



## Network Node

**WTT16...**  
**WTX16...**

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**The WT...16... network node is used to receive and handle the data transmitted by consumption meters of the Q 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 gateway is required. The WTT16... network node is battery-powered, the mains-powered WTX16... version is available for special applications.**

### Use

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The WT...16... network node is a component of the Q AMR 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 QUNDIS gateway for remote data transmission can be used with any of the nodes.

## Functions

- Reception and storage of the data transmitted by the 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 QUNDIS gateway
- Communication with the OZW10 M-bus central unit

## Network node versions

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

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

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

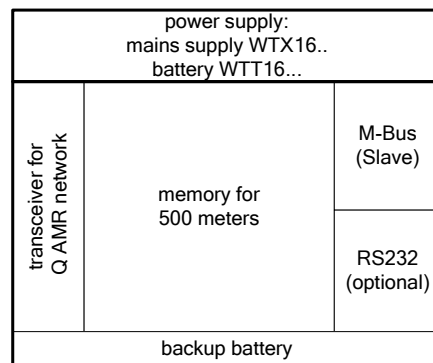
Network nodes with integrated gateway are used for the remote readout of Q AMR networks. They are described in data sheet CE1J2878.

## 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 EN13757-2/3

## 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.

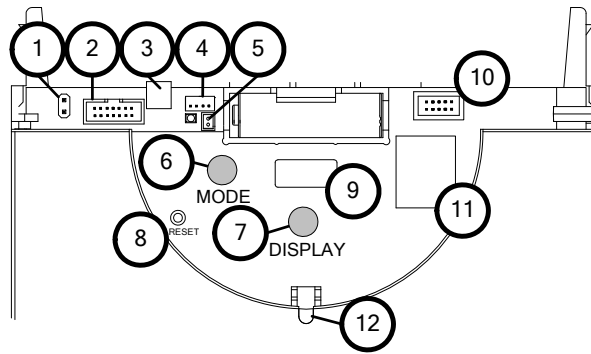
WTT16.. nodes are battery-operated, while WTX16.. require a mains power supply AC 100V .. 230 V.

## 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

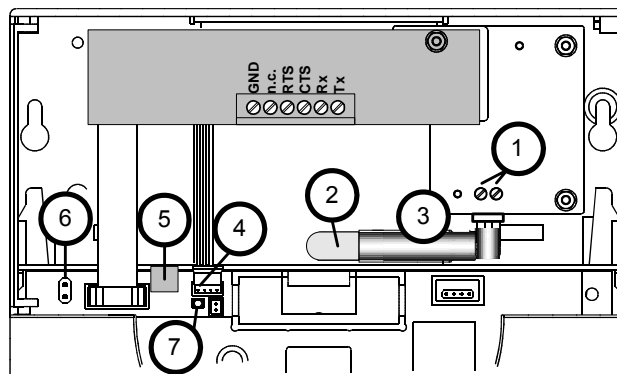
The housing with the electronics is identical for all types of network nodes. It contains the network controls:



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)
12. IrDA-Interface (optically)

#### Wall-mounted section

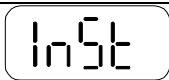

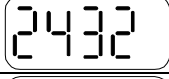




The wall-mounted section of the network nodes WTT16.. contains only the main battery. In variant WTT16.232 the RS232 interface is fixed here. The wall-mounted section of the network nodes WTX16 and WTX16.232 contains the power pack and possibly an additional RS232 interface.



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

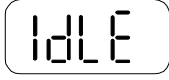
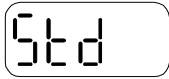
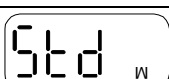
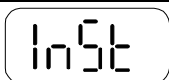
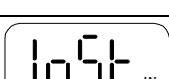
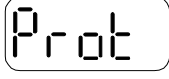



## Display

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.



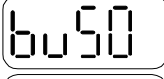

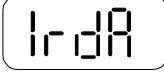

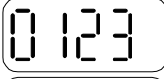
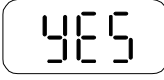
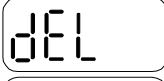
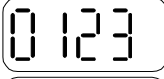
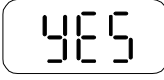

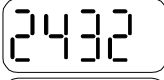

Display level		
-		Current operating mode
A	 	WT...16 number (primary address) and alternate network number
B		Number of WT...16 on the network
C		Number of consumption meters on the network
D		Remaining capacity of the WTT16's main battery in %
E		Error code (3 groups)

## Operating modes

There are different 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:

Mode	Display	Explanation
Idle-mode		Delivery status. Switch to install mode by pressing the button MODE (>2 sec).
Standard mode		This is the normal operating mode of the data collectors: Telegrams from the metering devices can be received, stored and handled further by the network.
Extended standardmode <sup>1)</sup>		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.
Installationsmode <sup>2)</sup>		In installation mode, the radio network will be built up automatically. Metering devices that transmit installation telegrams in this operating mode will be registered in the network. This mode is started by pressing the MODE button (>2sec).
Extended installationsmode <sup>2)</sup>		The extended Installation mode will register all metering devices that transmit either installation or data telegrams. This mode is useful if network is expanded later.
Protected installationsmode <sup>2)3)</sup>		Same as installation mode, except that connections are built up only by devices with the same network signature.
Search mode		This mode restores radio connection to lost or manually registered metering devices. This mode starts automatically.
Extended search mode <sup>2)</sup>		This search run is used to restore the radio connection to lost or manually registered metering devices. Starting from version 2.2 this mode can also be started manually by setting jumper 1 (in the plug field) and pressing the MODE button (>2 sec.)
Delete-mode <sup>2)3)</sup>		Same as installation mode, except that all registered metering devices which are transmitting installation telegrams will be deleted. (meter replacement)

- 1) In battery powered network nodes this mode is terminated automatically after eight hours.
- 2) This mode is terminated automatically after eight hours.
- 3) Possibly only with the software ACT26 version 2.0 or higher

State of the system	Display	Explanation
Remote access		During remote access the symbol ,>' will be displayed.
Highspeed-mode	for example 	When <u>all</u> network nodes have switched on their receivers for fast data exchange, this will be displayed as two dots in the upper part of the LCD.
Bus-connection (from version 2.2)	for example  	If a connection to a bus is being built up, the number of the bus and the primary address of this bus will be briefly displayed . In the example, network node 03 is connected to M-BUS
IrDA-master mode (from version 2.2)		This mode is started by pressing the button MODE. (< 0,5 sec). It indicates readiness to connect additional IrDA devices (in IrDA Slave mode). This mode stops after 10 sec.
Add (from version 2.2)	for example   	If an unregistered IrDA-capable metering device (e.g. WHE467) is connected in IrDA master mode, it can be inserted into the network node by pressing the button DISPLAY while ADD is displayed. The last 4 digits of device number are indicated. (e.g. 2000123). The registration of the device takes place and search mode starts.
Delete (from version 2.2)	for example   	If an already registered IrDA-capable metering device is connected in IrDA-master mode it can be removed from the network node by pressing the button DISPLAY while DEL is displayed. The last 4 digits of device number are indicated (e.g. 2000123). The removal of the device takes place and if necessary search mode is stopped.
Copy (from version 2.2)	for example   	If a new network node (running in idle mode) is connected in IrDA-master mode, it is possible to make a copy of all network data into the new node by pressing the button DISPLAY while COPY is displayed. Copying lasts up to 20 minutes. At the end "StArt Prof" is displayed on LCD of the new network node for 1 hour. After mounting the new node the protected mode is also started by pressing the DISPLAY button. By this procedure the new network node is integrated in network and search mode is started automatically.

## Engineering notes

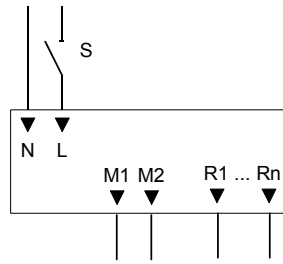
### Engineering

For detailed engineering instructions, refer to the Engineering Manual CE1J2870.

### Commissioning the WTX..

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.

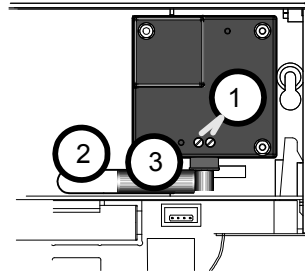
## Wiring diagram



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...).

Connection of the AC 230 V power line to the power pack of the WTX16... is to be made as follows:

## Mains connection

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 enclosed 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 Q 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.



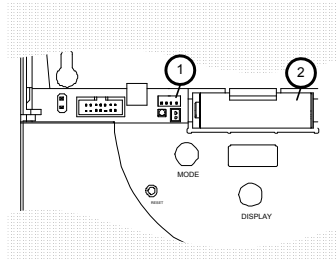
**Non-observance of these warning notes can lead to personal injury or damage to property!**

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 the WTT..



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.

### Depassivation

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 automatically in **idLE** mode. Long press of button MODE activates the installation mode of network node. Low temperatures at the battery may cause a similar behaviour in other modes too.

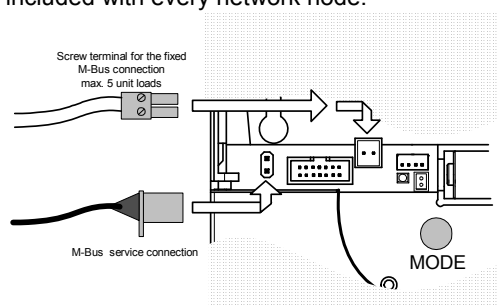
## Safety notes on lithium batteries

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.



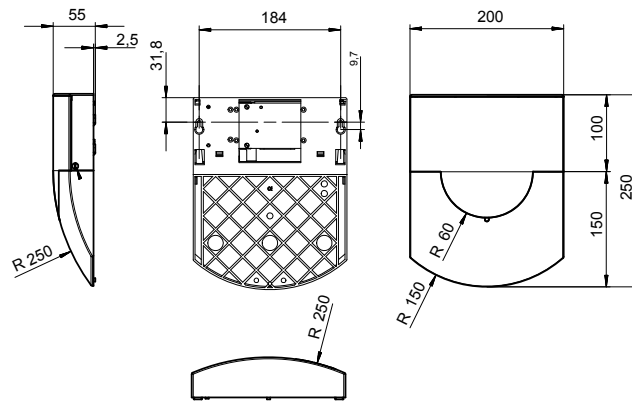
Starting from version 2.2 each network node supports optical IrDa interface. This interface is always active and could be used for service with commissioning tools or for data exchange with others IrDA-able QUNDIS products. IrDA-master mode has to be started manually if network node it self should work as IrDA-master (e.g for data exchange with metering device).

Technical data

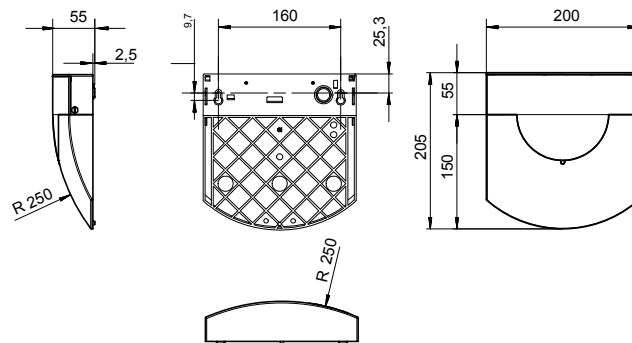
<input type="checkbox"/> conformity to EMC directives		
Safety class	IP32	
Safety class	2	
Electromagnetic compatibility	immunity:	EN 55 024/EN 301 489
	emissions:	EN 55 022/EN 300 220-1
Operating voltage WTT16...	DC 3.6 V	
Lifetime of main battery	> 5 years	
Operating voltage WTX16...	AC 100..240 V, 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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