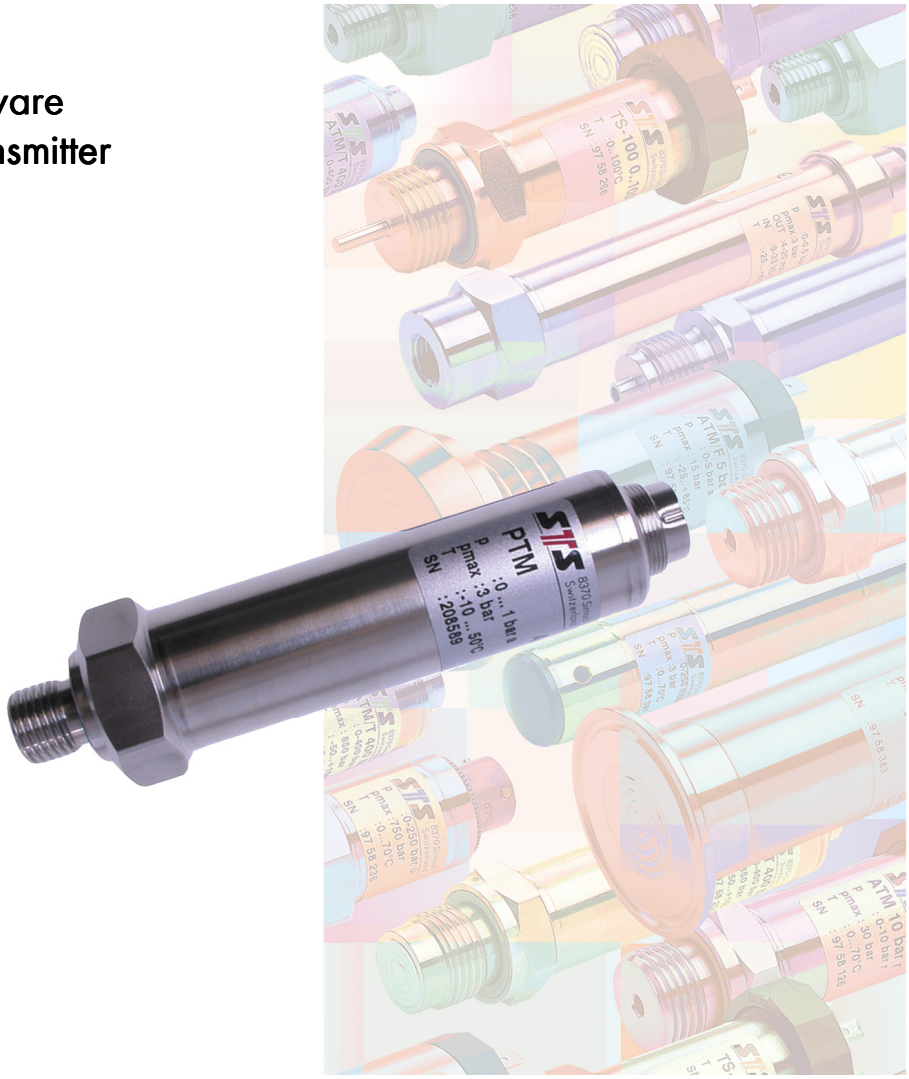
Configuration Software
Programmable Transmitter



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1. System Requirements

Programmable transmitter:
The related data sheet contains all relevant information.

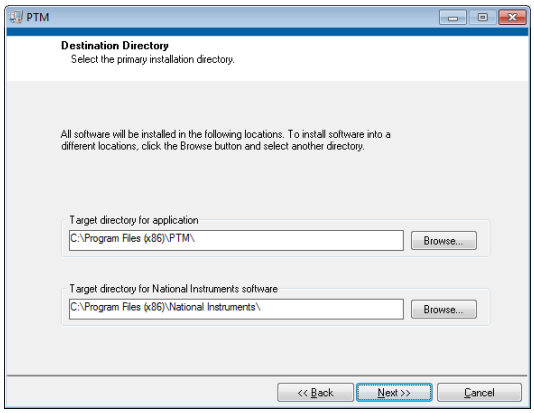
Hardware:
- IBM-compatible notebook or a PC with at least 10 MB free hard disk space and at least 64 MB RAM
- Free RS-232 serial port or USB port
- CD-ROM drive
- VART 199 PC interface box with RS-232 cable

Operating system:
Windows 95, 98, 98SE, ME, NT versions higher than Version 4, 2000 und XP, Vista and Windows 7

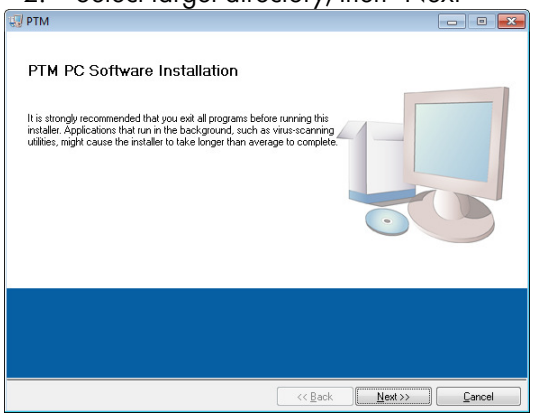
2. Software Installation

To install, insert the software CD in the CD-ROM drive, click on “Run” in the Start menu, enter the path of the installation program followed by a backslash and “setup.exe” and click on "OK". Previously installed versions will first be automatically uninstalled. Click “setup.exe” again to start installation. Now follow the instructions that appear on the screen.

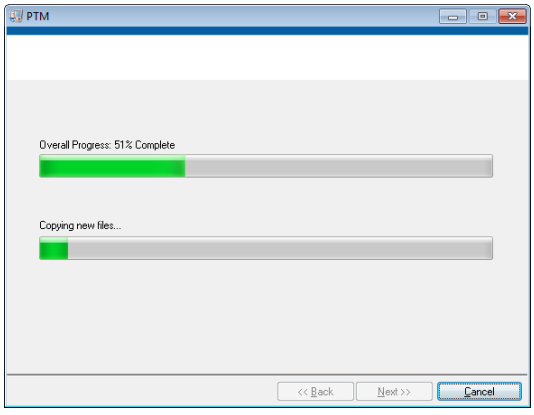
1. Click on "Next"



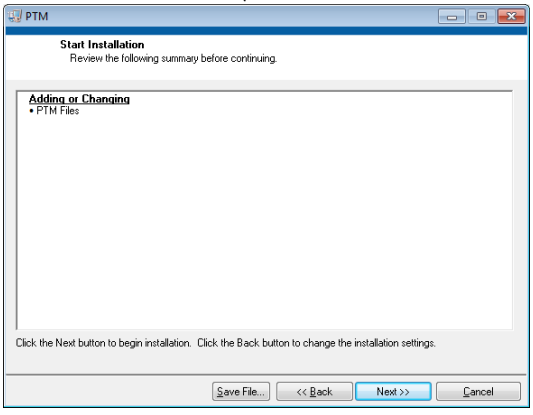
2. Select target directory, then "Next"



3. Click on "Next"



4. PTM is installed, then "Finish"



3. Preparation and Connection of the Transmitter

Connect the interface cable to a free serial port on the PC (or to a free USB port if using the USB RS232 adapter) and to the interface box. Then connect the transmitter to the box with the cable. The power supply to the interface box may either be a 230 V mains power supply, using the mains adapter provided, or a battery.
Switch the transmitter ON.

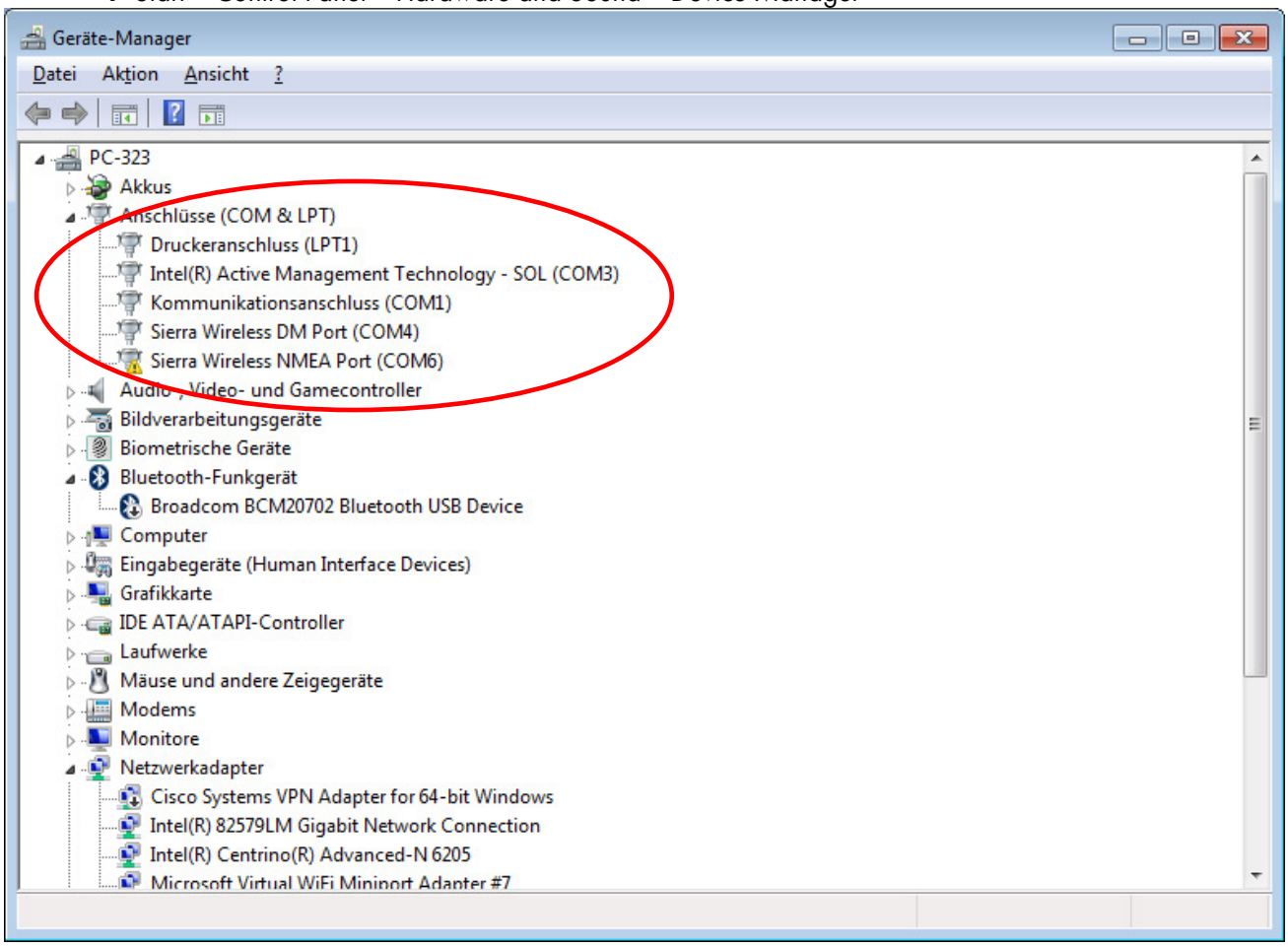
For communication with a digital transmitter with RS485, set the slide switch to "RS485 ON"; set the switch to "RS485 OFF" for 2-wire communication.
If possible, configure with the power supply. Prior to configuration with a battery, it must be ensured that sufficient battery capacity is available (use new battery if required).

Instructions:
Battery operation is only intended for short-term parameter operation (around 10 minutes) and not for continuous operation.

The LED (battery display) lights up when the battery needs to be replaced.
The LED goes off when the battery has sufficient voltage or is fully discharged.

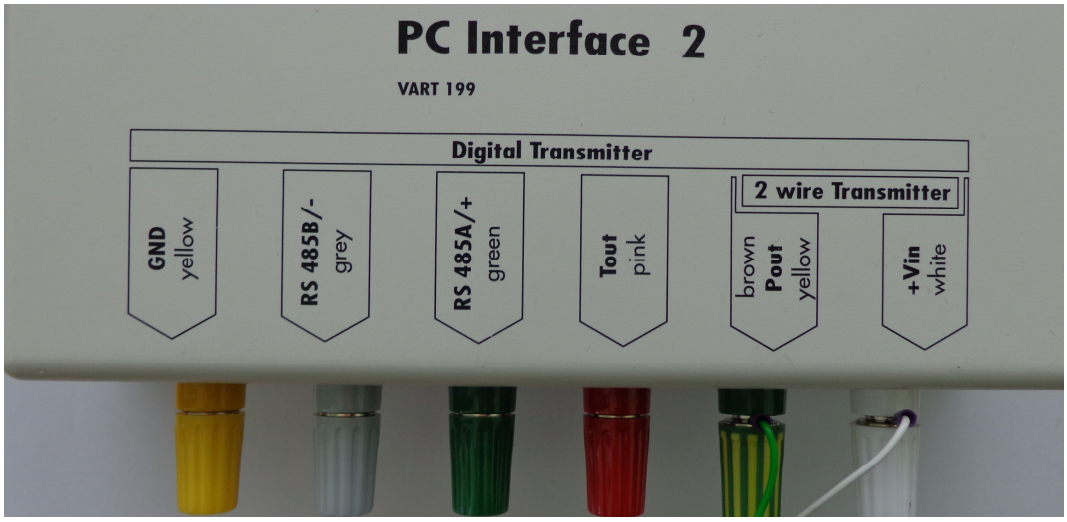
3.1. USB RS232 adapter

1. Connect adapter and connect to the USB port
2. A message will appear stating which COM is being used; if not, it can be found via the Device Manager
   → Start – Control Panel – Hardware and Sound – Device Manager



3.2. Transmitter types

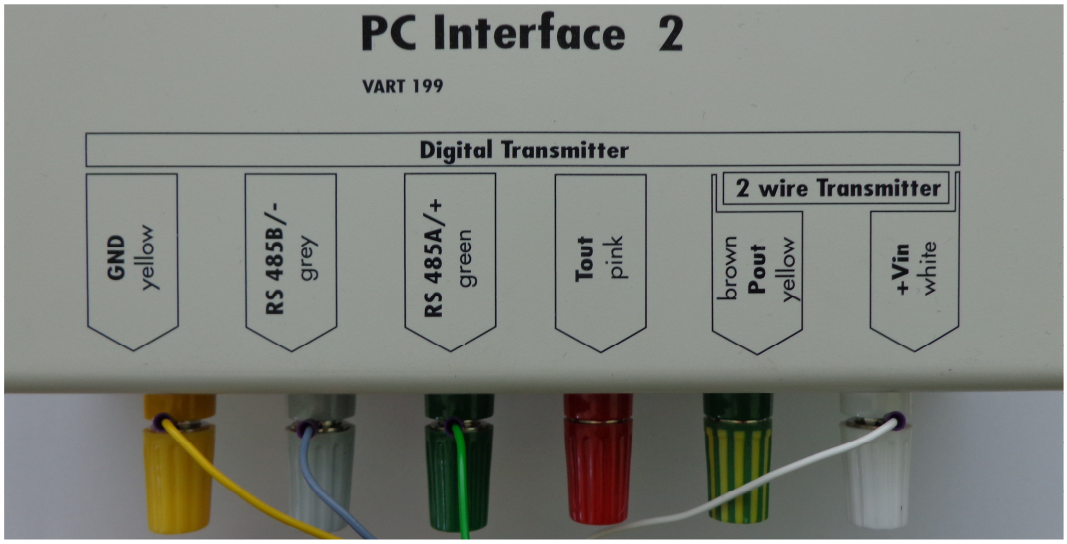
3.2.1. 4-20mA:



Pin numbers are marked on the transmitter itself.

3.2.2. Digital:

Connect all colours to their corresponding positions and set "RS485" switch to "ON".

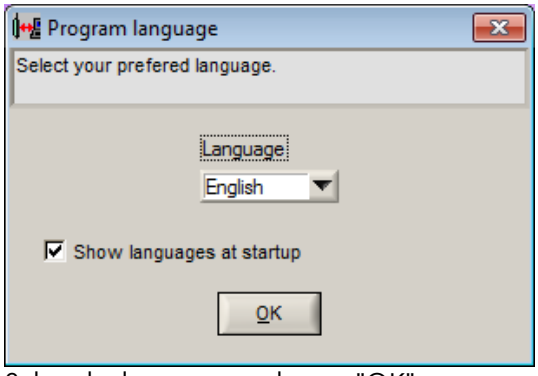


4. Program Function

4.1. Program start

Click on “Program” in the Start menu to start the Datalogger software. The default icon “PTM” will appear. This can be renamed as desired.

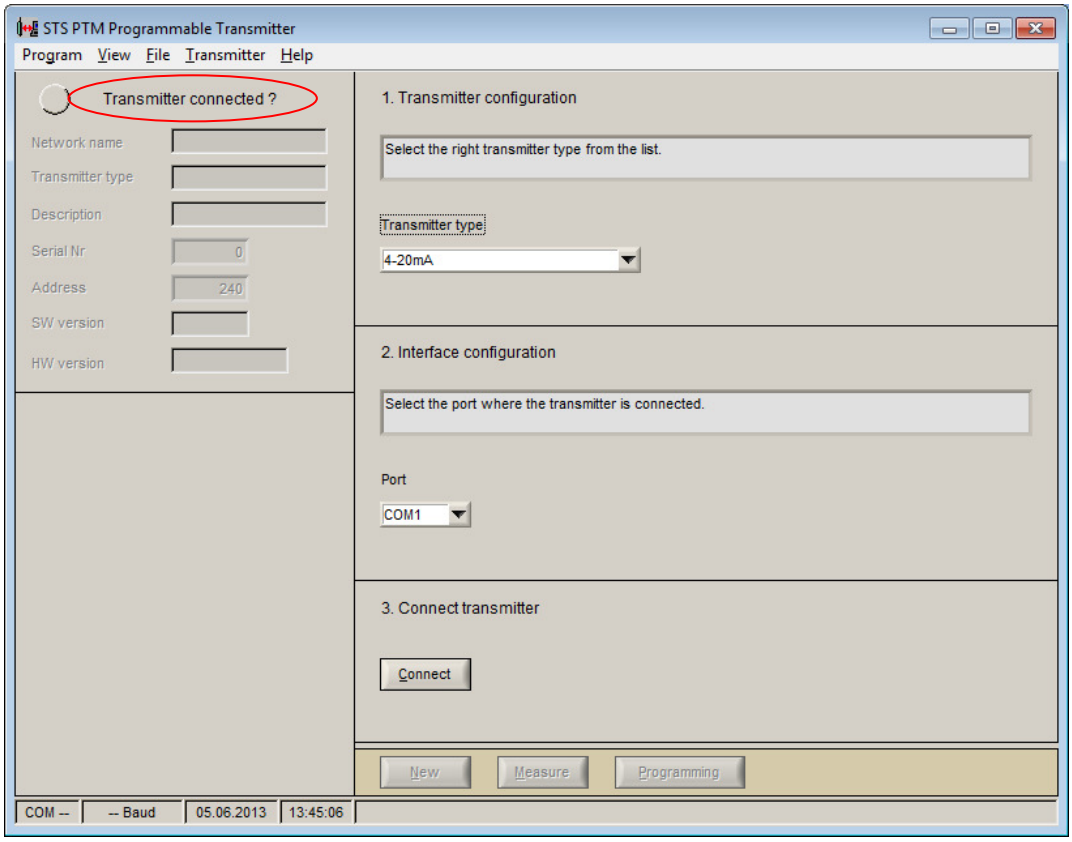
4.2. Language



Select the language and press "OK".
The language can also be selected in the main window under “Program” – “Language".

4.3. Connect transmitter

Basic communications settings can be made in this window.



1. Transmitter configuration

What is the transmitter type to be connected?

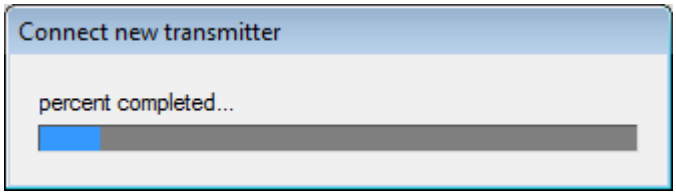
- 4-20 mA 2-wire (MPB / MPG)
- Digital (PTM/RS485) → Set RS485 switch to "ON".

2. Interface configuration

- Select the serial port for data transmission.
- For USB RS232, see Section 3.1.
- The correct baud rate will be set by default after selecting the transmitter.

3. Connect transmitter

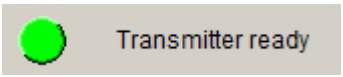
- Click on the "Connect" button to connect to the PTM.



The LED on the top left indicates the communication status:

Red::
1. Transmitter is not connected as yet → Press "Connect"!
2. Communication interrupted → Try again!
3. Is the LED on PC interface 2 illuminated and is the power switch set to "ON"? → Check power connection and batteries
4. Transmitter assignment → Check pin connection! (See Section 3.2.)
5. In case of "digital" transmitter type (RS485)→ Use "Search for new transmitters"

Yellow: The yellow LED will light up while the connection is being made.



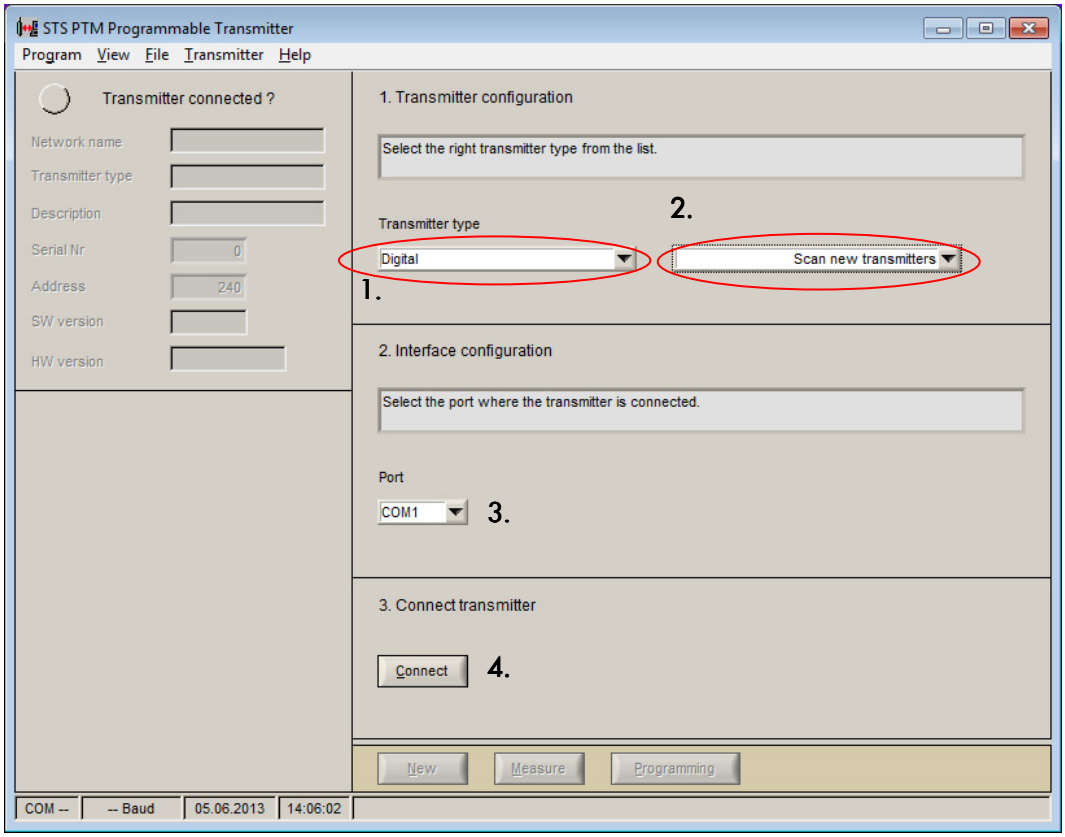
Green: Connection made.

The following functions can be selected after successful connection:

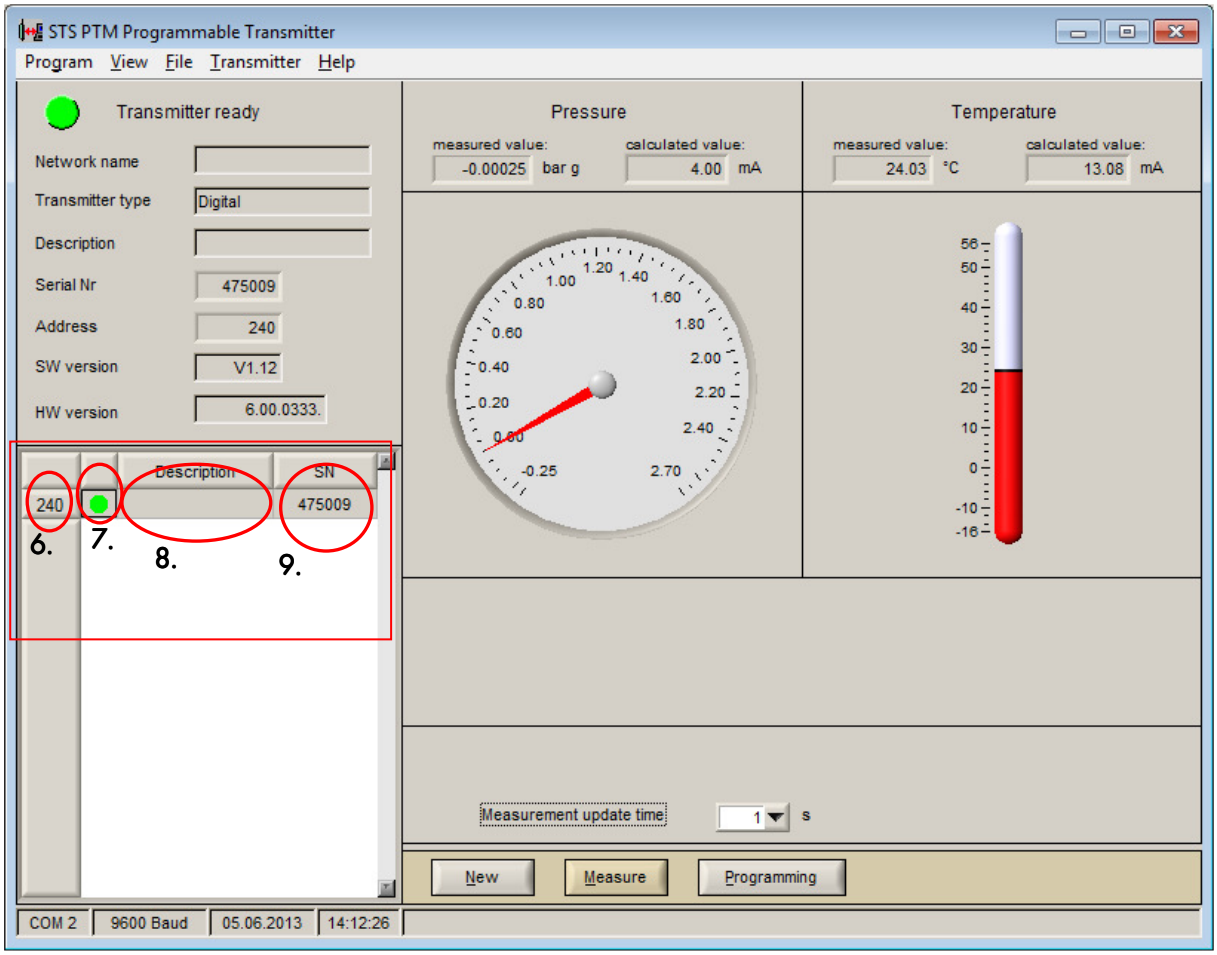
"New": Connect new transmitter Section 4.3.	"Measure": Display measurements Section 4.6.	"Programming": Program transmitter Section 4.7, 4.8

Instructions:
The three function-selection keys above can be activated at any time and operate without any additional security enquiry.

4.4. Network scanning with several digital transmitters



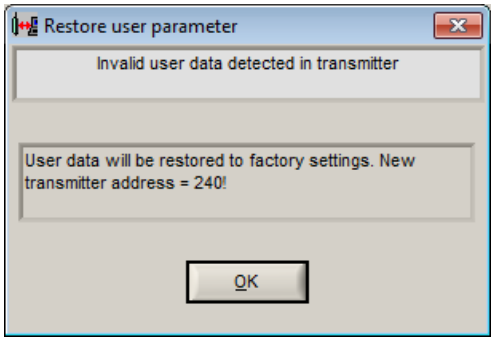
1. Transmitter type: Select digital
2. Individual transmitters: "Transmitter address" → Enter transmitter address (Standard 240)
   All transmitters in the network: "Search for new transmitters"
3. Configure COM port, baud rate is automatically adjusted.
4. Press "Connect" to start the procedure.
5. The transmitters connected to the network appear in the bottom left window.
6. Displays the address of the transmitter.
7. Red indicator: Transmitter is not activated.
   Green indicator: Transmitter is activated
8. Transmitter designation
9. Serial no. of the transmitter
10. Now select the transmitter to be reprogrammed or measured.
11. Press "Measure" or "Program" in order to execute the functions described in Sections 4.5 to 5.5.



To program further transmitters refer to 4.3.

4.5. Recover transmitter data

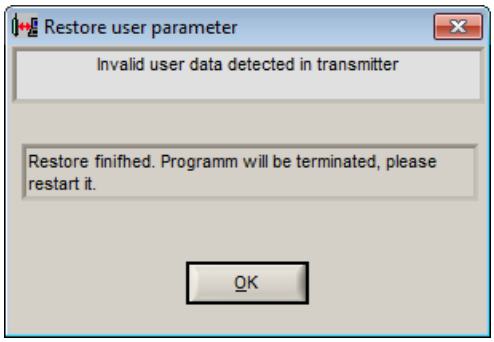
If the software detects corrupt data when connecting a transmitter, these will be automatically reset to factory settings.



The settings for the analog outputs, recalibrations, the description of the transmitter, the filter selection and address are reset to factory settings. After resetting to factory settings, the digital transmitter will have the **address 240** again!
The factory calibration of the transmitter is not affected by this measure. The transmitter is then returned to the state that it was in when delivered by STS.

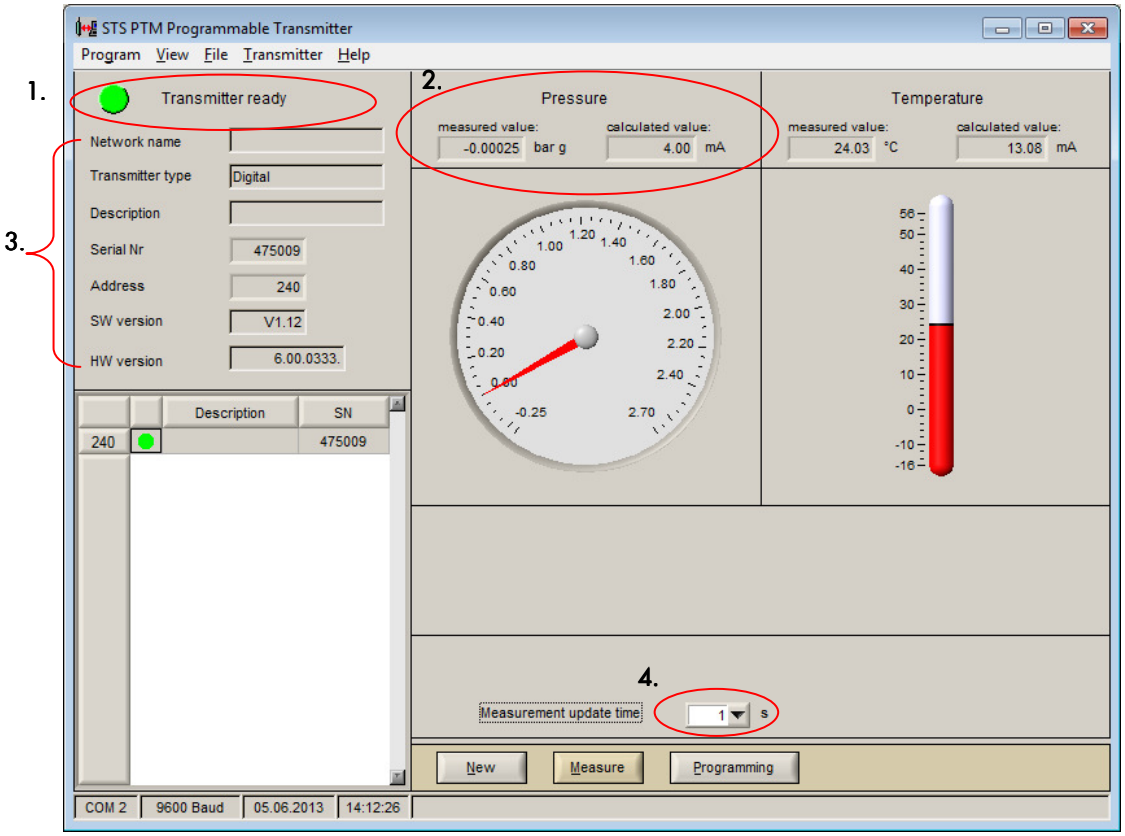
Any scaling of outputs and recalibrations must be carried out by the user again, otherwise new test results could be interpreted as erroneous in a higher-level measurement system.

After the recovery of transmitter data, the program is automatically terminated and must be restarted by the user.



4.6. Measure

The "Measure" window is for displaying the current measurement values. No transmitter-related settings can be made here.

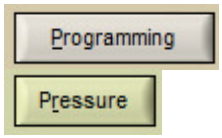


1. The transmitter is ready (also see Section 4.2).
2. The current measurement value can be seen on the pressure display.
   The software reads out the information from the transmitter. The display of the electrical current value is calculated on the basis of the analog output settings (Section 4.4).
3. General transmitter information
4. Measurement update time:
   The query interval for the transmitter measurement values can be set in the pull-down window. The interval can be set from 0.2 seconds to 30 seconds. (This property may be useful while using the monitoring software; the default value of 1 second is suitable for transmitter programming.)

Instructions:
The pressure-measuring device scale does not necessarily display the real measuring range of the transmitter that is connected. This applies in particular to the negative measurement range component.

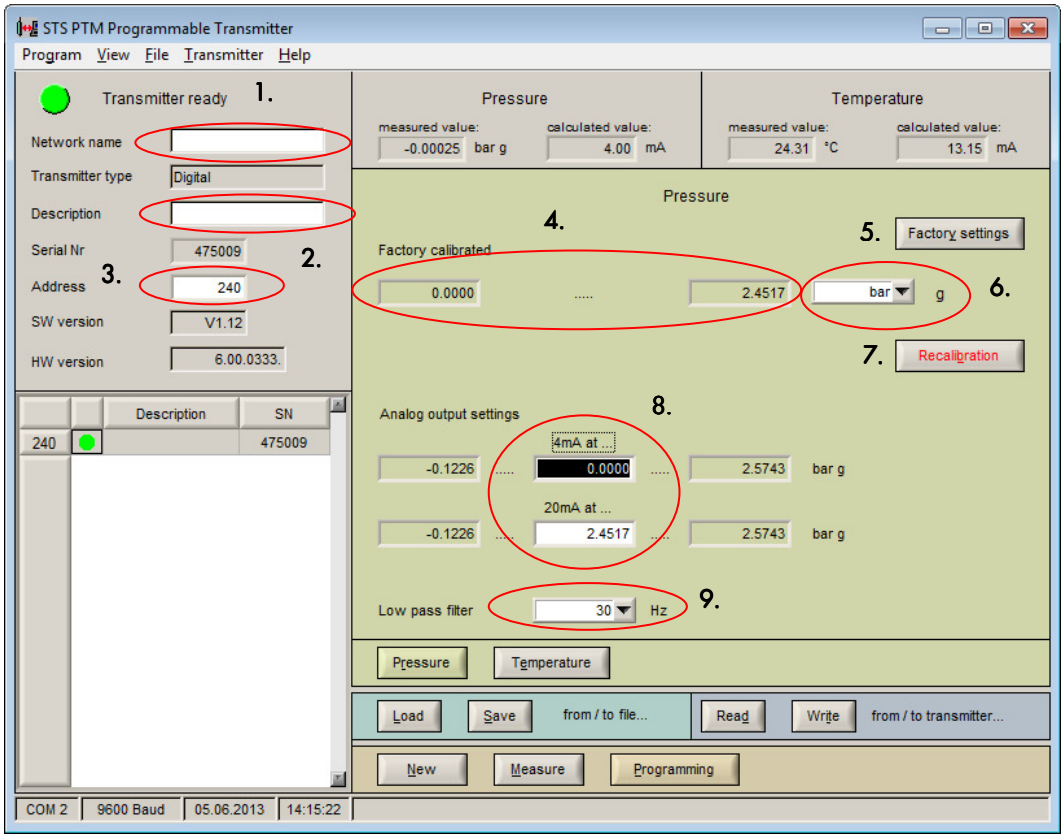
4.7. Pressure configuration

1. Click on "Programming".
2. Click on "Pressure".



In this window you can calibrate the end values of the analog output (4 mA and 20 mA) to the desired measurement range.

Note: Input of min. and max. pressure values subject to electrical signal (mA). Warning: Ratio max. 1:4, max. nominal pressure range at -5% und 105% as shown on the diagram on page 12. Min. span must be ¼ of the nominal pressure range (of the sensor in use).



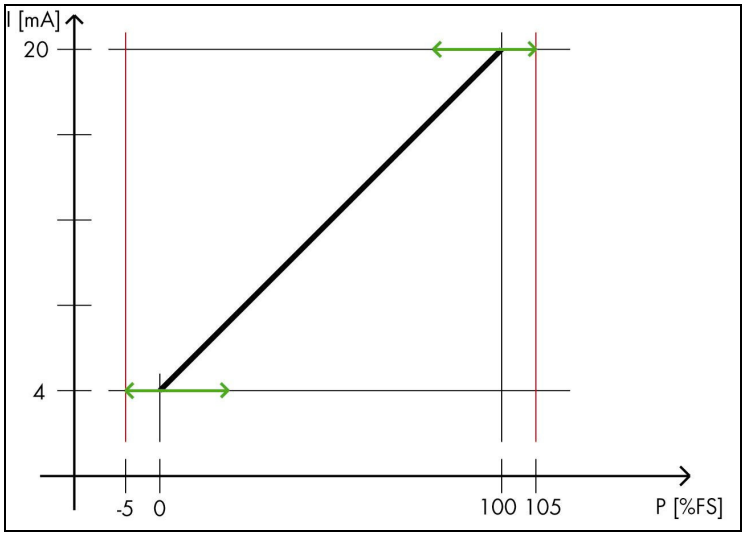
In general, all fields with a white background can be processed.

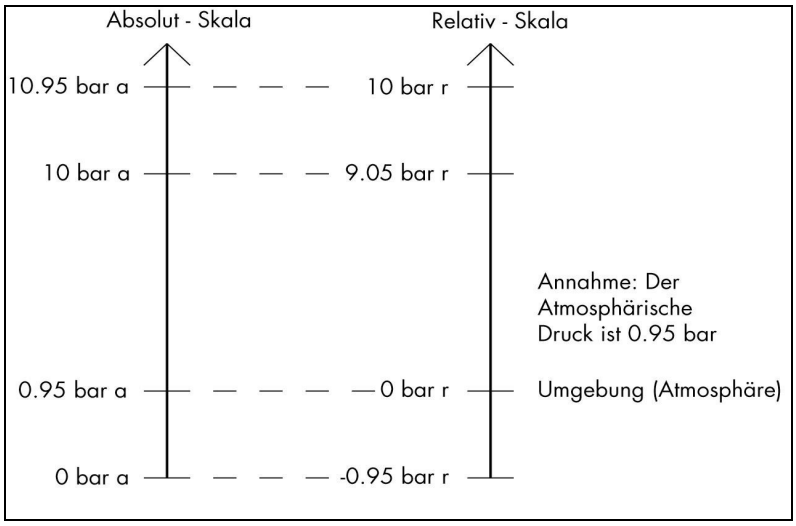
1. Network name: Grouping of multiple transmitters
2. Description: Select the name of your transmitter (max. 16 characters).
   Default: Pressure range
3. Address: Define own address (1 – max. 240).
   The address serves to identify the transmitter with RS-485 ports in a network. Two sensors in the same network may never have the same address.
   Default: 240 (analog 255).
   ➔ Address 240 may not be used with multiple transmitters in the network.
4. Calibrated pressure range
5. Field reset to factory settings.
6. Select the unit for the display (bar, mbar, mWC, psi).
7. Recalibration: Corrections of long-term shift (see Section **Fehler! Verweisquelle konnte nicht gefunden werden.**).
8. Analog output settings: The pressure range can be selected between −5% to 105% of the nominal pressure range.
9. Low pass filter: The limit frequency of the filter can be selected so as to suppress unwanted, rapid pressure changes in the output signal.

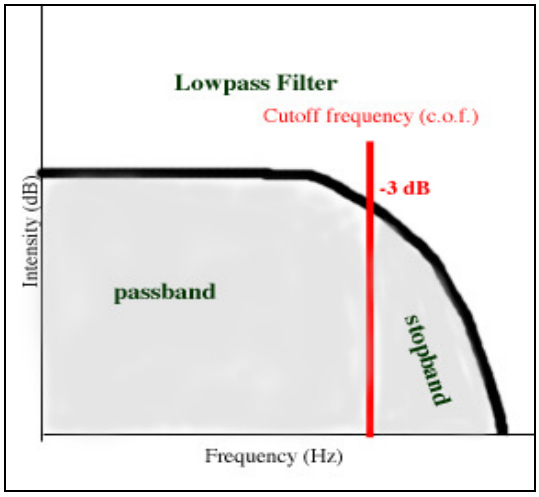
The digital output (RS485) is not adjustable. The measurement range is always directly to 0 ... 1,000 points calculated. These correspond to 0 ... 100% of full-scale.

The physical properties between absolute and relative pressure sensors must be taken into account:

The difference between the pressure value for 4mA and 20mA shall not be lower than 25% of the nominal pressure range and not less than 50 mbar. The accuracy is always specified to the nominal range of the transmitter and not to the adjusted range.







Low pass filter: The limit frequency of the filter can be selected so as to suppress unwanted, rapid pressure changes in the output signal.

30 Hz, 10 Hz, 1 Hz, 0.1 Hz

4.8. Temperature configuration

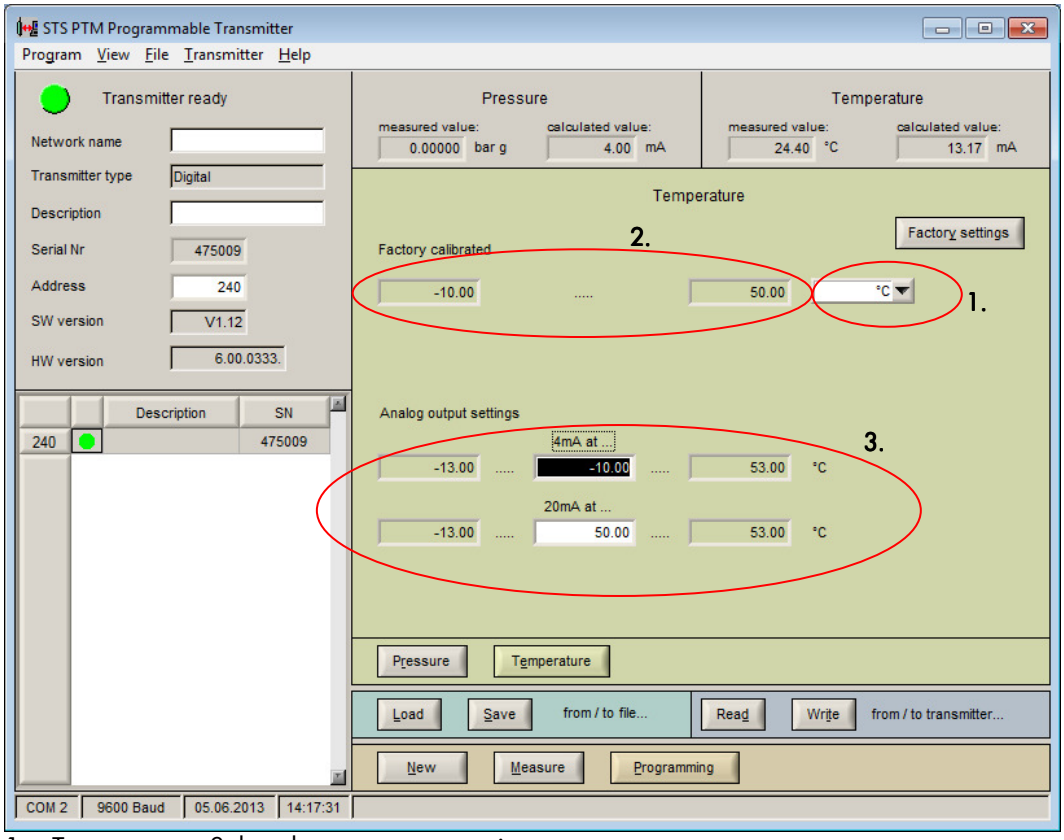
1. Click on "Programming".
2. Click on "Temperature".

Note:
4-20mA transmitters do not have temperature sensors.

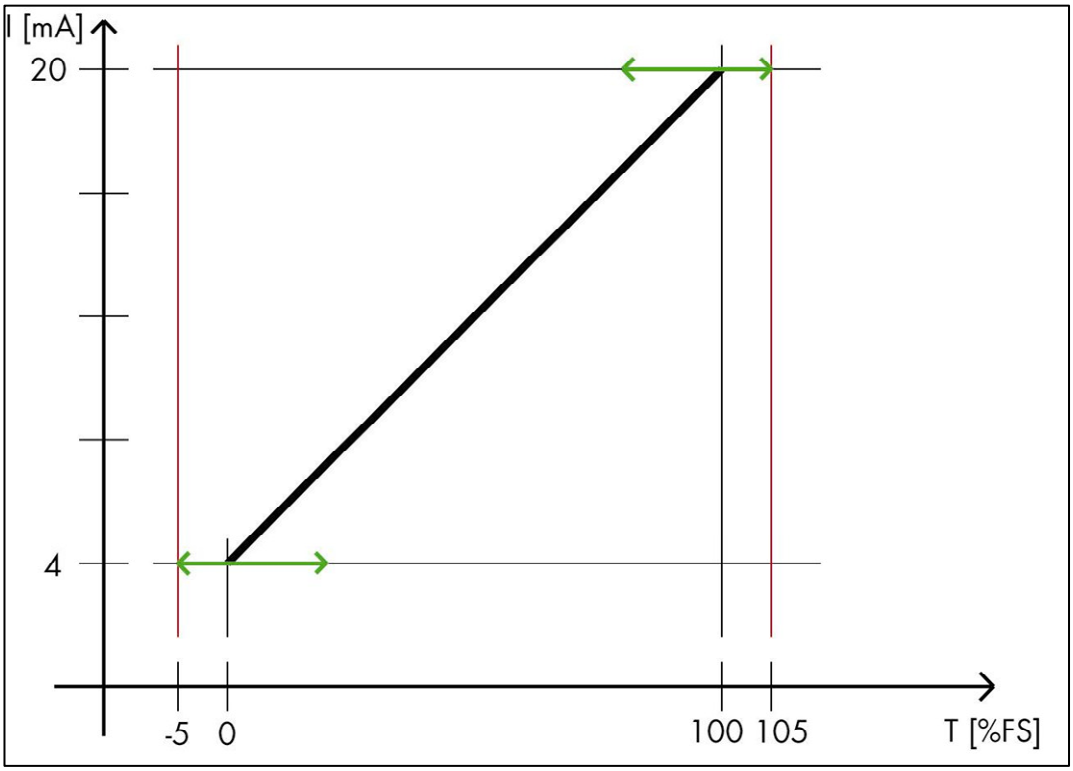
With MPC/MPJ (digital), with the option "Active temperature compensation" it is possible to calibrate also the temperature range. The software will only allow this when a suitable sensor is connected. Set the parameters using the procedure in 4.5 "Programming the pressure range".

➔ Parameters as in Section 4.7. Pressure configuration.

Note: Input of min. and max. temperature subject to electrical signal (mA). Warning: Ratio max. 1:4, max. temperature at -5% und 105% as shown on the diagram on page 15. Min. span must be ¼ of the temperature range (of the sensor in use).



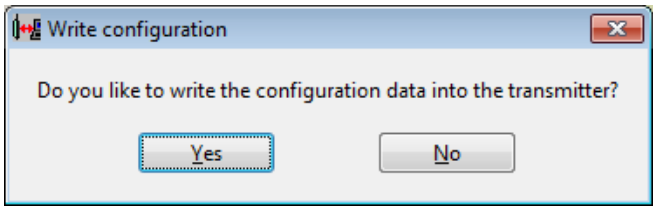
1. Temperature: Select the temperature unit
   °C: degrees Celsius
   K: Kelvin
   °F: Fahrenheit
2. Calibrated temperature range
3. Analog output settings: The temperature range can be selected from −5% to 105% of factory settings for the temperature range.
   The difference between temperature range 4mA and 20mA shall not be lower than 25% of the calibrated temperature range.


I [mA]
20
4
-5
0
100
105
T [%FS]

4.9. Transfer configuration to the transmitter

Read button: Read current transmitter settings.
Write button: Write the adjusted values to the transmitter.

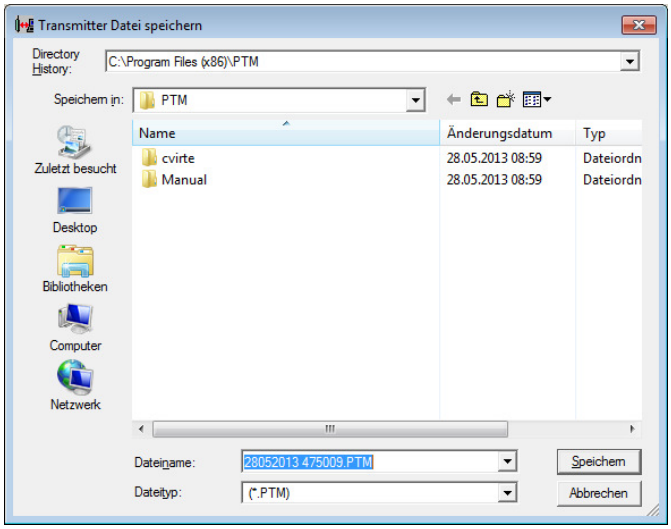
Further confirmation is required before the data are saved.



Confirm with "Yes" to read or write the data.

4.10. Upload and download from / to a file

Save: The settings can be saved in a text file.
Load: Saved settings can be loaded from a text file.



Select the directory where the data have to be saved.
By default, the program will name the file according to the "date & serial number"; you may change the filename as desired.

The PTM files are structured text files. They can be printed with any text editor, e.g. Notepad, Editor.

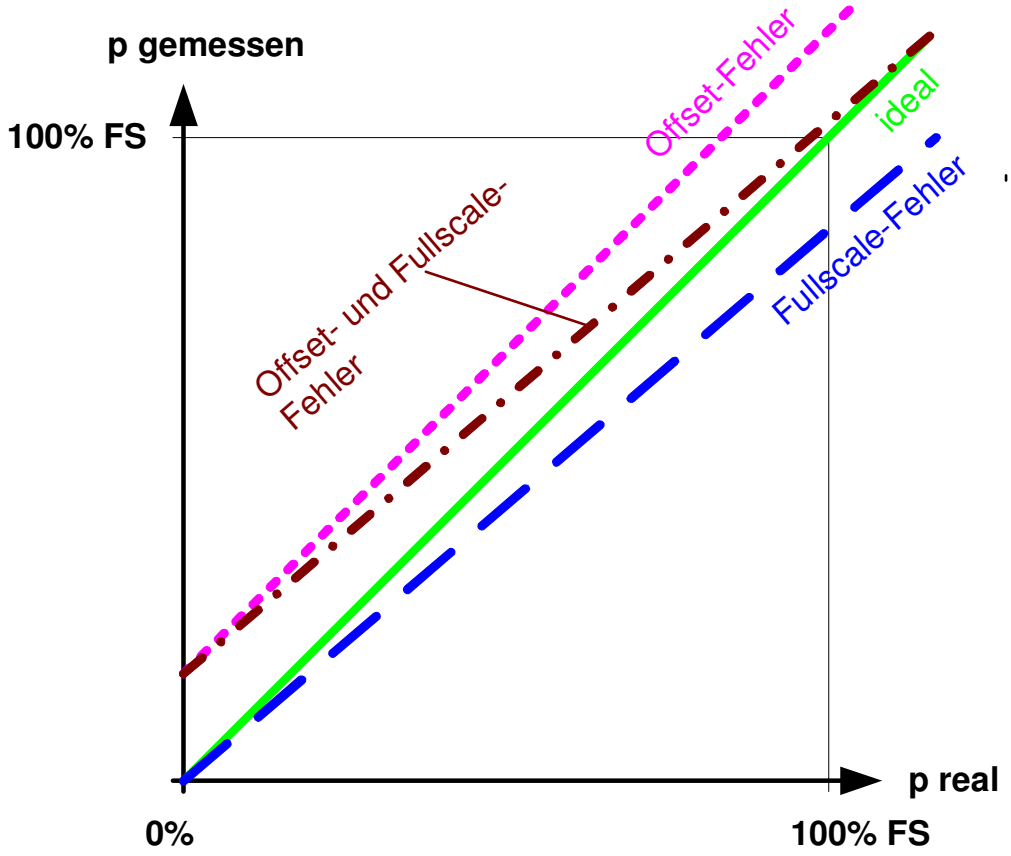
5. Recalibration

Instructions:

Recalibrations should only be carried out by technically qualified persons who have the required equipment and knowledge.

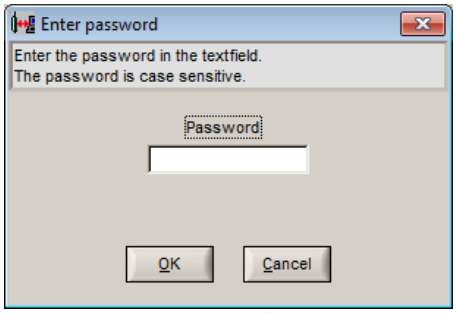
Sensors are factory calibrated at room temperature in a vertical position with the pressure sensor downwards! Recalibration does not affect the programming of the transmitter.

The illustration below shows measuring graphs for ideal conditions, as well as conditions where offset faults, full-scale faults and a combination of offset and full-scale faults are present:



The recalibration functionality can be accessed via the "Programming pressure" window (see Section 4.7.).

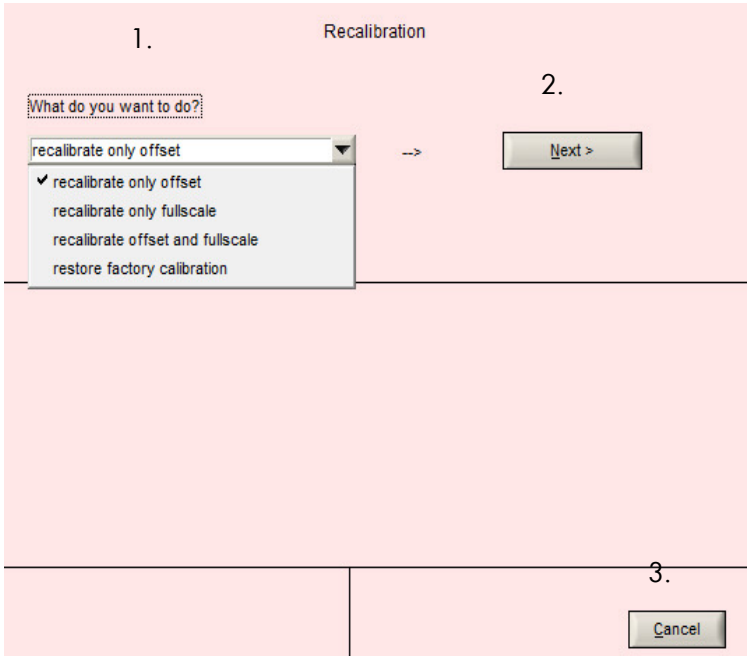
Press the "Recalibration" button and the password window will appear.



Enter the password (default: "Recalibration") and confirm with "OK".

(Please refer to Section 7 "Basic Settings in Editor" for details of how to change the password.)

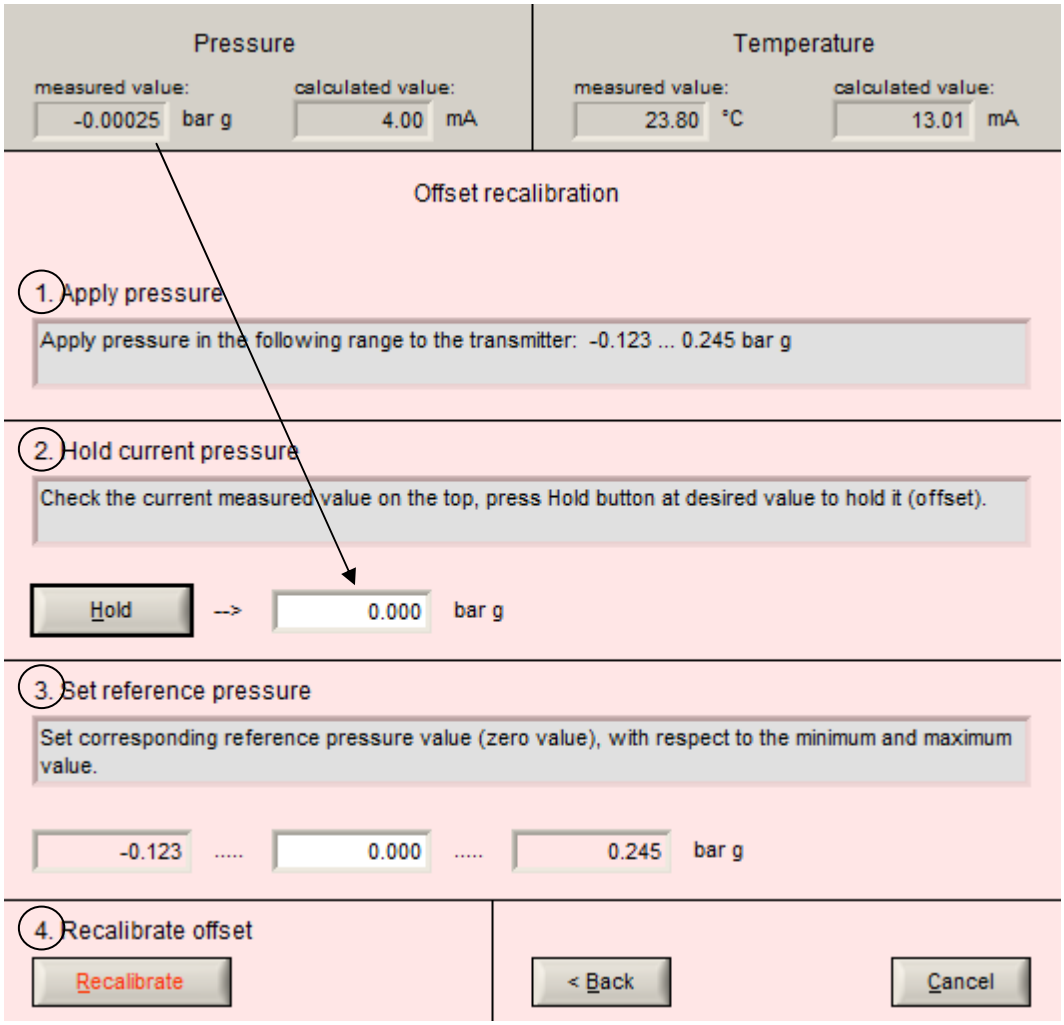
Select the desired recalibration as in the following window:



1. Select the desired recalibration or return to factory settings by selecting "Restore factory calibration".
2. Continue with the recalibration by pressing "Next".
3. Return to the start page ("Programming pressure") by pressing "Cancel".

5.1. Offset recalibration

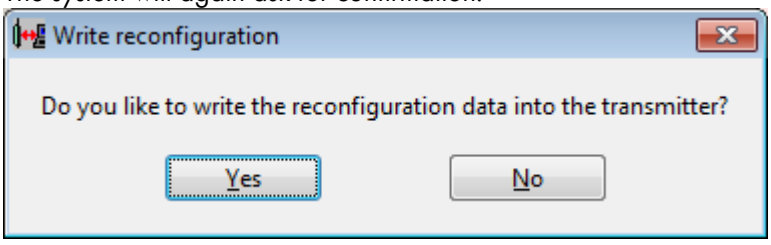
With offset recalibration, the entire measurement graph makes a parallel shift to the difference between the value measured by the transmitter and the correct value at the zero point of the FS. The gradient will remain the same.



Procedure: See above screen

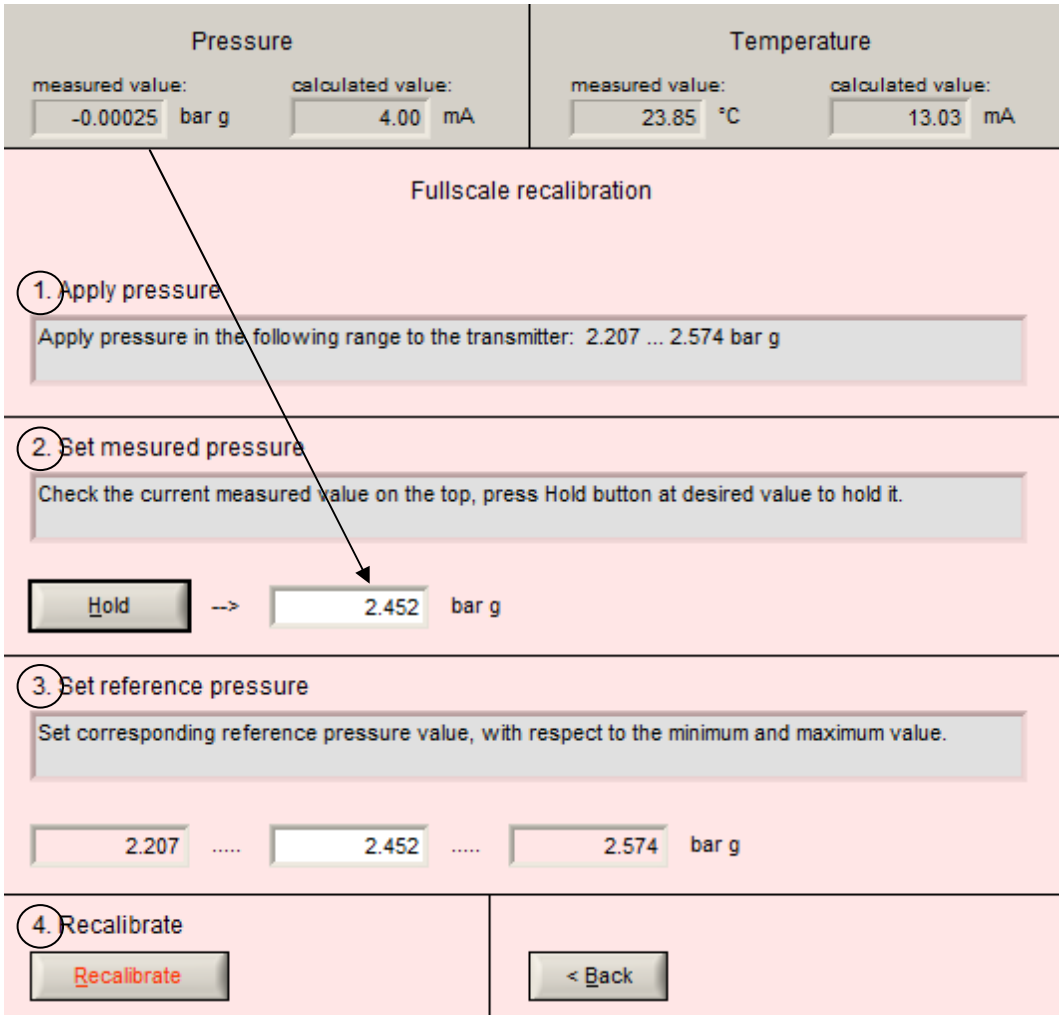
1. Apply the desired pressure range for the zero point. The nominal pressure range of the transmitter will be displayed in the window of step 1. The applied pressure range the transmitter measures is indicated in the window "Measured value".
2. Enter current pressure: The pressure currently being measured is applied by pressing the "Enter" key.
3. Enter reference pressure: The new zero point is entered.
4. You may close the new adjustments by pressing the "Recalibration" button (Section 5.5.)
   By clicking "Back" you will return to the selection menu.
   If you press "Cancel", you will quit the recalibration menu without saving your data.

   The system will again ask for confirmation:



5.2. Full-scale recalibration

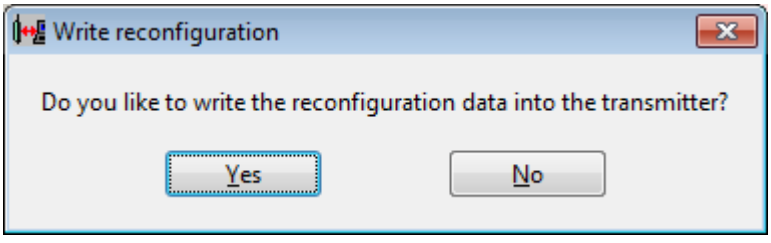
With full-scale recalibration, the gradient of the measuring curve is modified. The zero point does not change.



Procedure: see above screen:

1. Connect pressure: Apply pressure for zero point. (The nominal pressure range of the transmitter will be displayed in the window of step 1.) The current value is indicated in the "Measured value" window.
2. Enter current pressure: The pressure currently being measured is applied by pressing the "Enter" key.
3. Enter reference pressure: The new zero point is entered.
4. You can close the new adjustments by pressing the “Recalibration” button (Section 5.5.).
   By clicking “Back” you will return to the selection menu.
   If you press “Cancel”, you will quit the recalibration menu.

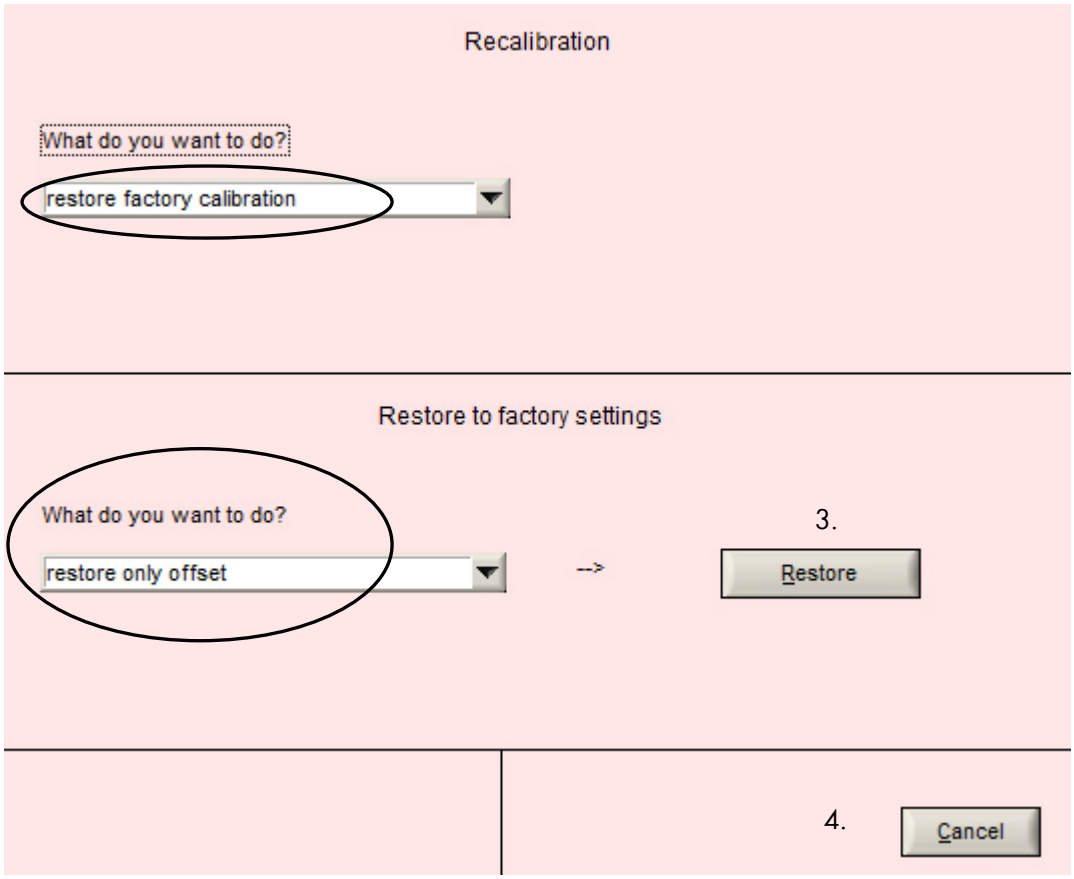
   The system will ask you for a confirmation.



5.3. Offset and full-scale recalibration

With offset and full-scale recalibration, the gradient and the zero point of the measurement curve are modified (see Sections 5.1 and 5.2).

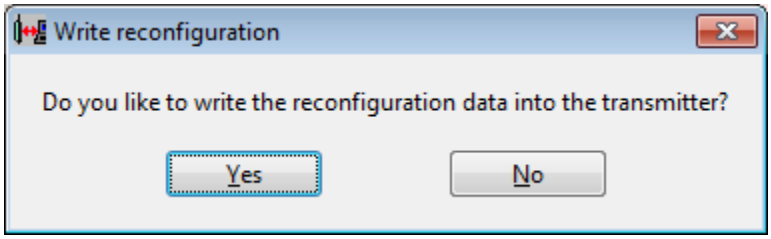
5.4. Restore to factory settings



1. Select “Restore factory calibration” to return to factory settings.
2. Select the items to be reset: Offset, full-scale or offset and full-scale.
3. Press “Restore” to recalibrate to factory settings (confirmation is required.
4. Press “Cancel” to quit the "Recalibration" program.

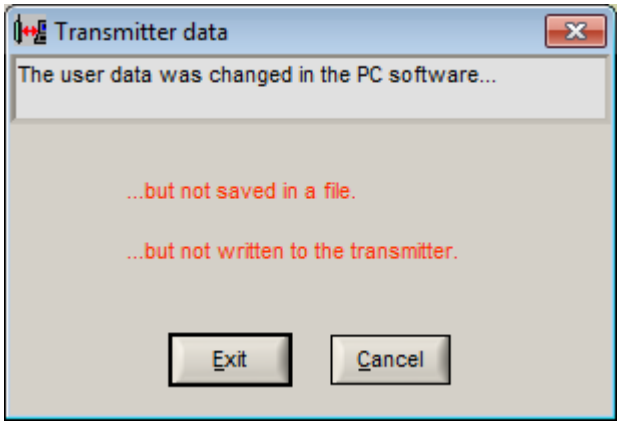
5.5. Run recalibration / Restore

Start writing to the transmitter by using the "Recalibrate" button.



6. Exit from the program

If you want to exit without completing the operation, the system will ask you for confirmation before leaving the program.



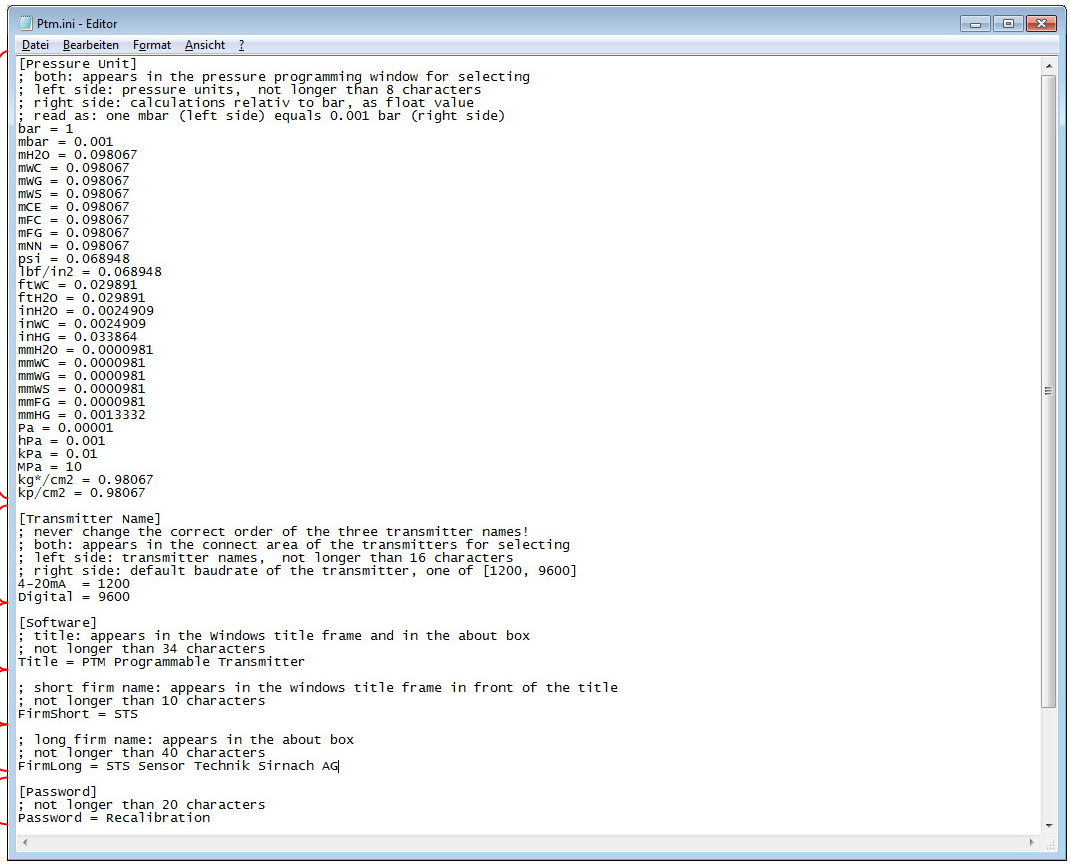
Exit: PTM is closed(changed settings are lost).
Cancel: PTM is not closed.

7. Basic settings in Editor

You can make various basic program and program format settings in the “PTM.ini” file.

You can open the PTM.ini file in the Datalogger directory by using a text editor that does not execute its own format (Notepad, for example, would be suitable, but WinWord would not). It will look similar to the read-out below:

However, you cannot change the sequence of the entries.



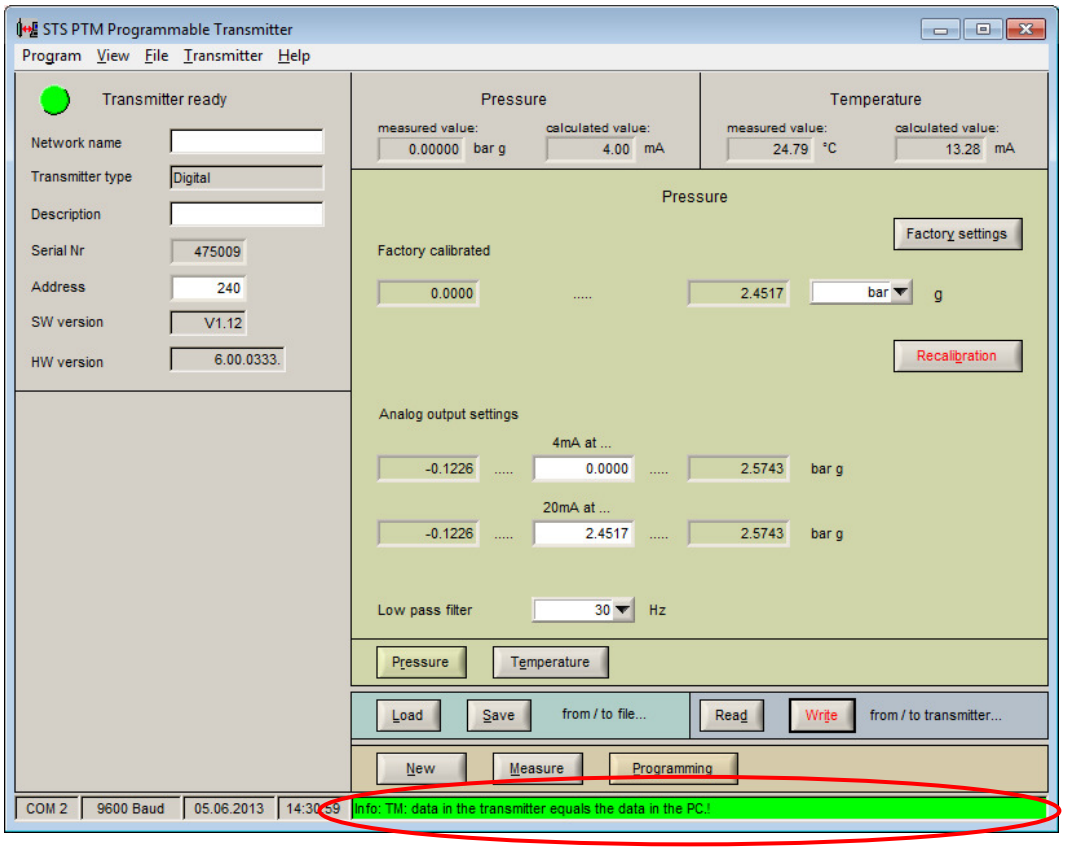
1. Pressure units may be added or removed. The conversion coefficients always refer to 1 bar.
2. The designation of the transmitter and the related baud rate can be changed.
3. Product designation (max 30 characters): Default is: "PTM Programmable Transmitter"
4. Short name (max 10 characters): Default is: "STS"
5. Full-firm name (max 40 characters): Default is: "STS Sensor Technik Sirnach"
6. Password for recalibration (max 20 characters): Default is: "Recalibration"

8. Error Messages

Referring: PC Software for PTM, PTM/N, V 1.30
Status: 19/04/2004

8.1. Information messages

A successful action will be confirmed and appears with a corresponding message.

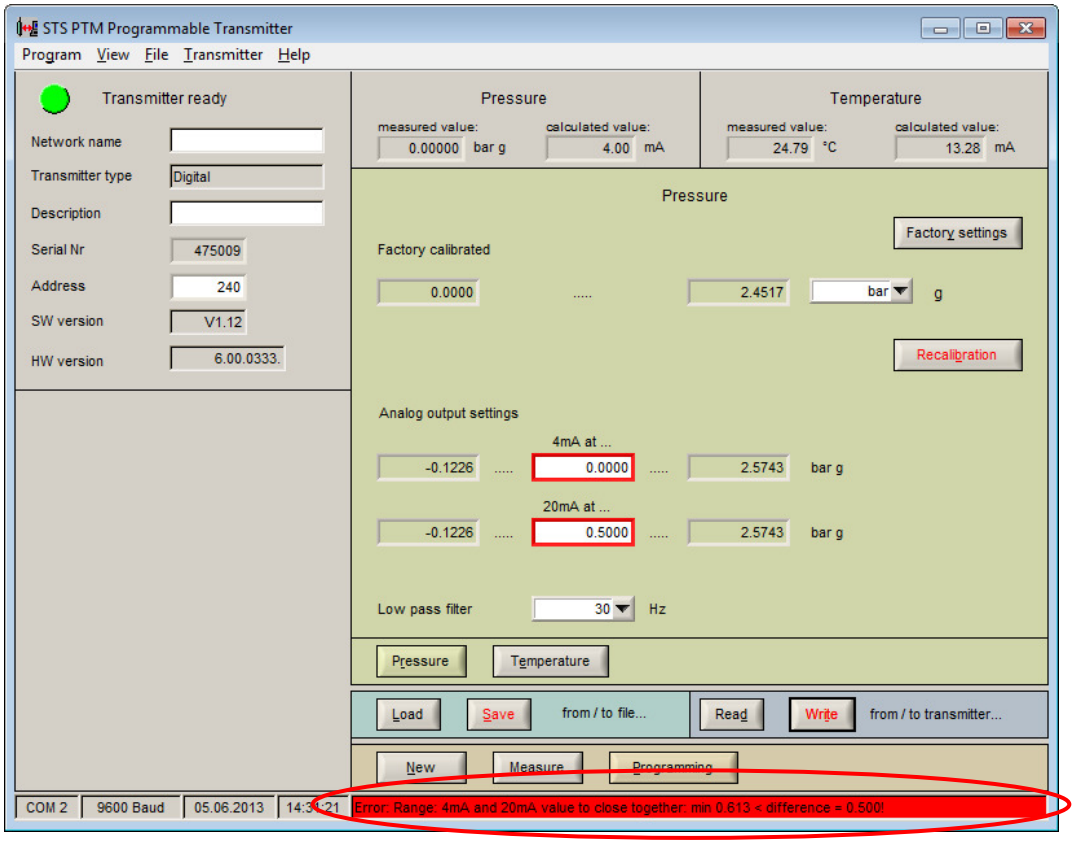


The information message appears in green for 5s in the status line below the window.
Afterwards the field will be reset.

Information message	Description	Possibilities
"Info: TM: Data in the transmitter equal the data in the PC."	Read data after "Write or Recalibration" from the transmitter are equal to the written data.	

8.2. Error messages

These error messages are caused generally in the software, the operating system or the hardware.



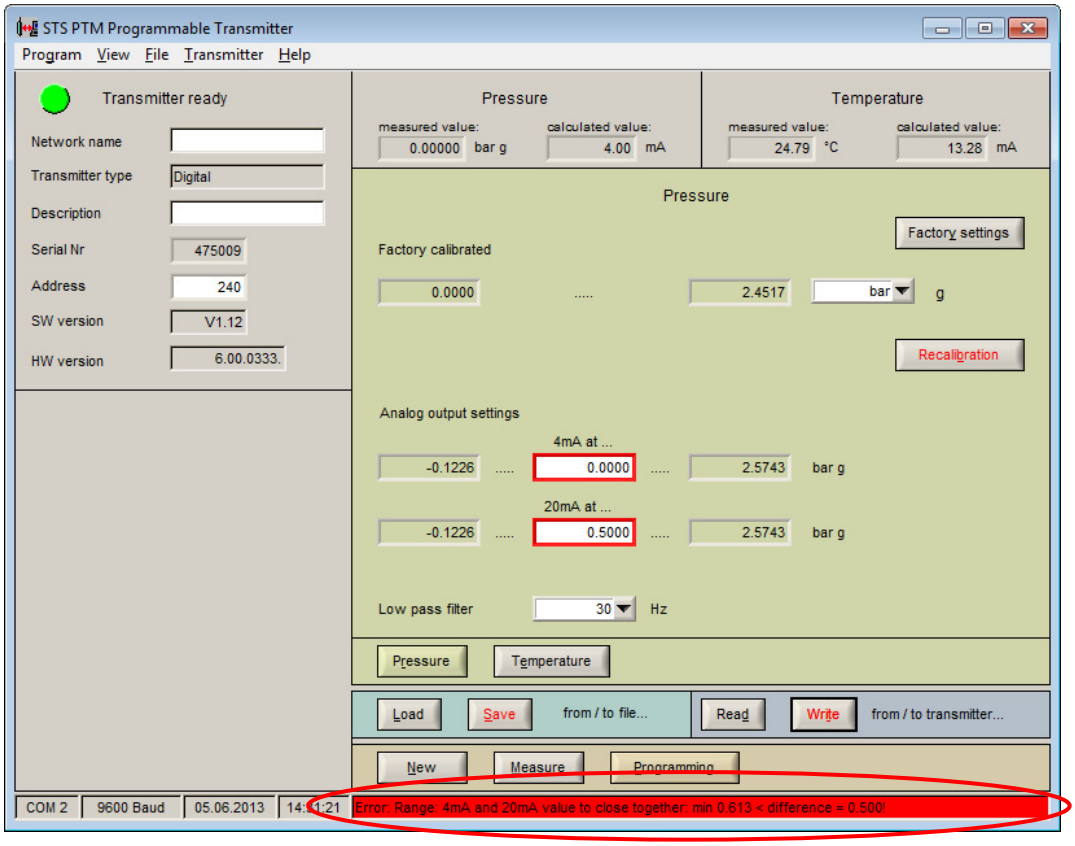
The information messages appears in red for 5s in the status line below the software window. Afterwards the field will be reset.

Error message	Description	Possibilities
"Error: COM: Cannot open the COM port!"	Cannot open the COM port.	Change COM port or close application that is using this COM port.
"Error: COM: Communication interrupted!"	Communication interrupted, the last command was transmitted five times without receiving any answer.	Check connector/cable connection and transmitter type (4-20mA, digital) and restart.
"Error: COM: Cannot find any transmitter!"	Was not able to find any transmitters while scanning the network.	Check connector/cable connection and switch position (RS485) and restart.
"Error: COM: *RS232 Error*!"	An error in the interface library was found. "RS232 Error" appears for any English text.	Stop the program and start again.
COM: COM port error!	Incorrect COM port selected.	Check COM port and select new COM port (see Section 4).

Error message	Description	Possibilities
"Error: COM: Cannot read input length!"	Was not able to read the length of the received data.	Stop the program and start again.
"Error: TSQ: Cannot write transmit modbus data to the transmit queue!"	Was not able to write data into the transmission memory.	Stop the program and start again.
"Error: TSQ: Cannot read data from the transmit queue!"	Was not able to read transmitted data from the transmission memory.	Stop the program and start again.
"Error: TSQ: Cannot write received modbus data to the receive queue!"	Was not able to write received data into the reception memory.	Stop the program and start again.
"Error: TSQ: Cannot write com error data to the receive queue!"	After a communication error it was not possible to write into the reception memory.	Stop the program and start again.
"Error: TSQ: Cannot read received modbus data from the receive queue!"	Was not able to read received data from the reception memory.	Stop the program and start again.
"Error: TM: Data in the transmitter is not equal the data in the PC, please write again!"	Read data after a "Write or Recalibration" does not correspond with written data.	Try again. If not possible, set data back to factory settings and try again.
"Error: TM: Another transmitter has the same address, please change!"	A collusion happened in a transmitter from the network, caused of an address change with the same address from another transmitter.	Change address.
"Error: DATA: Cannot load the file!"	Was not able to make a new *.PTM file, or error during opening of the chosen file.	Try again to open the file or make a new one.
"User data corrupted"	Data were corrupted as they were being changed.	Data are automatically reset to factory settings.

Error message	Description	Possibilities
"Error: DATA: The loaded file is incomplete, no such section: *section*!"	While opening the chosen file, it was not possible to find the data section.	Try again to open the file or make a new one.
"Error: DATA: A wrong temperature unit is loaded!"	While opening the file, a non-valid temperature unit was found.	Try again to open the file or make a new one.
"Error: Manual: No such pdf file or path!"	The manual was not found, or path does not exist.	The file name of the manuals with different languages are listed in the file "ptm.ini" in the section manual. The manuals have to be installed in the software path of the sub-listing \Manual\.
"Error: Manual: No default viewer for pdf files registered!"	Acrobat Reader is not installed or is not registered as program file with end pdf.	Install Acrobat Reader (see installation CD ROM or Internet), double click on pdf file → choose Acrobat Reader as program.
"Error: Manual: Cannot open instruction manual!"	Error unknown	

Errors of wrong value input from the user cause error messages and have to be changed.



These error messages appear in red in the status line below the software. Simultaneously you will see which numeric fields are affected by the error. The wrong values will be reset if you add a permissible value. Click on the button “Write, Recalibrate or Factory Settings” to reset.

Error message	Description	Possibilities
"Error: Value out of range: min. value < value = value < max. value”	Entered value is out of the permissible range that is defined by the entered min. and max. value.	Change value to the permissible min. and max. value.
“Error: Range: 4mA and 20mA value too close together: min. value < difference = value"	Entered value of the analog output settings is too close of the other output value. The calculated difference between the two output values is smaller than the necessary minimal difference.	Increase the difference. The difference has to be min. 25% of the full-scale range, which will be indicated under "Factory calibrated" and must not fall below 50mbar.