

blue'Log XM / XC

User manual



Version 20231121

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Details regarding the user manual

The original user manual is written in German. All other language versions are translations of the original user manual and are hereby identified as such.

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All information in this user manual has been compiled and checked with the greatest care and diligence. Nevertheless, the possibility of errors cannot be entirely excluded. meteocontrol GmbH therefore cannot accept any liability for errors or any circumstances resulting from errors.

Subject to technical alterations.

Release notes

Date	Changes
2023-04-13	Format and safety instructions updated Cables and wiring, bus cabling updated Images updated
2023-11-21	Minor wording changes in 7.3.3

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1. General notes

1.1 Safety instructions

Safety instructions warn of dangers when using the devices and explain how to avoid them.

The safety instructions are classified according to the severity of the risk and are subdivided into four groups:

DANGER



Imminent danger

Failure to comply with the warning notice will lead to an imminent risk of death or serious physical injury!

WARNING



Possible danger

Failure to comply with the warning notice may lead to a risk of death or serious physical injury!

CAUTION



Hazard with low risk

Failure to comply with the warning notice may lead to minor injuries!

NOTICE

Hazard with a risk of material damage

Failure to comply with the warning notice will lead to material damage!

1.2 Warning notices

Particular dangers are highlighted using warning symbols.

RISK OF ELECTRIC SHOCK



Electric shock hazard!

Danger to life and limb! Failure to comply with the warning notice will lead to an imminent risk of serious injury or death.

1.3 Additional information



This symbol can be found next to notes, additional information and tips.

2. Advice on using the user manual

2.1 Purpose of this user manual

This user manual is a key aid when it comes to ensuring proper operation of the device. It contains important information and safety notes to help you use the devices correctly, economically and in the intended manner.

The user manual helps to avoid dangers, to reduce repair costs and downtimes, and to increase the reliability and operating life of the devices. Read this user manual carefully and attentively before you start work on the blue'Log.

The user manual is continuously updated. The current version can be found on our website: www.meteocontrol.com.

2.2 Target group and qualification

This manual is intended for persons who are responsible for planning the installation, installing, starting up, operating, and maintaining the blue'Log. The activities described in this document may only be carried out by qualified personnel. Qualified personnel must meet the following criteria:

- Training in the installation and configuration of IT systems
- Training in hazards and risks when installing, repairing and operating electrical equipment and systems.
- Training for the installation and commissioning of electrical equipment and systems
- Knowledge of the relevant laws, standards and guidelines
- Knowledge of and compliance with this document with all safety instructions

DANGER



Danger due to improper handling

- The staff responsible for the installation, operation and maintenance of the system must have read and understood this user manual before the devices can be installed and used safely!
- The manuals and documentation must be kept by the system and be available at all times as required.

meteocontrol GmbH accepts no liability for personal injury, damage to property, or system malfunctions and their consequences, insofar as these result from non-observance of this user manual.

2.3 Warranty and liability

The scope, period and form of the warranty are specified in the general terms and conditions of meteocontrol GmbH. Further information on warranty and liability can be found at www.meteocontrol.com

meteocontrol rejects any liability for damage arising from the non-observance of the user manual. This applies, in particular, for damage from:

- Unintended use
- Faulty operation
- Wrongly chosen materials and tools
- Faulty or non-executed maintenance and repairs

In cases of control and regulation ("Power Control"), meteocontrol GmbH accepts no liability for events and occurrences outside of its control, such as:

- The correctness of control commands given by an energy supply company or failure to implement control commands
- Hardware and/or software faults on the part of the system operator
- End-user switching processes
- Any liability for damages caused by events and occurrences such as lost profits, grid instability, damage to parts of the customer's system, for instance of an inverter, shall remain expressly excluded.

3. Product description

Data loggers of the blue'Log X-series record all the data of your PV system to ensure the function of the system as well as its performance capabilities. Data such as current, voltage, temperature, output and yield from each individual inverter are measured, as are values from externally connected sensors. The blue'Log is the interface for grid-compliant feed-in for PV systems. The X-series is available in two variants: blue'Log XM and blue'Log XC. blue'Log XM is intended for monitoring purposes. blue'Log XC is intended for control and regulation ("power control") purposes.

See the blue'Log data sheet for further technical details. Further information about our licenses can be found at www.meteocontrol.com .

4. Transport and storage

Every product leaves our factory in perfect electrical and mechanical condition.

Special packaging ensures safe transport.

On delivery, unpack the device and all accessories and check them for any damage.

NOTICE

- To avoid possible damage, always use the original packaging when transporting or shipping the device.
- Protect the device against dust and moisture.

5. Safety

This chapter contains general safety regulations that must be followed during installation, operation, and maintenance of the blue'Log. Failure to do so can result in injury or death and/or damage the blue'Log. Read these safety regulations carefully before you start work on the blue'Log.

5.1 Intended use

Only the permitted signals and signal strengths may be applied to the connections of the data logger (blue'Log) and the expansion modules (MX modules) used here.

Installation is only permitted indoors. For installation outdoors or in a dusty environment, the device must be installed in a standardized protective enclosure.

5.2 Personnel

Installation, commissioning and maintenance of the device may only be performed by a qualified electrician.

Given their specialist training, knowledge, experience, and familiarity with the relevant standards and regulations, a qualified electrician is in a position not only to carry out work on electrical systems but also to recognize and avoid possible dangers unaided. The qualified electrician must comply with the occupational health and safety laws in force.

Please note in particular:

- All national installation and set-up regulations (e.g. VDE in Germany)
- The generally accepted codes of practice
- Information on transport, installation, operation, service, maintenance and disposal given in this user manual

- Specific values, limits, and information relating to operating and ambient conditions on type plates and in data sheets.

Protection concepts

- The memory card (SD memory) must not be removed while the blue'Log is in operation.
- The blue'Log may not be opened.
- The blue'Log may not be modified.
- Damaged devices must be taken out of operation immediately and checked by a qualified electrician.
- Local regulations must be observed when using the devices.
- The safety of the blue'Log and the user cannot be guaranteed if the safety precautions described are violated.

5.3 Internal battery

The blue'Log data logger contains an internal lithium battery (button cell) which ensures that the time and date remain stored in the device in the event that the power supply is interrupted.

NOTICE

The housing may only be opened by qualified personnel.

- The battery may only be replaced by the meteocontrol repair service, since the blue'Log housing needs to be opened.
- meteocontrol GmbH accepts no liability for material damage owing to non-compliance with this warning notice!

6. Device overview

6.1 blue'Log front panel

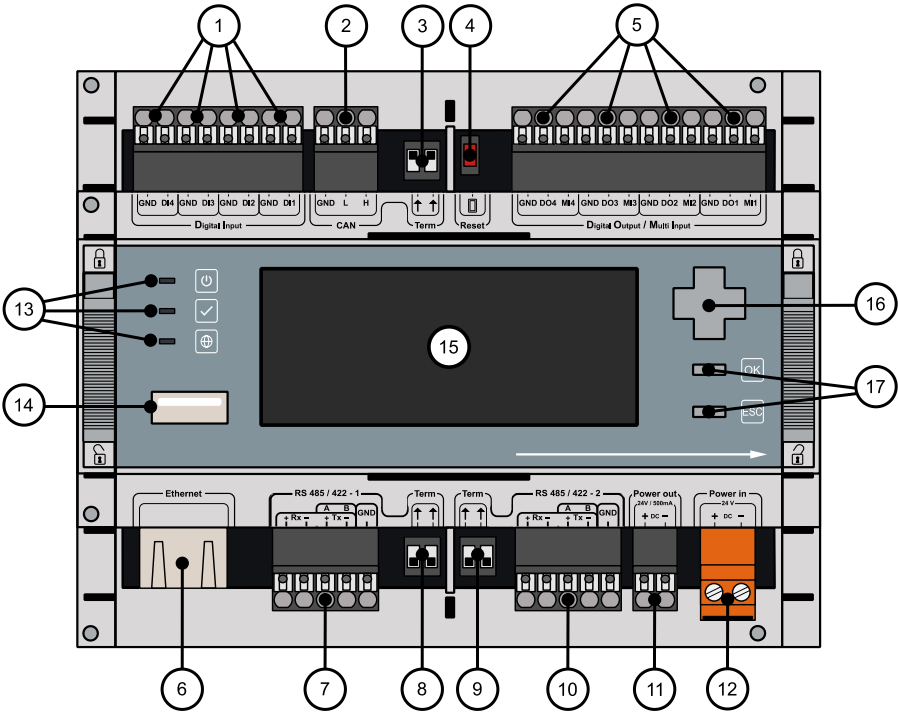


Fig. 1: Overview of the blue'Log front panel

- | | |
|---|----------------------------------|
| (1) Digital input (DI1–DI4) | (9) Termination RS 485 - 2 |
| (2) CAN | (10) RS485- 2 |
| (3) CAN termination | (11) Power out (24V DC / 500mA) |
| (4) Reset | (12) Power in (24 V DC) |
| (5) Digital output / multi-input (DO1 – DO4, MI1 – MI4) | (13) LEDs: power, status, online |
| (6) Ethernet | (14) USB interface |
| (7) RS485 -1 | (15) Display |
| (8) Termination RS 485 - 1 | (16) Directional pad |
| | (17) Buttons: OK, ESC |

6.2 blue'Log rear panel

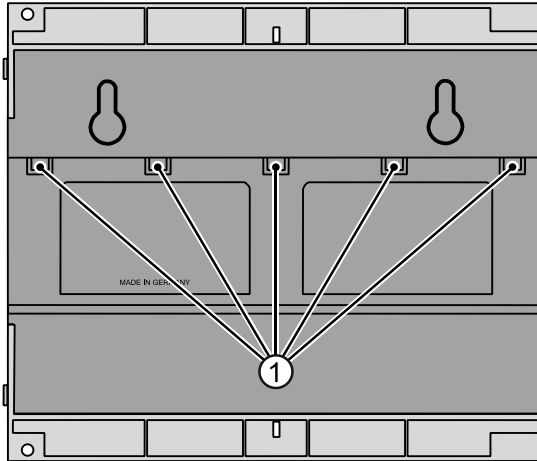













Fig. 2: Overview of the blue'Log rear panel

- (1) Clamp for top-hat rail

6.3 Status LEDs

The front panel features three LED displays with the following meanings:

Icon	LED	Explanation
		Green: blue'Log is supplied with power
		Off: No power supply
		Green: System loaded successfully: normal operation
		Orange: System booting: boot phase
		Red: System error
		Green: Connected to VCOM
		Orange: Connection setup to VCOM
		Red: No connection to VCOM

7. Mounting and installation

During installation, all the manuals for system modules and components must be taken into account.

7.1 Safety instructions for installation

DANGER



Electric shock hazard!

Fatal injuries or death from contact with cables and terminals.

- Only connect or disconnect cables while they are de-energized.
- Take measures to prevent the power cable from being reactivated.

NOTICE

Damage due to improperly connected wires and cables!

Incorrectly connected cables can lead to damage or destruction of the measuring inputs and the device.

- Connect cables only to the sockets provided for this purpose.
- Observe the polarity while connecting cables.

NOTICE

Damage due to overvoltage!

Overvoltages or surge voltages may damage or destroy the device.

- Protect the power supply against overvoltages.

Voltages of more than 24 V DC and currents of more than 20 mA on the analog and digital inputs can destroy the respective measuring inputs.

- Ensure that voltages only up to 24 V DC and currents up to 20 mA are applied.

7.2 Installation

7.2.1 Installing the device on a top-hat rail

Step	Action
1.	Hang the blue'Log on the top-hat rail using the clamp provided (rear panel).
2.	Push the top-hat rail latch ① on the front side of the device from bottom (latch open) to top (latch closed). This will attach the blue'Log to the top-hat rail. The icons (open/closed lock) above and below the top-hat rail latch indicate whether the device is attached.
3.	Check that the blue'Log is securely attached to the top-hat rail.

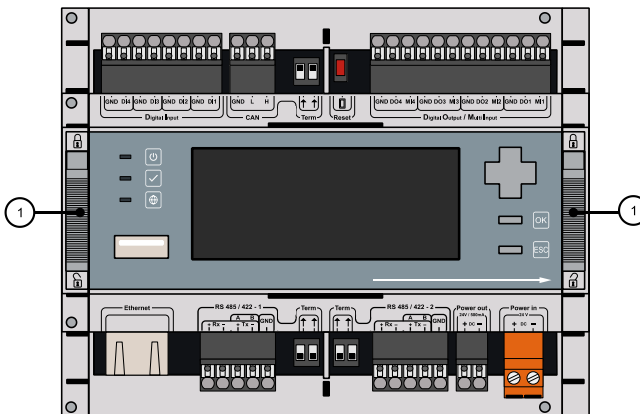


Fig. 3: Secure mounting on a top-hat rail

7.2.2 Dismounting the device

To remove the blue'Log from the top-hat rail, push the top-hat rail latch from top to bottom. The device can now be lifted off from the top-hat rail.

NOTICE

For installation within a control cabinet, ensure at least 3 cm of free space above and below the device for air circulation.

7.2.3 Mounting MX modules on the device

The blue'Log can be expanded to provide additional interfaces using various add-on modules (MX modules).

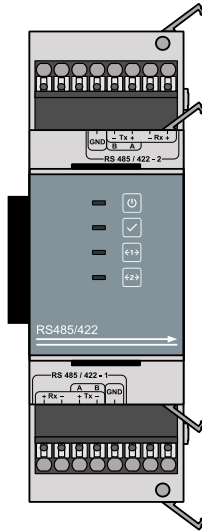


Fig. 4: MX module (example: RS485/422)

NOTICE

Risk of damage when installing add-on modules

Installing MX modules while the blue'Log is operating can damage or destroy the blue'Log and the MX modules.

- Before installing MX modules to provide additional interfaces, disconnect the blue'Log from the power supply.

1. If necessary, remove the blue'Log from the top-hat rail.
2. In order to add an MX module to the blue'Log, remove the cover on the right-hand side. For this, unlock the four fasteners ① and pull off the cover on the right-hand side.

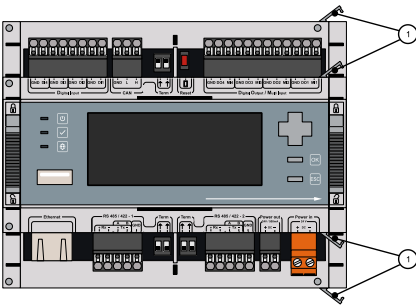


Fig. 5: Unlocking the fasteners

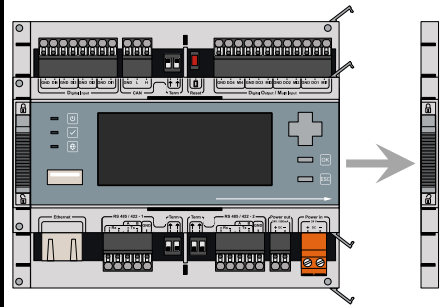


Fig. 6: Pulling off the right-hand side cover



Set the side cover aside, as you will need to reattach it to the right side of the MX module later. This is required in order to fasten the blue'Log and MX modules to the top-hat rail.

3. You can now see the expansion socket ① on the right-hand side of blue'Log housing.

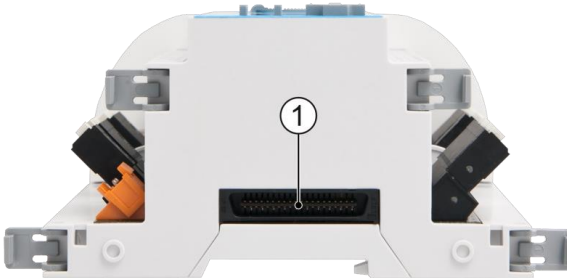


Fig. 7: Expansion socket

4. Insert the desired MX module into the expansion socket of the blue'Log.

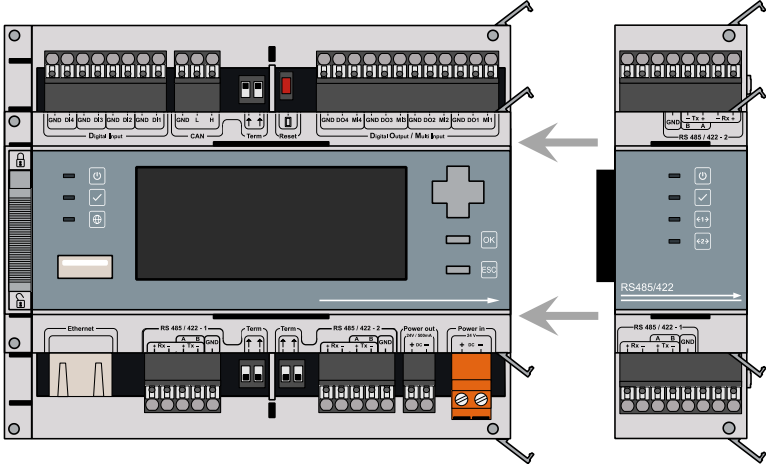


Fig. 8: Plugging the MX module into the blue'Log

5. Close the fasteners again in order to attach the MX module to the device to its left.

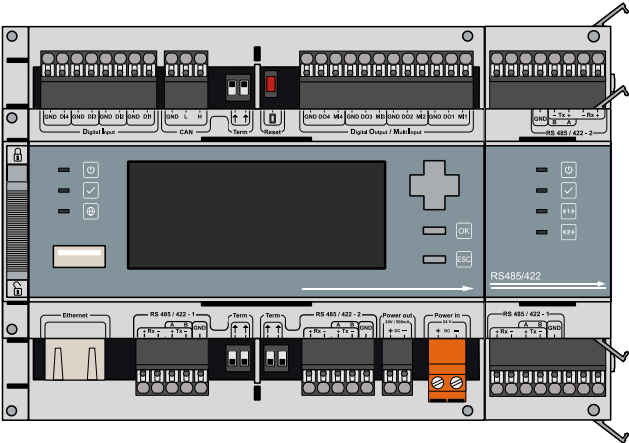


Fig. 9: Attached MX module

- Reattach the side cap to the right-hand side of the MX module and close the fasteners.

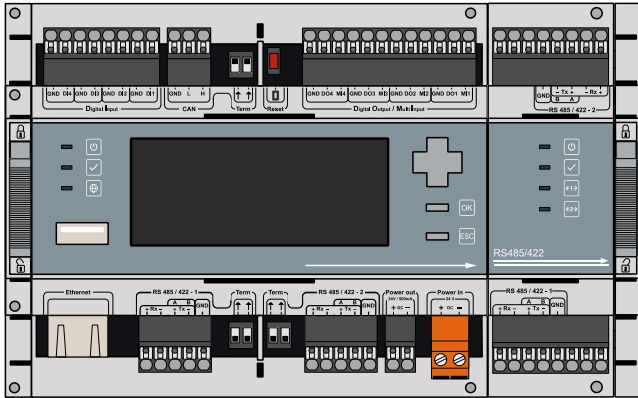


Fig. 10: blue'Log and MX module attached with side covers mounted

7.2.4 Multiple MX modules

The blue'Log can be expanded with several MX modules of the same type or with different MX modules. See the data sheet for your basic device for details on the maximum number of expansion modules.

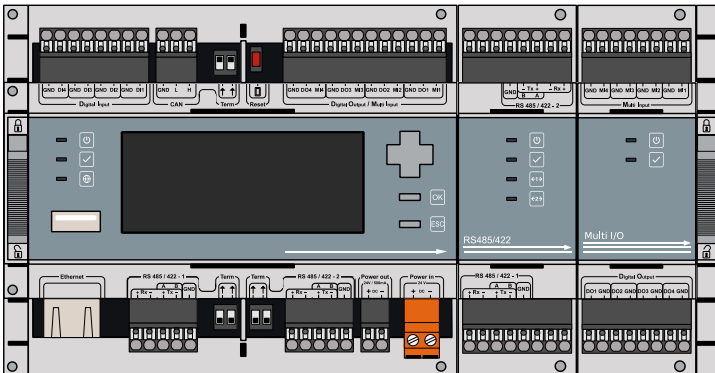


Fig. 11: blue'Log with various MX modules

7.2.5 Connection sequence for MX modules

When connecting MX modules to the basic device, observe the prescribed connection sequence in order to ensure correct functionality of the modules.

The number of arrows and lines on the bottom front panels of the blue'Log and MX modules indicates the connection sequence. Modules with a greater number of arrows/lines may not be installed before a module with fewer lines (e.g. two arrows/lines). For example, a module with three arrows/lines must not be connected before a module with two arrows/lines.

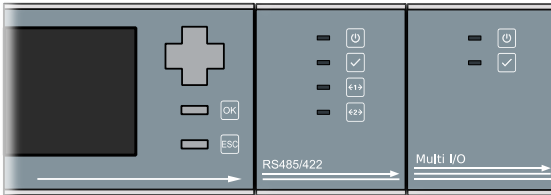


Fig. 12: Connection sequence for MX modules

7.3 Installation

7.3.1 Cables and wiring

Recommended cable types for wiring the individual system components are given below. Wiring restrictions are also listed.

7.3.2 Permitted wire and cable types for blue'Log power supply

Connecting cable	Voltage range	Cable cross section	Type
<ul style="list-style-type: none"> Finely stranded conductor 	U < 24 V DC	1 mm ²	H05V-K
<ul style="list-style-type: none"> Finely stranded conductor 	U >= 24 V DC	0.75 mm ²	H05V-K

7.3.3 Wire and cable types for device connection

Recommended wire and cable types for wiring the individual system components are given below. Wiring restrictions are also listed.

Type	Product designation	Item number	Max. permissible length
Bus cabling (devices) <ul style="list-style-type: none"> Recommended: Data cable (twisted and shielded) Data cable RS485 	UNITRONIC Li2YCYv (TP) data cable 2x2x0.50 mm ^{2 2) 1)}	200.116	1200 m ^{2) 3)}
	UNITRONIC Li2YCYv (TP) data cable 3x2x0.50 mm ^{2 2) 1)}	200.117	
	UNITRONIC Li2YCYv (TP) data cable 4x2x0.50 mm ^{2 2) 1)}	200.118	
Analog signals (irradiance sensor, temperature sensor) <ul style="list-style-type: none"> Sensor cable Voltage signal 0 V – 10 V 	UNITRONIC Li2YCYv (TP) data cable 2x2x0.50 mm ^{2 2) 1)}	200.116	100 m
	UNITRONIC Li2YCYv (TP) data cable 3x2x0.50 mm ^{2 2) 1)}	200.117	
	UNITRONIC Li2YCYv (TP) data cable 4x2x0.50 mm ^{2 2) 1)}	200.118	
Digital signals (status messages, remote control systems) <ul style="list-style-type: none"> Sensor cable Current signal 4 mA – 20 mA 	UNITRONIC Li2YCYv (TP) data cable 2x2x0.50 mm ^{2 2) 1)}	200.116	600 m ⁴⁾
	UNITRONIC Li2YCYv (TP) data cable 3x2x0.50 mm ^{2 2) 1)}	200.117	
	UNITRONIC Li2YCYv (TP) data cable 4x2x0.50 mm ^{2 2) 1)}	200.118	
Temperature sensor (PT 1000) Meter with S0 (digital pulse) signal	UNITRONIC Li2YCYv (TP) data cable 2x2x0.50 mm ^{2 2) 1)}	200.116	30 m
Ethernet network <ul style="list-style-type: none"> Network (shielded) 	At least CAT 5/6 S/FTP	n/a	100 m ³⁾

¹⁾ This cable is suitable for laying in the ground.

²⁾ Repeaters must be used for longer cable lengths.

³⁾ A hub is required if multiple separate cables of this length are used.

⁴⁾ Power supply of 24 V DC is required.



Data cables must be separated from live cables by means of a metal cable support system in accordance with DIN EN 50174-2: 2018-10.

7.3.4 Shielding

The cable shielding may only be grounded at one end of the connection.

7.4 Interfaces

See the blue'Log data sheet for more information about interfaces.

7.4.1 Power supply

The power supply of the data logger must comply with the requirements below.

- Power supply: 24 V DC; 3.33 A
max. 80 W

CAUTION



Complying with limit values for power supply

Ensure that the following limit values are complied with.

- IEC 61010-1 (or EN/CSA/UL--- 61010-1)
Power supply of limited-energy circuits with Safety Extra Low Voltage (SELV)
- EN 60950-1
Power supply with limited power sources

NOTICE

Installing the power supply

The power supply including any protective devices may only be installed by a qualified electrician.

7.4.2 Voltage output

- Voltage: 24 V DC

The blue'Log can supply sensors with a maximum current consumption of 500 mA. For sensors with a current consumption totaling more than 500 mA, please use an external power supply.

8. Commissioning and configuration

8.1 Requirements

In order to start up the blue'Log, the device must be securely mounted, and all cables must be properly connected.

NOTICE

A damaged device must not be put into operation!

8.2 Commissioning

1. Switch on the power supply
2. Wait until the blue'Log has finished booting.
3. The status LED on the device will light up.

NOTICE

During connection of the power supply it is imperative to ensure correct polarity (+ / -).

8.3 Establishing and checking the connection

8.3.1 Ethernet connection

The blue'Log can be integrated into a local network using a patch cable. Once the Ethernet connection is established, you can directly access the device and internet via the network. A 1 m long Ethernet patch cable is included with delivery.

8.3.2 Connecting bus devices

The blue'Log is equipped with two RS485 interfaces (RS485-1 und RS485-2) for connecting bus devices. These can query information from typical bus devices such as inverters, energy meters, string monitoring systems and power analyzers. Sensors and meters can be queried together if they communicate via Modbus.

Please note the following regarding bus cabling:

- Each RS485 interface supports only a single protocol (for example, Modbus).
- Devices from different manufacturers or categories with a Modbus RTU protocol can be mixed at one bus line. However, we do not recommend this because it reduces the performance and quality of Monitoring and Power Control functions.
- If devices from different manufacturers or categories with a Modbus RTU protocol are connected to one RS485 interface, then the baud rate and protocol frame of the RS485 settings must be the same (see Compatibility list).
- The blue'Log functions exclusively as a Master on the bus.
- Observe the maximum permitted number of bus devices (see Compatibility list).
- The order of the bus devices on the bus is unimportant.
- A repeater must be used for every 32nd bus device and for long cable runs.
- The bus should be cabled with a twisted and shielded pair of wires.
- The shield of the bus cable must be grounded at one end of the connection only. The blue'Log does not have its own grounding.
- When wiring the bus wires, the AC and DC cables must be routed separately.
- Do not switch the bus signal wires.
- Manufacturers interpret the underlying standard of the RS485 interface differently. This means that the A and B wire labels may be different depending on the manufacturer. The + and – indicators, on the other hand, are unambiguous.
- To prevent reflections, the bus must always be terminated with a parallel terminator.
- For more information, see the device connection plans.

8.3.3 Connections to analog and digital inputs

The blue'Log has several digital interfaces or analog/digital interfaces for recording and evaluating analog and digital signals.

- Devices with analog or digital outputs can be connected via the digital and analog inputs of the blue'Log.
- Typical devices for these interfaces are ripple control receivers, remote control systems and sensors.

8.4 Configuring the blue'Log

The necessary steps for the initial setup of the blue'Log via the display screen and web interface can be found in the blue'Log XM / XC Quick Start Guide.

9. Care and maintenance

NOTICE

Unplug the device from the mains before cleaning it!

NOTICE

The product can be damaged by moisture

- When cleaning the device, ensure that no moisture penetrates the device!

Clean the device only with a dry, lint-free cloth. If the device is very dirty, you can clean it using a slightly damp cloth and a commercially available household cleaner.

10. Technical data

For technical data please see data sheet of blue'Log XM / XC which can be found on our website: <https://www.meteocontrol.com/service/downloads/>.

11. Environmental protection and disposal



Old and defective devices should be disposed of in accordance with national and local environmental and recycling regulations. Electronic components may not be disposed of along with household waste.

12. Appendix

12.1 CE declaration of conformity

The EC Declaration of Conformity can be found on our website.

<https://www.meteocontrol.com/service/downloads/>

12.2 RoHS statement

ROHS STATEMENT DECLARATION OF CONFORMITY 2011/65/EU (ROHS)

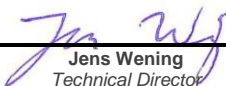
meteocontrol GmbH declares that all manufactured products are RoHS compliant according to the Directive 2011/65/EU of the European Parliament and the Council from 8 June 2011 on restriction of the use of certain hazardous substances in electrical and electronic appliances. <t0/This concerns the following substances whose concentrations must not be exceeded:

Lead	0.1%
Mercury	0.1%
Cadmium	0.01%
Hexavalent chromium	0.1%
Polybrominated biphenyls (PBB)	0.1%
Polybrominated diphenyl ethers (PBDE)	0.1%

Since we are guaranteed RoHS compliance by our suppliers, we, **meteocontrol GmbH**, can confirm with a clear conscience that all our products comply with the above mentioned Directive.

Augsburg, 15 October 2018

Place, date



Jens Wening
Technical Director

Further information: www.meteocontrol.com