

M-bus level converter

WTV531-GA5060



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

- Connects up to 60 M-bus meters per level converter
- Use up to 6 level converters on one M-bus network with a max. of 360 unit M-bus loads
- Local data reading with PC software ACT531 via USB
- Reads a max. 1,000 logical meters on a level converter network
- Remote reading via M-bus Web server (optional)
- Power supply AC/DC 24 V

Use

The level converter can supply up to 60 M-bus devices (60 unit M-bus loads).

It can be used:

- As master on an M-bus network with up to 60 meters. Can locally read data from the level converter with the help of PC software ACT531.
- As slaves to extend the M-bus network up to six level converters (a master and five slaves) with up to 60 devices each. Data is read locally over the master level converter.
- As slave on the optional M-bus Web server to remotely read data.

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

The level converter is protected against short circuits.

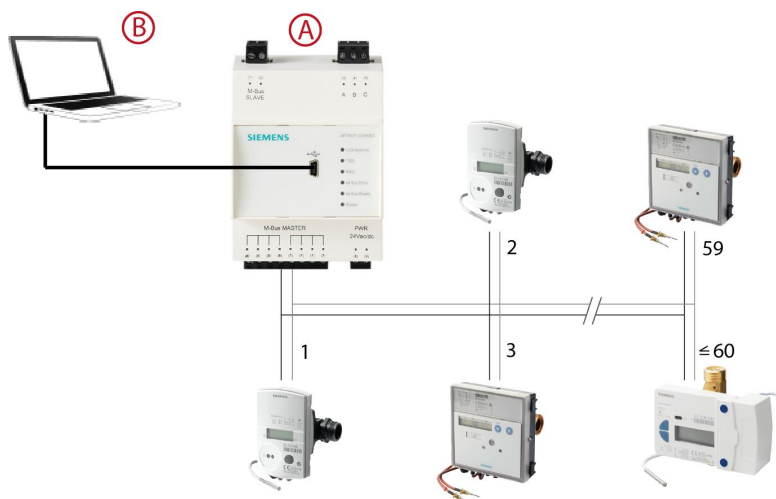
Functions

Operating modes

The level converter can be used in various ways.

Level converter as master, read with the ACT531 software

The level converter is used as the communication interface between M-bus meters and a PC using the ACT531 software. The ACT531 software can read a max. of 1,000 logical meters. The level converter is operated as the master. The data is read locally via the USB connection.



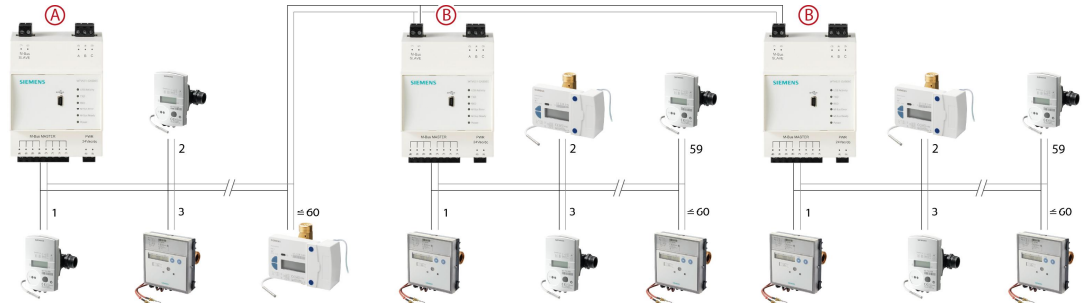
- A Level converter as master
- B PC with ACT531 software

Level converter as slave for system extension

The level converter is used to extend the M-bus system by 60 devices (60 unit M-bus loads). It is connected as a slave in series to the master level converter.

A maximum of six level converters can be integrated on a network.

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



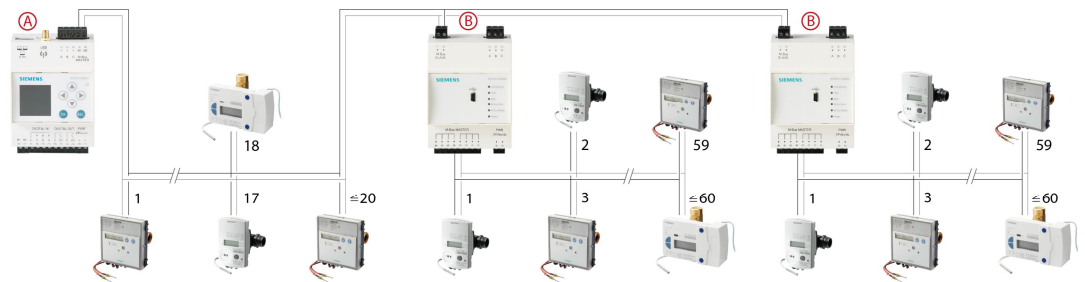
A Level converter as master

B Level converter as slave

Level converter as slave, reading over the M-bus Web server

The level converter is used as the communication interface between M-bus meters and a M-bus Web server. It is connected as a slave to the Web server. The data can be read via the Web server from anywhere on the Internet.

A maximum of 250 meters can be read via M-bus Web server.



A Web server as master

B Level converter as slave

- USBActivity** The level converter has six LEDs on the front side for indicating the operating state.
- TXD**
- RXD**
- M-Bus Error**
- M-Bus Ready**
- Power**

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 and correctly recognized by the PC.

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.

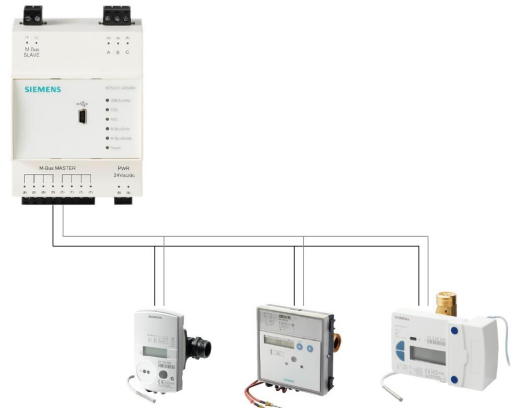
Ring topology is not permitted.

Bus cable polarity is not relevant, simplifying installation.

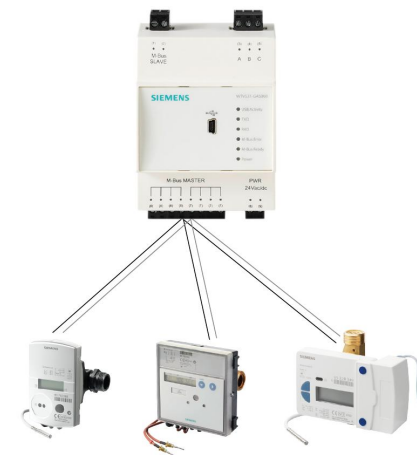
Line topology



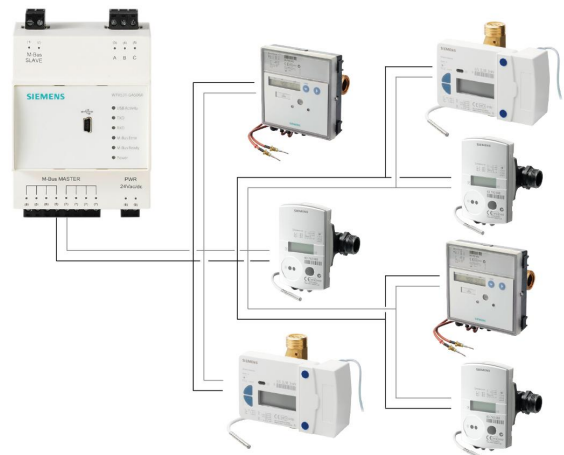
Bus topology



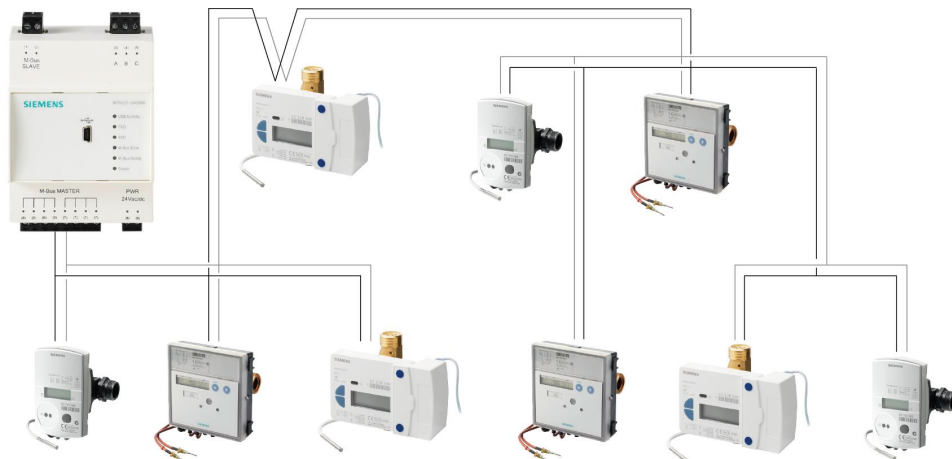
Star topology



Tree topology



Combination of topologies



Ring topology



Addressing

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

- Primary addressing: Up to 250 primary addresses can be assigned to an M-bus system. The primary address is normally assigned during device commissioning. Primary addressing is not possible if more than 250 meters 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 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	0.8 mm ²	250	9600 baud
Large residential buildings	350 m	4000 m	0.8 mm ²	250	2400 baud
				64	9600 baud
Small developments	1000 m	4000 m	0.8 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

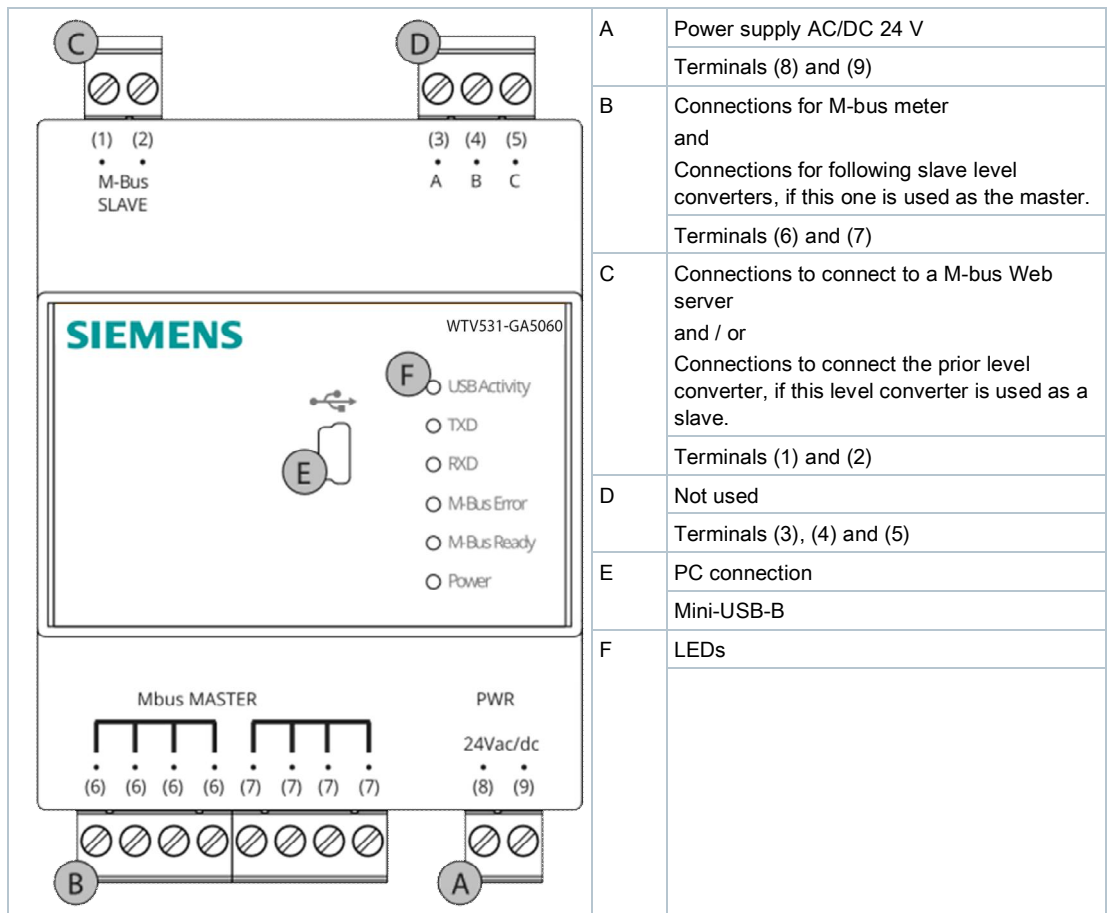
*Shielded cabling required at a distance in excess of 1,000 m (see EN13757-2 appendix E).

Signal specification

M-bus	Condition	Minimum.	Typical	Maximum.	Measuring unit
Number unit M-bus loads per segment	WTV531-GA5060	0		60	
Transfer rate	$C_{\text{Segment}} \leq 382 \text{ nF}$	300	2400	9600	Baud
Bus voltage (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.



Type summary

Order information

Description	Stock number	Type
Level converter to supply max. 60 unit 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	Stock number	Type
M-bus web server for remote meter data reading	S55563-F144	WTV534-0B4022
Readout 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



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. <ul style="list-style-type: none">• Observe national provisions and comply with the appropriate safety regulations.

Disposal

 	<p>The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU and may not be disposed of as domestic garbage.</p> <ul style="list-style-type: none">• Dispose of the device through channels provided for this purpose.• Comply with all local and currently applicable laws and regulations.
--	---

Warranty

Technical data on specific applications are valid only together with Siemens products listed under "Equipment combinations". Siemens rejects any and all warranties in the event that third-party products are used.

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	
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	

Connections	
M-bus master (terminals 6 and 7)	Connections for M-bus meter and Connections for following level converters, if this one is used as the master.
M-bus slave (terminals 1 and 2)	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, type B	To connect to a PC with installed ACT531 software

Interface	
USB (2.0)	Plug: Mini-USB, type B Data rate: 1.5 Mbps and 12 Mbps. Max. cable length max. 3 m

M-bus	
Reference standard	EN13757-2 (physical layer)
Baud rate	300 bps...9600 bps
M-bus USB insulation	1 kV AC
Max. number of M-bus devices per level converter	60 (unit M-bus loads)
Max. number of M-bus devices per level converter network	360 unit 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
Bus power	Minimum 30 V Maximum 40 V
Bus current	Minimum 0 mA Maximum 90 mA
Protection against short circuits	Yes

Directives, standards	
Product standard	EN 62368-1 Audio/video, information and communication technology equipment. Safety requirements
Electromagnetic compatibility	For residential and industrial environments
EU conformity (CE)	A5W00022156 *)

Environmental compatibility

The Environmental Declaration A6V10922887 *) contains data on environmental-compatible product design and assessment (RoHS compliance, compositions, packaging, environmental benefits and disposal).

*) Documents can be downloaded at <http://siemens.com/bt/download>.

Degree of protection

Degree of protection	IP20 per EN60529
----------------------	------------------

Protection class	III per EN 62368-1
------------------	--------------------

Ambient conditions

Operation	as per EN 60721-3-3
------------------	---------------------

Climatic conditions	Class 3K5
---------------------	-----------

Temperature	-10...+55° C
-------------	--------------

Air humidity	5...95 % r.h.
--------------	---------------

Mechanical conditions	Class 3M2
-----------------------	-----------

Transport	as per EN 60721-3-2
------------------	---------------------

Climatic conditions	Class 2K3
---------------------	-----------

Temperature	-25...+65 °C
-------------	--------------

Air humidity	5...95 %
--------------	----------

Mechanical conditions	Class 2M2
-----------------------	-----------

Storage	as per EN 60721-3-1
----------------	---------------------

Climatic conditions	Class 1K3
---------------------	-----------

Temperature	-25...+65 °C
-------------	--------------

Air humidity	5...95 %
--------------	----------

Mechanical conditions	Class 1M2
-----------------------	-----------

Materials and colors

Housing	PC + ASA, RAL 9010 (pure white)
---------	---------------------------------

Dimensions

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

Weight

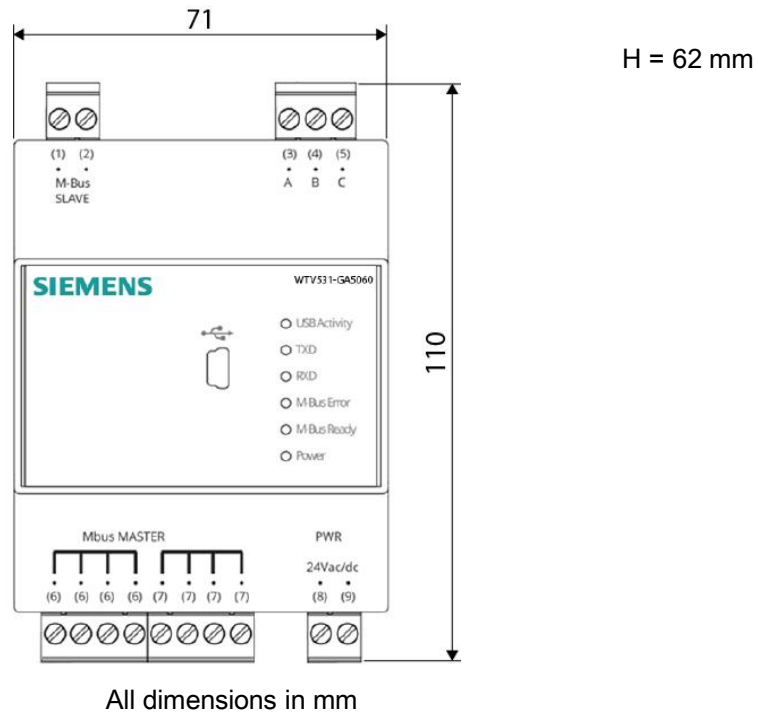
Level converter with mounting instructions	0.166 kg
--	----------

Packaging	0.055 kg
-----------	----------

Mounting

Mounting type	On 35mm DIN rails (EN60715)
---------------	-----------------------------

Dimensions



Issued by
Siemens Switzerland Ltd
Building Technologies Division
International Headquarters
Gubelstrasse 22
CH-6301 Zug
Tel. +41 41-724 24 24
www.siemens.com/buildingtechnologies

© Siemens Switzerland Ltd, 2016
Technical specifications and availability subject to change without notice.