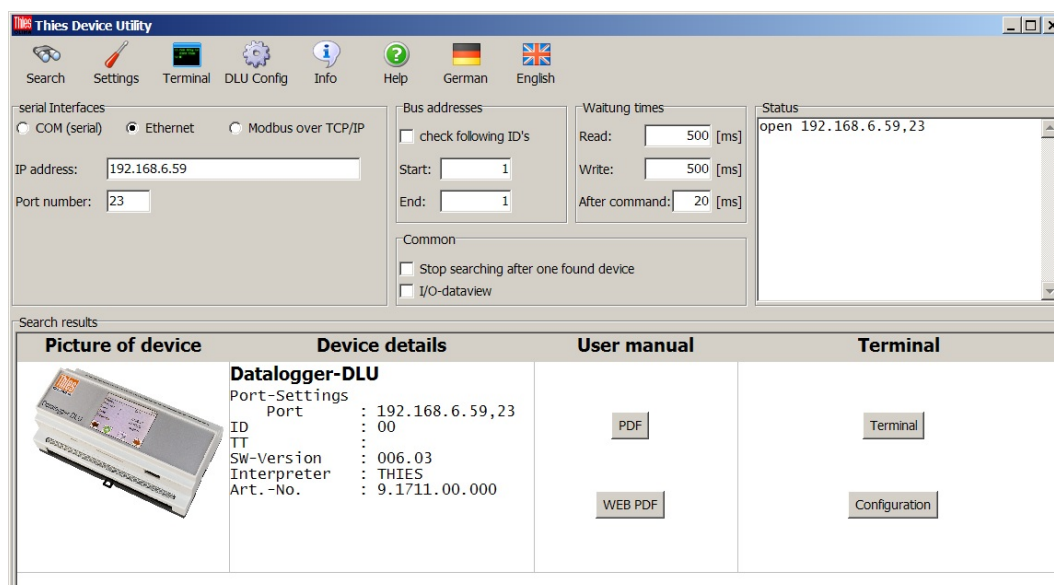


PC Program “Thies Device Utility”

Instruction for Use

9.1700.81.000

from version 6.0.9.0



Dok. No. 021725/12/20

THE WORLD OF WEATHER DATA

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1 Short Description

The PC program „Thies Device Utility“ serves for initial operation of the following sensors:

- Weather station Compact WSC11 (Thies article number: 4.9056.00.000).
- Clima Sensor US (Thies article number: 4.920x.x0.xxx).
- Ultrasonic Anemometer 2D (Thies order no.: 4.3820.xx.xxx).
- Ultrasonic Anemometer 3D (Thies order no.: 4.3830.xx.xxx).
- Pyranometer with MODBUS (Thies order no.: 7.1415.05(09).xxx).
- Ultrasonic Anemometer 2D compact (Thies order no.: 4.3875.xx.xxx).
- Datalogger DLU (Thies order no.: 9.1711.10.0x0).
- FirstClass Advanced X Wind Transmitter (Thies order no.: 4.3352.x0.40x).
- FirstClass Wind Direction transmitter (Thies order no.: 4.3151.xx.401).
- Barometric Transmitter (Thies order no.: 3.1157.10.xxx).

The program is able to find all sensors connected to the PC, and enables an initial operation via terminal function. Thanks to a user-friendly surface design the communication with the sensors is very easy.

2 System Requirement

The program is made for Microsoft Windows (WIN32) ©, and is functional from Windows 2000. The PC program “Thies Device Utility” is available as a setup and must be installed.

Minimum PC requirements:

Standard PC with Windows 2000, WindowsXP or higher.

3 Installation

The “Device Utility Tool” art.-no. 9.1700.81.000 is available for download on our homepage. Please download the tool with following link.

Link: <https://www.thiesclima.com/de/Download/>

In section "General" → “Software”, the program "Thies Device Utility" is the program available for download.

After the download run "Setup_ThiesDeviceUtility_Vxxxx.exe". After completing the installation, the "Thies Device Utility" program can be reached in the start menu under "START \ All Programs \ THIES Clima \ ThiesDeviceUtility".

4 Working with “Thies Device Utility”

After starting the PC program „Thies Device Utility“ the following view is shown to the user:

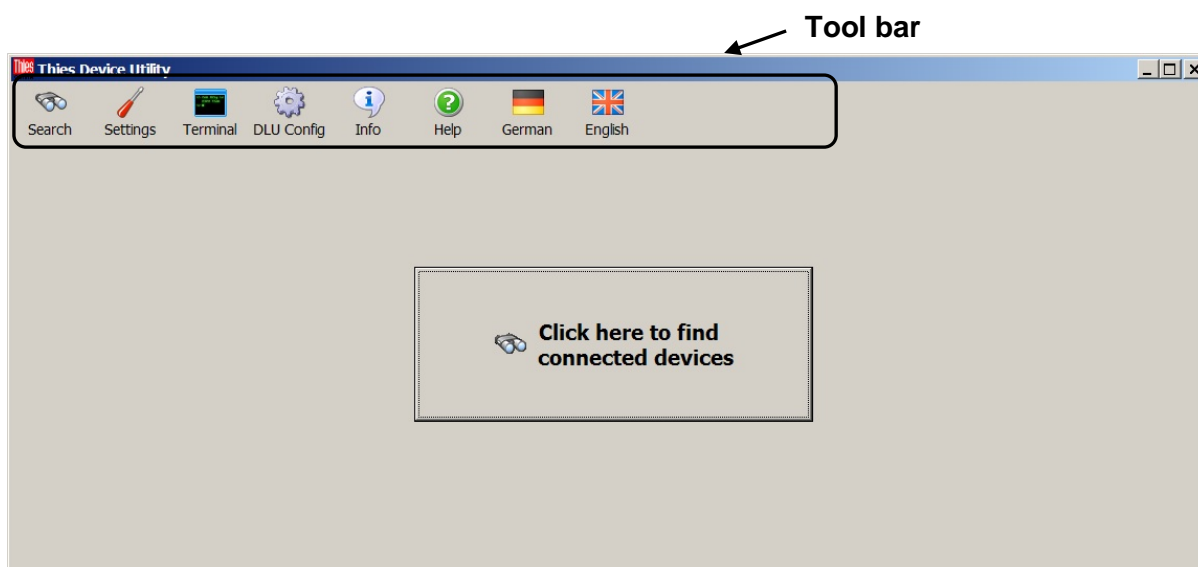


Figure 1 : Starting view

In the upper field of the user surface a tool bar is displayed with the following buttons:

- Search
- Settings
- Terminal
- DLU Konfig
- Info
- Help

On the start, the function “Search” is also accessible via the large centrally located button “click here for searching connected instruments”.

4.1 Searching

The automatic searching for Thies sensors is started by clicking the button “search”. Here, the button “click here for searching connected instruments” is replaced by a table with the located sensors. The search is carried out simultaneously on all selected COM interfaces (settings). During the search all buttons are de-activated.

Suchergebnisse			
Abbildung der Geräte	Geräteeigenschaften	Bedienungsanleitung	Terminal
	CLIMA SENSOR US TFB Port-Einstellungen Port : COM9 Baudrate : 9600 Datenbits : 8 Parität : keine Stopbits : 1 ID : 2 TT : SW-Version : 1.80 Interpreter : MODBUS RTU Art.-Nr. : 4.9201.00.000	PDF	Terminal
	CLIMA SENSOR US NHTFB Port-Einstellungen Port : COM9 Baudrate : 9600 Datenbits : 8 Parität : keine Stopbits : 1 ID : 3 TT : SW-Version : 1.80 Interpreter : MODBUS RTU Art.-Nr. : 4.9200.00.000	PDF	Terminal
	WSC11 Port-Einstellungen Port : COM9 Baudrate : 9600 Datenbits : 8 Parität : keine Stopbits : 1 ID : 4 TT : SW-Version : 3.06 Interpreter : MODBUS RTU Art.-Nr. : 4.9056.00.000	PDF	Terminal

Figure 2: Example, view with 1 located sensor

The table with the located sensor contains 4 columns:

Column 1: Figure of the instruments

In this column a figure of the sensor is presented.

Column 2: Instrument characteristics

In the second column the characteristics of the instrument are stated in detail. Here, the user finds the settings of the serial interface, the ID-number, the setting for the automatic telegram output, the software version, the active interpreter of the sensor, and the Thies article number.

Column 3: Instruction for Use

A click on the button „PDF“ opens the instruction for use of the sensor.

Precondition is, that the Adobe Acrobat Reader is installed, and that the respective instruction for use is located in the same directory as the PC program „Thies Device Utility“.

Column 4: Terminal

A click on the button “Terminal” activates a terminal function. With it, the user can read out the sensor, and can make settings. The type of terminal depends on the interpreter of the sensor (THIES or MODBUS-RTU).

4.2 Settings

A click on the button „Settings“ shows or hides the setting field.

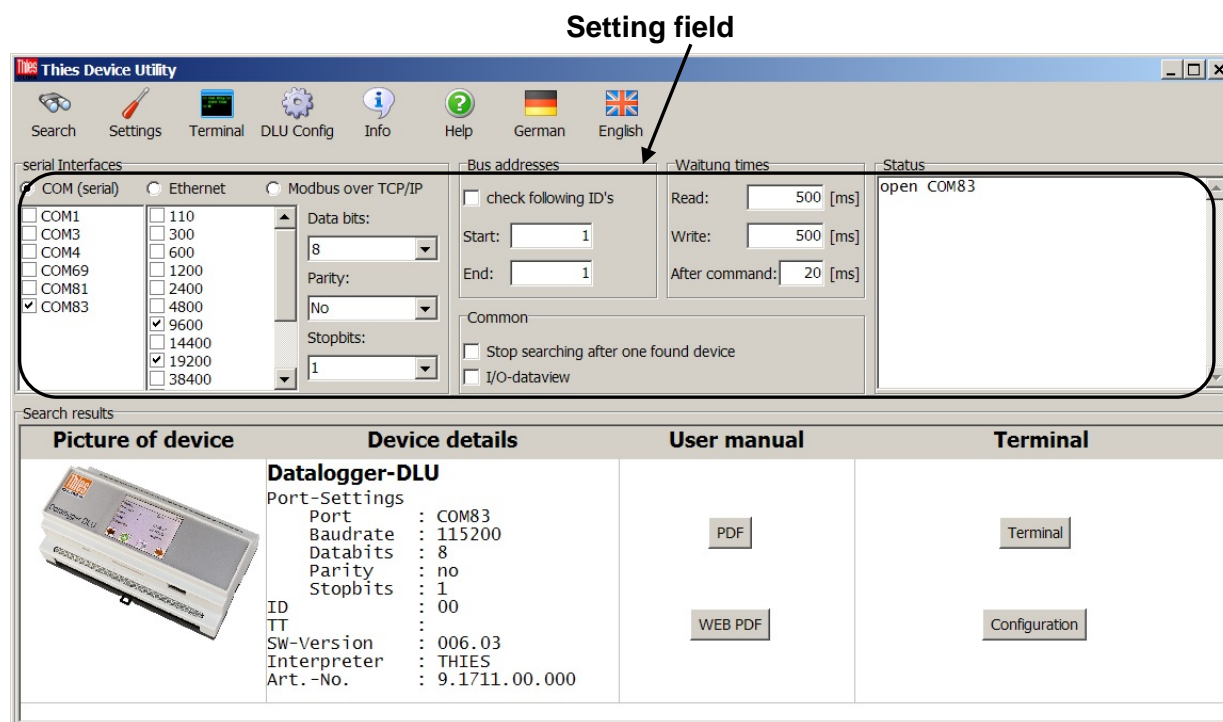


Figure 3: View with settings (serial)

In the left part of the setting field there are the two groups ‘interfaces’ and ‘bus addresses’. In the part ‘interfaces’, selection between ‘COM (serial)’, ‘Ethernet’ and Modbus over TCP/IP can be made.

For serial interface, the following settings can be made:

- Selection of the serial interface(s)**
 The list with the available serial interfaces is updated automatically.
 In case only certain interface shall be searched the user can put or remove the respective checkmark.
- Baud rates**
 On the start, in the baud rate list are selected automatically the baud rates most frequently used (9600, 19200, 57600, 115200). Here also, the user can set the baud rates for the search process by putting or removing the checkmark.
- Data bits**
 The user can change the number data bits for serial communication in the corresponding combo box (4, 5, 6, 7, 8). On the start of „Thies Device Utility“ 8 data bits will be preselected.

- **Parity**
The user can change the parity for serial communication in the corresponding combo box (no, odd, even, mark, space). On the start of „Thies Device Utility“ no parity will be preselected.
- **Stop bits**
The user can change the number stop bits for serial communication in the corresponding combo box (1, 1.5, 2). On the start of „Thies Device Utility“ 1 stop bit will be preselected.

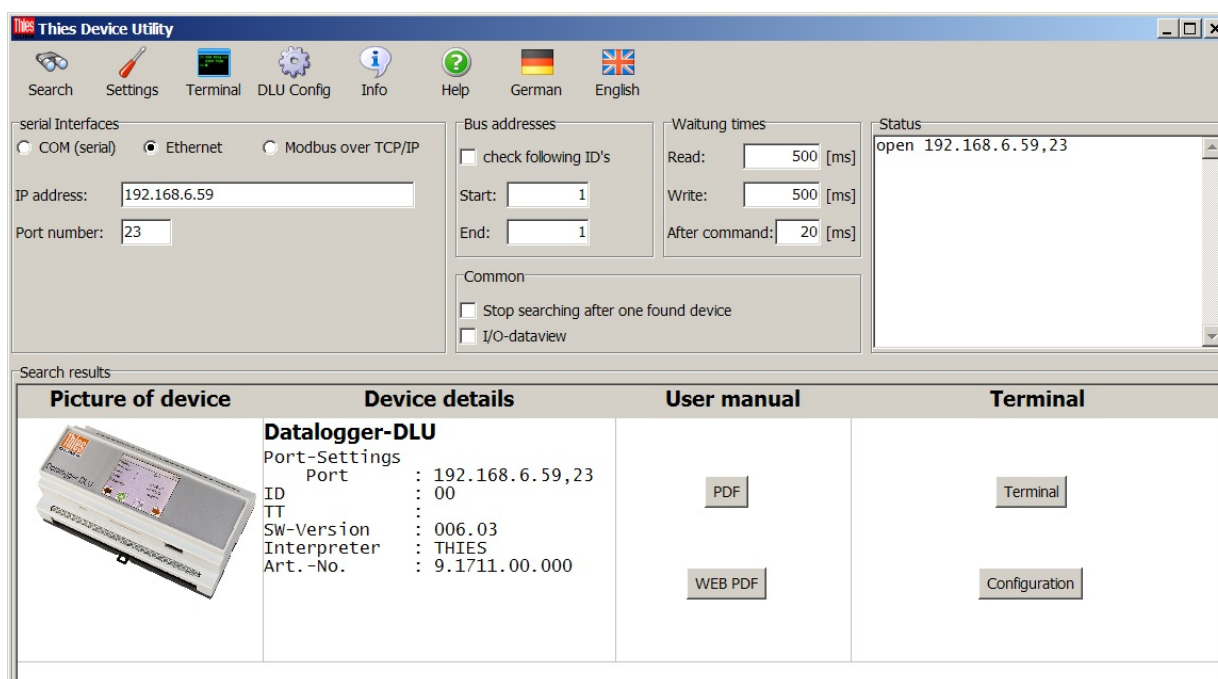


Figure 4 : View with settings (ethernet)

For ethernet interface, the following settings can be made:

- **IP-address**
The user can enter ip-address or name of the device.
- **Port-number**
The user can specify port-number for network access to the device.

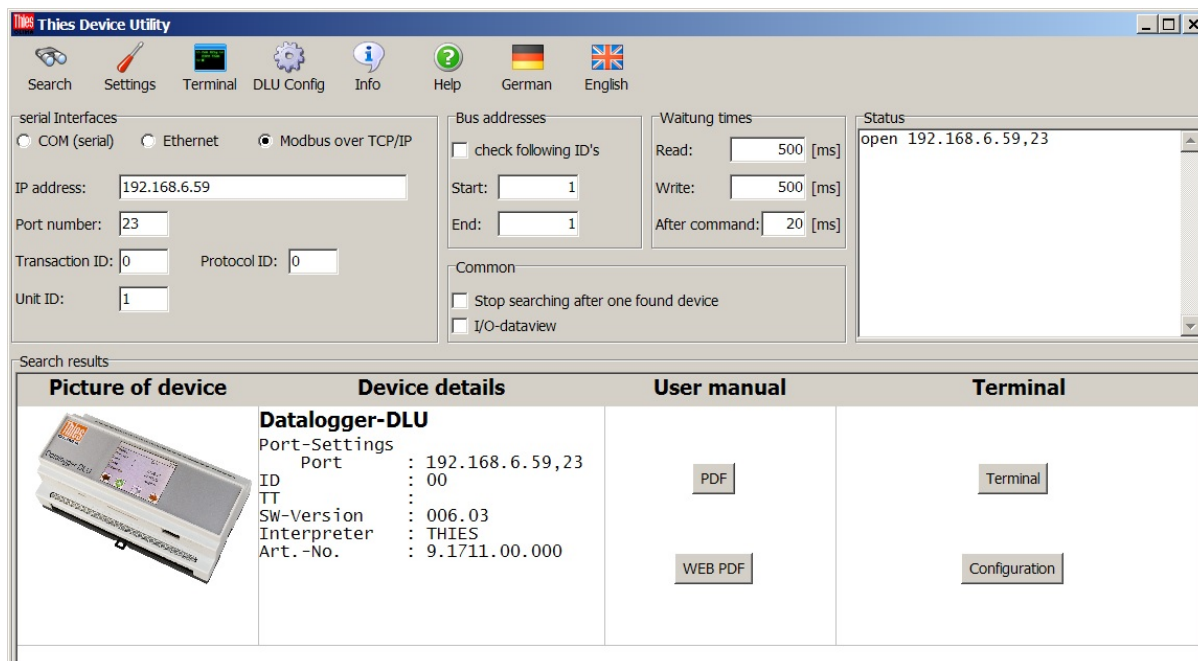


Figure 1 : View with setting (Modbus over TCP/IP)

If selecting the Ethernet interface, the following settings can be made:

- **IP-Adresse**
The user can either enter the corresponding IP address or the name of the device here.
- **Port-number**
The user can enter the port number to be used for network access to the device.
- **Transaction-ID**
The user can enter the transaction ID to be used for access via 'Modbus over TCP / IP'.
- **Protocol-ID**
The user can enter the protocol ID to be used for access via 'Modbus over TCP / IP'.
- **Unit-ID**
The user can enter the unit ID to be used for access via 'Modbus over TCP / IP'.

In the right part of the setting field following settings are possible:

- **Bus addresses**
If several sensors are connected to an interface (bus operation), the user can get search selectively for sensors by means of a special ID (bus address). For this, the checkmark 'check the following ID's' must be put, and the range of bus addresses, which is to be checked, must be indicated by means of the editable fields 'start' and 'end'.
- **Timeouts**
In the 3 data fields the user can set the timeouts for writing and reading, as well as the timeout after executing of a command. The timeouts for reading and writing are pre-set to 500ms, and should not be changed by the user. By setting the timeout after a command the communication can be adapted to the used RS485/RS422-interface converter. This can be required, for example, when the interface converter needs more than 20ms for changing over from transmitting to receiving operation in half duplex mode.

- **General**

The search can be affected by both the switchable (on/off) functions.

When „Stop search for an instrument“ is ticked, then the search process is stopped after the first instrument has been found. This can reduce the search process considerably.

If „E/A-data display“ is ticked, then an additional window is displayed with the details of the communication (see chapter **E/A-Data Display**).

The details of the search are stated in the right part of the setting field under ‘search process’. If no correctly connected sensor is located, the outputs in this field have to be checked/analyzed.

Note:

In bus operation the bus-addresses, which have to be checked, should always be determined.

4.3 Info

A click on the button „Info“ shows the information box.



Figure 5: Infobox

The user gets to the homepage of the Thies-company via the hyperlink “web”.

By using the set e-mail program, the hyperlink “Email” opens an e-mail with information concerning the located sensors, and the version number of the PC program „Thies Device Utility“ to (info@thiesclima.com).

4.4 Help

A click on the button „Help“ opens the current document.

4.5 Terminal Function (THIES Interpreter)

In case the terminal function for a sensor with THIES interpreter is activated the following view appears:

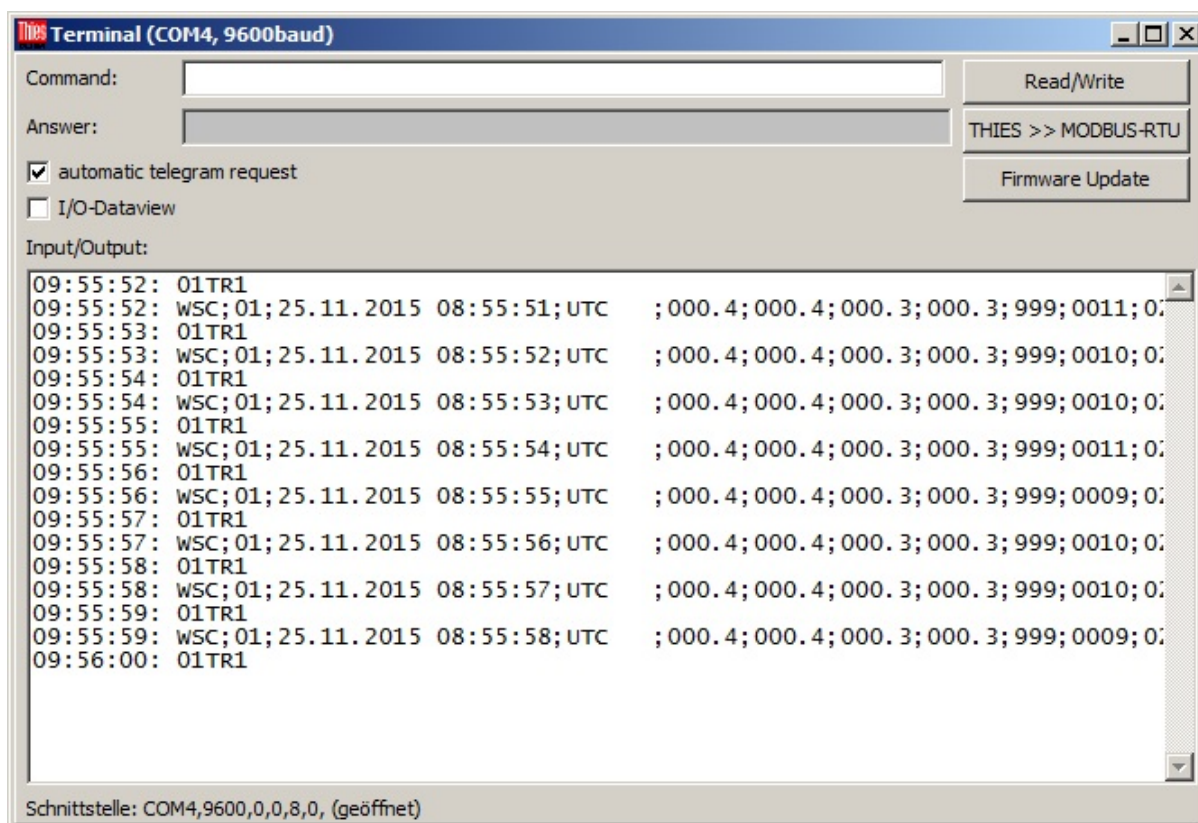


Figure 6: Terminal for THIES interpreter

In the box „Command“ the user can enter the selected command. Hereby, the command can be indicated with or without ID.

By pressing the enter-button or resp. clicking on the button “Read/write” the entered command is transmitted. The reply from the sensor is output in the box “Reply”

Figure 6 shows the described behavior by means of the command „BR“ for querying the baud rate.

The communication between program and sensor is recorded in the description field „Input/output“. By ticking „E/A-data display“ a detailed logging can be activated (see **chapter 4.8 E/A-Data Display**).

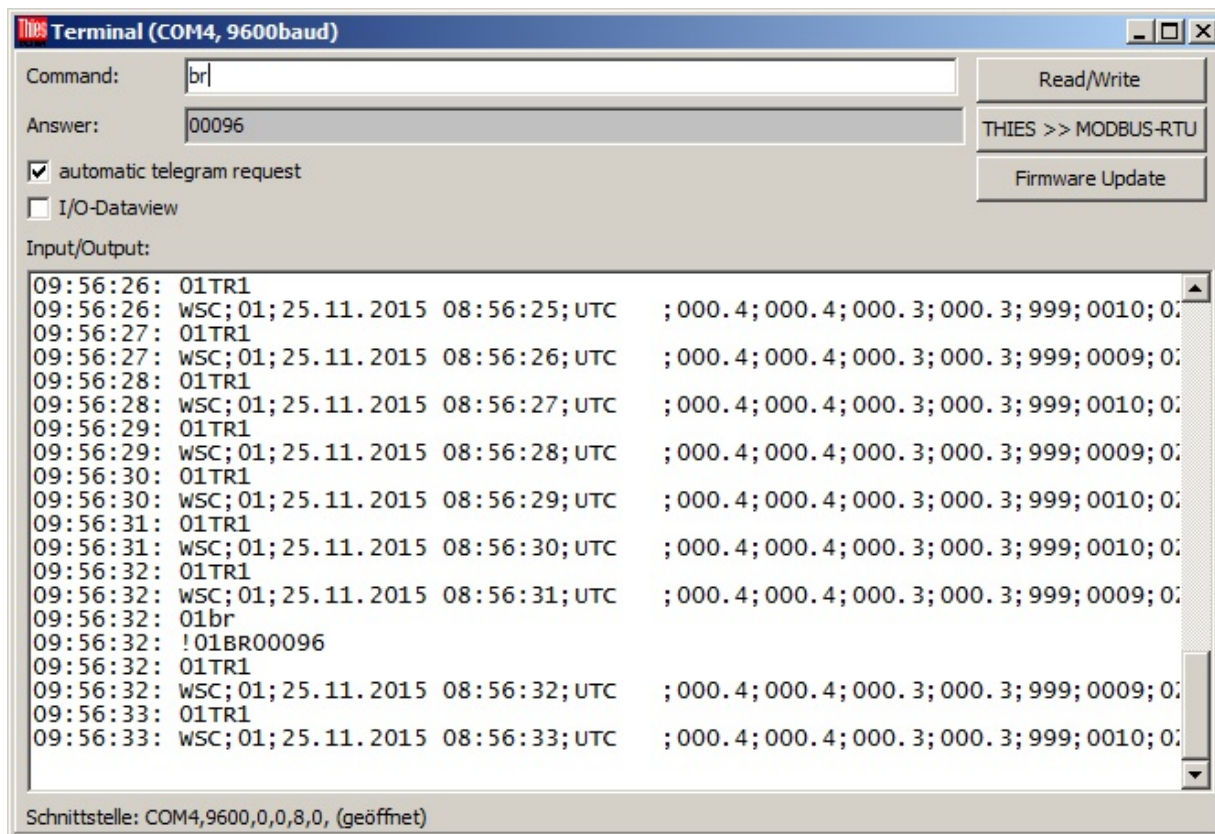


Figure 7: Terminal for THIES interpreter (example with command BR)

By a click on the button „MODBUS-RTU << THIES“ the sensor can be switched over to the MODBUS-RTU interpreter.

The switchover must be confirmed by the following dialogue:

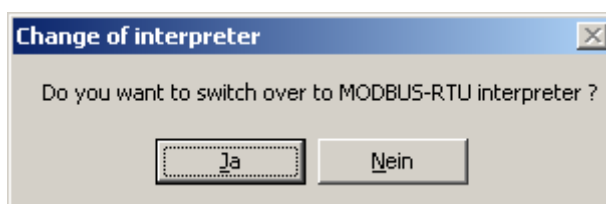


Figure 8: Confirmation dialogue for switchover to MODBUS-RTU interpreter

After successful changeover the terminal view is closed, and a new search is started automatically.

For description of the automatic telegram query see **chapter 4.8. Automatic telegram query**.

4.6 Terminal Function (MODBUS-RTU Interpreter)

When the terminal function is activated for a sensor by MODBUS-RTU interpreter, the following view appears:

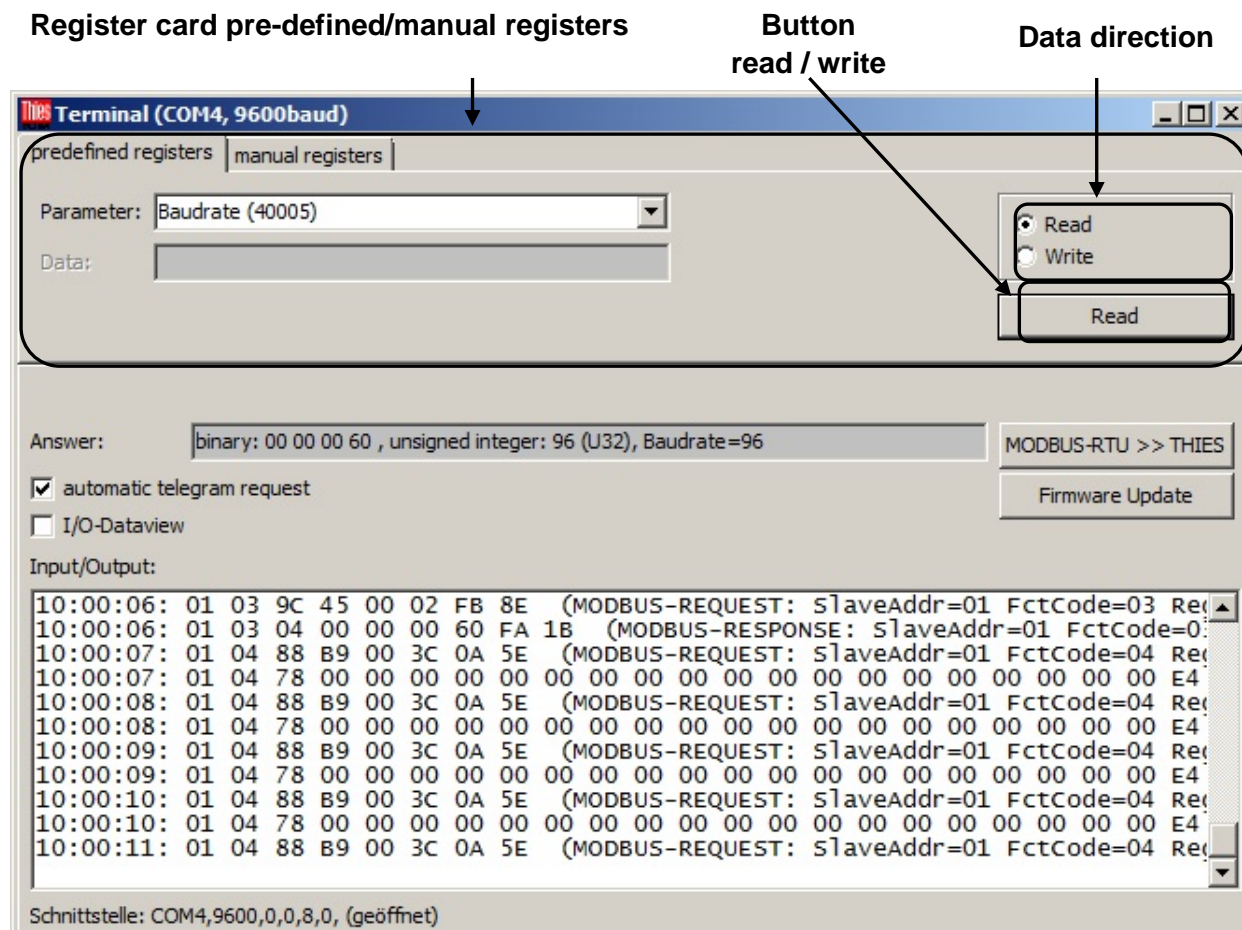


Figure 9: Terminal for MODBUS-RTU interpreter (pre-defined registers)

The query or resp. the setting of the MODBUS registers can be carried out by means of pre-defined registers (register card “pre-defined registers”) or by individually settable registers (register card “manual registers”).

The communication between program and sensor is logged in the textfield „Input/Output. By ticking „E/A-data display“ a detailed logging can be activated (see **chapter 4.8 E/A-Data Display**).

On the register card “pre-defined registers” the user can select the MODBUS register in the combo box “parameter”, and can carry out the query or setting of the selected register by clicking on the button “read/write”.

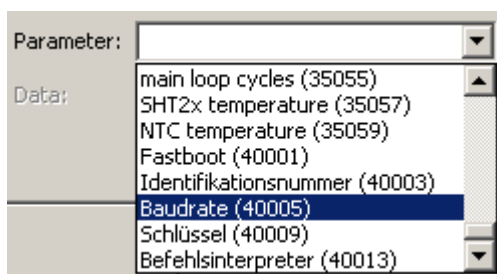


Figure 10: Combo box, terminal for MODBUS-RTU Interpreter (register select)

The data direction, i.e. read or write, is determined by the respective combo box. If an only-readable register is selected (input register), the data direction is switched automatically to read, and the combo box data direction is de-activated.

The input field enables the entry of a numeric value (integer), and is active only when the data direction is switched on write.



Figure 11: Terminal for MODBUS-RTU interpreter (write)

The combo box for the data direction, the button for read/write, and the input field for the data are arranged in the same way as on the register card “pre-defined registers”.

By a click on the button „MODBUS-RTU >> THIES“ the sensor can be switched over to the THIES interpreter. The switchover must be confirmed by the following dialogue.

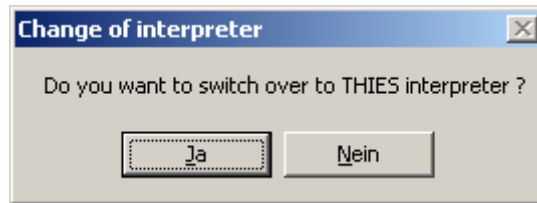


Figure 13: Confirmation dialogue for changing over into the THIES interpreter

After successful switchover the terminal view is closed, and a new search is started automatically.

For description of the automatic telegram query, ref. to **chapter 4.7 Automatic Telegram Query**.

4.7 Terminal Function (ASCII Interpreter)

When the terminal function is activated for a sensor by ASCII interpreter, the following view appears:

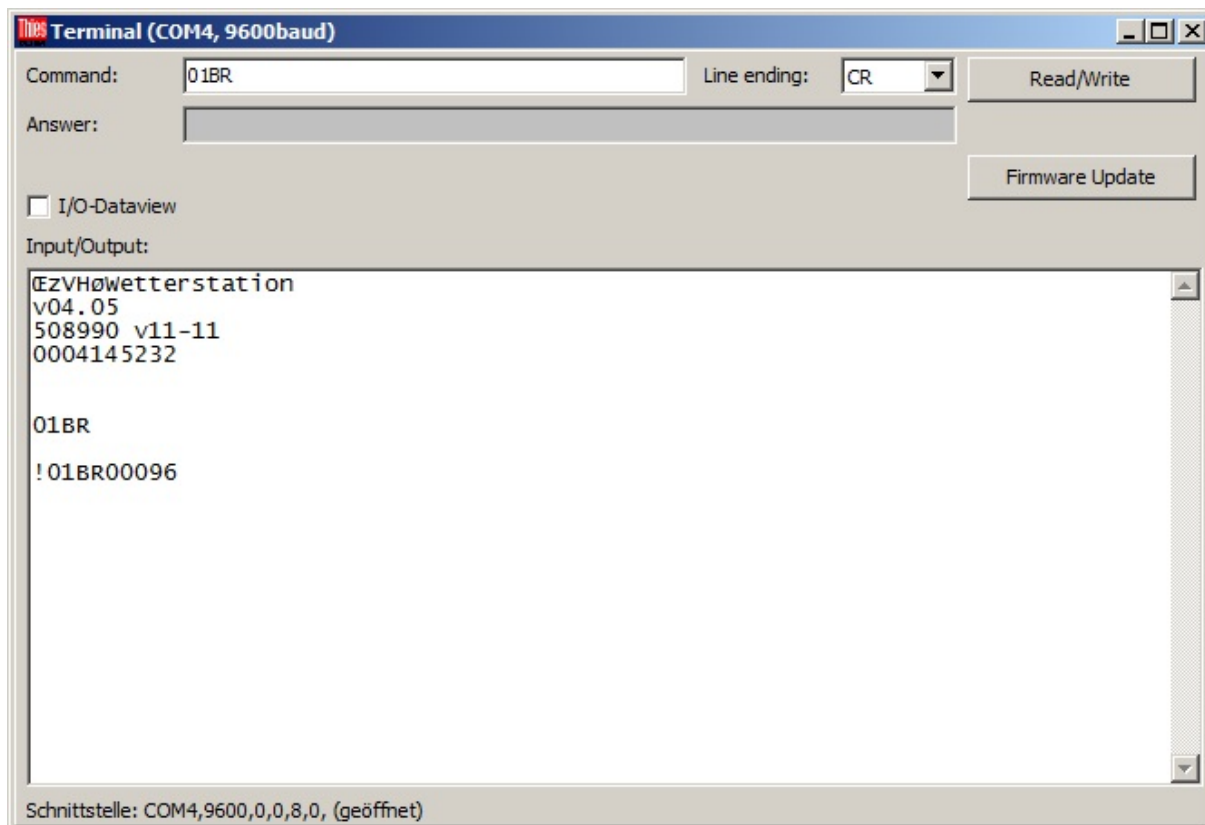


Figure 14 : Terminal for ASCII interpreter

In the box „Command“ the user can enter the desired command. Hereby, the command can be indicated with special characters. These special characters are specified by their hexadecimal value introduced by ‚#‘.

Example:

#02mm#03 → transmitted characters: <STX>mm<ETX>

By pressing the enter-button or resp. clicking on the button “Read/write” the entered command is transmitted. Thereby the selected “line ending” will be automatically added.

The communication between program and sensor is recorded in the description field „input/output“. By ticking „E/A-data display“ a detailed logging can be activated (see **chapter 4.10 E/A-Data Display**).

4.8 Terminal Function (MODBUS OVER TCP/IP Interpreter)

If the manual terminal function is activated for the MODBUS OVER TCP / IP interpreter, the view corresponding to the MODBUS-RTU interpreter appears.

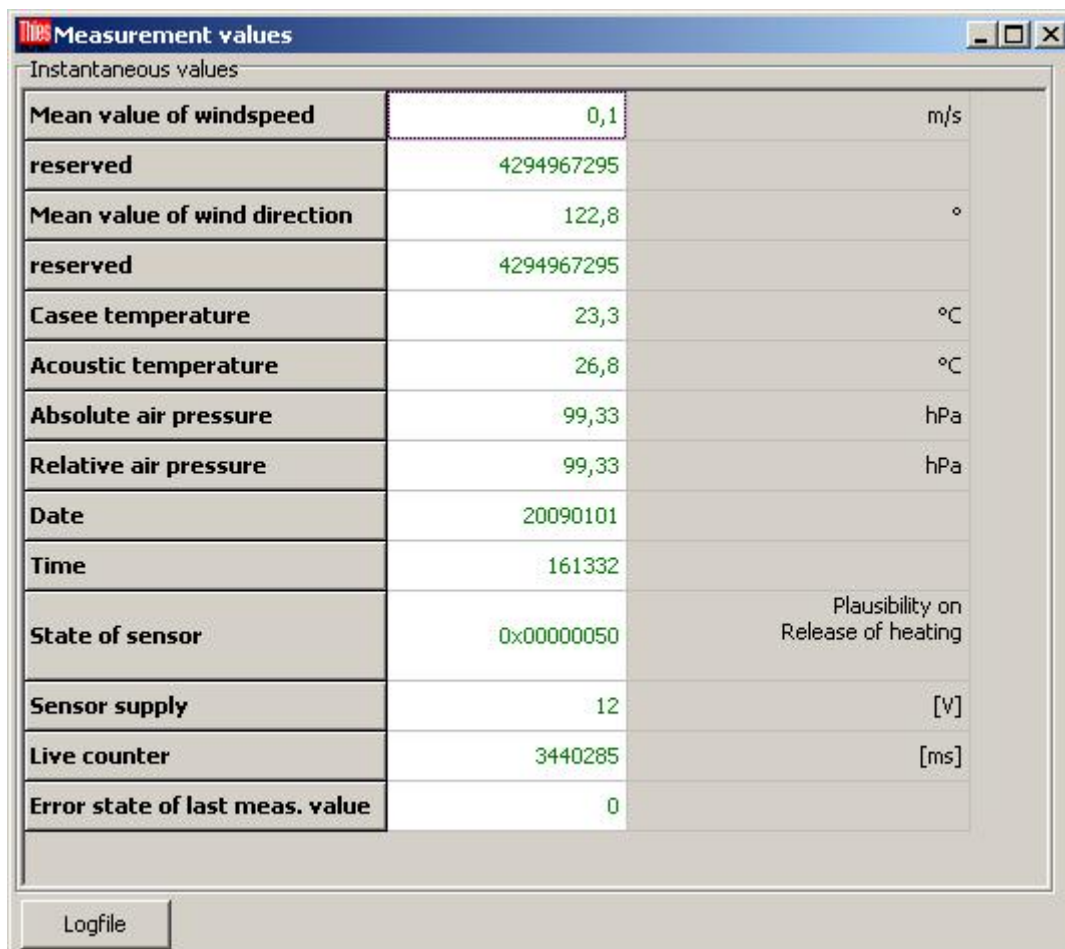
4.9 Automatic Telegram Query

Both terminal functions (THIES and MODBUS-RTU) support the automatic query of the instantaneous values (once per second). The function is to be switched on and off via the checkmark 'automatic telegram query'. Depending on the sensor, the following telegrams can be queried automatically.

Sensor	Telegram
Weather station Compact WSC11 (Thies article number: 4.9056.00.000)	Telegram 1
Clima Sensor US (Thies article number: 4.920x.00.000)	Telegram 6
Ultrasonic Anemometer 2D (Thies order no.: 4.3820.xx.xxx)	Telegram 2
Ultrasonic Anemometer 3D (Thies order no.: 4.3830.xx.xxx)	Telegram 2
Pyranometer mit MODBUS (Thies order no.: 7.1415.05(09).xxx)	Telegram 10
Ultrasonic Anemometer 2D compact (Thies order no.: 4.3875.0x.xxx / 4.3875.1x.xxx)	Telegram 2
Ultrasonic Anemometer 2D compact (Thies order no.: 4.3875.2x.xxx)	Telegramm 9

Table 1: automatic telegram query

The measuring values from the respective telegram are displayed tabularly in another blank.



Instantaneous values		
Mean value of windspeed	0,1	m/s
reserved	4294967295	
Mean value of wind direction	122,8	°
reserved	4294967295	
Casee temperature	23,3	°C
Acoustic temperature	26,8	°C
Absolute air pressure	99,33	hPa
Relative air pressure	99,33	hPa
Date	20090101	
Time	161332	
State of sensor	0x00000050	Plausibility on Release of heating
Sensor supply	12	[V]
Live counter	3440285	[ms]
Error state of last meas. value	0	

Logfile

Figure 15: Table, display of the instantaneous values

By clicking on the button „Logfile“ a filename could be chosen and therefore an automatic logging of the measuring values will be activated.

4.10 Manual Selection of Terminal Function

The user can manually select and activate terminal function. Thereby the communication with sensor is possible, even if sensor is not automatically detected.

By clicking on the interface (right mouse button) a popup menu with only 1 entry is displayed.

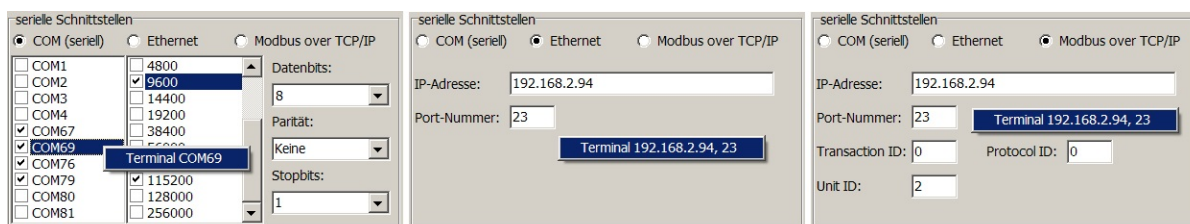


Figure 16: Terminal function activate

After clicking on the entry inside popup menu, the following dialogue is displayed. The option 'MODBUS OVER TCP / IP' is only displayed for network interfaces ('Ethernet' and 'Modbus over TCP / IP').

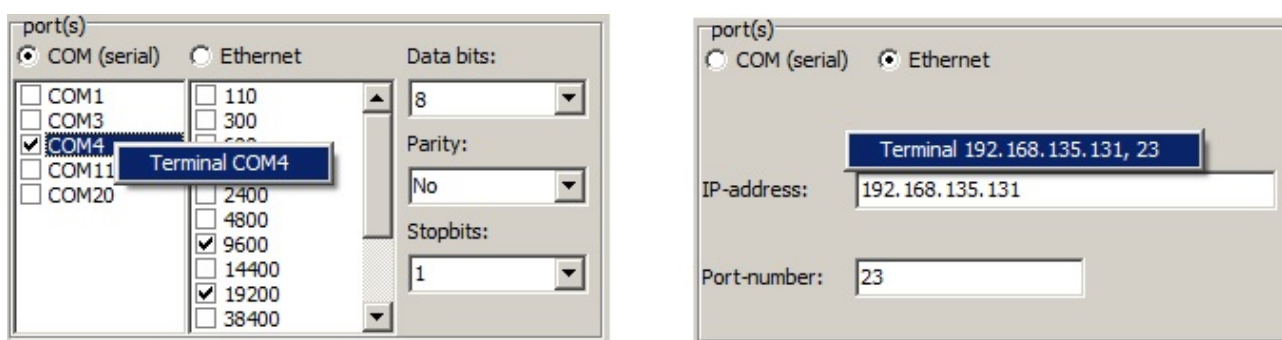


Figure 17 : activate terminal function

Depending on the selected interpreter, additional inputs must be made. After this the terminal function will be activated.

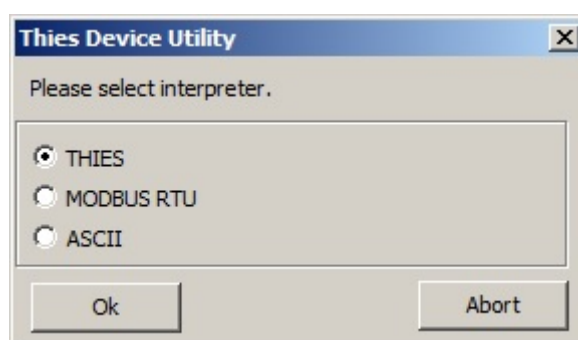


Figure 18 : Interpreter select

THIES- and MODBUS-RTU-Interpreter

- Selection of baud rate.

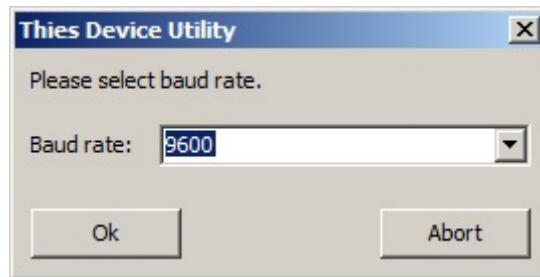


Figure 19 : Baud rate options

- Query of Bus-ID (bus address).

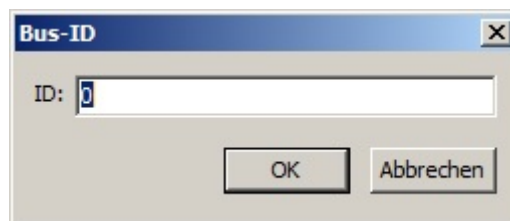


Figure 20 : Bus-ID input

- Password for command FB (fast boot).

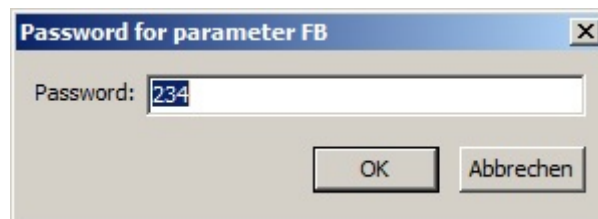


Figure 21 : Password parameter FB

ASCII-Interpreter

- Selection of baudrate (see **Figure 19**)

MODBUS OVER TCP/IP-Interpreter

- Selection of Bus-ID (see **Figure 20**)
- Enter the password for command FB (see **Figure 21**)

Note:

Alternatively, the terminal function can also be activated by clicking on the 'Terminal' button in the toolbar!

4.11 E/A-Data Display

Both terminal functions (THIES und MODBUS-RTU) as well as the real search process, support a detailed logging of the sent and received data. The function can be switched on or off by ticking "E/A data display". The following figure is showing the window with the data display.

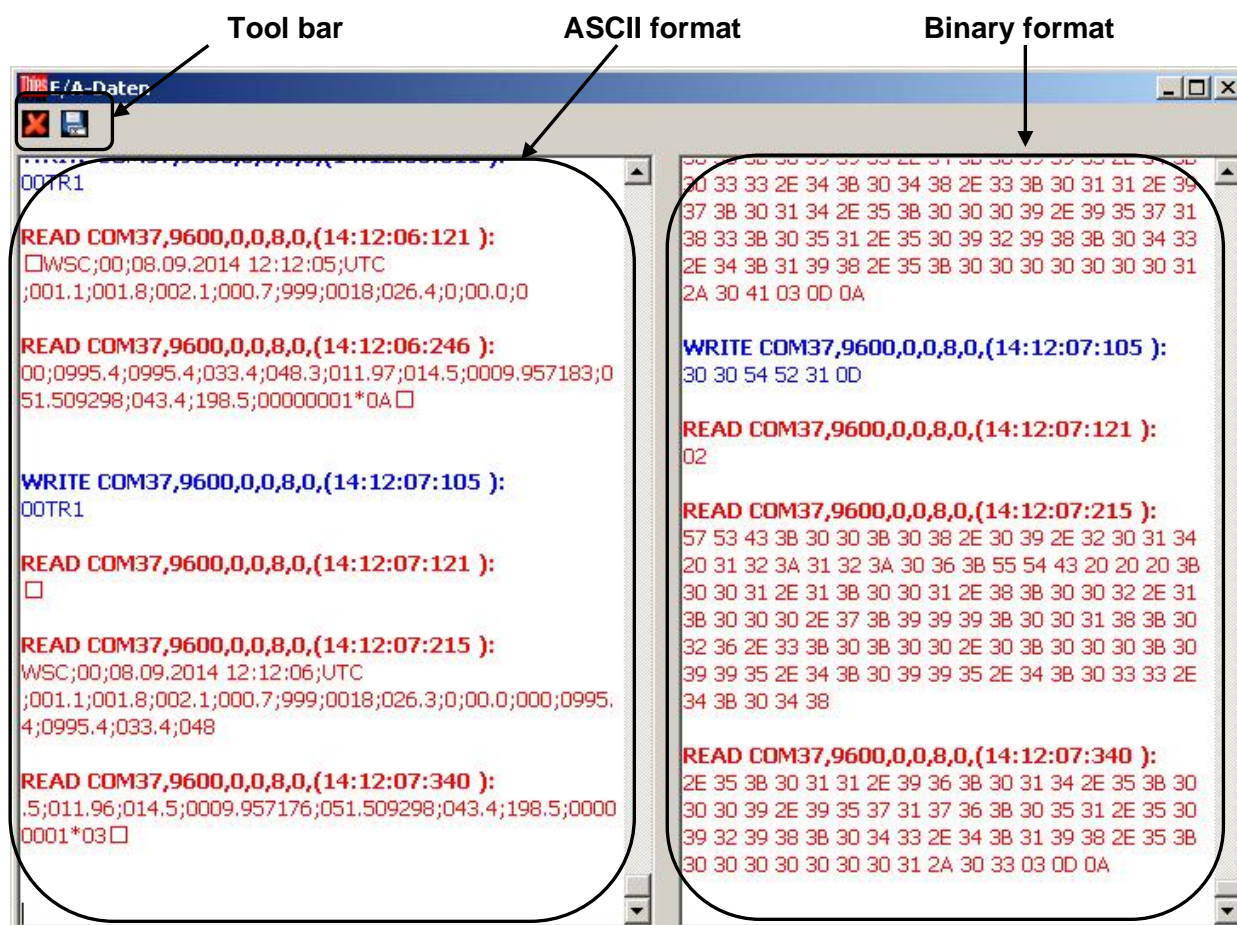


Figure 22 : Window E/A data

Sent data (WRITE) are displayed in blue, and received data (READ) in red. Here, each transaction is shown with the name of the interface, the configuration of the interface, and the timestamp.

In the left output range the data are displayed in ASCII format, and in the right output range in binary format (each byte is displayed hexadecimal-coded with 2 ASCII characters).

The two push buttons in the tool bar allow the deletion resp. saving of both output ranges.

5 Error Recovery

Error	Possible Cause(s)	Recovery
An interface cannot be opened (for example input „could not open COM9...“ in the setting field under “Search process”).	The interface is currently busy by another application (e.g. a terminal program).	Close the other program, and restart the search.
An interface cannot be opened (for example input „could not open COM9...“ in the setting field under “Search process”).	The interface is identified misleadingly as mouse, and is thus blocked ¹ for applications.	End the PC-program “Thies Device Utility“. Switch the sensor tension-free, and remove the RS485/RS422 transformer from the USB interface. Now, re-connect the RS485/RS422 transformer, first, to the USB Interface of the PC: Re-activate afterwards the supply of the sensor. Start now the „Thies Device Utility“, and run the search again.
A correctly connected sensor is not identified.	The baud rate set in the sensor deviates from the standard baud rates (9600, 19200, 57600, 115200).	Set the checkmark for the respective baud rate of the sensor in the setting field under serial interface (if not known, you can select all baud rates) and re-start the search.
A connected sensor is not identified.	The data cables DATA+/DATA- (RS485 half-duplex) resp. TX+/TX-/RX+/RX- (RS485 full-duplex) were connected incorrectly to the interface transformer.	Connect the data cables correctly, and re-start the search.
A connected sensor is not identified.	The interface transformer is configured incorrectly. (half-/full-duplex).	Correct the configuration in the interface transformer, and re-start the search.
A connected sensor is not identified.	The interface converter needs more than 20ms for changing over from transmitting to receiving mode (half duplex).	Increase the timeout after a command (see settings).

¹: This behavior can occur in interaction with sensors, which output telegrams autonomously.

**Please contact us for your system requirements.
We advise you gladly.**

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