MOBATIME

SWISS TIME SYSTEMS

HIGH-PRECISION TIME SERVER, GRANDMASTER & PRTC

DTS 4210.TIMECENTER

The DTS 4210.timecenter is a combined time distribution and synchronization device with up to 16 network ports (IPv4/IPv6). With its high-precision and intelligent concept for redundant operation, it offers a high degree of reliability and availability.

HIGHLIGHTS

PTP GRANDMASTER AND PRTC

The DTS 4210 is a primary reference time clock (PRTC) and PTP grandmaster according to IEEE 1588-2008 / PTPv2, with IEEE 1588-2019 / PTPv2.1 compability, for the synchronization of highly accurate clients. Usable for telecom (e.g. 5G), energy (e.g. smart grid), automation etc.

HIGH-PERFORMANCE NTP SERVER

The DTS 4210 can reply to more than 20'000 NTP and SNTP requests per second (up to 600'000 clients depending on NTP client configuration).

REDUNDANT LINK

For utmost availability, two DTS 4210 can be connected to offer redundant master-slave operation with automatic switch over in case of an error.

GNSS RECEIVER

The DTS 4210 can receive all GNSS L1 systems (GPS+QZSS/SBAS, Galileo, GLONASS, BeiDou), guaranteeing utmost accuracy and availability.

GNSS SECURITY / GNSS SIGNAL FIREWALL

Enhanced Protection against RF Layer attacks and anomalies, optional one-time licensed feature.

NETWORK SERVICES

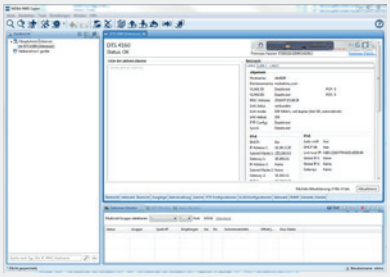
The DTS 4210 offers state-of-the-art network services such as VLAN, link aggregation, and static routing.

OSCILLATOR

The DTS 4210 features a high-precision rubidium oscillator for the best possible stability in holdover mode.

LEGACY OUTPUTS

The DTS 4210 supports legacy outputs such as IRIG, E1, DCF, pulse, and frequency.

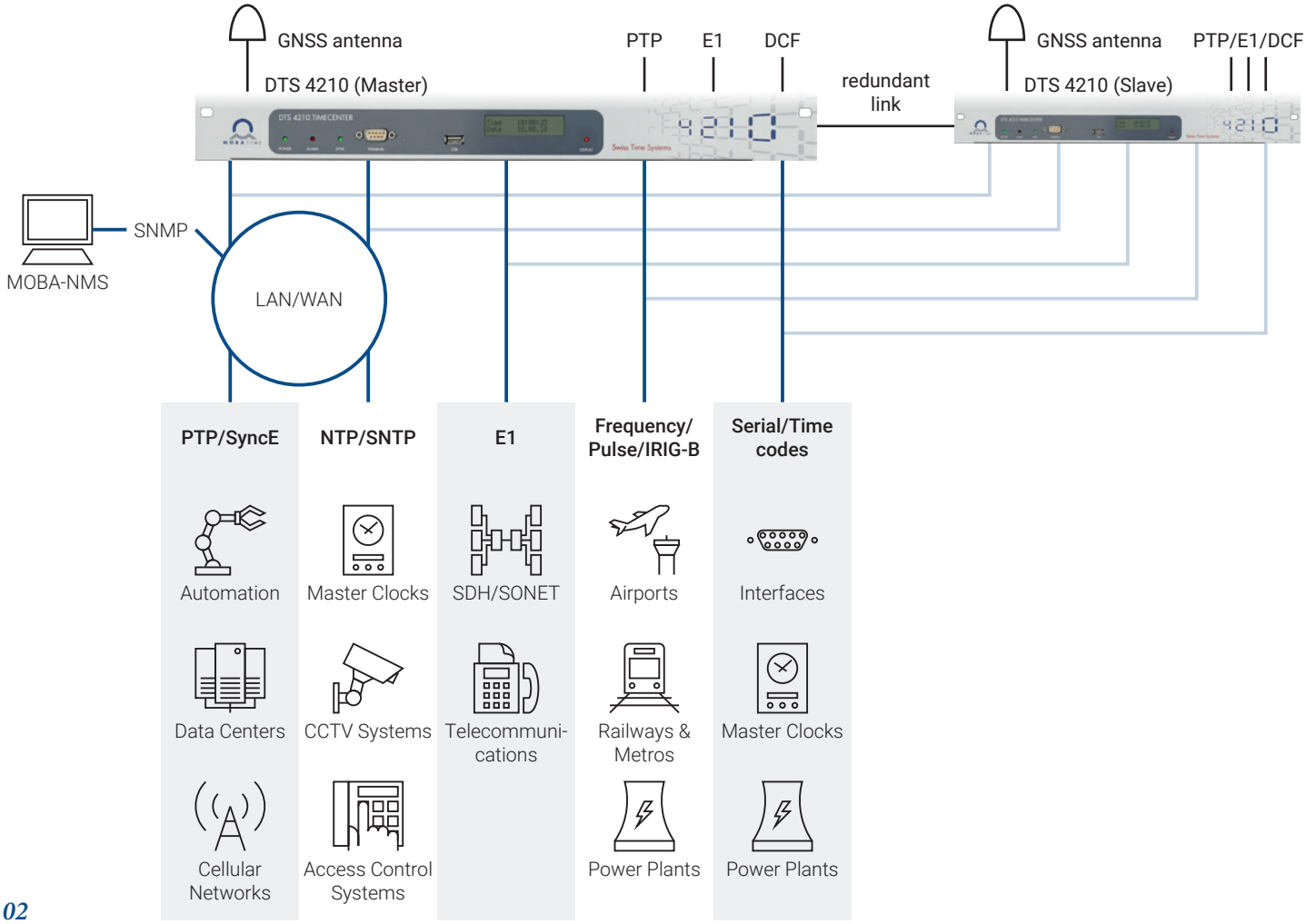


NETWORK MANAGEMENT SYSTEM

MOBA-NMS

The DTS 4210.timecenter can be fully monitored, configured and controlled using the Mobatime Network Management System software (MOBA-NMS).

APPLICATIONS



TECHNICAL DATA

HIGH-PRECISION RUBIDIUM

Oscillator

DTS 4210c	Rubidium
Aging	+/- 2.5*10^{-11}/day +/- 1*10^{-9}/year
Holdover[1]	< +/- 0.9 µs/day
ITU-T	G.811[3], G.8272[3]

[1] After 30 days of synchronization; for more detail, see product manual
[2] Typically fulfilled while GNSS synchronization is active
[3] For more information, see product manual

MECHANICAL DATA AND ENVIRONMENT

General data

Dimensions: 483 x 178 x 190 mm (19", 4U)
Weight: 5.6 kg
Housing material: Stainless steel
Protection degree: IP 20
Operating temperature: 0–50 °C
Operating humidity: 10–90 % relative, no condensation
Power supply: 2x 90–240 VAC or 80–240 VDC, 0.5 A; 2x 24–28 VDC, 2 A (redundant, supervised)
MTBF: > 250 000 h

STANDARDS

Conformity

The DTS 4210.timecenter conforms to the following agency approvals[1]:

CE, UKCA, CB, RoHS, WEEE
EMC: EN 50121-4[2], EN 61000-6-4, EN 61000-6-2
Safety: IEC 62368

[1] For full list, see product manual
[2] Not included in CB certificate

REFERENCE SIGNAL INPUTS

- 1x GNSS RF input (for GNSS antenna) to internal GNSS receiver, 92 channels, tracking sensitivity -167 dBm
- 1x connection to second DTS 4160.grandmaster (SFP) – redundant link
- 1x PTP (from other PTP grandmaster, as PTP slave)
- 1x DCF current loop (e.g. GNSS 4500)
- 1x E1 (for holdover enhancement only)
- 1x F-IN (1 PPS, 10 MHz, 2.048 MHz) (for hold-over enhancement only)

REFERENCE SIGNAL OUTPUTS - NETWORK

- PTP grandmaster (E2E, P2P, 1-step, 2-step, multicast, layer 2, IPv4/IPv6)
- PTP profiles: default E2E/P2P; power utility (IEEE/IEC 61850-9-3); telecom ITU-T G.8265.1, G.8275.1, G.8275.2; gPTP IEEE 802.1AS
- SyncE master, ESMC (SSM)
- NTP server (<20'000 requests/second on all 16 ports combined)
- NTP mode: Server, Peer, Broadcast, Multicast / SNTP / MD5 and SHA1 authentication for NTP
- TIME (RFC 868), DAYTIME (RFC 867)
- IEEE/IEC 61850-9-3 (only with NTP/SNTP/PTP synchronization)

REFERENCE SIGNAL OUTPUTS - NON-NETWORK

- 4x IRIG-B, precision output (AM/DC)
- 8x precision pulse/frequency output
- 8x serial output with configurable time telegrams, RS-232/422/485
- 4x DCF77
- 1x E1 (Option: +3x E1/2.048 MHz (as E1 unframed), compatible with ITU-T G.811, G.812, G.813; unprotected output (1:1), SSM only quality level option I (ITU-T G.781/704)

NETWORK INTERFACE

- 12x 100/1000BaseT
- 4x SFP for miniGBIC module 100/1000Base-T(X) or FX

NETWORK FEATURES

- PTP grandmaster / SyncE master / NTP V4/V3 server (RFC 5905/1305) / SNTP (RFC 4330)
- IP configuration: IPv4 (DHCP, static IP), IPv6 (autoconfiguration, DHCPv6, static IP)
- Link aggregation (IEEE 802.3ad) over 8 dedicated LAN interfaces
- VLAN: prioritized (IEEE 802.1p), tagged (IEEE 802.1Q)
- Static routing
- IGMP / Multicast (RFC 3376, 1112, 4601, 3973)

ALARMS

- Electrical output: relay contact
- Network outputs (LAN 1–3): SNMP notifications (Traps) V2c, Mail (RFC 4954, 2195)
- Alarm LED

ACCURACY (TYPICAL VALUES)

- Internal
  - GNSS to internal time: < +/- 30 ns
  - Redundant connection to internal time: < +/- 50 ns
  - PTP to internal time: < +/- 200 ns
  - DCF to internal time (with GNSS 4500): < +/- 200 ns (after compensation for fix offset)
  - E1 to internal time: < +/- 200 ns (frequency only)
  - F-In to internal time: < +/- 200 ns (frequency only)
- Time signal output
  - GNSS to NTP: < +/- 100 µs
  - GNSS to PTP: < +/- 0.25 µs
  - GNSS to DCF: < +/- 5 µs
  - GNSS to pulse: < +/- 5 µs
  - GNSS to IRIG (AM): < +/- 200 µs
  - GNSS to IRIG (DC): < +/- 1 µs
  - Pulse/frequency output, BNC & RS422: < +/- 200 ns
  - Pulse/frequency output, Current Loop: < +/- 10 µs
  - GNSS to serial output: < +/- 10 ms (Jitter <10 ms)

MANAGEMENT & SUPERVISION

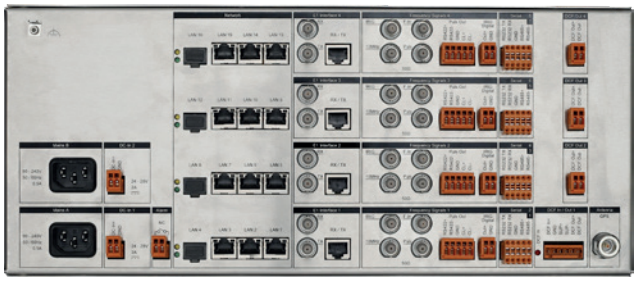
- MOBA-NMS; monitoring possible
- Terminal menu: Serial connector (RS-232), SSH, Telnet
- SNMP (v1/v2c/v3), SNMPv3 with authentication and encryption
- System firmware download via SCP, SFTP or FTP
- LEDs: Alarm, Power, Sync

SECURITY

- Configuration and log files are stored on non-volatile memory in order to survive power failures
- See Mobatime security guideline (available on request)
- SNMPv3, SCP, SSH, NTP authentication
- MOBATIME GNSS Security Feature (GNSS Signal Firewall) , one-time licensed feature (see LE-801399 for more details)

INTERFACES

1 2 3 4 5



6 7 8 9 10 11 12 13 14 15 16

1	**Status LEDs**	Power (green), alarm (red), synchronization (green)	
2	**Terminal**	RS232 interface for local management, D-Sub 9 connector	
3	**USB**	USB host for USB flash drive	For firmware updates and log files
4	**Display**	LCD, 2 lines with up to 20 characters (with backlight)	For status, time and network configuration info
5	**Display button**	For display illumination and paging through information displays	
6	**Mains power supply (2x)[1]**	C14 plug	90–240 VAC, 50/60 Hz or 80–240 VDC 0.5 A
7	**DC power supply (2x)[1]**	2-pin terminals	24–28 VDC 2 A
8	**Alarm contact**	2-pin terminal	Normally closed Max. load: 30 W (30 VDC or 1 A) / 60 VA (60 VAC or 1 A)
9	**LAN 1**	RJ45 100/1000MBit	Management/NTP
	LAN 2	RJ45 100/1000MBit	Management/NTP/PTP/LAG1
	LAN 3	RJ45 100/1000MBit	Management/NTP/PTP/LAG1
	LAN 4	SFP	NTP/PTP/Redundant link
	LAN 5	RJ45 100/1000MBit	NTP/PTP
	LAN 6	RJ45 100/1000MBit	NTP/PTP/LAG2
	LAN 7	RJ45 100/1000MBit	NTP/PTP/LAG2
	LAN 8	SFP	NTP/PTP
	LAN 9	RJ45 100/1000MBit	NTP/PTP
	LAN 10	RJ45 100/1000MBit	NTP/PTP/LAG3
	LAN 11	RJ45 100/1000MBit	NTP/PTP/LAG3
	LAN 12	SFP	NTP/PTP
	LAN 13	RJ45 100/1000MBit	NTP/PTP
	LAN 14	RJ45 100/1000MBit	NTP/PTP/LAG4
	LAN 15	RJ45 100/1000MBit	NTP/PTP/LAG4
	LAN 16	SFP	NTP/PTP

10	**E1**	2x BNC (female), 75 Ω	Tx/Rx, unbalanced, ITU-T G.703
		RJ48, 120 Ω	Tx/Rx, balanced, ITU-T G.703
	E1 (option)	6x BNC (female), 75 Ω	Tx/Rx, unbalanced, ITU-T G.703
		3x RJ48, 120 Ω	Tx/Rx, balanced, ITU-T G.703
11	**IRIG output (4x)[2]**	BNC (female), 50 Ω	IRIG-B1xx (AM), AFNOR A/C (AM)
	10MHz output (4x)	BNC (female), 50 Ω	10 MHz, 2.048 MHz, 2 Hz, 1 PPS
	Frequency input (4x)	BNC (female), 50 Ω	10 MHz, 2.048 MHz, 1 PPS
	Pulse output (4x)[3]	BNC (female), 50 Ω	10 MHz, 2.048 MHz, 2 Hz, 1 PPS
12	**Pulse output (4x)[3]**	5-pin terminal	RS-422 (10 MHz, 2.048 MHz, 2 Hz, 1 PPS) Current loop (2 Hz, 1 PPS)
13	**IRIG digital output (4x)[2]**	2-pin terminal	IRIG-B00x (DC), AFNOR-A/C (DC) (digital, 50 Ω, TTL)
14	**Serial output (8x)**	10-pin terminal	RS-232/422/485 RS-422: output only
15	**DCF In/Out (4x)**	6-pin terminal	DCF current loop input for the connection of a GNSS 4500
			DCF output, current loop passive
			DC output (28 VDC, max. 100 mA), e.g. GNSS 4500
			LED showing DCF signal
16	**GNSS input[4]**	Type N (female), 50 Ω	GNSS antenna signal Antenna supply max. 5 V/100 mA

[1] Redundant, monitored
[2] Signal configuration is identical for analog and digital IRIG (11, 13)
[3] Signal configuration is identical for both pulse outputs (see manual) (11, 12)
[4] For available accessories, see product manual

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Do you have any questions?
We are happy to help.

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