SIEMENS

2878

Siemeca™ AMR

Network nodes with gateway

WTX16.GSM
WTX16.IP
WTX16.MOD

The WT…16… network nodes are used to receive and handle the data transmitted by consumption meters of the Siemeca™ AMR system. They are equipped with a gateway that can provide data of up to 2,000 meters for remote readout. WTX16.IP can be read via Ethernet while WTX16.GSM and WTX16.MOD contain a GSM modem. They are read via the telephone network.

Use

The WT…16… network node is a component of the Siemeca™ system.
It has been designed for use in buildings to create a radio network for receiving and storing the data transmitted by the consumption meters installed in the building. Communication between several network nodes is via radio also so that no wiring is required. All measured values acquired by the consumption meters are continuously exchanged within the network, which means that every network node stores the current consumption values, the values read out at the end of the month, and the set day values of all metering devices on the network. Owing to this operating principle, all network data can be read out at any of the nodes, or a Siemeca™ gateway for remote data transmission can be used with any of the nodes.
The field of use of the Siemeca™ AMR system is described in Data Sheet N2870.

Functions

- Reception and storage of the data transmitted by the Siemeca™ AMR consumption meters
- Automatic creation of a network with up to 12 WT…16 (with a maximum of 500 consumption meters)
- Passing on all relevant consumption values to all WT…16 on the network
- Communication via the Siemeca™ gateway

Type summary

The WT…16… network node is a component of the Siemeca™ system and has been designed for exclusive use with that system.
The network node with integrated gateway is available in a number of versions for different applications:

Type code	*Application*	*Integrated M-Bus master*	*Max. number of meters*
WTX16.GSM	Network node with gateway remote readout via GSM	yes, 5 unit loads	2000
WTX16.IP	Network node with gateway remote readout via Ethernet	yes, 5 unit loads	2000
WTX16.MOD	Network node with gateway remote readout via GSM or GPRS*)	no	500**)

*) The use of the GPRS application requires certain provisions by the network operator. To use the GPRS option the user has to conclude a special contract with the service provider.

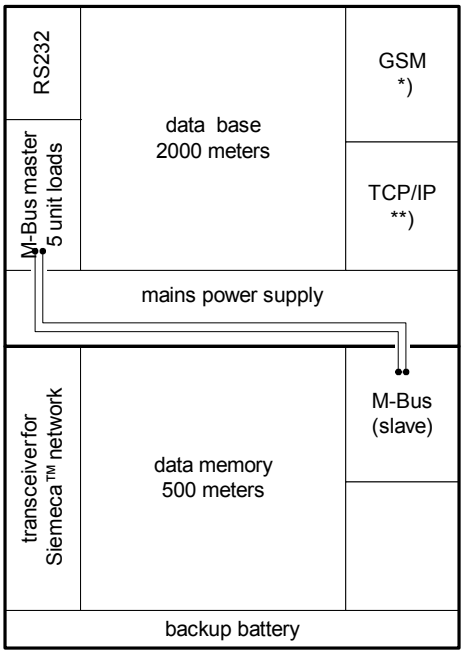
**) WTX16.MOD has no M-Bus master. It cannot be used to interconnect different networks.

Equipment combinations

All network nodes with gateway can be used in any combination with other Siemeca™ network nodes as long as the maximum number of 12 nodes per network is not exceeded.
Network nodes with gateway and integrated M-Bus master (WTX16.GSM and WTX16.IP) can read external M-Bus meters complying EN1434/3.

The WT…16… consists of the following blocks:

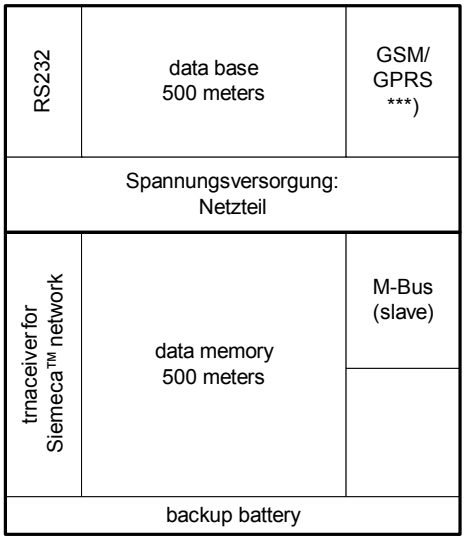
WTX16.GSM
WTX16.IP



*) WTX16.GSM only
**) WTX16.IP only

The transmitter and the receiver are used to collect data from the consumption meters and to forward theses data to other nodes in the network the data memory stores the consumption data. It is protected against temporary mains power failures by the backup battery.
The network nodes WTX16.GSM and WTX16.IP are equipped with a gateway to store data of up to 2000 meters and to provide a possibility for remote readout via GSM or Ethernet. The gateway has an additional M-Bus master that can drive up to 5 external M-Bus unit loads (e.g. up to 5 M-Bus meters). Usually, however, the M-Bus master is used to connect nodes of different networks to be able to read more meters using only one gateway.
The gateway can be programmed using an additional RS-232 interface.

WTX16.MOD



***) user programmable

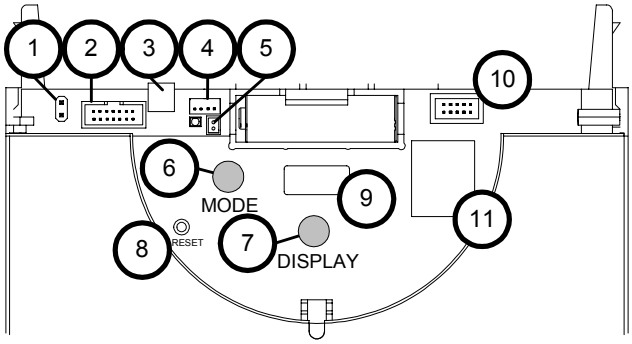
The network node WTX16.MOD is equipped with a gateway for remote readout via GSM or GPRS.
It has no M-Bus master, though. Therefore it can read data from one network only (max. 500 meters).

Basic design

The WT…16… consists of 2 major sections: The base and the housing with the electronics. It is thus possible to mount the base prior to commissioning, enabling the electrical installer to connect the WTX16 to the mains network. At the time of commissioning, the electronics section is snapped on and the electrical connections are made.

The electronics section is identical for all types of network nodes. It contains control elements of the network:

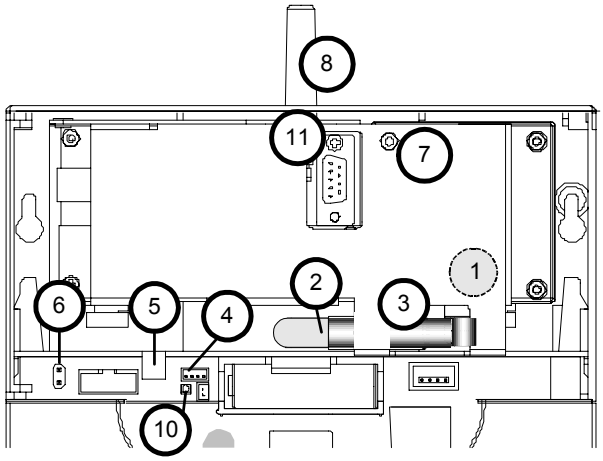
Electronics section



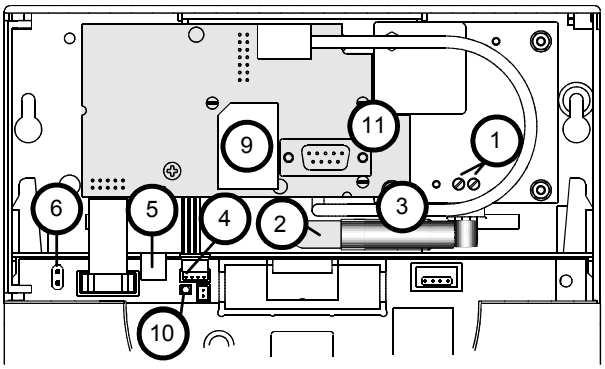
1 Connector for M-bus service connection
2 Connector for RS-232 module
3 Screw terminal for the fixed M-bus connection
4 Connector for power supply DC 3,6 V
5 Connector for backup battery
6 Operating mode button (MODE, red)
7 Button for switching the display (DISPLAY, blue)
8 Reset button (recessed)
9 Display
10 Connector (not for the user)
11 Firmware memory (covered up)

Wall-mounted section

The wall-mounted section of WTX16.GSM and WTX16.IP contains these components:



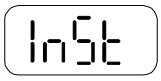
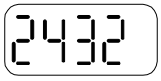
The wall-mounted section of WTX16.MOD contains these components:



1 Mains connection L and N
2 Permanently installed cable (no flexible cable!)
3 Extra insulation (shrink sleeve)
4 Connector for power supply DC 3,6 V
5 Screw terminal for the fixed M-bus connection
6 Connector for M-bus service connection
7 M3 nut to fix the hinged protection lid (WTX16.GSM and WTX16.IP only)
8 Antenna (WTX16.GSM only)
9 SIM card holder (WTX16.MOD only)
10 Indication of mains supply
11 RS-232 interface for servicing

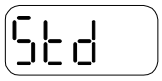
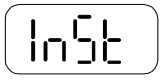
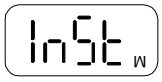
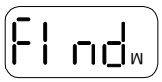
Display

The display of the WT…16… facilitates commissioning work and troubleshooting. In addition to the standard display that shows the operating mode of the WT…16…, there are 6 different display levels from “A“ to “H“ that can be selected by the user.

Display level		
-		Current operating mode
A	 	WT…16… number (primary address) and network number alternate
B		Number of WT…16… on the network
C		Number of consumption meters on the network
D		Remaining capacity of the WTT16’s main battery in percent
E		Error code (3 groups)
H		Error code for WTX16.MOD (visible in different types)

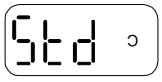
Operating modes

There is a total of 6 operating modes some of which can be selected by pressing the button on the network node, some are selected automatically, or from a connected PC via the ACT26 commissioning software. The selected operating mode appears on the display:

Operating mode	*Display*	*Explanation*
Standard mode		This is the normal operating mode of the data collectors: Telegrams from the metering devices are received, stored and further handled by the network.
Extended standard mode[1)]		The receiver is always active to ensure fast communication. This mode is automatically activated in the case of mains-powered operation (WTX16…). It can also be started manually with the ACT26 service tool.
Installation mode[2)]		In installation mode, the radio network will be configured automatically. Metering devices that transmit installation telegrams in this operating mode are registered on the network.
Extended installation mode[2)]		Same as installation mode, except that in addition to installation telegrams, data telegrams are accepted also. This mode is practical when the network is installed at a later stage.
Search mode		Metering devices that have been lost are synchronized again (this mode is activated automatically).
Extended search mode[2)]		Same as resynchronization mode. It must be started manually with the ACT26 service tool and searches for lost or manually entered metering devices.

[1)] This mode will be turned off automatically after eight hours in battery powered network nodes WTT16…

[2)] This mode will be turned off automatically after eight hours.

State of the system	*Display*	*Explanation*
Remote access		When, from a PC, the WT…16 is accessed with a WTZ.RM radio module, symbol " " will appear
High-speed mode	For example 	When all WTT… have their receivers continuously on so that all new data can immediately be exchanged on the network, 2 dots will appear in the upper half of the display

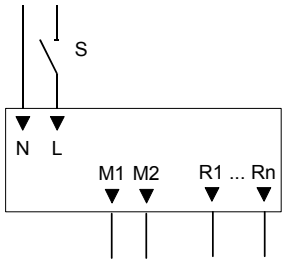
Engineering notes

For detailed engineering instructions, refer to the Siemeca™ Engineering Manual J2870.

Notes on Mounting and Commissioning

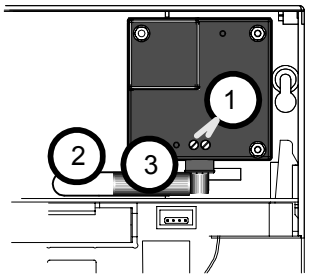
For mains-powered WTX16…. network nodes, the mains connections are to be made first at the selected mounting positions (typically on every second floor, mounting height ≥ 2 m).

Connection diagram

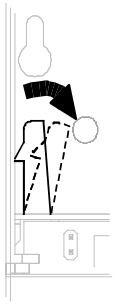


S	switch
L, N	AC 230 V mains supply
M1, M2	M-Bus output
R1…Rn	optional interface(s)

CAUTION:
Connect the mains cable to the power supply unit only!



1 Mains connection L and N
2 Permanently installed mains cable (no flexible power cable!)
3 Extra insulation (shrink sleeve)



Connect the AC 230 V power supply line to the power pack of the WTX16… in the following order: Remove the upper housing section of the WTX16… from the base. For that purpose, remove the 2 cable connections (power supply (4) and M-Bus (6)) between gateway and base. Then, use a suitable tool (screwdriver or similar) to slightly open one of the two lateral fixing levers so that upper housing section and base can be separated. Then, the top section of the WT…16 is to be fitted using 2 dowels and screws (spacing of dowels is 184 mm with the WTX16…).

Mains connection

Connection of the AC 230 V power line to the power pack of the WTX16… is to be made as follows:
A 2-core mains cable (L and N) has to be preinstalled at the mounting site already. The power pack must be connected by qualified staff. The cores must be sheathed with the en-closed insulating sleeves to ensure compliance with safety class II. Then, the live (L) and neutral (N) conductors must be connected to terminal “IN” of the power pack.

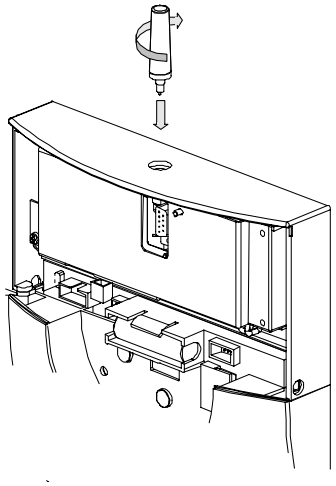
Mains voltage must be in the range from AC 100 to 240 V (50 / 60 Hz). There is no protective earth (PE) connection. Then, cable strain relief must be provided by fitting cable ties.
Once the top section of the WTX16 is fitted, the housing with the electronics can be snapped on. Then, the power supply connector can be plugged into the electronics section and the WTT16 switched to installation mode by pressing the MODE button (red) for a few seconds. Then, additional network nodes or consumption meters of the Siemeca™ AMR system can automatically configure themselves to form a network.

Search run

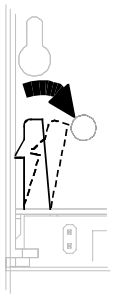
After the complete installation of the network the gateway must do a search run to find all meters of the network(s). One can start a search run either by restarting the WTX16… by disconnecting it shortly from the mains power (switch S) or by triggering it with a command sent by the commissioning software ACT21 from a PC attached to the network node.

GSM antenna of WTX16.GSM

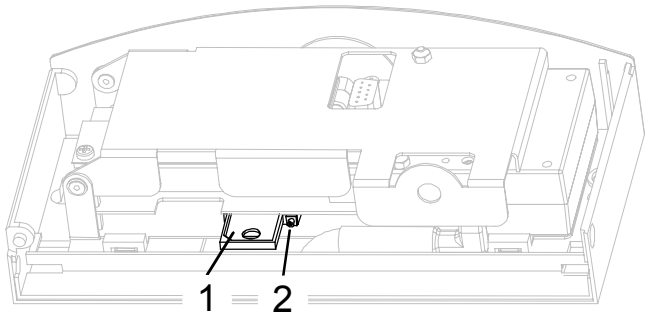
Screw tight the GSM antenna prior to commissioning



SIM card of WTX16.GSM



Network nodes WTX16.GSM require a SIM card. For that purpose, remove the upper section of the WTX16.GSM from the base. Remove the 2 cable connections (power supply and M-Bus) between gateway and base. Then, use a suitable tool (screwdriver or similar) to open one of the two lateral fixing levers so that upper housing section and base can be separated.
Insert the SIM card in the slot at the bottom of the gateway.

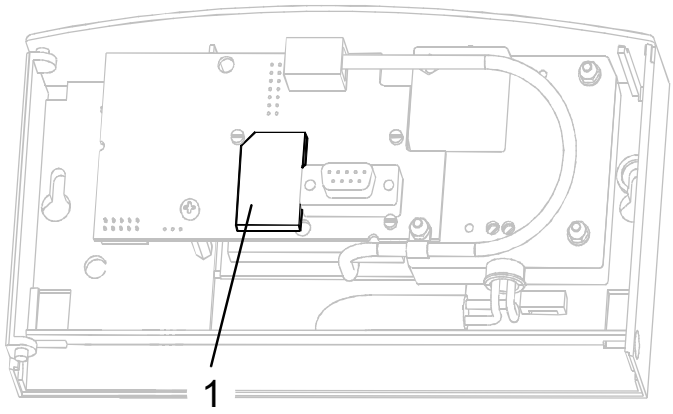


Then, snap base and upper housing section together and reestablish the connections for M-Bus and power supply.

1 SIM card
2 Card ejector

SIM card of WTX16.MOD

Network nodes WTX16.GSM require a SIM card. The cardholder is easily accessible



1 SIM card holder

WTX16.IP

The WTX16.IP network node features an Ethernet interface, which connects to the outside world via an RJ45 connector, where the net-work cable is to be connected. The distance to the network conduit box may not exceed 2 meters.

Parameter setting

The WTX16.GSM, WTX16.MOD and WTX16.IP network nodes are parameterized with the ACT21 software. The scope of delivery of the software includes an RS-232 cable for connecting the PC to the gateway.

Sealing

On completion of commissioning, secure the network node with the seal provided. Insert the seal in the opening to the right of the network node.

Safety guidelines

After opening the housing, certain parts of the device / system that become accessible carry dangerous voltage. Only qualified staff may interfere with such devices / systems.

- To ensure correct and safe operation, the pro-duct must be adequately shipped, stored, installed, operated and maintained.
- Staff dealing with the product must be familiar with all potential hazards and maintenance measures in accordance with the instructions given in this document.

Non-observance of these warning notes can lead to personal injury or damage to property!

The power line to the WTX16… must include an easily accessible switch (contact gap ≥ 3 mm) that allows the user to disconnect the device from the mains supply. The connection cable has to be protected by an appropriate fuse. Whenever performing any work on the WTX16…, disconnect the device from the mains supply.

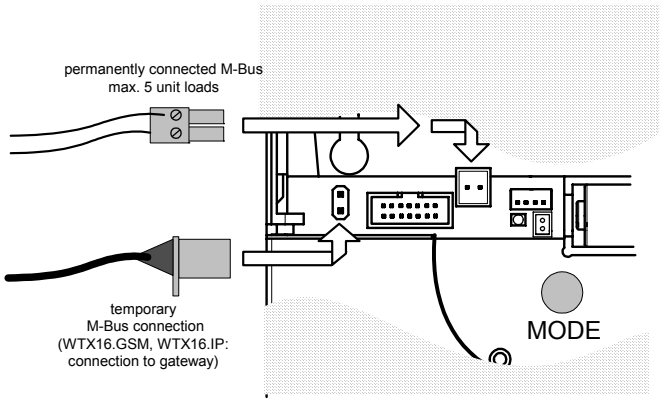
The local regulations for electrical installations and wireless systems must be complied with.

In Germany:

Pursuant to the "Verordnung über Allgemeine Bedingungen für die Elektrizitätsversorgung von Tarifkunden (AVBEltV)" of the Ministry of Economics, electrical installations behind the house's fused connection may only be erected, extended, changed and maintained by electrical installers that are registered with an electric utility. They must ensure that the general technical regulations and legal safety regulations are complied with.

M-Bus connection

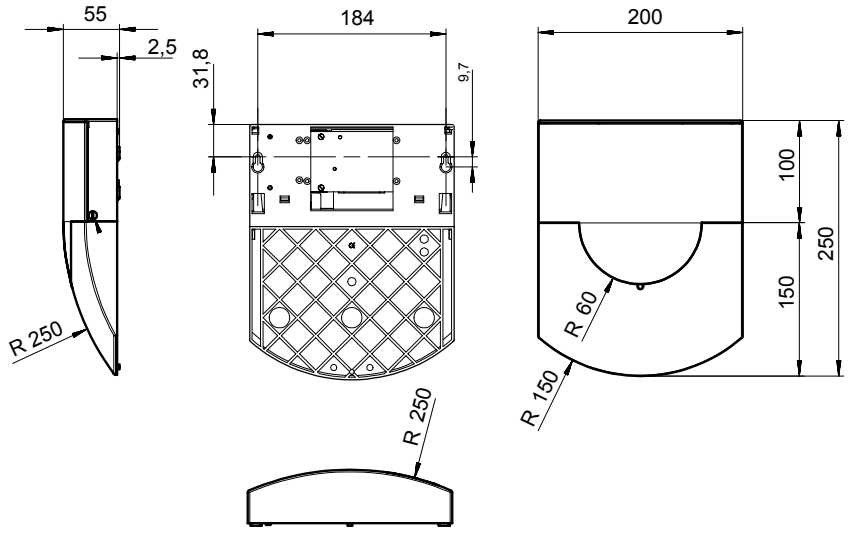
Each network node has a screw terminal for a permanently installed M-Bus connection. A fitting plug is included.



Technical data

CE conformity to EMC directives	
Protection degree	IP 32 (WTX16.IP has IP21)
Safety class	2
Electromagnetic compatibility	Immunity: EN 55 024/EN 301 489 Emissions: EN 55 022/EN 300 220-1
Operating voltage WTX16…	AC 100…240 V 50/60 Hz
Rated frequency	868,3 MHz
Transmitter power	< 14 dBm
Frequency of transmission	<1 %
Permanent ambient temperature	
Transport and storage	–20…+60 °C (< 30 °C recommended)
Operation	0…55 °C
Weight	0,3 kg

Dimensions



Dimensions in mm