MULTI-PORT TIME SERVER & GRANDMASTER

DTS 4150.GRANDMASTER

The DTS 4150.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.

HIGHLIGHTS

PTP GRANDMASTER

The DTS 4150 is a PTP grandmaster according to IEEE 1588-2008 / PTPv2, with IEEE 1588-2019 / PTPv2.1 compability, for the synchronization of highly accurate clients. Usable for data centers, energy (e.g. smart grid), automation etc.

HIGH-PERFORMANCE NTP SERVER

The DTS 4150 can reply to more than 10'000 NTP and SNTP requests per second (up to 600'000 clients depending on NTP client configuration).
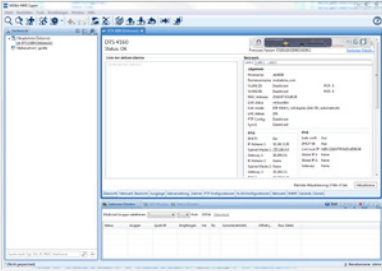
REDUNDANT LINK

For utmost availability, two DTS 4150 can be connected to offer redundant master-slave operation with automatic switch over in case of an error.

GNSS RECEIVER

The DTS 4150 can receive all GNSS L1 systems (GPS+QZSS/SBAS, Galileo, GLONASS, Bei-Dou), guaranteeing utmost accuracy and availability.
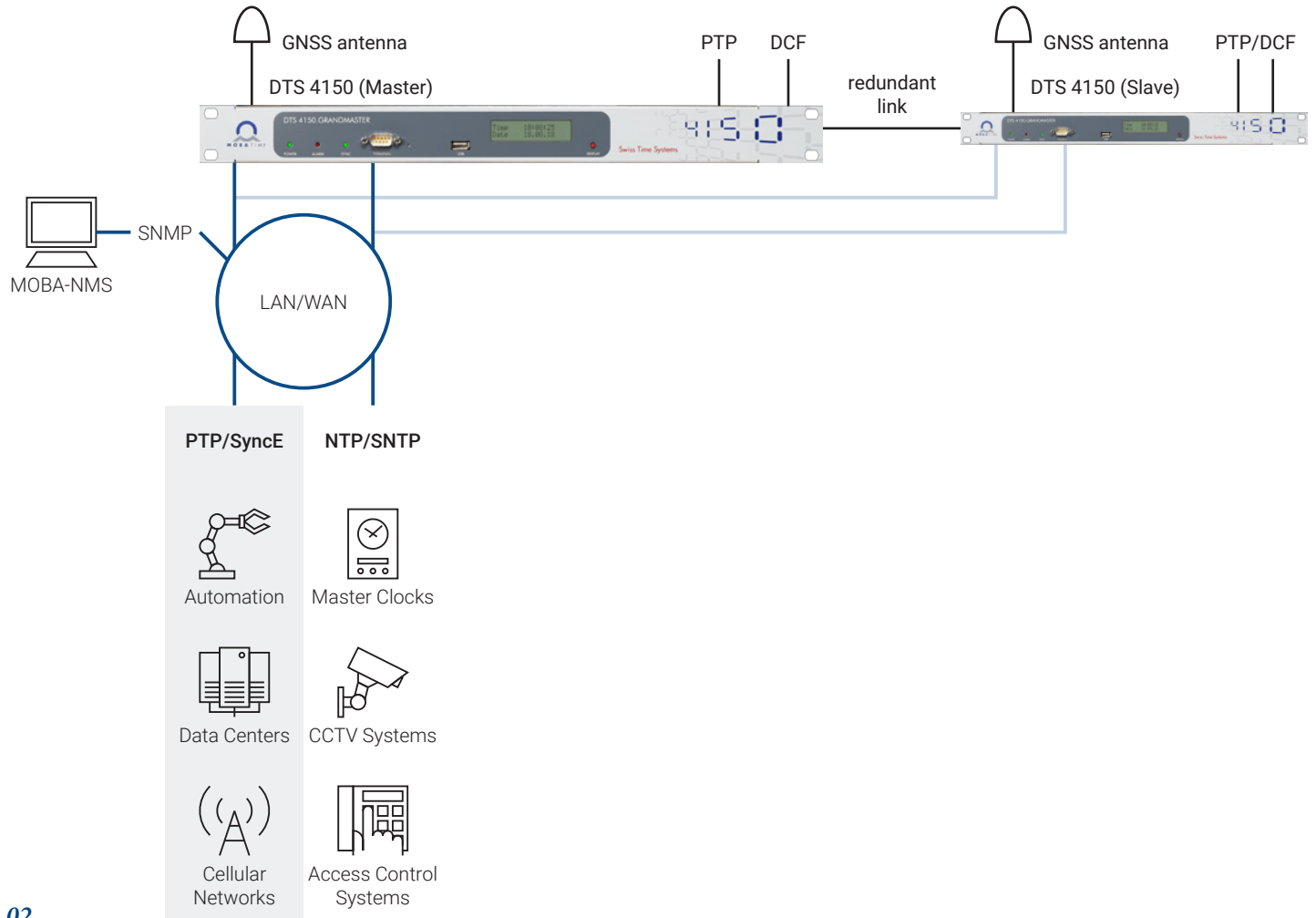
NETWORK SERVICES

The DTS 4150 offers state-of-the-art network services such as VLAN, link aggregation, and static routing.

NETWORK MANAGEMENT SYSTEM

MOBA-NMS

The DTS 4150.grandmaster can be fully monitored, configured and controlled using the Mobatime Network Management System software (MOBA-NMS).

APPLICATIONS

TECHNICAL DATA

MECHANICAL DATA AND ENVIRONMENT

General data

Dimensions: 483 x 44 x 190 mm (19", 1U)
Weight: 1.9 kg
Housing material: Stainless steel
Protection degree: IP 20
Operating temperature: 0–50 °C
Operating humidity: 10–90 % relative, no condensation
Power supply: 90–240 VAC, 0.5 A; 24–28 VDC, 2 A (redundant, supervised)
MTBF: > 250,000 h

STANDARDS

Conformity

The DTS 4150.grandmaster 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 4150.grandmaster (SFP) – redundant link
- 1x PTP (from other PTP grandmaster, as PTP slave)
- 1x DCF current loop (e.g. GNSS 4500)

REFERENCE SIGNAL OUTPUTS - NETWORK

- PTP grandmaster (E2E, P2P, 1-step, 2-step, multicast, layer 2, IPv4/IPv6) (LAN 2–4)
- 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 (<10'000 requests/second on all 4 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

- 1x DCF77

NETWORK INTERFACE

- 3x 100/1000BaseT (LAN 1–3)
- 1x SFP for miniGBIC module 100/1000Base-T(X) or FX (LAN 4)

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 2 / dedicated LAN interfaces (LAN 2 & 3)
- 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

OSCILLATOR STABILITY

- Holdover (after 24h synchronization) at constant temperature < +/- 10ms / <0.1ppm

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)
- Time signal output
  - GNSS to NTP: < +/- 100 µs
 - GNSS to PTP: < +/- 0.25 µs
  - GNSS to DCF: < +/- 5 µs

MANAGEMENT & SUPERVISION

- MOBA-NMS; monitoring possible with MOBA-DSS (included in MOBA-NMS EXPERT)
- 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

INTERFACES

DTS 4150.GRANDMASTER

| 1 | 2 | 3 | 4 | 5 |

| 6 | 7 | 8 | 9 | 10 | 11 |
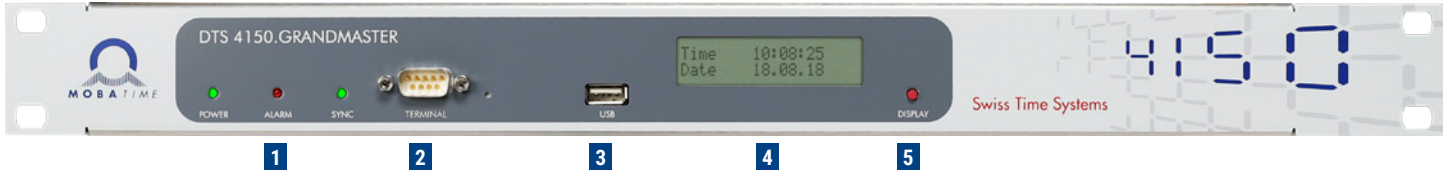
1	**Status LEDs**	Power (green), alarm (red), synchronization (green)	
2	**Terminal**	RS232 interface for local management, D-Sub 9 connector	
3	**USB**	USB host for USB flash drive	For firmware updates and log files
4	**Display**	LCD, 2 lines with up to 20 characters (with backlight)	For status, time and network configuration info
5	**Display button**	For display illumination and paging through information displays	
6	**Mains power supply[1]**	C14 plug	90–240 VAC, 50/60 Hz 0.5 A
7	**DC power supply[1]**	2-pin terminal	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/LAG
	LAN 3	RJ45 100/1000MBit	Management/NTP/PTP/LAG
	LAN 4	SFP	NTP/PTP/Redundant link

10	**DCF In/Out**	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

11	**GNSS input[2]**	SMA (female), 50 Ω	GNSS antenna signal Antenna supply max. 5 V/100 mA

[1] Redundant, monitored
[2] For available accessories, see product manual

MOBATIME