blue'Log XM / XC

Operating Manual

Version 20181015

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Details regarding the manual

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

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All information in this operating 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 their consequences.

Subject to technical alterations.

Contents

1. General notes

1.1 Safety instructions

Safety instructions warn of dangers when using the devices and explain how they can be avoided.

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 death or serious physical injury!

CAUTION
Hazard with a risk of material damage
Failure to comply with the warning notice may lead to minor injuries!

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

1.2 Warning symbols

Particular dangers are highlighted using warning symbols.

ELECTRICAL HAZARD
Risk of electrocution!
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.

1.4 Text display

Emphasized points are shown in bold and indicate important information.

Lists are shown with bullet points (level 1) and dashes (level 2):

- List 1
  - Point A
  - Point B
- List 2

Instructions describe steps which are to be carried out in the given order.

1. Instruction 1
2. Instruction 2
↳ Result of the operation

Button names are shown in capitals and in "QUOTATION MARKS".

In **illustrations**, **item numbers** are used to indicate components.

The legend including item numbers and descriptions of the components is shown below the figure. Alternatively, direct references to components are made in the text.

2.   Notes on this operating manual

This 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 manual helps to avoid dangers, to reduce repair costs and downtimes, and to increase the reliability and operating life of the devices.

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

DANGER
Danger from improper handling of the device   The personnel responsible for installation, operation and maintenance of the system must have read and understood the operating manual before the devices can be installed and used safely!   The manual 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 operating manual.

2.1 Warranty and liability

Details of the scope and form of the warranty as well as the warranty period are given in the meteocontrol GmbH General Terms and Conditions.

meteocontrol GmbH rejects any liability for damage arising from the non-observance of the operating manual.

This applies, in particular, to damage resulting from:

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

With 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 that have been passed on
- hardware and/or software faults on the part of the system operator
- end-user switching processes
- Any liability for damage caused by such 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.   Safety instructions for operation

3.1   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.

3.2   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),
- all generally accepted codes of practice,
- information on transport, installation, operation, service, maintenance and disposal given in this installation manual,
- specific values, limits, and information relating to operating and ambient conditions on type plates and in data sheets.

3.3 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

3.4 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.

WARNING
A damaged device must not be put into operation!

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

3.5   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 of a power cut.

ATTENTION

Lithium battery

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!

3.6   Cleaning

Clean the outside of the device only using 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.

ATTENTION

Unplug the device from the mains before cleaning it!

ATTENTION

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

4. Device overview

4.1 Overview of product versions

	X-MONITORING	X-CONTROL
Monitoring	max. 100 devices*	max. 30 devices*
Power Control (Active and Reactive Power Control)	No (Slave function**)	Yes

*number of devices
Devices affects all except status via multi / digital inputs

**Slave function

For systems with Power Control and more than one data logger, the meteocontrol Master / Slave functionality is used. The blue'Log XM can get configured as a slave and thus transmits the Power Control setpoints to the connected inverters.

Installed capacity	X-MONITORING	X-CONTROL
≤ 200 kW	532.010 blue'Log XM-200	532.020 blue'Log XC-200
≤ 1.000 kW	532.011 blue'Log XM-1000	532.021 blue'Log XC-1000
≤ 3.000 kW	532.012 blue'Log XM-3000	532.022 blue'Log XC-3000
≤ 5.000 kW	532.013 blue'Log XM-5000	532.023 blue'Log XC-5000
≤ 10.000 kW	532.014 blue'Log XM-10000	532.024 blue'Log XC-10000
≤ 20.000 kW	532.015 blue'Log XM-20000	532.025 blue'Log XC-20000
≤ 50.000 kW		532.026 blue'Log XC-50000
≤ 100.000 kW		532.027 blue'Log XC-100000

4.2 blue'Log front panel
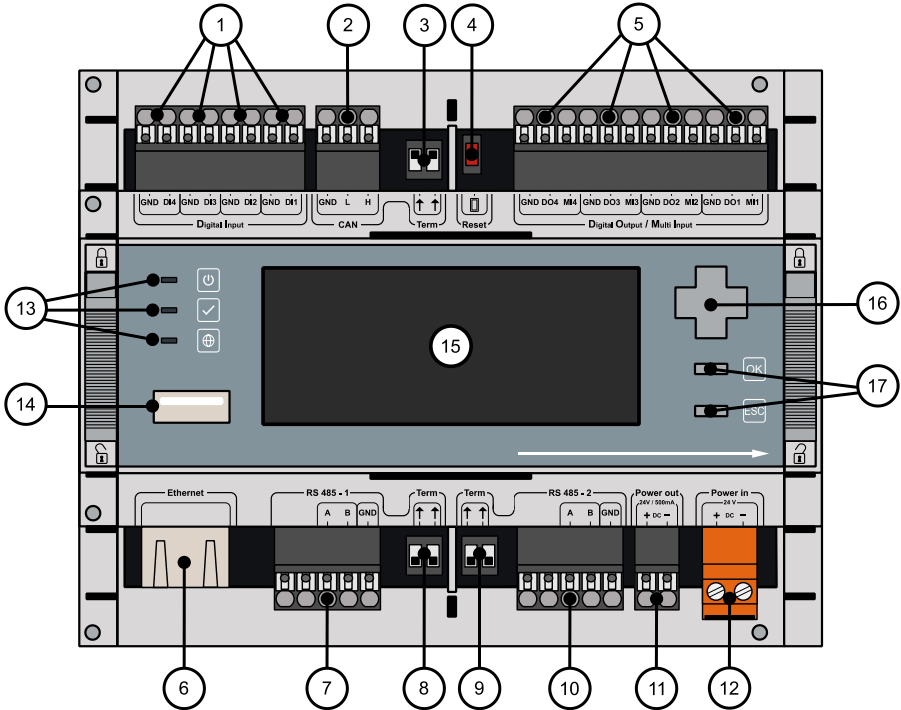

Fig. 1: Overview of the blue'Log front panel

(1)	Digital input (DI1–DI4)	(9)	RS485 termination – 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)	RS485 termination – 1	(16)	Directional pad
		(17)	Buttons: OK, ESC

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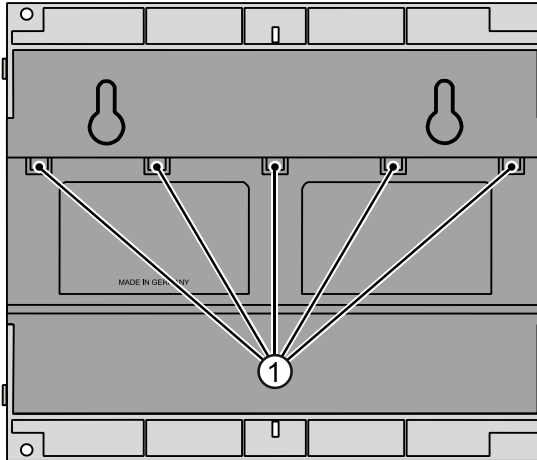
Fig. 2: Overview of the blue'Log rear panel

(1)   Clamp for DIN rail

4.4   Status LEDs

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

Symbol	LED	Meaning	
⏻	🟢	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

5. Installation

5.1 Safety instructions for installation

DANGER

Risk of electrocution!

Fatal injuries or death from contact with cables and terminals.

- Only connect or disconnect cables while the power supply is switched off.
- Provide a safeguard to prevent unintentional restart.

ATTENTION

Damage due to incorrect cabling!

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 during connection.

ATTENTION

Damage due to overvoltage!

Overvoltages or surge voltages may damage or destroy the device.

- Protect the power supply against overvoltages.

ATTENTION

Damage due to overvoltage!

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

- Ensure that only voltages of up to 24 V DC are applied and only currents of up to 20 mA flow.
- Voltages of more than 24 V DC and currents of more than 20 mA on the digital inputs can destroy the relevant measuring inputs.

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5.2 Cables and wiring

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

5.2.1 Permitted cable types for the blue'Log power supply

Connecting cable	Voltage range	Cable cross section	Type
• Finely stranded conductor	U < 24 V DC	1 mm^2	H05V-K
• Finely stranded conductor	U >= 24 V DC	0.75 mm^2	H05V-K

5.2.2 Cable types for device connections

Bus cabling (inverters, current sensors)

- Recommended: Data cable (twisted and shielded)   Li2YCYv (TP) 2×2×0.5mm$^{2)\ 1)}$
- Alternatively: Network cable   CAT 6-SFTP

Analog signals (irradiance sensor, temperature sensor)

- Sensor cable   LiYCY 2×2×0.5mm^2

Digital signals (energy meter, remote control system)

- Sensor cable   LiYCY 2×2×0.5mm^2

Ethernet network

- Network cable   CAT 5 / CAT 6

5.2.3   Maximum recommended cable lengths

- Bus cabling (data cable RS485)   1200 m[2) 3)]
- Sensors (voltage signal 0 V – 10 V)   100 m
- Sensors (current signal 4 mA – 20 mA)   600 m[4)]
- Meters   30 m
- Ethernet network   100 m[3)]

[1)] We recommend using the cable type UNITRONIC® Li2YCYv (TP) manufactured by Lapp Kabel, or an equivalent cable type. This cable is suitable for laying in soil.

[2)] For cables exceeding the given length, the additional use of repeaters is necessary.

[3)] Several separate cables of this length require a hub.

[4)] 24 V DC power supply required.

> ⓘ Data cables must be isolated from power cables in accordance with EN 50174-2 using metal cable supports.

5.2.4   Shielding

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

5.3   Installation

5.3.1   Installing device on DIN rail

1. Hang the blue'Log on the DIN rail using the provided clamp (rear panel).

2. Push the DIN rail latch ① on the front side of the device from bottom (latch open) to top (latch closed). This will fix the blue'Log to the DIN rail. The symbols (open/closed lock) above and below the DIN rail latch indicate whether or not the device is fixed.

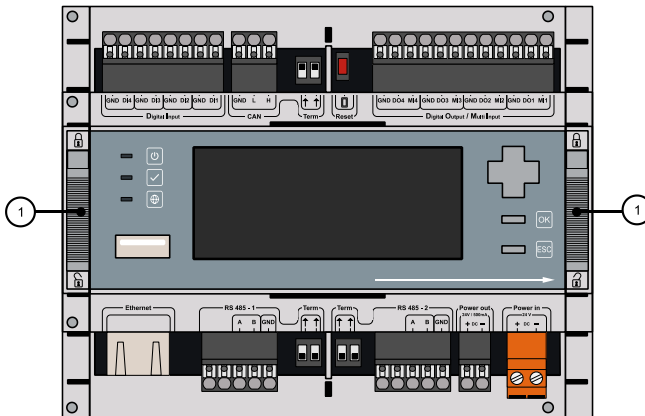3. Check the secure connection of the blue'Log to the DIN rail.

Fig. 3: Secure mounting on a DIN rail

To release the blue'Log from the DIN rail, push the DIN rail latch from top to bottom position. The device can now be removed from the DIN rail by lifting it off.

ATTENTION

Ventilation

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

5.4   Expanding the blue'Log

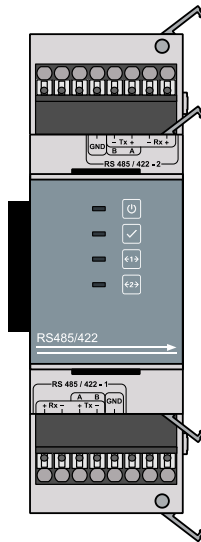The blue'Log can be expanded to provide additional interfaces using various expansion modules (MX modules).

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

ATTENTION

Risk of damage when installing expansion modules

Installing MX modules during operation of the blue'Log can damage or destroy the blue'Log and the expansion modules.

- Disconnect the blue'Log from the power supply before installing MX modules for additional interfaces.

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5.4.1 Connecting expansion modules

In order to expand the blue'Log by installing MX modules, remove the right-hand side-cover. To do this, unlock the four fasteners ① and pull off the right-hand side cap.
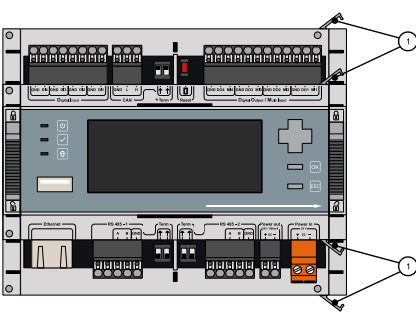
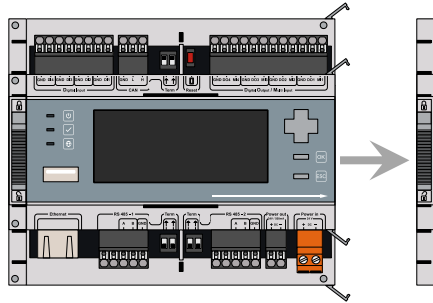

Fig. 5: Unlocking the fasteners

Fig. 6: Pulling off right-hand side cap

> ⓘ Keep the side cap at hand, as you will need to reattach it to the right-hand side of the expansion module later on to fasten the blue'Log and MX modules to the DIN rail again.

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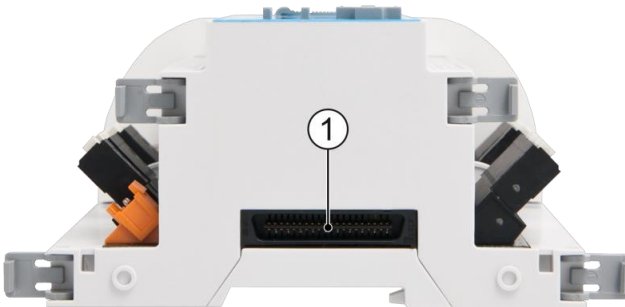

Fig. 7: Expansion socket

Plug the desired expansion module into the blue'Log's expansion socket.
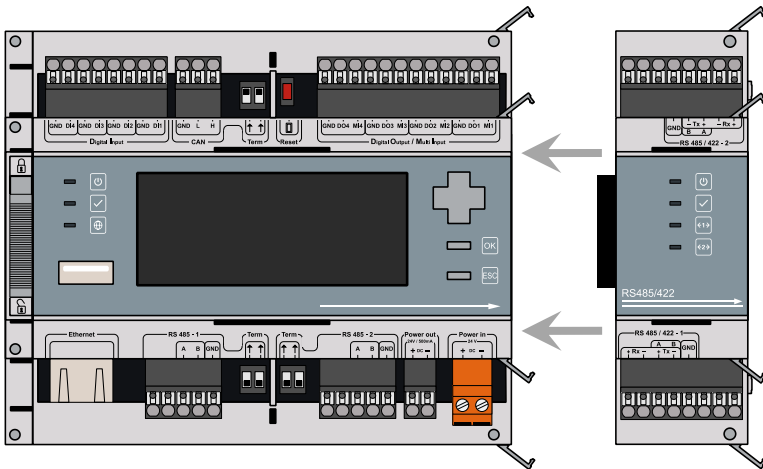

Fig. 8: Plugging expansion module into the blue'Log.

Now close the blue'Log's fasteners again in order to fix the expansion module to the preceding device.
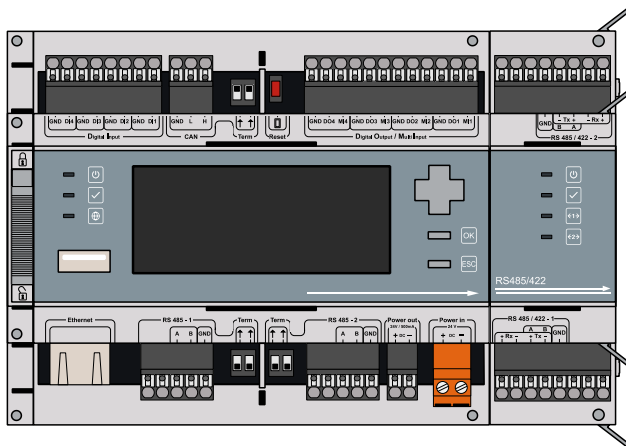

Fig. 9: Attached expansion module

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Reattach the side cap to the right-hand side of the expansion module and close the case locks.
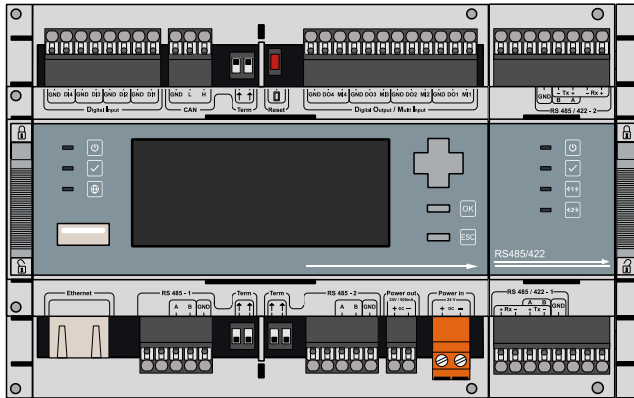

Fig. 10: blue'Log and MX module connected and side cap attached

The blue'Log can be expanded with several MX modules of the same type or with different MX modules. Please see the data sheet for your basic device for details of the maximum number of expansion modules.
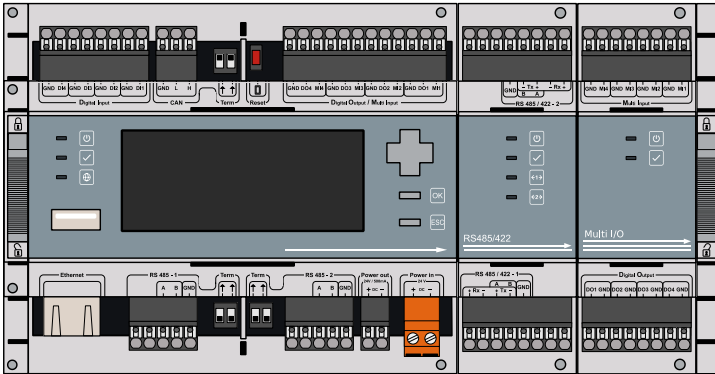
Fig. 11: blue'Log with various MX modules

ATTENTION

Order of installed MX modules

When connecting MX modules to the basic device, the prescribed order has to be observed in order to ensure correct functionality of the modules.

- The number of arrows and lines at the bottom of the front panels of blue'Log and MX modules indicates the order of connection. Higher rated modules must 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.
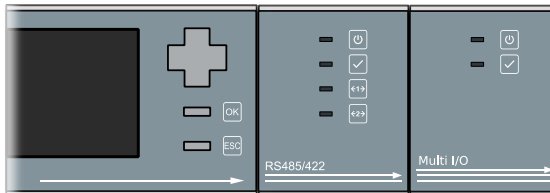
Fig. 12: Order of installed MX modules

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6. Interfaces

6.1 Power supply

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

- Power supply: 24 V DC; 3.33 A

  max. 80 W

CAUTION

Complying with limit values

You should ensure that alternatively the following limit values are complied with.

- IEC 61010-1 (or EN-/CSA-/UL- 61010-1)
  Power supply of Limited-energy circuit with safety extra low voltage (SELV)
- EN 60950-1
  Power supply with limited power sources

ATTENTION

Installing the power supply

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

6.2   Voltage output

- Voltage: 24 V DC

The blue'Log can supply sensors (e.g. i'checker) 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.

6.3   Ethernet

- The blue'Log is directly connected to the PC / laptop or hub / switch using an Ethernet patch cable, which is included in delivery.

6.4   Multi input

The blue'Log has four multi inputs which can be used for either analog or digital signals. Each port is configured individually via software.

6.4.1   Analog input

The analog inputs are freely configurable as:

- Voltage input: 0-10 V DC
- Current input: 0-20 mA
- Resistor (PT1000): 600-1800 Ω

6.4.2   Digital input

The digital inputs are freely configurable as:

- Pulse input in accordance with DIN 43864 (S0) / 16 Hz
- Status input as wet contact max. 24 V / max. 20 mA

6.5   Digital input

The digital inputs are freely configurable as:

- Pulse input in accordance with DIN 43864 (S0) / 16 Hz
- Status input as wet contact max. 24 V / max. 20 mA

6.6 Digital output

The digital outputs can be used for setpoint feedback (acknowledgement): The following configurations are available

- Digital Open Collector – Active low max. 24 V DC / max 50 mA
- Digital Open Collector – Active high 24 V DC / max 50 mA

> **ⓘ** In order to provide dry contacts relays (e.g. 250 V AC / DC, 6 A) can be used for providing setpoint feedback signals.

6.7 RS485 interface

The RS485 interfaces are used to connect communication devices via the RS485 bus.

- Each RS485 interface adapts automatically and can be terminated individually via switches.

6.8 CAN interface

The CAN interface is used to connect communication devices via the CAN bus.

- The interface currently has no function.

6.9 USB interface

The USB front socket (type A) is provided as a service interface.

- The interface currently has no function.

7. Commissioning, configuration

7.1 Requirements

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

7.2 Commissioning

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

ATTENTION

Power supply

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

7.3 Establishing / checking connections

7.3.1 Ethernet connection

- The blue'Log can be integrated into a local network using a patch cable. Establishing the Ethernet connection allows direct access to the device and Internet access. A 1 m long Ethernet patch cable is included in delivery.

7.3.2 Connecting bus devices

The blue'Log is equipped with two RS485 interfaces to connect bus devices.

- Connect your bus devices to the data logger via the RS485 interfaces.
- Typical bus devices include inverters, energy meters, string measuring systems and power quality analyzers.
- Only one device manufacturer can be queried per bus. Querying other sensors, meters or string measuring systems in parallel is not possible.
  Sensors and meters can be queried together if they communicate via Modbus.

7.3.3 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 blue'Log's digital and analog inputs.
- Typical devices for these interfaces are ripple-control receivers, remote control systems and sensors.

7.4 Configuration blue'Log

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

8. Technical data

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

9. 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.

10. CE certificate

The EC Declaration of Conformity can be found on the meteocontrol homepage.

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

11. RoHS Statement

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Energy & Weather Services

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. 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 abovementioned Directive.

Augsburg, 15.10.2018

Place and Date

Jens Wening
Technical Director

12. List of figures