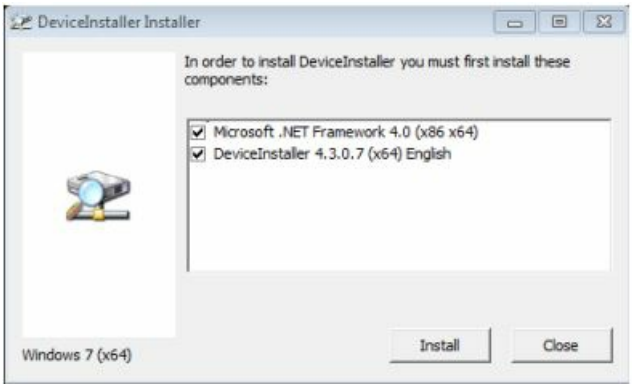
- **Connection setup and configuration**
  Depending on your network, some settings have to be made. First, a connection to the interface converter has to be established. For this, the IP Address has to be determined. The recommended way to detect the device in the Network and to identify its IP Address is to use the Program “Lantronix Device Installer”
  CAUTION Be careful when connecting to a corporate network, because wrong or duplicate IP addresses can cause a lot of trouble and prevent other PCs from network access!
  If you are not familiar with network administration and configuration, we strongly recommend to make your first steps in a standalone network without connection to your corporate network (connection via a CrossOver-cable)! Alternatively, please ask your local network administrator for help!
- **Install DeviceInstaller**

Depending on your network, some settings have to be made.

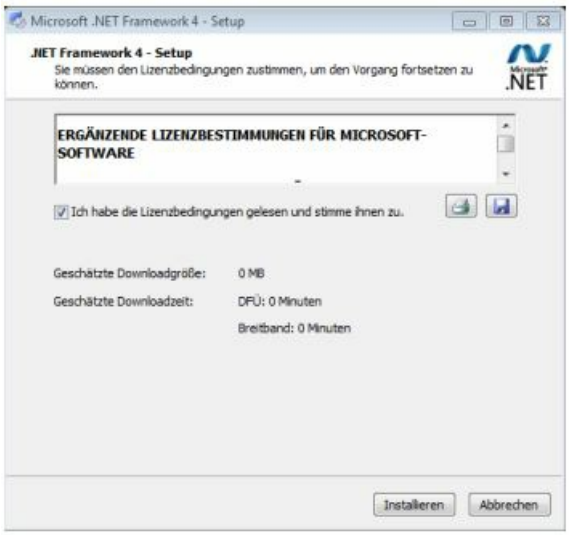
1. Download the „Lantronix Device Installer“ program from www.lantronix.com and run it.
2. After Select your preferred language.



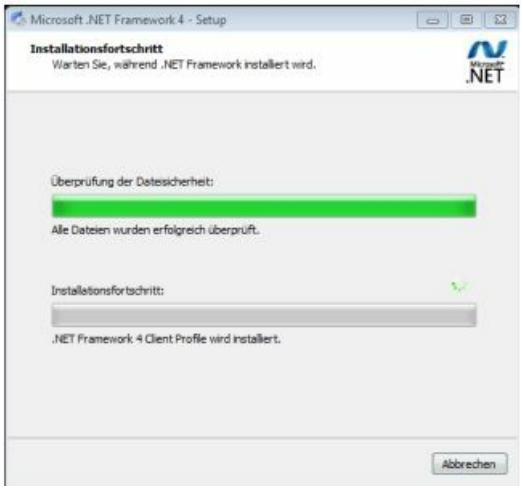
3. Now it is checked whether “Microsoft .NET Framework 4.0” or the “DeviceInstaller” is already installed on your PC. If “Microsoft .NET Framework” is not yet installed, it will be installed first.



4. Accept the license terms of “Microsoft .NET Framework 4.0”.

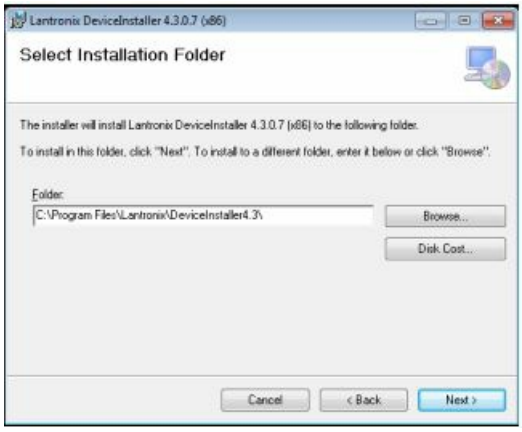


5. The installation of “Microsoft .NET Framework 4.0” can take up to 30 minutes.

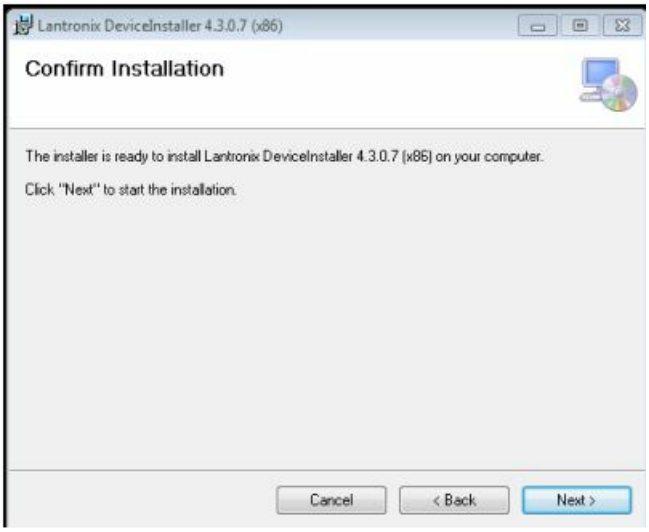


6. Now the installation must be completed via “Finish”.
7. Then the installation of the “DeviceInstaller” starts.
8. Acknowledge the different pages with “Next >”.

9. Choose your folder for the installation.



10. Confirm that the program is to be installed.

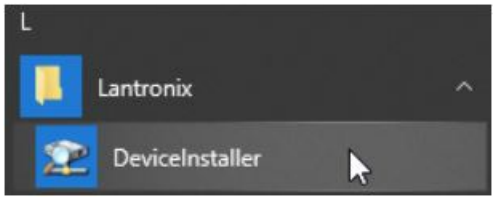


Now the program “DeviceInstaller” is installed.

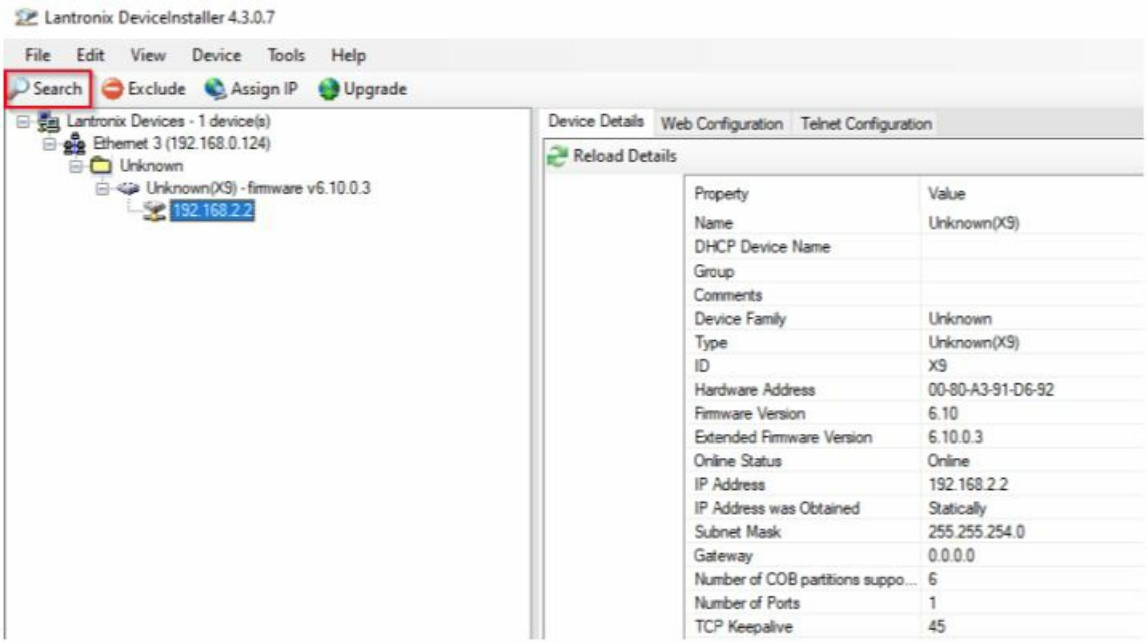
- **Detection of the device**

  NOTE The following instructions refer to the use of Microsoft Windows 10.

  1. After installation, start the “DeviceInstaller” from the Windows start menu.

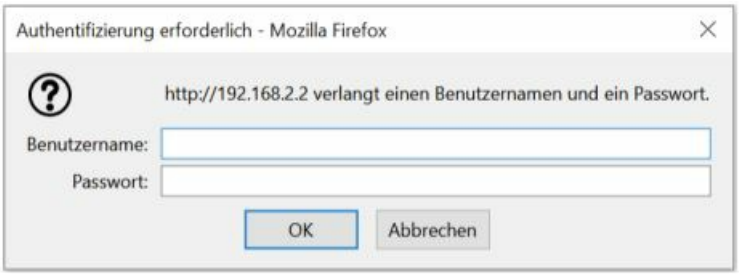


  2. If a Windows Firewall warning appears, click on “Allow access”.
  3. All devices found on the network will be displayed. If the desired device is not displayed, you can restart the search with the button “Search”.



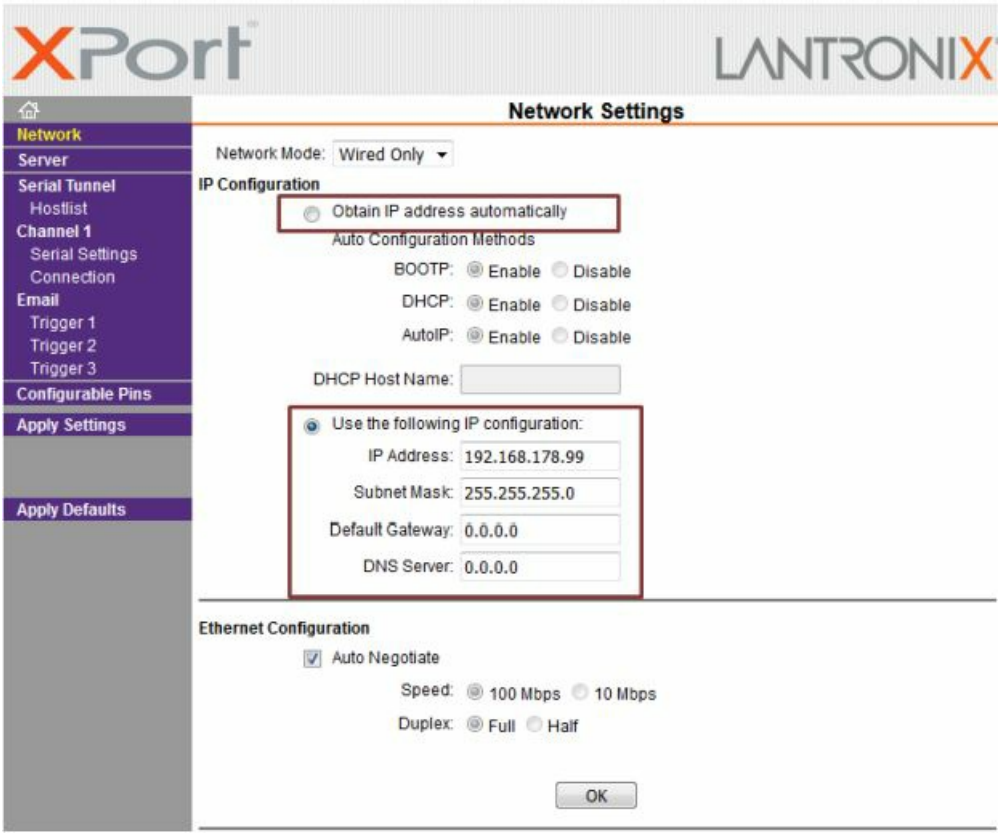
4. The IP address, in this case 192.168.2.2, is required for connection to the device. Depending on the network configuration, the IP Address may change each time the device is powered down. After you've obtained the IP-Address via the DeviceInstaller you're able to connect with the device.

- **Configuration via the web interface**
  1. It is recommended to use a webbrowser for configuration.
     Type the IP address of your device into the address bar and hit enter.
  2. A login window might be shown, but you only have to click "OK". By default, no login credentials are required.



- **Customise Settings**

  A customer specific IP address and subnet mask can be set in the "Use the following IP configuration" area. The shown IP addresses / subnet mask are examples. "Obtain IP address automatically" is the factory default.



- **Local Port**

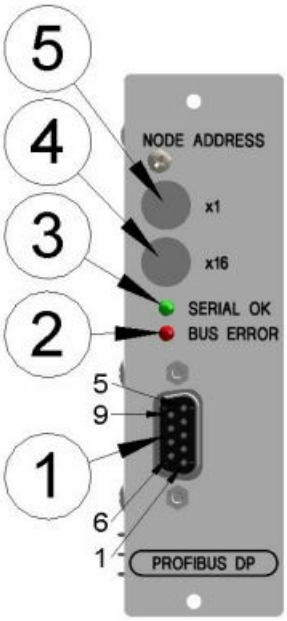
  The Local Port “2101” is factory default.

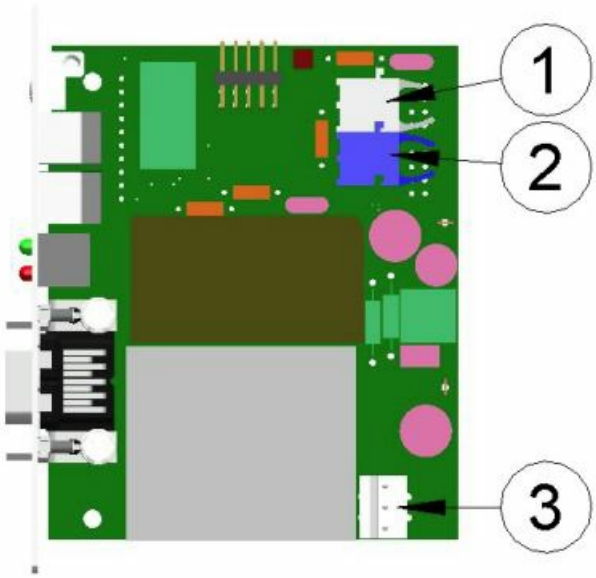
- **Further Information**

  The interface converter is based on the embedded device Lantronix-X-Power. Driver updates for new operating systems as well as further information can be obtained from: http://www.lantronix.com/device-networking/embedded-device-servers/xport.html

Profibus DP

Pin assignment of the interface





1	ProfibusDP Connector
2	LED BUS ERROR ON, if disconnected from master
3	LED SERIAL OK ON, if the fiber optic connection to the ADDAT module is operating correctly
4, 5	Setting of Node Address

1	Fiber optic transmitter (Tx)
2	Fiber optic receiver (Rx)
3	Mains connection

Interface Setup – GSD File

The GSD file of the interface converter is located in the directory „Digital_Interface\ProfibusDP\GSD“. Depending on the version of the converter module, either „PBI10V20.GSD“ has to be used. If the file is incorrect, the power supply unit is not recognized by the master.

Interface Setup – Setting of Node Address

The node address identifies the units (=nodes) connected to the Profibus. A unique address must be assigned to every node on the bus. The address is set with switches on the rear side of the interface converter. The housing of the power supply does not need to be opened. After any change in the configuration, the power supply (interface converter) must be switched od for at least 5 seconds. Slave addresses in the range 1…126 are possible.

Indicators

- Green LED -> SERIAL OK
- This LED is on, if the serial fiber optic connection between ADDAT base module and interface converter is working correctly.
- At the same time, the LED BUSY on the front panel of the power supply is continuously on, indicating a continuous data transfer between the interface converter and the ADDAT base module.
- Red LED -> BUS ERROR

- This LED is on, if there is no connection to the ProfibusDP Master.

Mode of Operation

- The ProfibusDP interface converter provides a 16 Byte input data block and a 16 Byte output data block.
- Incoming data from Profibus is stored in the input data block.
- This block is transferred cyclically as a 32-character hexadecimal string to the ADDAT base module. (Register “>H0” of ADDAT 30/31)
- The ADDAT base module responds with a 32-character hexadecimal string.
- This string contains 16 Bytes of monitor and status signals.
- The Profibus interface converter stores these 16 Bytes in the output data block, which can be read by the Profibus master.
- The cycle time is approximately 35ms.
- Please refer also to the description of Register “>H0” in document Digital Interfaces Command Reference ProbusV.

Date Formats

Data format input data block ">H0"		
Byte		
0	LSB	Set value **"0"** (Voltage set value), unsigned integer, **"0...65535"** represents 0V to nominal voltage in **">CS0T"**, **">S0"** is set
1	MSB	
2	LSB	Set value **"1"** (Current set value), unsigned integer **"0...65535"** represents 0A to nominal current in **">CS1T"**, **">S1"** is set
3	MSB	
4	Bit 0	Sign for **"0"** (**"0"** = pos., **"1"** = neg.)
	Bit 1	Sign for **"1"** (**"0"** = pos., **"1"** = neg.)
	Bit 2	Not used

	Bit 3	Not used	
	Bit 4	Not used	
	Bit 5	Not used	
	Bit 6	Not used	
	Bit 7	**"0"**: **">CASM 3"** Timeout 5sec.	Concerns communication between PBI10 and ADDAT30/31.
		"1": **">CASM 3"** Timeout 500msec.	
5	Bit 0...3	Behavior of the set value **"0"**, value is copied to register **">S0B"**	
	Bit 4...7	Behavior of the set value **"1"**, value is copied to register **">S1B"**	
6	Bit 0...3	Not used	
	Bit 4...7	Not used	
7	Bit 0	Unit ON command, value is copied to register **">BON"**	
	Bit 1	Output **"X-CMD"** (polarity reversal), value is copied to register **">BX"**	
	Bit 2	Output **"X0"**, value is copied to register **">B0"**	
	Bit 3	Output **"X1"**, value is copied to register **">B1"**	
	Bit 4	Output **"X2"**, value is copied to register **">B2"**	
	Bit 5	Not used	
	Bit 6	Not used	
	Bit 7	Not used	
8	LSB	Set value **"0"** ramp rate, unsigned integer, **"0...65535"** represents 0...1x nominal value per second, **">S0R"** is set	
9	MSB		
10	LSB	Set value **"1"** ramp rate, unsigned integer, **"0...65535"** represents 0...1x nominal value per second, **">S1R"** is set	
11	MSB		
12		Not used	
13		Not used	
14		Not used	
15		SYNC Byte, value is transferred to output data block, no further function	

Data format output data block ">H1"		
Byte		
0	LSB	Monitor **"0"** (voltage monitor), unsigned integer, (Value from register **">M0"**), **"0...65535"** represents 0V to nominal voltage in **">CM0T"**
1	MSB	
2	LSB	Monitor **"1"** (current monitor), unsigned integer, (Value from register **">M1"**), **"0...65535"** represents 0A to nominal current in **">CM1T"**
3	MSB	
4	Bit 0	Sign of Monitor **"0"** (**"0"** = pos., **"1"** = neg.)
	Bit 1	Sign of Monitor **"1"** (**"0"** = pos., **"1"** = neg.)
	Bit 2	Not used
	Bit 3	Not used
	Bit 4	Not used

	Bit 5	Not used
	Bit 6	Not used
	Bit 7	Not used
5	Bit 0	Input signal **"SEL-D"** (**"1"** = power supply is digitally controlled)
	Bit 1	Input signal **"SEL-A"** (**"1"** = power supply is analogously controlled)
	Bit 2	**"CAL-Mode"** (**"1"** = power supply is in calibration mode)
	Bit 3	Input signal **"X-STAT"** (polarity of HVPS with polarity reversal)
	Bit 4	Input signal **"3-REG"** (for special applications)
	Bit 5	Input signal **"ON-STAT"** (**"1"** = power supply ON)
	Bit 6	Input signal **"V-REG"** (**"1"** = power supply is in constant-voltage regulation)
	Bit 7	Input signal **"I-REG"** (**"1"** = power supply is in constant-current regulation)
6		Not used
7		Not used
8		Not used
9		Not used
10	LSB	Serial number, long integer
11		
12		
13	MSB	
14		Error code of the most recent command
15		SYNC Byte, value is copied from input data block

More Information
The interface converter Profibus DP is based on the standard converter “UNIGATE-IC” from Deutschmann Automationstechnik (product page). All common Profibus baud rates up to 12 MBit/s are supported. The conversion settings are script-controlled with a cycle time of approx. 35ms.

RS232/422

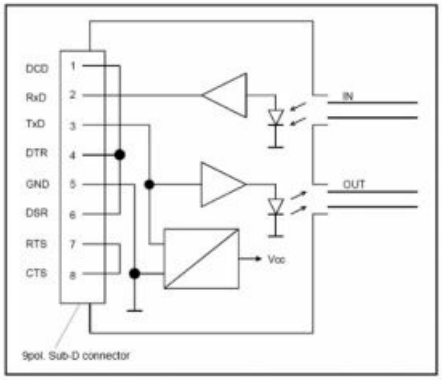
Interface setup information
Each Device which is equipped with a RS232, or a RS422 internal or external converter, can be remotely controlled via a PC over the COM port. From the view of the application programmer, there is no difference between these variations.

RS232, external interface converter

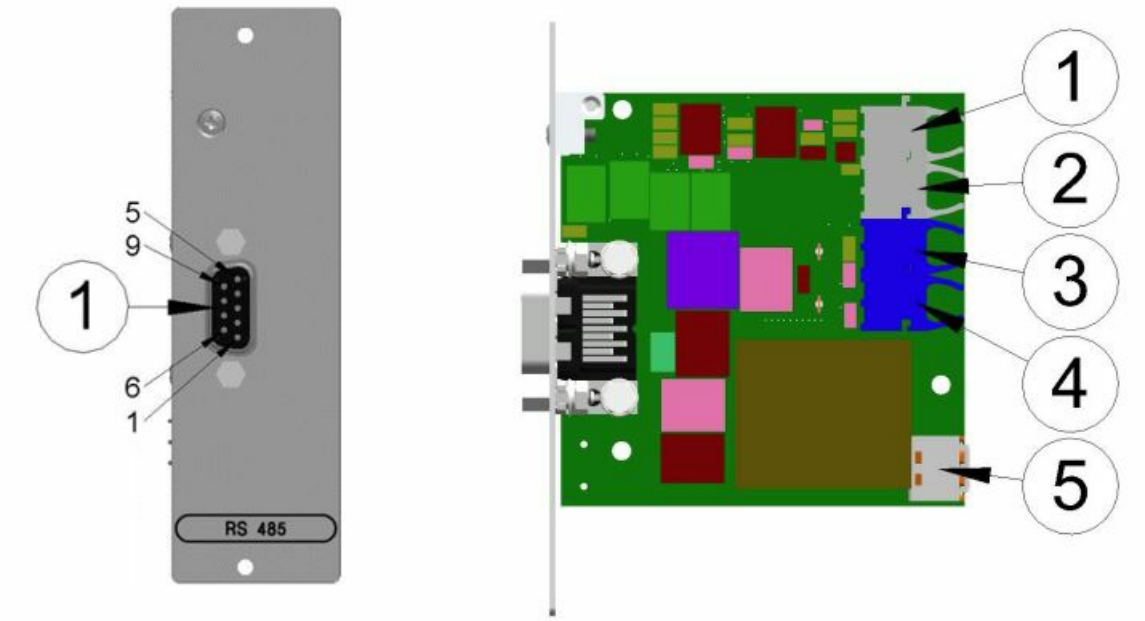
- The power supply is connected to the pc via a Plastic Optic Fiber link (POF). This ensures the highest possible noise immunity.
- The maximum link distance is 20m.
- On the PC side, the interface converter is connected directly to a standard COM port. The interface signal Tx is used to power the converter, therefore no external supply is needed.

Fiber optic connections:

- The data output of the converter (“T”, Transmit) needs to be connected to the data input (“Rx”, Receive) of the power supply.
- The data input of the converter (“R”, Receive) needs to be connected to the data output (“T”, Transmit) of the power supply.



Pin assignment – RS232, intern



1	Sub-D connector

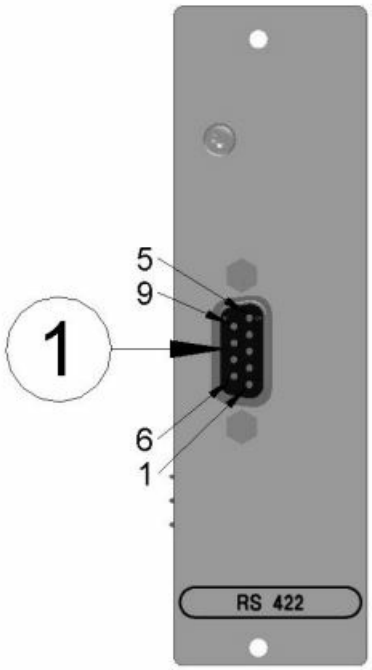
1, 2	Fiber optic transmitter (Tx, equivalent)
3, 4	Fiber optic receiver (Rx, equivalent)
5	Mains connection

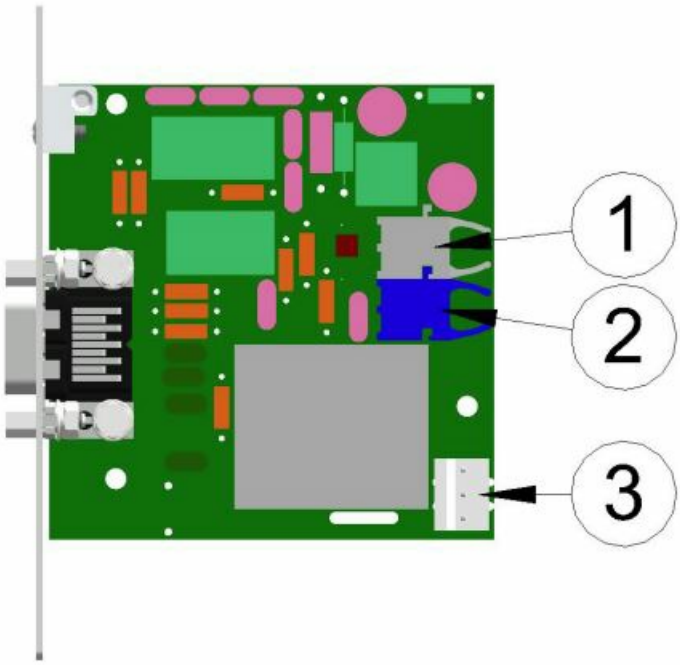
Connector Pin assignment:	
1	Tx- Transmit data
2	Tx+ Transmit data
3	Rx+ Receive data
4	Rx- Receive data
5	GND
7 - 8	120 Ohm resistor
6, 9	Not connected

To establish a connection to a standard PC it is sufficient to connect pins 2, 3 and 5 with the same PINs at the PC com port.
Standard RS-232 cables with 1:1 pin connection are recommended.

CAUTION There are NULL-modem cables existing with Pins 2 and 3 crossed. Such cables do not work.

Pin assignment – RS422





1	Sub-D connector

1	Fiber optic transmitter (Tx)
2	Fiber optic receiver (Rx)
3	Mains connection

Connector Pin assignment:	
1	Tx- Transmit data
2	Tx+ Transmit data
3	Rx+ Receive data
4	Rx- Receive data
5	GND
7 - 8	Internally shorted
6, 9	Not connected

CAUTION The pin assignment follows a quasi-standard. Therefore, it cannot be guaranteed, that the pin assignment is compatible to your PC RS-422 output. In case of doubt, the pin assignment of the PC and interface converter has to be verified.

RS485

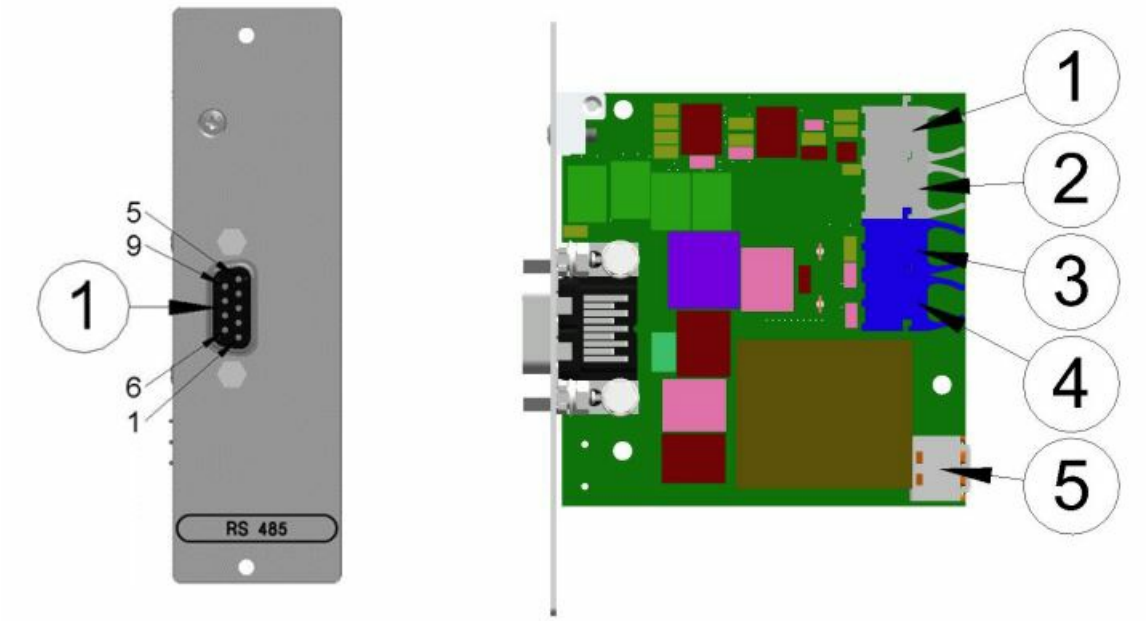
RS485 Background Information

- The “RS485 Bus” is mostly associated with a simple 2-wire bus system that is used to connect multiple addressed slaves with a master device (i.e. PC).
- It only defines the signal levels on the physical layer of communication.
- RS485 does not define any data format, nor any protocol or even a connector pin assignment!
- Therefore, every manufacturer of RS485 equipment is absolutely free in defining how the units on the RS485 bus communicate with each other.
- This results in diderent units from diderent manufacturers usually not working together correctly. To enable diderent units from diderent manufacturers working together, complex standards like ProfibusDP were introduced. These standards are based on
- RS485 on the physical layer, but also define the communication on higher levels.

Interface Converter RS232/USB to RS485

- A PC with a common RS232/USB interface can be adapted to RS485 by interface converters available on the market.
- Usually, these converters work well in full duplex mode (2 pairs of wires).
- In half duplex mode (1 pair of wires), the transmitter of each station must be disabled immediately after the last byte was sent to clear the bus for the next data expected.
- In most available RS232 – RS485 interface converters the transmitter is controlled via the RTS signal. This special use of RTS is not supported by standard software drivers and requires special software.

Pin assignment – RS485



1	Sub-D connector

1, 2	Fiber optic transmitter (Tx, equivalent)
3, 4	Fiber optic receiver (Rx, equivalent)
5	Mains connection

Connector Pin assignment:	
1	Tx- Transmit data
2	Tx+ Transmit data
3	Rx+ Receive data
4	Rx- Receive data
5	GND
7 - 8	120 Ohm resistor
6, 9	Not connected

RS485 does not define any pin assignment. The assignment of the pins corresponds to usual systems. Most likely, the pin assignment on PC side or other equipment will be diderent!

Configuration – Address

- Address 0 is the factory default.
- If more than one device is linked together via RS485, the favored addresses can be set as factory default. In that case, please contact XP Power.
- In a normal use case, changing the addresses of the devices is therefore not necessary.
- The calibration mode needs to be enabled in order to change the address of a device.
- Activation of the calibration mode is done at your own risk! In order to do so, the device needs to be opened which should be done by trained personnel only! The current safety regulations are to be satisfied!

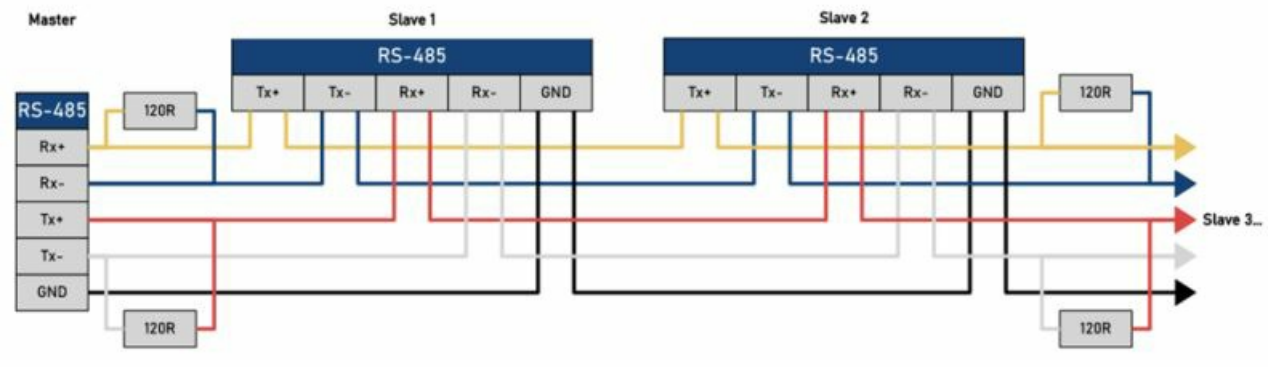
Network Structure and Termination

- The bus should have a linear structure with 120 Ohm termination resistors on both ends. In half duplex mode, the 120 Ohm resistor between Pins 7 and 8 can be used for this purpose.

- Star topology or long branch wires should be avoided to prevent signal degradation due to reflections.
- The master device can be located anywhere within the bus.

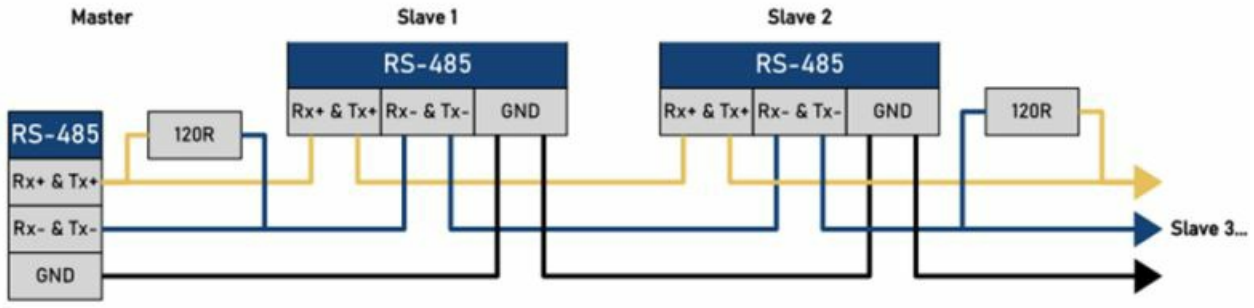
Fullduplex Mode (separated Rx and Tx)

- The bus consists of 2 wire pairs (4 signal wires and GND)
- **Timing:** The Answer time of the ADDAT module is significantly below 1ms (typically a few 100us). The master must wait at least 2ms after receiving the last byte of an answer string before starting to send the next command string. Otherwise, data collision on the bus may occur.



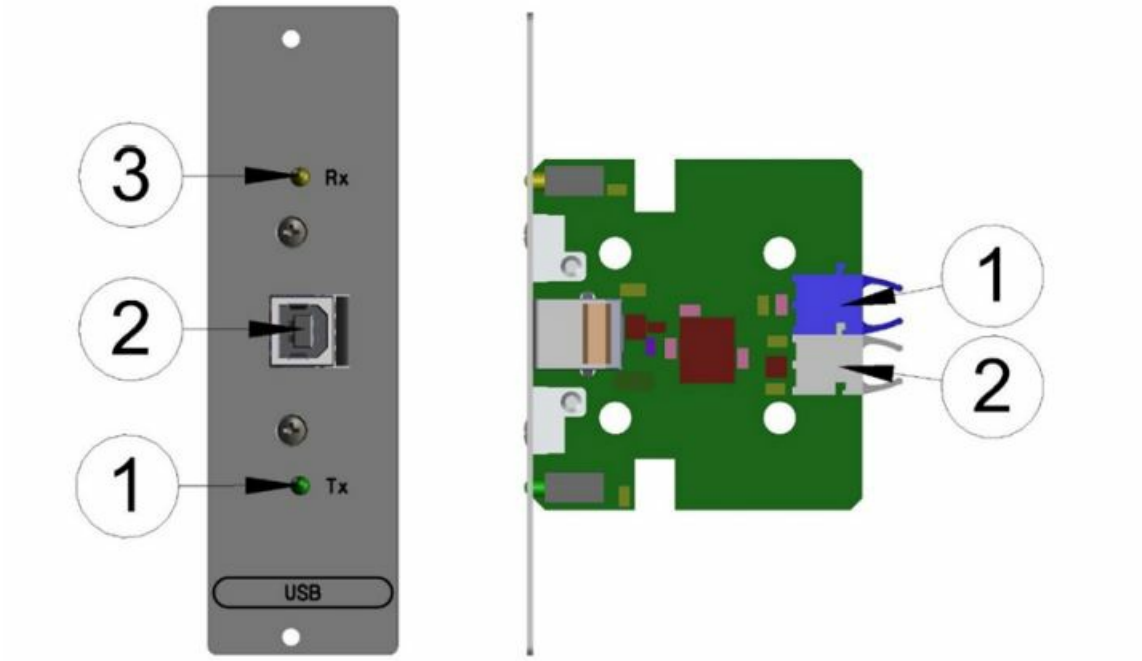
Half duplex Operation (Rx and Tx combined on one Wire Pair)

- The bus consists of 1 wire pair (2 signal wires and GND)
- **Timing 1:** The Answer time of the ADDAT module is significantly below 1ms (typically a few 100us). The master must be able to switch od its transmitter within 100us after the last byte transmitted.
- **Timing 2:** The slave's transmitter (Probus V RS-485 interface) remains active for a maximum of 2ms after the last byte transmitted and is set to high impedance after this. The master must wait at least 2ms after receiving the last byte of an answer string before starting to send the next command string.
- Violating these timing constrains leads to data collision.



USB

Pin assignment – USB



1	LED indicator Tx
2	USB port
3	LED indicator Rx

1	Fiber optic receiver (Rx)
2	Fiber optic transmitter (Tx)

Installation

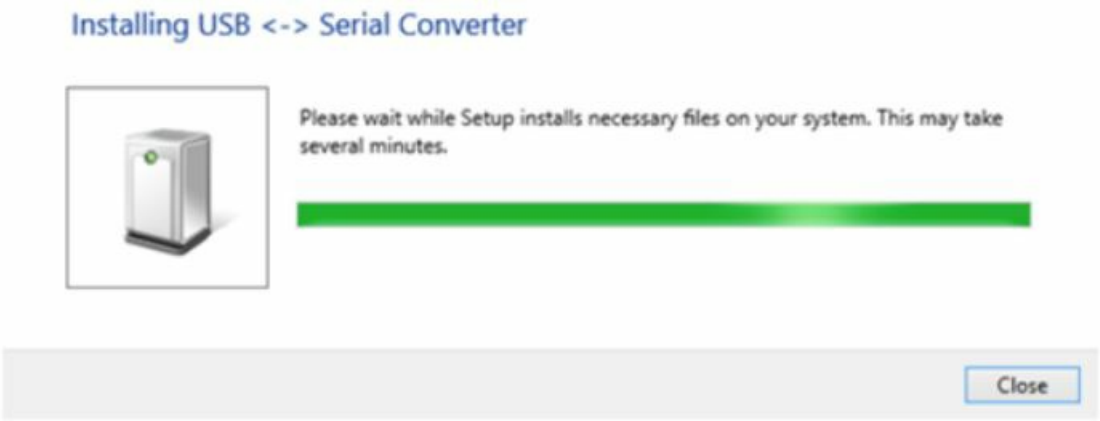
The USB interface works together with the driver software as a virtual COM port. Therefore, it's easy to program the power supply without special USB knowledge. You can even use existing software that worked up to now with a real COM port.

Please use the driver installation file from the XP Power Terminal package.

Automatic Driver Installation

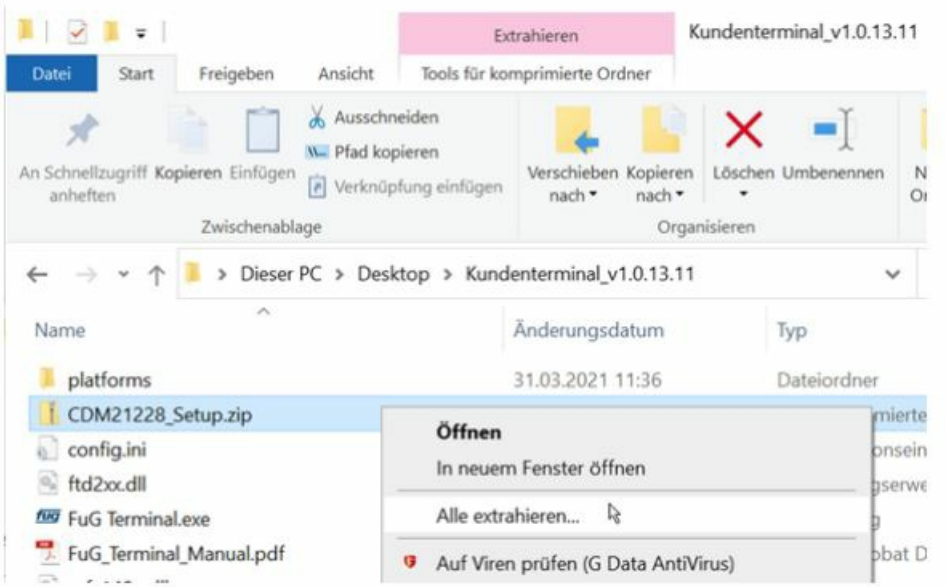
1. Connect the power supply to the PC via the USB cable.
2. If there is an available internet connection, Windows 10 will silently connect to the Windows Update website and install any suitable driver it finds for the device.

Installation is complete.

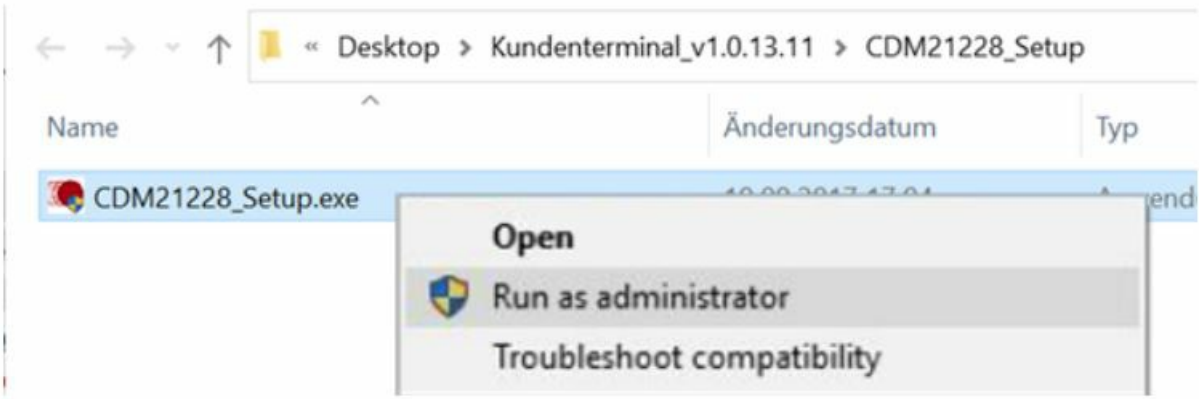


Installation via executable setup file

1. The executable CDM21228_Setup.exe is located in the XP Power Terminal download packet.
2. Right-click the executable and choose “Alle extrahieren…”

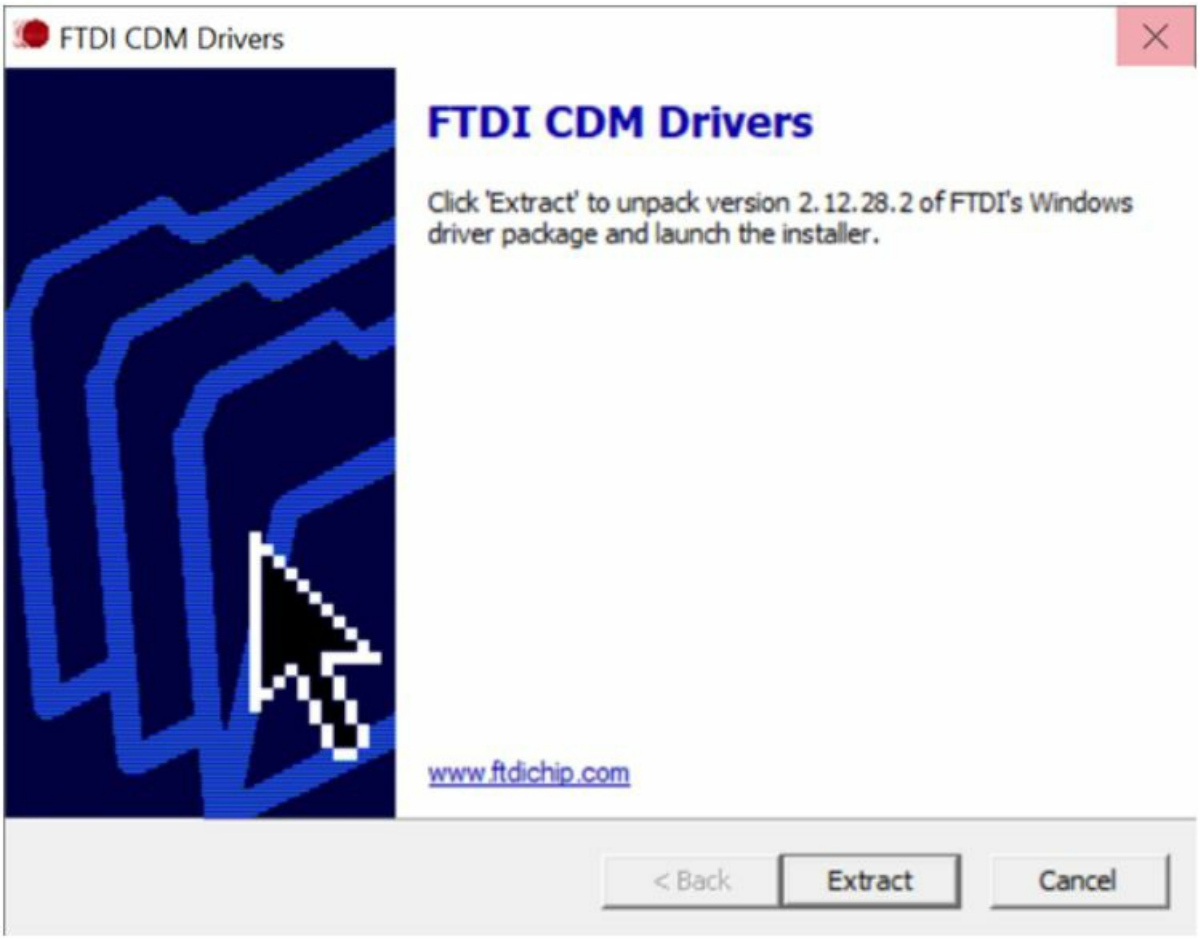


3. Run the executable as administrator and follow the instructions.

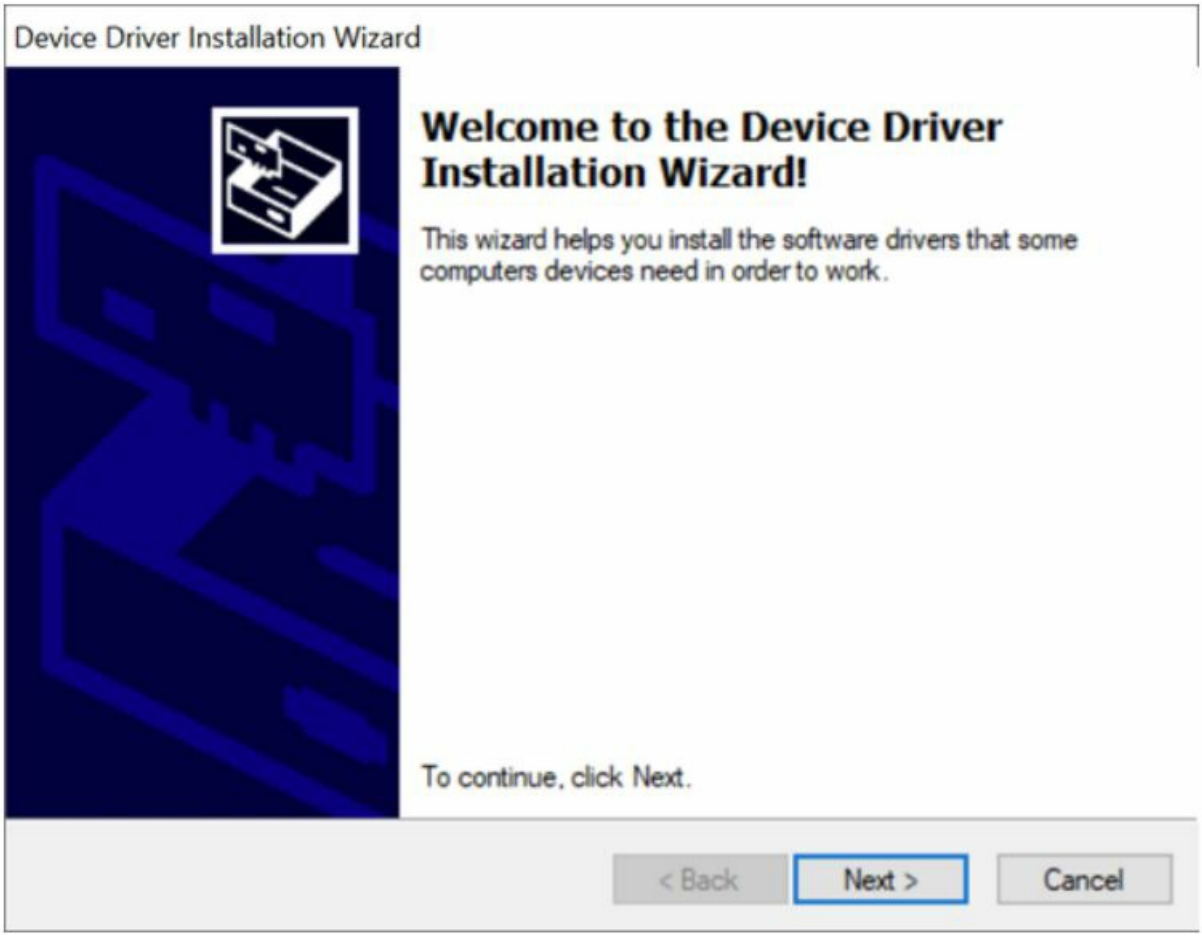


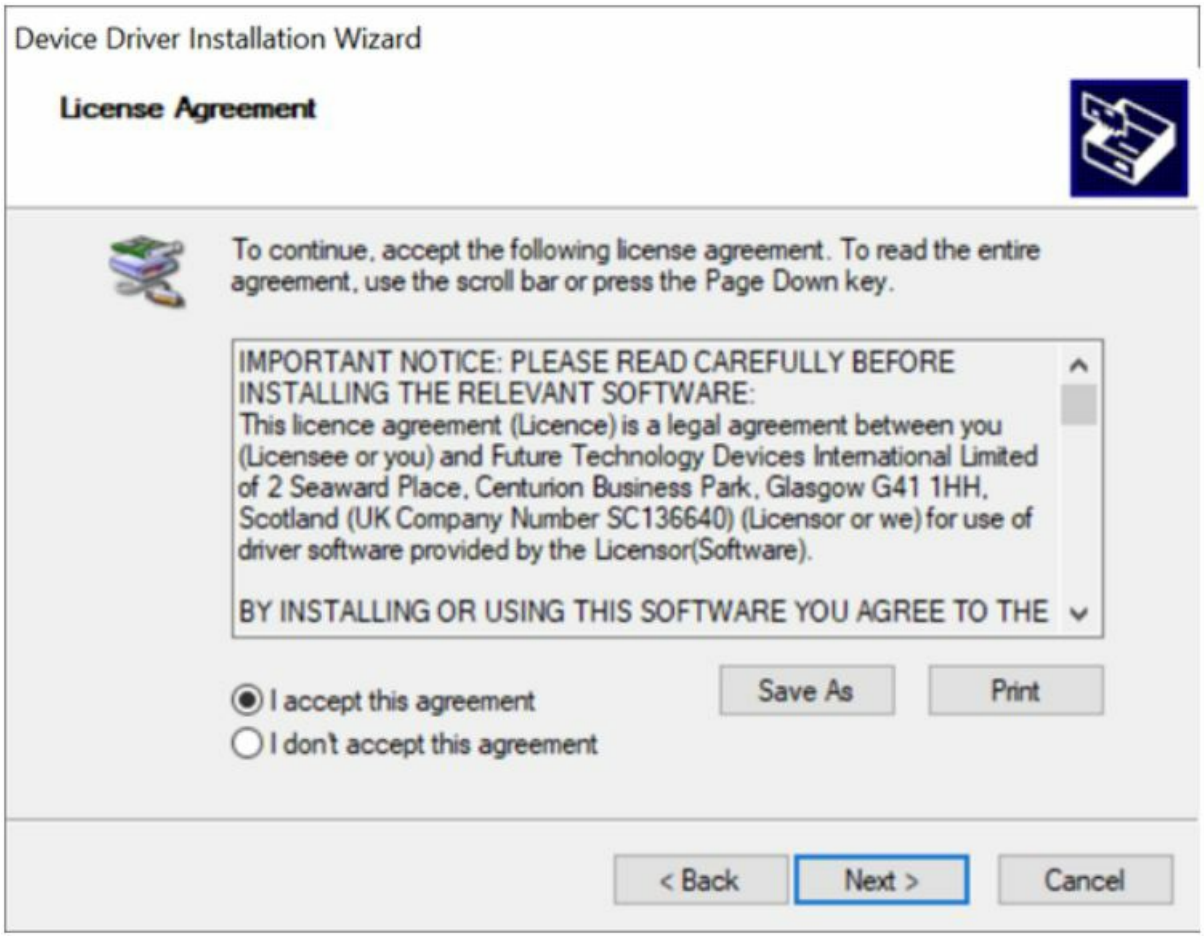
4.

5.


FTDI CDM Drivers
FTDI CDM Drivers
Click 'Extract' to unpack version 2.12.28.2 of FTDI's Windows driver package and launch the installer.
www.ftdichip.com
< Back
Extract
Cancel

6.


Device Driver Installation Wizard
Welcome to the Device Driver Installation Wizard!
This wizard helps you install the software drivers that some computers devices need in order to work.
To continue, click Next.
< Back
Next >
Cancel



Once the installation is complete, click “finish”.

Appendix

Configuration

- **Baud Rate**

  The default Baud rate for devices with a:

  - USB interface is set to 115200 Baud.

    The maximum baud rate for USB is 115200 Baud.
  - LANI21/22 interface is set to 230400 Baud.

    The maximum baud rate for LANI21/22 is 230k Baud.
  - RS485 interface is set to 9600 Baud.

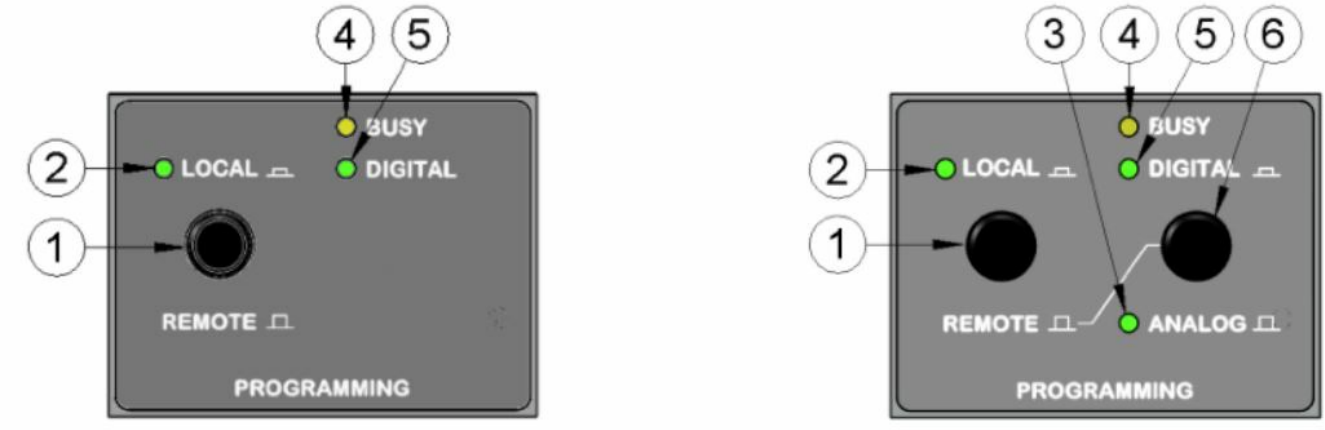
    The maximum baud rate for RS485 is 115k Baud.
  - RS232/RS422 interface is set to 9600 Baud.

    The maximum baud rate for RS485 is 115k Baud.

Terminator
The termination character “LF” is the factory default.

Commissioning

1. Before beginning the commissioning of the interface, the DC power supply must be switched off.
2. The interface of the control computer is to be connected to the interface of the DC power supply as specified.
3. Now turn on the POWER switch.
4. Press the REMOTE switch (1) on the front panel so that the LOCAL LED (2) turns off. If an additional analog interface is present, set the switch (6) to DIGITAL. The DIGITAL LED (5) light up.
5. Start your operating software and establish the connection to the interface in the device. The device is now controlled via the operating software. The BUSY LED (4) lights up shortly during data traffic for monitoring purposes. Further information about the commands and functions can be found in the document Digital Interface Command Reference Probus V



To safely switch o: the power supply, proceed as follows:
That procedure is absolutely essential for safety reasons. This is because the discharging output voltage can still be observed in the voltage display. If the unit is switched o: immediately using the AC Power switch, any dangerous voltage present (e.g. charged capacitors) cannot be shown since the display has been turned o:.

1. With the operating software, the setpoints and current are set to “0” and then the output is switched off.
2. After the output is less than <50V, switch the unit completely off using the POWER (1) switch. Pay attention to the residual energy in your application!
   The DC power supply is switched off.

Dangers of digital programming misuse

- **Danger of electrical shock at the power outputs!**
  - If the digital interface cable is pulled during the device operating in DIGITAL mode, the outputs of the device will maintain the last set value!
  - When switching from DIGITAL mode to LOCAL or ANALOG mode, the outputs of the device will maintain the last set value set via the digital interface.
  - If the DC supply is turned od via the POWER switch or by an outage of the voltage supply, the set values will be set to “0” when the device is restarted.

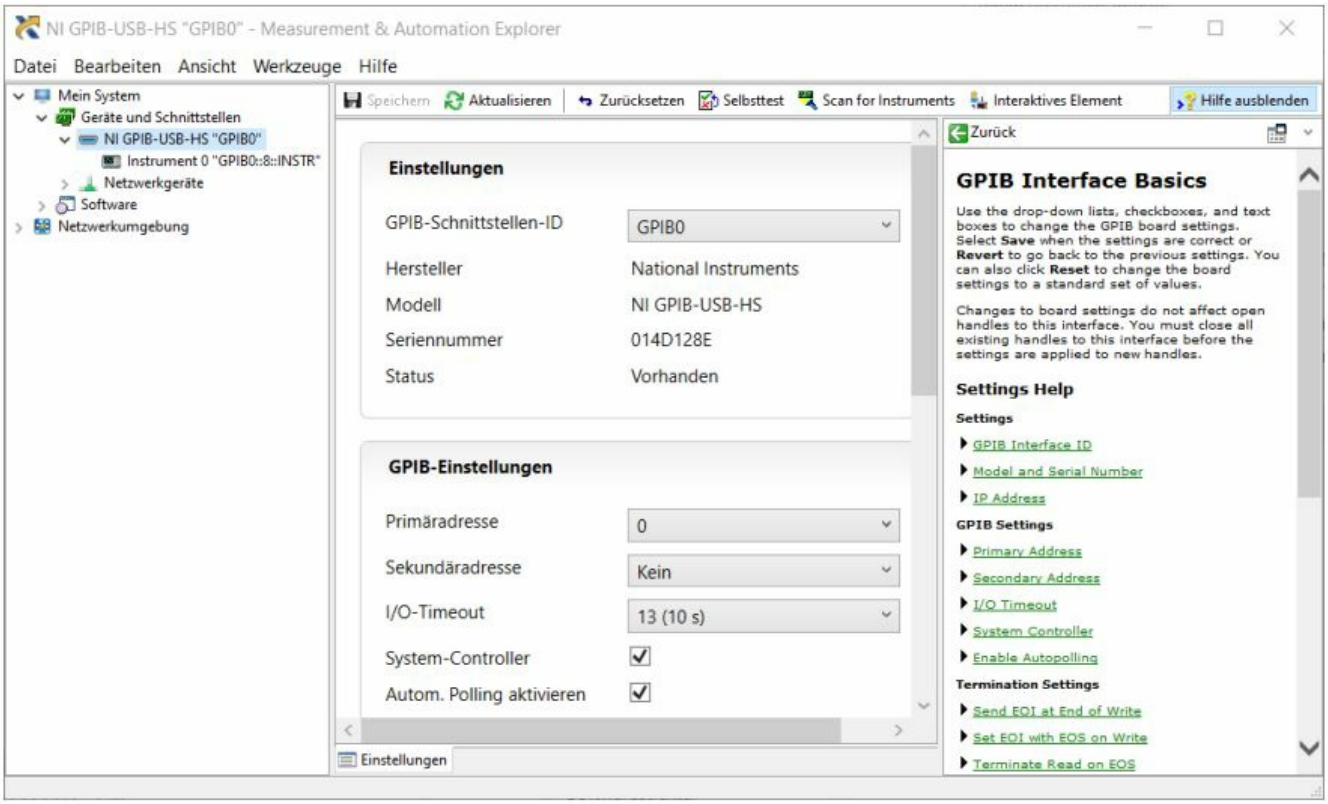
Testing the connection: NI IEEE-488

If you use a National Instruments IEEE-488 plug in card in your PC, the connection can be tested very easily. The card is delivered together with a program: the “National Instruments Measurement And Automation Explorer”. Short form: “NI MAX”. It is used for the following example.

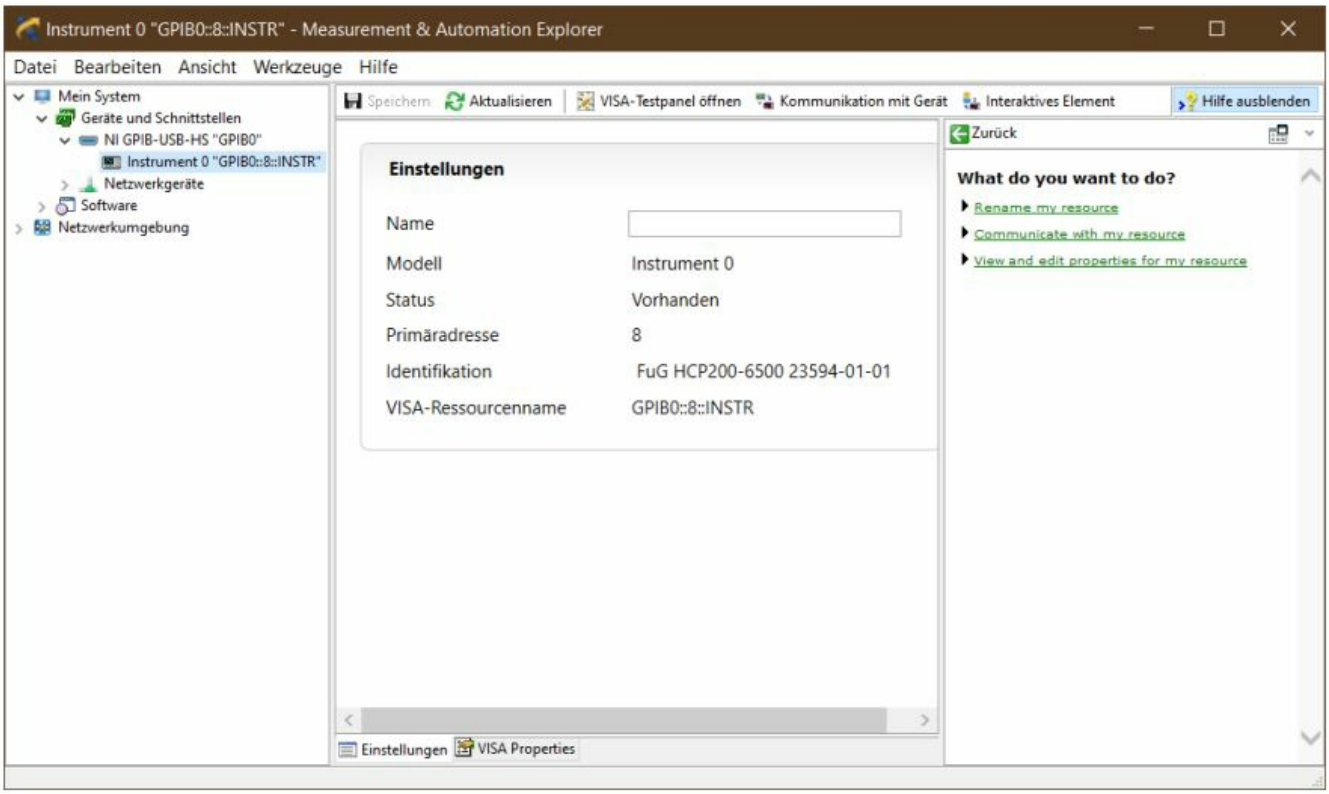
NOTE Other manufacturers of IEEE-488 boards should have similar programs. Please refer to the manufacturer of your card.

Example for NI MAX, Version 20.0

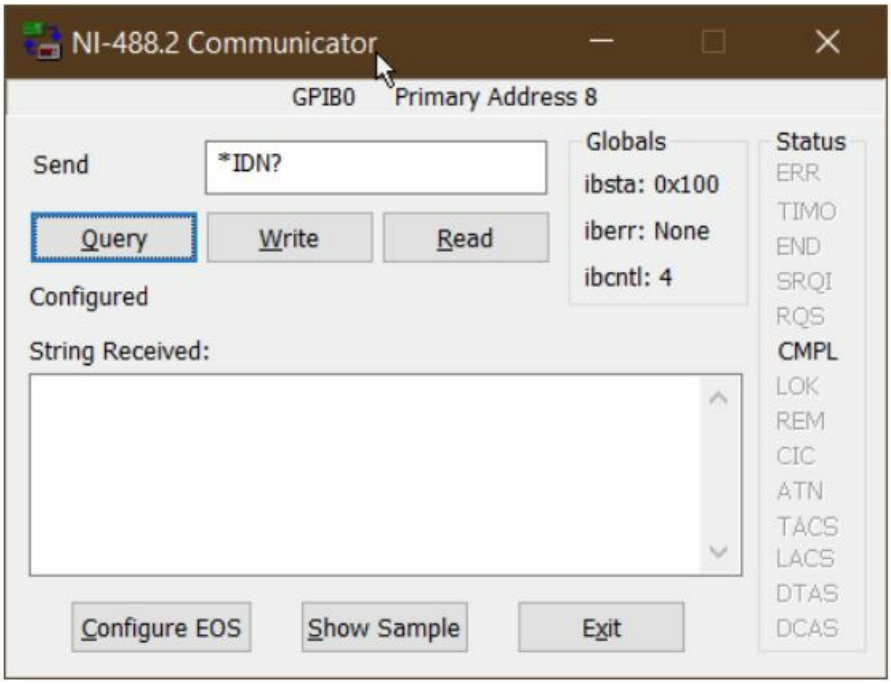
1. Connect the FuG power supply to the PC via IEEE-488.
2. Start NI MAX and click on “Geräte und Schnittstellen” and “GPIB0”.



3. Now click on “Scan for Instruments”. The power supply will respond with “FuG”, Type and serial number.



4. Click on “Kommunikation mit Gerät”: Now you can type a command into the “Send” field: After starting the communicator, the string “*IDN?” is already placed in the input field. This is the standard query for the identification string of the device.



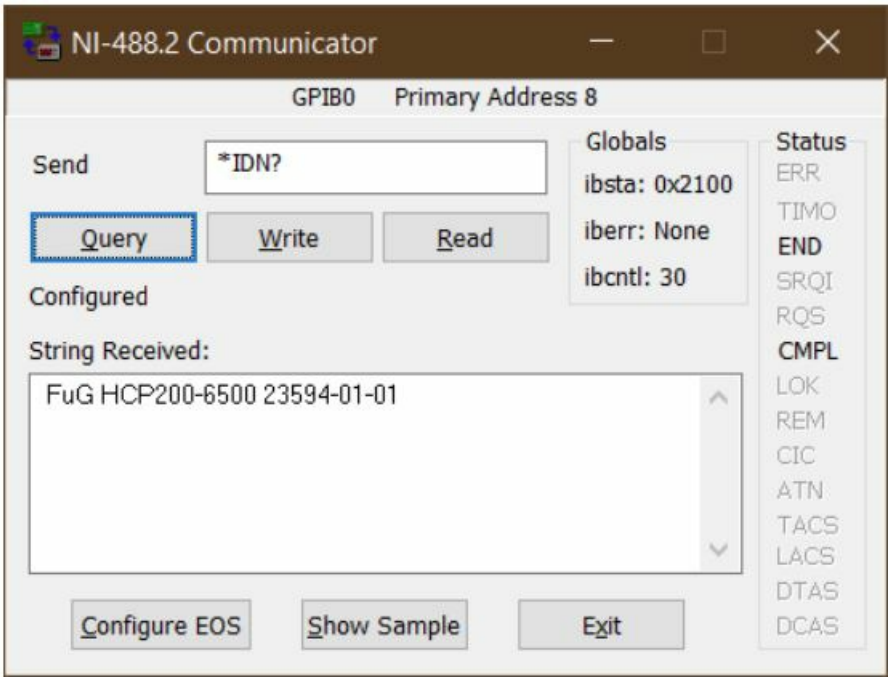
If you click on “QUERY” the “Send” field is transmitted to the power supply and the answer string is displayed in the “String Received” field.

If you click on “WRITE”, the “Send” field is sent to the power supply, but the answer string is not collected from the power supply.

A click on “READ” collects and displays the answer string.

(“QUERY” is just a combination of “WRITE” and “READ”.)

5. Click on “QUERY”:



The power supply outputs type and serial number.

Testing the connection: XP Power Terminal

The XP Power Terminal program can be used to test the connection to the power supply unit. This can be downloaded from the Resources tab on each XP Power Fug product page.

Simple communication examples

IEEE488

To connect the device, almost any terminal program can be used.

Command:	
>S0 x	Sends set value for voltage, x = value
>S1 y	Sends set value for current, y = value
⚠ DANGER	**By sending the command “>BON 1” the output is activated immediately.**
>BON 1	Sends command HV-ON
>BON 0	Sends command HV-OFF
>M0?	Query for current voltage monitor
>M1?	Query for current current monitor

ProfibusDP

- **Voltage set value**

  Input data block Bytes 0 (=LSB) and Byte 1 (=MSB)

  0…65535 results in 0…nominal voltage.

  In bipolar power supplies the set value can be inverted by setting of Byte4/Bit0.
- **Current set value**

  Input data block Bytes 2 (=LSB) and Byte 3 (=MSB)

  0…65535 results in 0…nominal current.

  In bipolar power supplies the set value can be inverted by setting of Byte4/Bit1.
- **Release output voltage**

  DANGER By sending the changed input block (register “>BON”) the output is activated immediately!

  Input data block Byte 7, Bit 0

  The output of the power supply is electronically released and switched od.
- **Read back of output voltage**

  Output data block Bytes 0 (=LSB) and Byte 1 (=MSB)

  0…65535 results in 0…nominal voltage.

  The sign of the value is in Byte4/Bit0 (1 = negative)
- **Read back of output current**

  Output data block Bytes 2 (=LSB) and Byte 3 (=MSB)

  0…65535 results in 0…nominal current.

  The sign of the value is in Byte4/Bit1 (1 = negative)

Instruction set and programming

For a complete overview of the registers with further commands and functions refer to the document Digital Interfaces Command Reference Probus V. The power supply unit is controlled via simple ASCII commands. Before transmitting a new command, the response corresponding to the previous command should be waited for and evaluated if needed.

- Each command string must be terminated by at least one of the following termination characters or any combination of them: “CR”, “LF” or “0x00”.
- Each command string sent to the power supply unit will be answered by a corresponding response string.
- “empty” command strings, i.e. strings consisting only of termination characters, are rejected and do not return an answer string.
- All read data and handshake strings from the power supply unit are terminated with the set terminator (see register “>KT” or “>CKT” and “Y” command)
- Receive timeout: If no new character has been received for longer than 5000ms all previously received characters will be discarded. Due to the relatively long timeout, it is possible to transmit commands manually using the terminal program.
- Command length: The maximum command string length is limited to 50 characters.
- Receive buffer: The ADDAT has a 255 characters long FIFO Receive Buffer.

Documents / Resources

	XP Power Digital Programming [pdf] Instruction Manual Digital Programming, Programming

References

- X Intelligent IoT Solutions - Connect, Compute, Comprehend, Control
- X XPort Embedded Ethernet Module | Lantronix
- User Manual