

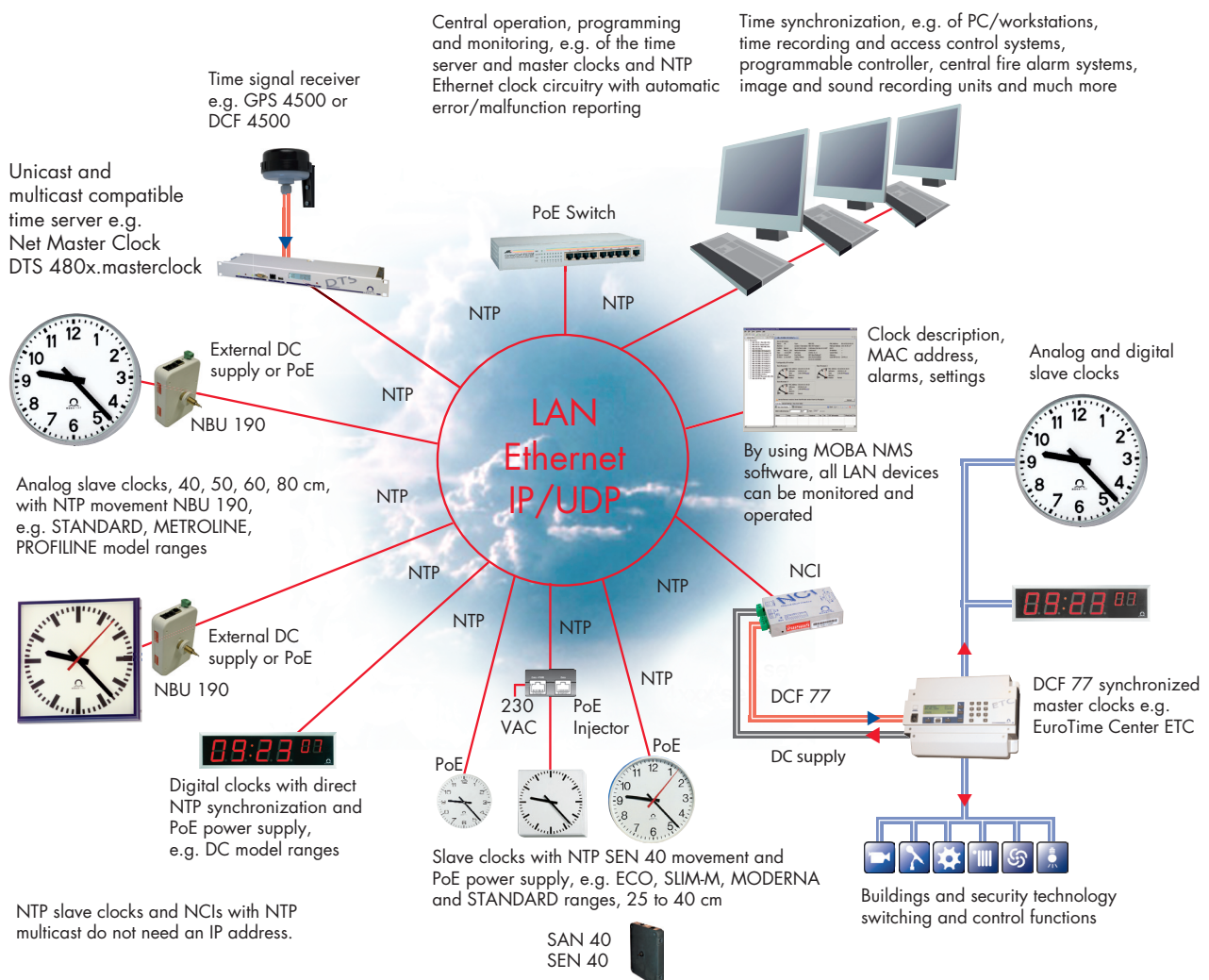
Time over Ethernet - State of the art for IP-based time distribution

Technology of time distribution systems has evolved over the past. In the last century synchronization of slave clocks was based on minute or second impulses in a two-wire cabling installation. No diagnosis and setting function was available in impulse mode. The same two-wire cabling has been used the last twenty years for self-setting clocks. MOBATIME set the industrial standard through MOBALine: MOBALine is a time code which contains the complete time and date information. By connecting a device to the MOBALine code, it will set its time automatically. As the clocks are powered through the same cabling, no additional power cable is necessary to run the clocks.

The recent past saw a major step in the technology for time systems and clocks. Time distribution systems as well as other low voltage systems such as CCTV, entrance control, time attendance, etc. have been heavily influenced by the fundamental development in information and communication technology (ICT). Nowadays new installations of time systems and clocks are network-based. Time distribution systems – and other sub-systems – are no longer run over an own, designated network installation. They rely on existing LAN-cablings (e.g. CAT 5e / CAT 6e). LAN-based systems make use of the TCP/IP standard of modern communication and internet technology. Within this standard the

NTP (Network Time Protocol) is the reliable time standard for the synchronization of clocks as well as for the time reference of IT-subsystems.

Based on this common NTP-standard, master clocks, time servers, slave devices (clocks, information displays) and suitable management software form a centrally administrated and monitored time distribution system. MOBATIME – SWISS TIME SYSTEMS offers the full range of IP-based products for Distributed Time Systems (DTS) over the LAN.



Time servers and master clocks

Time servers and master clocks provide reliable and accurate time to IT-sub-systems and slave devices. MOBATIME time servers and master clocks are GPS-synchronized. Certain devices (DTS timeserver 4135 and 4136) contain an oscillator (quartz) as internal time basis which maintains time accuracy in case of power- or GPS-failure. The time servers and master clocks are equipped with LAN/NTP-outputs. Additional outputs such as IRIG/AFNOR, serial RS 232/RS 485 interfaces, DCF or high accurate pulse / frequency outputs ensure that time servers and master clocks provide utmost flexibility for synchronizing variant sub-systems. Additional key features of the time servers and master clocks are:

- Fully controllable by SNMP: Put, get, alarm traps, alive messages, e-mail notification.
- IP configuration: DHCP, static IP, IPv4, IPv6.
- Time server protocols: NTP v4 (compatible with v3), SNTP.

- Time zone server for individual calculation of local time(s) on the slave devices.
- NTP modes: Server, Peer, Broadcast, Multicast. Server and client modes are possible simultaneously.

Redundancy is crucial to assure reliability of a time system. Identification of time servers and master clocks with designated IP-addresses in the LAN allows a new concept of redundancy. It is no longer necessary to have two time references at the same physical place (e.g. substation of a Metro). The time reference can be linked to the LAN where ever necessary – distributed in the time system (DTS). The NTP slave clocks can be synchronized from up to four time servers or master clocks by entering their IP addresses in the NTP server list of the slave clock during commissioning.

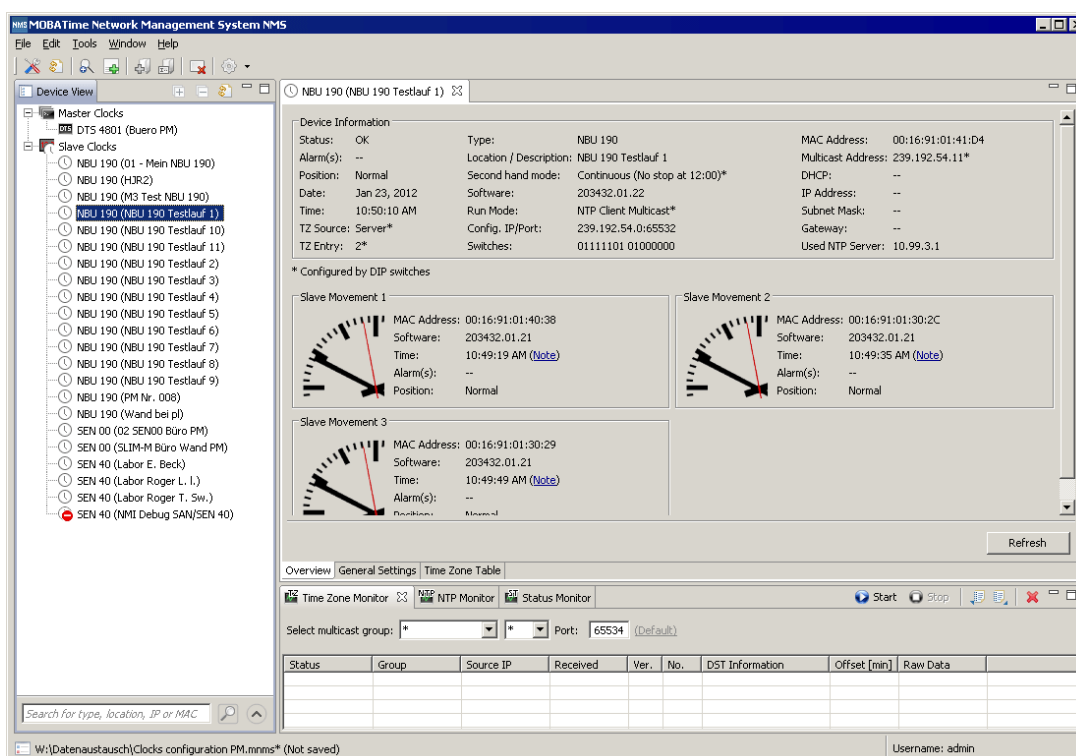
Slave clocks

Analog and digital slave clocks derive the NTP-signal from time servers and master clocks through the LAN. As soon as the slave clocks are

plugged to the LAN they will automatically adjust themselves to the right time. The NTP-synchronization can either be in a unicast or multicast mode. Active alarm- and alive-traps sending to the management software ensures monitoring the status of the clocks. Analog clocks are mainly powered over the Ethernet (PoE) which saves additional power cabling to the installation spot. MOBATIME – SWISS TIME SYSTEMS can offer you the full range of slave clocks according to your needs.

Management Software

Latest developments in ICT and their influence on low voltage installations have lead to a demand for centralized management software. This is valid for time systems and clocks as well. With MOBANMS a highly advanced solution is available from MOBATIME – SWISS TIME SYSTEMS. MOBANMS is Java-based (Eclipse RCP) and therefore operating system independent (Windows, Linux).



In detail, MOBANMS offers the following functions:

- Central device management from one workstation 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.
 - 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.
 - Create logical groups and move/sort devices per drag and drop for easier management and supervision.
 - Define an individual name (e.g. with location) for each device.
 - Available for download with integrated online self update feature.
- The technology of time servers, master clocks and slave clocks is based on common standards such as NTP, SNMP, TCP/IP, DHCP, IPv4/IPv6, etc. By applying these standards in the time distribution a long-term investment security is achieved.
 - The use of common ICT-standards assures that time servers and master clocks can be used as a time reference for other sub-systems in the low voltage world (CCTV, time attendance, fire alarm systems, etc.).
 - MOBANMS forms the bracket of the system. Its architecture and platform guarantees a centralized and well-known mode of managing and monitoring time systems.
 - The LAN allows powerful data transmission and is the basis for a scalable time distribution system. Extending a system can easily be done by simply plugging additional time servers, master clocks and slave clocks.

sub-systems. Commissioning, administration and monitoring of the time system needs to be done with minor time efforts by the installation and maintenance team of a facility. Finally, support and updates shall be easily and available – today and in the future.

MOBATIME – SWISS TIME SYSTEMS is your right partner and represents all these aspects: latest technology compliant with actual industry standards, common but powerful time distribution systems and 75 years of experience in the field of time systems and clocks.

DTS - your advantages at a glance

An IP-based time system is a powerful instrument to display time and provide reliable time reference for sub-systems. By running your entire time distribution with designated devices over the Ethernet you will benefit from several advantages:

- The local area network (LAN) is nowadays state of the art for data transmission networks. Time over Ethernet benefits from existing networks and avoids additional cabling installation for time systems only.

In many cases, time distribution systems are of minor importance during investment decisions for new buildings or for renovations of existing facilities. First of all, the investment amount is by far less than for example an audio-visual system. Secondly, the time system is not one of the major systems in the security field. Clocks “just” have to display time. When it comes to time systems it is exactly this low interest which makes it even more crucial to invest into the right and reliable technology. The time system shall be of the latest technology standards to ensure long-term investment security and compliancy with other low voltage