Multi-purpose network master clock and time server

DTS 4132.timeserver

The DTS 4132.timeserver sets new standards as a time reference for NTP clients in medium and large networks (Ethernet/ IPV4/IPV6). With its high-precision and intelligent concept for redundant operation, it offers a high degree of reliability and availability.

Your benefits using DTS 4132.timeserver:
- Two completely separated LAN ports:
  – provides NTP in two different networks
  – can be synchronized over one LAN port and synchronize a separated network over the other LAN port

- Multi-purpose device due to the different time code outputs:
  – NTP (more than 1500 requests/s)
  – 2x MOBALine / impulse lines for slave clocks
  – 2x serial RS 232 / RS 422 / RS 485 interfaces
  – DCF current loop
  – DCF or highly accurate synchronization impulses (opto coupler, RS 422)
- High degree of system redundancy by connecting two DTS 4132 via fiber-optic link:
  – high availability
  – master-slave operation with automatic switch over in case of an error

DTS 4132.timeserver - Features

Time precision

Utmost accuracy is achieved with GPS synchronization. An intelligent time management ensures lasting high accuracy by continuously compensating quartz drift and aging.

The internal time is adjusted to the time reference (e.g. GPS) in one step or slowly shifted (in adjustable micro steps) to avoid any time leaps (e.g. after a longer loss of the time source).

Top performance for large networks

The high performance DTS 4132.timeserver can reply more than 1500 NTP and SNTP requests per second, which allows for the synchronization of several thousand clients.

It can also work as an NTP time reference for a network, being synchronized from a superior NTP-Server in a physically separated network (client and server at the same time).

NTP authentication

The DTS 4132 supports NTP authentication for increased security, which allows the clients to verify the source of the received NTP packets.
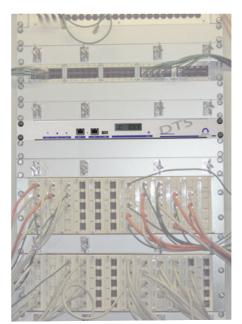
Safe and convenient operation

Operation over LAN via MOBA-NMS (SNMP), 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.

Fault indication

Alarms are reported via SNMP messages, e-mail or by alarm relay.

Additionally, the display can be used to check the alarm state by pressing the red push button.

Front view

Connectors:

- 2 LAN connectors RJ 45, 10/100 MBit Ethernet
- USB connector for software update, file upload to the time server (e.g. telegram files, time zone table...) and maintenance
- PC terminal connector, RS 232 Sub D 9p male

LEDs: Power, alarm, synchronization and network transmission control.

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

Rear view

Connectors:

- Power: Mains power connector, 2x DC power supply input, DC output (e.g. for GPS)
- Alarm: alarm relay contact, alarm input
- Synch. inputs: DCF current loop
- Synch. outputs: DCF current loop, DTS link (GBIC-module)
- Serial: 2x RS 232/485, for script file programmable serial message
- Clock lines: 2x MOBALine or impulse line
- Pulses: 1x DCF or pulse/frequency output (RS 422 & opto coupler)

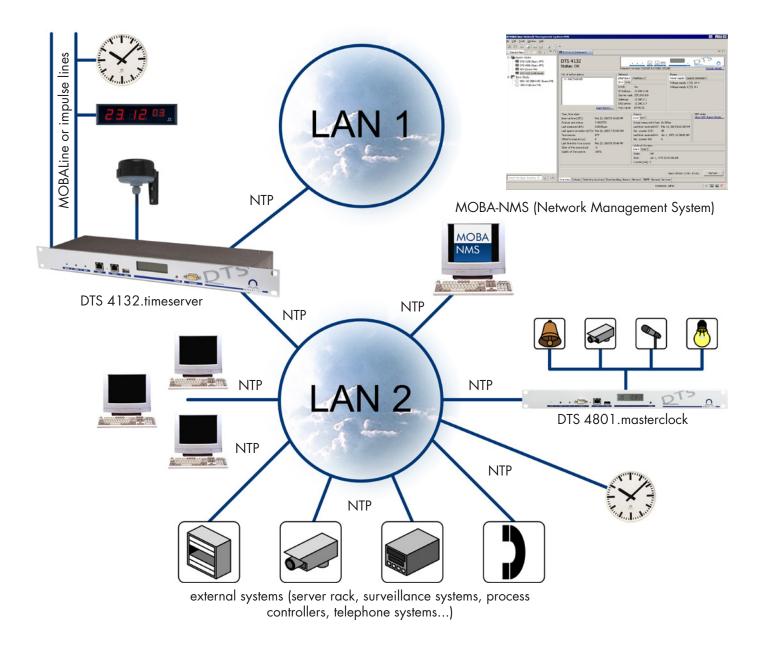

DTS device mounted in a 19" IT-Rack

DTS 4132.timeserver - Network time server application

The DTS 4132.timeserver is a versatile time reference in several respects.

It relays the external time signals with high precision and reliability directly to 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 synchronization.

It can also synchronize slave clocks with two MOBALine or impulse outputs. Slave master clocks can be synchronized via NTP or DCF current loop.

Furthermore, PCs/workstations, photocopiers, printers, fax equipment, time recording terminals, access control systems, central fire alarm systems, image and sound recording equipment and

many other kinds of clients in the network can be directly synchronized by means of the network time protocol (NTP).

MOBALine or impulse lines

DTS 4132.timeserver

MOBA-NMS (Network Management System)

LAN 1

LAN 2

NTP

DTS 4801.masterclock

external systems (server rack, surveillance systems, process controllers, telephone systems...)

DTS 4132.timeserver - Redundant operation

Description

To avoid time deviation between two DTS 4132.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 a failure of the synchronization source (GPS or NTP), automatic swap between master and slave state will occur. The parameters for the swap can be configured.The "master" DTS time server always has the better NTP stratum level than the slave.

LAN 1 and LAN 2 are always synchronized by the same time server.

Possible synchronization sources

- 2 GPS receivers
- 2 external NTP servers
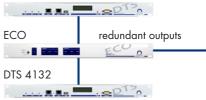
Redundant power

The DTS 4132.timeserver has two monitored inputs for entirely redundant power supply. The stand-by power supply input is also monitored. Possible power variants:

- 24 VDC, non-redundant
- 24 VDC + 24 VDC, redundant
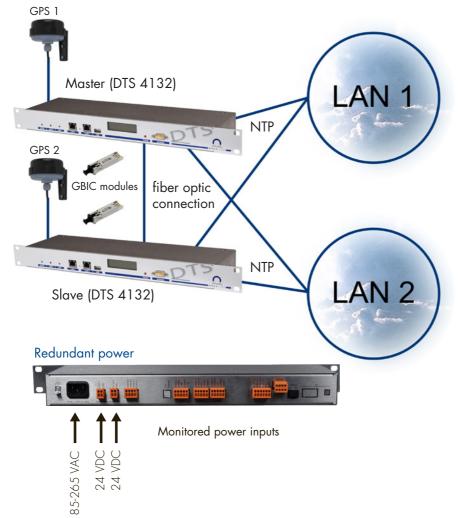- 230 VAC + 24 VDC, redundant

Redundant outputs

Redundant MOBALine, serial telegram, DCF and/or pulse/frequency outputs can be achieved by the external change over unit (ECO).

DTS 4132

ECO   redundant outputs

DTS 4132

Redundant operation with GPS synchronisation source

GPS 1

Master (DTS 4132)

LAN 1

NTP

GPS 2

GBIC modules   fiber optic connection

NTP

LAN 2

Slave (DTS 4132)

Redundant power

Monitored power inputs
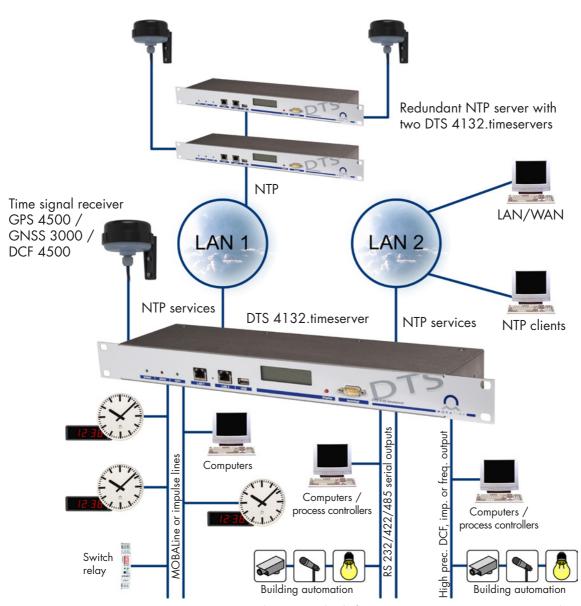
85-265 VAC

24 VDC

24 VDC

DTS 4132.timeserver - Master clock application

The DTS 4132.timeserver features two MOBALine outputs to synchronize self-setting analog and digital slave clocks, switch relays and various time code interfaces.

Alternatively, conventional impulse clocks can be synchronized.

The DTS 4132 also features two programmable RS 232/422/485 serial outputs (message definable by script file), for synchronization of any kind of technical equipment like e.g. computer server, process controller, fire alarm system …

For utmost precision of the synchronization, one high accurate pulse output is provided. It can either be used as DCF output (RS 422 and opto coupler) or for periodical pulses or frequencies.

Typical applications are industries, railways, metros, airports, hospitals, schools etc., where high reliability, high precision, no time leaps and permanent availability combined with slave clock lines are requested.

DTS 4132.timeserver as NTP server and master clock features two MOBALine or impulse line outputs, two RS 232/422/485 serial interfaces and one technical pulse or frequency output.

DTS 4132.timeserver - Technical details

Technical Data		
Time signal outputs (short-circuit proof)	NTP V4 (fully V3 compatible) /SNTP, NTP multicast, physically separated	2
	DCF time signal output (current loop passive, galvanic separation)	1
	DCF, programmable pulses/frequency (RS 422 and opto coupler)	1
	RS 232/422/485 serial message programmable by script file (RS 422 output only)	2
	MOBALine/impulse/DCF active, for up to 100 slave clocks, current limit adjustable	2
	MOBALine: max. output current (sum):	700 mA
	Impulse: minute, half minute or second impulses, 24 V polarized, max. output current (sum):	1 A
	DCF active: bipolar/unipolar/inverted, max. output current (sum):	1 A
DTS Link (Redundancy)	Length of the fiberglass cable, e.g. multimode fiber Ø 50 µm:	max. 550 m
	multimode fiber Ø 62.5 µm:	max. 275 m
NTP-slave clock line	For slave clocks synchronization by NTP multicast or unicast (IP based)	
	Time zone server function with up to 15 different time zone entries.	
Network services	NTP server, max. no. of NTP and SNTP client requests:	typical > 1500 request/sec
	NTP client	
	SNMP V1, V2c, V3 (get, put, notification, trap) with MD5 authentication and DES for encryption	
	E-Mail for alarm messages (2 addresses possible)	
	DATE, TIME, FTP (for update)	
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: MOBA-NMS, 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:	typical < ± 100 µs
	GPS (DCF input) to DCF / pulse output:	typical < ± 10 µs
	NTP to internal time:	typical < ± 100 µs
	Redundant operation: master to slave	typical < ± 1 µs
	GPS (DCF input) to MOBALine/impulse	typical < ± 10 ms
	Internal time to serial outputs (jitter: ± 10 ms)	typical < ± 10 ms
Time keeping (internal) TCXO	Synchronized with GPS:	± 10 µs to UTC
	Hold over (after > 24h synch. from GPS) at 20°C ± 5°C:	< ± 10 ms/d or < 0.1 ppm
	Hold over (after > 24h synch. from GPS) at constant temperature:	< ± 1ms/d or < 0.01 ppm
	After restart without synchronization (for 24h) at 20°C ± 5°C:	< ± 250 ms/d or < 2.5 ppm
External time source	External NTP / SNTP server (4 NTP sources possible), or	
	DCF 77 time signal receiver (opto coupler, e.g. DCF 4500), or	
	GPS time signal receiver (opto coupler, e.g. GPS 4500, GNSS 3000), or	
	Manual time setting (only for test purposes)	
Alarm output	Relay: potential free, opening contact for signalizing disturbances	open -> alarm
	SNMP traps and/or mail	
Alarm input	1 alarm input for monitoring of an external device, 18 - 36 VDC, max. 6 mA	input open -> alarm
Power supply	Redundant power supply (mains/DC or DC/DC)	
	AC input: 85-265 VAC / 50-60 Hz / max. 15 VA	
	2 x DC input: 24 VDC +20 % / -10 % / max. 10 W	
	DC output: DC input voltage -2 V, max. 400 mA	
Dimensions	19" rack, 1 rack unit, W x H x D	483 x 44 x 125 mm
Weight		approx. 1.8 kg
Power reserve	No internal active running reserve, timekeeping with RTC for short power outages	
Ambient temperature	0.. 60°C, 10 - 90 % relative humidity, without condensation	
Options	Mini GBIC module (GigaBit Interface Converter) SX LC 1000Mpbs, 3.3V	
	fiber optic cable, 2xLC/LC50/125µm patch cable FiberChannel duplex 100 cm	

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