



Modbus Protocol for Precipitation Sensor rain[e]

1. Modbus protocol

The Lambrecht meteo Modbus sensors and the met[LOG] follow the specification of the Modbus organization: "MODBUS APPLICATION PROTOCOL SPECIFICATION V1.1b3".
(See www.modbus.org).

Data Encoding

MODBUS uses the "Big-Endian" format for addresses and data. This means that if a value is transmitted with a number format larger than a single byte, the "most significant byte" is transmitted first. For values that exit through a register (e. g. 32 bit), this is not clearly specified on the Modbus. In these cases, the LAMBRECHT Modbus sensors (32 bit or 64 bit) follow the Big-Endian number format.

Example Big-Endian:

Register size value

16 - bits 0x1234 is transmitted in the sequence: 0x12 0x34.

Example Big-Endian (32bit or 64bit):

Register size value

32 - bits 0x12345678 is transmitted in the sequence: 0x12 0x34 0x56 0x78.

1.1 Device address

Addresses 1... 247 are allowed with Modbus, address 0 can be used for messages to all devices (broadcast), if the selected function supports this.

1.2 Standard Configuration - Default

Baud rate: 19200 Baud

Address: Each sensor type (or family) gets its own address.

Default addresses of the LAMBRECHT sensors:

Address	Sensor
1	Wind speed
2	Wind direction
3	Precipitation
4	THP
5	EOLOS IND
6	com[b]
7	PREOS
8	ARCO
9	u[sonic]

Byte frame according to MODBUS standard for RTU mode:

8E1 (1 start bit, 8 data bits, 1 parity bit (Even Parity), 1 stop bit)

1.3 Reading out the measured values

The measured values of the LAMBRECHT Modbus sensors are read out with the function code: 0x04.

Except for precipitation (rain[e]), all measured values are to be read in as instantaneous values.

1.3.1 (Note) Data retrieval and storage in low-power mode

In low-power operation with Modbus sensors, it can be useful to limit the data communication and, for example, to read out the mean values, min. and max. values from the sensors directly once a minute. The instantaneous values can only be queried for visualization.

1.3.2 Standard register with instantaneous values

The following table lists all available instantaneous values.

By precipitation this register area contains the total amount of precipitation instead of the instantaneous value (which does not exist).

Register Address	Parameter Name	Unit	Factor	Description	
31001	Total amount of precipitation	mm	10	1 decimal	INT
31101	Total amount of precipitation (High-WORD)	mm	1000	3 decimal The register 31101 + 31102 can be read out only together (functional code 0x04)	uLONG
31102	Total amount of precipitation (Low-WORD)				
31201	Intensity of precipitation in the last minute (floating)	mm/min	1000	= average (1-min.) 3 decimal Time base = 1 min. Rate of measurement=6x per min.	INT

1.3.3 Special case: amount of precipitation

Except for precipitation, all measured values are to be read as instantaneous values. The precipitation amount must be imported as a total quantity and the difference of the amount of rainfall displayed and stored compared to the previous data retrieval must be calculated, since values can be lost if the quantity from retrieval to retrieval is evaluated and a log or data record is lost.

Note: The value overflow of the total amount of precipitation must be taken into account and must be considered upon calculating the difference.

1.4 Modbus command set (minimum)

The LAMBRECHT Modbus sensors support the following commands:

Command: 0x03 Address range: 40000+ (sensor characteristics)

Command: 0x04 Address range: 30000+ (measured data)

1.5 Measured value and parameter register LAMBRECHT Modbus sensors

The registers addresses 30001 to 35000 are valid for all LAMBRECHT meteo Modbus sensors but are only valid if the respective sensor supports the corresponding values. (e. g. a pure wind sensor does not provide humidity).

The error code or invalid value is 0xFFFF (0xFFFFFFFFFFFFFFFF).

Individual reading of contiguous registers (e. g. 31101 and 31102) is not permitted.

1.6 Modbus rain[e] register

310		Precipitation amount					
31001		Total amount of precipitation	mm	10	1 decimal	INT	0xFFFF
311		Precipitation amount High Resolution					
31101		Total amount of precipitation (High-WORD)	mm	1000	3 decimal The register 31101 + 31102 can be read out only together (functional code 0x04)	uLONG	0xFFFF
31102		Total amount of precipitation (Low-WORD)					0xFFFF
31103		Total amount of precipitation since last retrieval (High-WORD)	mm	1000	3 decimal The register 31101 + 31102 can be read out only together (functional code 0x04)	uLONG	0xFFFF
31104		Total amount of precipitation since last retrieval (Low-WORD)					0xFFFF
312		Precipitation intensity					
31201		Total amount of precipitation of the last minute (sliding)	mm/min	1000	= average (1-min.) 3 decimal Time base = 1 min. Rate of measurement = 6x per min.	INT	0xFFFF
349		General information heater					
34921		Status of heating (only rain[e])					0xFFFF
34931		Total heating capacity in percentage (only rain[e])	%	1		INT	0xFFFF

Subject to change without notice.

rain[e] Modbus (06.18)

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