WebLog120

M-Bus Datalogger / Webserver for 120 Meters

Content

© Relay GmbH 2024
www.relay.de

1. Features

- M-Bus Datalogger for up to 120 devices (M-Bus unit loads)
- Integrated web server for operating the device via web browser
- 2 x LAN-Ethernet 10/100BaseT
- Built-in universal power supply
- Transparent level conversion from RS232C to M-Bus
- Integrated M-Bus Repeater allows dual operation with a second M-Bus master
- 2-wire RS485 interface
- 2 x USB-Host Ports for USB FLASH drive, mouse etc.
- Data export as XML, XLSX or CSV via email, FTP, USB or download
- Automatic, time-controlled export of meter readings per tenant / group
- Firmware update via web browser

2. Installation

2.1 Illustration of principle

Remote access via web browser   WebLog M-Bus center   up to 120 meters
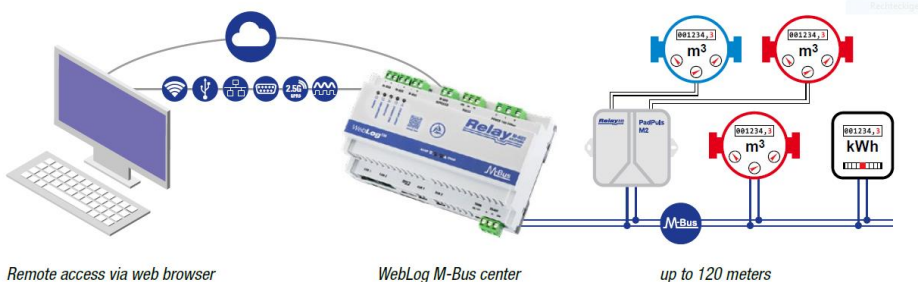
2.2 Mounting

The WebLog120 housing is installed on a TS35 top-hat rail. The housing occupies 8 division units (8 DU) on the rail and, due to its low overall height of 60 mm, not only fits in a switch cabinet, but also in a meter cabinet under the cover.

The device requires an external mains voltage of 110 to 250VAC, which must be connected by an electrician. Please protect the device with a suitable fuse. We also recommend installing a circuit breaker in the control cabinet so that the mains voltage can be switched off for service purposes.

2.3 Connectors

The figure below shows the connections in a plan view:

All terminals are pluggable, allowing simplest wiring and replacing of the WebLog120.

Attention: Please make sure to put the terminals back correctly in the intended place after removing them. Incorrectly positioned terminals can lead to defects.
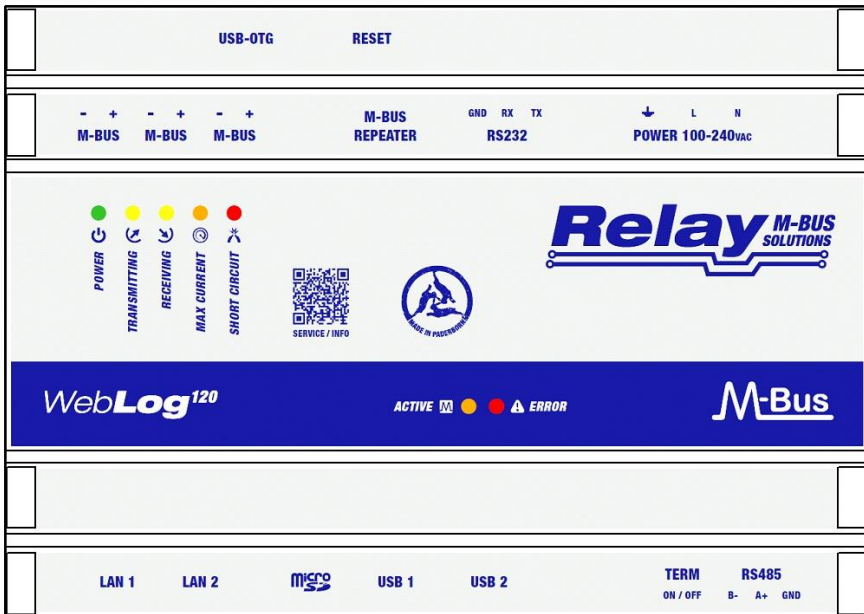

Upper terminals (from left to right):

Type	Signal	Description
USB-OTG		Micro-USB socket (lowest level)
M-BUS	- / +	M-Bus output, lines to the M-Bus meters, 3 pairs in parallel
M-BUS REPEATER		M-Bus Repeater input for network expansion / second M-Bus master
RS232	TX / RX / GND	RS232C Interface, TX = PC transmits, RX = PC receives, GND
POWER	$\perp$	Protective conductor PE for symmetry binding and to protect the M-Bus
	L	Connection of the phase (L) of the mains voltage
	N	Connection of the neutral conductor (N) of the mains voltage

Lower terminals (from left to right):

Type	Signal	Description
LAN 1		10/100 MBit RJ45 Ethernet socket for a network connection
LAN 2		10/100 MBit RJ45 Ethernet socket for a network connection
MICRO-SD		Holder for an optional micro SD card (push-push mechanism)
USB 1		USB host port #1
USB 2		USB host port #1
TERM	ON / OFF	Slide switch for switching the 120Ω terminating resistor of the RS485 on and off
RS485	B- / A+ / GND	RS485 interface, 2-wire, B = - / A = + / GND = ground reference

2.4 LED Indicators

A total of 7 LEDs in the front cover indicate the status of the M-Bus and the system. A lighted LED has the following meaning:
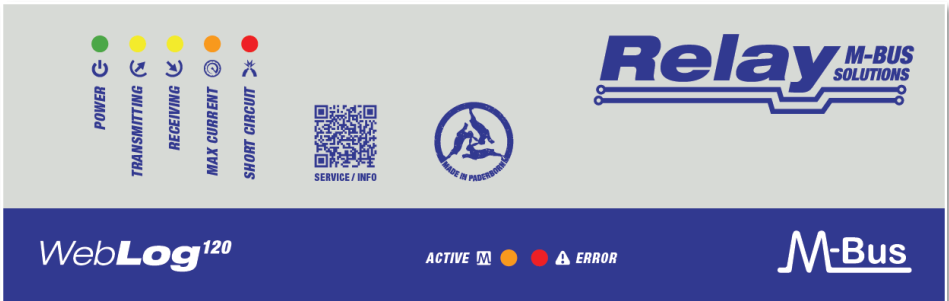
POWER	🟢	The M-Bus output voltage is switched on
TRANSMITTING	🟡	The master sends data
RECEIVING	🟡	At least one meter responds with data
MAX CURRENT	🟠	The maximum number of meters has been exceeded (warning current)
SHORT CIRCUIT	🔴	M-Bus overcurrent / short circuit (2 Hz flashing)
M-BUS ACTIVE	🟠	The WebLog120 occupies the M-Bus exclusively (RS232C + Repeater off)
ERROR	🔴	New unread error message(s) in event log

3. Description of functions

The WebLog120 is an M-Bus data logger and web server. Up to 120 meters (= standard loads á 1.5mA) can be connected directly to the internal M-Bus level converter. The device can manage and read a total of up to 1000 devices if appropriate M-Bus Repeaters (PW100 / PW250) are used as an extension.

The integrated web server enables complete setup and operation via the network interface (LAN) or the optional WLAN module with a web browser. No additional software is required. Access to the Internet can be implemented via LAN or WLAN with the help of an additional DSL or cellular router. Access to the WebLog120 via the Internet usually requires port forward or a VPN connection.

The WebLog120 manages all M-Bus meters of the system. For this purpose, an automatic meter search is started and, if necessary, individual texts and log intervals are assigned to each meter or meter group. The logged data is permanently stored in an SQLite database in the internal FLASH memory. In principle, all data from the first M-Bus protocol of the meter are stored in the database. This data can conveniently be exported manually or automatically by e-mail, (S)FTP, by download in the browser or to a USB stick. The user decides which data he needs for the respective export.

The device offers structured user management with various access rights, from administrators to tenants, who can only read their own meters.

The WebLog120 also has an RS232C interface that allows transparent access to the internal level converter. There, externally connected controllers such as a GLT, a DDC or a PC can read the connected meters with M-Bus software (not included in the scope of delivery). The device also offers a transparent repeater input for dual operation with a second M-Bus master / level converter.

3.1 Interfaces

The transparent RS232C and Repeater interfaces are always connected directly to the internal M-Bus level converter when the WebLog120 is not reading the M-Bus meters itself.

The LED labelled ACTIVE shows the activity status of the internal interface switch. While this LED is lighted, the CPU is active on the M-Bus, i.e. the other interfaces are deactivated during this time and cannot access the M-Bus. When the LED is off, an external controller (PC) can read the M-Bus via RS232C or repeater.

3.2 RS232C Interface

The WebLog120 offers an RS232C interface that is transparent to the M-Bus and is connected via a 3-pin screw terminal. The assignment is as follows: TX = PC receives from M Bus, RX = PC transmits to M Bus, GND = signal ground. If you want to connect a D-SUB cable, please use the additional, optional cable KA006 with 3 open wires. To connect to a PC (1:1 connection), connect the 3 wires as follows:
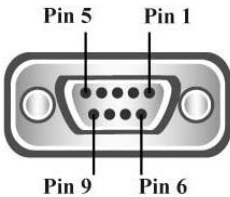
D-SUB	Signal	Function WebLog120	Colour (terminal)
Pin 1	DCD (data carrier detect)	unused	
Pin 2	RXD (PC receives data)	M-Bus sends data to PC	green (TX)
Pin 3	TXD (PC sends data)	PC sends data to M-Bus	yellow (RX)
Pin 4	DTR (data terminal ready)	unused	
Pin 5	GND (signal ground)	GND	black (GND)
Pin 6	DSR (date set ready)	unused	
Pin 7	RTS (request to send)	unused	
Pin 8	CTS (clear to send)	unused	
Pin 9	RI (ring indicator)	unused	

3.3 RS485 Interface

The software support of RS485 interface will be available in a future version of the WebLog120 as an interface to the internal CPU, but not as a transparent interface to the M-Bus. One intended application is reading of meters with a Modbus RTU interface.

A 2-wire RS485 interface is connected to the terminals marked RS485 (A = + and B = -). With the help of the slide switch labelled "TERM", you can activate a 120 Ω terminating resistor between terminals A+ and B- as required.

3.4 Repeater Interface

The WebLog120 can be used as a so-called repeater for network expansion for existing M-Bus systems if the maximum number of meters or the maximum cable length for the installation has been exceeded. Up to 120 end devices and up to 4 km of cable (JYSTY 1 x 2 x 0.8) can be connected to the device at a transmission speed of 2400 baud. The repeater input also enables a second M-Bus master to access the meters connected to the WebLog120.
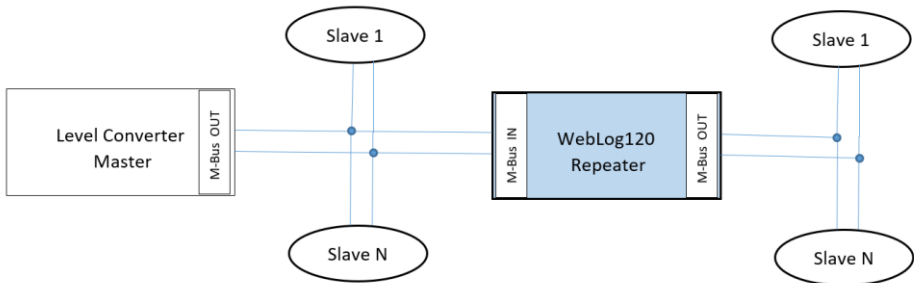
The M-Bus line of the existing master or level converter is connected to the terminals marked M-Bus Repeater. As standardized for M-Bus slaves, the polarity is arbitrary. A processed signal for connecting an M-Bus net-work is then available at the M-Bus output of the WebLog120. This M-Bus network can then be read out by the WebLog120 and the other master one after the other, but not at the same time.

3.5 USB Interfaces

The WebLog120 provides two USB host interfaces as USB 2.0 type A sockets on the front of the housing. These interfaces, labelled USB 1 and USB 2, are used, for example, for a USB memory stick as an export medium or to load firmware updates. A USB WLAN stick can also be permanently inserted here to provide a WLAN interface (Art. FG eWLAN). Another USB interface is available as a micro-USB socket (USB-OTG)..

3.6 Ethernet Interfaces

The WebLog120 has two 10/100Mbit network ports labelled LAN 1 and LAN 2. LAN 1 is used to permanently connect the device to a local network or a separate router for DSL or mobile communications. LAN 2 is re-served for future applications.

4. Operating Manual

The operation and setup of the device via the Ethernet interface. For the initial setup, please establish a 1:1 connection between your PC and LAN 1 of the WebLog120 using a network cable.

For easy configuration, the WebLog120 offers a so-called link-local IP address, under which you can always reach the device in the local network or directly in a 1:1 connection. Start your browser on your PC and enter this IP address in the address bar of the browser:

https://weblog120-SN.local   (SN = 5 digit serial number of the device)

Here an example for the device with the serial number 00015: https://weblog120-00015.local.

The WebLog120 shows the serial number (SN) and a user definable name (ID) on the login screen.

In the browser, enter the administrator password and click on Login and then click the "Login" button.

The factory default password is as follows: **00001767**

After successfully logging in, you will see the main menu of the web interface.

The operation of the device via the web interface is described in a separate manual, which is available for download on our homepage.

5. Technical Data

5.1 General Data

Operating voltage	110 .. 250VAC, 47 .. 63 Hz
Power consumption	max. 60W
Operating temperature range	0 .. 45°C
M-Bus voltage (no load)	36 V (Mark), 24V (Space)
M-Bus basic current	max. 180 mA
Overcurrent threshold	> 250 mA
Internal bus resistance	8 Ohm
Communication speeds	300 .. 38400 Baud
Maximum cable length for recommended cable type JYSTY 1 x 2 x 0,8 mm	Total (all wires): 1km (9600 baud), 4km (2400 baud), 10km (300 baud) Max. distance to slave (120 slaves at the end of the cable):800 m Max. distance to slave (120 slaves equally distributed): 1600 m
Galvanic isolation	All interfaces are isolated from M-Bus and power supply. The Repeater input is additionally isolated from the other interfaces.
Housing	Light-grey and black PC plastic, protective class IP30 H x B x T: 140 x 90 x 60 mm (height without terminals) Mounting on a rail (8 HP)
LED indicators	power, communication Master, slave, warning current, overcurrent M-Bus, M-Bus Activity, Error
Interfaces	2 x 10/100 Mbit Ethernet, 2 x USB-Host, RS232C, RS485, Repeater, Micro-SD Optional: W-LAN
Terminals (all pluggable)	3 pair of terminals M-Bus, 3-pin terminal for RS232C, 3-pin terminals for RS485, 2-pin terminal for Repeater, 3-pin terminal for power supply / protective ground

5.2 Interface Data

RS232C	Driver load	Current max. 5mA, resistive: min. 3kΩ, capacity: max. 2,5 nF
	Voltage transmit (at 3kΩ)	Mark: +5V ≤ U_T ≤ +15V Space: -15V ≤ U_T ≤ -5V
	Voltage receive	Mark: +2,5V ≤ U_R ≤ +15V Space: -15V ≤ U_R ≤ -2,5V
RS485	Driver load	Current max. 250 mA, resistance min. 54Ω
	Signal voltage TX	Space (0): +1.5V ≤ U_t ≤ +5.0V Mark (1): -5.0V ≤ U_t ≤ -1.5V
	Addressing	Not possible (transparent)
	Max. cable length	3,0 m
Repeater	Current M-Bus IN	Basic current < 1,5 mA (1 Unit Load), TX current typ. 15mA
	Capacity	Max. 250 pF
	Galvanic isolation	> 2,5 kV to all interfaces, M-Bus and power supply
USB	Type	USB 2.0 device, socket type B
	USB IC	FTDI Chip: FT232R, Vendor ID = 0403, Product ID = 6001
	Power supply	Bus powered, Low Power (max. 90mA)
	Max. cable length	3,0 m
Ethernet	Network interface	10/100BaseT (RJ45), auto-MDIX, with 2 LEDs

5.3 Ordering information

Article number	Description
WEBLOG120	Web-based M-Bus Central for 120 meters
KA003	Power cable (German connector), length 2m
KA PATCH.5E RJ45 1M	Network patch cable CAT5E FTP, Length = 1m, grey
KA006	Serial D-SUB-9 female cable with 3 open wires
EWLAN	External USB WiFi Dongle

6. CE Declaration of Conformity

EU DECLARATION OF CONFORMITY

for WebLog120

We the company

Relay GmbH
Stettiner Str. 38
D-33106 Paderborn

declare that the product

WebLog120
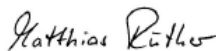**M-Bus datalogger with webserver for 120 slaves**

is compliant with the requirements of the following directives:

EMC Directive (2014/30/EU)
Low Voltage Directive (2014/35/EU)
RoHS Directive (2011/65/EU)

The products have been tested in accordance with the following standards:

EN IEC 61000-6-1:2019	Electromagnetic compatibility (EMC) – Immunity for residential, commercial and light-industrial environments (Generic standards)
EN IEC 61000-6-2:2019	Electromagnetic compatibility (EMC) – Immunity for industrial environments (Generic standards)
EN 61000-6-3:2007 +A1:2011 +AC:2012	Electromagnetic compatibility (EMC) – Emission standard for residential, commercial and light-industrial environments (Generic standards)
EN 61000-6-4:2007 +A1:2011	Electromagnetic compatibility (EMC) – Emission standard for industrial environments (Generic standards)
EN 61000-4-2:2009	Electromagnetic compatibility (EMC) – Electrostatic discharge immunity test
EN 61000-4-3:2006 +A1:2007 +A2:2010	Electromagnetic compatibility (EMC) – Radiated, radio-frequency, electromagnetic field immunity test
EN 61000-4-4:2012	Electromagnetic compatibility (EMC) – Electrical fast transient/burst immunity test
EN 61000-4-5:2014	Electromagnetic compatibility (EMC) – Surge immunity test
EN 61000-4-6:2013	Electromagnetic compatibility (EMC) – Immunity to conducted disturbances, induced by radio-frequency fields
EN 62368-1:2014 +AC:2015	Audio/video, information and communication technology equipment – Safety requirements
EN IEC 63000:2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Paderborn, 29.08.2023

Matthias Rüther (Product Development Manager)