MEETINSTRUMENTATIE

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CLIMA SENSOR US

Short manual

4.92xx.xx.xxx

From Softwareversion V5.08 Stand: 02/2023

4.920**0**.00.xxx ; 4.920**1**.00.x0x

4.92xx.**2**x.xxx

4.920**2**.00.00x ; 4.920**3**.00.x0x

Dok. No. 021690/01/24/short

THE WORLD OF WEATHER DATA

Safety Instructions

- Before operating with or at the device/product, read through the operating instructions.
  This manual contains instructions which should be followed on mounting, start-up, and operation.
  A non-observance might cause:
  - failure of important functions
  - endangerment of persons by electrical or mechanical effect
  - damage to objects
- Mounting, electrical connection and wiring of the device/product must be carried out only by a qualified technician who is familiar with and observes the engineering regulations, provisions and standards applicable in each case.
- Repairs and maintenance may only be carried out by trained staff or **Adolf Thies GmbH & Co. KG**. Only components and spare parts supplied and/or recommended by **Adolf Thies GmbH & Co. KG** should be used for repairs.
- Electrical devices/products must be mounted and wired only in a voltage-free state.
- **Adolf Thies GmbH & Co KG** guarantees proper functioning of the device/products provided that no modifications have been made to the mechanics, electronics or software, and that the following points are observed:
- All information, warnings and instructions for use included in these operating instructions must be taken into account and observed as this is essential to ensure trouble-free operation and a safe condition of the measuring system / device / product.
- The device / product is designed for a specific application as described in these operating instructions.
- The device / product should be operated with the accessories and consumables supplied and/or recommended by **Adolf Thies GmbH & Co KG.**
- „Statement of limited liability of use in ‘man safe’ rated, security & safety applications: As it is possible that measuring systems / devices / products may, under certain conditions and in rare cases, output erroneous measuring values, it is recommended and requested to use redundant systems with plausibility checks for any ‘man safe’ rated use or security & safety applications.“

Environment

- As a longstanding manufacturer of sensors Adolf Thies GmbH & Co KG is committed to the objectives of environmental protection and is therefore willing to take back all supplied products governed by the provisions of "*ElektroG*" (German Electrical and Electronic Equipment Act) and to perform environmentally compatible disposal and recycling. We are prepared to take back all Thies products concerned free of charge if returned to Thies by our customers carriage-paid.

- Make sure you retain packaging for storage or transport of products. Should packaging however no longer be required, please arrange for recycling as the packaging materials are designed to be recycled.

Documentation

- © Copyright **Adolf Thies GmbH & Co KG**, Göttingen / Germany
- Although these operating instruction has been drawn up with due care, **Adolf Thies GmbH & Co KG** can accept no liability whatsoever for any technical and typographical errors or omissions in this document that might remain.
- We can accept no liability whatsoever for any losses arising from the information contained in this document.
- Subject to modification in terms of content.
- The device / product should not be passed on without the/these operating instructions.

Remark:

This document is an instruction for starting-up the ClimaSensorUS. The complete manual available for download.

1 Introduction

Thies “short manual” describes the installation and startup of the “Clima Sensor US” by means of the PC-program “ThiesDeviceUtility”.

Article- No.	Description	Parameter, output, interface, equipment, etc.
4.92xx.xx.xxx	CLIMA SENSOR US	The description of the products can be found in the complete manual.

Scope of Delivery:
1 x CLIMA SENSOR US.
1 x Supplementary sheet with the factory settings.
1 x Short Manual (the complete manual available for download).

For assisting the parameter settings and/or special configurations there is our cost-free “Device Utility Tool” art.-no. 9.1700.81.000 available for download on our homepage. Please download the tool with following link.

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

In section "General", the program "Thies Device Utility 9.1700.81.000" is the program available for download.

The instructions for use are available for download under the following link:

https://www.thiesclima.com/db/dnl/4.920x.x0.xxx_Clima_Sensor_US_e.pdf

For an initial start-up, we recommend to use a PC, the power supply unit 9.3389.20.000, the connecting cable 509427 or 509311, and the interface converter 9.1702.40.002. For connection diagrams for wiring please refer to **chapter 3**.

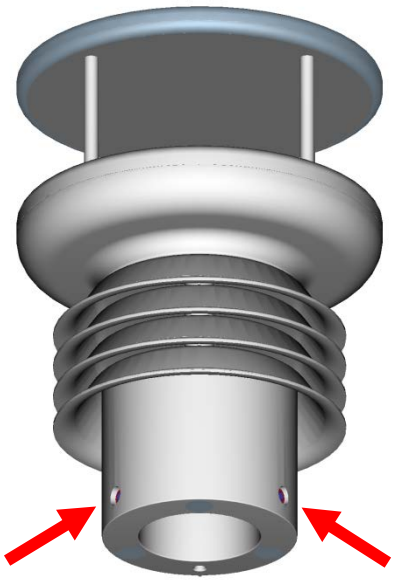
2 Installation

Attention:
The working position of the CLIMA SENSOR US is vertical (plug connection underneath).
During mounting, de-mounting, transport or maintenance of the CLIMA SENSOR US please make sure that no water gets into the instrument base or plug.
The instrument must be mounted and wired only by qualified personnel, who knows and observes the generalities of techniques, and applicable regulations and norms.

2.1 Mechanical installation

Proper installation of the CLIMA SENSOR US is carried out using a tube socket Ø 48 – 49mm and at least 30mm in length. The inside diameter of the tube socket must be at least 30mm as the electrical connection of the CLIMA SENSOR US is carried out at the bottom of the device. After connection the CLIMA SENSOR US is then mounted on the tube or mast socket. The marking for north on the device must be aligned to north (see section 4.2.1). The device is fixed to the shaft with the two Allen screws (AF 4mm).

Caution:
The Allen screws must be tightened to 2Nm

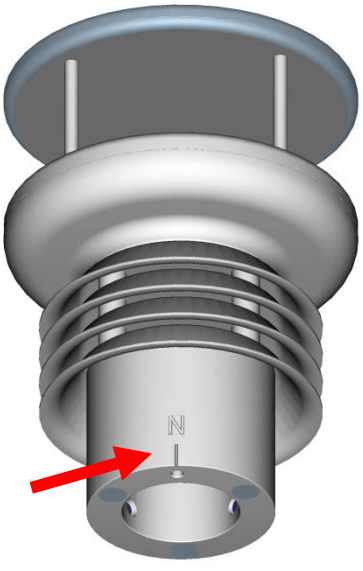


2.1.1 Alignment to north

For exact determination of the wind and Brightness direction the CLIMA SENSOR US must be installed aligned to **north** (true north).

When aligning the device, the **marking for north (N)** must point to **north** (true north). To do so, select a conspicuous feature of the landscape to the north or south with a compass and turn the mast or sensor until the marking for north points to true north.
When aligning the device to north using a compass, bear in mind the magnetic variation (= deviation in the direction of the compass needle from true north) and possible interference from magnetic fields (e.g. iron parts, electric cables).

The lower edge of the sensor base is equipped with a **bore for north** aligned to the marking for north. This bore allows a mast adapter with a pin for north to be used here. The mast adapter is not included in the scope of supply.



2.2 Electrical installation / Start-up

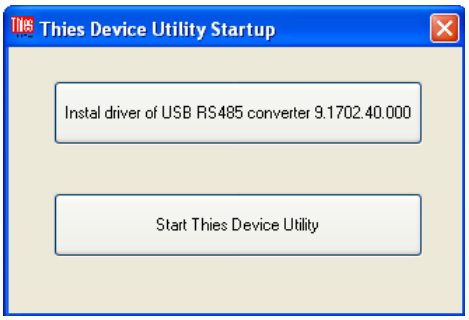
1. The connection of the Clima Sensor US to the interface module and power supply unit differs, depending on the instrument variant. You have to distinguish between the connection types full-duplex and half-duplex with cable 16pole or resp. 8pole. Information on the duplex-mode are given by parameter DM on the supplemental sheet “Factory settings” of the Clima Sensor US.

   The following table serves for the circuit diagram selection. The following assignments apply:

Cable	Parameter DM	Used duplex-mode	Connection diagram
16pole	1	Full-duplex	**Chapter 3 page 7**
16pole	2	Full-duplex	**Chapter 3 page 7**
8pole	0	Half-duplex	**Chapter 5 page 9**
8pole	1	Full-duplex	**Chapter 4 page 8**
8pole	2	Full-duplex	**Chapter 4 page 8**

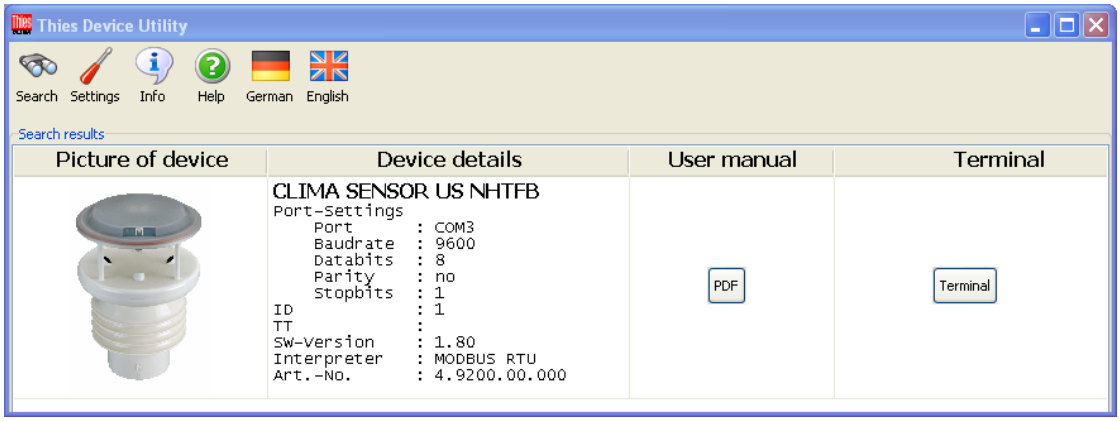
Table 1: Selection Connection Diagram

2. Connect the supplied 8pole or resp. 16pole cable to the power supply unit 9.3389.20.000, acc. to the connection diagram, see **Table 1**.
3. Put the plug of the 8pole or resp. 16pole cable into the Clima Sensor US.
4. Connect the USB/RS485 interface converter to the power supply unit 9.3389.20.000.
5. Connect the 230V / 115V line to the power supply unit 9.3389.20.000.
6. Start the program “ThiesDeviceUtilityStartup.exe” after download.
7. For installation of the interface transducer select the button “install driver for USB RS485 converter”.
8. Connect the USB/RS485 interface converter and your PC by means of the included USB-cable.



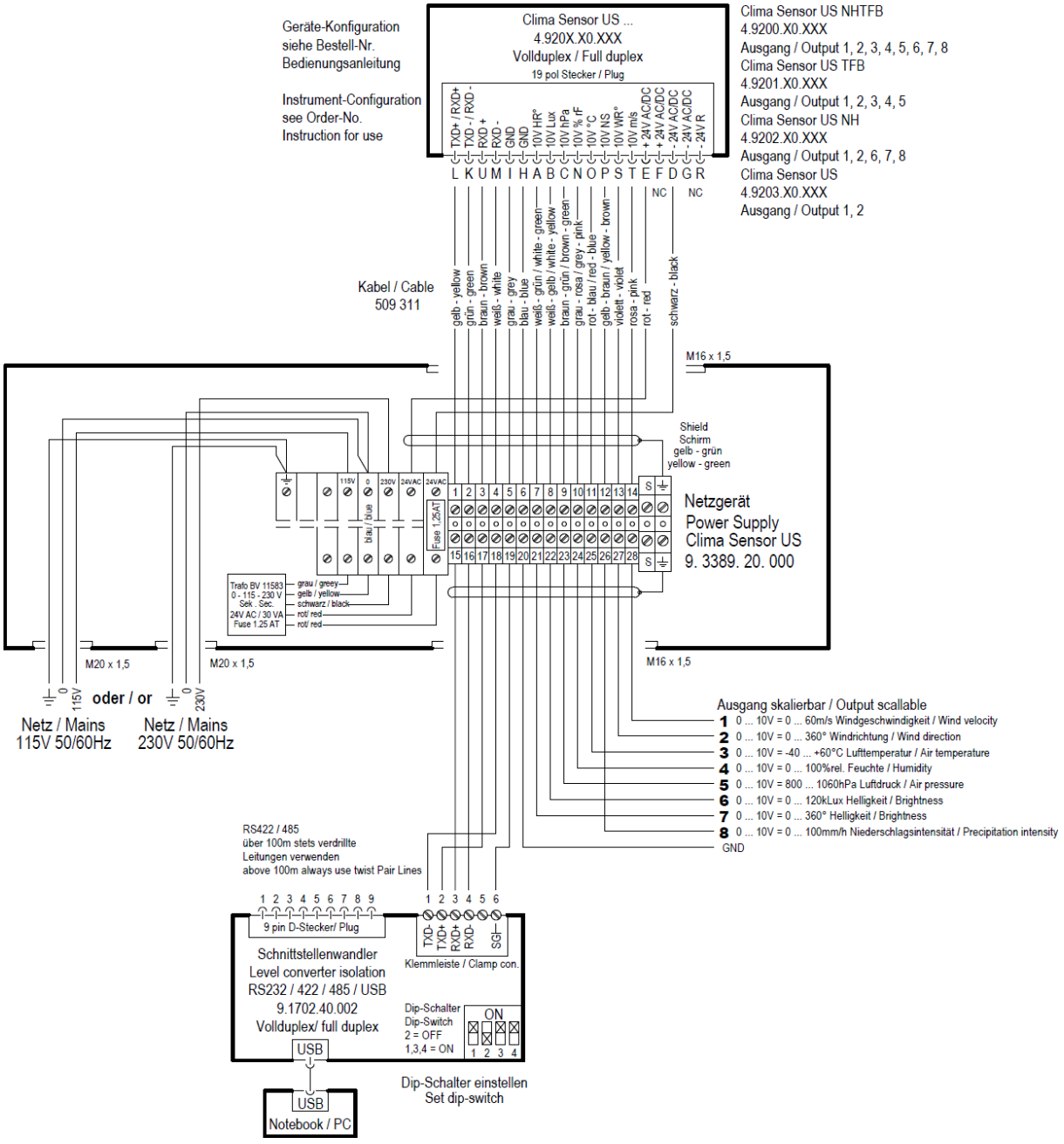
9. For starting the program “ThiesDeviceUtility.exe” select the button “Start ThiesDeviceUtility” in the program “ThiesDeviceUtilityStartup”.

10. After the program start select the button “Search”.
11. The program searches for connected instruments, and displays the search result and detail parameter.

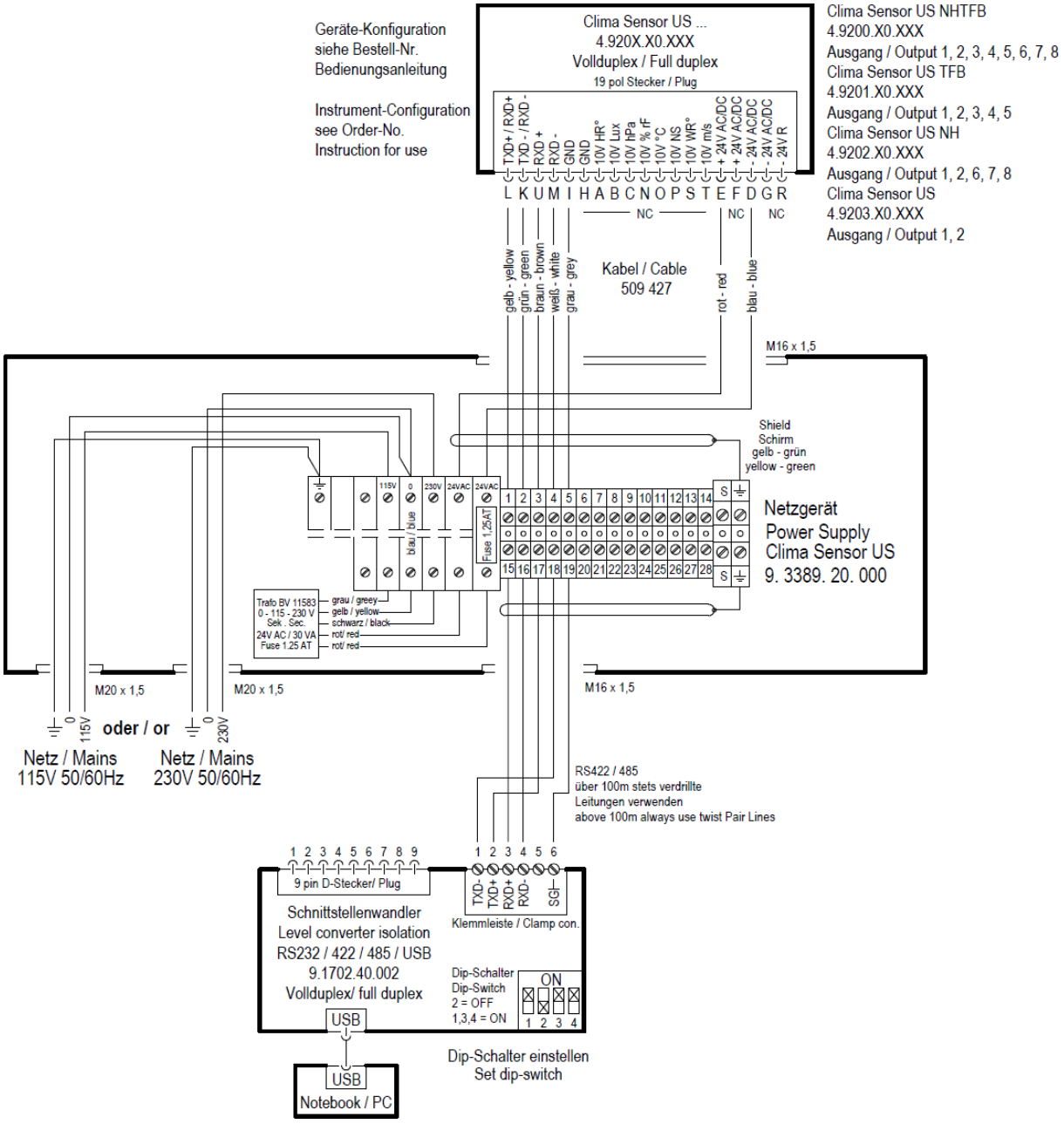


12. By pressing the button “Terminal” a window is opened, where individual commands can be sent, and parameters can be changed. See also the online help of the program “ThiesDeviceUtility.exe”. The program supports both the “Thies”- and the MODBUS-command interpreter. Depending on the identified device the command interpreter is selected automatically.
13. By operating the switch “PDF” the instructions for use of the instrument are opened in the current line.
14. For information on mounting, installation, and other technical details please refer to the instructions for use.

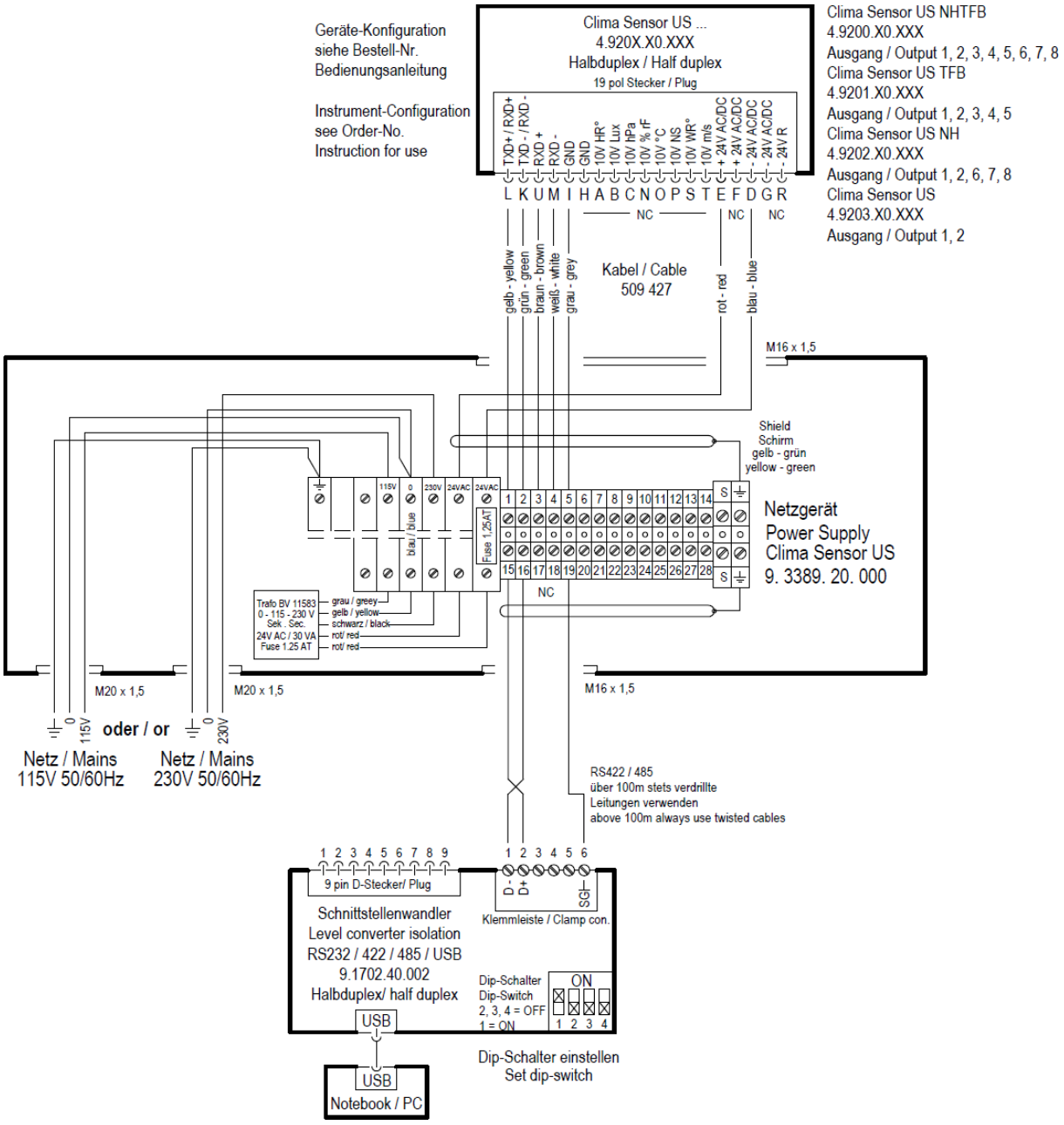
3 Connection Diagram of 4.920x.x0.xxx in Full-duplex Mode and 16pole Connecting Cable



4 Connection Diagram of 4.920x.x0.xxx in Full-duplex Mode and 8pole Connecting Cable



5 Connection Cable of 4.920x.x0.xxx in Half-duplex Mode and 8pole Connection Cable



6 Installation of the USB/RS485 Interface Converter 9.1702.40.002

For the installation of the USB/RS485 interface converter please proceed as follows:

1. Put the USB-plug of the RS485 converter into the provided socket of the PC.
2. The PC identifies a new instrument, and displays it as follows.
3. Select in the dialogue “No, not this time”.
4. Acknowledge the next dialogue with OK.
5. Windows will install the driver for the USB/RS485 converter.
6. After successful completion the instrument is ready for use.
7. In the Windows system control a new COM-port is registered. The program “ThiesDeviceUtility.EXE” is using this port automatically.
8. Settings for RS485 half-duplex operation.

   In half-duplex operation the connections 1,2, and 6 are used. The sliding switches have to be set as follows:

   1: ON 3: OFF

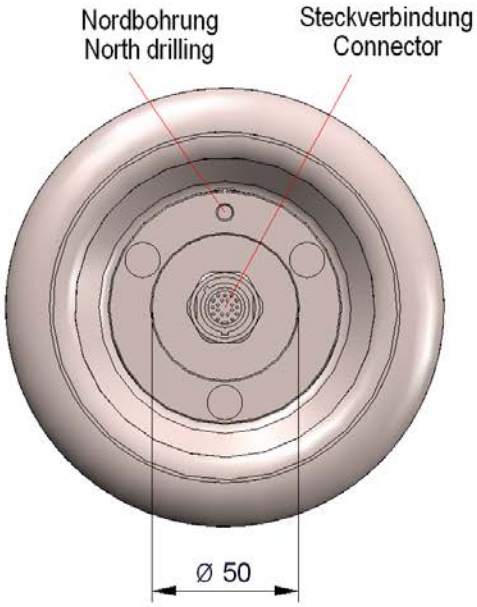
   2: OFF 4: OFF
9. Settings for RS485 full-duplex operation.

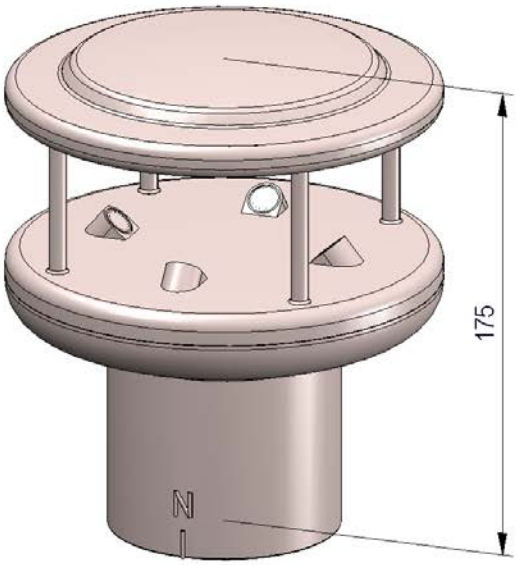
   In full-duplex operation the connections 1,2,3,4, and 6 are used. The sliding switches must be set as follows:

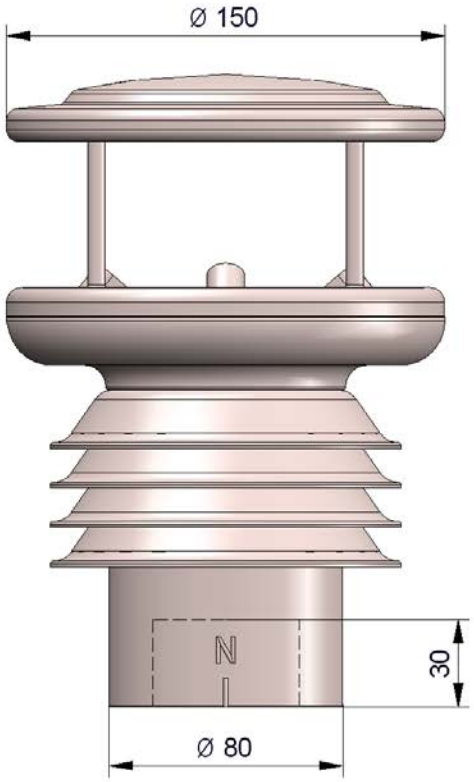
   1: ON 3: ON

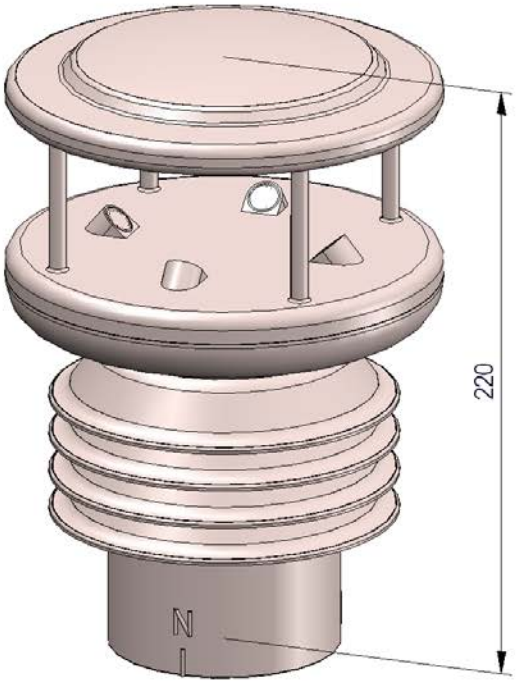
   2: OFF 4: ON

7 Dimensional Drawing









8 Technical Data

Parameter			
Wind velocity [1]	Measuring range	0.01 ... 60m/s Scaling of analogue output freely selectable.	
	Accuracy	≤ 10m/s:	±0.25m/s (rms - mean over 360°)
		≤ 30m/s:	±2.5% (rms - mean over 360°)
		30 ... 60m/s:	±3.5% (rms - mean over 360°)
	Resolution	0.1m/s:	in telegrams 1, 2, 3, 5, 6
		0.01m/s:	in telegram 14
Wind direction [1]	Measuring range	0 ... 360°	
	Accuracy	±2.0° (rms - mean over 360°) with WS > 2m/s ±3.0° (rms - mean over 360°) with WS > 35m/s	
	Resolution	1°:	in telegrams 1, 2, 3, 4, 6
		0.1°:	in telegrams 5, 14
Acoustic virtual temperature [2]	Measuring range	-50 ... +80°C	
	Accuracy	±0,5K at absolutely dry air in the range of 20°C. The acoustic temperature is not suitable for the exact measurement of air temperature. It serves exclusively for the verification of the acquired wind measuring values	
	Resolution	0.1K	
Air temperature [3]	Measuring range	-50 …+80°C	
	Accuracy	±0.3K @ 25°C ±0.5K @ -45 … +60°C ±1.0K @ -50 … +80°C	
	Resolution	0.1K	
	Long-term stability	< 0.04K per year	
Air humidity, relative [3]	Measuring range	0 …100% relative humidity	
	Accuracy	±1.8% of 10 … 90%, ±3.0% of 0 … 100%	
	Long-term stability	<0.5% per year	
	Resolution	0.1%	
Air pressure [3]	Measuring range	260 … 1260hPa	
	Accuracy	typ. ± 0,25hPa @ -20 … +80°C @ 800…1100hPa	
		typ. ± 0,50hPa @ -20 … +80°C @ 600…1100hPa	
		typ. ± 1,00hPa @ -50 … -20°C @ 600…800hPa	
	Resolution	0,1hPa	
	Long-term stability	typ. ± 0,3hPa pro Jahr	
Brightness [4]	Measuring range	1 … 150.000Lux	
	Accuracy	3% of relative measured value	
	Resolution	Approx. 0.3% of measuring value	
Brightness direction [4]	Measuring range	0 … 360°, 0° ≙ Brightness <10.000Lux	
	Accuracy	Typically < 2° in direct sunlight without clouds	
Twilight [4]	Measuring range: Accuracy: Resolution:	0 … 250Lux 3% of relative measured value Approx. 0.3% of measuring value	
Precipitation [5]	Measuring ranges:		
	Intensities	0.001 … 999mm/h	

	Resolution intensity	0.001mm/h
	Daily total	0.01 … 999mm
	Resolution daily total	0.01mm
	Droplet size	0.25 … 5.0mm, large as hail
	Accuracy with precipitation	With 95% of the precipitations deviations less than 10% compared with Thies Laser Precipitation Monitor (Reference)
	Type of precipitation	Rain, snow, sleet, ice crystals, hail
Rain Temperature [9]	Measuring range	5 … 50°C
	Resolution	0,1°C
	Accuracy	0,5°C
Electr. compass [6] Differential angle of instrument north marking to magnetic north pole	Measuring range	1 … 360°
	Accuracy	Typically <2° in magnetically undisturbed environment
	Resolution	0.1°
Derivative Parameter		
Absolute Humidity [3]	Measuring Range: Resolution:	0 …10,00g/m³ 0.01g/m³
Dew point temperature [3]	Measuring range: Accuracy: Resolution:	Data see „Air Temperature“
Windchill temperature [3] Remark: measuring value valid only from ≤10°C	Measuring range: Accuracy: Resolution:	Data see „Air Temperature“
Heat index temperature [3] Remark: measuring value valid only from ≥26°C	Measuring range: Accuracy: Resolution:	Data see „Air Temperature“
Direction of magnetic compass (optionally) [6]	Measuring range: Accuracy: Resolution:	1 … 360° Typ. <2° in magnetically undisturbed surroundings. 0.1°
Global radiation[8] is calculated with the brightness measurement.	Measuring range: Accuracy: Resolution:	0 … 2000W/m² Typ. ± 30W/m² compared to a Class B pyranometer 1W/m²
Data output digital [7]	Interface	RS 485 / RS 422 Electrically isolated from supply
	Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600 selectable
	Output	Instantaneous values, sliding means from 100msec to 10min in increments of 100msec freely selectable. The mean value of the last minute is always output for the precipitation intensity. Precipitation totals are reset at the beginning of the next day "00:00:00".

	Output rate	One per 20msec to one per 60 seconds in increments of 1msec freely selectable.
	Protocol	ASCII- Thies-Format and MODBUS RTU
	Parameter	All a/m parameters, including derivative parameters, are depending on the respective model.
Data output analogue [7]	Electrical outputs	0 ... 10V Electrically isolated from supply. Please see table 9. selectable parameters with scaling.
Attention: For the actual scaling of the analogue outputs, please refer to the supplementary sheet "Factory setting" on delivery or Table 9.		
	Quantity	max. 8
	Burden	Permissible burden on voltage output: ≥2000Ω.
	Output	Instantaneous values, sliding means from 100msec to 2min in increments of 100msec freely selectable.
	Output rate	Update rate at an output rate (see command OR) >= 250msec always 250msec. For output rates < 250msec applies: update rate = output rate. Recommended output rates >= 100msec with an average AV1 = 100mesc
	Resolution	16bit
	Parameter	@ 4.9200.x0.00x : WV, WD, Temp., Rel. H., Air Pressure; Brightness, Direction of brightness, Precipitation
		@ 4.9201.x0.00x : WV, WD, Temp., Rel. H., Air Pressure
		@ 4.92x2.x0.00x : WV, WD, Brightness, Precipitation
		@ 4.9203.x0.00x : WV, WD,
GPS reception	Low power consumption GPS receiver, integrated RTC and antenna	
	Service life of the RTC (buffered by battery)	Ca. 10 years
General	Internal measuring rate	Wind: up to 500 propagation time measurements per second, up to 125 complete measuring sequences/second incl. calculations. Temperature, humidity, pressure, precipitation, brightness: updated 1x a second.
	Bus mode	Bus mode with up to 99 devices possible.
	Firmware update	Firmware update via RS422/485 with 4800 Bd..115200 Bd 8N1 in full duplex and half duplex mode.

	Temperature range	Operating temperature -50 ... +80°C Storage temperature -55 ... +80°C
Operating voltage	Supply without heating	6 ... 40V DC or 10 ... 28V AC 50Hz / 60Hz typ. 50mA @ 24V
	Supply with cover heating	24V AC/DC ±15 %, 1,1A typically @ 24V nominal
	Supply with ultrasonic transducer heating	6 ... 40V DC or 10 ... 28V AC 50Hz / 60Hz typ. 400mA @ 24V
	Supply with ultrasonic transducer heating and cover heating	24V AC/DC ±15 %, 1,4A typically @ 24V nominal
	Type of protection	IP 67 (when mounted correctly, see section "5. Installation").
Housing	4.92xx.xx.xxx	Plastic: LEXAN (polycarbonate, UV-stabilised) impact and weather-resistant.
	Mounting	e.g. on mast tube outer-Ø 48 … 49mm, inner-Ø >30mm
	Type of connection	19 pin plug connection.
	Weight	Approx. 900g (full version)

1),2), 3), 4), 5), 6), 7), 8) @ 4.92x0.x0.00x
1), 2), 3), 6), 7) @ 4.9201.00.00x
1), 2), 4), 5), 6), 7) 8) @ 4.9202.x0.xxx
1), 2), 6) 7) @ 4.9203.00.00x
9) @ 4.9200.20.xxx

9 More Information / Documents as download

Further information can be found in the instructions for use. These document and also the instruction for use are available for download under the following links.

Short instruction for use

https://www.thiesclima.com/db/dnl/4.920x.x0.xxx_Clima_Sensor_US_e.pdf

Instruction for use

https://www.thiesclima.com/db/dnl/4.920x.x0.xxx_Clima_Sensor_US_e_short.pdf

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

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