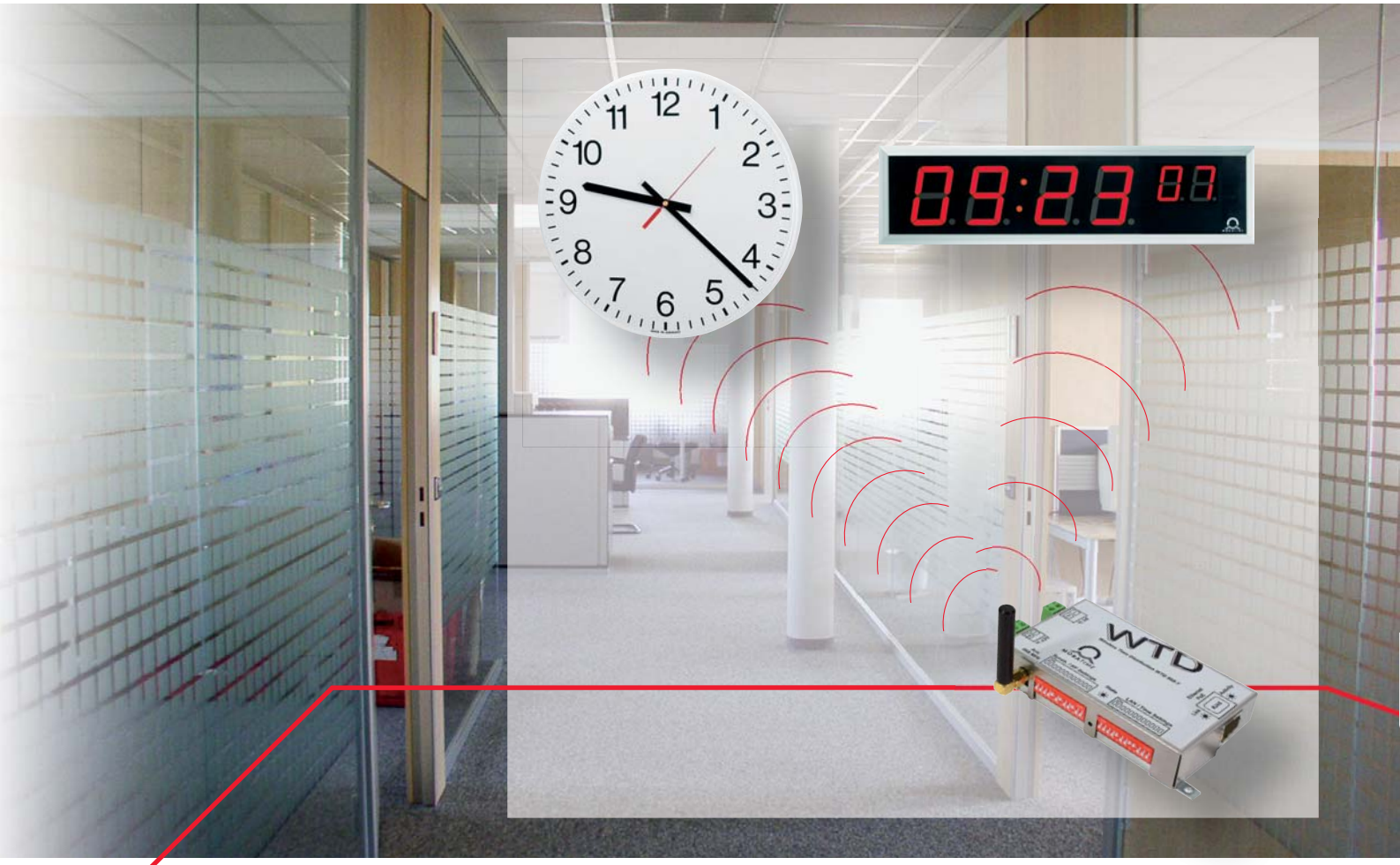


Wireless time distribution for digital and analogue radio slave clocks (frequency band 868 MHz)

Wireless Time Distribution WTD

The innovative radio clock system is based on a transmitter which sends the time signal (868 MHz) to the end devices (i.e. clocks). The end devices are equipped with a WTD movement or with a special WTD receiver module. The WTD transmitter is synchronized either by a standard master clock, by a modern NTP timeserver or by a GPS or DCF 77 receiver directly.

Advantages:

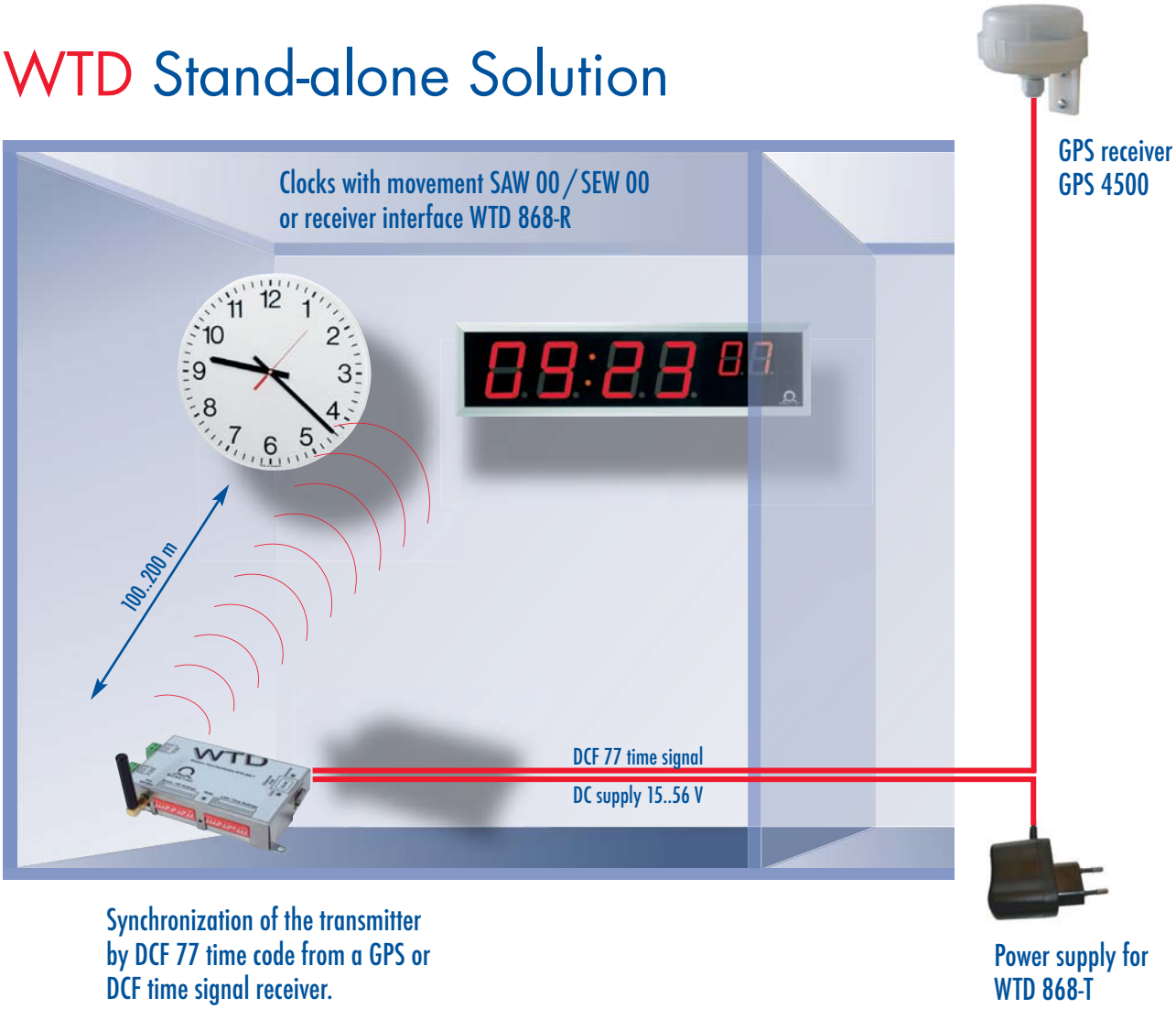
- Flexibility in clock installation and realization of clock systems.
- No cabling as wireless synchronization.
- Distribution over large distances (100..200 m, depending on building structure, extension by repeater possible).
- Compatible to norm AFNOR NFS 87500.

Wireless Time Distribution WTD

The new dimension of time distribution technology offers …

- High flexibility for realizing new time systems or the extension of existing clock systems in a convenient way.
- Simple and economic installation – therefore essential cost savings.
- High reliability in time synchronization over distances of up to 200 m.
- Versatile application e.g. in historic buildings under monument protection, low cost wireless installation for small clock systems e.g. in schools, simple retrofitting of existing clock systems in buildings and open-plan offices, extension of existing wired clock systems.
- The WTD transmitter can be easily integrated in cable ducts (plastic).
- Use of unlimited number of slave clocks within the range of a transmitter.

WTD Stand-alone Solution



Synchronization of the transmitter by DCF 77 time code from a GPS or DCF time signal receiver.

Transmitter WTD 868-T

Two possibilities of synchronization

- DCF *77* time code from a MOBATIME master clock (ETC, CTC, NMC etc. with DCF *77* output) or radio receiver DCF 450, DCF 4500 or GPS 4500.
- From LAN/Ethernet, by Network Time Protocol NTP (Multicast).

Power supply

- External DC power supply 15..56 V (e.g. from a MOBATIME master clock with DC output).
- PoE (Power over Ethernet) supply over LAN cabling from a PoE switch.

Automatic calculation of local time

- One entry from 56 predefined time zones can be selected by DIP switches.
- One entry of 15 time zones, received from a season server (e.g. Net Master Clock NMC), can be selected.

Selectable transmission power

25 mW, 125 mW and 500 mW (for large distances).

Service / Maintenance

The transmitter is able to force a stop at 12.00 o'clock position for analogue MOBATIME movements (e.g. for maintenance reasons, to check the correct mounting of the hands and the correct radio reception).

Receiver Interface WTD 868-R

Synchronization

Reception of the time information on the 868 MHz radio frequency.

Two variants of time code output

- WTD 868-RM: MOBA*Line* time code output.
- WTD 868-RD: DCF *77* time code output.
- All MOBA*Line* or DCF controlled analogue and digital clocks for in- and outdoor use can be equipped with the WTD 868-R interface.

Power supply

5 V..30 VDC from slave clock or through external power supply.

Movement SAW 00/SEW 00

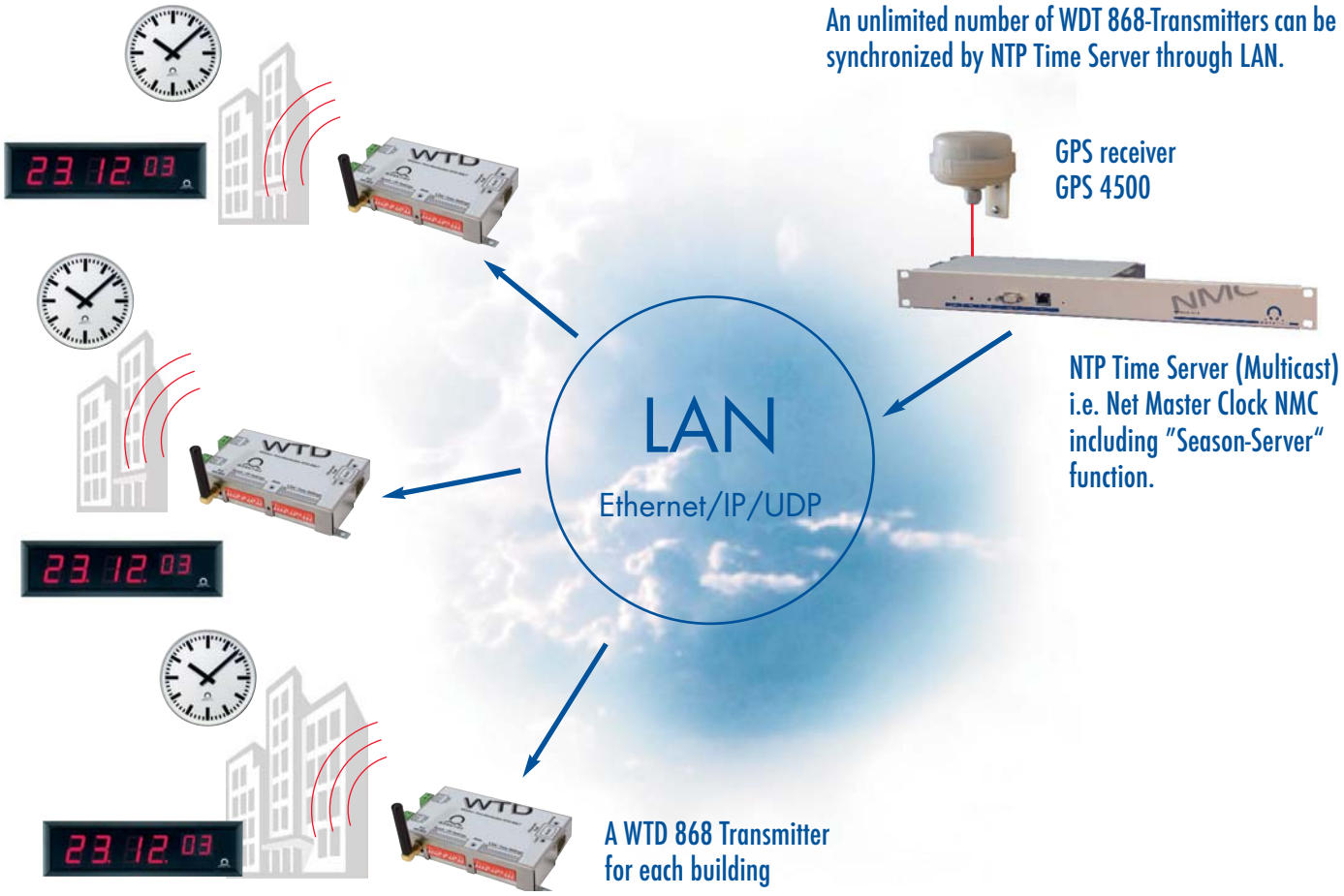
A large range of analogue indoor clocks of the ECO and STANDARD series (Ø 25, 30 and 40 cm) with SAW 00 / SEW 00 radio movement are capable of receiving directly time information based on time code AFNOR NFS 87500. They are battery powered (optional mains powered) and can therefore be used in many kinds of applications.

WTD Solution with Master Clock

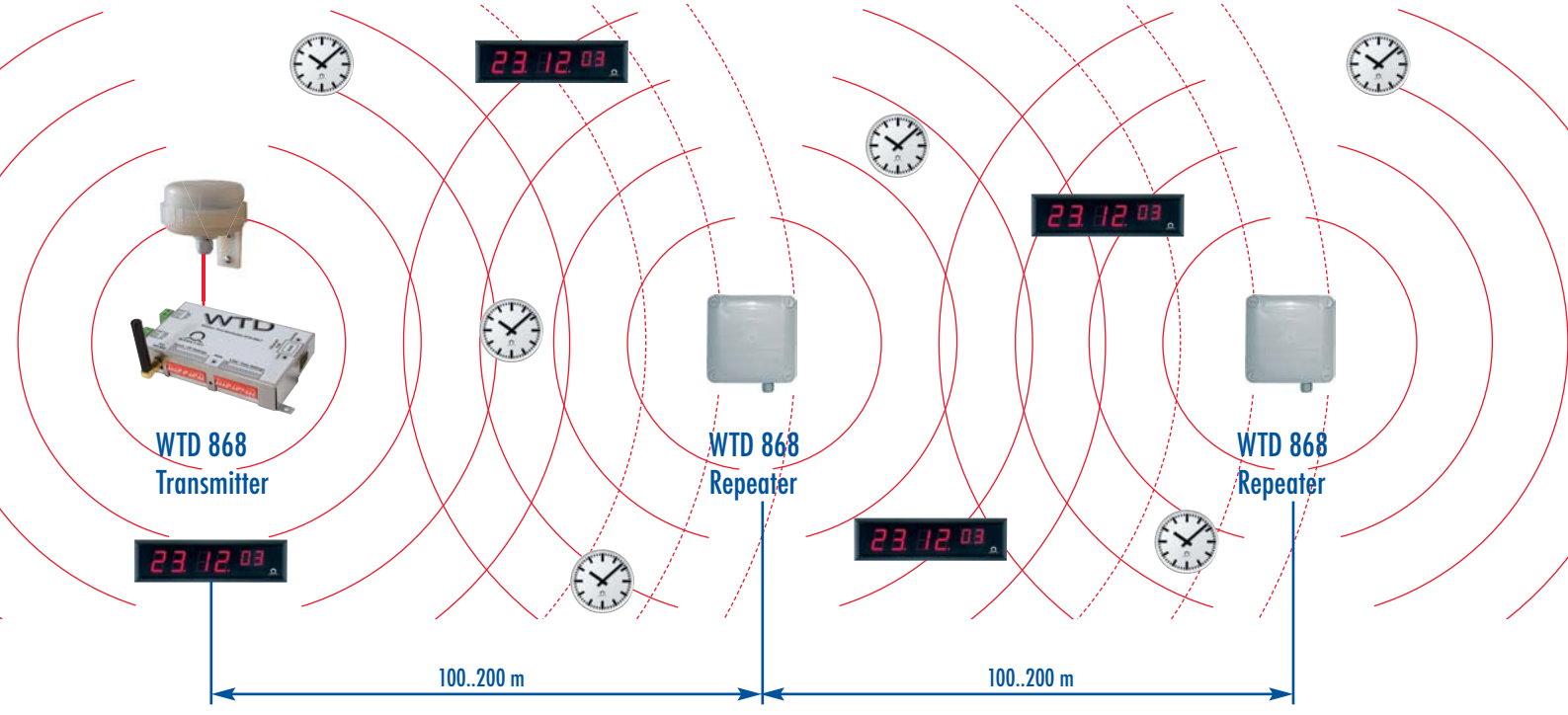
Synchronization of the transmitter by a master clock via DCF 77 and DC power supply from master clock

Extension of existing Master Clock systems: Master Clock, e.g. Euro Time Center ETC to control conventional slave clocks and switching functions e.g. in the building technology.

Extension of WTD system through LAN



Extension of a WTD system with Repeaters



Available WTD products:

Transmitter WTD 868-T
Input: LAN, DCF 77, GPS
Output: Radio transmitted time code (868 MHz)

ECO Slave Clocks for WTD:
With WTD movements SAW 00, SEW 00 (battery powered) or SEW 00 MPS (mains powered), available up to Ø 40 cm.

Repeater: WTD Repeater
Input: Time code from a WTD 868-Transmitter
Output: Radio transmitted time code (868 MHz)

Type 200

Type 210

Clock Dials for ECO clocks:
Only type 200 and 210 are available with defined hands especially for SAW/SEW movements.

Receiver Interface:
WTD 868-RM or WTD 868-RD
Input: Time code from a WTD 868-Transmitter or Repeater
Output: - RM: Mobaline
- RD: DCF 77

Standard Slave Clocks for WTD:
With WTD movements SAW 00, SEW 00 (battery powered) or SEW 00 MPS (mains powered), available up to Ø 40 cm.
Clocks with Ø 50 to 80 cm with external WTD 868-RD receiver interface.

Power supply for WTD 868-T:
Input: 100 – 240 VAC 50/60 Hz
Output: 24 VDC, 300 mA

Type 360

Type 310

Clock Dials for Standard clocks:
Only type 360 and 310 are available with defined hands especially for SAW/SEW movements.

DC 57, 100 & 180:
Digital indoor clocks equipped with exernal WTD 868-RD receiver interface.

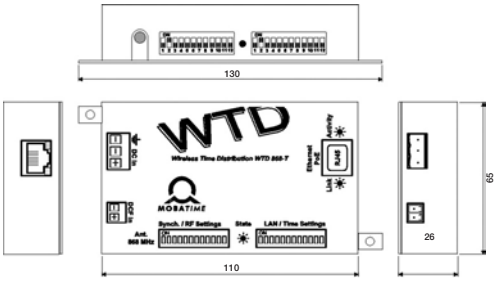
Profiline Outdoor Slave Clocks for WTD:
With built in WTD 868-RM receiver interface.

DK 57:
Indoor calendar clocks equipped with external WTD 868-RD receiver interface.

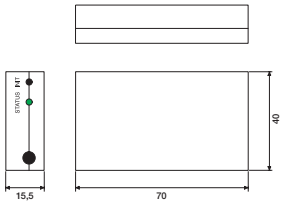
Metroline Outdoor Slave Clocks for WTD:
With built in WTD 868-RM receiver interface.

Technical Data

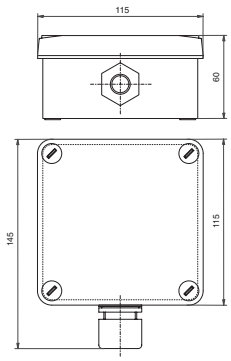
WTD 868-T



WTD 868-Rx



WTD Repeater



WTD 868-T (Transmitter)	
Transmitter	Center frequency: 869.525 MHz Transmission power (3 steps): 15 mW, 125 mW or 500 mW
Synchronization	From LAN by Network Time Protocol (NTP, UTC) Synchronization input (active current loop) for synchronization with DCF 77 (UTC) time code either from a master clock or from GPS or radio receiver
Ethernet connection	Ethernet controller 10 MBit/s Mod-Jack RJ45 with integrated LED
Power supply	DC input: 15..56 VDC or PoE: 48 V (Phantom/Pins 4,5 and 7,8) Screw terminal (DC In plug) with earth connection
Current consumption	< 100 mA @ 48 V / < 300 mA @ 15 V
Antenna	SMA connector (female) for antenna
Time keeping	1 h autonomously running on quartz base
Accuracy	+/-20 ms (synchronized)
Range	Max. 100..200 m (depending on building structure)
Configuration	2 x 12 DIP swiches
LED indicators	Status, LAN Link, LAN Speed/activity
Ambient temperature	0..50 °C, 10–90 % relative humidity, without condensation
Case	Stainless steel, hanger for wall mounting
Dimensions	130 x 65 x 26 mm (L x W x H), weight: approx. 300 g

WTD 868-Rx (Receiver interface)		
Radio receiver	Center frequency: Bandwidth: Modulation:	869.525 MHz 100 kHz FSK, +/-25 kHz
Time code output	WTD 868-RM: WTD 868-RD:	MOBA*Line*, local time, 20 mA max. DCF 77, local time Passive current loop, optocoupler: U_{min} = 5 V, U_{max} = 30 V, I_{on} = 10..15 mA, I_{off} = 2 mA @ 20 V
Control elements	Initialization key: Key pressed < 5 s: Key pressed > 5 s:	 Show operation state (status LED) Start initialization mode
LED indicators	Green status LED	
Power supply	5 V..30 V, 25 mA, galvanic separation from time code output	
Antenna	Integrated antenna	
Time keeping	1 h autonomously running on quartz base	
Accuracy	+/– 20 ms (synchronized)	
Range	100..200 m (depending on building structure)	
Ambient temperature	–20..+70 °C	
Case	Plastic, black, mounting with Velcro strip	
Dimensions	70 x 40 x 15 mm (L x W x H), weight: approx. 80 g	
Connections	Black connection cable, 0.5 m, 4 x 0.25 mm²	

WTD Repeater		
Radio receiver	Center frequency: Bandwidth: Modulation:	869.525 MHz 100 kHz FSK, +/-25 kHz
Transmitter	Center frequency: 869.525 MHz Transmission power (3 steps): 15 mW, 125 mW or 500 mW	
LED indicators	1 LED for init. mode, 2 LED's for transmission power	
Power supply	100 – 240 VAC 50/60 Hz (power cable not included)	
Current consumption	< 50 mA	
Antenna	Integrated antenna	
Time keeping	1 h autonomously running on quartz base	
Accuracy	+/– 20 ms (synchronized)	
Range	100..200 m (depending on building structure)	
Configuration	2 DIP switches for transmission power, jumper for init. mode	
Ambient temperature	0..50 °C, 10-90 % relative humidity, without condensation	
Case	Plastic, white	
Dimensions	115 x 115 x 60 mm (L x W x H), weight: approx. 300 g	

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