SIEMENS

Meters and Energy Cost Allocation

Level converter 60

WTV531-GA5060

The level converter WTV531-GA5060 is an interface between M-bus meters and reader systems. PC software ACT531 reads the data locally or via the Internet using an optional web server.

- Connect up to 60 M-bus devices (max. 60 simply M-bus loads)
- Use up to six level converters on one M-bus network with a max. of 360 simple M-bus loads
- Local data read out with the ACT531 PC software via USB or the RS-232 interface
- Remote read out via M-bus web server
- Local data read out via a PXC device via the RS-232 interface
- Reads a max. 1,000 logical devices on a level converter network
- Supply voltage AC/DC 24 V

CE

Use

The level converter is the communications interface to read up to 60 M-bus devices (simple M-bus loads).

The data is read out:

- Locally with the ACT531 PC software via USB
- Locally with the ACT531 PC software via the RS-232 interface
- Via the M-bus web server WTV534.., WTV676..
- Via Desigo CC

Up to six level converters can be connected in parallel to a M-bus web server WTV676.. (Master) on a M-bus network.

Up to 60 M-bus devices can be connected to each level converter WTV531... The level converter can be used:

- As individual components on a M-bus network.
- To extend a M-bus network by up to six level converters connected in parallel.

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

The level converter is protected against short circuits.

NOTICE	
!	We recommend using a DC 24 V power supply to ensure a stable signal.

Functions

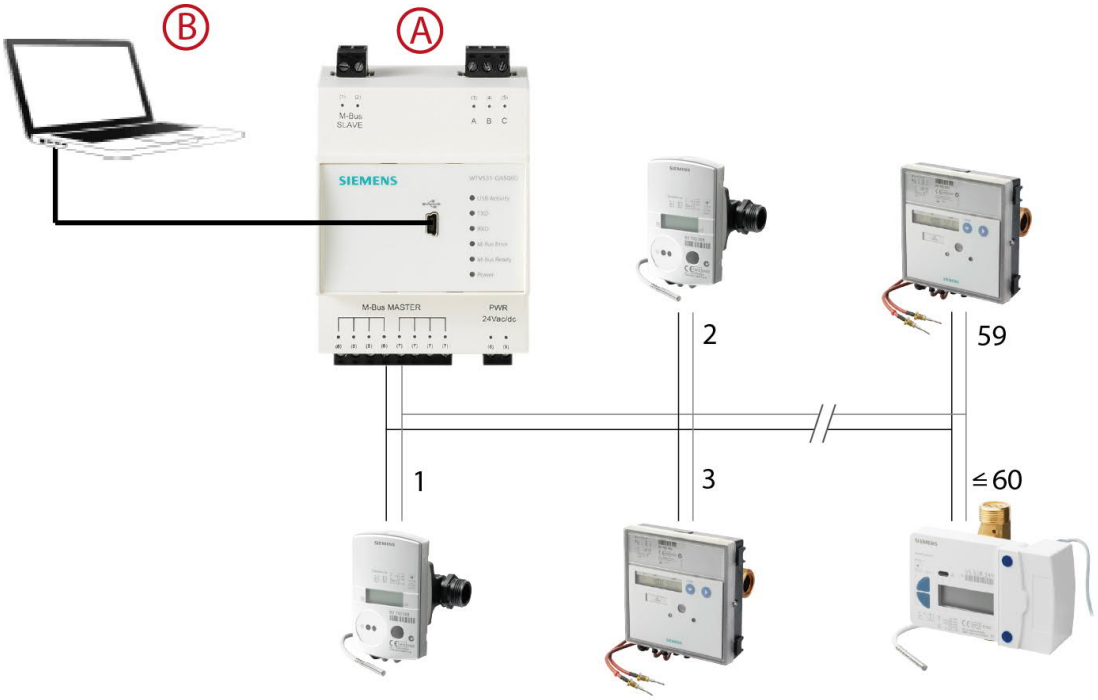
Operating modes

The data can be read in different ways.

Local data read out with the ACT531 software via the USB connection

The level converter is used as the communication interface between M-bus devices and a laptop using the ACT531 software. The ACT531 software can read a max. of 1,000 logical devices.

The level converter is operated as the master. The data is read locally via the USB connection.

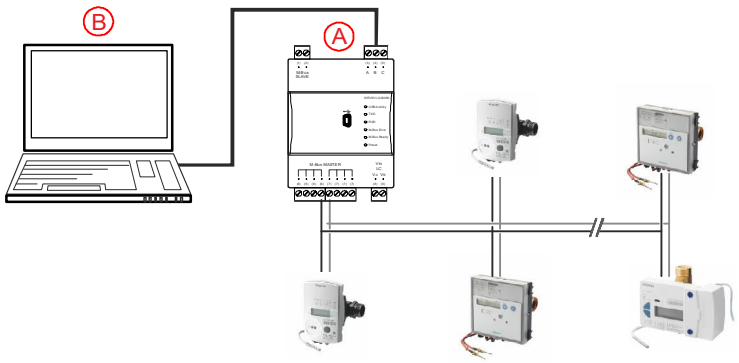


A Level converter as master

B Laptop with ACT531 software

Local data read out using the ACT531 PC software via the RS-232 interface

The level converter can also be connected to a laptop via a RS-232 interface.



A Level converter as master

B Laptop with ACT531 software

Remote read out via M-bus web server

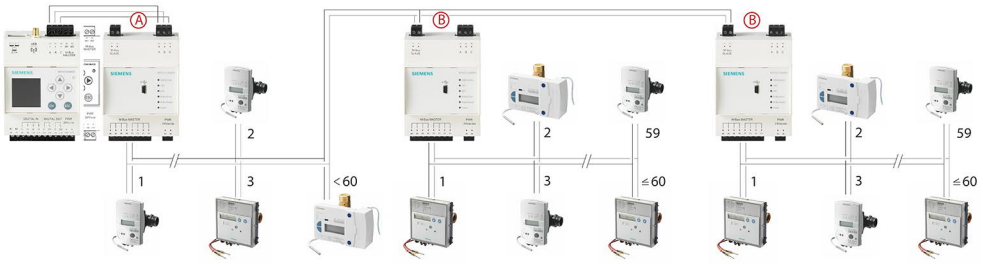
The level converter is used as the communication interface between M-bus devices and a M-bus web server.

The master level converter WTV531(A) is connected to a M-bus web server WTV676.. via the RS-232 interface (terminals A, B, C).

The following slave level converters (B) can be connected via the M-bus slave connection.

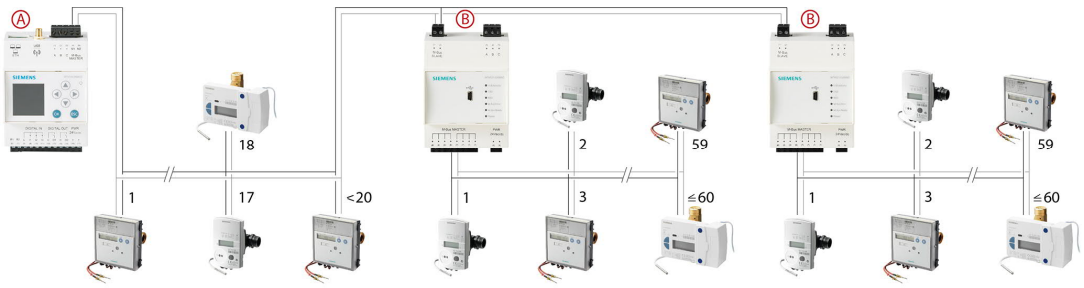
The data can be read via the web server from anywhere on the Internet.

A maximum of 250 devices can be read via M-bus web server WTV676...



A Level converter as master

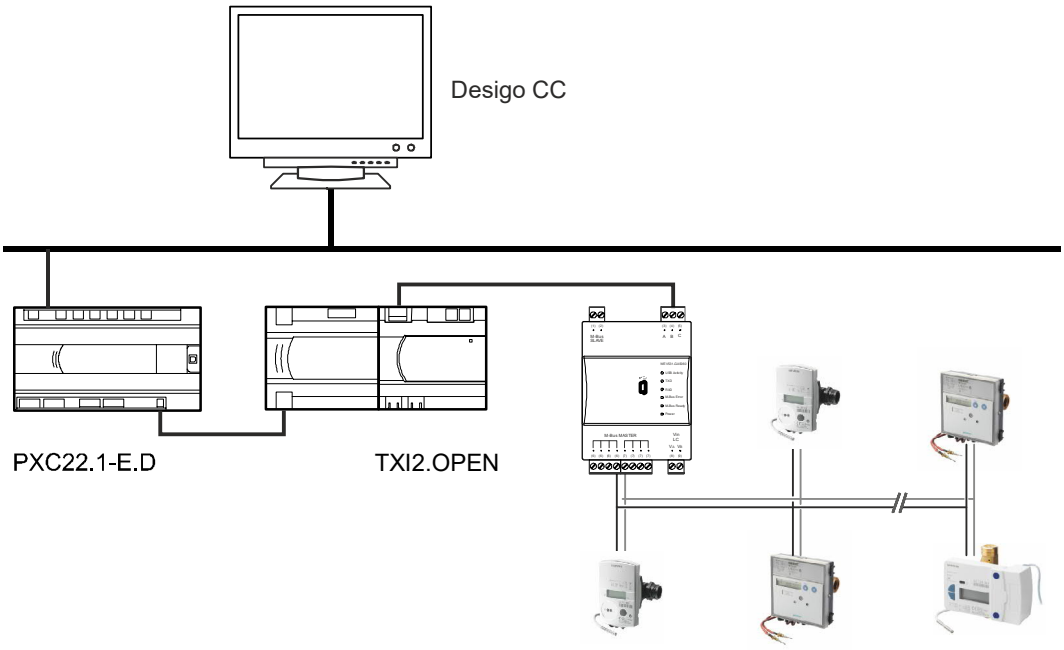
B Level converter as slave

NOTICE	
!	The level converter is connected as a slave (B) to the web server (A) (terminals M1M2 of the web server) if the firmware version of the web server WTV676.. is less than SIE.WTV676_WI-2.29_FW-3.0-17-2.6. 

Local data read out with Desigo CC via the RS-232 interface

The TX Open module integrates M-bus devices via a RS-232 interface to 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 Section "Product documentation [► 12]".

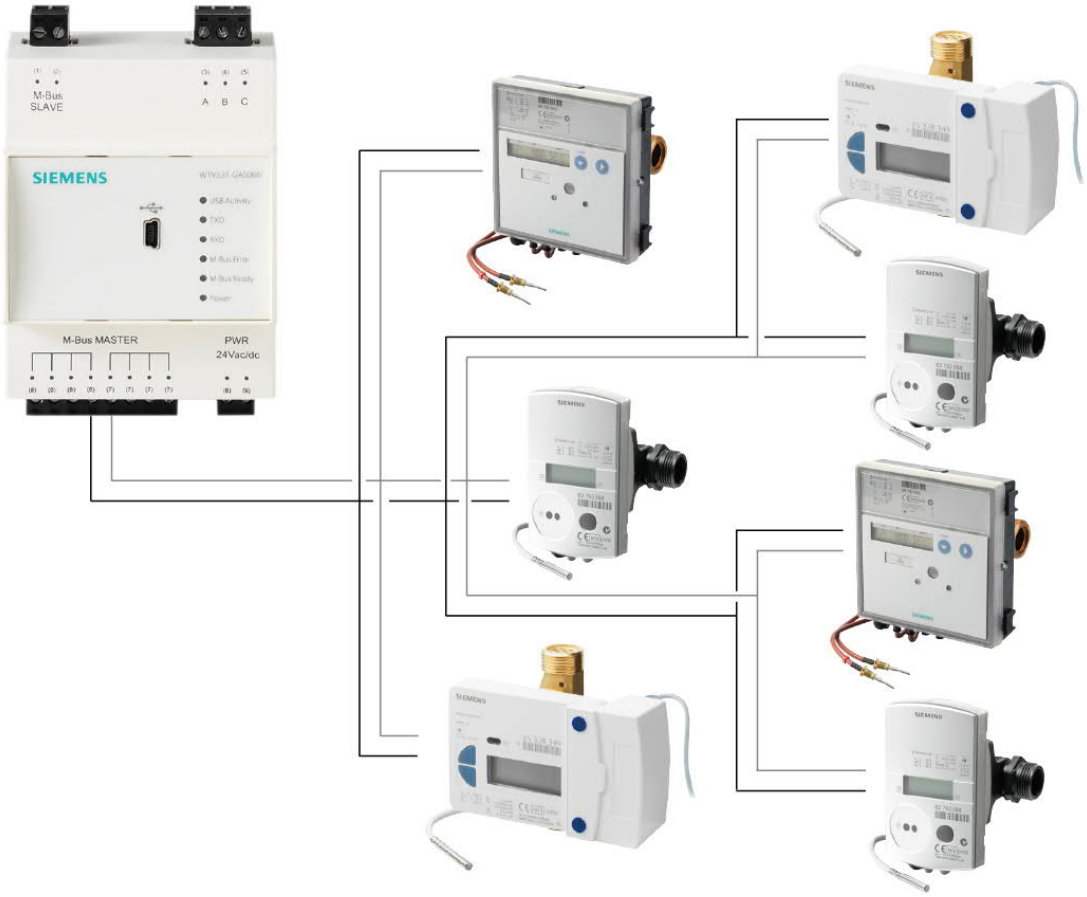


The level converter can be used in various ways.

Up to 60 M-bus devices can be connected to each level converter WTV531...

Level converter as individual component

The level converter can be used as an individual component on one M-bus network with up to 60 devices.



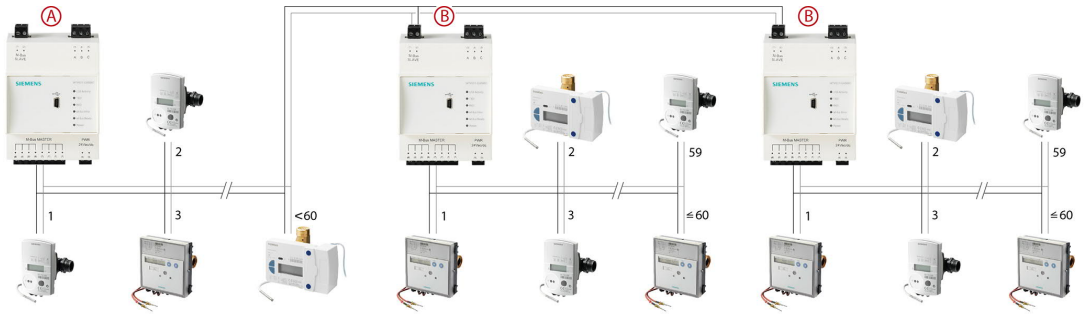
Level converter to extend a M-bus network

The level converter extends a M-bus network with up to six level converters connected in parallel.

It is connected with a serial connection to the master level converter and in parallel to other level converters.

A maximum of six level converters can be integrated in parallel and connected to a M-bus web server WTV676... A maximum of five level converters can be connected in parallel to a master level converter WTV531.

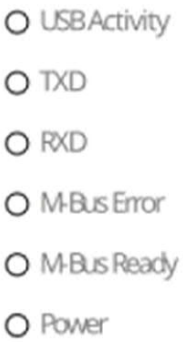
A maximum of 360 M-bus loads or 1,000 logical devices can be read via the master level converter.



A Level converter as master

B Level converter as slave

Indicators



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

USB activity

The LED indicates the USB interface connection state.

- Flashes 2 x -> The device is ready to connect to a PC using a mini USB-B cable.
- Flashes 5 x -> The device is connected to a PC and correctly recognized by it.

TXD

The LED indicates the transmission state on the M-bus master (terminals 6 and 7).

- On -> Data transmitting.
- Off -> No data transmission.

RXD

The LED indicates the receive state on the M-bus master (terminals 6 and 7).

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

M-bus error

The LED indicates the state of the M-bus power supply.

- On -> Bus overload. (short circuit or too many devices on the bus).
- Off -> No faults recognized.

M-bus ready

The LED indicates that bus power is correct and there are no anomalies.

- On -> Bus power is properly polled and sufficient for trouble-free operation.
- Off -> Bus power is insufficient for trouble-free operation.

Power

The LED indicates the state of the level converter power supply.

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

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.

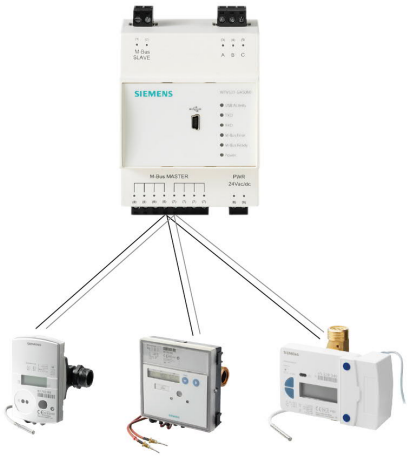
Ring topology is not permitted.

Bus cable polarity is not relevant, simplifying installation.

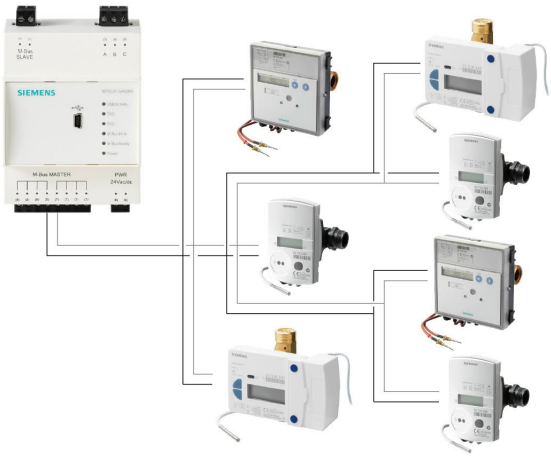
Line topology

Bus topology

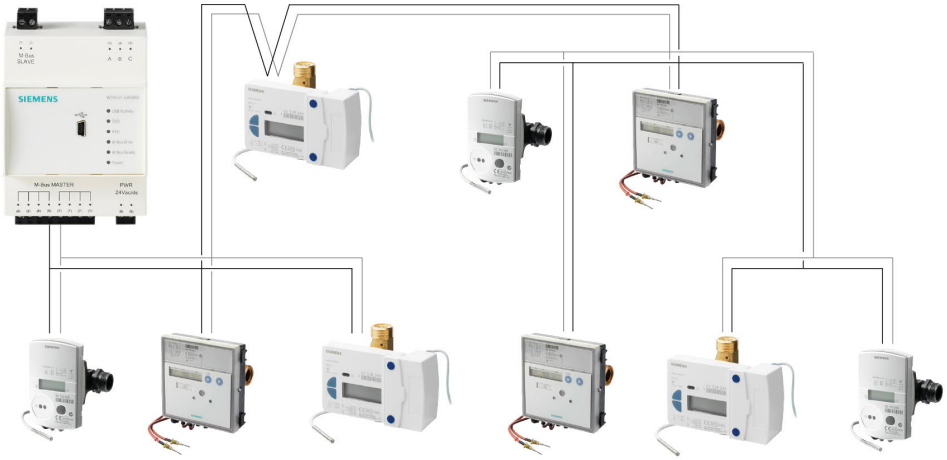
Star topology



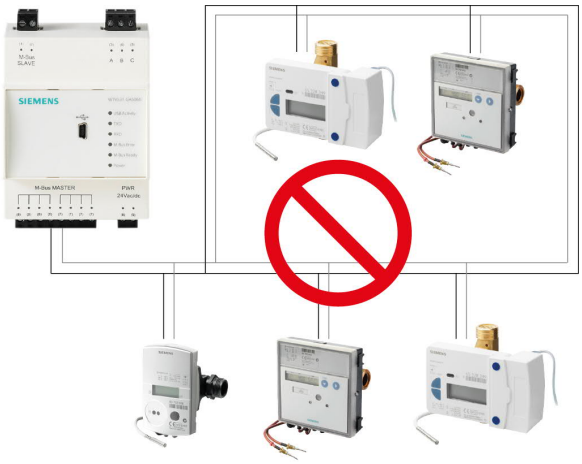
Tree topology



Combination of topologies



Ring topology



Address

M-bus uses two types of addresses to recognize devices:

- Primary addressing: Up to 250 primary addresses can be assigned to a M-bus system. The primary address is normally assigned during device commissioning. Pure primary addressing is not possible if more than 250 devices are read.
- Secondary addressing: Secondary addressing consists of 8 bytes and permits the assignment of any number. In the default setting, the secondary address for a device normally matches the serial number issued by the device manufacturer. The assignment prevents address conflicts on the bus.

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

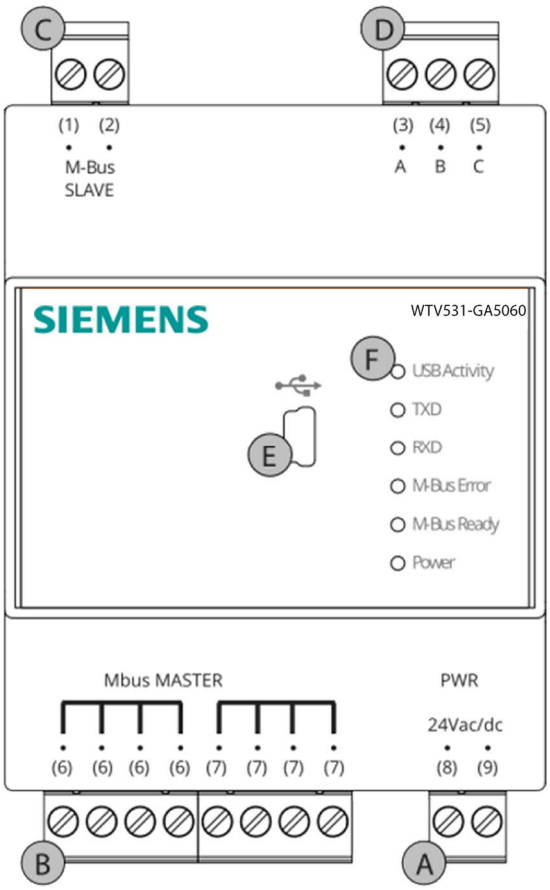
*Shielded cabling required at a distance in excess of 1,000 m (see EN13757-2 appendix E).

Signal specification

M-bus	Condition	Minimum	Typical	Maximum	Measuring unit
Number simple M-bus loads per segment	WTV531-GA5060	0		60	
Transfer rate	$C_{Segment} \leq 382$ nF	300	2400	9600	baud
Bus power (Master)	WTV531-GA5060	30	39	40	R
Bus current (master)	WTV531-GA5060	0		90	mA

Connection terminals

The device as the following connection terminals / LEDs.



A	Power supply AC/DC 24 V
	Terminals (8) and (9)
B	Connections for M-bus meters and Connections for following level converters, if this one is used as the master.
	Terminals (6) and (7)
C	Non-isolated connections to connect to a M-bus web server and / or Connections to connect the prior level converter, if this level converter is used as a slave.
	Terminals (1) and (2)
D	Isolated serial interface RS232 to connect to a laptop or M-bus master A = TX B = RX C = GND
	Terminals (3), (4) and (5)
E	Laptop connection
	Mini-USB-B
F	LEDs

Type summary

Order information

Description	Order number	Type
Level converter to power a max. 60 simple M-bus loads	S55563-F145	WTV531-GA5060

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.

Equipment combinations

The following products are available for reading data:

Description	Order number	Type
M-bus web server for remote meter data reading	S55563-F144	WTV534-0B4022
M-bus web server for remote meter data reading	S55563-F150	WTV676-HB6035
Read software for local data reading at the level converter	---	ACT531

Product documentation

Topic	Title	Document ID
Device mounting, wiring, connecting peripheral devices.	Mounting instructions, level converter WTV531..	A6V10844308
Engineering, commissioning, operation, and troubleshooting.	User manual level converter WTV531.. and Web Server WTV534..	A6V10844341
Engineering, commissioning, operation, and troubleshooting	User's 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 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:

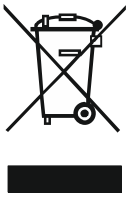
http://siemens.com/bt/download

Notes

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

	The device is considered an electronic device for disposal in accordance with European Directive and may not be disposed of as domestic waste. ● Use only designated channels for disposing the devices. ● Comply with all local and currently applicable laws and regulations.

Warranty service

The application-specific technical data is guaranteed only in combination with the Siemens products listed in the 'Device combinations' section. If third-party products are used, any guarantee provided by Siemens will be invalidated.

Technical data

Power supply		
Operating voltage	AC/DC 24 V +/- 10 %	
AC frequency	50/60 Hz	
Power consumption	3 W + 0.07 W for each connected M-bus device	
Maximum power consumption	12 W, 12 VA	
Internal fuse	PTC resistance and varistor	
Fusing of supply lines	Fusible links	Max. 10 A, slow
	Circuit breaker	max. 13 A, type B, C, D per EN 60898
	or Power supply with current limitation at 10 A	

Pins	
M-bus master (terminals 6 and 7)	Connections for M-bus meters and Connections for following level converters, if this one is used as the master.
M-bus slave (terminals 1 and 2)	Non-isolated connections to connect to a M-bus web server and / or Connections to connect the prior level converter, if this level converter is used as a slave.
Mini-USB-B	To connect to a laptop with installed ACT531 software

Interface	
USB (2.0)	Non-isolated plug: Mini-USB-B Data rate: 1.5 Mbps and 12 Mbps. Max. cable length: 3 m
RS-232	Galvanically isolated connection with a laptop/data logger Max. cable length: 3 m ● Terminal 3 [A]: TX laptop/data logger receiving line ● Terminal 4 [B]: RX laptop/data logger transmission line ● Terminal 5 [C]: GND interface reference voltage

M-bus	
Reference standard	EN13757-2 (physical layer)
Baud rate	300 bps…9600 bps
M-bus USB insulation	1kV AC
Max. number of M-bus devices per level converter	60 (simple M-bus loads)
Max. number of M-bus devices per level converter network	360 simple M-bus loads or 1,000 logical M-bus meters
Max. number of level converters per network	1 master level converter and 5 slave level converters connected in parallel or 6 level converters connected in parallel to a M-bus web server WTV676..
Bus power	Minimum 30 V Maximum 40 V
Bus current	Maximum 90 mA
Protection against short circuits	Yes

Directives and standards	
Product standards	EN 62368-1 Information Technology Equipment Safety
Electromagnetic compatibility	For residential and industrial environments
EU conformity (CE)	A5W00022156 *)

Environmental compatibility
The product environmental declaration A6V10922887 *) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).
*) Documents can be downloaded at http://siemens.com/bt/download.

Degree of protection	
IP class	IP20 per EN60529
Protection class	III 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
Temperature	-40…+70 °C
Air humidity	5...95 %
Mechanical conditions	Class 2M4
Storage	as per IEC/EN 60721-3-1
Climatic conditions	Class 1K22
Temperature	-40…+70 °C
Air humidity	5...95 %
Mechanical conditions	Class 2M4

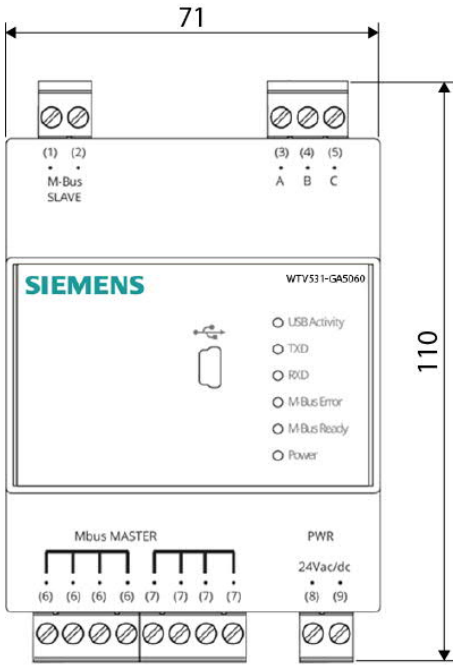
Materials and colors	
Housing	PC + ASA, RAL 9010 (white)

Dimensions	
Length x Width x Height	110x71x62 mm (including terminals)

Weight	
Level converter with mounting instructions	0.166 kg
Packaging	0.055 kg

Mounting	
Mounting type	On 35mm DIN rails (EN60715)

Dimensions



H = 62 mm

All dimensions in mm

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