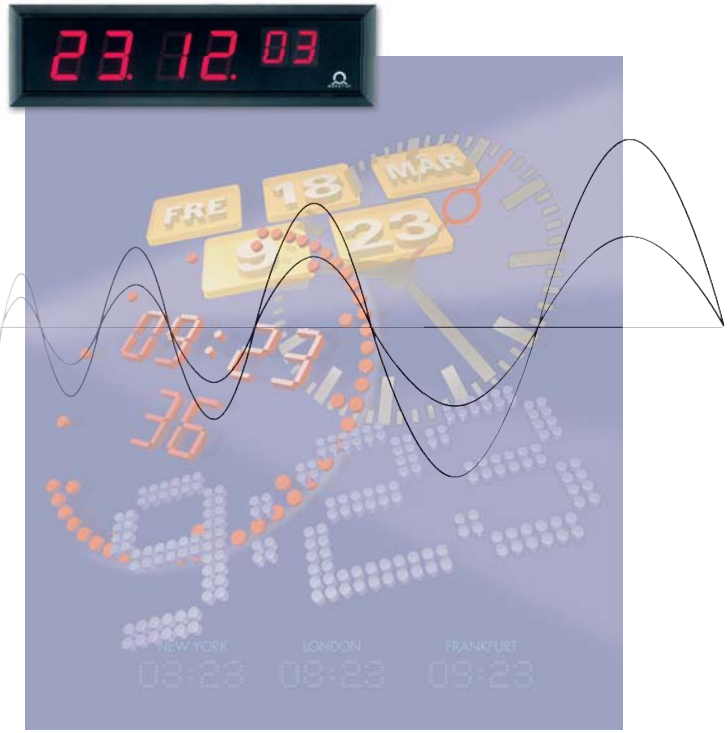
MOBALine -
Makes time distribution easy

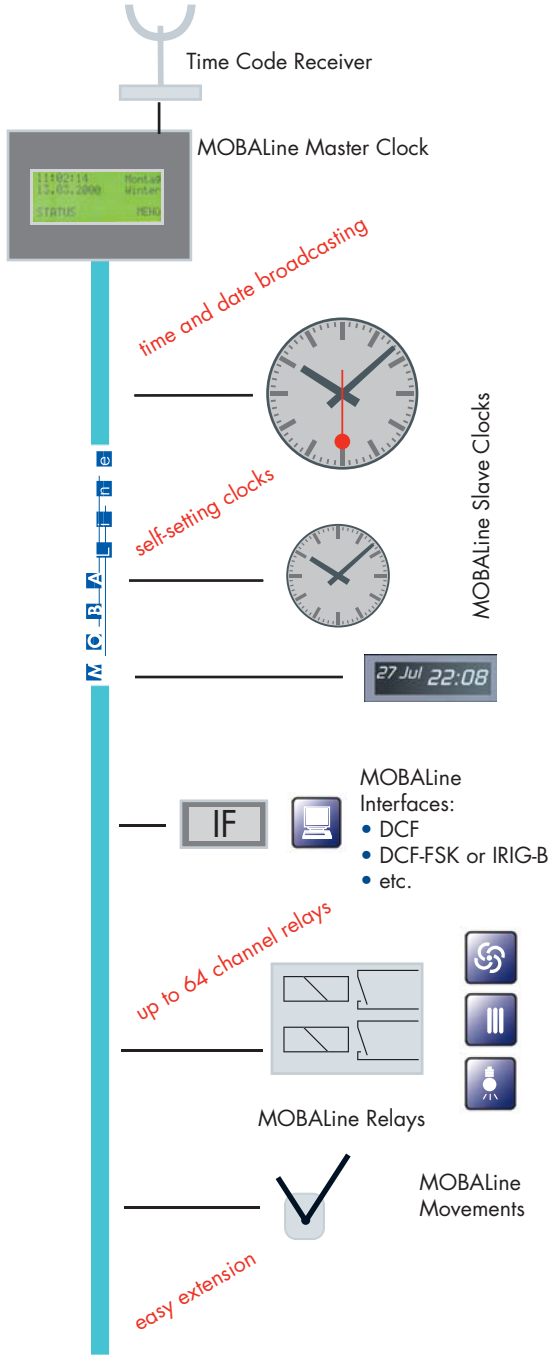


MOBALine is a 2-wire transmission system for maintenance-free self-setting clocks and remotely synchronized computer based systems.

MOBALine controls:
- self-setting analog and digital clocks
- relays; switching of remotely located electrical loads such as light, heat, bells, ...

Advantages:
- simple, robust alternative to DCF 77, DCF-FSK and IRIG-B
- can use existing 2-wire lines
- can supply clocks with both synchronization and power

MOBALine



WTD Wireless Time Distribution

Wireless Time Distribution for digital and analog clocks (radio frequency 868 MHz)

WTD Stand-alone solution

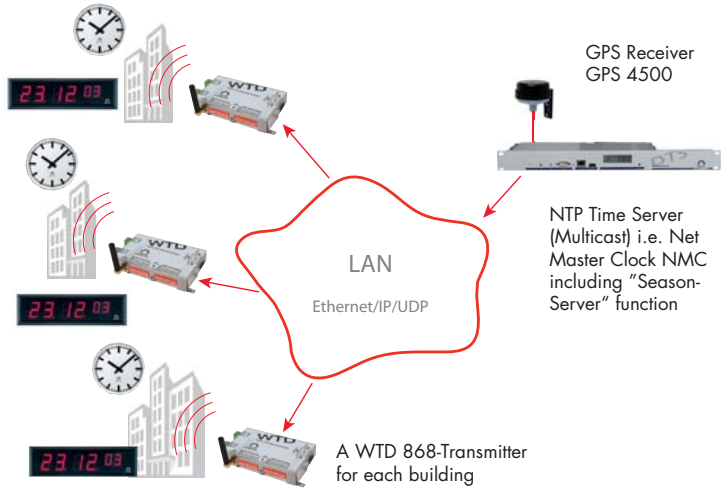
Synchronization of the transmitter by DCF 77 time code from a GPS or DCF time signal receiver.

WTD, the most important features and advantages:

- High flexibility for realizing new time systems or the extension of existing clock systems in a convenient way
- 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
- Use of unlimited number of slave clocks within the range of a transmitter
- High reliability in time synchronization over distances of up to 200 m
- Simple and economic installation – therefore essential cost savings

Extension of WTD system through LAN

An unlimited number of WDT 868-Transmitters can be synchronized by NTP Time Server through LAN.



Some WTD products:

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

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

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

Slave clocks for WTD with or without second display:
- FLEX
- ECO

2

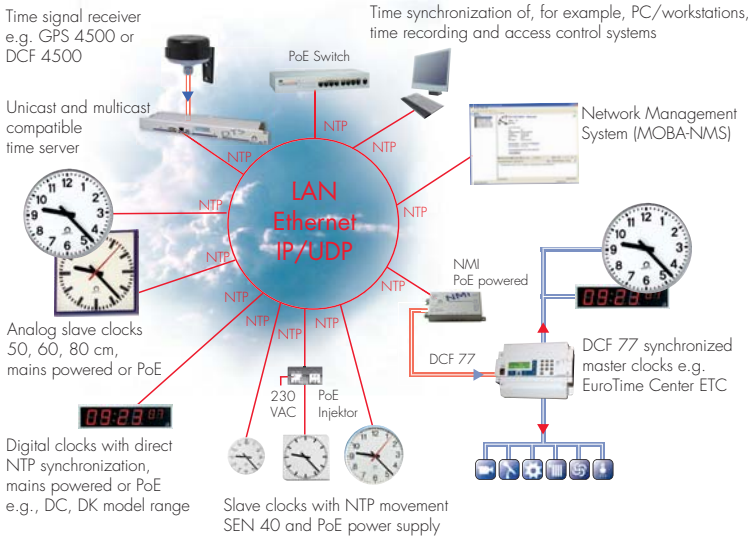
NTP - Time over Ethernet ToE

The innovative way to distribute time to clock systems, IT infrastructures, building and security technology

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. MOBATIME DTS masterclock or or DTS 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
- 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 e-mails. If the clocks have the new LAN-compatible MOBATIME clock circuitry on the network it is even possible to ascertain whether all the clocks are functioning correctly using the MOBATIME software Network Management System (MOBA-NMS)

Example of a LAN based time distribution



NTP slave clocks and NMIs with NTP multicast don't need an IP address.

Some LAN products:

NTP movement SAN 40 / SEN 40
for clocks up to 40 cm in size

Indoor and Outdoor slave clocks with LAN movement:
- FLEX
- ECO
- MODERNA
- Metroline
- Profiline

Network Management System:
- MOBA-NMS

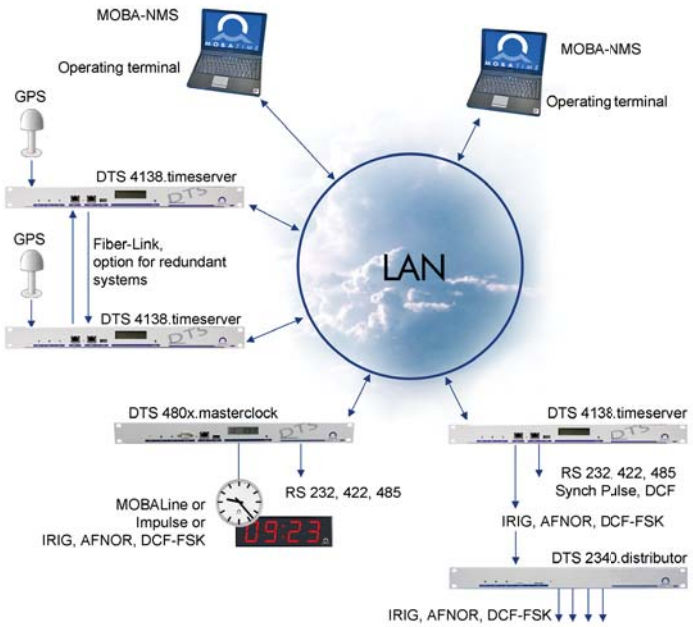
Network Management Interface:
- NMI

MOBATIME timeservers:
- DTS timeserver
- DTS masterclock

Digital clocks with direct NTP control

DTS Distributed Time System

Time system with persuasive future prospects

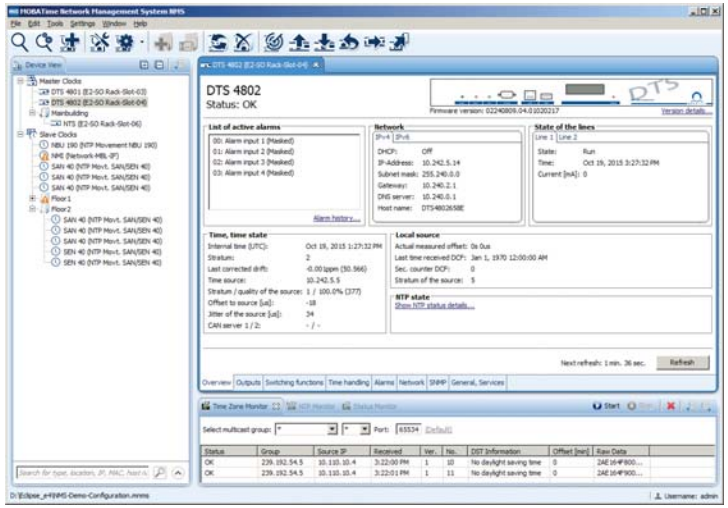


The DTS concept is specially designed for medium and large networks and offers a range of persuasive features:

- The system can be decentralized; "Function where it is required"
- Security and reliability is provided by redundancy in operation and in power supply, as well as by alternative alarm reports (alarm relay, e-mail or SNMP)
- Maximum precision of the DTS time reference
- Simple, convenient and centralized operation, configuration, programming, administration, and monitoring via LAN
- Network functions for highly precise time distribution to all NTP clients in the LAN/WAN network, as well as to sub-systems, such as slave clock lines, or switching and control systems of buildings and to IT Security services

MOBA-NMS

Network Management Software



The MOBA-NMS software can be used to access and manage MOBATIME network devices, from master clocks and time servers to slave clocks, interfaces and relays.

Features:

- Automated device search
- Easy device configuration
- Central device management (not in NMS Basic)
- System monitoring
- System supervision
- Analysis tools
- Reporting tools
- DSS (Device Supervision Service) (NMS Expert only)

Versions:

- NMS Basic: for controlling a single device, limited functionality
- NMS Pro Limited: for up to 50 slave and 2 master devices
- NMS Pro Unlimited: for up to 5'000 slave and 100 master devices
- NMS Expert: same capacity as Pro Unlimited, contains DSS

Net Master Clock
DTS 480x.masterclock
NTP Time Server and Master Clock

The Concept

The DTS masterclock is designed especially for network environment. It is able to work as an accurate time server, master clock or submaster clock, synchronized from LAN.

Synchronization sources: DCF, GPS, LAN (NTP).

Time signal outputs:

DTS 4801:
- 1 MOBALine or impulse line (700mA eff.)
- 1 RS 485 line for monitored self-setting slave clocks
- 1 DCF / pulses / frequency output

DTS 4802:
- 2 MOBALine or impulse lines (totally 700mA eff.)
- 1 RS 232/485 for script file programmable serial telegrams
- 1 DCF / pulses / frequency output

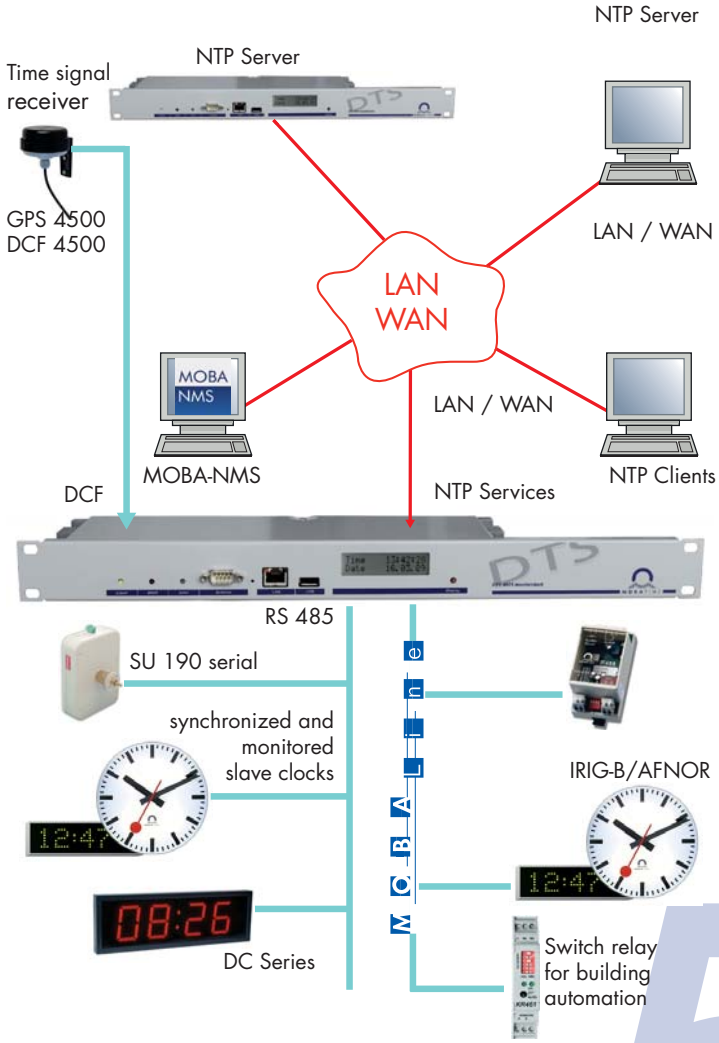
Operating control: PC terminal software over RS 232 (front Sub-D 9 pin) or Telnet, SSH, SNMP over LAN or MOBA-NMS

Power supply: 85 - 250 VAC, 50 - 60 Hz or 24 - 28 VDC / 1.5 A

DC output: 28 VDC, max. 400 mA, to supply SU 190 movements and / or GPS 4500

Dimension: 19" rack mounting, 1 HU
W x H x D: 483 x 44 x 125 mm

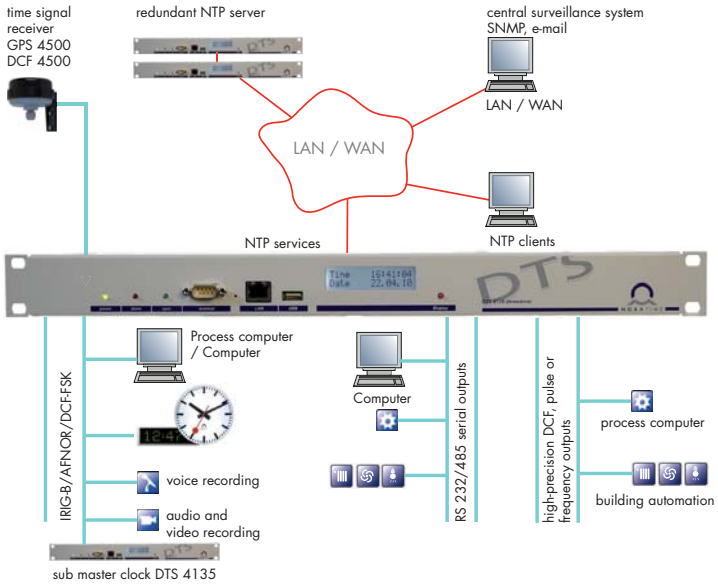
Application example: DTS 4801.masterclock as NTP Time Server synchronized from GPS or synchronized from another NTP Time Server (LAN / Internet).



DTS 4801.masterclock, e.g. to control and monitor up to 31 self-setting slave clocks and to synchronize self-setting MOBALine slave clocks (optional IRIG-B/AFNOR).

DTS 4135.timeserver

Master Clock and NTP Time Server



DTS 4135.timeserver, e.g. as NTP server and master clock for precision IRIG-B/AFNOR outputs, RS 232/485 serial telegrams and technical pulses/frequencies.

The most important technical data:

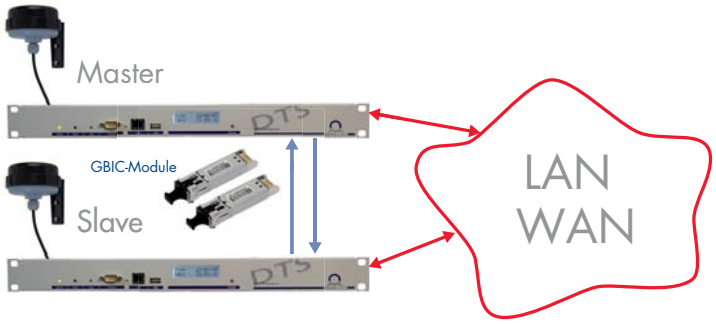
Accuracy
GPS (DCF input) to NTP server: typical < +/- 100 µs
GPS (DCF input) to DCF output: typical < +/- 10 µs

External time source
External NTP / SNTP server (4 NTP sources possible), and / or GPS (DCF 77) time signal receiver (current loop, e.g. GPS 4500) or AFNOR time signal (analog, BNC)

Power supply
AC input: 85 - 265 VAC / 50 - 60 Hz / max. 15 VA
2 x DC input: 24 VDC + 20 % / - 10 % / max. 10 W

Dimensions
19" rack, 1 rack unit, W x H x D (483 x 44 x 125 mm)

DTS redundancy concept



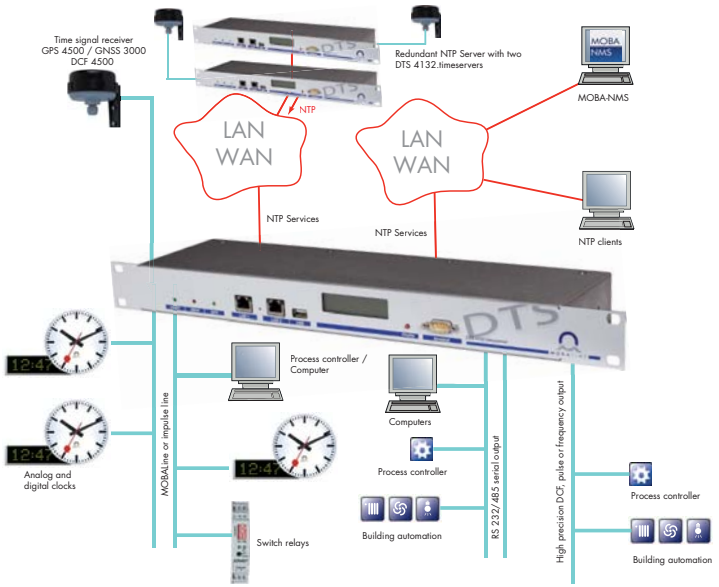
Two DTS devices are synchronized via a fiber-optic connection for redundant operation, using two GBIC mini modules for the fiber-optic link. The two time servers automatically regulate their role as master or slave via this connection after start-up. The slave is synchronized by the master. In case of a GPS failure, automatic switchover from master to slave will occur, whereby limits for the switchover can be configured.

Supported devices
- DTS 4128.timeserver
- DTS 4132.timeserver
- DTS 4135.timeserver
- DTS 4138.timeserver
- DTS 4148.grandmaster
- DTS 4160.grandmaster
- DTS 4210.timecenter

Redundant outputs
Redundant outputs (MOBALine, IRIG-B/AFNOR, serial interfaces, DCF and/or pulse/frequency) can be achieved by using an ECO (External Change Over) unit.

DTS 4132.timeserver

Multipurpose Master Clock and Time Server



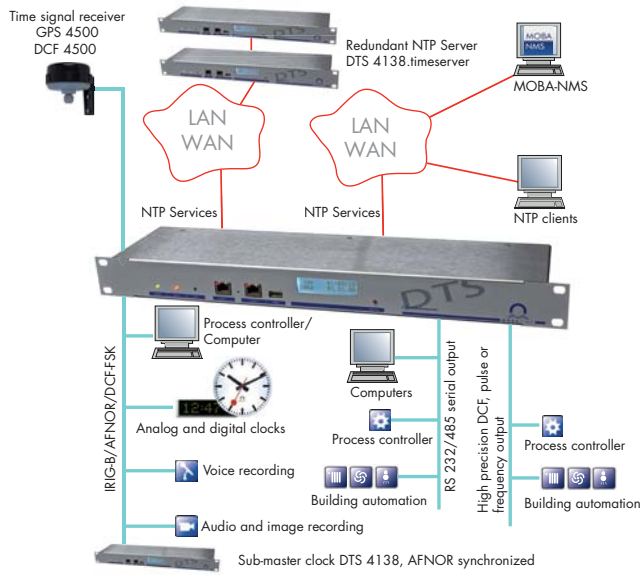
DTS 4132.timeserver, e.g. as NTP server and master clock for precision MOBALine outputs, RS 232/485 serial telegrams and technical pulses/frequencies.

Main differences between DTS 4135 and DTS 4132:

- 1 pulse/frequency output (4135: 2)
- 2 MOBALine/impulse outputs (4135: 2 IRIG)
- 2 LAN ports (4135: 1)

DTS 4138.timeserver

Multipurpose time server



The DTS 4138.timeserver sets new standards as a time reference for all NTP clients in medium and large networks (LAN/Ethernet/IP/UDP). It is highly precise and with its intelligent concept for redundant operation, it offers a high degree of reliability and availability.

Main differences between DTS 4135 and DTS 4138:

- no serial interface for PC terminal
- 2 LAN ports (4135: 1)
- only one of the following outputs each (4135: 2 each):
  - IRIG-B / AFNOR / DCF-FSK
  - RS 232 / 485
  - high-precision DCF, pulse or frequency

DTS 4148.grandmaster

Grandmaster clock with PTP, based on the DTS 4138, with the same outputs

DTS 4160.grandmaster

High precision NTP/PTP time server

The DTS 4160.grandmaster is a combined time distribution and synchronization device with up to 4 network ports (IPv4/IPv6). With its high-precision and intelligent concept for redundant operation, it offers a high degree of reliability and availability.

Connectors and displays:

Front side

- USB connector for software update, file upload and maintenance
- PC terminal connector, RS 232 Sub D 9p male
- LEDs: Power, alarm, synchronization
- Display: Time, date, status, alarm, IP...

Rear side

- Power: Mains power connector, 2x DC power supply input
- Alarm: alarm relay contact
- LAN connectors (NTP/PTP):
  - 3x RJ45 10/100/1000MBit
  - 1x SFP
- Synch. outputs:
  - 1x E1
  - 2x serial RS 232 / RS 422 / RS 485 interfaces
  - 1x DCF current loop output
  - 1x IRIG-B
  - 1x frequency/pulse output
- GPS antenna connector N

DTS 4210.timecenter

Multipurpose NTP/PTP time server

Based on the DTS 4160.grandmaster, the DTS 4210.timecenter is a combined time distribution and synchronization device. It features a vastly expanded array of connectors and redundant mains power inputs.

Main differences between DTS 4210 and DTS 4160:

- Redundant mains power connector
- LAN connectors (NTP/PTP):
  - 12x RJ45 10/100/1000MBit
  - 4x SFP
- Synch. outputs:
  - 4x E1
  - 8x serial RS 232 / RS 422 / RS 485 interfaces
  - 4x DCF current loop output
  - 4x IRIG-B
  - 4x frequency/pulse output

ETC Master Clocks

ETC 12 & ETC 12 R

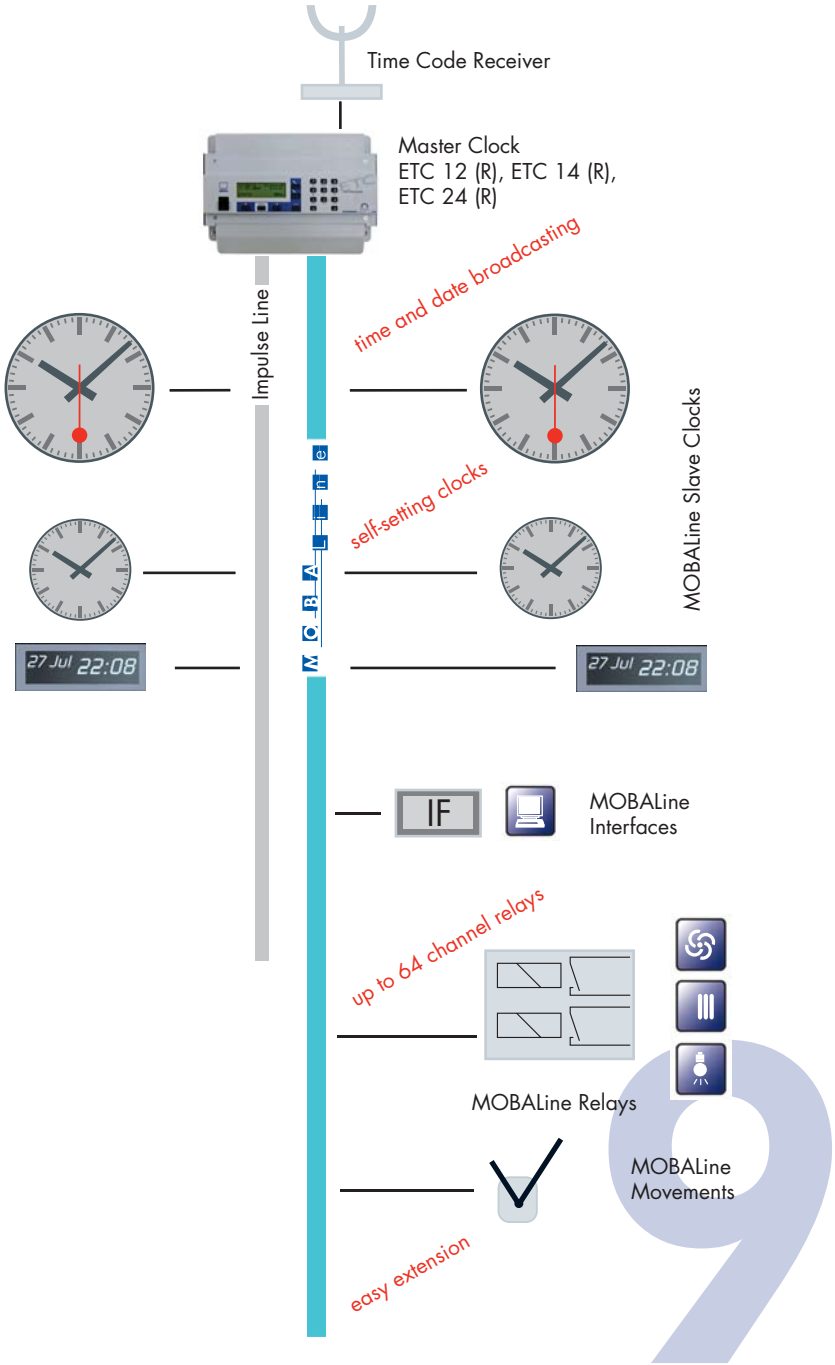
- 1 line selectable for minute, half-minute, second impulses (polarized, 24 V / 500 mA) or DCF time code
- Radio synchronization by DCF time code
- 2 programmable channel relays with switch over contacts
- Control of up to 80 slave clocks. 80 time zone definitions
- Menu guided, self-explaining operation control

ETC 14 & ETC 14 R

- 1 line selectable for MOBALine (500 mA eff.), minute, half-minute, second impulses (polarized, 24 V / 700 mA) or DCF time code
- Synchronization by DCF, GPS time code or Serial (RS 232, RS 422) ASCII time string
- 4 programmable channel relays with switch over contacts
- Control of up to 100 slave clocks. 80 time zone definitions
- World time function available in connection with IF 480WT
- Menu guided, self-explaining operation control

ETC 24 & ETC 24 R

- 2 lines selectable for MOBALine (700 mA eff. totally), minute, half-minute, second impulses (polarized, 24 V / 1000 mA totally) or DCF time code
- Synchronization by DCF, GPS time code or Serial (RS 232, RS 422) ASCII time string
- 4 programmable channel relays with switch over contacts
- Control of up to 160 slave clocks, 80 time zone definitions
- World time function available in connection with IF 480WT
- Menu guided, self-explaining operation control



Master Time Center MTC

The Master Time Center controls clocks, synchronizes computers to the exact time, supplies serial time information in various formats and provides a reliable time reference to the computer network. The MTC has been optimized to offer the best possible reliability and flexibility, in order to produce specific and versatile system solutions.

Applications

Airports, Hospitals, Railways, Industrial Companies, Public Buildings, Government Buildings...

Customer-specific designed systems with high requirements regarding different kinds of time signals, accuracy of time signals, reliability and availability of time signals (e.g. redundant design).

- Power plants and distribution stations
- Research station
- Radio- and TV stations and studios
- Air traffic control (Skyguide)

CompuTime Center CTC

Master Clock

The reliable, modern and modular concept with its configuration flexibility makes the CTC suitable for a wide range of applications. The different types of outputs provide the facility of controlling traditional or self-setting slave clocks as well as computer based systems.

CTC's Application Boards

Impulse Line Driver
selectable pulse-periods, up to 1A per line

MOBALine Driver
for self-setting clocks, computer interfaces and switching relays

Serial Communication
programmable serial time-strings on RS 232/422

Program Module
4 independent relays. Contact load up to 1250 VA

Time Code Generator
2 independent Audio Frequency Time Code outputs IRIG-B, AFNOR, DCF-FSK

Network Processor Master ClockModule
Different services on a TCP/IP Ethernet LAN network: Time synchronization with (S)NTP (Server and Client), alarm reporting with SNMP traps or e-mails. 10/100Base-T connection by RJ45 plug. Master clock functions, for direct GPS 4500 connection.

GPS Receivers

Satellite Time Signal Receiver

GNSS 3000

- The GNSS 3000 is a time signal receiver intended for receiving time signals from navigation satellites
- It can receive and process GLONASS and GPS signals
- Outputs:
  - DCF current loop or RS 422 time code output (UTC time) for master clocks, Master Time Center MTC and almost any device compatible with DCF 77 time code
  - 1 PPS current loop or RS 422
  - NMEA serial telegram RS 422
- Power supply from connected device or external 12 - 60 VDC

GPS 4500

- DCF current loop time code output (UTC or MET time) for master clocks, Master Time Center MTC and almost any device compatible with DCF 77 time code
- Power supply from connected device or external 10 - 40 VDC

DCF 77 and MSF 60

Time Code Receiver

DCF 77 reception

The DCF 77 signal transmitter is located in Mainflingen near Frankfurt. The time information transmitted from the atomic clock has a range of some 1500 km.

MSF 60 reception

The MSF 60 transmitter is located in Anthorn UK. The time information from atomic clock has a range of some 1500 km.

DCF 4500 / MSF 4500

Standard receiver for usual reception conditions.

Depending on the location of the clock installation and the local reception conditions, the most appropriate receiver is used.

Interfaces

Time Code Converters

IF 480 WT

Input: MOBALine
Output: DCF 77 time code
Time synchronization of any DCF 77 compatible device. Selectable time zone with automatic daylight saving time change.

IF 487

Input: IRIG-B, AFNOR, DCF-FSK (selectable)
Output: DCF 77 time code

IF 488

Input: MOBALine
Output: IRIG-B, AFNOR, DCF-FSK (selectable) with DIN-bar mounting bracket

MOBALine Booster

Input: MOBALine
Output: MOBALine (boosts signal to allow for the synchronization of more clocks)

NMI

Input: NTP (PoE)
Output: MOBALine, DCF 77 time code

Switching Relays

Controlled Power Switches

Switching relays, remotely controlled via MOBALine or LAN.
Functions: on / off, signal (1-99s)
Max. contact load: 150 W, 1250 VA, 250 V.
Switching programs can be built either by means of the Windows software „Switch-Editor" or directly on the master clocks.
With the DTS 480x.masterclock, switching programs can be directly up- and downloaded via LAN after creation. The active switching program can be selected as well.

KR 461 (MOBALine)

1 relay with switch-over contact. The compact design saves space. Control LEDs available for MOBALine and switching status. Manual operation possible for testing reasons by means of the built in toggle switch (AUTO / OFF / ON).

KR 465 (MOBALine)

5 relays with switch-over contacts, controlled by separate channels.

NPR (LAN/NTP)

1 relay with switch-over contact, programmable via LAN. Control LEDs for LAN and switching status. Manual operation by means of toggle switch (AUTO / OFF / ON).

12

Indoor Analog Clocks

ECO

Clocks at advantageous prices for multiple applications in offices and administrations.

- High quality, white plastic case with acrylic glass cover
- Dials Ø 30 and 40 cm, round
- Single-sided and double-sided clocks
- Impulse, radio-controlled (DCF 77), MOBALine, battery operated quartz movements, WTD or Ethernet/NTP/PoE

MODERNA

For industrial and commercial applications.

- Modern design
- Flat metal case with acrylic glass cover
- Dial dimensions 30 or 40 cm, square
- Single-sided and double-sided clocks
- Impulse, MOBALine, battery operated quartz movements or Ethernet/NTP/PoE

TREND

Modern and slim design

- Dials: Ø 30 and 40 cm, round
- Controlled and powered by two-wire MOBALine or Ethernet/NTP/PoE
- Ethernet/NTP version can be administrated and supervised by MOBA-NMS (Network Management System)
- Optional metal housing

FLEX

Sturdy and elegant analog clock FLEX with metal housing inspires you reliably through the day.

- Dials: Ø 25, 30, 40, 50, 60 and 80 cm, round
- Single- or double-sided
- Different mounting variants (wall and ceiling set)
- Quick mounting - simply snap it on
- Impulse, radio-controlled (DCF 77), MOBALine, IRIG-B/AFNOR, serial RS 232 / RS 422, WTD, Ethernet/NTP/PoE or battery operated quartz movement

FLEX LN

- low noise housing (Ø 30 and 40 cm) for series 40 movements

FLEX V2A

- stainless steel housing (Ø 30 - 50 cm)

13

Outdoor analog clocks

PROFILINE ROUND and PROFILINE SQUARE

A modular concept in modern design.

- Single- or double-sided, 4-sided cubic execution
- With or without illumination
- Weather-proof housing of aluminum profile, natural anodized
- Dial dimensions:
  - round Ø 50, 60, 80 cm
  - square 40, 50, 60, 80 cm
  - cubic 60, 80 cm
- White dial with black markers or Arabic figures
- With or without synchronous second hand
- Flat mineral protection glass or impact protection
- Minute-impulse, radio-controlled (DCF 77), MOBALine, IRIG-B, AFNOR, autonomous operation (quartz) or Ethernet/NTP/PoE

METROLINE

- Single- or double-sided, round
- With or without illumination (LED)
- Weather-proof housing, light metal, color RAL 9006, white aluminum, powder coated
- Dials: Ø 50, 60, 80 cm, round
- White dial with black markers or Arabic figures
- With or without synchronous second hand
- Convex acrylic protection glass
- Minute-impulse, radio-controlled (DCF 77), MOBALine, IRIG-B, AFNOR, autonomous operation (quartz) or Ethernet/NTP/PoE

FLEX Outdoor

- Single- or double-sided, round
- Weather-proof housing, light metal, color RAL 9002
- Dial Ø 40 cm
- White dial with black markers or Arabic figures
- With or without second hand
- Flat mineral protection glass
- MOBALine or Ethernet/NTP/PoE

14

Indoor Digital Clocks

LED Digital Clocks
DC Series

- 7 segment LED time display in red, green, blue and yellow
- Hour / minute or hour / minute / second, alternating time, date and temperature display (optional temperature sensor)
- Character heights 57, 100 or 180 mm; viewing distance up to 25 / 40 / 80 meters
- Impulse, radio-controlled (DCF 77), MOBALine or autonomous operation (quartz) Optional: Serial RS 232 / RS 422 or RS 485 supervised or IRIG-B, AFNOR or NTP (PoE)
- Stop-watch function, up/down counting
- Infrared remote control for easy access to all functions

Calendar Clocks
DK Series

- Dot matrix display in red or green
- Display of time, date, temp., up to 5 world times (alternating)
- Impulse, radio (DCF 77), MOBALine, quartz. Optional: Serial RS 232 / RS 422 or RS 485 supervised or IRIG-B, AFNOR or NTP (PoE)
- Stop-watch function
- Infrared remote control

World Time Clocks
TZ Series

- 7 segment LED time display red, green, blue and yellow
- Display of up to 6 world times and date (depending on version)
- DCF, MOBALine or autonomous operation (quartz) Optional: NTP
- Infrared remote control

Outdoor Digital Clocks

LED Digital Clocks
DSC Series

- Self-setting digital clock for indoor and outdoor use with 7 segment LED display in red and green
- Bright and clear display in 100, 180, 250, 320 and 500 mm character heights
- Slim, elegant design with black powder-coated aluminum case
- Impulse, radio (DCF 77), MOBALine, quartz controlled. Optional: Serial, RS 232 / RS 422 or RS 485 supervised or IRIG-B, AFNOR or NTP
- Available for standard wall mounting, for mounting with single- or double-sided wall or ceiling suspension bracket

Temperature Clocks
DT Series

- 7 segment LED display in red, green, blue, yellow and white (different colors for each display possible)
- Up to two time and three temperature displays
- Various options for temperature labeling (icons or text)
- Character heights 100/57, 100 or 180 mm; viewing distance up to 25 / 40 / 80 meters
- DCF 77, GPS 4500 or autonomous operation (quartz)
- Available for standard wall mounting, for mounting with single- or double-sided wall or ceiling suspension bracket
- Infrared remote control for easy access to all functions

15

Movements

NU 90
Minute impulse, for clocks up to Ø 80 cm.

NU 90 SYN
Minute impulse with synchronous second hand, for clocks up to Ø 80cm.

SEI 40
Second impulse, slim shaped, for clocks up to Ø 40 cm.

Type range 190
Self-setting movement with input for DCF 77, MSF 60 time signal receiver or serial ASCII time telegram RS 232 / 422 (BU 190). Available for audio time code IRIG-B, AFNOR, DCF-FSK (ITBU 190) reception, for polarized minute impulses (IBU 190) or NTP (NBU 190). For hour, minute or hour, minute and second display up to Ø 80 cm. Different modes of second hand selectable on DIP switches.

SAM 40, SEM 40
Self-setting MOBALine movement for clocks up to Ø 40 cm. Shafts for hour- and minute-hand (SEM: h, min. and sec. hand).

SAN 40, SEN 40
Self-setting, NTP-synchronized, for clocks up to Ø 40 cm.

SAM 100, SEM 100
Self-setting MOBALine or DCF active movement for clocks up to Ø 100 cm.

MW 10, MW 20, MW 24, DMU 160, DMU 350
Movements for facade clocks.

Movements 192-series

For indoor and outdoor clocks with hour and minute display, up to Ø 80 cm, with or without illumination.

AD 192 / AM 192
DCF 77 / MSF 60 time signal receiver for BU 192.

BU 192
DCF 77, MSF 60 or serial ASCII controlled. Battery powered for up to 6 years. Output to control BU 192 in cascade.

FU 192
Radio controlled movement, consisting of BU 192 and AD 192 (detachable).

QU 192
Temperature compensated quartz for autonomous operation. Battery powered for up to 6 years. Output to control BU 192 in cascade.

FU 192 WWVB
Radio controlled movement for WWVB time code reception (USA, Canada). Time zone selectable by means of DIP switches. Battery powered for up to 6 years. Output to control BU 192 in cascade.

GU 192
GPS radio clock movement with built-in satellite antenna receiver for worldwide use. Time zone selectable by means of DIP switches or user programmable. Battery powered for up to 5 years. Output to control BU 192 in cascade.

Facade Clocks

FACADE CLOCKS for outdoor mounting

- Diameter from 40 up to 500 cm[1]
- Self-setting motor movements
- With or without illumination
- Special design on request

Consisting of:
- 1 motorized slave clock movement for rear- or front sided wall mounting
- 1 pair of hands (hour, minute)
- 1 dial consisting of 12 hour markers, with or without illumination
  or
- 1 skeleton dial with or without illumination

[1]With standard movements. Larger clocks on demand

Swiss Time Systems

FLORAL CLOCKS

A decorative way to display the time in public places, parks and gardens.
- Available for dial diameters from 2.5 meters up to 7 meters
- Floral clock equipment consists of:
  - 1 motor movement controlled by minute impulses, connected to the mains 110/230 VAC
  - 1 pair of hands (hour, minute or hour, minute, second)
  - 1 master clock

The flower decoration of the dial shall be executed by a gardener on site.

17