Features

PreLOG / PreLOG ECO

- Memory for up to 65536 measured values
- Saves pulses / sums of precipitation with timestamp
- Resolution configurable (standard: 0.1 mm)
- Event-driven recording (no zero values)
- Integrated debouncing of the reed contact
- Intensity-dependent correction of precipitation sums
- Data retrieval via USB
- Real-time clock
- Power supply by rechargeable Li-ion battery for 3-5 years (depending on the precipitation intensity and without a modem)
- Recharging of the battery via USB port
- Housing IP65 (plugged-in connector: IP67)

PreLOG

- Pulse output (not corrected, debounced)
- Optional external power supply e. g. via solar set
- RS232 interface for data retrieval and connection to a modem (optional)
- Optional data transmission via GPRS modem to a appropriate MeteoWare host with static IP address
- Event-driven alarm function via connectable modem
  - Start / End Precipitation
  - Exceeding of a defined max. amount of precipitation since the last retrieval / alarm
  - Exceeding of a defined max. amount of precipitation as a moving sum over a defined time frame (with hysteresis)
  - Exceeding of a defined max. precipitation intensity (with hysteresis)

Table of contents

1 Scope of Delivery

- PreLOG or PreLOG ECO
- Connecting cable with circular MiniUSB connector
- Connecting cable precipitation sensor (2-pole)
- USB to MiniUSB cable
- Cable connector
- Operating instructions
- Software PreLOG-Commander (country-depending on CD or as download)
- Software MeteoWare Rain (country-depending on CD or as download)

Check the delivery for transport damages and document them extensively for following claims for damages against the shipper. Afterwards contact the LAMBRECHT service department under **+49-(0)551-4958-390.**

2 Order Codes

PreLOG   Id-No. 00.15190.000000
PreLOG ECO   Id-No. 00.15190.010000

3 Safety Instructions and Warranty

This system is designed according to the state-of-the-art accepted safety regulations. However, please note the following rules:

1. Before setting into operation please read all respective manuals!
2. Please take notice of internal and state-specific guidelines and/or rules for the prevention of accidents (e. g. the professional association). If necessary ask your responsible safety representative.
3. Use the system according to the manual's regulations only.
4. Always have the manual at hand at the installation site.
5. Use the system in technically correct conditions only! You have to eliminate influences immediately, which might impair security .
6. Prevent the ingress of unwanted liquids into the devices.

Please note the loss of warranty and non-liability by unauthorised manipulation of the system. You need a written permission from the LAMBRECHT meteo GmbH for changes of system components. These activities must be operated by a qualified technician.

The warranty does not cover:

1. Mechanical damages caused by external impacts (e. g. icefall, rockfall, vandalism).
2. Impacts or damages caused by over-voltages or electromagnetic fields which are beyond the standards and specifications in the technical data.
3. Damages caused by improper handling, e. g. by wrong tools, incorrect installation, incorrect electrical installation (incorrect polarity) etc.
4. Damages which are caused by using the device beyond the specified operation conditions.

4   Dimensional Drawings

PreLOG ECO

ca. 270,00 mm

Ø32,00

PreLOG

ca. 290,00 mm

Ø32,00
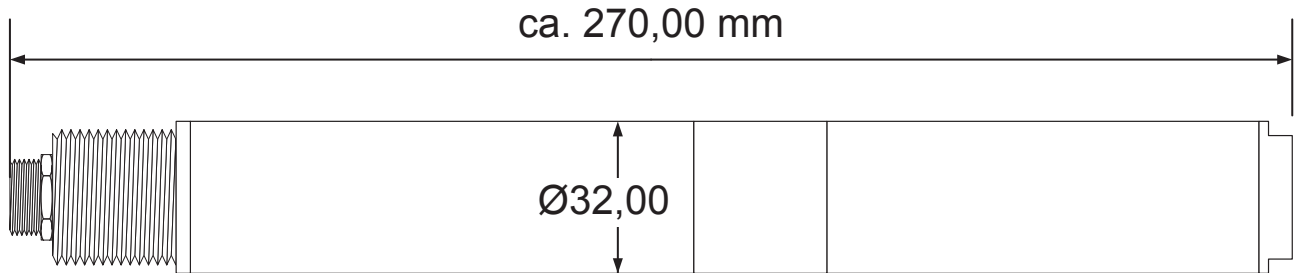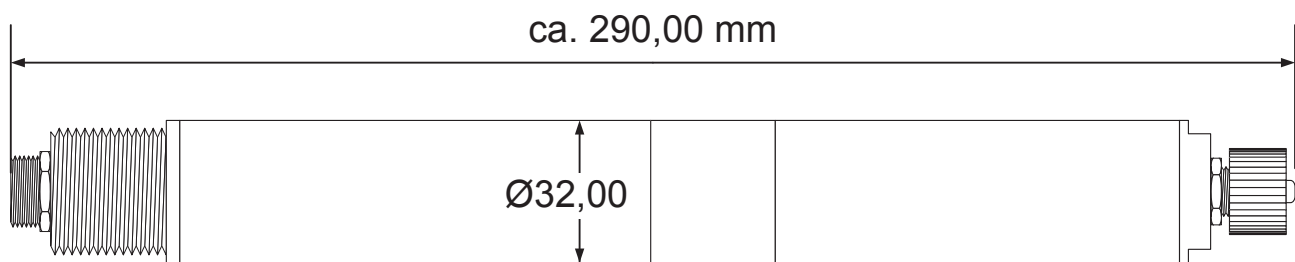
Fig. 01

5   Mounting

You can mount the PreLOG directly to the LAMBRECHT precipitation sensor 15189. Therefore the precipitation sensor is already delivered with the necessary bore or an appropriate 29 - 30 mm bore can be drilled.

15189

PreLOG

Ø 29-30 mm

1

2
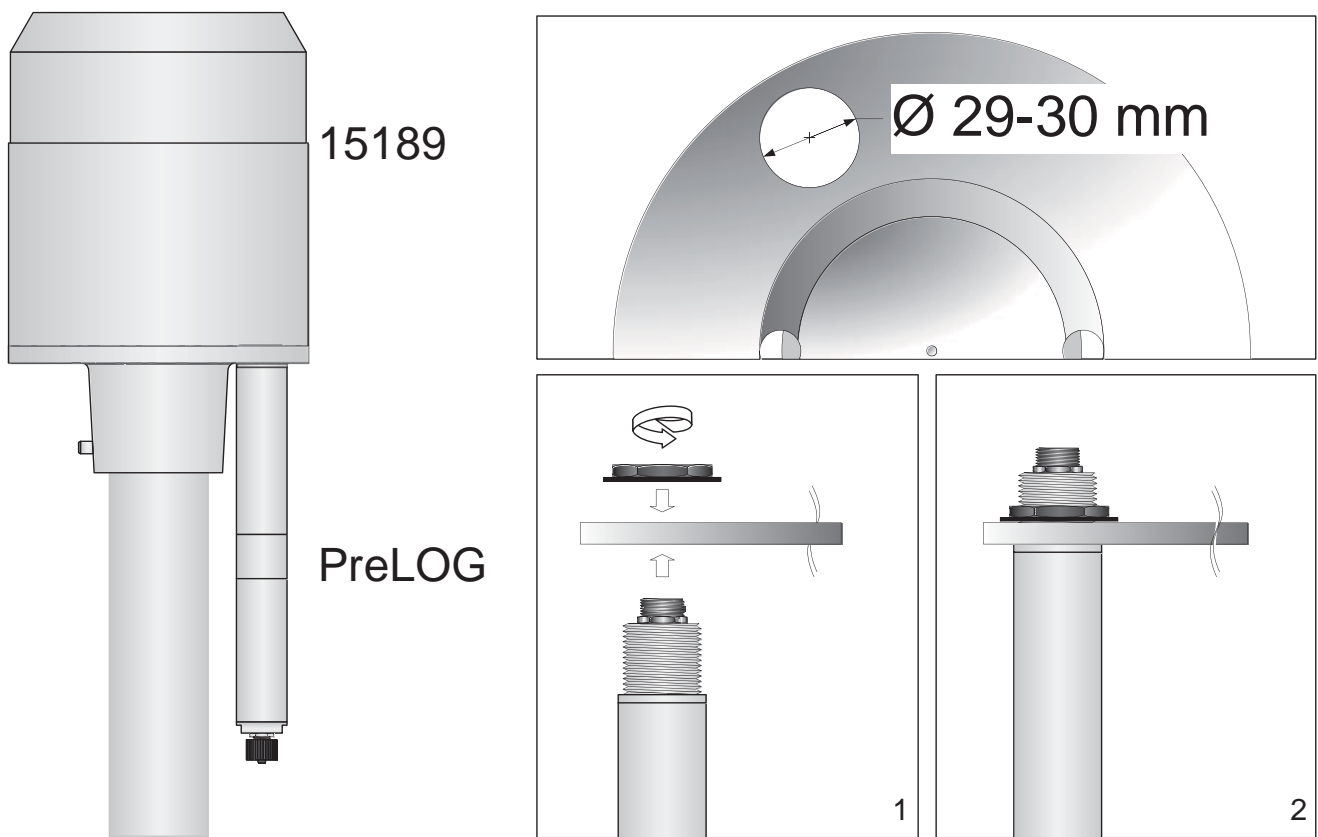
Fig. 02

Another option is to mount the data logger to a mast with our special mast fixation from our traverse system Id.-No. 32.14627.001010 (See Fig. 03).

PreLOG

1

2
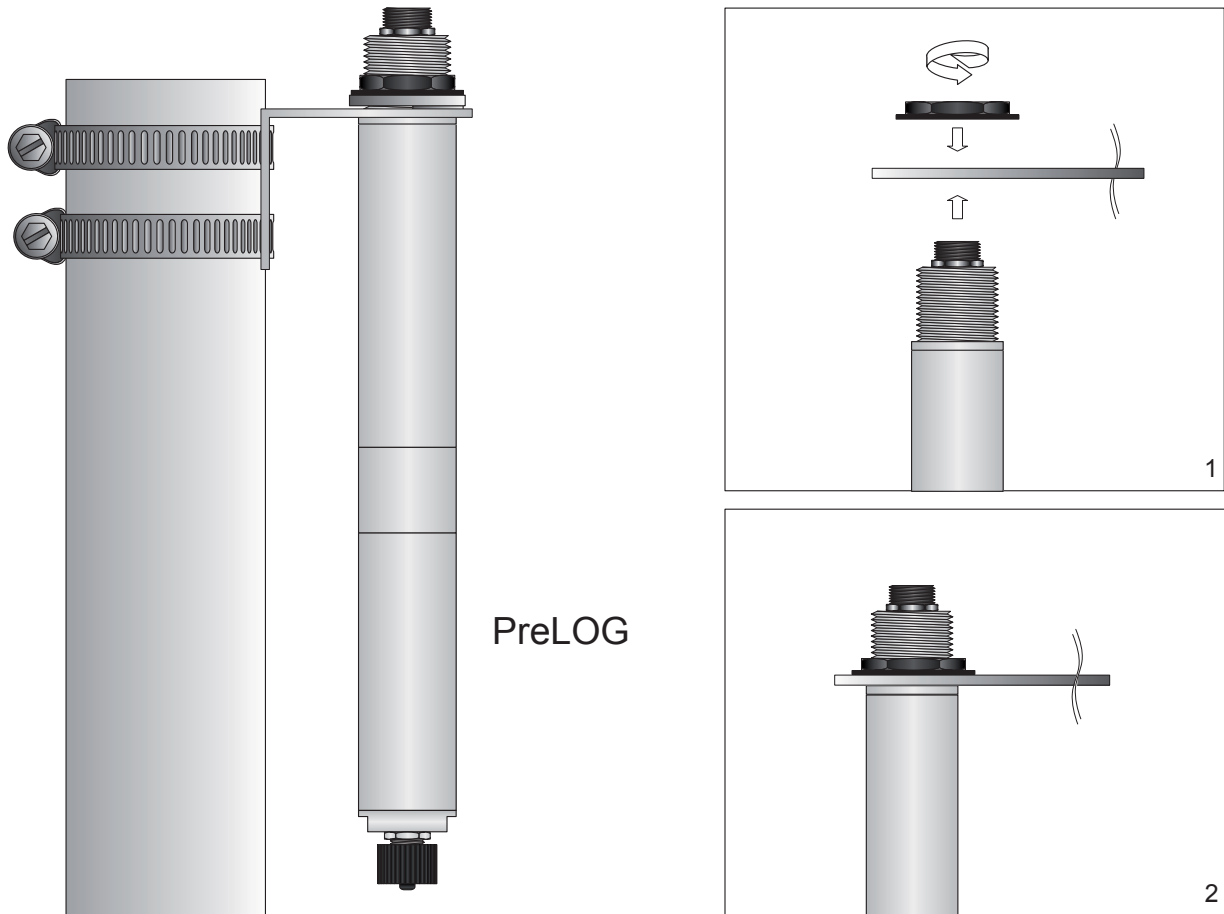
Fig. 03

6 Power and Signal Connection

The PreLOG is connected to the pulse output of the precipitation sensor with the supplied cable. We recommend using the supplied cable connector. This cable connector ensures optimal protection (e.g. strain-relief) for the wire with the USB circular plug-in connector (see Fig. 04).

(1) Trim the supplied cable to the desired length and remove the sheath on 2 cm.

(2) Use a straight cut to remove the shielding braid up to the edge of the sheath.

(3) Cut the not used strands (wire with USB circular plug-in connector) straightly to different lengths in steps of approx. 2 mm.

(4) Conduct the screw connection on each cable end.

(5) The black strand of connection cable and the USB cable must be placed in the black slot of the particular screw connection and the brown and yellow strand must be placed in the brown slot in each case.

(6) Cut the overlaying strands on 1-2 mm.

(7) Insert the screw connections into the proper intermediate part (matching the colors: dark-grey to dark-grey and light-grey to light-grey). Pay attention to the corresponding guide lugs!

(8) Torque down the connections hand-tight until stop.

+ PULSE IN			
brown/braun			
GND (-)			
black / schwarz			

	Connection cabel / Anschlusskabel	USB cable / USB Kabel
+ PULSE IN	brown/braun	yellow/gelb
GND (-)	black / schwarz	black / schwarz

Ø3.8 mm

ca. 1 m

Ø20 mm

PIN 4

PIN 5

+ PULSE IN	PIN 4	yellow/gelb
GND (-)	PIN 5	black / schwarz
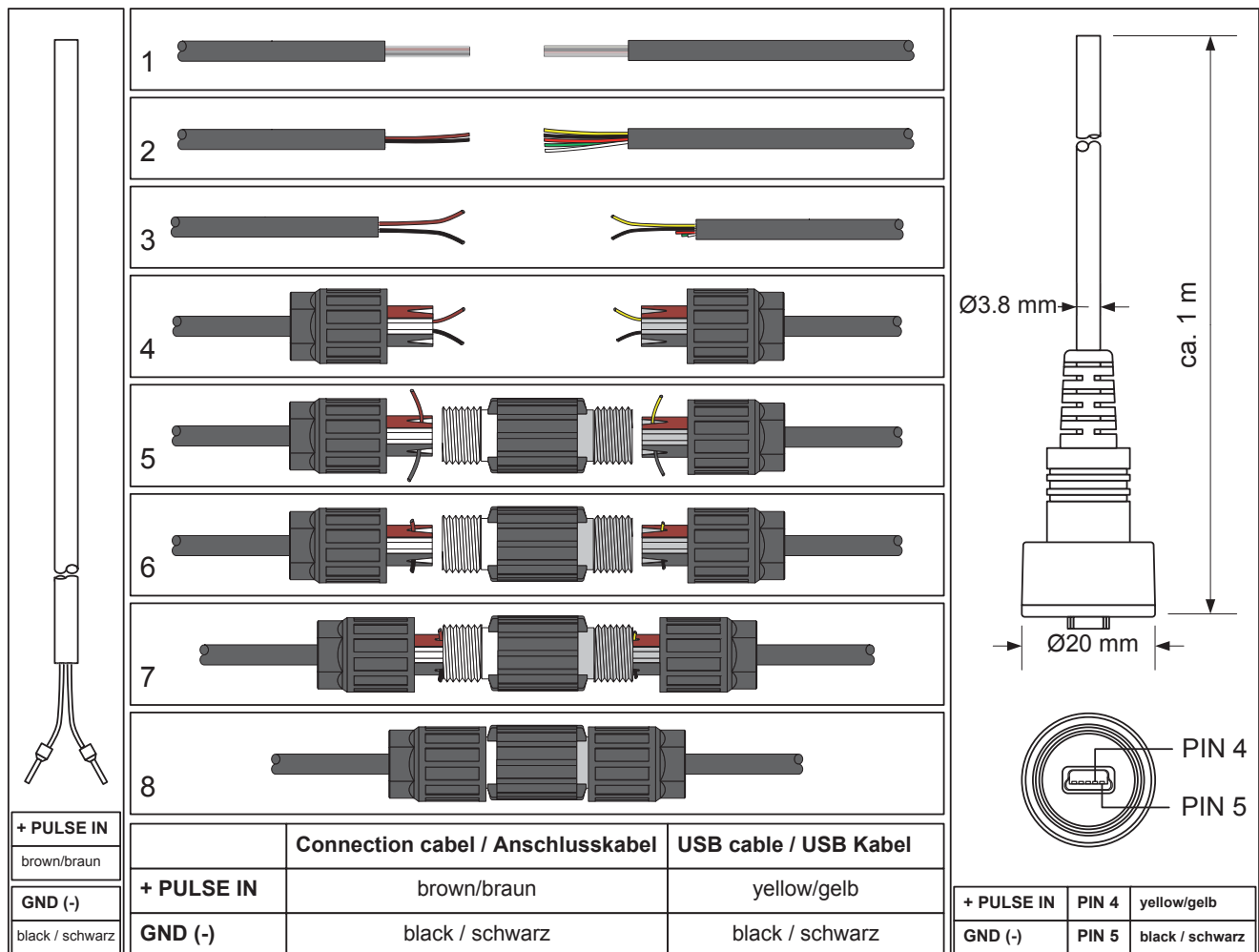
Fig. 04

Connection to LAMBRECHT Precipitation Sensors

In combination with a LAMBRECHT precipitation sensor, the PreLOG is connected directly to the reed switch. As the data logger has integrated pulse debouncing, therefore no further power supply for debouncing electronics in the precipitation sensors is necessary.

Connection to 15189, 15188, 1518H3

REED CONTACT DIRECT	1	br/brn + PULSE IN
NC	2	sw/blk GND (-)
NC	3	
NC	4	
NC	5	
REED CONTACT DIRECT	6	
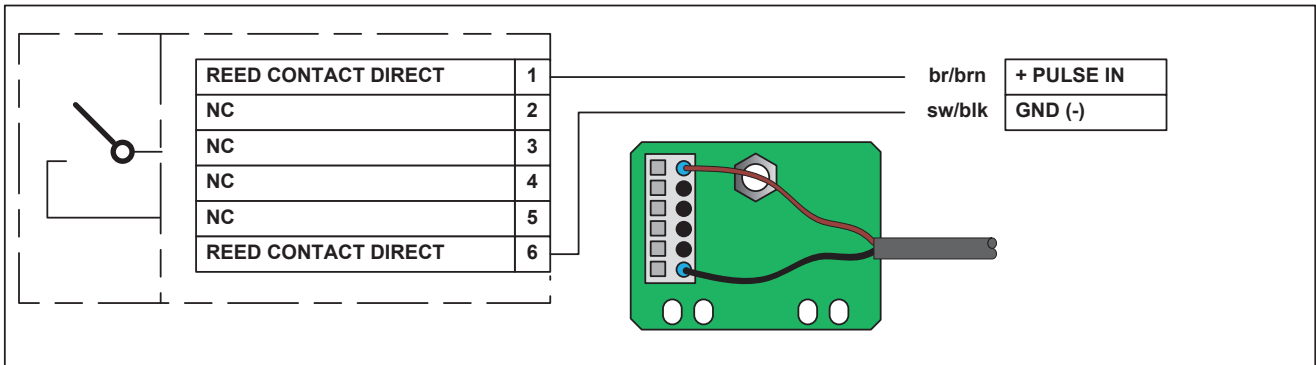
Fig. 05

Connection to 15189 ECO

REED CONTACT DIRECT	1	br/brn + PULSE IN
REED CONTACT DIRECT	2	sw/blk GND (-)
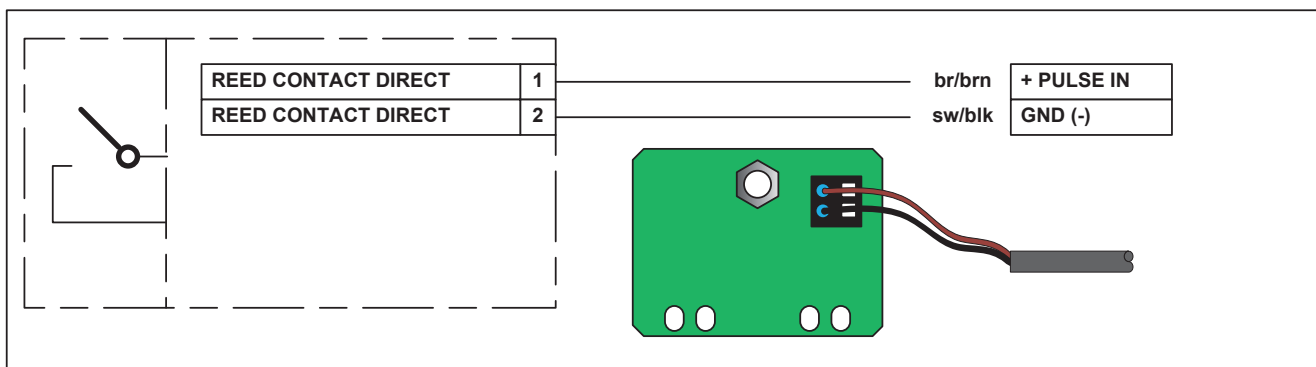
Fig. 06

Pin Assignment M12 Connector, 8-Pin (only PreLOG)

If the PreLOG should be read out via the RS232 interface, externally powered or connected to the GPRS solar set, the following pin assignment of the 8-pin M12 connector is used (see Fig. 07 (pin side view)).

Pin	Wire Color	Function	
1	White	RS232 Input	(R x D)
2	Brown	RS232 Output	(T x D)
3	Green	Masse GND	
4	Yellow	Control Pin RS232 Communication ON (have to be on Masse GND for ON)	
5	Grey	Masse GND	
6	Pink	+ external power supply 9…26 V DC (Attention: This voltage is used to supply the modem via the PreLOG.)	
7	Blue	Power Supply for Modem Output	
8	Red	Pulse Pin (Output of the input pulse)	
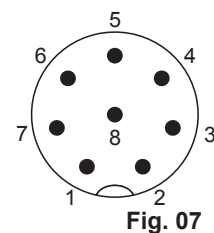
Fig. 07

Connecting RS232

In general the PreLOG RS232 interface is deactivated to save energy. It will only be activated by the PreLOG to transmit data. For external access to the PreLOG via RS232 , e. g. to retrieve data or to configure the PreLOG, the control pin "**RS232-Communication ON**" (4) has to be connected with the "**Masse GND**" pin (3) or (5) (see Fig. 08).

PRELOG M12-CONNECTOR				
RS232 RxD (IN)	1		1	
RS232 TXD (OUT)	2		2	RS232 RxD
MASSE GND	3		3	RS232 TxD
RS232 COMMUNICATION ON	4		4	
MASSE GND	5		5	SIGNAL GND
EXT POWER SUPPLY 9...26V DC	6		6	
MODEM SUPPLY OUT (+)	7		7	
PULSE OUT	8		8	
			9	
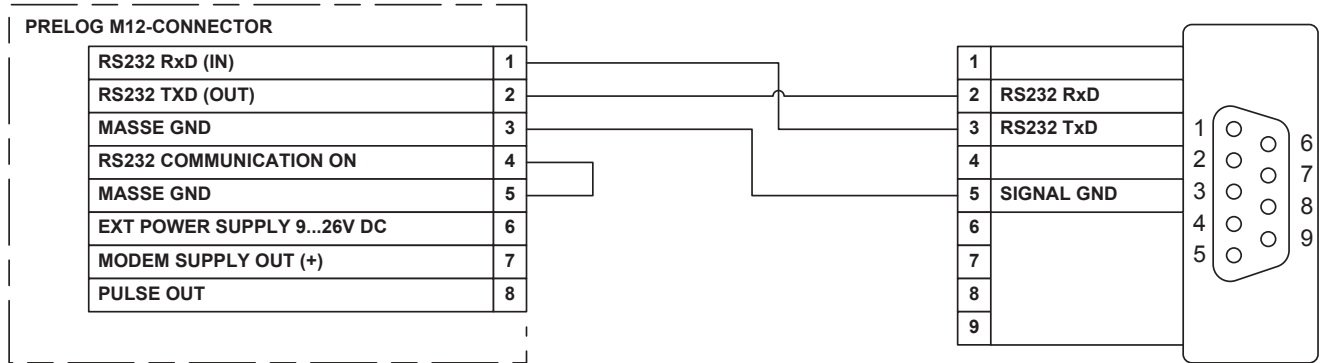
Fig. 08

Connecting Modem via RS232– GPRS (GPRS-Solar-Set)

If the PreLOG should only actively communicate via GPRS using a modem at the RS232 interface (e. g. of the GPRS solar set), the control pin "**RS232 Communication ON**" (4) must <u>not</u> be connected to the "**Masse GND**" pin. In this mode external communication with the PreLOG via the RS232 interface is not available. (In Fig. 09 the solar charge controller of the GPRS solar set is not shown!)

| PRELOG M12-CONNECTOR			
RS232 RxD (IN)	1	RS232 RxD	Modem output
RS232 TXD (OUT)	2	RS232 TxD	Modem input
MASSE GND	3	SIGNAL GND	
RS232 COMMUNICATION ON	4	+12 V DC SUPPLY	
MASSE GND	5	GND SUPPLY	
EXT POWER SUPPLY 9...26V DC	6		
MODEM SUPPLY OUT (+)	7		
PULSE OUT	8		

+ e.g. -

ACCU 12 V
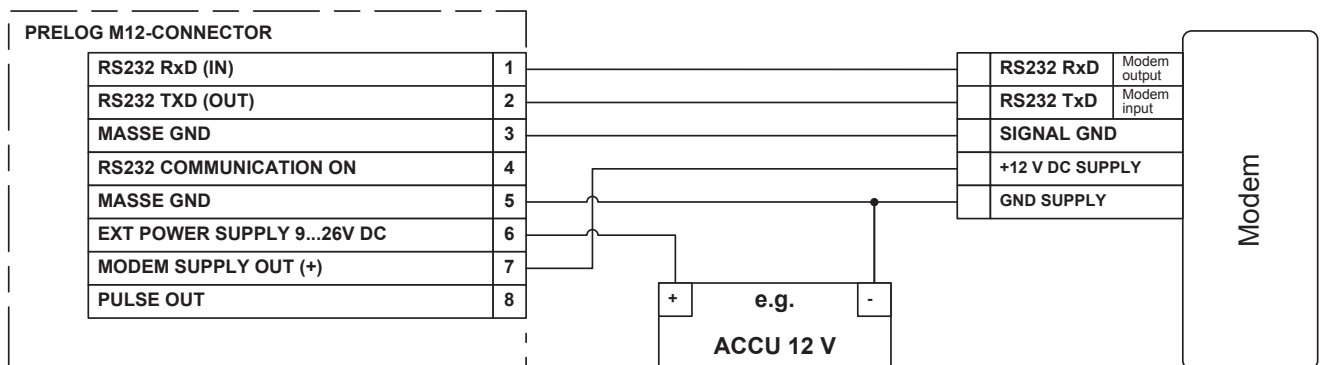
Modem

Fig. 09

Connecting Modem via RS232 – GSM

If the PreLOG should always be accessible the control pin "**RS232 Communication ON**" (4) has to be connected to the "**Masse GND**" pin. This operating mode needs the most energy since both, the RS232 interface and the modem, are permanently activated (see Fig. 10).

PRELOG M12-CONNECTOR			
RS232 RxD (IN)	1	RS232 RxD	Modem output
RS232 TXD (OUT)	2	RS232 TxD	Modem input
MASSE GND	3	SIGNAL GND	
RS232 COMMUNICATION ON	4	+12 V DC SUPPLY	
MASSE GND	5	GND SUPPLY	
EXT POWER SUPPLY 9...26V DC	6		
MODEM SUPPLY OUT (+)	7		
PULSE OUT	8		

+ -

12 V DC POWER SUPPLY

Modem

Fig. 10

Connecting pulse output - Open Collector (OC)

The PreLOG comes with an Open Collector output which can be used to forward the recorded pulses for example to a programmable logic controller (PLC). See also „Pin Assignment M12 Connector, 8-Pin".

Remark: The PreLOG ECO has no OC output.

$V_{CC}= 3.3 \ldots 40V_{DC}$

Pull-Up
$R_a=5k\Omega\ldots10k\Omega$

SWITCH.INPUT
active LOW

GND

power supply

Fig. 11

7   Functions

7.1   Pulse Registration

• Integrated debouncing of the pulse signal of a reed contact
• Integrated precipitation correction of the recorded pulses, respectively linearisation of the precipitation signal of LAMBRECHT precipitation sensors
• Pulse output (OC, not galv. isolated) for uncorrected transmission of the input signal. At a resolution factor ≥ 0.1* the length of the returned pulse is 125 ms. At a resolution factor < 0.1 the pulse length will be reduced to 10 ms.
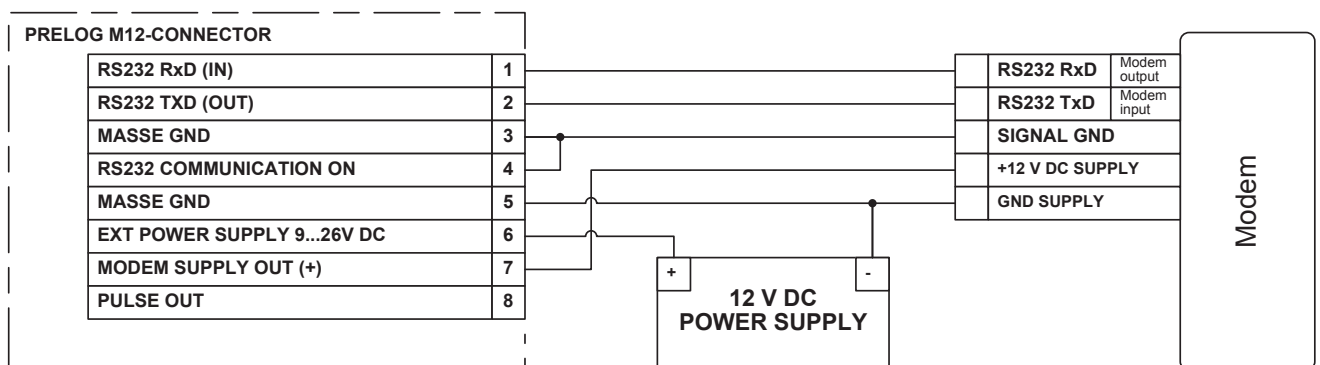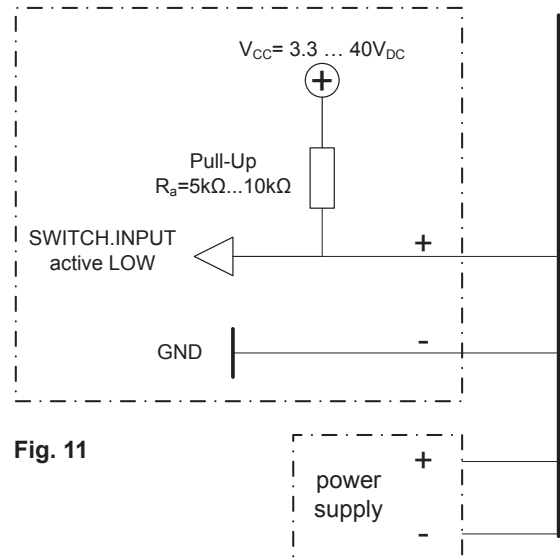
7.2   Recording

• Recording of precipitation pulses with timestamp
• Recording of precipitation amount in selectable time intervals
• Recording of precipitation amount between retrievals
• Recording of precipitation amount since switch on of the device

7.3   Alarm / Event Message

• Event message at start of precipitation
• Event message at end of precipitation
• Event message at exceeding of a max. precipitation amount since last retrieval or message
• Event message at exceeding of a max. precipitation amount as moving sum of a specified period (with hysteresis)
• Event message at exceeding of a max. precipitation intensity (with hysteresis)

7.4   Data Output

• Recorded measured values (no zero values)
  Data retrieval of the recorded values with timestamp to a CSV file or MeteoWare Rain database with the programs:
    ◦ PreLOG-Commander (USB / GSM-Mode)
    ◦ MeteoWare Rain (USB / GSM- / GPRS-Mode)
• Operating data
• Battery status (OK / charge)
• Flash memory status (in % available space)
• Name of the data logger / identification
• Firmware version
• Precipitation amount since switch on of the device
• Precipitation amount since last retrieval
• GPRS error code
• Position in the command sequence of the error causing command

A resolution factor 0.1 means 1 pulse = 0.1 mm (precipitation per m^2)

8　　Description of the Functions

Integrated Debouncing of the Reed Contact Pulse Signal

The PreLOG has an integrated debouncing attuned to the LAMBRECHT precipitation sensors (15189, 15188, 1518H3).

Therefore a maximum of 4 pulses per second is allowed at a resolution factor (precipitation amount corresponding to an incoming pulse) ≥ 0.1. Then the min. distance between falling edges is 250 ms.

At a resolution factor < 0.1 the debouncing will be changed automatically and the min. closing time will be 10 ms and the max. pulse frequency 50 Hz.
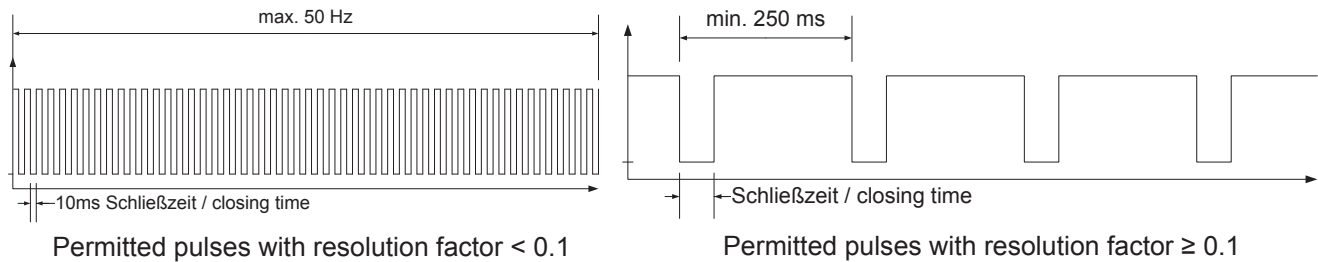
max. 50 Hz　　　　　　　　　　min. 250 ms

→ 10ms Schließzeit / closing time　　　　　Schließzeit / closing time

Permitted pulses with resolution factor < 0.1　　　Permitted pulses with resolution factor ≥ 0.1

Fig. 12

Linearisation of the Precipitation Signal - Precipitation Correction of the Recorded Pulses

Precipitation sensors using tipping buckets generally have an intensity-dependent error. The PreLOG has integrated precipitation correction compatible with the LAMBRECHT precipitation sensors 15189, 15188 and 1518H3. With activated correction the PreLOG records the corrected factor with the timestamp instead of the originally set resolution factor (see "**Recording of Precipitation Pulses With Timestamp**").
Without correction the pulses are recorded with the originally set factor and a timestamp.

Using the intensity correction in combination with precipitation sensors of other manufacturers may result in incorrect measured values. Therefore the intensity correction should be deactivated in such cases.

Since some LAMBRECHT precipitation sensors already have integrated intensity correction, the correction of the PreLOG has to be deactivated if used with these sensors. Otherwise "double" correction would lead to incorrect results.

Configuration
The precipitation correction can be activated or deactivated in the PreLOG-Commander in the area "**Setup – PreLOG Configuration – General – Operating Mode**" as "**Signal Linearisation**."

> **Tip: The integrated precipitation correction can only be activated at resolution factors ≥ 0.1. At smaller resolution factors (< 0.1) the PreLOG automatically deactivates the correction.**

Pulse Output

If another device should process the precipitation pulses, the received pulse can be output by the PreLOG by activating its pulse output. The length of the output pulse depends on the specified resolution factor. At resolution factors ≥ 0.1 the closing time (pulse length) is 125 ms. At resolution factors < 0.1 the closing time is reduced to 10 ms.

> **Attention! Please note that the pulse output of the PreLOG is <u>not</u> galvanically isolated!**

Configuration
The pulse output can be activated or deactivated in the PreLOG-Commander in the area "**Setup – PreLOG Configuration – General – Operating Mode**" at "**Pulse Output Active**."

8.1   Recording

Recording of Precipitation Pulses With Timestamp

The PreLOG records each pulse with the value of the resolution factor and a timestamp. Thus times without precipitation will not be explicitly registered. With activated precipitation correction the corrected values will be recorded.

⚠️ **Attention! Since the real time clock has a resolution of 1 s, it is possible that at very high intensities multiple values (pulses) will be recorded with the same timestamp!**

With resolution factors < 0.1 it is recommended to record the precipitation in sums of configurable time intervals instead of individual pulses.

Example:
Recording individual pulses; correction activated

Date	Time	Precipitation (in mm/m²)
01/11/2013	12:12:01	0.1
01/11/2013	12:13:01	0.1
01/11/2013	12:13:03	0.132 (corrected)
01/11/2013	12:13:06	0.112 (corrected)
...	...	...

Configuration
The recording of individual pulses will be activated, if the option "**Individual Pulses**" is selected in the selection box "**Setup – PreLOG Configuration – Operating Mode – Time Base**" in the PreLOG-Commander. In the same area you have to select the corresponding resolution factor of the sensor.

The date and time of the real time clock of the PreLOG is set by the function "**Setup – Set PreLOG Clock**" of the PreLOG-Commander. By default the function suggests the date and time of the PC clock.

The circular buffer of the PreLOG can store up to 65535 measured values. Therefore the recorded values have to be retrieved in appropriate time intervals. If the memory is full, the oldest value will be overwritten.

Recording of Precipitation Amounts in a Selectable Period

As an alternative the PreLOG can add up the received pulses of a selectable period with their (corrected) resolution factor and record the resulting "precipitation sums". Hence the PreLOG can record the precipitation amount e. g. at 1 min intervals.
With activated precipitation correction the corrected values will be recorded. Recording will take place on the minute mark. Only values > 0 mm/m² will be recorded.

Example:
Recording every 10 min; correction activated

Date	Time	Precipitation (in mm/m²)
01/11/2013	12:10:00	0.5
01/11/2013	12:20:00	2.611 (corrected)
01/11/2013	14:10:00	0.8
01/12/2013	06:50:00	0.2
...	...	...

Configuration
The recording of the precipitation amount in periods of time will be activated in the PreLOG-Commander in the selection box "**Setup – PreLOG Configuration – Operating Mode – Time Base**" by selecting a time in min. The corresponding resolution factor has to be specified in the same area.
It is recommended to record in 1 or 10 min intervals. If the processing should be done with the software MeteoWare

Rain, the values should be recorded in 1, 2, 5, or 10 min intervals.

The flash memory (circular buffer) of the PreLOG can store up to 65535 measured values. In other words: if values are recorded in 10 min intervals, even with permanent rain it is not necessary to retrieve the data more often than once a year (52704 values).

Recording of Precipitation Amount Between Retrievals

In addition, parallel to the individual values or precipitation sums, the PreLOG records the precipitation since the last data retrieval in an extra storage location. If the precipitation correction is activated, the corrected values will be added up. The value will be reset to zero after each data retrieval or alarm message.

Furthermore the value can be retrieved and displayed with the PreLOG-Commander function "**Retrieval – PreLOG Status**". After this retrieval the value will be reset to zero, too.

Example:

Precipitation (in mm/m²)
21.318

Configuration

The recording of the precipitation amount between retrievals can be activated by checking the option "**Calculate Amount Since Last Retrieval**" in the area "**Setup – PreLOG Configuration – Operating Mode**" in the PreLOG-Commander.

Recording of Precipitation Amount since Switch On of the Device

The PreLOG records the total precipitation amount since switch on of the device. The value can be reset to zero in the PreLOG-Commander. With activated precipitation correction the corrected values will be added up.

Example:

Precipitation (in mm/m²)
85.146

Configuration

The recording of the precipitation amount since switch on of the device can be activated by checking the option "**Calculate Amount Since Switch On**" in the area "**Setup – PreLOG Configuration – Operating Mode**" in the PreLOG-Commander.

The value can be reset to zero with the PreLOG-Commander function "**Utilities – PreLOG Reset Total Precipitation Amount**".

8.2 Event / Alarm

To use the alarm functions of the PreLOG a GPRS modem is necessary, for example the one in the GRPS solar set. In case of occurance of a predefined PreLOG event or alarm the PreLOG switches on the modem and transmits the alarm data set with the following pieces of information:

Station name	
Date / Time of the PreLOG	
Event: Start of Precipitation	YES / NO
Event: End of Precipitation	YES / NO
Time Since End of Precipitation	in s
Event: Exceeding of a Max. Precipitation Amount Since Last Retrieval / Message	YES / NO
Amount Since Last Retrieval / Message	in mm/m²
Event: Exceeding of a Max. Precipitation Amount in a Specified Period	YES / NO
Max. Precipitation Amount	in mm/m²
Duration of the Period	in s
Event: Exceeding of a Max. Precipitation Intensity	YES / NO
Max. Precipitation Intensity	in mm/m²

.

> **Tip: If the transmission of the alarm data was successful, the PreLOG automatically transmits the measured values since the last data retrieval.**

Event: Start of Precipitation

If the event "**Start of Precipitation**" is activated, the PreLOG will transmit an alarm message as soon as it has started to rain (or any other precipitation). The event will be triggered if the specified precipitation amount is detected in a defined moving time interval. The moving time interval is moved every 6 s and the precipitation amount in the time interval is recalculated.

Configuration
The alarm "**Start of Precipitation**" can be activated in the PreLOG-Commander in the tab "**Setup – PreLOG Configuration – Alarm (Part 1)**". Furthermore the "**Amount Threshold**" in mm/m² as well as the "**Trigger Period**" (period in which the amount threshold has to be reached to trigger the alarm) and the "**Release Period**" (period for which no further precipitation shall be detected to release the alarm again) in min can be specified in the corresponding area. If the option "**End of Precipitation**" is selected in the selection box for the release period, the event "**Start of Precipitation**" cannot be triggered before the event "**End of Precipitation**" has occured.

Event: End of Precipitation

If the event "**End of Precipitation**" is activated, the PreLOG will transmit an alarm message if it stops to rain. The event can only be triggered if the event "**Start of Precipitation**" or the event "**Exceeding of a Max. Precipitation Amount as Moving Sum**" has been triggered.

Configuration
The alarm "**End of Precipitation**" can be activated in the PreLOG-Commander in the tab "**Setup – PreLOG Configuration – Alarm (Part 1)**". Furthermore the "**Trigger Period**" (in which no further precipitation may be detected) and the "**Release Period**" (in which the alarm cannot be triggered again) in min can be specified in the corresponding area.

Event: Exceeding of a Max. Precipitation Amount since Last Retrieval or Message

If the event "**Exceeding of a Max. Precipitation Amount Since Last Retrieval**" is activated, the PreLOG will transmit an alarm message if a max. precipitation amount is exceeded since the last retrieval or message. After the alarm has been sent, the PreLOG resets the "**Precipitation Amount Since Last Retrieval**" to zero.

> **Tip: Please note, that the** *Precipitation Amount Since Last Retrieval* **will be transmitted in the alarm data and reset after any other alarm, too.**
> **Also keep in mind, that the** *Precipitation Amount Since Last Retrieval* **will be reset to zero after retrieval of the** *PreLOG Status*.

Configuration

The alarm "**Exceeding of a Max. Precipitation Amount Since Last Retrieval**" can be activated in the PreLOG-Commander in the tab "**Setup – PreLOG Configuration – Alarm (Part 1)**." Furthermore the "**Amount T**h**reshold**" can be specified in steps of 0.1 mm/m² between 0 and 100 mm/m².

Event: Exceeding of a Max. Precipitation Amount as Moving Sum in a Selected Period

If the event "**Exceeding of a Max. Precipitation Amount in a Selected Period**" is activated, the PreLOG transmits an alarm message if a max. precipitation amount is exceeded in a given time interval. The event will be released as soon as the detected precipitation amount per time interval falls below a specified release amount. The moving time interval is moved every 6 s and the precipitation amount in the time interval is recalculated.

Configuration

The alarm "**Exceeding of a Max. Precipitation Amount in a Selected Period**" can be activated in the PreLOG-Commander in the tab "**Setup – PreLOG Configuration – Alarm (Part 2)**." Furthermore the "**Trigger Period**" can be specified in steps of 1 min between 1 and 60 min in the corresponding area as well as the "**Amount Threshold**" and the "**Release Amount**" in steps of 0.1 mm/m² between 0 to 100 mm/m².

Event: Exceeding of a Max. Precipitation Intensity

If the event "**Exceeding of a Max. Precipitation Intensity**" is activated, the PreLOG transmits an alarm if a max. intensity is exceeded at all times of a given period. The event will be released if the intensity falls below a specified release intensity.

Configuration

The alarm "**Exceeding of a Max. Precipitation Intensity**" can be activated in the PreLOG-Commander in the tab "**Setup – (PreLOG) Configuration – Alarm (Part 2)**." Furthermore the "**Time Base**" (for the calculation of the intensity) can be specified in steps of 1 min in the corresponding area as well as the "**Intensity Threshold**", the "**Release Intensity**" (intensity has to drop below this value before another alarm can be triggered) in steps of 0.1 mm/min up to 100 mm/min and the "**Trigger Period**" in min (during which the intensity has to be above the intensity threshold).

8.3   Data Transmission

The PreLOG can transmit data in several ways: from communication via USB cable to a directly connected PC to the use of mobile communications networks. For instance in the case of automatic transmission via modem to a PC with appropriate MeteoWare software e. g. the MeteoWare Rain.
In all cases the communication is done via the 8-pin M12 connector (COM1).
For further details regarding the configuration of the data transmission see chapter 9.2.2 (pp. 20 ff.) as well as 9.2.4 (p. 24).

Remote Request (Online/PSTN/GSM/CSD)

This technology establishes a dedicated communication channel (circuit) through the network before the nodes may communicate. Consequently the COM1 interface is permanently available. The central node can call the PreLOG at any time and retrieve the data via landline (PSTN - Public Switched Telephone Network), or GSM network (CSD - Circuit Switched Data). In this communication type the PreLOG does not send alarm messages.
Many telecommunication carriers are dropping support for CSD, and CSD has been superseded by packet oriented mobile data services.
Since the COM1 and the modem are permanently activated and consume energy in this type of communication, the CSD mode is only conditionally suitable for applications with solar power supply.
Please note the respective connecting diagram (Fig. 10, p. 8).

Remote Send (GPRS)

The COM1 interface (with connected modem) will be activated by the PreLOG in specified intervals or to transmit triggered alarm messages. Then a packet oriented connection to an appropriate MeteoWare host with static IP address will be established via GPRS.

All data which have not been sent previously, will be transmitted automatically by the PreLOG. It recalls the last transmitted data set and starts the next transmission with the following data set. If there are no recent data available, the record "**NoData**" will be transmitted.

After a successful data transmission the interface and the modem will be deactivated.

This type of communication is most suitable for application with limited power supply e. g. solar powered precipitation stations. Please note the respective connecting diagram (Fig. 9, p. 8).

**Communication PreLOG – PC
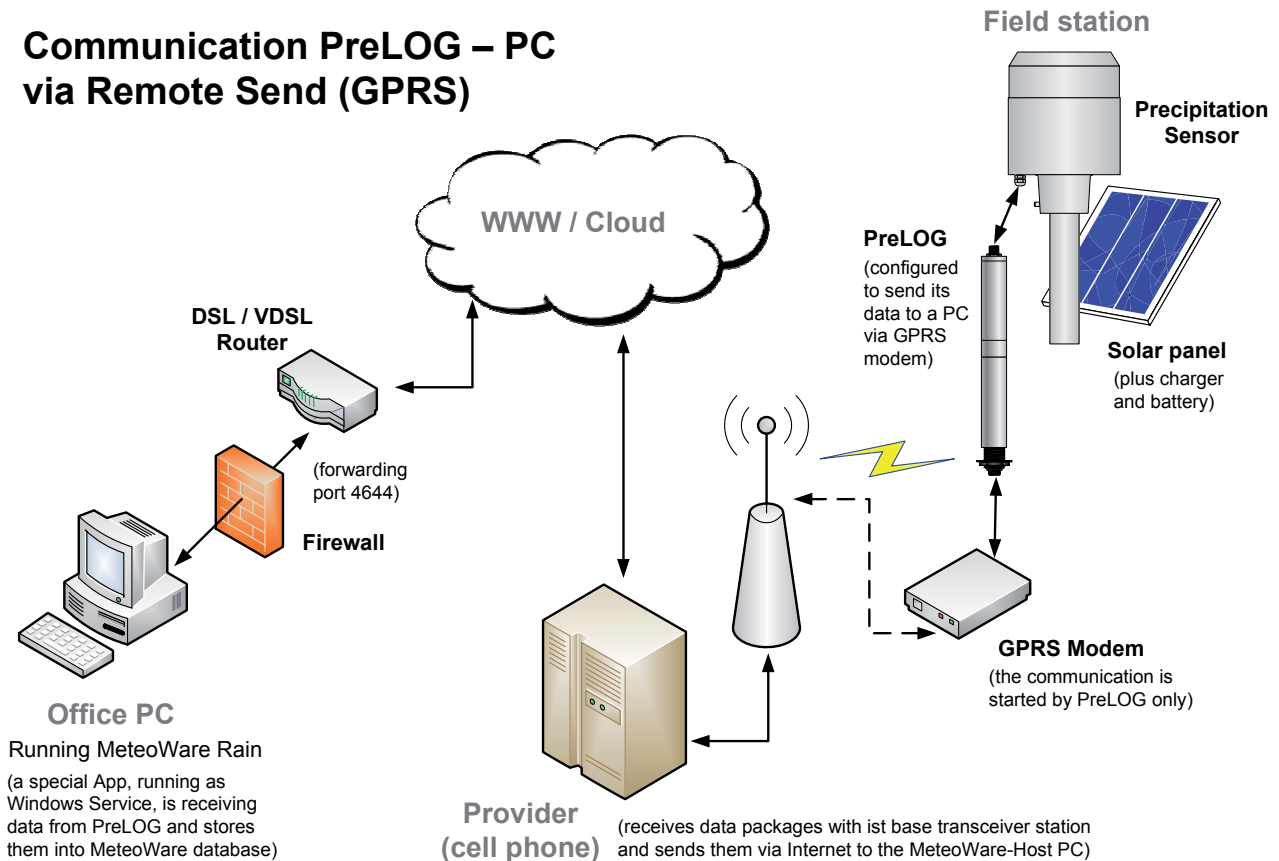via Remote Send (GPRS)**

Field station

Precipitation Sensor

WWW / Cloud

PreLOG
(configured to send its data to a PC via GPRS modem)

DSL / VDSL Router

Solar panel
(plus charger and battery)

(forwarding port 4644)

Firewall

GPRS Modem
(the communication is started by PreLOG only)

Office PC

Running MeteoWare Rain

(a special App, running as Windows Service, is receiving data from PreLOG and stores them into MeteoWare database)

**Provider
(cell phone)**

(receives data packages with ist base transceiver station and sends them via Internet to the MeteoWare-Host PC)

Fig. 13

Additional remark for the recommended communication mode „Remote Send":

The MeteoWare host must be accessible via internet on an invariable address (hostname/IP address). Either with a static IP address (for example a company network with a fix connection to the internet via firewall) or, in case of a dial up connection (DSL), via a so called Dynamic Hostname Service: A well-known example (among others) is DynDNS. Such a dynamic DNS service automatically maps between the volatile IP address of the router (that will change on every dial up, but at the latest once a day) and a fix hostname.

Remote Send / Request (GPRS/GSM)

The COM1 interface and a connected modem are permanently activated. Requests can be made as in the communication type Remote Request. In the specified interval or in case of alarms the PreLOG will transmit data as in the communication type Remote Send.

Since the COM1 and the modem are permanently activated and consume energy in this type of communication, its suitability is limited for applications with solar power supply.

⚠ **Attention! If the mode** "*Remote Send / Request*" **is used, the PreLOG will terminate a possibly existing connection and thereby any ongoing data transmission of a Request process and establishes a new connection to execute the Send process on time.**

Please also note the respective connecting diagram (Fig. 10, p. 8).

8.3.1 Data Retrieval using PreLOG-Commander (USB)

With the PreLOG-Commander the recorded data sets on the PreLOG can be retrieved directly via USB or RS232 connection for specified time frames and saved into a CSV file.

Implementation:
1. Connect the PreLOG to a PC or notebook via USB or serial interface (RS232).
2. Select the corresponding PreLOG and the option "**Standard PC**" for the PC modem in the menu "**Setup – Select Current Station**"
3. Make sure, that in the area "**Setup – PreLOG Configuration – General – PC Settings**" the connection type "**Online**" and the baud rate "**115200**" Bd for USB or "**19200**" Bd for RS232 connections are selected.
4. Using the function "**Retrieval – Measured Values**" you can retrieve the data from the PreLOG. Select the desired time frame and after pressing "**Request**" specify the directory and file name for the CSV file.
5. The corresponding data set will be saved to a CSV file. The format can be defined with the function "**Setup – CSV Format Settings**" (see p. 24). These files can be further processed with Microsoft Excel.

The circular buffer of the PreLOG can store up to 65535 measured values (with timestamp). With a time base of 10 min, a whole year with (hypothetical) permanent raining can be recorded.

8.3.2 Data Retrieval using PreLOG-Commander (GSM Mode)

In addition to the direct data retrieval via USB, the PreLOG can transmit the recorded data sets for specified time frames via an appropriate GSM modem to a PC with PreLOG-Commander and save them as a CSV file.

Implementation:
1. Before you use the station it has to be configured with the PreLOG-Commander via USB or serial interface (RS232) for GSM communication (see pp. 20 ff.).
   - Connect the PreLOG to a PC or notebook via USB or serial connection (RS232).
   - Select the PreLOG and the modem option "**Standard PC**" under "**Setup – Select Current Station**"
   - Retrieve the configuration of the corresponding station ("**Request CFG**") and check the connection settings in the tab "**Setup – PreLOG Configuration – General**" and "**– PreLOG Internal Communication**" For the appropriate values see the corresponding sections in ch. 9.2.2 on pp. 20 ff. and the documentation of the modem in use. – if necessary. "**Save**" and transmit the new configuration to the station ("**Send CFG**").
   - Initialise the PreLOG modem for GSM communication with the function "**Setup – Modem Configuration**" (for the appropriate values and commands see ch. 9.2.4 pp. 24 ff.).
2. Afterwards the PreLOG can be commnuicated with via GSM using the PreLOG-Commander:
   - Select the corresponding PreLOG and PC modem in the menu "**Setup – Select Current Station**"Retrieve the configuration of the corresponding station ("**Request CFG**") and make sure, that the connection settings in the tab "**Setup – PreLOG Configuration – General**" and "**– PreLOG Internal Communication**" are correct (for the appropriate values see the corresponding sections on pp. 20 ff. and the documentation of the modem in use).
3. Using the function "**Retrieval – Measured Values**" you can retrieve the data from the PreLOG. Select the desired time frame and after pressing "**Request**" specify the directory and file name for the CSV file.
4. The corresponding data set will be saved to a CSV file. The format can be defined with the function "**Setup – CSV Format Settings**" (see p. 24). These files can be further processed with Microsoft Excel.

8.3.3 Data Retrieval using MeteoWare Rain (USB)

With the MeteoWare Rain the recorded data sets on the PreLOG can be retrieved directly via USB or RS232 connection for specified time frames and saved into the MeteoWare Rain database. If required, the data can be exported in several file formats.

Implementation:

1. Connect the PreLOG to a PC or notebook via USB or serial interface (RS232).
2. Select the corresponding PreLOG and the option "**Standard PC**" for the PC modem in the menu "**Setup – Workstation**"
3. Make sure, that in the window "**Setup – Station**" the correct COM port is selected as well as the connection type "**Online**" and the baud rate "**115200**" Bd for USB and "**19200**" Bd for RS232 connections.
4. Using the function "**Online – Mean Values**" you can retrieve the data from the PreLOG.
5. The data set will be saved directly into the MetoWare Rain database. With the function "**Utilities – ... export**" the data can be exported in the formats "**MW**" (MeteoWare Rain specific), "**ASCII**", "**dBASE**" and "**Excel**."

For a complete documentation of the scope of functions please refer to the operating instructions (help pages) of the MeteoWare Rain.

8.3.4 Data Retrieval using MeteoWare Rain (GSM Mode)

In addition to the direct data retrieval via USB the MeteoWare Rain can transmit the recorded data sets via an appropriate GSM modem for specified time frames and save them directly into the MeteoWare Rain database. If required, the data can be exported in several file formats.

Implementation:

1. Before you use the station it has to be configured with the PreLOG-Commander via USB or serial interface (RS232) for GSM communication (see pp. 20 ff.).
   - Connect the PreLOG to a PC or notebook via USB or serial connection (RS232).
   - Select the PreLOG and the modem option "**Standard PC**" under "**Setup – Select Current Station**"
   - Retrieve the configuration of the corresponding station ("**Request CFG**") and check the connection settings in the tab "**Setup – PreLOG Configuration – General**" and "**– PreLOG Internal Communication**" For the appropriate values see the corresponding sections in ch. 9.2.2 on pp. 20 ff. and the documentation of the modem in use. – if necessary. "**Save**" and transmit the new configuration to the station ("**Send CFG**").
   - Initialise the PreLOG modem for GSM communication with the function "**Setup – Modem Configuration**" (for the appropriate values and commands see ch. 9.2.4 pp. 24 ff.).
2. Afterwards the PreLOG can be commnuicated with via GSM using the PreLOG-Commander:
   - Select the corresponding PreLOG and the PC modem in the menu "**Setup – Workstation**"
   - Check the settings for the interface and the connection in the menu "**Setup – Station**." For the appropriate values see the corresponding sections in the operating instructions of the MeteoWare Rain and the documentation of the modem in use.
3. Using the function "**Online – Mean Values**" you can retrieve the data of a specified time frame from the PreLOG.The corresponding data set will be saved directly into the MeteoWare database. With the function "**Utilities – ...export**" the data can be exported in the formats "**MW**" (MeteoWare Rain specific), "**ASCII**", "**dBASE**" and "**Excel**."

For a complete documentation of the scope of functions please refer to the operating instructions (help pages) of the MeteoWare Rain.

8.3.5 Data Reception using MeteoWare Rain (GPRS Remote Send Mode)

With the MeteoWare Rain and the corresponding GPRS service you can receive measured values sent via GPRS from up to 255 known PreLOG. Received data sets are stored in the MeteoWare Rain database.

Implementation:

1. Before you use the station, it has to be configured for GPRS communication using the PreLOG-Commander (see pp. 20 ff.).
   - Select the corresponding PreLOG and the option "**Standard PC**" for the PC modem in the menu "**Setup – Select Current Station**"
   - Retrieve the configuration of the corresponding station ("**Request CFG**") and check the connection settings in the tab "**Setup – PreLOG Configuration – General**" and "**– PreLOG Internal Communication**"

For the appropriate values see the corresponding sections on pp. 20 ff. and the documentation of the modem in use.

- Test the GPRS functionality with the "**GPRS Test**" button in the "**Setup – PreLOG Configuration**" window.

2. Configuration of the station in the MeteoWare Rain with the button "**Setup – Station – New**"

- Set the station (number code), name and short description.
- Select the station type.
- Specify the interface settings.
- Press the button "**Retr. settings**." Afterwards the MeteoWare Rain configures itself automatically.

3. Setting up the GPRS service on the MeteoWare host.

- Start the MeteoWare Rain-Service-Control-Manager by pressing the shortcut "**MWR_SCM**" (on the desktop after installation).
- Install the GPRS service in the tab "**Install**."
- Start the GPRS service in the tab "**Start / Stop**."

4. The corresponding data set will be saved directly into the MeteoWare data base. With the function "**Utilities – ...export**" the data can be exported in the formats "**MW**" (MeteoWare Rain specific), "**ASCII**", "**dBASE**" and "**Excel**."

> **To receive data from a station the PC has to be switched on and must be connected to the internet. There is no need to have any user logged-in.**

8.3.6 Automated Data Reception and Monitoring of Measuring Networks using MeteoWare Rain full version

In addition to the periodical reception of data from stations via GPRS and the manual retrieval of data from the stations one by one via USB or GSM, the full version of MeteoWare Rain is able to retrieve respectively receive the data and alarm messages of complete networks automatically via GSM/GPRS. Thereby the full version of MeteoWare Rain is the software of choice for monitoring measuring networks with several PreLOG. For a complete documentation of this and further functions please refer to the operating instructions (help pages) of the MeteoWare Rain software. Before you use the station in this way, it has to be configured for GPRS communication using the PreLOG-Commander (see pp. 20 ff.)

9 PreLOG-Commander

The PreLOG will be configured with the PreLOG-Commander - best done with the PreLOG connected directly to the PC via USB.

Requirements:

- PC with Windows XP, Windows 7 or Windows 8
- 1 USB port
- FTDI driver - the latest version is available at www.ftdichip.com/Drivers/VCP.htm

Features of the PreLOG-Commander

- Configuration and test of the PreLOG
- Documentation of the configuration
- Retrieval of the recorded data via USB or GSM modem
- Configuration and test of modems for communication
- Saving the measured values on the PC / notebook as excel-compatible CSV file
- Visualisation of the CSV file in a table

9.1 Initial Configuration of a PreLOG – Quickstart

Please note:
Information and warnings displayed on the screen should be read conscientiously and all consequential steps performed. If you close the messages too quickly, it is likely you will miss important information!

1. Connect the PreLOG to a PC or notebook via USB. Start the PreLOG-Commander and open the function "**Setup – PreLOG Configuration.**"
2. Create a new configuration by pressing the button "**New.**"
   All fields will be filled with factory settings.
   a. Enter a station name - up to 32 characters of the ISO 8850-15 standard are allowed.
   b. Specify the COM port the PreLOG is connected to.
   c. Save the configuration by pressing the "**Save**" button.
3. Retrieve the configuration of the connected PreLOG with the "**Request CFG**" button. Now the PreLOG-Commander displays the configuration data of the connected PreLOG.

   Save the retrieved configuration under the new station name and afterwards configure if necessary and save the configuration again. For further information on the configuration option please refer to chapter 9.2.2 on the following pages.
4. At the end transmit the configuration to the PreLOG by pressing the "**Send CFG**" button.
5. If the Prelog should be used in the "**Remote Request**" mode, the used modem has to be initialised with the function "**Setup – Modem Configuration**" (see pp. 24 f.).
6. Now the PreLOG can be mounted and used at its operational site.

Tip: If the PreLOG will not be externally power supplied, we recommend to charge the battery completely via USB before using the PreLOG. This may take up to 8 h.

9.2 Setup

9.2.1 Setup - Select Current Station

The PreLOG-Commander can manage up to 255 stations.
Under the function "**Select Current Station**" in the field "**Station**" you can specify the station you want to configure or from which you want to retrieve measured values. In the field "**Modem**" the PC modem has to be selected. If no modem is used, the option "**Standard PC**" has to be selected. When you "**Close**" the window, the settings will be saved.

9.2.2 Setup – PreLOG Configuration

The function "**PreLOG Configuration**" is used to configure PreLOGs.

(!) Tip: Please note that a PreLOG can only be configured if it is connected to the configuring PC!

The window "**PreLOG Configuration**" has 4 tabs: "**General**", "**PreLOG Internal Communication**", "**Alarm (Part 1)**" and "**Alarm (Part 2).**" In the tab "**General**" you can specify the "**Station Identification**" and "**Operating Mode**" as well as the "**PC Settings**" for the communication. In the tab "**PreLOG Internal Communication**" you can specify the settings of the PreLOG for the communication via modem. For further information on the configuration of the modem respectively the initialisation commands for the modem, please refer to chapter 9.2.4 (p. 22) and the documentation of the modem in use. In the tabs "**Alarm (Part 1)**" and "**Alarm (Part 2)**" you can define certain events at which the PreLOG will transmit a standardised alarm message via GPRS modem.

General

Station Identification

The "**Serial number**" and the date of the "**Last Configuration**" will be obtained from the PreLOG which is selected under "**Setup – Select Current Station**." They are used to identify the station. The standard station number is 0001. This value should only be changed if, and only if, multiple PreLOG systems are in the same network or are used with GPRS communication. Numbers between 0001 and 9999 are allowed.

(!) Tip: The station number "*0*" ist reserved. Every PreLOG will react with it on requests, but no PreLOG can be configured to have the station number "*0.*"

If the station number of the PreLOG differs from the number saved in the PreLOG-Commander, please first check if the correct station is selected ("**Setup – Select Current Station**"). If you know the station number, enter it in the field and press the tabulator key. An "**Enter**" button will then appear, click on this to finish the process. Afterwards communication with the connected PreLOG should work again. If you do not know the station number, enter the station number "**0**" instead. "**Request CFG**" you receive the configuration data of the connected station and thereby the current station number. Before closing the window save the data by pressing the "**Save**" button.

Operating Mode

Since the PreLOG is a pulse logger, it is mainly used to record amounts of precipitation over time. To use it this way one selects in the field "**Time Base**" the duration in min over which the pulses are added up. If instead of a time "**Individual Pulses**" is selected, the PreLOG records each pulse with a corresponding timestamp. The pulses will be recorded with the specified resolution factor or if necessary with the corresponding intensity-dependent corrected value and a timestamp. The sums are calculated respectively and recorded with timestamp, too.

In the field "**Resolution Factor**" you can enter the amount of precipitation in mm/m² which corresponds to a tipping bucket pulse of the connected precipitation sensor. In case of precipitation sensors of the type 1518H3, 15188 and 15189 this is 0.1 mm/pulse for the 2 cm³ tipping bucket and 0.2 mm/pulse for the 4 cm³ tipping bucket. If a rain[e] is connected, the resolution factor has to be selected in accordance to the rain[e] settings (smallest possible value: 0.01).

For LAMBRECHT precipitation sensors without an integrated precipitation correction or signal linearisation the PreLOG specific linearisation can be activated by checking the box for "**Signal Linearisation**." It compensates the intensity-dependent measuring error due to the principle of tipping bucket precipitation sensors. It means that precipitation amounts (individual pulses as well as sums) will be recorded corrected depending on the intensity.

If needed the PreLOG can "**Calculate Sum Since Switch On**" (amount of precipitation since the PreLOG was switched on) and "**Calculate Sum Since Last Retrieval**." These options can be activated with the corresponding check boxes. The recorded precipitation amount since the last retrieval will be reset to zero automatically after each retrieval. The values will be recorded and displayed in mm/m². Removing the battery and disconnection from any power supply will reset both values to zero, too.

If another device should process the pulses from the precipitation sensor, the pulse output of the PreLOG can be activated. The length of an output pulse depends on the specified resolution factor (Standard: 0.1). At resolution factors ≥ 0.1 the closing time and the pulse duration are 125 ms. At resolution factors < 0.1 the closing time is reduced to 10 ms.

⚠️ **Attention! Please note, the pulse output of the PreLOG is <u>not</u> galvanically isolated!**

PC Settings

In the area "**PC Settings**" you can specify the settings for the communication of the PC with the PreLOG.

In the field "**COM Port**" you can select the port to which the PreLOG is connected. The transmission speed can be specified in the field "**Baud Rate**."

🛈 **Tip: USB ports work with a baud rate of 115200 Bd while GSM and GPRS modems as well as the RS232 interface communicate with 19200 Bd.**

If the option "**TCP/IP...**" is selected as COM port, the corresponding IP address of the host and the used port have to be specified in the corresponding fields. The field "**Handshake**" can be used to specify the control lines of the PC interface. Only if a telephone or radio modem is used the option "**RTS/CTS**" should be selected, else the option "**none**" is correct.

The field "**Connection type**" has only two options: "**Online**" (direct connection) and "**Modem**." "**Online**" is used for PreLOGs directly connected to the PC via USB or availabe in a network via LAN. If a modem is used, the phone number of the modem has to be entered in the field "**Modem Phone Number**." Furthermore for connections with a telephone modem the maximum allowed duration to set up a connection ("M**ax. Connect Time**") is needed. The attempt will be cancelled if this duration is exceeded.
If the connection was successful, a break according to the time in "**Break After CONNECT**" will be taken. This break is necessary, since some modem types will cancel the connection if the communication starts right after the connection has been established.
The maximum number of dialing attempts can be specified in the field "**Max. Redials**." If this limit is exceeded, the communication will be cancelled.
In the field "**Timeout**" you can specify how much seconds the software will wait for an answer from the station after a data request before it detects an error. For the PreLOG this value should be 3 s. In the field "**Max. No. of Errors**" you can specify the limit of communication errors after which no further connection attempts will be made.

PreLOG Internal Communication

In the tab "**PreLOG Internal Communication**" the settings for the communication of the PreLOG via COM1 interface (8-pin connector) are set.

There are three different "**Communication Types**" available. Alternatively the COM1 interface of the PreLOG can be deactivated by chosing the option "**OFF**."
- In the mode "**Remote Request**" the COM1 interface is permanently available via a dedicated communication channel (Circuit Switched Data) - a connected GSM modem can be reached at any time. In this mode the PreLOG does not send alarm messages.
- In the mode "**Remote Send**" the interface and thereby the connected modem will be activated according to the times specified in the field "**Interval**." The PreLOG will connect to a suitable MeteoWare host with static IP address via packed oriented GPRS and then automatically transmits the latest measured values. The PreLOG remembers the last send data set and continues with the next one. If no new data sets have been recorded, the data set "**NoData**" will be sent. After successful data transmission the interface and modem will be deactivated again.
- The mode "**Remote Send / Request**" is the combination of the options "**Remote Send**" and "**Remote Request**." Interface and modem are activated the whole time. Therefore communication with the PreLOG is possible at any time. In addition the PreLOG transmits the latest measured values at the times specified in the field "**Interval**" as in the mode "**Remote Send**."

We recommend the communication type "**Remote Send**" for applications with solar power supply.

> **Attention! If the mode** "*Remote Send / Request*" **is used, the PreLOG will terminate a possibly existing connection and thereby any ongoing data transmission of a request process and establishes a new connection to execute the send process on time.**

The standard communication speed of the PreLOG is 19200 Bd. This is the communication speed for GSM and GPRS connections. In case of other connection types it can be changed in the field "**Baud Rate**."

In the field "**Interval**" the transmission intervals for the communication types "**Remote Send**" and "**Remote Send / Request**" can be specified. The start time for all periods is 00:00:00. The option "**at hour 'Instant of Time'**" allows daily data transmission via GPRS at the instant of time, defined in the field "**Instant of Time**." If the option "**at alarm only**" is selected, the data will only be transmitted if an alarm has been triggered.

The "**Break After Switch On**" is the time the modem needs to initialise itself after being switched on before it can receive further commands. If a GSM modem is used, this time has to be long enough for the modem to connect to a GSM network.

For the establishment of a GPRS connection several control commands have to be transmitted to the modem. The length of the break between the individual commands can be specified in the field "**Command Pause**."

Modem connections need further information regarding the allowed "**Max. Connect Time**" for a connection. If this duration is exceeded, the attempt to connect will be cancelled. The maximum number of connection attempts is specified in the field "**Max. Redials.**" If this limit is exceeded, the communication will be cancelled. Between connection attempts a "**Timeout**" has to be adhered. After a connection has been established successfully, a "**Break After CONNECT**" has to be adhered to. This break is necessary, because some modem types will cancel the connection if the communication starts right after connection has been established.

The following access data are necessary for a GPRS connection:

APN: Accesspoint address of the GPRS provider
User: User name for access to the APN
Password: User-specific password
(These three access data will be provided by your GPRS provider.)
Host: IP address or hostname of the network router respective PC, on which MeteoWare is installed for communication with the PreLOG.
Port: Access port which the MeteoWare monitors for incoming data (Standard: 4644)
(Remark: Possibly for this port must be configured a forward to the MeteoWare host in the configuration menu of the network router.)

Additional remark for the recommended communication mode „Remote Send":

The MeteoWare host must be accessible via internet on an invariable address (hostname/IP address). Either with a static IP address (for example a company network with a fix connection to the internet via firewall) or, in case of a dial up connection (DSL), via a so called Dynamic Hostname Service: A well-known example (among others) is DynDNS. Such a dynamic DNS service automatically maps between the volatile IP address of the router (that will change on every dial up, but at the latest once a day) and a fix hostname.

Alarm (Part 1)

In the two tabs "**Alarm (Part 1)**" and "**Alarm (Part 2)**" you can specify in which cases the used PreLOG will transmit the alarm data set (see p. 13). If the alarm data set (or alarm message) has been transmitted, the PreLOG will start automatically the transmission of the new values which have been recorded since the last data transfer.

Event: Start of Precipitation

If the alarm "**Start of Precipitation**" is activated, the PreLOG will transmit the alarm data set to the data centre if the "**Amount Threshold**" is exceeded in the "**Trigger Period.**" This event cannot be triggered again within the following "**Release Time.**" If the option "**End of Precipitation**" is selected in the selection box for the release period, the event "**Start of Precipitation**" cannot be triggered before the event "**End of Precipitation**" has occurred.

Event: End of Precipitation

If the alarm "**End of Precipitation**" is activated, the PreLOG will transmit the alarm data set to the data centre, if no precipitation is detected over the duration of the "**Trigger Period.**" This alarm cannot be triggered again within the following "**Release Time.**" Furthermore it can only be triggered if the alarms "**Start of Precipitation**" or "**Exceeding of a Max. Precipitation Amount as Moving Sum**" have been triggered before.

Event: Exceeding of a Max. Precipitation Amount Since Last Retrieval

If the alarm "**Exceeding of a Max. Precipiation Amount Since Last Retrieval**" is activated, the PreLOG will transmit a single alarm message to the data centre if more precipitation has been detected than specified as "**Amount Threshold.**" Afterwards the value will be reset to zero.

Alarm (Part 2)

Event: Exceeding of a Max. Precipitation Amount in a Selected Period

If the alarm "**Exceeding of a Max. Precipitation Amount in a Selected Period**" is activated, the PreLOG will transmit an alarm message to the data centre, if the "**Amount Threshold**" has been exceeded over the duration of the "**Trigger Period**". The alarm will be triggered again until the detected amount of precipitation of a trigger period is less than the "**Release Amount**".

Event: Exceeding of a Max. Precipitation Intensity

If the alarm "**Exceeding of a Max. Precipitation Intensity**" is activated, the PreLOG will transmit an alarm message, if the "**Intensity Threshold**" has been exceeded over the duration of the "**Trigger Period**". The alarm will be triggered again until the detected precipitation intensity over a trigger period is less than the "**Release Intensity**". The intensity is calculated based on the specified "**Time Base**".

Buttons

With the button "**GPRS Test**" you can test, if a GPRS connection can be established to the selected PreLOG. In the process the command sequence to establish a connection via the selected GPRS modem will be executed by the connected PreLOG. The sequence has to be specified for the used modem type under "**Setup – Modem Configuration**". The commands and the corresponding answers will be displayed and recorded with timestamp to the file "GPRS.LOG" in the installation directory.

The current configuration (the content of all four tabs) can be transferred to the PreLOG by clicking the button "**Send CFG**." The transmission is done via the interface specified in the area "**PC Settings.**" The progress is displayed in a display bar. A message box returns if the transmission has been successful.

⚠️ **Attention!** "Send *CFG*" **deletes all data on the flash memory! Please retrieve all data from the flash memory before using** "Send *CFG*"**!**

To retrieve the configuration of the selected PreLOG use the function "**Request CFG**". The retrieval is done via the interface specified in the area "**PC Settings.**" The retrieval may take several minutes and the progress is displayed in the display bar. A message box returns if the retrieval has been successful. The retrieved configuration can be saved under the name deposited in the PreLOG or the current station name.
If you want to save the configuration under a new name, you have to create a new station with the "**New**" button prior to the retrieval of the configuration.

Changed profiles have to be saved onto the PC by clicking the "**Save**" button. Unnecessary profiles can be deleted with the "**Delete**" button. To copy the configuration of a profile into a new or existing profile use the "**Copy**" button.

The "**Lock/Unlock**" button in the top right corner can be used to prevent changes of the configurations. Clicking the button will lock and respectively unlock all boxes and fields of the selected station until clicking the button again. This status has to be saved via the "**Save**" button to be remembered by the PC.

9.2.3 Setup – Set PreLOG Clock

With the function "**Set PreLOG Clock**" you can set the real time clock of the PreLOG. The program suggests the system time of the PC. Enter the date and time in the appropriate fields. By clicking the "**Set Clock**" button the time will be transmitted to the PreLOG. The time necessary to establish a connection will be taken into account by the program.

9.2.4 Setup - Modem Configuration

The main purpose of the function "**Modem Configuration**" is to have a database with all necessary configuration data to initialise GSM modems connected to the PreLOG directly with the PC. Modems for GPRS connections do not have to be initialised via the PC since the PreLOG can initialise them independently regardless of modem type.

To initialise a GSM modem please select the connected modem from the database or create a corresponding entry including the initialisation sequence and save it - for the necessary information please refer to the operating instructions of the used modem.
Then use the subfunction "**Configuration**" and select the interface and corresponding baud rate. After clicking "**Initialisation**" button the progress will be displayed in the initialisation dialog.

> **Tip: The baud rate has to be identical to the corresponding value in the settings of the PreLOG (Standard: 19200 Bd).**

The "**Dial Command**" has to contain a control sequence which suits the telephone system the modem is connected to. It has to be distinguished between tone and pulse dial as well as between main station or telephone extension - for further information please refer to the operating instructions of the used modem and the documentation of the telephone system.
The "**Command Pause**" is the break between the initialisation commands. This modem-dependent value may be up to 10 s to give the modem the necessary time to process the individual commands. It is especially important after the "**AT&F0**" command.

The "**Dialing Pause**" is the time of the necessary break between two dialing attempts. Too short breaks lead to modem blocking.

9.2.5 Setup – CSV Format Settings

With this function you can specify the format of the timestamp, the decimal character and the field separator in the CSV files. For example you can use the German or the (English) international notation.

German

"Tag";"Zeit";"Niederschlag"
"dd.mm.yyyy";"hh:mm:ss";nn,nnnn

International

"Date","Time","Precipitation"
"mm/dd/yyyy","hh:mm:ss",nn.nnnn

9.3 Retrieval

9.3.1 Retrieval – Measured Values

With the function "**Retrieval – Measured Values**" you can retrieve the recorded measured values of the selected PreLOG using a direct connection via USB, serial interface (RS232) or a GSM modem.

In the area "**Start Date / Time**" you can specify start time for the data retrieval and respectively the end time in the area "**End Date / Time**".
Each time the function "**Measured Values**" is used, the fields will be set automatically to the current day. If no changes are made, the time between 00:00:00 and the current time of the current day will be selected.

After clicking the "**Request**" button you can select the directory and the file name to save the recorded data. The PreLOG-Commander checks if the connected station is identical with the selected configurations. A message box will inform you, if there are differences in the configuration. In that case the function "**Measured Values**" will be cancelled, so you are able to correct the configuration with the aid of the functions "**Setup – Select Current Station**" and "**Setup – PreLOG Configuration**" (see ch. 9.2.2, pp. 20 ff.).

If the configuration is correct, the PreLOG-Commander will start to retrieve and save the data. The progress as well as the end of retrieval will be displayed in the "**Info**" area. The selected file name including the complete path is displayed in the field "**File**". After the data transfer has been finished, the duration of the data transfer as well as the number of transferred measured values is displayed in the bottom left corner.

The data of each retrieval are saved to a separate CSV file. For further information regarding the CSV file format please refer to the previous chapter.

9.3.2 Retrieval - PreLOG Status

The function "**PreLOG Status**" can be used to display additional information regarding the selected PreLOG. The function returns the following pieces of information:

- **Station Name**
- **Firmware Version**
- **Amount of Precipitation Since Last Retrieval** (reset to zero afterwards)
- **Amount of Precipitation Since Switch On of the PreLOG**
- **Battery Status**
- **Percentage of Free Memory**
- **Most Recent GPRS Error**
- **Position of the Error in the Command Sequence**

The GPRS error is returned as a modem-compliant error code (see operating instructions of the used modem) with the error code "-1 = no error". The commands are internally numbered consecutively. Therefore the "**Position of the Error**" is the position of the error causing command in the command sequence.

9.4 Visualisation – Measured Data

The function "**Measured Data**" can be used to visualise the stored values of CSV files on the PC. At the start of the function the Windows file dialogue opens. It can be used to select the file you want to visualise. The data will be displayed as a table with scrolling bars. The data cannot be printed or processed in this presentation.

If you want to display another file, use the "**Open**" button and select the desired file.

9.5 Utilities

The tool functions are used to fix problems as well as for maintenance or to update the firmware.

> **Tip: The execution of these functions may take up to several minutes depending on the configuration of the selected PreLOG.**

9.5.1 Utilities – Factory Reset

The function "**Factory Reset**" can be used to reset the configuration of PreLOG to the factory settings and thereby delete the prior configuration. A message box returns if the factory reset has been successful.

> **Attention! The function "***Factory Reset***" resets the configuration of the PreLOG as well as deletes all data in the flash memory! Therefore please retrieve all data from the flash memory prior to loading the factory settings.**

9.5.2 Utilities – PreLOG Reboot

The function "**PreLOG Reboot**" can be used to reboot the PreLOG. In the process the RAM will be deleted, the configuration loaded from the flash memory, the flash memory initialised again and a connected modem reset. A successful reboot will be reported in a message box.

> **Tip: At a reboot of the PreLOG neither recorded data as nor the values** "*Precipitation Amount Between Retrievals*" **and** "*Precipitation Amount since Switch On*" **will** <u>not</u> **be deleted.**

9.5.3 Utilities – PreLOG Clear Flash Memory

The function "**PreLOG Clear Flash Memory**" completely clears the flash memory of the PreLOG. This may be useful after a maintenance, if artificially generated data from a simulation were written on the PreLOG memory. A successful deletion will be reported in a message box.

> **Attention: The function "***Clear Flash Memory***" deletes all data in the flash memory. Please retrieve all data from the PreLOG before using this function.**

9.5.4 Utilities – PreLOG Reset Total Precipitation Amount

With the function "**PreLOG Reset Total Precipitation Amount**" you can reset the value for the precipitation amount since switch on of the PreLOG to zero. A successful reset will be reported by a message box.

9.5.5 Utilities – PreLOG Critical Error

At switch on or reboot the PreLOG does a self-checking of its hardware. If any errors are detected, the PreLOG will not start to record data and reports a critical error. The description of these critical errors can be displayed with the function "**PreLOG Critical Error**".
If a critical error occurs, **please check the PreLOG immediately** and contact the LAMBRECHT service department (+49-5514958390), since the PreLOG cannot proceed as long as a critical error exists.

9.5.6 Utilities – PreLOG Firmware Update

The function "**PreLOG Firmware Update**" can be used to load a new firmware into the EEPROM memory of the PreLOG. This might be necessary if new program features or improvements are available.

> **Attention! In the firmware updating process all data in the flash memory will be deleted. Therefore please retrieve all data from the flash memory before updating the firmware.**

To perform a firmware update please follow these steps:

1. Select the interface the PreLOG is connected to.
2. Select the installation file of the new firmware and start the firmware update.
3. After a successful update please check the configuration and time of the PreLOG. Correct the settings if necessary.

10 Inspection and Troubleshooting

It is recommended to perform visual and functional inspections on a regular basis at least once a year. The PreLOG is highly insensitive to external contamination. Nevertheless it should be ensured that no contaminations enter into the interfaces or that they are not accessible due to severe icing. The inspection intervals have to be adjusted to the respective environmental conditions.

10.1 Critical Error

At switch on or reboot the PreLOG does a self-checking of its hardware. If any errors are detected, the PreLOG will not start to log and reports a critical error. The description of these critical errors can be displayed with the function "**PreLOG Critical Error**".

If a critical error occurs, **please check the PreLOG immediately** and contact the LAMBRECHT service department (+49-5514958390) as the PreLOG cannot proceed as long as a critical error exists.

10.2   GPRS Test Failed

First open the file "GPRS.LOG" in the installation directory. The entry for the failed GPRS test may provide valuable information on the cause of the error. If the error is not obvious, please follow these steps:

- Check if the correct station with the correct station number, connection type "**Modem**" and baud rate 19200 Bd are selected in the tab "**Setup – PreLOG Configuration – General**". Check if the further PC settings are according to your PC modem and if the settings in the tab "**PreLOG Internal Communication**" are according to your GPRS modem at the PreLOG.

- If the problem persists, please reboot the PreLOG with the function "**Utilities – PreLOG Reboot**".If the problem persists:

  1. Please first retrieve the recorded data from the PreLOG via USB with the function "**Retrieval – Measured Values**". Here it is necessary to pay attention to the correct PC settings in the tab "**Setup – PreLOG Configuration – General**".

  2. Then reset the configuration of the PreLOG to factory settings with the function "**Utilities – PreLOG Factory Reset**".

> ⚠️ **Attention! The function** "*Factory Reset*" **resets the configuration of the PreLOG as well as deletes all data in the flash memory! Therefore please retrieve all data from the flash memory prior to loading the factory settings.**

  3. Now just configure the settings for the GPRS connection and perform the GPRS test again.

- If the problem persists, please contact the LAMBRECHT service department and keep the entry from the "GPRS.LOG" file within reach.

10.3   Retrieval of PreLOG Configuration Failed

- Check in the tab "**Setup – PreLOG Configuration – General**" if the correct station with the correct station number and corresponding PC settings for your connection is selected. In case of communication via modem check the settings in the tab "**PreLOG Internal Communication**" regarding the necessary parameters for the modem connected to the PreLOG.

- If the problem persists, please set the station number to "**0**" (see p. 20) and then request the configuration.

- If the problem persists, please contact the LAMBRECHT service department.

10.4   Transmission of PreLOG Configuration Failed

- Check in the tab "**Setup – PreLOG Configuration – General**" if the correct station with the correct station number and corresponding PC settings for your connection is selected. In case of communication via modem check the settings in the tab "**PreLOG Internal Communication**" regarding the necessary parameters for the modem connected to the PreLOG.

- If the problem persists, please set the station number to "**0**" (see p. 20) and then request the configuration. If you received the configuration, the desired parameters can be specified again. Afterwards transmit the configuration to the station. If this fails, check the connection-relevant parameters once again.

- If the problem persists, please contact the LAMBRECHT service department.

10.5   Exchanging the Rechargeable Battery

The integrated rechargeable lithium-ion battery has an average service life of 5 years. The actual service life depends on different factors, such as ambient temperature, logging interval, interval of retrieval via PC (thereby charging the battery), etc.
The exchange of the battery can be done at site by appropriately trained employees. An appropriate replacement battery can be obtained from LAMBRECHT.

The removed batteries have to be disposed according to the country-specific regulations. In Germany batteries can be returned to any battery-selling store or the local recycling depot.

11 Maintenance and Repair

In case you should be faced with any specific problems which you cannot solve, please contact the LAMBRECHT service department on:

Tel.:   **+49-(0)551-4958-0**
or   **+49-(0)551-4958-390**
E-mail: support@lambrecht.net

12 Equipment and Spare Parts

General Accessories

00.90519.000 000	GPRS solar set
36.09338.010 000	Software MeteoWare Rain basic
36.09338.210 000	Software MeteoWare Rain full version (automatable retrieval and alarm function)
36.15190.000 000	PreLOG-Commander
65.53090.160 100	USB cable for configuration and data retrieval
65.53090.170 100	USB cable with circular connector for connection of a sensor; L = 1 m
32.15184.060 000	M12 cable (8-pin) for data retrieval via RS232; L = 10 m
32.14627.001 010	Fastening angle

Service

97.15180.000 000	User-specific configuration

13   Space for Notes

14   Technical Data

PreLOG	**00.15190.000000**
Input:	1 Pulse Input, integrated signal debouncing
Output:	1 Pulse Output (OC)
Resolution	configurable (Standard value 0.1 mm)
Intensity Correction	integrated for LAMBRECHT precipitation sensors 15189, 15188, 1518H3; can be deactivated
Power Supply Modem	optional via PreLOG 12 V DC (9…26 V DC) *
Storing Intervall	"Event with timestamp; Sum of precipitation: 1 min to 24 h"
Storage Period	at a resolution 0.1 mm/pulse and a mean amount of precipitation of 850 mm/m² (Germany) per year: 7 years
Recording Mode	event-driven recording (no zero values)
Max. Number of Records	65535
Interfaces	USB for configuration, data retrieval and battery recharging RS232 for data retrieval and connection to a modem *
Configuration	via USB with PreLOG-Commander
Real-time Clock	typ. ± 3 ppm, at -15 °C …+60 °C max ± 5 ppm at -25 °C …+65 °C max ± 10ppm
Rechargeable Battery	3.6 Li-Ion, exchangeable
Ext. Power Supply	12 V DC (9…26 V DC) Caution: Power supply with connected modem is patched through directly to the modem.
Charging the Battery	only via USB-interface (5 V DC, 500 mA)
Max. Current Consumption	at 12 V DC ext. power supply, 2 - 10.5 mA; typ. ca. 2.5 mA
Battery life	up to 5 years (without recharging, at +20 °C)
Operating temperature	-20 °C to +60 °C (battery)
Protection class	IP65 (casing), IP67 (connected connector)
Casing	seawater resistant aluminium
Dimensions	approx. 290 x Ø 32 mm
Weight	approx. 0.33 kg

PreLOG ECO	**00.15190.010000**

Same as PreLOG without RS232 interface and alarm functions and without M12 plug connector.

* = not available with PreLOG ECO