

## Clima Sensor US

The CLIMA Sensor US offers a comprehensive range of weather data - combined with state-of-the-art measurement accuracy and maintenance-free technology. Integration into existing infrastructures is facilitated by various communication interfaces (Modbus, ASCII, 0-10V), while the shockproof and UV-resistant LEXAN® housing reliably protects the sensor even in extreme environments (-50°C to +80°C).

Recorded weather parameters:

Wind: Wind speed, wind direction (ultrasonic technology)

Radiation & light: Global radiation, brightness (4 hemispheres), twilight

Precipitation: status, amount, intensity, type

Air values: temperature, absolute & relative humidity, dew point

Air pressure: Absolute & relative air pressure

GPS receiver: Position, altitude, time, date, sun position,

E-compass: North orientation

Typical areas of application:

Solar parks & PV performance measurement: Optimization of energy yields

Building automation: intelligent control of air conditioning, shading and ventilation systems

Smart city: environmental monitoring and weather forecast models

Agriculture & greenhouses: Precise control of irrigation and climate

Meteorology & research: High-precision recording of weather and climate data

## Specification

**Part number: 4.920x.x0.00x**

### Wind speed

|                 |                                                                                                                                                               |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measuring range | 0 ... 60 m/s                                                                                                                                                  |
| Resolution      | 0.1 m/s ( standard )                                                                                                                                          |
| Accuracy        | 0 ... 10 m/s $\pm 0.25$ m/s (rms - mean over 360 °)<br>10 ... 30 m/s $\pm 2.5$ % (rms - mean over 360 °)<br>30 ... 60 m/s $\pm 3.5$ % (rms - mean over 360 °) |

### Wind direction

|                 |                                   |
|-----------------|-----------------------------------|
| Measuring range | 0 ... 360 °                       |
| Resolution      | 1 °<br>0.1 ° in special telegrams |
| Accuracy        | $\pm 2$ ° WS $> 2$ m/s            |

### Data output digital

|                |                                                                                    |
|----------------|------------------------------------------------------------------------------------|
| Interface      | RS485 / RS422                                                                      |
| Baudrate       | 1200 ... 921600 Baud                                                               |
| Data values    | div. meas. data, date, time, check sum, Precipitation type according to Synop etc. |
| Output range   | 1 per 10 msec up to<br>1 per 60sec                                                 |
| Status signals | heating, Meas section error, Temperature of meas section                           |
| Protocol       | ASCII ( preselected )                                                              |

### Data output analog

|                   |                                                                                                           |
|-------------------|-----------------------------------------------------------------------------------------------------------|
| Type              | max. 8 x 0 ... 10 V                                                                                       |
| Wind speed        | 0 ... 10 V                                                                                                |
| Stromausgang      | max. 400                                                                                                  |
| Wind direction    | 0 ... 10 V                                                                                                |
| Voltage output    | min. 2000                                                                                                 |
| Output parameters | wind speed, wind direction, brightness, precipitation, rel. humidity, air temperature, air pressure, etc, |

#### Operating voltage

|            |                                                     |
|------------|-----------------------------------------------------|
| Electronic | 6 ... 40V DC or<br>10 ... 28 V AC / typ. 50mA @ 24V |
| Heating    | 24 V AC/DC, typ 1,4 A @ 24V                         |

#### General

|                    |                                             |
|--------------------|---------------------------------------------|
| Bus operation      | up to 98 sensors                            |
| Electr. connection | 19 pol. connector                           |
| Mounting           | on a mast tube 1,5"                         |
| Housing            | Plastic LEXAN (Polycarbonat, UV-stabilised) |
| Protection         | IP 67                                       |

## Versions

As per 4.920x.x0.00x, but:

#### Product number 4.9200.00.001

##### Precipitation

|                         |                     |
|-------------------------|---------------------|
| Measuring range general | 0.001 ... 10 mm/min |
| Accuracy                | typ. 95%            |

##### Radiation

|                 |                                                                                                      |
|-----------------|------------------------------------------------------------------------------------------------------|
| Measuring range | 0 ... 2000 W/m <sup>2</sup>                                                                          |
| Accuracy        | ± 30 W/m <sup>2</sup> compared to a Class B pyranometer, calculated from brightness and sun position |

##### Temperature

|                 |                    |
|-----------------|--------------------|
| Measuring range | -45 ... +80 °C     |
| Accuracy        | ±0,3 K ( @ 25 °C ) |

##### Rel. Humidity

|                 |                                         |
|-----------------|-----------------------------------------|
| Measuring range | 0 ... 100 % rel. h.                     |
| Accuracy        | ± 1.8 % rel. h. ( 10 ... 90 % rel. H. ) |

##### Brightness

|                 |                             |
|-----------------|-----------------------------|
| Measuring range | 0 ... 150 kLux              |
| Accuracy        | 3 % of rel. measuring value |

##### Twilight

|                 |                             |
|-----------------|-----------------------------|
| Measuring range | 0 ... 250 Lux               |
| Accuracy        | 3 % of rel. measuring value |

##### Air pressure

|                 |                  |
|-----------------|------------------|
| Measuring range | 260 ... 1260 hPa |
|-----------------|------------------|

Accuracy                    ±0.25 hPa @ - 20 ... +80 °C @ 800 ... 1100 hPa  
                                  ±0.50 hPa @ - 20 ... +80 °C @ 600 ... 800 hPa  
                                  ±1.00 hPa @ - 50 ... -20 °C @ 600 ... 1100 hPa

#### Data output digital

Protocol                    MODBUS RTU ( preselected )

#### Data output analog

Output parameters        wind speed, wind direction, brightness, precipitation, rel. humidity, air temperature, air pressure , etc.

#### General

Dimension                Ø 150 x 220 mm

Weight                    0.9 kg

#### Product number 4.9201.00.000

##### Temperature

Measuring range        -45 ... +80 °C

Accuracy                ±0,3 K ( @ 25 °C )

##### Rel. Humidity

Measuring range        0 ... 100 % rel. h.

Accuracy                ± 1.8 % rel. h. ( 10 % ... 90 % rel. H. )

##### Air pressure

Measuring range        260 ... 1260 hPa

Accuracy                ±0.25 hPa @ - 20 ... +80 °C @ 800 ... 1100 hPa  
                                  ±0.50 hPa @ - 20 ... +80 °C @ 600 ... 800 hPa  
                                  ±1.00 hPa @ - 50 ... -20 °C @ 600 ... 1100 hPa

#### Data output analog

Output parameters        wind speed, wind direction, rel. humidity, air temperature, air pressure , etc.

#### General

Dimension                Ø 150 x 220 mm

Weight                    0.9 kg

#### Product number 4.9201.00.001

##### Temperature

Measuring range        -45 ... +80 °C

Accuracy                ±0,3 K ( @ 25 °C )

##### Rel. Humidity

Measuring range        0 ... 100 % rel. h.

Accuracy                ± 1.8 % rel. h. ( 10 % ... 90 % rel. H. )

##### Air pressure

Measuring range        260 ... 1260 hPa

Accuracy                ±0.25 hPa @ - 20 ... +80 °C @ 800 ... 1100 hPa  
                                  ±0.50 hPa @ - 20 ... +80 °C @ 600 ... 800 hPa  
                                  ±1.00 hPa @ - 50 ... -20 °C @ 600 ... 1100 hPa

#### Data output digital

Protocol                    MODBUS RTU ( preselected )

#### Data output analog

Output parameters      wind speed, wind direction, rel. humidity, air temperature, air pressure , etc.

#### General

Dimension                  Ø 150 x 220 mm

Weight                      0.9 kg

#### Product number 4.9202.00.000

##### Precipitation

Measuring range  
general                      0.001 ... 10 mm/min

Accuracy                      typ. 95%

##### Radiation

Measuring range              0 ... 2000 W/m<sup>2</sup>

Accuracy                      ± 30 W/m<sup>2</sup> compared to a Class B pyranometer, calculated from brightness and sun position

##### Brightness

Measuring range              0 ... 150 kLux

Accuracy                      3 % of rel. measuring value

##### Twilight

Measuring range              0 ... 250 Lux

Accuracy                      3 % of rel. measuring value

##### Data output analog

Output parameters              wind speed, wind direction, brightness, precipitation, etc.

#### General

Dimension                  Ø 150 x 175 mm

Weight                      0.7 kg

#### Product number 4.9202.00.001

##### Precipitation

Measuring range  
general                      0.001 ... 10 mm/min

Accuracy                      typ. 95%

##### Radiation

Measuring range              0 ... 2000 W/m<sup>2</sup>

Accuracy                      ±30 W/m<sup>2</sup> im Vergleich zu einem Class B Pyranometer, berechnet aus Helligkeiten und Sonnenstand

##### Brightness

Measuring range              0 ... 150 kLux

Accuracy                      3 % of rel. measuring value

##### Twilight

Measuring range              0 ... 250 Lux

Accuracy                      3 % of rel. measuring value

##### Data output digital

Protocol                      MODBUS RTU ( preselected )

##### Data output analog

Output parameters      wind speed, wind direction, brightness, precipitation, etc.

#### General

Dimension              Ø 150 x 175 mm

Weight                  0.7 kg

#### Product number 4.9203.00.000

##### Data output analog

Output parameters                      wind speed, wind direction, etc.

#### General

Dimension                      Ø 150 x 175 mm

Weight                          0.7 kg

#### Product number 4.9203.00.001

##### Data output digital

Protocol                      MODBUS RTU ( preselected )

##### Data output analog

Output parameters                      wind speed, wind direction, etc.

#### General

Dimension                      Ø 150 x 175 mm

Weight                          0.7 kg

#### Product number 4.9200.20.000

##### Precipitation

Measuring range              0.001 ... 10 mm/min  
general

Accuracy                      typ. 95%

##### Radiation

Measuring range              0 ... 2000 W/m<sup>2</sup>

Accuracy                      ± 30 W/m<sup>2</sup> compared to a Class B pyranometer, calculated from brightness and sun position

##### Temperature

Measuring range              -45 ... +80 °C

Accuracy                      ±0,3 K ( @ 25 °C )

##### Rain Temperature

Measuring range              5 ... 50 °C

Accuracy                      0,5 °C

##### Rel. Humidity

Measuring range              0 ... 100 % rel. h.

Accuracy                      ± 1.8 % rel. h. ( 10 ... 90 % rel. H. )

##### Brightness

Measuring range              0 ... 150 kLux

Accuracy                      3 % of rel. measuring value

##### Twilight

Measuring range              0 ... 250 Lux

Accuracy 3 % of rel. measuring value

#### Air pressure

Measuring range 260 ... 1260 hPa

Accuracy  $\pm 0.25$  hPa @ - 20 ... +80 °C @ 800 ... 1100 hPa  
 $\pm 0.50$  hPa @ - 20 ... +80 °C @ 600 ... 800 hPa  
 $\pm 1.00$  hPa @ - 50 ... -20 °C @ 600 ... 1100 hPa

#### Data output analog

Output parameters wind speed, wind direction, brightness, precipitation, rel. humidity, air temperature, air pressure , etc.

#### General

Dimension Ø 150 x 220 mm

Weight 0.9 kg

#### Product number 4.9200.20.001

#### Precipitation

Measuring range 0.001 ... 10 mm/min  
 general

Accuracy typ. 95%

#### Radiation

Measuring range 0 ... 2000 W/m<sup>2</sup>

Accuracy  $\pm 30$  W/m<sup>2</sup> compared to a Class B pyranometer, calculated from brightness and sun position

#### Temperature

Measuring range -45 ... +80 °C

Accuracy  $\pm 0,3$  K ( @ 25 °C )

#### Rain Temperature

Measuring range 5 ... 50 °C

Accuracy 0,5 °C

#### Rel. Humidity

Measuring range 0 ... 100 % rel. h.

Accuracy  $\pm 1.8$  % rel. h. ( 10 ... 90 % rel. H. )

#### Brightness

Measuring range 0 ... 150 kLux

Accuracy 3 % of measuring value

#### Twilight

Measuring range 0 ... 250 Lux

Accuracy 3 % of measuring value

#### Air pressure

Measuring range 260 ... 1260 hPa

Accuracy  $\pm 0.25$  hPa @ - 20 ... +80 °C @ 800 ... 1100 hPa  
 $\pm 0.50$  hPa @ - 20 ... +80 °C @ 600 ... 800 hPa  
 $\pm 1.00$  hPa @ - 50 ... -20 °C @ 600 ... 1100 hPa

#### Data output digital

Protocol MODBUS RTU ( preselected )

#### Data output analog

Output parameters      wind speed, wind direction, brightness, precipitation, rel. humidity, air temperature, air pressure , etc.

#### General

Dimension                Ø 150 x 220 mm

Weight                    0.9 kg

#### Product number 4.9202.20.000

##### Precipitation

Measuring range        0.001 ... 10 mm/min  
general

Accuracy                typ. 95%

##### Radiation

Measuring range        0 ... 2000 W/m<sup>2</sup>

Accuracy                ± 30 W/m<sup>2</sup> compared to a Class B pyranometer, calculated from brightness and sun position

##### Rain Temperature

Measuring range        5 ... 50 °C

Accuracy                0,5 °C

##### Brightness

Measuring range        0 ... 150 kLux

Accuracy                3 % of rel. measuring value

##### Twilight

Measuring range        0 ... 250 Lux

Accuracy                3 % of rel. measuring value

#### Data output analog

Output parameters      wind speed, wind direction, brightness, precipitation, etc.

#### General

Dimension                Ø 150 x 175 mm

Weight                    0.7 kg

#### Product number 4.9202.20.001

##### Precipitation

Measuring range        0.001 ... 10 mm/min  
general

Accuracy                typ. 95%

##### Radiation

Measuring range        0 ... 2000 W/m<sup>2</sup>

Accuracy                ± 30 W/m<sup>2</sup> compared to a Class B pyranometer, calculated from brightness and sun position

##### Rain Temperature

Measuring range        5 ... 50 °C

Accuracy                0,5 °C

##### Brightness

Measuring range        0 ... 150 kLux

Accuracy 3 % of rel. measuring value

#### Twilight

Measuring range 0 ... 250 Lux

Accuracy 3 % of rel. Measuring value

#### Data output digital

Protocol MODBUS RTU ( preselected )

#### Data output analog

Output parameters wind speed, wind direction, brightness, precipitation, etc.

#### General

Dimension Ø 150 x 175 mm

Weight 0.7 kg

#### Product number 4.9200.00.000

#### Precipitation

Measuring range  
general 0.001 ... 10 mm/min

Accuracy typ. 95%

#### Radiation

Measuring range 0 ... 2000 W/m<sup>2</sup>

Accuracy ± 30 W/m<sup>2</sup> compared to a Class B pyranometer, calculated from brightness and sun position

#### Temperature

Measuring range -45 ... +80 °C

Accuracy ±0,3 K ( @ 25 °C )

#### Rel. Humidity

Measuring range 0 ... 100 % rel. h.

Accuracy ± 1.8 % rel. h. ( 10 % ... 90 % rel. H. )

#### Brightness

Measuring range 0 ... 150 kLux

Accuracy 3 % of rel. measuring value

#### Twilight

Measuring range 0 ... 250 Lux

Accuracy 3 % of rel. measuring value

#### Air pressure

Measuring range 260 ... 1260 hPa

Accuracy  
±0.25 hPa @ - 20 ... +80 °C @ 800 ... 1100 hPa  
±0.50 hPa @ - 20 ... +80 °C @ 600 ... 800 hPa  
±1.00 hPa @ - 50 ... -20 °C @ 600 ... 1100 hPa

#### Data output analog

Output parameters wind speed, wind direction, brightness, precipitation, rel. humidity, air temperature, air pressure , etc.

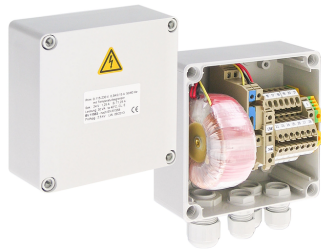
#### General

Dimension Ø 150 x 220 mm

Weight 0.9 kg

Accessories

| Product | Product name                       | Brief description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         | Cable for Clima Sensor US 509311   | <div>Cable assembled, 16-core connecting cable for Clima Sensor US</div> <div><div>• length 10 m</div><div><div>General</div><div><div>Cable</div><div>FRNC 16 x 0,25 mm²</div></div><div><div>Length</div><div>10 m</div></div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|         | Cable for Clima Sensor US 509427   | <div>Cable assembled, 8-core connecting cable for Clima Sensor US.</div> <div><div>• length 10 m</div><div><div>General</div><div><div>Cable length</div><div>10 m</div></div><div><div>Cable</div><div>LiYCY 8 x 0,25 mm²</div></div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|         | Thies Device Utility 9.1700.81.000 | <div><div>The PC program “Thies Device Utility” serves for the initial operation and configuration of Thies sensors with serial interface.</div><div>The program can find all sensors connected to the PC, and facilitates an initial operation via terminal function. Thanks to a user-friendly surface design the communication with the sensors is very easy.</div><div><div>General</div><div><div>Function</div><div>searching for Thies-sensors<br/>settings for the communication monitor-presentation of instantaneous measuring values and settings</div></div><div><div>Compatibility</div><div><div>Connectable instruments</div><div>Weather Station Compact WSC11 4.9056.00.000<br/>Clima Sensor US 4.920x.00.000<br/>US-Anemometer 2D 4.38xx.xx.xxx<br/>US-Anemometer 3D 4.3830.xx.xxx<br/>US-Anemometer 2D compact 4.3875.xx.xxx<br/>etc.</div></div><div><div>System requirements</div><div>PC with Windows 7 or higher</div></div></div></div></div> |



Power supply  
Unit  
9.3389.20.000

Serves for the power supply of the ClimaSensor US as well as for the connection and distribution of cable resp. cable wires.

- primary:  
• 230 V AC  
secondary:  
• 24 V AC / 30 W

**Operating voltage**

|           |                     |
|-----------|---------------------|
| Primary   | 230 V AC / 115 V AC |
| Secondary | 24 V AC / 30 W      |

**Electrical connection**

|                  |                            |
|------------------|----------------------------|
| Series terminals | 16                         |
| Cable gland      | 3 x M16x1.5<br>1 x M20x1.5 |

**General**

|            |                          |
|------------|--------------------------|
| Housing    | plastic                  |
| Protection | IP 66                    |
| Dimension  | ca. 125 x 112.5 x 104 mm |
| Weight     | approx. 1.5 kg           |

