



Siemeca™ AMR

Network Node

WTT16...
WTX16...

The WT...16... network node is used to receive and handle the data transmitted by consumption meters of the Siemeca™ AMR system. In small plants, one network node suffices as a data collector. In larger plants, or when consumption data shall be read out from a remote location, an M-bus interface for connection to an OZW10 M-bus central unit or a Siemeca™ gateway is required. The WTT16... network node is battery-powered, the mains-powered WTX16... version is available for special applications.

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
- Communication with the OZW10 M-bus central unit

Network node versions

The WT...16... network node is a component of the Siemeca™ system and has been designed for exclusive use with that system.

It is available in a number of versions for different applications:

<i>Application</i>	<i>Battery-powered</i>	<i>Mains-powered</i>
Standard	WTT16	WTX16
With RS-232 interface for local data readout	WTT16.232	WTX16.232

Network nodes with integrated gateway are used for the remote readout of Siemeca™ AMR networks. They are described in data sheet N2878.

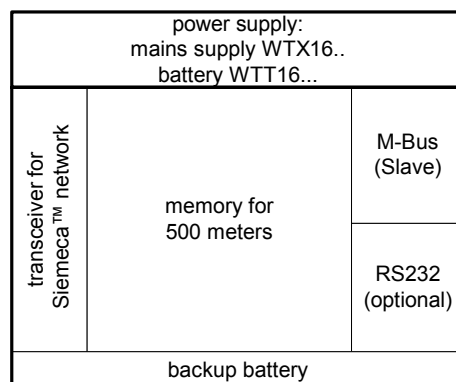
Combinations

All network nodes with integrated gateway can be used along with any other network node. The maximum number of 12 network nodes in one system must not be exceeded.

The network nodes with gateway and integrated M-Bus master (WTX16.GSM and WTX16.IP) are able to read M-Bus meters according to EN1434/3.

Technical design

The network node consists of the following subassemblies:



Receiver and transmitter are used for receiving consumption data and forwarding them to other network nodes of the network. The memory stores the consumption data. It is protected against temporary power drops (e.g. mains power failure or replacement of the main battery) by a backup battery. The network can be read locally via the M-Bus interface. The network nodes WT...16.232 have an additional RS232 interface for readout purposes.

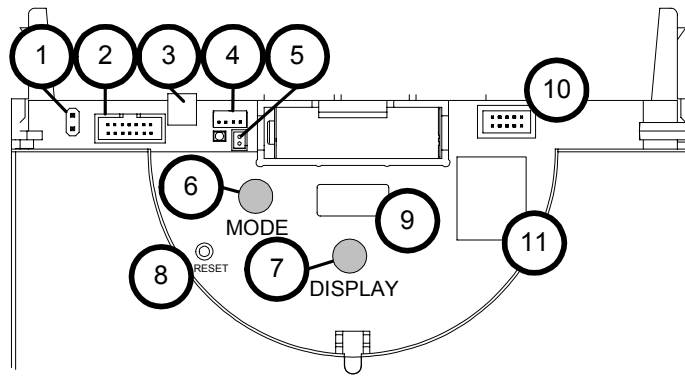
WTT16... nodes are battery-operated, while WTX16... require a mains power supply AC 100 V...230 V.

Basic design

The network node 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.

Electronics section

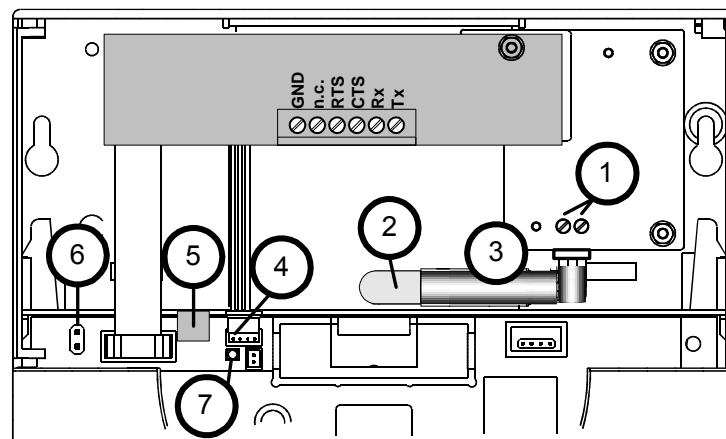
The housing with the electronics is identical for all types of network nodes. It contains the network controls:



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

Wall-mounted section

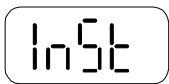
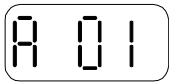
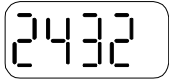
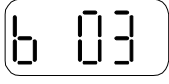
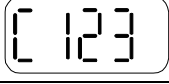


The wall-mounted section of the network nodes WTT16... contains only the main battery. The wall-mounted section of the network nodes WTX16 and WTX16.232 contains the power pack and possibly an additional RS232 interface.



- 1 Mains connection L and N
- 2 Preinstalled mains cable (no flexible power 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 Indication of mains supply

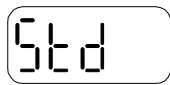
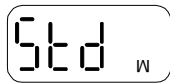
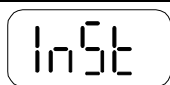
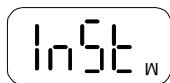
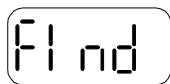
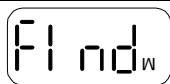
Display

The display of the WT...16... facilitates commissioning work and troubleshooting. In addition to the standard display that shows the operating mode of the WTT16, there are 5 different display levels from "A" to "E" 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 %
E		Error code (3 groups)

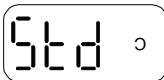
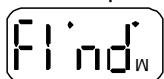
Operating modes

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⁾ In battery powered network nodes this mode is terminated automatically after eight hours.

²⁾ This mode is terminated 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

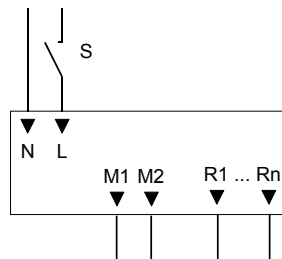
Engineering notes

For detailed engineering instructions, refer to the Siemeca™ Engineering manual CE1J2870.

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), if required.

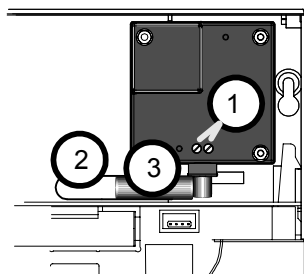
Wiring diagram



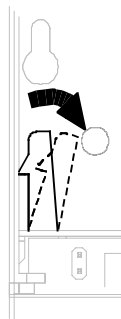
S Switch
L, N AC 230 V mains power supply
M1, M2 M-Bus output
R1...Rn optional interface(s)



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



1 Mains connection L and N
2 Preinstalled 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 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) is already preinstalled at the mounting site. 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 WT...16 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. Ensure that the local regulations for radio transmission installations and electrical installations are complied with.

Safety notes

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 product 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.



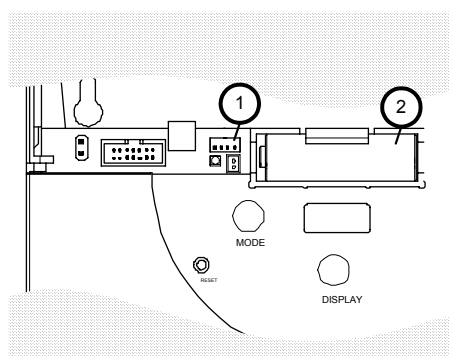
Non-observance of these warning notes can lead to personal injury or damage to property!

Ensure that the local regulations for radio transmission installations and electrical installations are complied with.

In Germany:

Pursuant to the "Verordnung über Allgemeine Bedingungen für die Elektrizitätsversorgung von Tarifkunden (AVBEitV)" 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.

Commissioning



For safety reasons, the WTT16... is supplied without having the main battery connected.

- 1 Connector for power supply
- 2 Backup battery

Calculating the battery's life expectancy

After installation of the network node, connect the battery plug to the relevant connector (1). The display of the network node will show **bAtt**. Press the blue DISPLAY button once to start the life expectancy calculation for the new main battery.

Caution: The main battery can be removed from the network node during operation and the plug can be connected again. In that case, the DISPLAY button may not be pressed

as a confirmation. The result would be an erroneous display when showing the remaining capacity.

Battery replacement

First, remove the discharged main battery and insert the new one. Press the blue DISPLAY button once to start the life expectancy calculation for the new main battery. The backup battery MUST NOT be removed simultaneously. A fatal loss of data would happen.

De-passivation

After storing the main battery for longer periods, especially at temperatures higher than 30 °C, the battery might passivate. Under these circumstances it will not be able to deliver sufficient energy to the network node. If the network node detects a passivated battery a de-passivation cycle is triggered. This is indicated by a flashing front LED. The procedure might take a few minutes. After de-passivation the network node will start up in **IdLE** mode. Low temperatures at the battery may cause a similar behavior in other modes too.

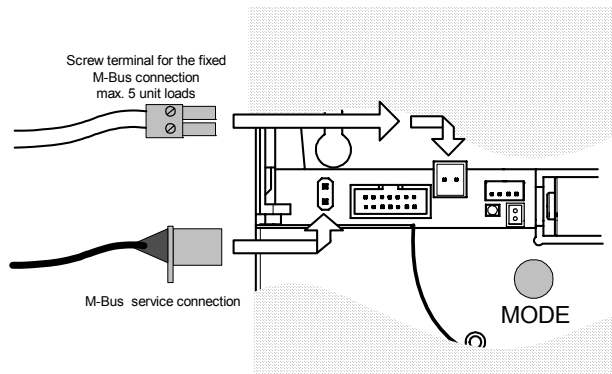
Safety notes on lithium batteries

The main battery used by the WTT16... requires careful treatment:

- Do not short-circuit or damage the battery
- Do not expose the battery to excessive heat
- Return exhausted batteries to the supplier
- Read the enclosed safety instructions carefully

M-Bus connection

Any network node can be connected to the M-Bus temporarily (service connector) or continuously (screw terminal for the fixed M-bus connection). A plug for the screw terminal is included with every network node.

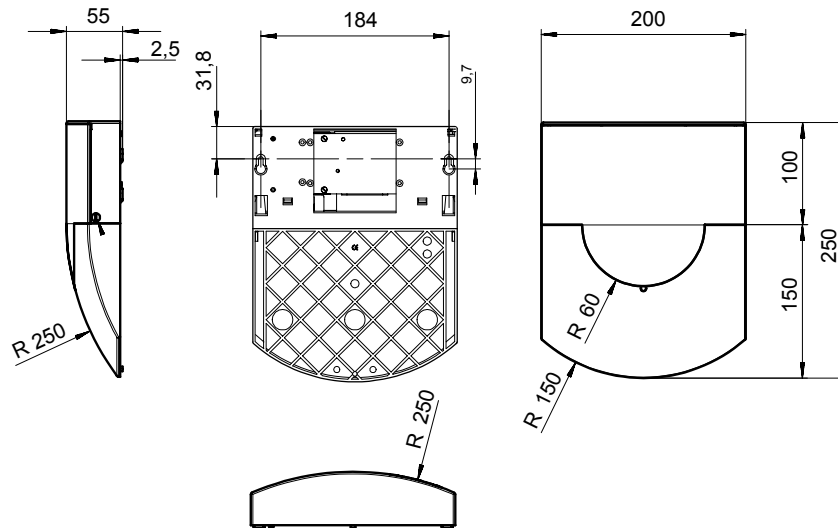


Technical data

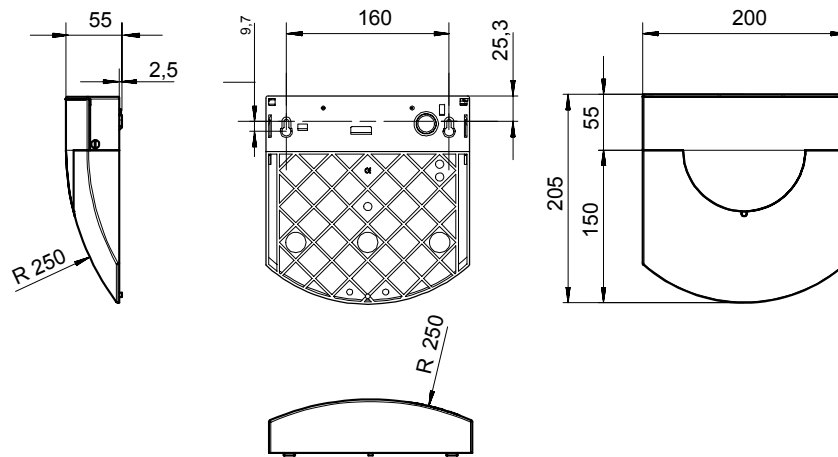
CE conformity to EMC directives	
Safety class	IP32
Safety class	2
Electromagnetic compatibility	immunity: EN 55 024/EN 301 489 emissions: EN 55 022/EN 300 220-1
Operating voltage WTT16...	DC 3.6 V
Lifetime of main battery	> 5 years
Operating voltage WTX16...	AC 100...240 V, 50/60Hz
Rated frequency	868.3 MHz
Transmitter power	< 14 dBm
Frequency of transmission	<1%
Perm. ambient temperature	
Transport and storage	-20...+60 °C (< 30°C recommended)
Operation	0...55 °C
Weight	0.3 kg

Dimensions

WTX16...



WTT16...



Dimensions in mm

The information provided in this Data Sheet only gives general descriptions and general technical features which, in the case of specific applications, may not necessarily apply, or which may change due to further development of the product. Technical features are binding only when expressly agreed upon at the time a contract is concluded.

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