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# NTP – Time over Ethernet ToE The innovative way to distribute time to clock systems, IT infrastructures, buildings and security technology

Nowadays, state-of-the-art devices in nearly all application fields are equipped with an Ethernet LAN connection. LAN cabling is available in all newer buildings. We use these opportunities to distribute high-precision time in an easy way, without additional cabling, by providing our DTS products and LAN clocks.

DTS (Distributed Time System) devices are our master clocks and time servers to distribute the exact time in LAN/WAN applications via NTP protocol. The NTP (Network Time Protocol) ensures that all components in a LAN/WAN are synchronized accurately to the same time.



# ToE – precise, cost-effective time synchronization for all Ethernet LAN "Clients"

Considerable **advantages** can be gained by using networks for time synchronization of clocks, clock systems and time servers.

- Installation costs for networked clock systems can be drastically reduced.
- The **entire network** including all components and systems is absolutely synchronized to the **same time**.
- By including a **time server** (e.g. **MOBA***TIME* DTS 480x. masterclock or DTS 413x.timeserver) the exact atomic clock time signal received via the DCF 77 or GPS can be fed directly into the network in the form of **NTP time information**.
- A considerable advantage is gained by the option of being able to integrate modern computer master clocks directly into the network. Via Ethernet LAN and NTP an almost unlimited number of slave clocks can be synchronized, no additional time signal receivers are necessary. Furthermore, master clocks are able to take over time depending switching and control functions for building automation and other connected devices.
- A LAN-based time system can be configured and monitored from any computer in the network. Malfunctions, error messages and alarms are signalled via alarm relays, using SNMP traps or emails. If the clocks are equipped with one of the new LAN-compatible MOBATIME movements, it is even possible to ascertain whether all the clocks are functioning correctly by using the MOBATIME software MOBA NMS (Network Management System).
- Using the NCI Network Clock Interface, non-LAN-compatible master clocks or even existing master clocks and slave clocks can also be connected to the LAN. Cabling can be reduced to single feeders to the individual end units.
- The new NTP movements **NBU 190** and **SAN/SEN 40** can be used for in- and outdoor clocks. This movements are able to work in multicast and unicast (IP based) mode and can therefore be used in any network application.







## **ToE** Management and Time Sources

#### **MOBA NMS** - Network Management System

Network management software used to administrate **MOBA***TIME* network devices. With this application you have full control over all **MOBA***TIME* devices in your network!

#### **Main Features**

- Central device management for all MOBATIME network master clocks, time servers and slave clocks (analog, digital).
- Designed to handle/configurate more than 1000 devices per network at the same time.
- Compared to a web-based configuration on each single device, MOBA NMS manages all devices centrally.
- Device auto detection for multicast and unicast (IP range scan) communication.
- Read and change device configuration with a comfortable user interface.
- Display device status, time, error and alarm information of each device. Error and alarm information are additionally shown at group level.
- Create logical groups and move/sort devices per drag and drop for easier management and supervision.
- Save and load created configurations with all logical groups and devices.

# Central Network Management System

- Java-based (Eclipse RCP) and therefore operating system independent (Windows, Linux).
- Intuitive GUI design with well known features (like drag and drop etc.).
- Available for download with integrated online self update feature.

#### Time Servers and Master Clocks

The **MOBA***TIME* time servers (e.g. the Net Master Clock DTS 480x.masterclock or the DTS 413x.timeserver) can be used as NTP network time servers. They provide an NTP time reference for devices and systems connected to the network. The time server synchronization can be realized with DCF 77 or GPS time signal receivers and/or by means of another NTP server in the LAN. See corresponding product brochures for detailed information regarding these innovative servers and their use.

#### DTS 4135.timeserver:

- Precise, powerful NTP time server, synchronized by DCF 77, GPS or IRIG-B/AFNOR.
- Possibility to work in redundant operation via optical link (master-slave), without any time leaps.
- Intelligent concept for redundant and monitored power supply.
- NTP time source for clocks and time distribution systems.
- Max. number of NTP or SNTP requests: > 250 requests/ sec.

#### DTS 480x.masterclock:

- Network master clock as NTP time source, with 1 or 2 slave clock lines for MOBALine, polarized impulses (max. 700 mA) or optional IRIG, AFNOR, DCF-FSK. This allows the management of numerous and different time codes with only one master clock.
- Serial interface RS 232, 422, 485 for the synchronization of external devices.
- Master clock for monitored slave clocks with supervised illumination control via RS 485 (only DTS 4801).



- Outputs: 2 x IRIG-B/AFNOR, 2 x serial, 2 x high precision pulses; allows flexible use in all sorts of environments.
- Version DTS 4136.timeserver with oven heated quartz provides even higher accuracy of time signal in case of loss of external time reference (DCF, GPS).



- NTP time server : Unicast and multicast addressing possible; IP v6 compatible.
- LAN/WAN monitored and synchronized master clock in connection with Master Time Center MTC and CAN module (Communication and Alarm Network).



## ToE system components

#### Main features:

- Components can be addressed by both unicast and multicast.
- Management of installation, commissioning, operation, monitoring, maintenance and updating by MOBA NMS.
- Self-setting movements and clocks.
- Configuration, powering and monitoring over Ethernet. Only one network connection per multi-sided clock necessary.

#### Slave clocks and movements with NTP synchronization

#### NTP movements SAN 40/SEN 40 for clocks up to 40 cm respectively NBU 190 for clocks up to 80 cm

These newly developed self-setting movements are synchronized directly from the network via NTP and powered by PoE (NBU 190: PoE and/or 24 VDC). See corresponding product brochures for detailed information.

#### **NCI Network Clock Interface**

The NCI is synchronized via the NTP protocol by a NTP multicast compatible time server and generates the usual MOBALine and DCF time codes in local time format. In that way slave clocks with MOBALine or DCF 77 input plus all master clocks with DCF 77 input can be synchronized.

#### ECO indoor slave clocks for NTP synchronization

With NTP movement SAN 40/SEN 40, powered by PoE, up to Ø 40 cm. Available with dial types 200 and 210.

#### SLIM-metallic indoor slave clocks for NTP synchronization

With NTP movement SAN 40/SEN 40, powered by PoE, up to Ø 40 cm. Available with dial types 200 and 210.

#### MODERNA indoor slave clocks for NTP synchronization

With NTP movement SAN 40/SEN 40, powered by PoE, up to Ø 40 cm. Available with dial types 360 and 310.

#### STANDARD indoor slave clocks for NTP synchronization

With NTP movement SAN 40/SEN 40, powered by PoE, up to Ø 40 cm. Available with dial types 300 and 310. Clocks with Ø 50 to 80 cm are equipped with the NTP movement NBU 190.

#### Analog slave clocks 40,50, 60 and 80cm

Clocks in the STANDARD, PROFILINE and METROLINE ranges are equipped with the NTP movement NBU 190 and can be connected to the Ethernet LAN.

#### Digital clocks with direct NTP control

Even LED digital clocks, e.g. those in the ECO-DC, DC, DK and DSC model ranges, can be fitted on request with an NTP input. In that way they can be connected directly to the Ethernet LAN.

See corresponding product brochures for detailed information.



CH-3454 Sumiswald/Geneva, Switzerland

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