



BROCHURE:

Modbus Weather Solutions

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What are Modbus Weather Solutions?

What are Modbus Weather Solutions?

Lambrecht meteo provides a large range of Modbus sensors for all common weather parameters. You can select the best combination of sensors for your specific application and create a personalized solution or weather station.

OVERVIEW met[LOG]

- Real-time access to measurement data via integrated web server, visualized in your browser with met[APP]
- Easy management of your weather data (wind direction, wind speed, relative humidity, temperature, air pressure, global radiation, precipitation)
- Calculation of trends and progressions, as well as automatic corrections of altitude and air pressure
- Alerts adjustable by digital outputs
- Full performance within seconds due to autoconfiguration at the push of a button

ID 00.95800.010000	Data Logger met[LOG] incl. SD card
Interface:	3 x RS 485; A+, B-; half duplex
Input:	4 analogue/ digital inputs Range: 0...10 V (configurable); $R_i \geq 10 \text{ K}\Omega$
Output:	4 digital outputs digital maximum output voltage: $V_O - 0.1 \text{ V}$ up to $V_O \cdot \text{max. } 0.7 \text{ A}$
Ethernet:	10/100 BaseT; plug RJ45 shielded
Power Supply (V_O):	11...32 V DC; Caution: The power supply is switched through to the digital outputs.
Current consumption:	500 mW typically (no digital output active)
Operating temperature:	-40...+85 °C
EMC:	IEC 61000-4-2 up to 8 kV
Bracket:	DIN rail mount 3 TE
Dimensions/ Weight:	17.8 x 89 x 60 mm / 62 g
Web server:	Integrated web page to display instantaneous values; configuration web page; data export
Alarm:	8 freely configurable warning channels; direction-dependent wind warning; logical linking of warning channels
Auto configuration:	Automatic configuration of the connected Lambrecht meteo Modbus sensors



met[LOG] with met[APP]

The data logger met[LOG] and the browser app met[APP] quickly and easily transfer your climate data to your network (LAN).



Browser-App met[APP]

The browser app works platform-independently with all common browsers, such as Google Chrome, Safari, Firefox, Edge and Mozilla.

- Display real-time values from your station on PC, laptop, tablet, or smartphone
- Export the measured values stored by the met[LOG]
- Configuration of the met[LOG]

| Data logger Ser[LOG]:
| One for all



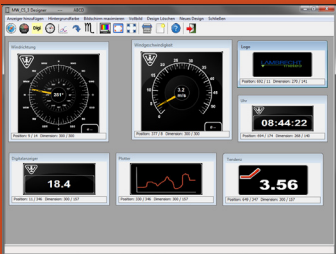
Data logger Ser[LOG]: One for all

The Ser[LOG] gives you the maximum freedom for individual adaptations of your measurement tasks. Modular design and a variety of configuration options ensure expandability.

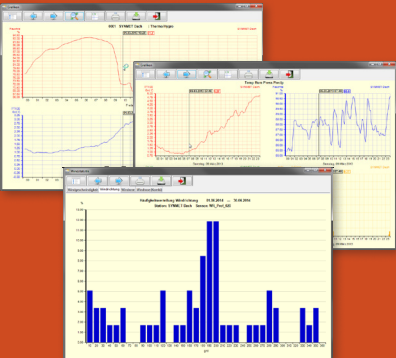
Overview:

- Easy configuration with the **Ser[LOG] Commander** app
- Acquire up to 60 measured values to process with Modbus RTU
- Up to 32 Modbus TCP connections with sensors from other manufacturers
- Extensive sensor library with predefined sensors
- Simple expandability of the sensor library with sensors of other manufacturers
- Supports 16-bit and 32-bit registers (standard, floating point in addition)

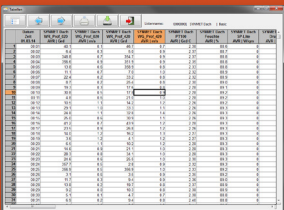
FUNCTIONS METEOWARE CS:



Individualization of the instantaneous value display with MeteoWare Designer



Selectable evaluation definitions, evaluation period, graphic types



Tabular evaluations with many options

ID 00.95770.000000	Data Logger Ser[LOG]
Resolution:	16-Bit-ADC with up to 1024-times oversampling; processing in 8-byte IEEE real format
Signal input:	COM5 also as SDI12; 2 status inputs
Output:	2 potential-free, configurable relays; with maximum 8 Modbus relays expandable up to 10 relays
Interface:	5 x RS 485; 6 x RS 422; 4 x RS 232; USB device; USB host; Ethernet
Operating conditions:	-30...+70 °C; 5...95 % r. h. (non condensing)
Supply voltage:	10...30 VDC
Current consumption:	From 34 mA (12 V) up to 200 mA (12 V); configuration-dependent
Storage capacity:	1 year in ring buffer (8-byte IEEE real format); configuration-independent
Ethernet:	100 MBit; connector RJ45
Dimensions/ Weight:	135 x 135 x 72 mm / approx. 0.9 kg
EMC Standards / Electrical safety:	IEC 60945; RS422 and RS485 up to 2.5 kV isolated all interfaces with 15 kV ESD protection
Scope of delivery:	USB cable, configuration software Ser[LOG] Commander

Various applications

Various applications:



1. SOLAR ENERGY

All Modbus sensors are used via plug-and-play either stand-alone or as a complete weather station. They are especially suitable for capturing weather data in photovoltaic systems.

2. INDUSTRY

The proven bus structure with the Modbus RTU interface is cost-effective, easy to set up, and interference-proof even over long distances.



3. BUILDING AUTOMATION

Fast detection of building conditions and efficient switchings ensure smooth operation and decrease resource consumption of the facilities.



Overview of connectable sensors

Overview of connectable sensors

MAXIMUM FLEXIBILITY

You can craft your individual Modbus Solution from a wide array of available sensors to achieve the correct parameters. This includes heated and unheated sensors. You can use the chart below to help you find the right sensors for your application.

Up to seven measurable parameters

Sensor	Parameter						
	Wind	Precipitation	Temperature/ Rel. Humidity	Air Pressure	Global Radiation	Dew Point (calculated)	Heating
u[sonic] Modbus	✓						✓
u[sonic]WS6 Modbus	✓		✓	✓		✓	✓
u[sonic]WS7 Modbus	✓		✓	✓	✓	✓	✓
EOLOS-Modbus	✓		✓	✓		✓	✓
ARCO-Modbus	✓						✓
PRO-Modbus	✓						✓
INDUSTRY Modbus	✓						✓
rain[e] Modbus, unheated		✓					
rain[e] Modbus, heated		✓					✓
rain[e]one Modbus, unheated		✓					
rain[e]one Modbus, heated		✓					✓
TH[pro] Modbus			✓				
THP[pro] Modbus			✓	✓			
sun[e] Modbus					✓		
16131.5-Modbus					✓		
16103-Modbus					✓		



Individual component specifications

Individual component specifications



Data Logger Ser[LOG]
ID 00.95770.000000

Data logger for serial sensors with extensive sensor library for the professional acquisition and processing of your meteorological data



Data Logger met[LOG]
ID 00.95800.010000 (incl. SD card)

The smart serial solution with the data logger met[LOG] and the browser app met[APP] bring your climate data easily and quickly into your network (LAN)



Combined Ultrasonic Wind Sensor u[sonic] Modbus
ID 00.16470.100130

Measuring range: Wind direction: 0...359.9° • Wind speed: 0...75 m/s

Range of application: -40...+70 °C (with heating -50...+70 °C) • 0...100 % r. h.

Accuracy:

Wind direction: < 2° (> 1 m/s) RMSE

Wind speed: 0.2 m/s RMSE (v < 10 m/s) • 2 % RMSE (10 m/s < v < 65 m/s)



Combined Ultrasonic Weather Sensor u[sonic]WS6 Modbus
ID 00.16480.000130

Measuring range: Wind direction: 0...359.9° • Wind speed: 0...65 m/s

Range of application: -40...+70 °C (with heating -50...+70 °C) • 0...100 % r. h.

Accuracy:

Wind direction: < 2° (> 1 m/s) RMSE

Wind speed: 0.2 m/s RMSE (v < 10 m/s) • 2 % RMSE (10 m/s < v < 65 m/s)

Air temperature: 0.1 K (0...60 °C) • 0.2 K (-40...0 °C)

Relative humidity: typical 1.5 % (0...80 %) r. h. • 2 % (>80 %) r. h.

Air pressure: 0.5 mbar



Combined Ultrasonic Weather Sensor u[sonic]WS7 Modbus
ID 00.16480.001130

Measuring range: Wind direction: 0...359.9° • Wind speed: 0...65 m/s

Range of application: -40...+70 °C (with heating -50...+70 °C) • 0...100 % r. h.

Accuracy:

Wind direction: < 2° (> 1 m/s) RMSE

Wind speed: 0.2 m/s RMSE (v < 10 m/s) • 2 % RMSE (10 m/s < v < 65 m/s)

Air temperature: 0.1 K (0...60 °C) • 0.2 K (-40...0 °C)

Relative humidity: typical 1.5 % (0...80 %) r. h. • 2 % (>80 %) r. h.

Air pressure: 0.5 mbar

Global radiation: 0.2 W/m²





Static Weather Sensor EOLOS-Modbus
ID 00.16430.001032

Measuring range:

Wind direction: 0...360° • Wind speed: 0.1...85 m/s

Air temperature: -40...+70 °C • Relative humidity: 0...100 % r. h.

Air pressure: 600...1100 hPa

Range of application: -30...+70 °C (unheated • under non-icing conditions) •
-40...+70 °C (heated) • 0...100 m/s • 0...100 % r. h.

Accuracy:

Wind direction: 3° • Wind speed: 0.5 m/s ± 5 % from measured value

Air temperature: 0.8 °C (v > 2 m/s)

Relative humidity: 3 % (10...90 %) • 4 % (0...100 %)

Air pressure: 2 hPa (-40...+85 °C) • 0.5 hPa at 25 °C



Combined Wind Sensor ARCO-Modbus
ID 00.14581.030430

Measuring range:

Wind direction: 0...360°

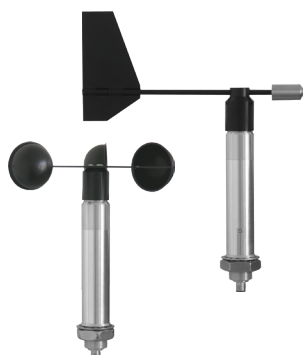
Wind speed: 0.3 ... 75 m/s

Range of application: -30...+70 °C (heated • under non-icing conditions) •
0...80 m/s • 0...100 % r. h.

Accuracy:

Wind direction: 1°

Wind speed: 2 % FS at 0.3 ... 50 m/s



Wind Sensor PRO-Modbus
ID 00.14523.131030 Wind direction • 00.14524.101030 Wind speed

Measuring range:

Wind direction: 0...360°

Wind speed: 0.5...60 m/s

Range of application: -40...+70 °C heated • maximum gusts 100 m/s • 0...100 % r. h.

Accuracy:

Wind direction: 2°

Wind speed: 0.3 m/s ≤ 10 m/s • 0.5 m/s...60 m/s



Wind Sensors INDUSTRY Modbus
ID 00.14567.110030 Wind direction • 00.14577.110030 Wind speed

Measuring range:

Wind direction: 0...360°

Wind speed: 0.7...50 m/s

Range of application: -30...+70 °C (heated) • 0...60 m/s

Accuracy:

Wind direction: 2°

Wind speed: < 2 % FS





Weighing Precipitation Sensor rain[e] Modbus
ID 00.15184.00010 unheated • 00.15184.400100 heated

Measuring range: 0...20 mm/min resp. 0...1200 mm/h

Range of application: 0...+70 °C (unheated) • -40...+70 °C (heated - no icing, no snow drifting)

Accuracy: 0.1 mm or 1 % at < 6 mm/min and 2 % at ≥ 6 mm/min



Weighing Precipitation Sensor rain[e]one Modbus
ID 00.15184.000101 unheated • 00.15184.400101 heated

Measuring range: 0...10 mm/min resp. 0...600 mm/h

Range of application: 0...+70 °C (unheated) • -40...+70 °C (heated - no icing, no snow drifting)

Accuracy: 0.1 mm/min • resp. 6 mm/h or 2 %



Combined Sensor TH[pro] Modbus
ID 00.08095.100031

Measuring range: Temperature: -40...+70 °C • Relative Humidity: 0...100 % r. h.

Accuracy:

Temperature: 0.1 K (0...60 °C) • 0.2 K (-40...0 °C)

Relative Humidity: typical 1.5 % (0...80 %) r. h. • 2 % (>80 %) r. h.



Combined Sensor THP[pro] Modbus
ID 00.08095.100030

Measuring range: Temperature: -40...+70 °C • Relative Humidity: 0...100 % r. h.
Barometric Pressure: 500...1100 hPa

Accuracy:

Temperature: ± 0.1 K (0...60 °C) • ± 0.2 K (-40...0 °C)

Relative Humidity: typical 1.5 % (0...80 %) r. h. • 2 % (>80 %) r. h.

Barometric Pressure: 2 hPa (at -30...+70 °C) • 1 hPa (at -10...+60 °C) • 0.5 hPa (at 25 °C)



Pyranometer sun[e] 'Secondary Standard' (Class A)
ID 00.16130.501030

Measuring range: -400...4000 W/m²

Global radiation in the spectral range of 285...3000 nm

Range of application: -40...+80 °C

Spectral sensitivity: < 3 % (0.35...1.5 µm) • Tilt deviation < 0.2 %





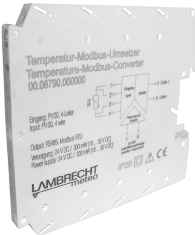
Pyranometer 16131.5-Modbus 'First Class' (Class B)
ID 00.16131.501030

Measuring range: 0...3000 W/m²
Global radiation in the spectral range of 285...3000 nm
Range of application: -40...+80 °C
Spectral sensitivity: < 3 % (0.35...1.5 µm)



Pyranometer 16103-Modbus 'Second Class' (Class C)
ID 00.16103.501060

Measuring range: 0...2000 W/m²
Global radiation in the spectral range of 285...3000 nm
Range of application: -40...+80 °C
Nonlinearity: < 1 % (100...1000 W/m²)



Pt100 Modbus Converter
ID 00.08790.000000

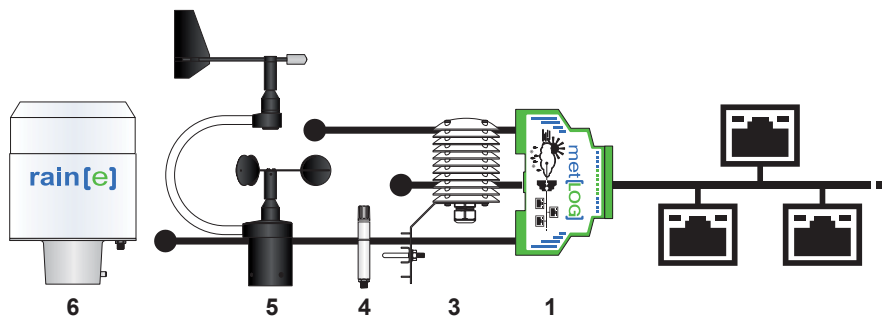
Measuring range: -40...+80 °C
Temperature influence: ± 100 ppm/K of FS
Resolution: 16 Bit
Operating condition: -40...+80 °C
Supply voltage: 24 VDC (18...30 VDC)



Module Temperature Sensor
ID 00.08290.000030

Measuring range: -40...+105 °C
Accuracy: (0.3 + 0.005 · |T|)
Measuring element: Pt100 F 0.3 resp. DIN EN 60751
Cable length: 3 m

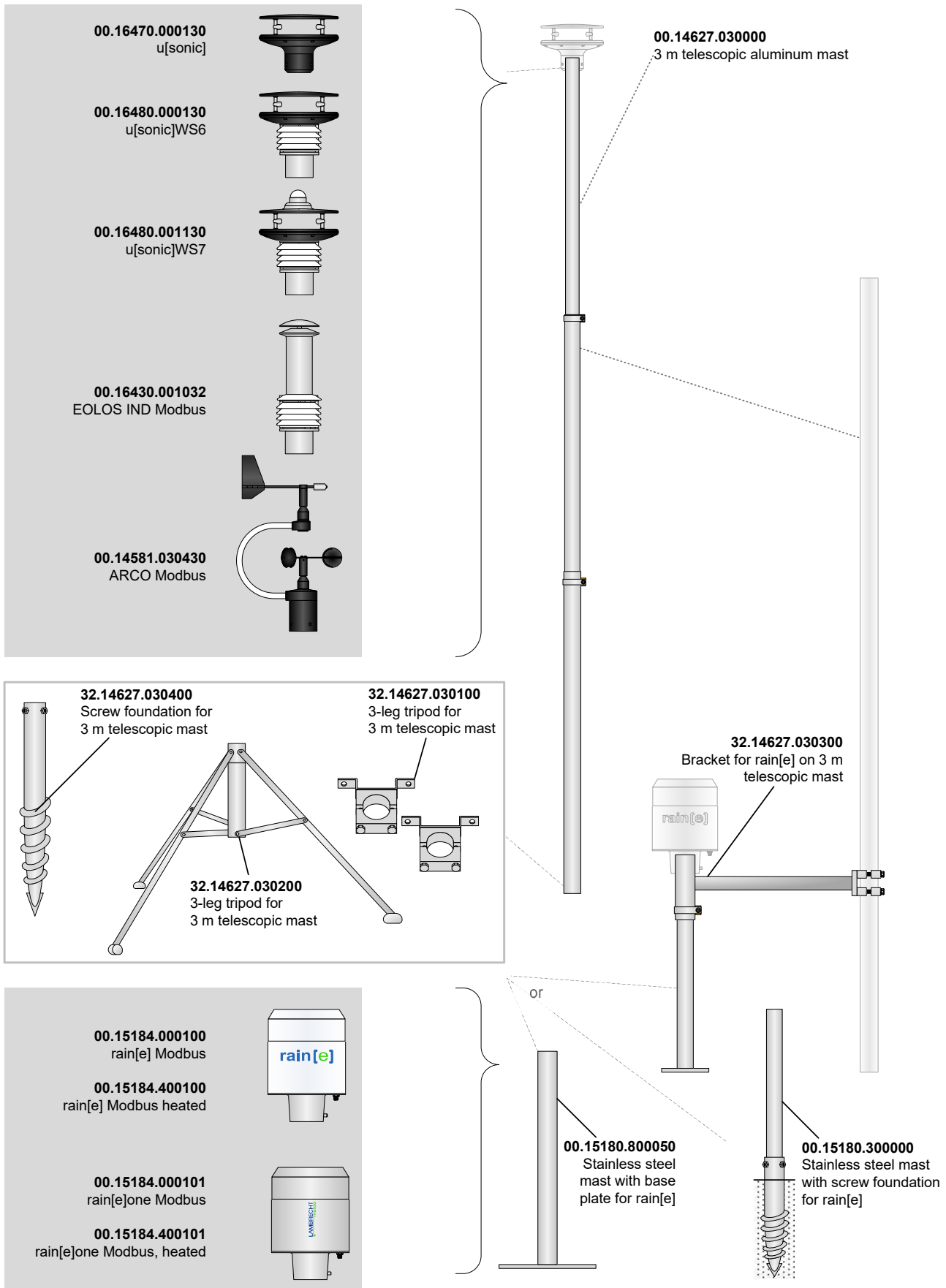
SYSTEM EXAMPLE WITH SIX MEASURABLE PARAMETERS:



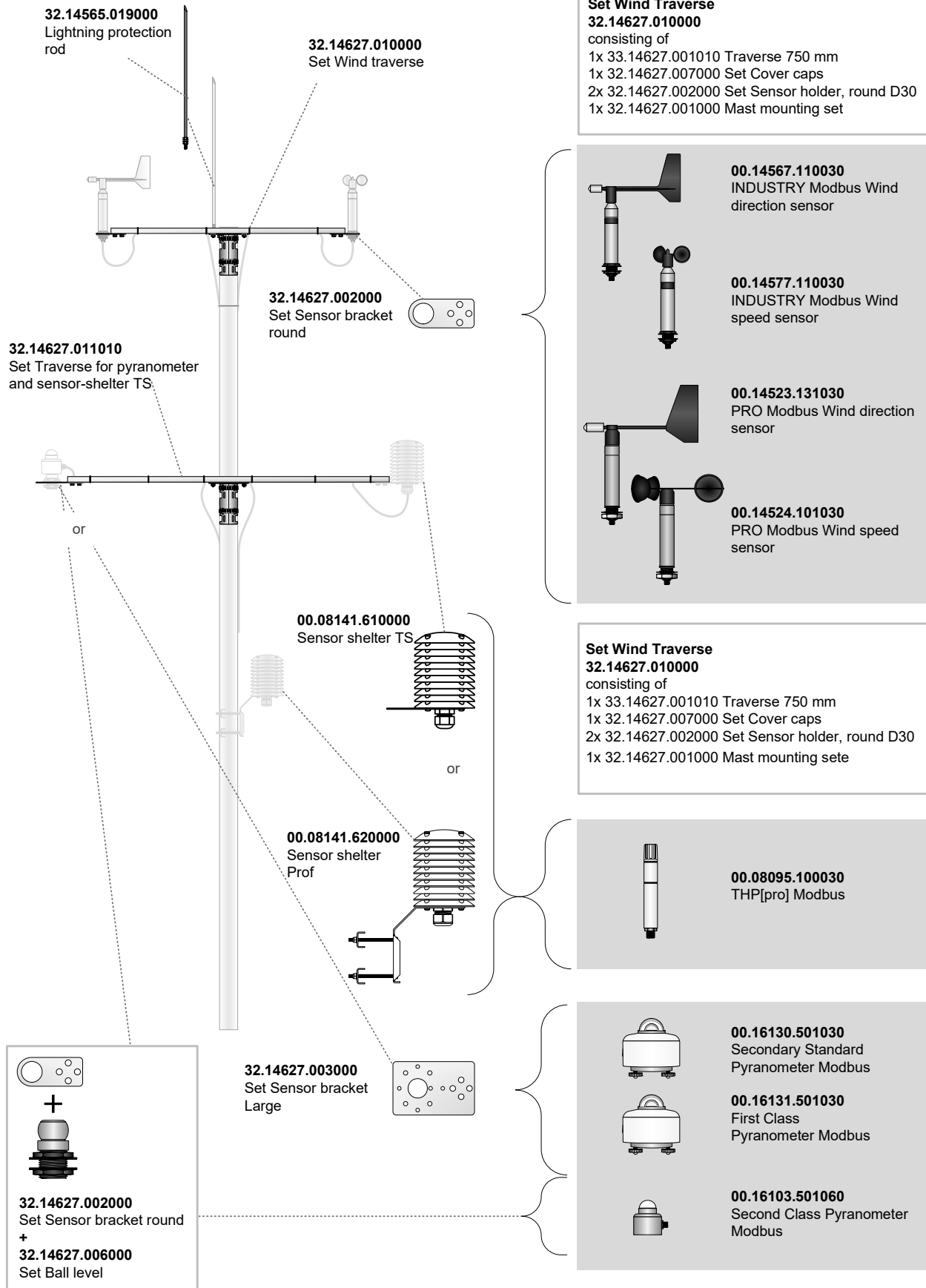
- 1 Data Logger met[LOG]
- 3 Sensor Shelter
- 4 Temperature-/Humidity/
Air Pressure Sensor
THP[pro]Modbus
- 5 Combined Wind Sensor
ARCO-Modbus
- 6 Precipitation Sensor
rain[e] Modbus



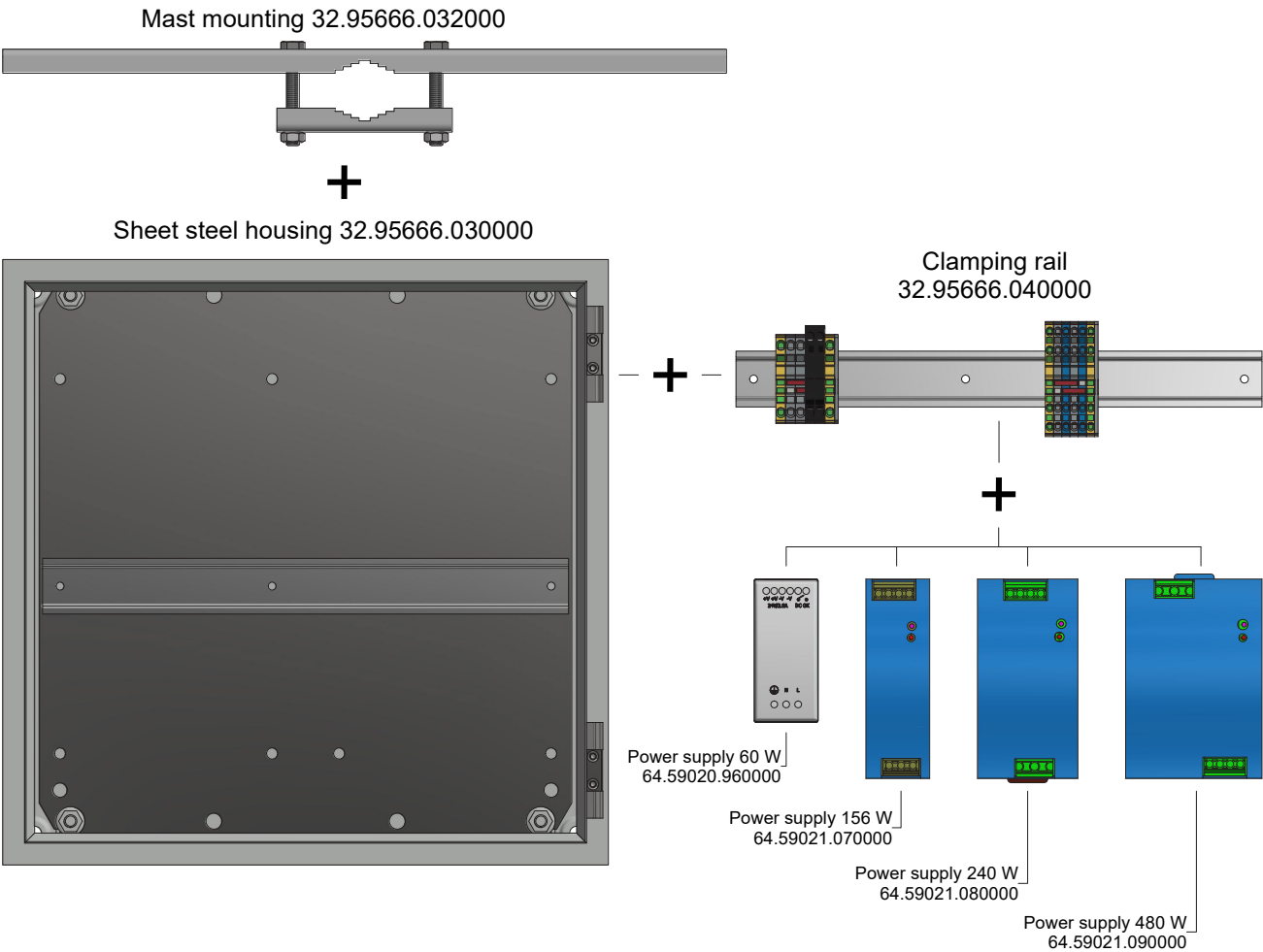
MODBUS SYSTEM COMPONENTS I:



MODBUS SYSTEM COMPONENTS II:



Ser[LOG] HOUSING COMPONENTS:



Power requirements and order overview

Power requirements and order overview

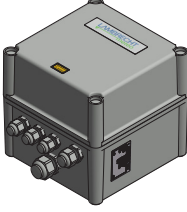
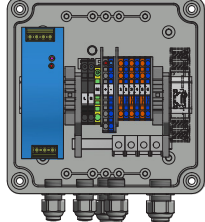
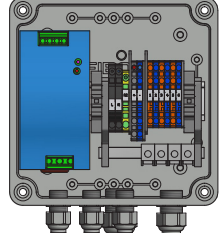
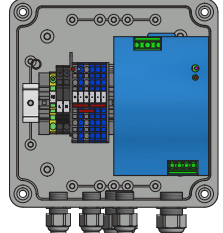
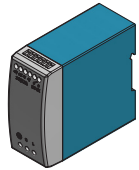
Here you can calculate the total power requirements of your sensors and select the appropriate power[cube]. In the overview, you will find all the accessories you need to complete your individual weather station. If the accessory you need is not listed, please contact our sales team at info@lambrecht.net or **+49 551 4958-0**.

Parameter	Description	ID	Power demand in Watt	
Data Logger and Software				
	met[LOG] · Data Logger incl. Memory Card	00.95800.010000	0.5	
	Ser[LOG] · Data Logger	00.95770.000000	0.5	
	Meteoware CS-3 Basis · Software	36.09340.000000	0.0	
Single and Combined Sensors				
W	INDUSTRY Modbus · Wind Direction Sensor	00.14567.110030	19.2	
W	INDUSTRY Modbus · Wind Speed Sensor	00.14577.110030	19.2	
W	PRO-Modbus · Wind Direction Sensor	00.14523.131030	19.2	
W	PRO-Modbus · Wind Speed Sensor	00.14524.101030	19.2	
TH	TH[pro] Modbus · Temperature/Humidity Sensor	00.08095.100031	0.1	
THP	THP[pro] Modbus · Temperature/Humidity/Air Pressure Sensor	00.08095.100030	0.1	
T	Module Temperature Sensor Pt100 (4-wire)	00.08290.000030	0	
T	Pt100 Modbus Converter	00.08790.000000	0.3	
G	16131.5-Modbus · Pyranometer 'First Class'	00.16131.501030	0.1	
G	16103-Modbus · Pyranometer 'Second Class'	00.16103.501060	0.1	
G	sun[e] Modbus · Pyranometer 'Secondary Standard'	00.16130.501030	2.3	
W	u[sonic] Modbus · Combined Ultrasonic Wind Sensor	00.16470.000130	62.0	
W	ARCO Modbus · Combined Wind Sensor	00.14581.030430	18.5	
WTHP	EOLOS-Modbus · Combined Weather Sensor	00.16430.001032	60.0	
WTHP	u[sonic]WS6 Modbus · Combined Weather Sensor	00.16480.000130	62.0	
WTHPG	u[sonic]WS7 Modbus · Combined Weather Sensor	00.16480.001130	62.0	
R	rain[e] Modbus · Weighing Precipitation Sensor, unheated	00.15184.000100	1.0	
R	rain[e] Modbus · Weighing Precipitation Sensor, heated	00.15184.400100	141.0	
R	rain[e]one Modbus · Weighing Precipitation Sensor, unheated	00.15184.000101	1.0	
R	rain[e]one Modbus · Weighing Precipitation Sensor, heated	00.15184.400101	141.0	
			Total Power Consumption = (Power ≤)	

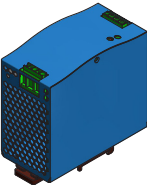
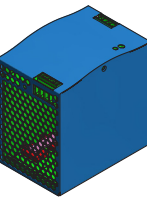
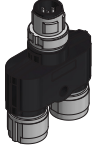
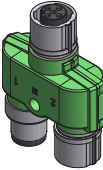
Legend:

W	Wind	P	Air pressure
T	Air temperature	R	Precipitation
H	Relative humidity	G	Global radiation

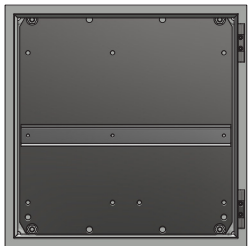
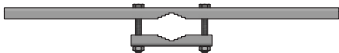
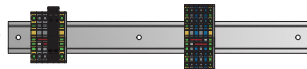
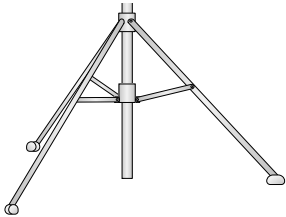


Power Supplies incl. Data Logger met[LOG]		
Power: 150 W (@230 VAC; 125 W @115 VAC) Output: 24 VDC (6.5 A @ 230 VAC; 5.2 A @115 VAC) Input: 90...264 VAC in PC housing, gray, IP66 incl. data logger met[LOG] 00.95800.010000 and distribution clamps	30.95800.015000 	☐
Power: 150 W (@230 VAC; 125 W @115 VAC) Output: 24 VDC (6.5 A @ 230 VAC; 5.2 A @115 VAC) Input: 90...264 VAC in PC housing, gray, IP66 incl. data logger met[LOG] 00.95800.010000 and, distribution clamps and WiFi router	30.95800.115000 	☐
Power Supplies in Housing		
Power: 150 W (@230 VAC; 125 W @115 VAC) Output: 24 VDC (6.5 A @ 230 VAC; 5.2 A @115 VAC) Input: 90...264 VAC in PC housing, gray, IP66 incl. distribution clamps	00.14966.715000 	☐
Power: 240 W Input: 24 VDC (10 A) Input: 90...264 VAC in PC housing, gray, IP66 incl. distribution clamps	00.14966.724000 	☐
Power: 480 W Input: 24 VDC (20 A) Input: 90...264 VAC in PC housing, gray, IP66 incl. distribution clamps	00.14966.748000 	☐
Power Supplies for Top Hat Rail TS35		
Power: 60 W Output: 24 VDC (2.5 A) Input: 85...264 VAC	64.59020.960000 	☐

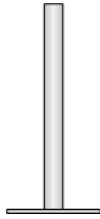
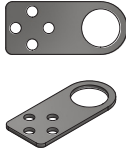
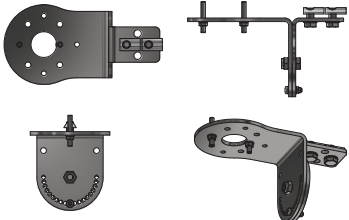


Power: 150 W (@230 VAC; 125 W @115 VAC) Output: 24 VDC (6.5 A @ 230 VAC; 5.2 A @115 VAC) Output: 90...264 VAC	64.59021.070000		☐
Power: 240 W Output: 24 VDC (10 A) Output: 90...264 VAC	64.59021.080000		☐
Power: 480 W Output: 24 VDC (20 A) Input: 90...264 VAC	64.59021.090000		☐
Cable			
Cable, 12 m, 4-pin M12 cable socket	32.14567.060000		
Heating Cable for rain[e]; Length = 10 m	32.15184.061010		
Heating Cable for rain[e]; Length = 1 m	32.15184.061000		
0.6 m Cable M12 socket-plug	32.50000.000060		
1.5 m Cable, socket-plug (1500868)	32.50000.000150		
3 m Cable, socket-plug (1500871)	32.50000.000300		
Quickon Cable Connector, 4-pin, IP 65 and IP 67	65.53070.820000		
Y-Distributor M/2xF Wind Sensor Pair	32.50000.100000		
Y-Distributor F/M-F	32.50000.000000		

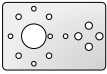
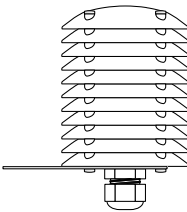
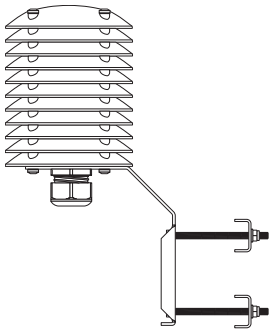
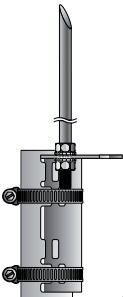
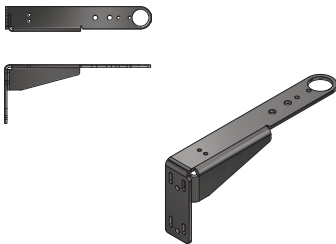


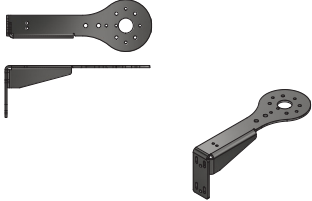
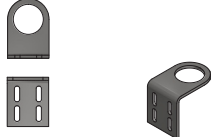
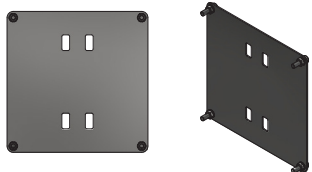
Masts, Traverses and Accessories		
Modbus Distributor Box (8-way)	32.50001.000001	
Sheet Steel Housing	32.95666.030000	
Mast Mounting	32.95666.032000	
Clamping Rail, complete	32.95666.040000	
Aluminum Telescopic Mast; Length = 3 m Tip-Ø: 50 mm	00.14627.030000	ohne Abb.
3-Leg Tripod Base for 3 m Aluminum Telescopic Mast	32.14627.030200	
Wall Bracket Set, 150 mm, for 3 m Aluminum Telescopic Mast	32.14627.030100	
Screw Foundation for 3m Telescopic Mast	32.14627.030400	



Stainless Steel Pole with Base Plate for rain[e]	00.15180.800050	
Stainless Steel Mast with Screw Foundation for rain[e]	00.15180.300000	
750 mm Bracket for Precipitation Sensor, ffor 3 m Aluminum Telescopic Masts Ø 60 mm	32.14627.030300	
Set Wind Traverse consisting of: 1x 33.14627.001010 Traverse 750 mm 1x 32.14627.007000 Set Cover Caps 2x 32.14627.002000 Set Sensor Bracket, round D30 1x 32.14627.001000 Set Mast Mounting	32.14627.010000	
Set Traverse for Pyranometer and Sensor Shelter consisting of: 1x 33.14627.001000 Set Traverse 1000 mm 1x 32.14627.007000 Set Cover Caps 1x 32.14627.003000 Set Sensor Bracket, large 1x 32.14627.001000 Set Mast Mounting	32.14627.011010	
Set Sensor Bracket, round (small)	32.14627.002000	
Rotatable Sensor Holder for Pyranometer 16130	32.14627.003010	



Set Sensor Bracket (large) for Pyranometer I6130	32.14627.003000 	
Set Ball-Level for 2nd Class Pyranometer I6103.5	32.14627.006000 	
Weather and Radiation Protection 8141.6 TS for Traverse System	00.08141.610000 	
Weather and Radiation Protection PROF for Mounting on Ø up to 63 mm	00.08141.620000 	
Lightning Rod	32.14565.019000 	
Small Mounting Bracket (for Wind Sensor and I6103.5)	33.14627.011000 	

Large Mounting Bracket (for sun[e])	33.14627.012000	
Mast Mounting Bracket (mini)	32.14627.001010	
Holding Plate for power[cube]	32.14966.030000	

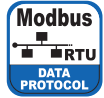


WHY AEM?

Lambrecht meteo, an AEM brand, develops and manufactures world-class meteorological sensors and measurement solutions for wind, precipitation, pressure, temperature, and humidity serving various classical meteorological and highly specific environmental and industrial end-markets. Our highest goal is to deliver state-of-the-art sensors and customer-friendly complete measurement solutions including data acquisition, maintenance, and service. With our products and the portfolio of the AEM family of innovative brands, we aim to be a globally established brand and to provide a wide range of meteorological applications with flexible and high-quality solutions for our customers' weather measurement tasks.

Example of a Modbus Weather Station

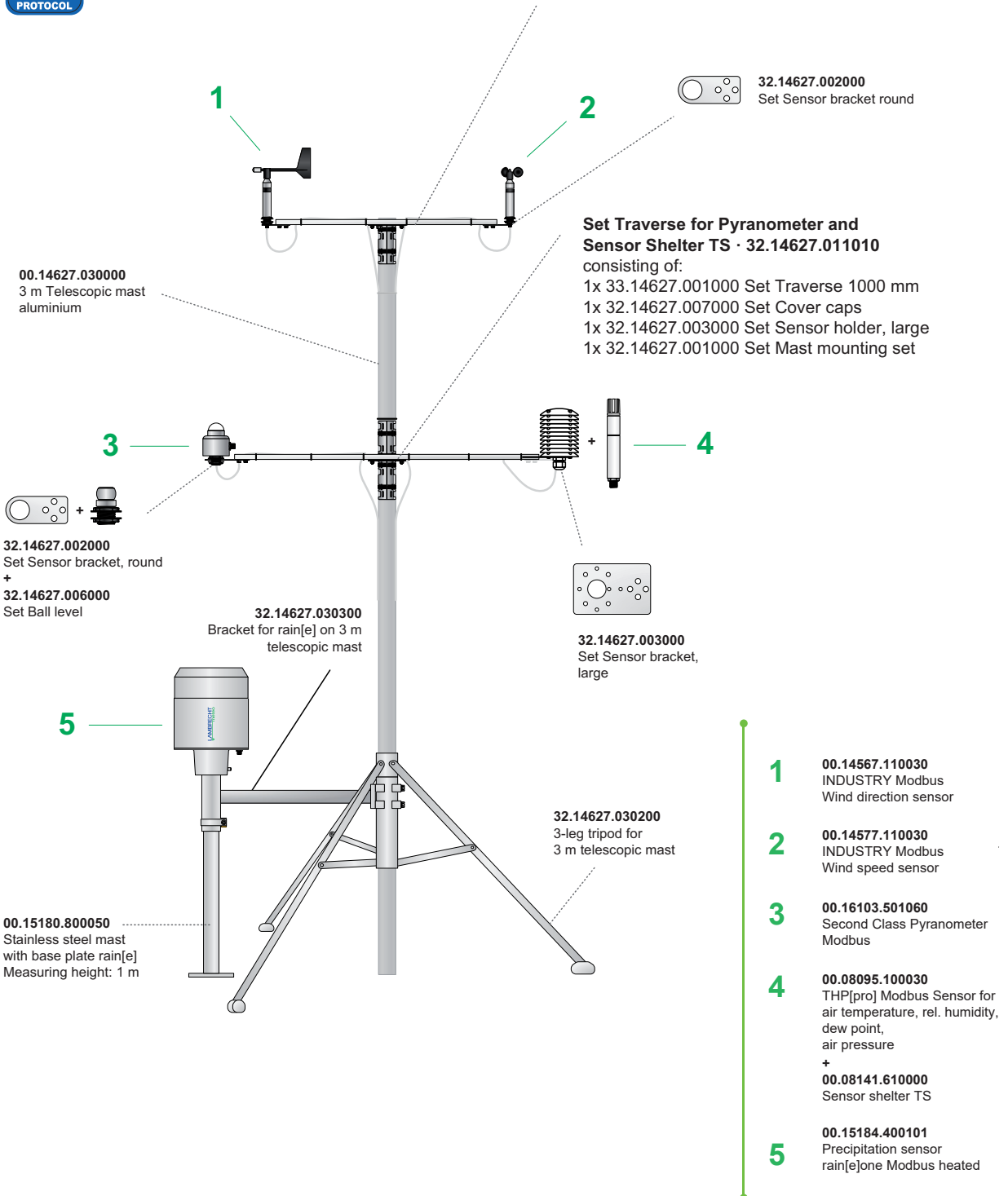
EXAMPLE OF A MODBUS WEATHER STATION:



Set Wind Traverse 32.14627.010000

consisting of:

- 1x 33.14627.001010 Traverse 750 mm
- 1x 32.14627.007000 Set Cover caps
- 2x 32.14627.002000 Set Sensor holder, round D30
- 1x 32.14627.001000 Set Mast mounting set



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