

M-bus level converter/repeater 250

WTX631-GA0090



The level converter/repeater WTX631-GA0090 is the interface between M-bus devices and a readout system. It consists of a level converter and the associated power supply.

- The level converter and associated power supply form a single unit, with no additional transformer or auxiliary power required
- Connect up to 250 M-bus devices (max. 250 simple M-bus loads)
- Can be used with the M-bus IoT gateway WTV776 (or predecessor), PXC devices, other M-bus readout/configuration systems
- Up to six level converters can be connected in parallel on an M-bus network
- Up to six level converters/repeaters (max. five level converters as repeaters in series) can be serially connected on an M-bus network
- Local data readout from M-bus devices via RS-232 or RS-485 interface
- Remote readout from M-bus devices via M-bus IoT gateway WTV776 (or predecessor)

Application

The level converter WTX631-GA0090 is a communications interface for reading data from up to 250 M-bus devices (simple M-bus loads). It consists of a level converter/repeater and the associated power supply.

The data is read:

- Locally with the ACT531 PC software via the RS-232 interface
- Via an M-bus master (WTV776 or predecessor) over line M1M2 (repeater)
- Via an M-bus master (WTV776 or predecessor) over line ABC (level converter)
- Via Desigo CC over an RS-232 or RS-485 interface

Up to six level converters can be connected in parallel to a WTV776 on an M-bus network. Up to six level converters (max. five repeaters) can be connected in series to bridge large distances.

Up to 250 M-bus devices can be connected to each WTX631 level converter.

The level converter can be used:

- As a single component on an M-bus network with up to 250 M-bus devices.
- To extend an M-bus network to up to six level converters connected in parallel.
- As a power supply for the WTV776.

You can also use the level converter, at your own risk, as an interface to suitable software and devices from third-party manufacturers.

The level converter is galvanically isolated. It is protected against short circuits.

Features

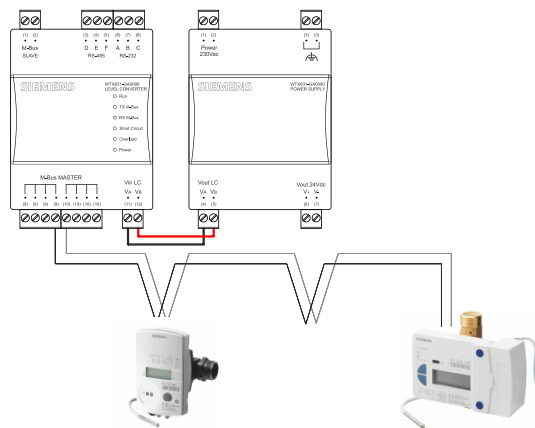
Topology

The M-bus permits various network topologies. The devices can be connected to the level converter in a line, bus, star, or tree topology, or a combination thereof.

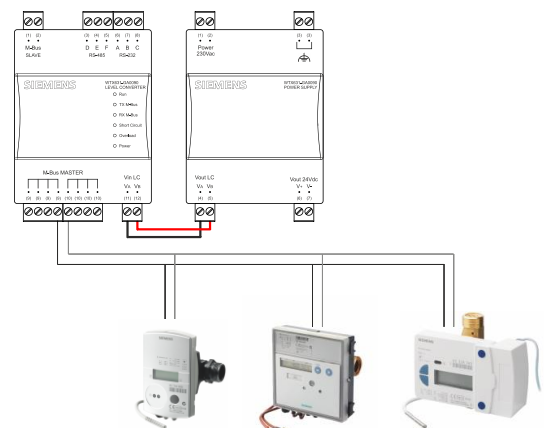
Ring topology is not permitted.

Bus cable polarity is not relevant, simplifying installation.

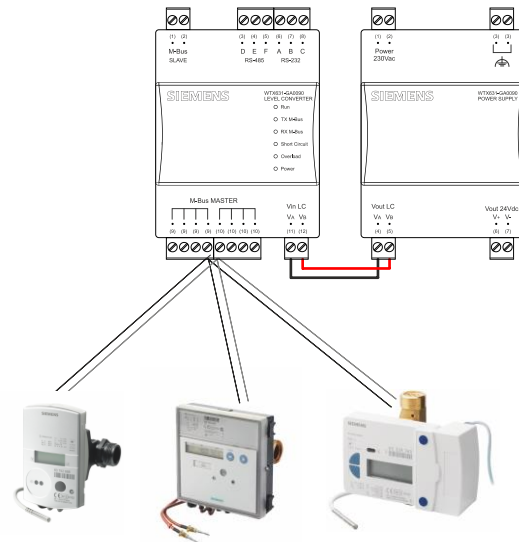
Line topology



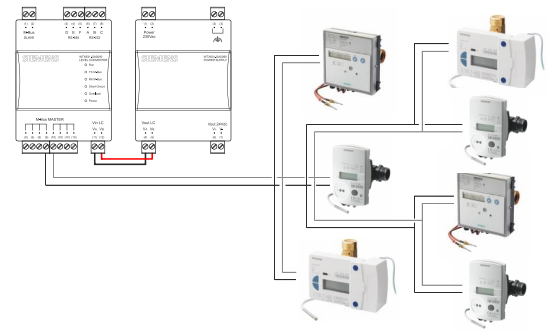
Bus topology



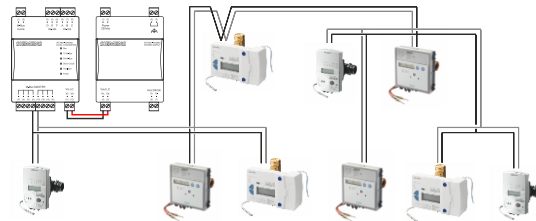
Star topology



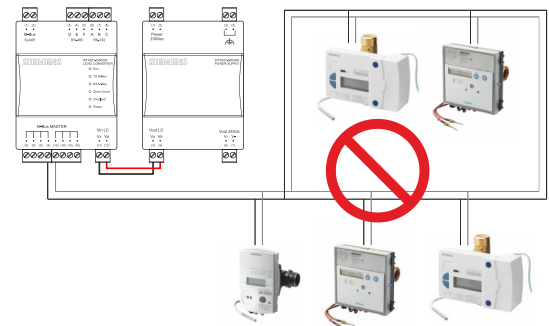
Tree topology



Combination of topologies



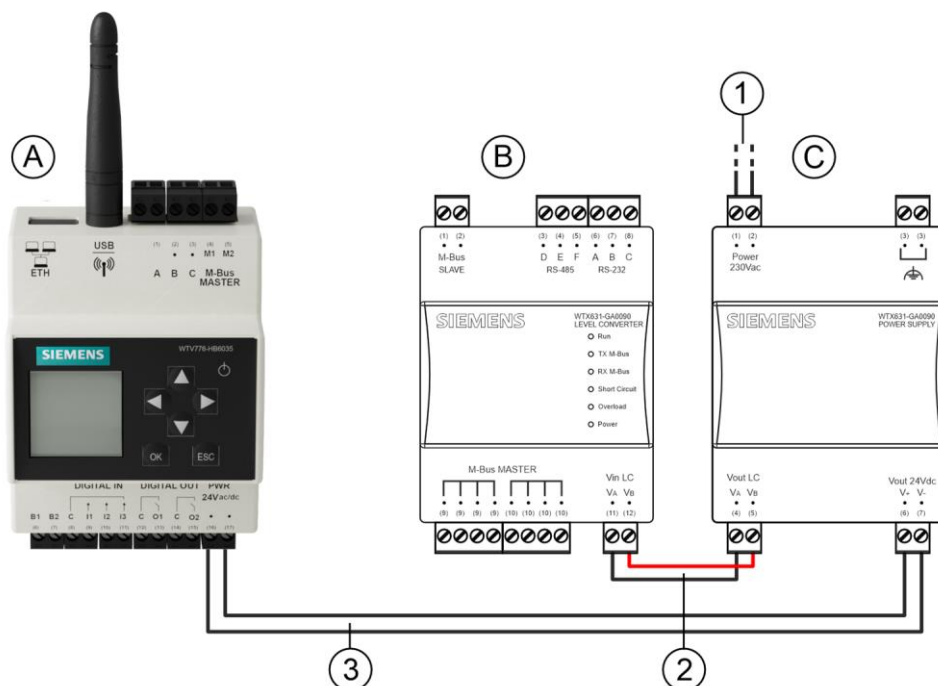
Ring topology



Power supply

The power supply (C) can be employed as follows:

- To power the level converter WTX631
- To power the M-bus IoT gateway WTV776



A	M-bus IoT-Gateway WTV776	1	Input voltage 230 V
B	Level converter WTX631	2	Powering WTX631
C	Voltage supply WTX631	3	Powering WTV776 (or predecessor)

Detailed information on connections is available under 'Connection terminals [► 9]'

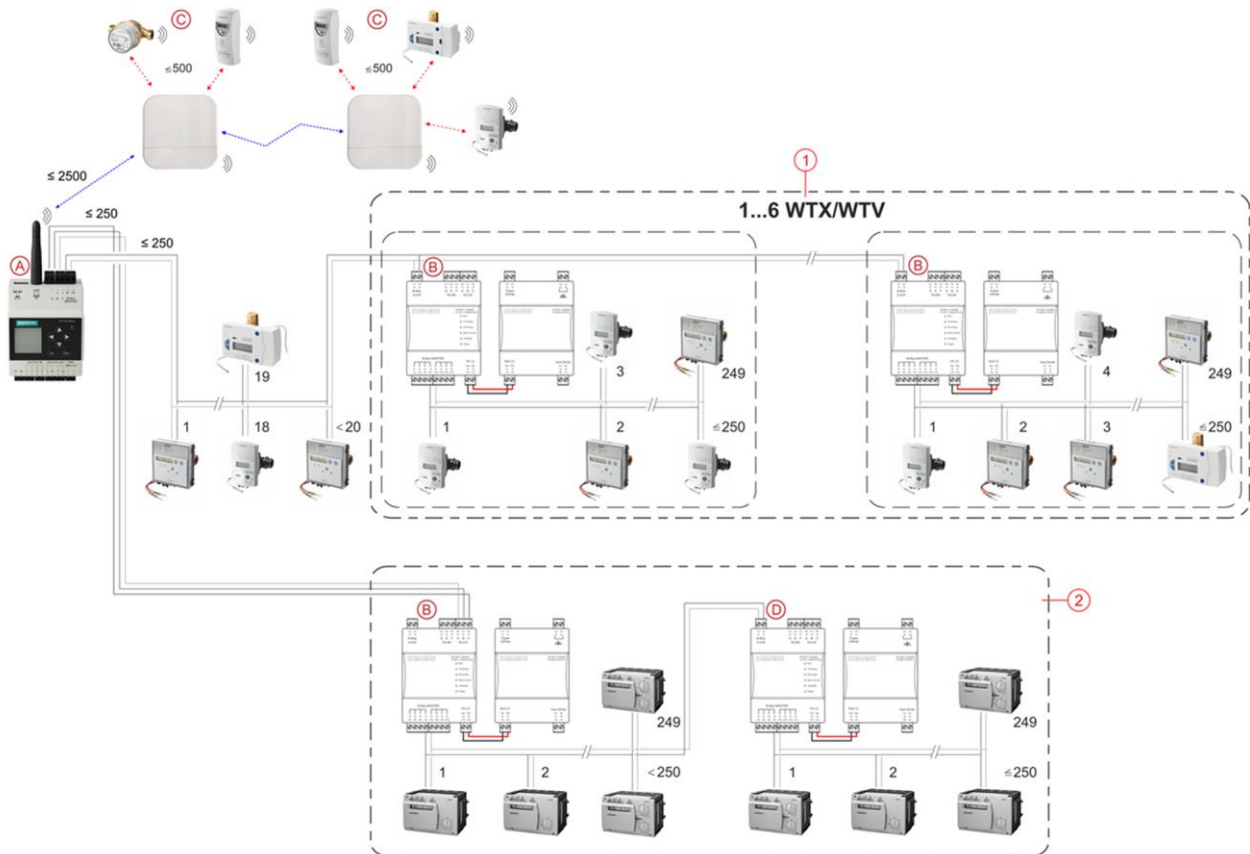
Operating modes

The level converter can be used in various ways:

Reading data via the M-bus IoT gateway WTV776 (or predecessor)

The level converter can be connected as a slave to a WTV776 to extend the M-bus network. Up to six level converters can be connected in parallel. Up to six level converters (max. five repeaters) can be connected in series to bridge large distances. Data is read via the WTV776.

Up to 250 M-bus devices can be read via the WTV776.



A M-bus master (WTV776 or predecessor)

B Level converter

C M-bus wireless devices

D Level converter as repeater

1 M-bus slave, connected in parallel (max. 6 level converters)

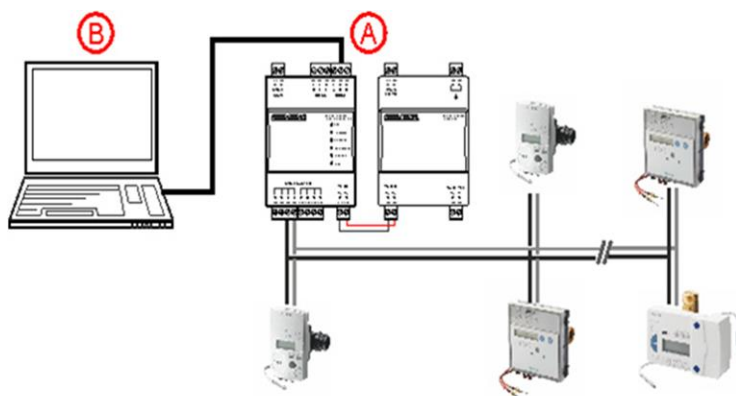
2 RS-232, serial connection (the first level converter is connected in series to the WTV776 via the RS-232 interface as an M-bus slave. Up to 5 repeaters can be connected in series to the first level converter.)

Additional information on the M-bus IoT gateway WTV776 is available under 'Product documentation [► 11]', document A6V14166901.

Reading data via the RS-232 or RS-485 interface

The level converter can be connected as master via the RS-232 or RS-485 interface to a PC to read out device data.

A USB RS-232 adapter connects the level converter to the PC.



A Level converter (RS232 or RS485 interface)

B PC or M-bus device

Proceed as follows to connect the level converter to the PC:

1. Connect a USB RS-232 adapter to the PC. **NOTICE! If not recognized, check whether a driver is installed for the USB RS-232 adapter.**
2. Connect the level converter with a proper power supply (AC 230 V).
3. Connect the level converter to the PC using the USB RS-232 adapter via the RS-232 interface (terminals A, B, C).



You can use a RS-485 and connect the level converter via terminals D, E, F.

NOTICE

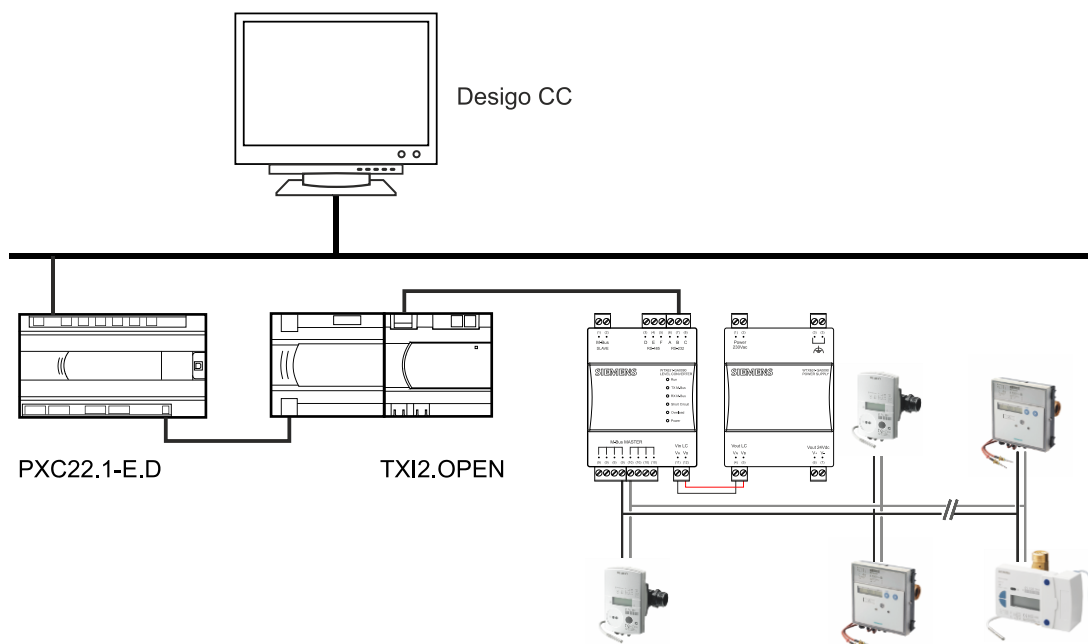


The level converter WTX631 does not have a mini USB interface to read the data locally. The device data cannot be read locally using the ACT531 software.

Reading data using Desigo CC via the RS-232 interface

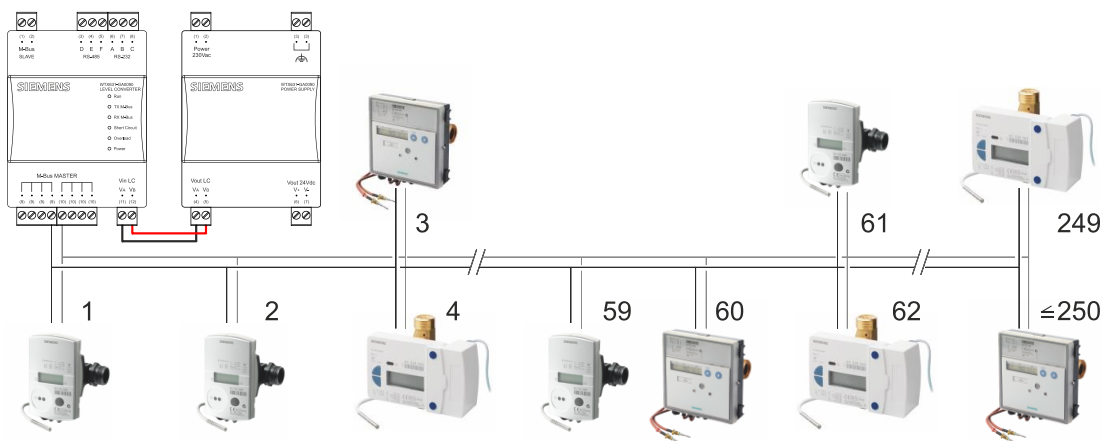
The TX Open module enables M-bus devices to be integrated via a RS-232 or RS-485 interface into the Desigo CC building management platform.

Additional information on the Desigo CC management platform is available in the engineering guide 'Desigo TM TX Open, TX M-bus', document CM110572. See 'Product documentation [► 11]'.



Level converter as a standalone device with up to 250 connected M-bus devices

The level converter can be used as the master on an M-bus network with up to 250 M-bus devices.



The level converter has six LEDs on the front side for indicating the operating status.

- ☐ Run
- ☐ TX M-Bus
- ☐ RX M-Bus
- ☐ Short Circuit
- ☐ Overload
- ☐ Power

Run

The (green) LED indicates the operational status of the device.

- Blinking at 1 Hz (slow) -> Device functions are being set up. No communication.
- Blinking at 10 Hz (fast) -> Device update pending.
- On -> The device is operational.

TX M-bus

The (green) LED indicates the transmission status on the M-bus network.

- On -> Data is being transmitted.
- Off -> No data is being transmitted.

RX M-bus

The (orange) LED indicates the receive status of data on the M-bus network.

- On -> Data is being received.
- Off -> No data is being received.

Short circuit

The (red) LED indicates a short circuit on the bus, very high traffic, or a collision.

Overload

The (orange) LED indicates a bus overload that may prevent correct operation.

- On -> Bus overload that may prevent correct operation.
- Off -> No bus overload detected.

Power

The (green) LED indicates the status of the level converter power supply.

- On -> The device power supply is correct.
- Off -> Device power is not correct or unavailable.

Addressing

The M-bus uses two types of addresses to identify devices:

- Primary addressing: Up to 250 primary addresses can be allocated to an M-bus system. The primary address is normally allocated during device set-up. Pure primary addressing is not possible when more than 250 devices are to be read on the M-bus network.
- Secondary addressing: Secondary addressing consists of 8 bytes and permits the allocation of any number. By default, the secondary address for a device is the same as the serial number issued by the device manufacturer. This type of allocation prevents M-bus conflicts.

Bus expansion

Plant type	Maximum distance	Total cable length	Cable cross-section	Number of devices (slaves)	Max. transmission rate
Small residential buildings	350 m	1000 m	0.5 mm ²	250	9600 baud
Large residential buildings	350 m	4000 m	0.5 mm ²	250	2400 baud
				64	9600 baud
Small developments	1000 m	4000 m	0.5 mm ²	64	2400 baud
Large developments	3000 m*	5000 m	1.5 mm ²	64	2400 baud
Direct vicinity	5000 m*	7000 m	1.5 mm ²	16	300 baud
Point-to-point connection	10000 m*	10000 m	1.5 mm ²	1	300 baud

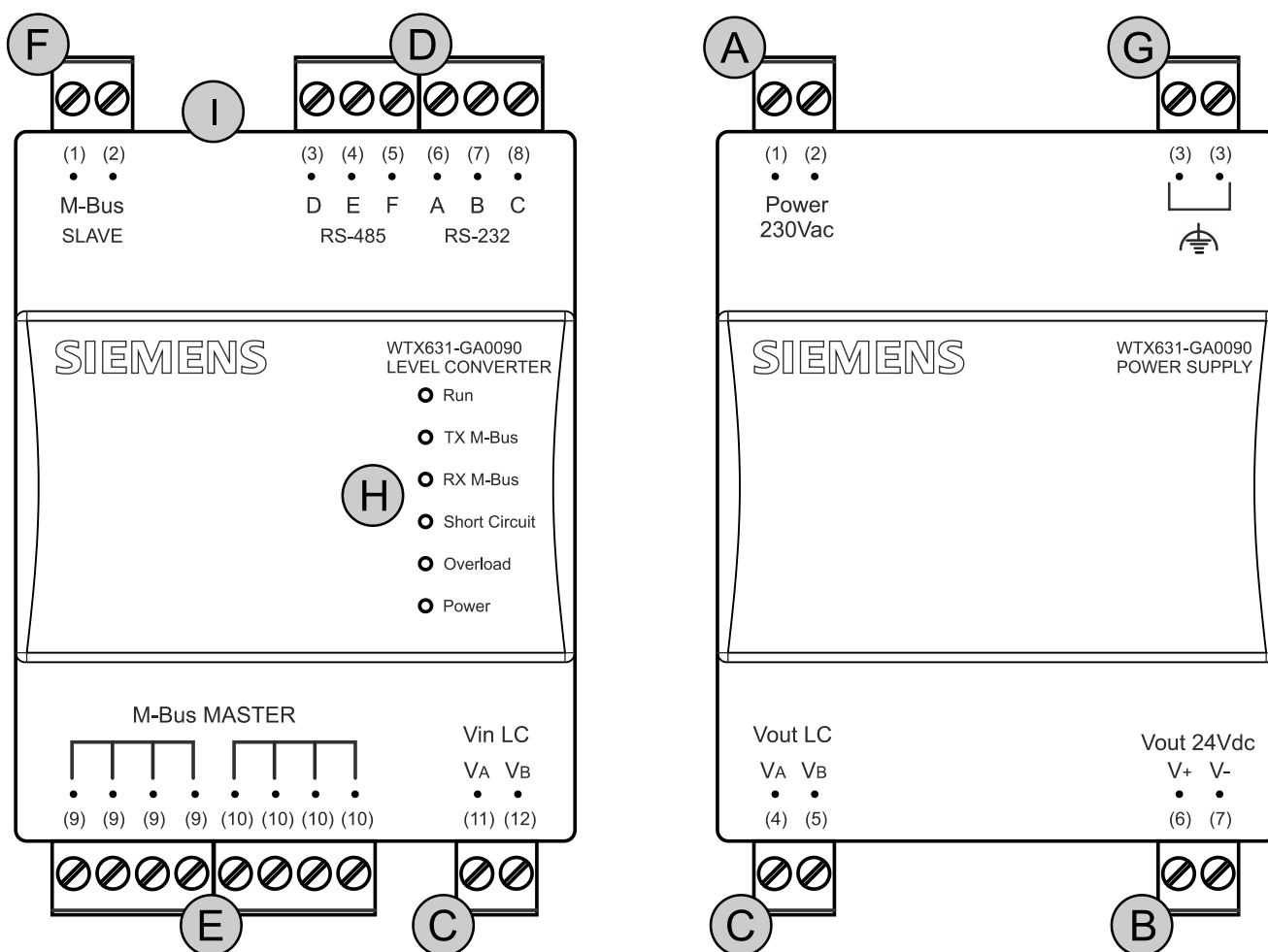
*Shielded cabling required at a distance in excess of 1,000 m (see EN13757-2 appendix E).

Signal specification

M-bus	Condition	Minimum	Typical	Maximum	Unit
Number simple M-bus loads per segment	WTX631-GA0090	0	-	250	-
Transmission rate	$C_{\text{Segment}} \leq 382 \text{ nF}$	300	2400	9600	baud
Bus power (master)	WTX631-GA0090	30	39	42	V
Bus current (master)	WTX631-GA0090	0	-	375	mA

Connection terminals

The level converter has the following connection terminals:



- | | | | |
|---|---|---|--|
| A | Mains voltage AC 230 V | E | Connections for M-bus devices and repeaters |
| B | Output for power supply to level converter WTX631 (DC 24 V) | F | Connections to connect an M-bus master or an upstream master level converter when this is used as a repeater. Terminals (1), (2) |
| C | Power supply connection to the level converter/repeater (not to be used for any other purposes) | G | Ground |
| D | Serial interface RS-232 and RS-485 to connect to a PC or M-bus master | H | Status LEDs |
| | <div> RS-232
 A = TX
 B = RX
 C = GND
 Terminals (6), (7), (8) </div> <div> RS-485
 D = REF
 E = D-
 F = D+
 Terminals (3), (4), (5) </div> | I | Button for firmware update |

Ordering

Description	Order number	Type
Level converter to power up to 250 simple M-bus loads	S55563-F159	WTX631-GA0090

Product inserts

Mounting instructions for the level converter are included in the following languages: Bulgarian, German, English, Finnish, French, Greek, Italian, Croatian, Lithuanian, Dutch, Norwegian, Polish, Slovakian, Slovenian, Spanish, Czech, Turkish, and Hungarian.

Device combinations

The following products are available for reading data:

Description	Order number	Type
M-bus web server for remote reading of meter data	S55563-F150	WTV676-HB6035
M-bus IoT gateway for remote reading of meter data	S55563-F166	WTV776-HB6035

Product documentation

Topic	Title	Document ID
Device mounting, wiring, connecting peripheral devices	Mounting instructions level converter WTX631-GA0090.	A6V11751461
Engineering, commissioning, operation, and troubleshooting	User guide M-bus web server WTV676-HB6035, M-bus level converter WTX631-GA0090, M-bus level converter WTV531-GA5060, RF converter WTX660-E05060	A6V11157985
Engineering, commissioning, operation, and troubleshooting	User guide M-bus IoT gateway WTV776-HB6035, M-bus level converter WTV531-GA5060, M-bus level converter WTX631-GA0090, RF converter WTX660-E05060	A6V14166901
Engineering instructions	Desigo TM TX Open, TX M-bus	CM110572

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following Internet address:

<http://siemens.com/bt/download>

Safety

⚠ CAUTION**National safety regulations**

Failure to comply with national safety regulations may result in personal injury and property damage.

- Observe national provisions and comply with the appropriate safety regulations.

Disposal



This symbol or any other national label indicates that the product, its packaging, and, where applicable, any batteries may not be disposed of as domestic waste. Delete all personal data and dispose of the item(s) at separate collection and recycling facilities in accordance with local and national legislation.

For additional details, refer to [Siemens information on disposal](#).

Warranty

Technical data on specific applications are valid only together with the Siemens products listed under 'Device combinations [► 11]'. Siemens rejects any and all warranties in the event that third-party products are used.

Power supply		
Operating voltage	AC 110...240 V	
AC frequency	47...63 Hz	
Power consumption	6 W + 0.07 W for each connected M-bus device	
Maximum power consumption	45 W, 45 VA Vout: DC 24 V, max. 15 VA	
Power consumption level converter (in series)	≤3 mA (2 M-bus loads)	
Internal fuse	PTC resistance and varistor	
Fuse protection of supply line	Circuit breaker	Max. 13 A, type B, C, D as per EN 60898
	or Power supply with current limitation at 10 A	

Connections	
M-bus master (terminals 9 and 10 on the level converter)	Connections for M-bus devices and Connections for the following repeater
M-bus slave (terminals 1 and 2 on the level converter)	Galvanically isolated connections to the M-bus web server or to the previous master level converter if the level converter is used as a repeater.
Vin LC/Vout LC (terminals 11 and 12 on the level converter) / (terminals 4 and 5 on the power supply)	Power supply for level converter/repeater
Vout 24 Vdc (terminals 6 and 7 on the power supply)	DC 24 V, max. 15 VA

Interface	
Serial RS-232 interface (terminals A, B, and C on the level converter)	Galvanically isolated connections • Connection to a PC/data logger as master: – Terminal A: TX (PC/data logger transmission line) – Terminal B: RX (PC/data logger receiving line) – Terminal C: GND (interface reference voltage) • Connection to an M-bus master WTV776 (or predecessor): – Terminal A, RS-232 with terminal A WTV776 – Terminal B, RS-232 with terminal B WTV776 – Terminal C, RS-232 with terminal C WTV776
Serial RS-485 interface (terminals D, E, and F on the level converter)	Galvanically isolated connections • Connection to a PC/data logger as master: – Terminal D: REF (interface reference voltage) – Terminal E: D+ (receive/transmission line potential+) – Terminal F: D- (receive/transmission line potential-)

M-bus master	
Reference standard	EN13757-2 (physical layer)
Baud rate	300 bps...9600 bps
Max. number of M-bus devices per level converter	250 (simple M-bus loads)
Max. number of M-bus devices per level converter network	250 simple M-bus loads
Max. number of level converters in parallel per network	Up to 6 slave level converters
Max. number of serial level converters per network	6 level converters, of which up to 5 repeaters
Bus power	Minimum 30 V
	Maximum 42 V
Bus current	Maximum 90 mA
Protection against short circuits	Yes
Galvanic isolation	RS-232 interface. Connection to a PC and connection to a WTV676.

Directives and standards	
Product standards	EN 62368-1 Equipment for audio/video, information and communication technology. Safety requirements
Electromagnetic compatibility	For residential and commercial environments
EU conformity (CE)	See EU declaration of conformance *)

Environmental compatibility	
The product environmental declaration *) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	
*) The documents can be downloaded at http://siemens.com/bt/download .	

Protection data	
Degree of protection	IP20 as per EN60529
Protection class	II as per EN 62368-1

Ambient conditions	
Operation	As per IEC/EN 60721-3-3
Climatic conditions	Class 3K23
Temperature	-5...+50° C
Air humidity	5...95 % r.h.
Mechanical conditions	Class 3M11
Transportation	As per IEC/EN 60721-3-2
Climatic conditions	Class 2K12

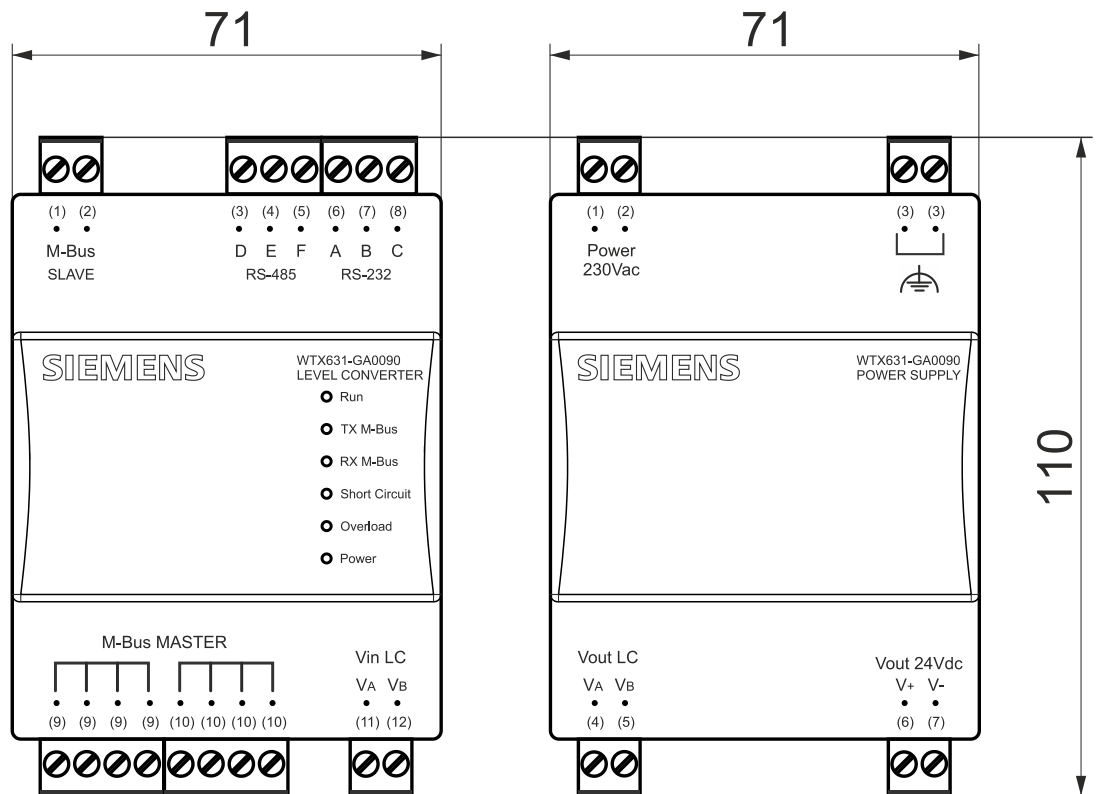
Ambient conditions	
Temperature	-40...+70° C
Air humidity	5...95 %
Mechanical conditions	Class 2M4
Storage	
Climatic conditions	Class 1K22
Temperature	-40...+70° C
Air humidity	5...95 %
Mechanical conditions	Class 2M4

Materials and colors	
Housing	PC + ASA, RAL 9010 (white)

Dimensions	
Length x Width x Height	110 x 71 x 62 mm per device (including terminals)

Weight	
Level converter with mounting instructions	0.392 kg for both devices
Packaging	0.055 kg

Mounting	
Mounting type	On 35 mm DIN rails (EN60715)



European Union conformity

Contact for regulatory topics: (EU) Siemens AG, Berliner Ring 23, DE-76437 Rastatt

United Kingdom conformity assessed

Contact for regulatory topics: (GB) Siemens plc, Sir William Siemens House, Princess Road, Manchester, M20 2UR

Issued by
Siemens Switzerland Ltd
Smart Infrastructure
Global Headquarters
Theilerstrasse 1a
CH-6300 Zug
+41 58 724 2424
www.siemens.com/buildingtechnologies

© Siemens 2019
Technical specifications and availability subject to change without notice.

Document ID A6V11742346_en--_c
Edition 2025-05-09