Master Time Center

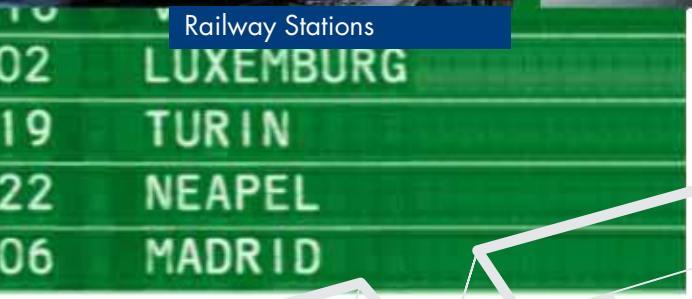
Control Center for Multifunctional Time Distribution Systems and Mains Frequency Supervision

Master Time Center

Railway Stations

Airports

Power Stations



The Master Time Center controls clocks, synchronizes computers to exact time, serves as a time reference on the LAN, switches electrical loads, supplies time information in various formats and supervises the mains frequency. The MTC has been optimized to offer the best possible reliability and flexibility, in order to produce specific and flexible system-solutions for time distribution, in industries, airports, railways, radio-TV stations, hospitals, power stations and scientific laboratories. The reliable, internal bus system wire, the intelligent function modules, the centralized operation control by means of user friendly menus, the comprehensive software for system management as well as many other outstanding features distinguish the MTC system from conventional time centers.

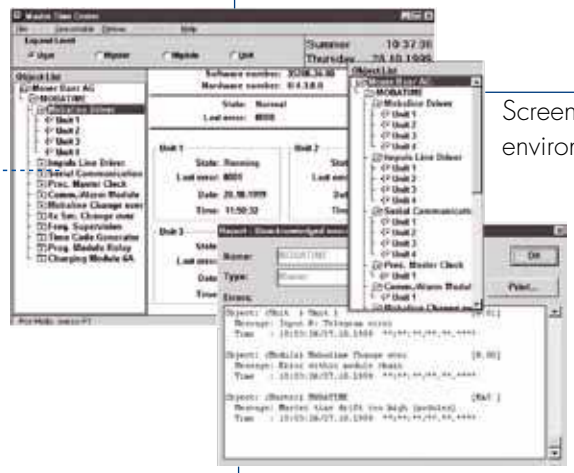
MTC - Operation and design

Operation Terminal

Notebook-PC in lockable drawer or external PC

Remote Operation Terminal

- Comprehensive information about operations
- Versatile Configuration



Screenshots of WINDOWS environment

Detailed alarm messages

MTC housings

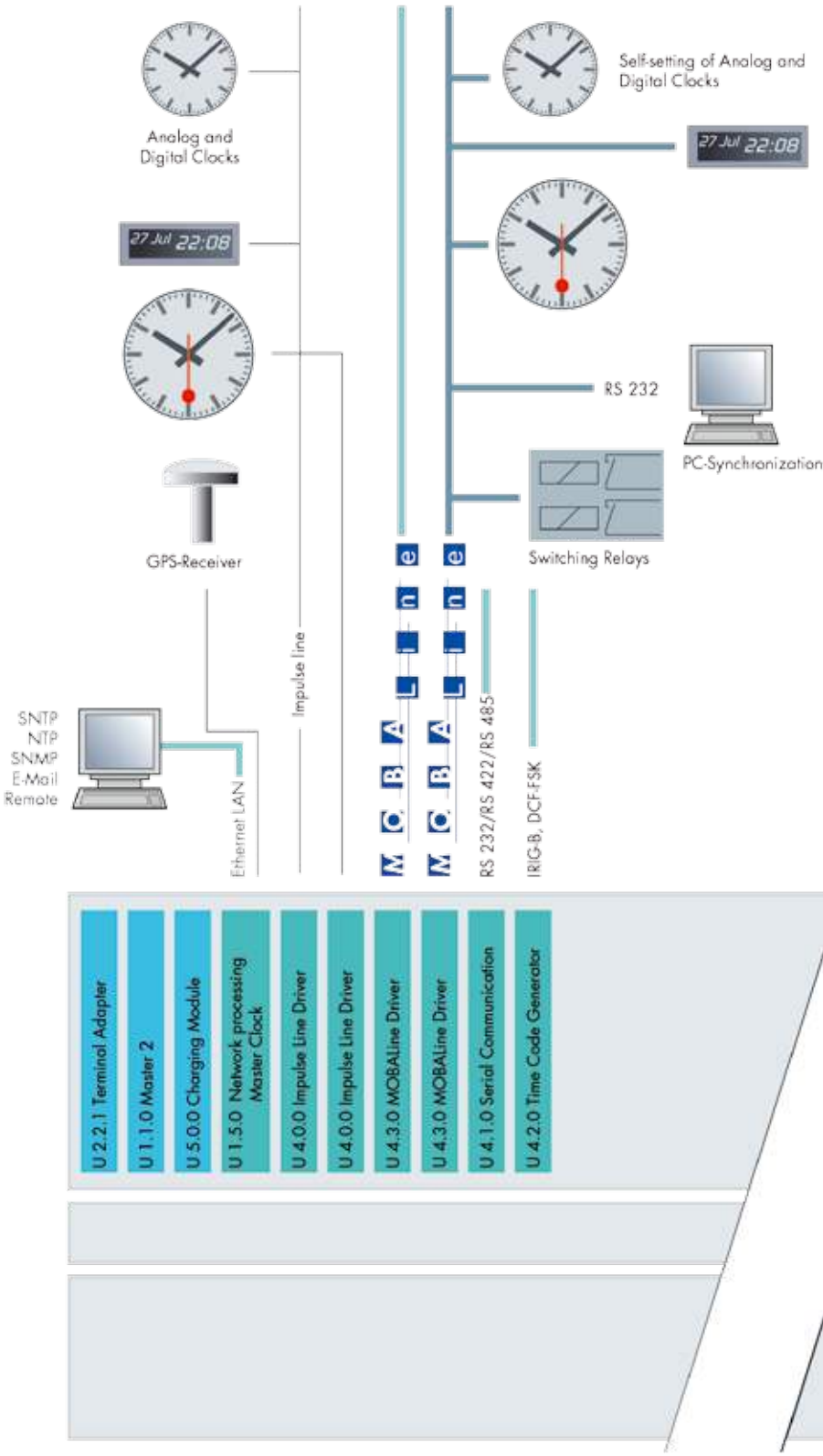
- 19″ wall cabinet with lockable glass front door. W x H x D: 600 x 746 x 583 mm or 15 height units
- 19″ cabinet with lockable glass front door and detachable rear and side plates. W x H x D: 600 x 2000 x 600 mm or 41 height units

Electrical connections on the rear side

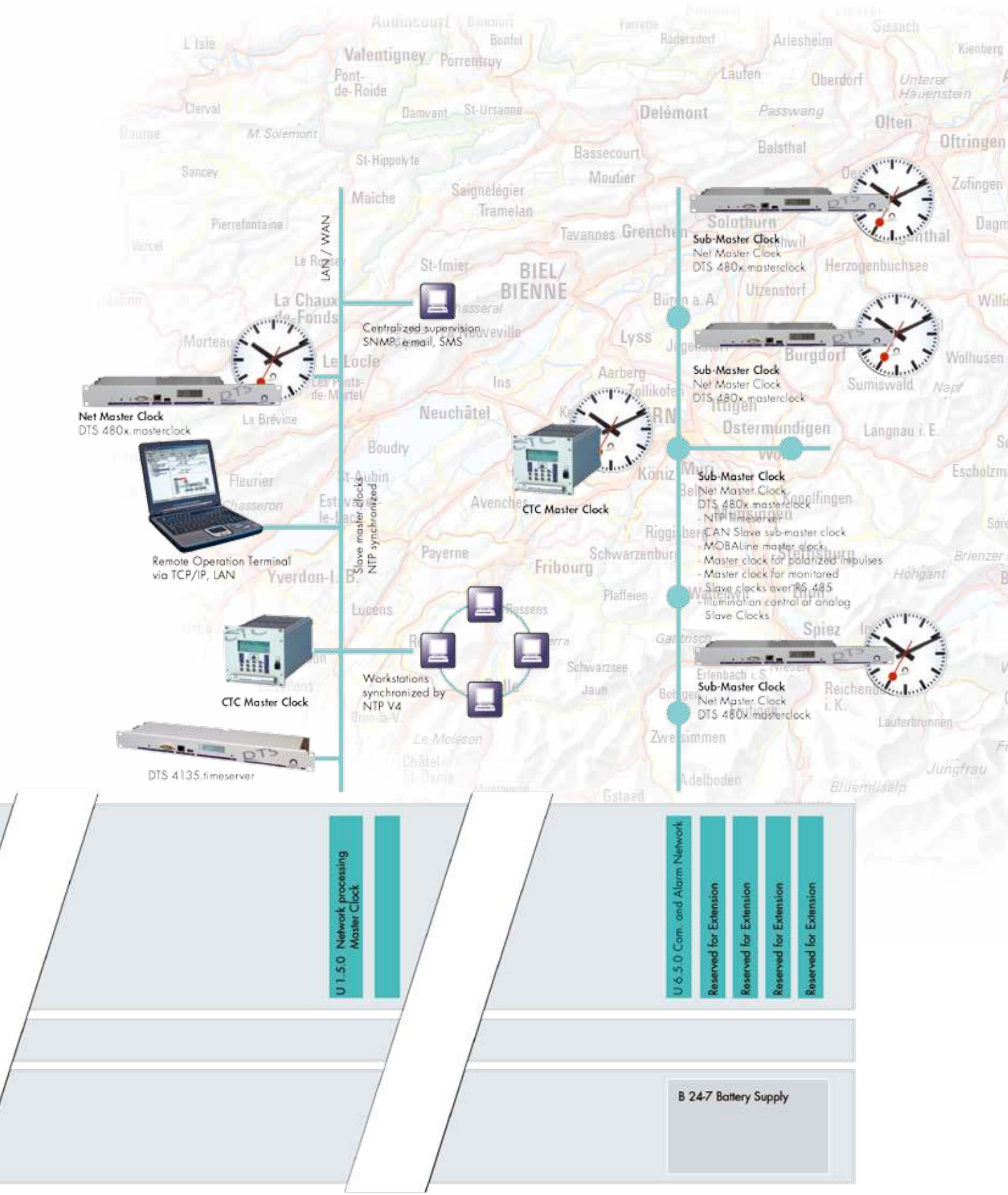
On each module individual plug-in connectors, screw or spring terminals.

Time Distribution System

- Construction of versatile systems for specific applications by means of various modules
- Conventional impulse slave clocks
- Self-setting MOBALine slave clocks
- NTP Time server V4
- Computer synchronization by serial interfaces
- Synchronization of electrical devices and installations by means of various time codes
- Remote relays switching through time program
- Analog and Digital Clocks
- Alarm reporting by SNMP-Traps V1, e-mail

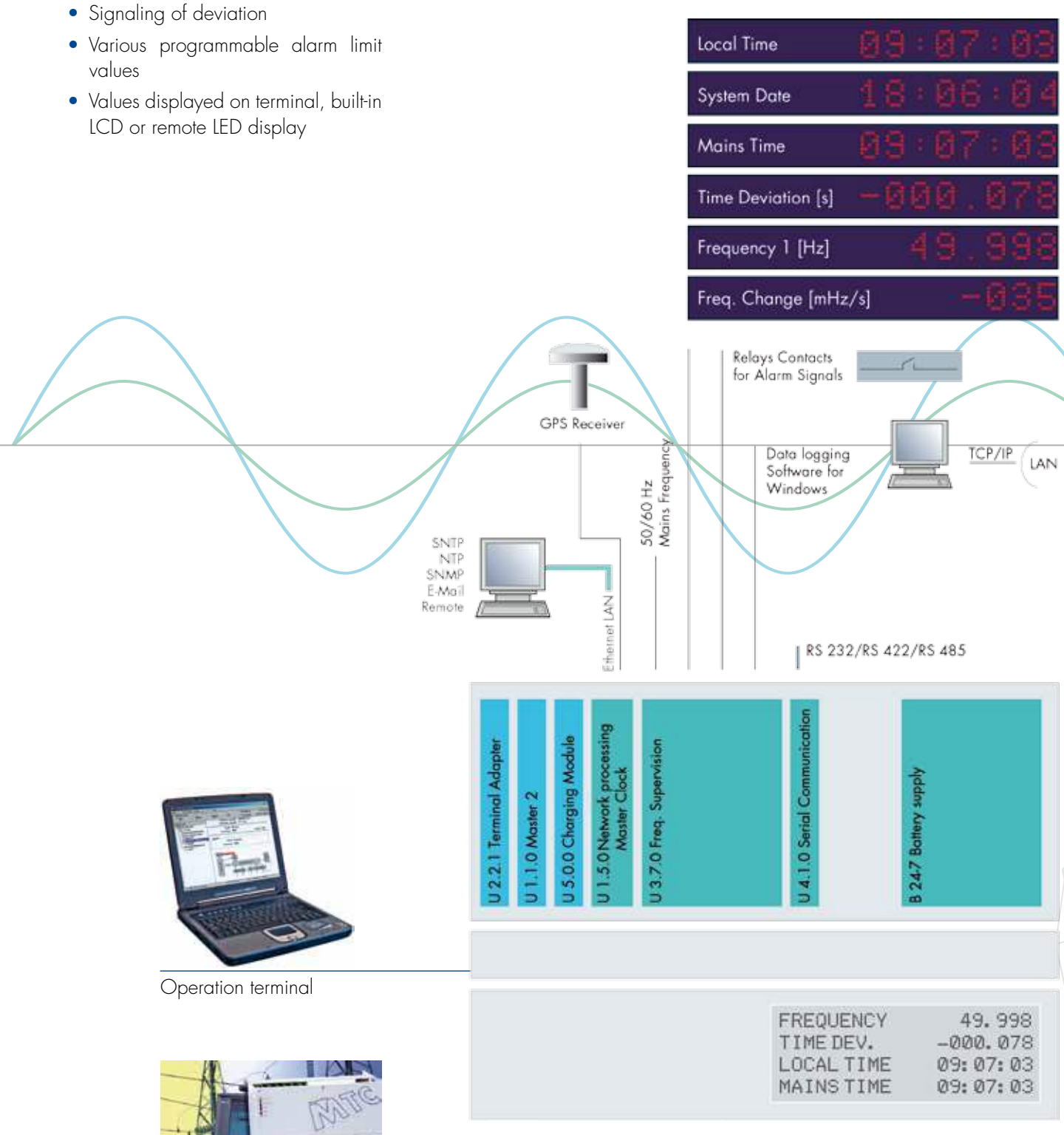


Operation terminal


LAN / WAN
Centralized supervision
SNMP, e-mail, SMS
Net Master Clock
DTS 480x masterclock
Remote Operation Terminal
via TCP/IP, LAN
Slave master clocks
NTP synchronized
CTC Master Clock
Workstations
synchronized by
NTP V4
CTC Master Clock
DTS 4135 timeserver
Sub-Master Clock
Net Master Clock
DTS 480x masterclock
Sub-Master Clock
Net Master Clock
DTS 480x masterclock
Sub-Master Clock
Net Master Clock
DTS 480x masterclock
- NTP timeserver
- CAN Slave sub-master clock
- MOBALine master clock
- Master clock for polarized impulses
- Master clock for monitored
Slave clocks over RS 485
- Illumination control of analog
Slave Clocks
Sub-Master Clock
Net Master Clock
DTS 480x masterclock
U1.5.0 Network processing
Master Clock
U6.5.0 Com. and Alarm Network
Reserved for Extension
Reserved for Extension
Reserved for Extension
Reserved for Extension
B 24-7 Battery Supply

Mains Frequency Supervision

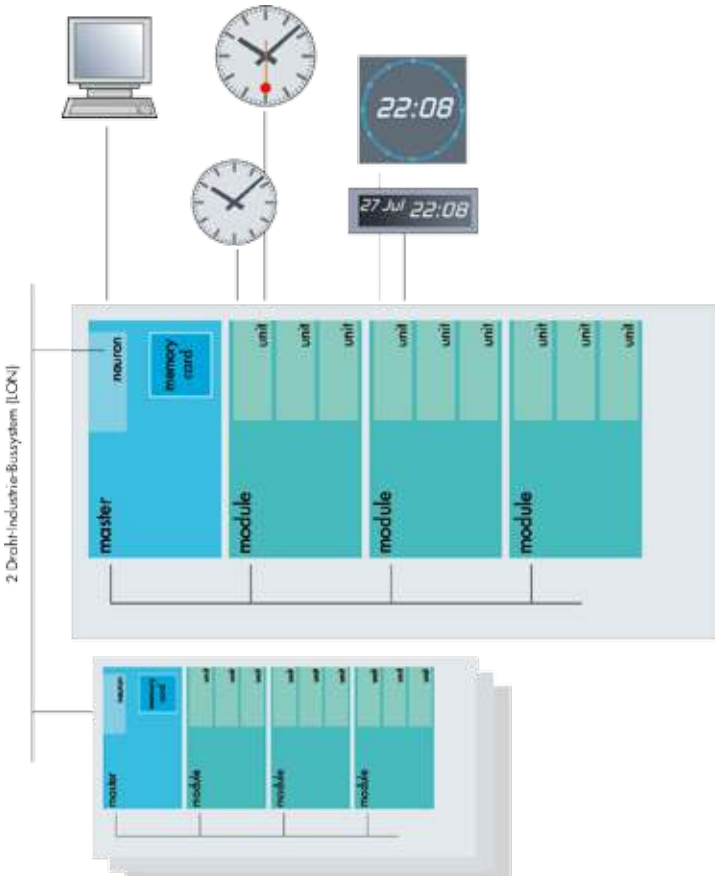
- Precise measurement and log of mains frequency (50/60 Hz)
- Signaling of deviation
- Various programmable alarm limit values
- Values displayed on terminal, built-in LCD or remote LED display



Operation terminal

System structure

- An MTC installation is composed of systems, modules and units, hierarchically organized.
- A unit controls and monitors inputs and outputs. e.g. impulse or MOBA-Line clock lines, Ethernet connection with its numerous services, serial outputs, time code generators, etc.
- One or several units of the same type are included in one module. e.g. U 4.0.0 with four impulse lines, U 4.1.0 with four serial outputs. A module is composed of single or multiple boards. For system operational reliability and security each module fulfills its task independently.
- The master and modules together make a system. All modules have identical priorities and communicate in a polling procedure with the master. It communicates over an internal two-wire-bus with optocoupler-isolation to / from each module. No connected module is able to block the communication. The system is mounted in a 19" rack, with indicators for power, regular operation, alarms and DCF signal. System operation is performed by PC terminal.
- The complete MTC system can be expanded with an almost unlimited number of sub-systems by means of the industrial two-wire-bus LON™ (Local Operation Network).



Versatile modules for all applications

- **U 1.1.0 Master 2**
  Time synchronization, supervision and control of all modules, communicating with PC terminal and other systems. The software is saved on an extractable memory-card. The software is automatically downloaded to modules.

- **U 2.2.1 Terminal Adapter**
  Display for «alarm», «warning» and «regular operation» by LEDs. RS 232 or USB adapter between the master and PC-terminal. RS 232 interface for protocol printer. In each MTC system (19'' sub-rack) a terminal adapter U 2.2.1. is required.

- **U 5.0.0 Charger (charging-controller)**
  Automatic charging of 24 or 48 V lead-acid batteries. Charging current 6 A max. Supervision of voltage, current and temperature. Several U 5.0.0 may be used in parallel connection for current increase.

- **U 1.5.x Network processing Master Clock**
  Inputs for different external time sources: GPS, DCF, serial time telegrams RS 232/RS 422. Four outputs for high precision synch pulses or DCF (current loop or RS 422). Master clock with accurate time base for stand alone operation (U 1.5.0: +/- 0.01s/day; U 1.5.1: +/- 0.001 s/day (at 20 °C +/- 5 °C). Connection via TCP/IP, Ethernet to LAN/WAN. Numerous services: NTP V4-server, NTP-client (as MTC's master clock), SNMP-traps V1/ e-mail alarm reporting, remote operation control.

- **U 3.4.0 Time code Switchover Module**
  Supervision of 2 x 4 time code (IRIG-B/AFNOR) slave clock lines. Automatic or manual switchover of 4 outputs.

- **U 3.5.0 MOBALine Switchover Module**
  Supervision of 2x4 MOBALine slave clock lines. Automatic or manual switchover of 4 outputs.

- **U 3.6.x Serial Switchover Module-**
  Supervision of 2x2 (U 3.6.0) or 2x4 (U 3.6.1) serial outputs RS 232/RS 422. Automatic or manual switchover of respectively 2 or 4 outputs.

- **U 3.7.1 Precision Frequency Supervision**
  Measurement, averaging and supervision of mains frequency (50/60 Hz). Programmable limit values for alarm messages. Four serial outputs for frequency, frequency deviation, frequency time, etc.

- **U 4.0.0 4x Impulse Line Driver**
  Four impulse clock lines. Each line may be adjusted as a minute, halfminute, 1/8 minute or second line. Measurement and supervision of impulse voltage and impulse current.

- **U 4.1.0 4x Serial Communication**
  Four serial RS 232 or RS 422 outputs of time and date information. The telegram format and transmission parameters are freely configurable.

- **U 4.2.0 Time-Code-Generator**
  Four audio frequency time code outputs, configurable as standard time code IRIG-B, IRIG-E, AFNOR or DCFFSK. Four optocoupler outputs, selectable for DCF/DC time code or periodical impulses. Two digital demodulated time code outputs (1 x IRIG-B and 1 x IRIG-E) 5 V 50 ohms. Measurement and supervision of output signals.

- **U 4.3.0 4x MOBALine Driver**
  Four MOBALine clock lines for MOBALine devices as self-setting clocks, computer interfaces and channel relays. Measurement and supervision of line voltage and line current.

- **U 6.5.0 Communication and Alarm Network CAN**
  Time synchronization and supervision of up to 16 remote master clocks (NMC, CTC, DTS 480x.masterclock) via LAN/WAN communcation.

- **U 9.0.0 Program Module**
  16 free selectable signaling and switching circuits by potential free relay contacts. PC software for programming.

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