GPS or DCF 77

DTS Manager
and DTS Master
Software

DTS Masterclock

DTS

MOBATime's
Distributed Time System

LAN

The multi purpose time server in the new LAN and
NTP-based Distributed Time System by **MOBA**Time

DTS 4135.timeserver

The DTS 4135.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.

The DTS 4135.timeserver can either be synchronized from a time signal receiver (DCF 4500, GPS 4500 or IRIG/AFNOR time source), or from another NTP or SNTP time server in the LAN or Internet. The DTS 4135 can synchronize all slave clocks with NTP movements, either with NTP Multicast or NTP Unicast (both with timezone server function).

As a multi purpose device the timeserver is equipped with two independent IRIG/AFNOR outputs, two serial RS 232/RS 485 interfaces with script file programmable telegrams, two DCF or high accurate pulse /frequency outputs (RS 422 and opto coupler) and one additional DCF current loop output.

The highest degree of system security and reliability can be achieved by the master-slave operation of two DTS 4135.timeservers connected via fiber-optic (redundant operation).

Alarms are signaled by alarm relay, SNMP messages or e-mails.

DTS 4135.timeserver - the innovative, precise time reference for networked, multifunctional systems

Time precision

Best accuracy can be achieved by synchronizing the DTS 4135 via a connected GPS receiver. The internal time is adjusted to the time reference (e.g. GPS) in one step or continuously (adjustment speed configurable) to avoid any time leaps (e.g. after a longer loss of the time source), thanks to the intelligent time management. To achieve utmost accuracy, the quartz drift and aging is continuously compensated.

Top performance - even for large networks

The high performance DTS 4135 timeserver can answer more than 250 NTP and SNTP requests per second. It can also work as an NTP time reference for a subnetwork, being synchronized from a superior NTP-Server (client and server at the same time).

Secure NTP

Supports NTP authentication for increased security, which allows clients, to verify the received NTP packets.

Safe, convenient operation

After configuring an IP address via serial interface (terminal program), operation over LAN via Telnet, SSH or SNMP protocols is possible. SSH and SNMP (MD5 authentication and DES for encryption) enable a secured connection. Special software is required for operation by SNMP protocol.

Effective fault indication

Alarms are reported by alarm relay, by e-mail, or via SNMP messages. Additionally, the display can be used to check the alarm state by pressing the red push button.

Front view

Connectors:

- LAN connector RJ 45, 10/100 Mbit
- PC terminal connector, RS232 Sub-D 9p male
- USB connector for software update, maintenance or file download to the timeserver (e.g. telegram files, timezone table ...)

LEDs: Mains power, alarm, synchronization and network transmission control.

Display: Time, date, status, alarm, IP...

Rear view

Connectors:

- Power: Mains power connector, 2 DC power supply inputs, DC output (e.g. for GPS)
- Alarm: alarm relay contact, alarm input
- Synch. inputs: IRIG-B/AFNOR input (BNC), DCF current loop
- Synch. outputs: DCF current loop, DTS link (GBIC-module)

- Serial: 2 RS 232/485, both for script file progr. serial message
- IRIG: 2 IRIG-B/AFNOR outputs (BNC)
- IRIG DC: 2 DC level IRIG-B/AFNOR outputs (both RS 422 & current loop)
- Pulses: 2 DCF or pulse/frequency outputs (both RS 422 & current loop)
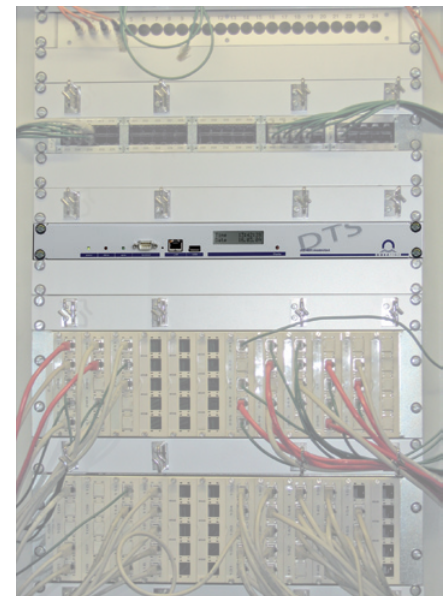
DTS device mounted in a 19" IT-Rack

DTS 4135.timeserver - the time source for LAN-based clock and time distribution systems

The DTS 4135.timeserver is a versatile time reference in several respects. On one hand, it relays the external time signals with maximum precision and reliability. It is compatible with all NTP unicast (IP based) or multicast devices, such as slave clocks with NTP movement (e.g. NBU 190),

digital clocks and digital information displays with NTP synchronisation. On the other hand, it can also synchronize the NCI (Network Clock Interface), which for its part can control master clocks and slave clocks with MOBA*Line* and DCF 77 input.

Even PCs/workstations, photocopiers, printers, fax equipment, time recording terminals, and access control systems, central fire alarm systems, image and sound recording equipment, and many other „clients in the network" can be directly synchronized by means of the NTP protocol.
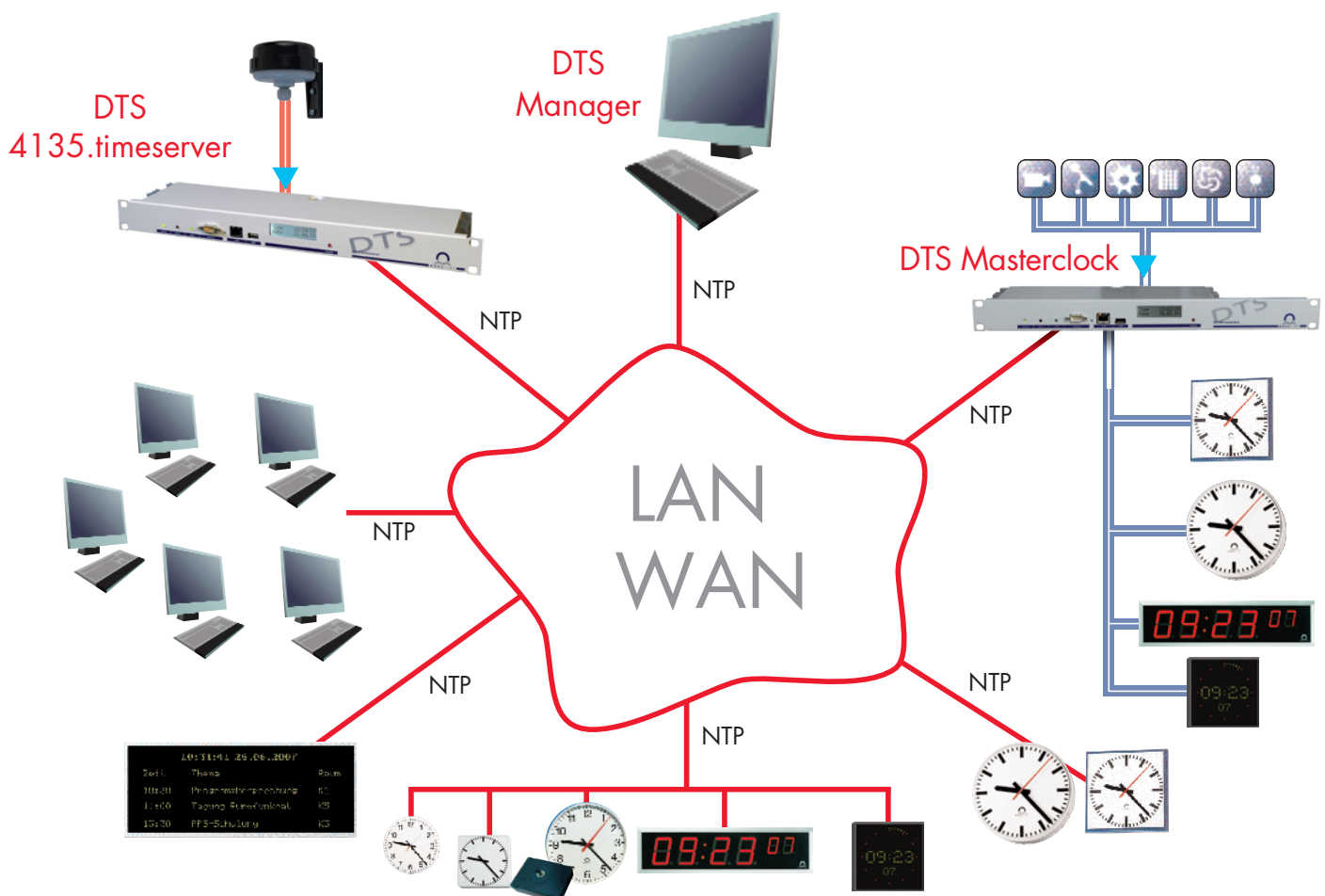
DTS 4135.timeserver - greatest priority for security and reliability

Redundant operation

To avoid time deviation between two DTS 4135.timeservers, they can be linked via a fiber-optic connection by using two GBIC modules.

The two timeservers automatically negotiate their state as master or slave. The slave is always synchronized by the master. In case of GPS failure, an automatic swap between master and slave state will occur. The parameters for the swap can be configured.

The "master" DTS timeserver always has the better NTP stratum level than the slave.

Redundant power

The DTS 4135.timeserver has several monitored power inputs for completely redundant power supply. The non-active power supply input is also monitored.

Possible power variants:
- 24 VCD, non-redundant
- 230 VAC, non-redundant
- 24 VDC + 24 VDC, redundant
- 230 VAC + 24 VDC, redundant
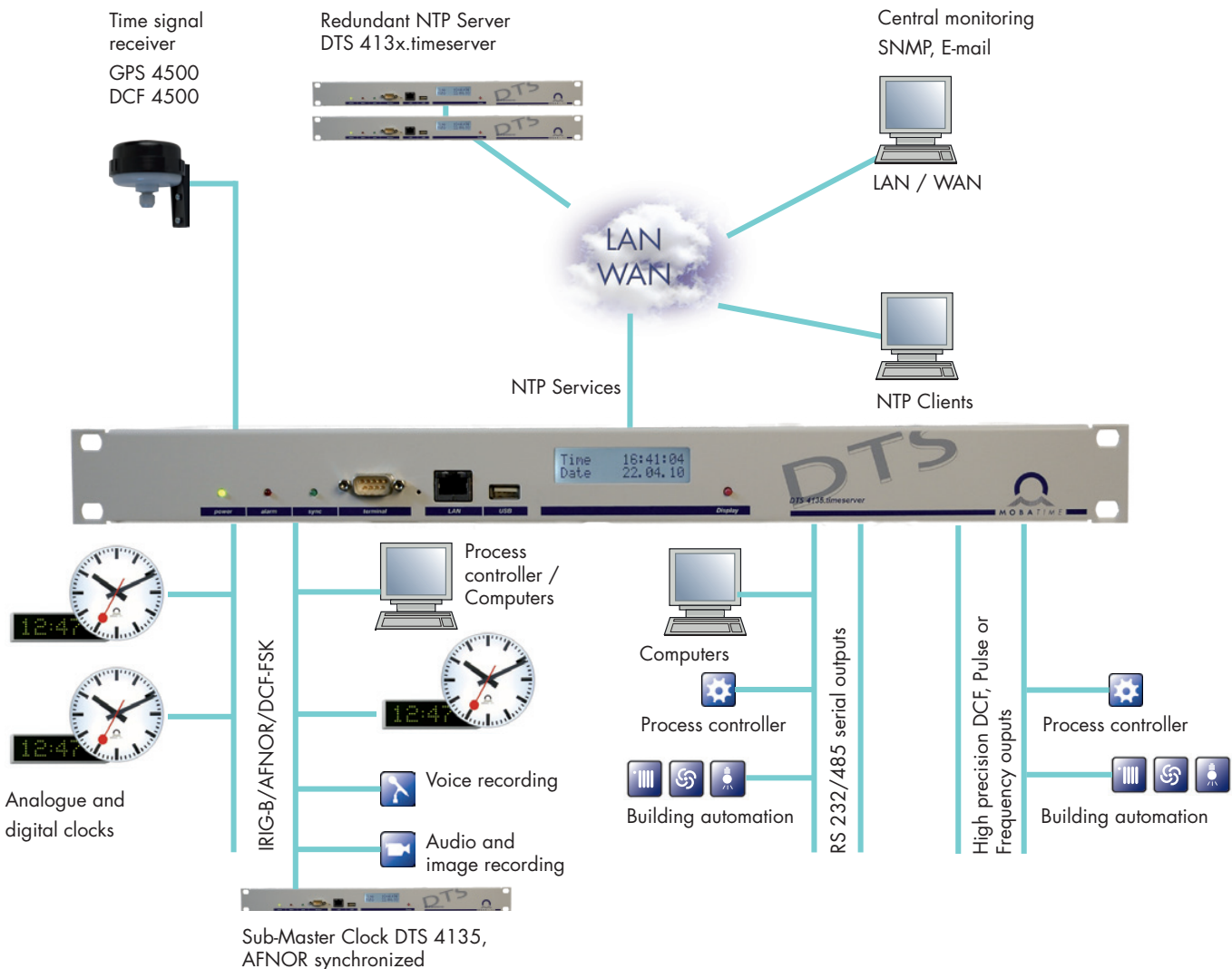
Redundant outputs

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

Master

GBIC modules

Slave

LAN WAN

Monitored inputs

85 - 265 VAC

24 VDC

24 VDC
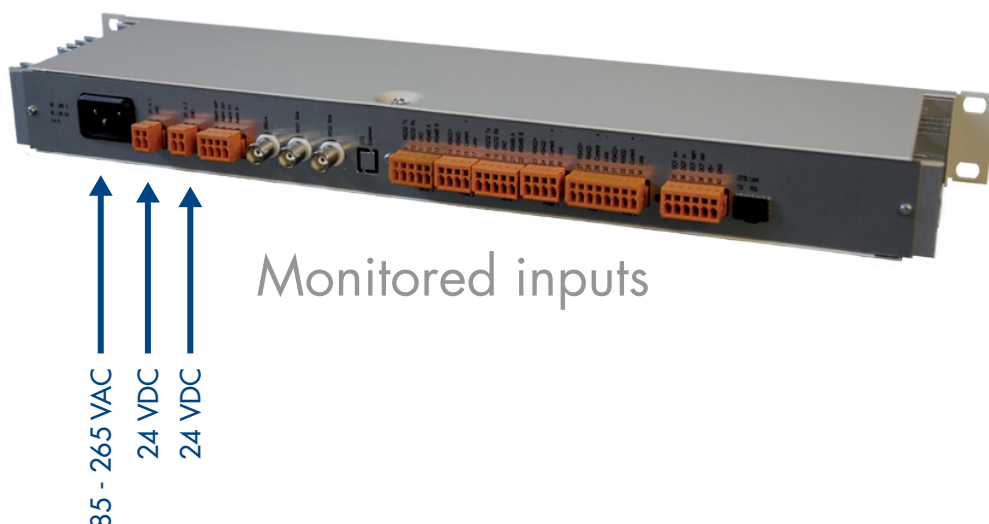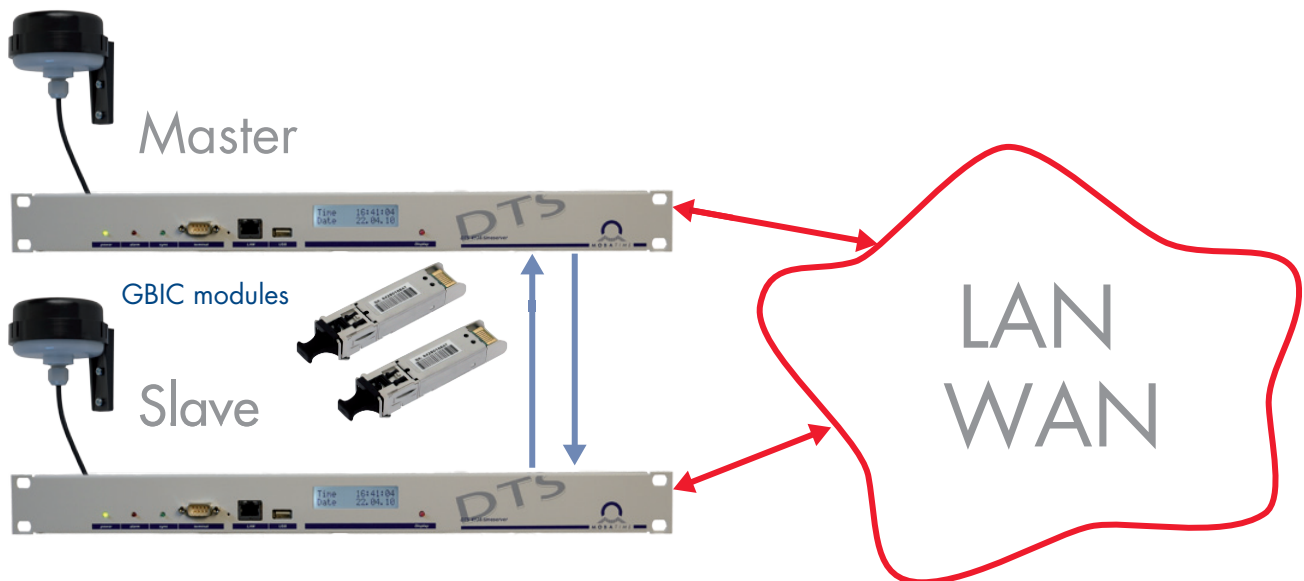
DTS 4135.timeserver, versatile high precision master clock and NTP time server

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

Time signal receiver
GPS 4500
DCF 4500

Redundant NTP Server
DTS 413x.timeserver

Central monitoring
SNMP, E-mail

LAN / WAN

LAN WAN

NTP Services

NTP Clients

Time   16:41:04
Date   22.04.10

Analogue and digital clocks

IRIG-B/AFNOR/DCF-FSK

Process controller / Computers

Voice recording

Audio and image recording

Sub-Master Clock DTS 4135, AFNOR synchronized

Computers

Process controller

Building automation

RS 232/485 serial outputs

High precision DCF, Pulse or Frequency ouputs

Process controller

Building automation

The DTS 4135.timeserver is equipped with two IRIG-B/AFNOR outputs to control analogue and digital slave clocks, process controllers, voice recording systems and many other technical equipment.

Typical application e.g. for power distribution stations or energy production plants, where high reliability, high precision, no time leaps and permanent availability are required.

The DTS 4135.timeserver is further equipped with two RS 232/485 serial outputs. Programmable messages with script file allow for synchronization of any kind of technical equipment like e.g. computer server, process controller, fire supervision system, …

To increase the precision of the synchronization, two high accurate pulse outputs are provided. They can either be used as DCF outputs (RS 422 and opto coupler) or periodical pulses.

Typical application e.g. for power distribution stations or energy production plants, industries…

DTS 4135.timeserver - Technical and performance details

Technical Data

Time signal outputs	NTP V4 (fully V3 compatible) / SNTP, NTP multicast DCF-time signal output (opto coupler passive) 2 x IRIG-B/AFNOR output, each with analogue (BNC) and DC level (RS 422 and opto coupler) output 2 x DCF 77, programmable pulses/frequencies (RS 422 and opto coupler) 2 x RS 232/485 serial message programmable by script file	IRIG-B122, IRIG-B123, AFNOR A, AFNOR C, DCF-FSK, …
DTS Link (Redundancy)	Max. length of the fiberglass cable, e.g. multimode fiber Ø 50 µm: multimode fiber Ø 62.5 µm:	max. 550 m max. 275 m
NTP-slave clock line	For slave clocks synchronized by NTP multicast or unicast (IP based). Timezone server function with up to 15 different time zone entries.	
Network services	NTP client NTP server, max. no. of NTP and SNTP client requests: SNMP V1, V2c, V3 (get, put, notification, trap) with MD5 authentic. and DES for encryption E-mail for alarm messages (2 addresses possible) DATE, TIME, FTP (for update)	typical > 250 requests/sec
Network Interface	10BaseT / 100BaseTX (IEEE 802.3) Data transmission rate: auto-negotiation / manual Connection: RJ45 (only shielded cable permitted)	
IP configuration	DHCP, static IPv4, IPv6	
Operation	Serial terminal via RS 232 (front side, sub-D 9p male) Via LAN: Telnet, SSH, SNMP (special software necessary) USB connector for software update, maintenance (config. and log files upload) or file download (e.g. telegram files…)	
LED indication	Power supply, synchronization status, LAN status, alarm, DCF input	
Display	Display for status information: Time, date, IP, alarm… (2 lines with 16 characters)	
Local time calculation	Automatic, preprogrammed daylight saving time change. Up to 80 pre-defined time zone entries and 20 user-definable entries. All outputs can be individually allocated to a time zone (UTC or local time)	
Accuracy	GPS (DCF input) to NTP server: GPS (DCF input) to DCF 77 / pulse output: NTP to internal time: Redundant operation: master to slave GPS (DCF input) to IRIG (analogue) GPS (DCF input) to IRIG (digital) Internal time to serial outputs (jitter: +/- 10ms)	typical < +/- 100 µs typical < +/- 10 µs typical < +/- 100 µs typical < +/- 1 µs typical < +/- 100 µs typical < +/- 10 µs typical < +/- 10 ms
Time-keeping (internal) DTS 4135 -> TCXO DTS 4136 -> OCXO	Synchronized with GPS: Hold over (after >24h synch. from GPS) at 20°C +/- 5°C: Hold over (after >24h synch. from GPS) at const. temp.: After restart without synchronization (for 24 hours) at 20°C +/- 5°C: Hold over (after >24h synch. from GPS) at 20°C +/- 5°C:	+/- 10 µs to UTC < +/- 10 ms/d or < 0.1 ppm < +/- 1 ms/d or < 0.01 ppm < +/- 250 ms/d or < 2.5 ppm < +/- 1 ms/d or < 0.01 ppm
External time source	External NTP / SNTP server (4 NTP sources possible), and / or DCF 77- time signal receiver (opto coupler, e.g. DCF 4500), or GPS time signal receiver (opto coupler, e.g. GPS 4500), or IRIG-B/AFNOR (analogue), or manual time setting (only for test purposes)	
Alarm relay	Potential free, opening contact for signalizing disturbances	open -> alarm
Alarm input	1 alarm input for monitoring of an external device, 18 - 36 VDC, max. 6 mA	input open -> alarm
Power supply	AC input: 85 to 265 VAC / 50 - 60 Hz / max. 15 VA 2 x DC input: 24 VDC + 20 % / - 10 % / max. 10 W DC output: nominal 28 VDC, max. 400 mA	
Dimensions	19" rack, 1 rack unit, W x H x D mm	483 x 44 x 125
Weight		approx. 1.8 kg
Power reserve	No internal active running reserve, timekeeping with RTC for short power outages	none
Ambient temperature	-5 to 50°C, 10 - 90 % relative humidity, without condensation	
Options	Mini GBIC module (GigaBit Interface Converter) SX LC 1000Mbps, 3.3V fibre optic cable, 2xLC/LC50/125µm patch cable FibreChannel duplex 100 cm	