masibus®

A Sonepar Company

MTS300R

Redundant Master Time Sync Unit

High Performance. Accurate. Redundant.

Masibus MTS300R is GPS based time server available in redundant and non-redundant options, capable for the time synchronization requirements in various industries like Power, IT, Process, Telecommunication sector etc.

MTS300R is housed in a compact 19", 3U rack mounted package that can accommodate power supply card slots, GPS receiver/clock Card slots, single CPU card (with internal intelligent switch Card) and other multiple optional output cards.

MTS300R when considered with redundant option, provides complete redundancy over Power supply and GPS receiver functionality for reliable and continuous operation. CPU card has intelligent switching facility capable of handling GPS receiver redundancy logic along with each clock card healthy LED indication and serial output. In addition to above, it provides flexibility to choose from available different output card options like 1PPS, IRIG-B TTL/AM, NTP, Serial (RS232/RS485), Event/Relay, PTP, Pulse FO, 2.048 MHz frequency (E1) output

MTS300R has a 20 x 4 LCD display for viewing of time parameters, status of GPS receiver parameters and output ports, discrete LEDs in front and rear panel provide status information. The GPS Clock Card is TCXO based built-in RTC backed up with on board rechargable battery to maintain time during power loss and instant recovery on power resumption.

MTS300R is a Stratum1 GPS based full featured NTP Server for synchronizing all types of NTP and SNTP clients in LAN. NTP v2/v3 and v4 with all modes (Unicast / Broadcast / Multicast) and all necessary MD5 based authentication mechanisms are provided in MTS300R. It is also capable to record and log internal CPU clock drift and accuracy statistics and displays it graphically on MTS300R webserver.

MTS300R provides secured access for device configuration and management through SSH, SCP, HTTPS. It has full featured SNMP protocol with encryption DES/AES and authentication SHA/MD5 mechanism. Device configuration through SSH, Telnet and webserver is MD5 based password protected.

MTS300R is simple to install and easy to manage. Front panel controls allows network configuration and other set-up parameters. DHCP and IPv6 [AUTOCONF] feature capability makes MTS300R easy & ready to use on client network. Further, MTS300R can be completely configured remotely through Webserver, SSH, SNMP, Telnet & Serial port. MTS300R can send notifications regarding various internal alarms to remote servers through SYSLOG and SNMP as well as logs it internally for future reference.

Features

- GPS based time Server available in Redundant & Non-Redundant options
- Internal Comparator / Switching module
- Auto / Manual with Clock1/Clock2 switch for receiver selection
- 12 Satellite parallel tracking
- 20 x 4 LCD Display with Status LED's
- Redundant or Independent Ethernet port
- NTP v2/v3/v4 with MD5 authentication with symmetric and autokey management
- Secured Web server
- IPv4, IPv6, UDP, TCP, SNMP, SSH, SCP, HTTP, HTTPS, SYSLOG, Telnet, FTP networking protocols
- Remote Alarm notifications via SNMP, SYSLOG
- Remote configuration using SSH, Web, SNMP, Telnet
- USB Port
- Universal Time-zone and DST Settings
- Supports synchronization of IEC61850 compliant devices via NTP/SNTP protocol
- Highly accurate TCXO Type crystal (OCXO Optional)
- Compact 19", 3U Rack mount enclosure
- NTP Client Synchronization software
- Diagnostic Relay outputs
- Supporting Time Protocol options:
    - NMEA [GPRMC, GPZDA, GPGGA], NGTS, T-FORMAT
    - IRIG-B Modulated
    - IRIG-B TTL
    - SNTP/NTP
    - PTPv2
    - 2.048 MHz frequency output (ITU-T G.703 Standard)

Applications

Time synchronization of

- Sequence of Event recorders, Disturbance recorders, PMU
- Numerical relays, Slave clocks
- UNIX, Linux, Solaris& Windows servers
- PLC/DCS/SCADA,ABT metering
- Telecommunication, Synchrophasor measurement
- EMS system, Fault locator

TECHNICAL SPECIFICATIONS

GPS Receiver	
Timing Accuracy	15ns with GPS Receiver (Receiver is locked on fixed position)
Positioning Accuracy	< 10m
Input Frequency	1575.42 MHz, L1 C/A code
Tracking	12 parallel channels
Acquisition time	Hot Start < 5 Sec, Warm Start < 38 Sec, Cold Start < 45 Sec
Satellites reception capability	GPS, GLONASS (Optional)

Antenna	
Type	Active L1. GPS, 30 dB gain
Antenna Cable type	RG 6
Operating Temperature	-40 to +85°C
Coverage	360 Degree
Ingress Protection	IP67
Weight	150 g

Interface and Configuration	
Display	4 x 20 Character backlit LCD Display
Displayed data	Local / UTC time and date Day of the week Status of the GPS receiver, Position latitude, longitude Configuration parameters.
Status LEDs	Front Panel - Power, Event, GPS Locked, Error, Network Rear Panel – Each card having Power and Status LED indicators as per card functionality
Redundancy	Power Supply redundancy GPS receiver Clock module with individual GPS Antenna connector Configurable Ethernet port Auto / Manual Switch to automatic or manual selection of GPS Clock module Clock 1 / Clock 2 switch to select preferable GPS clock module when MANUAL switch is selected
Configuration Methods	Front Keypad, Front Console DB-9 Port (Serial RS232) Web server (HTTP/HTTPS), SSH, SNMP, TELNET (Ethernet RJ45 Port)
Keypad Configurable Parameters	Universal time zone correction, DST Settings Hour settings for Display (12 or 24 format), UTC/LOCAL time display Data format selection (NGTS/T-FORMAT/GPGGA/GPZDA) Additional Event Configuration (Total & On time of Events) Manual Time setting, Propagation delay correction (compensation for antenna cable length) IPv4 Network parameters [IP, Subnet, Gateway], DHCP, IPv6 Network address and settings Ethernet protocols (NTP, SNMP, Syslog, SSH, HTTPS) configuration
Network Protocols	IPv4, IPv6, TCP, UDP, DHCP, AUTCONF(IPv6), Telnet, SSH NTP v2[RFC 1119], v3[RFC 1305] and v4[RFC 5905] with Unicast, Broadcast / Multicast Modes SNMP v1[RFC 1157], v2[RFC 1901-1908] and v3[RFC 3411-3418] with Enterprise MIB file SNMP v1, v2 and v3 compatible Traps with two configurable SNMP Trap Managers SYSLOG for internal and remote Alarm logging SSH v1, v2, Telnet for remote configuration PTPv2 Master - IEEE C37.238-2011, IEEE C37.238-2017, IEC 61890-3 (except SNMP & PRP) Webserver through HTTP and HTTPS – Browser based Configuration & monitoring
Network Security Features	Configurable MD5 based encrypted password user access to SSH, Telnet and Webserver access NTP v3,v4 MD5 Authentication with Symmetric and Autokey Management SNMP v3 - AES/DES Encryption and SHA/MD5 Authentication Configurable SSH v1, v2 security keys and HTTPS SSL certificate
Logging & Alarms	100Kbytes of internal log memory Alarms, system Messages internal & remote logging feature with two configurable SYSLOG servers Remote Alarm Notification through SNMP Traps and SYSLOG
NTP / SNTP Client Software	Platform Support: Windows 10/8.1/7 SP1/ Windows Server 2012 R2/ 2008 R2 SP1 Unix Linux, Solaris server synchronization
USB Port	1 x USB Port on front panel for Download/ Upload of configuration files, Install firmware upgrades
Firmware Upgrade	Via Webserver, USB

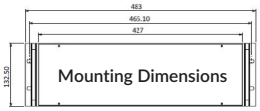
Power Supply Card

Input	Output
Standard: 90 - 264 V AC / 125- 370 V DC, 65W Option 1: 18 - 36 V DC, 50W Option 2: 36 - 75 V DC, 50W	Power LED status, Power Fail Relay output Relay Rating: 230 V AC / 30V DC @ 2A; 110V DC@0.3A; 220 V DC@ 0.12 A (max) Plug in screw terminals AWG max. 2.5 mm^2

Isolation (Withstanding voltage)

Between primary terminals* and secondary terminals**: **At least 1500 V AC for 1 minute**
Between primary terminals* and grounding terminal: **At least 1500 V AC for 1 minute**
Between grounding terminal and secondary terminals**: **At least 1500 V AC for 1 minute**
Between secondary terminals**: **At least 500 V AC for 1 minute**
* Primary terminals indicate power terminals and relay output terminals
**Secondary terminals indicate Output Ports
Insulation resistance: 50MΩ or more @ 500 V DC between power terminals and grounding terminal

Physical	
Mounting	3U, 19" Rack Mount
Dimensions (mm)	133(H) x 483(W) x 240(D)
Ingress protection	IP20 enclosure



Environmental	
Operating temperature	0 to +55°C
Storage temperature	-20 to +80°C
Humidity	20-90% RH Non Condensing

TECHNICAL SPECIFICATIONS

CPU Card

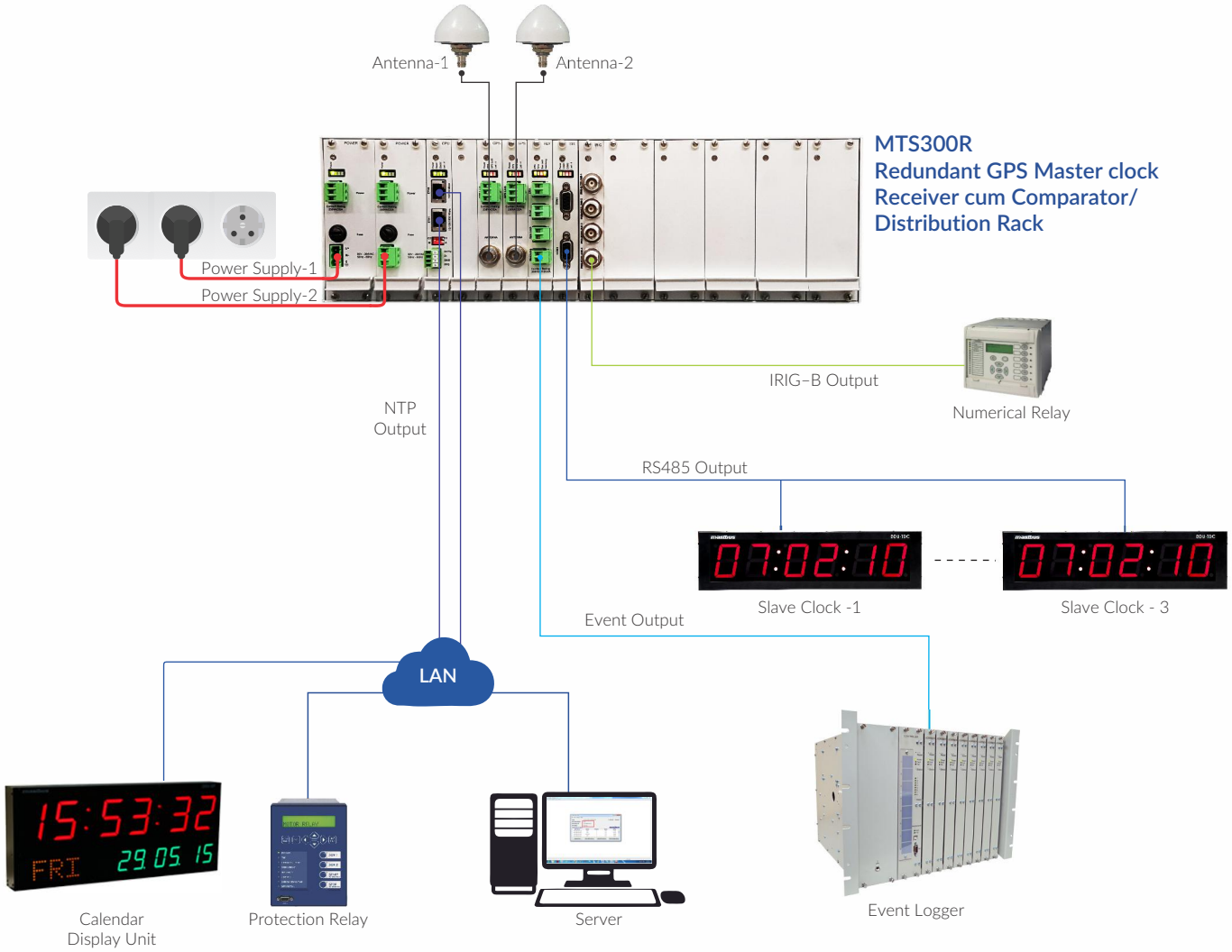
Output	Description	Connector	Accuracy (to UTC)	Output Per Card
ETHx (LAN)	IPv4, IPv6, DHCP, NTP, SNMP, Webserver, SSH, Telnet Mode: Server Network Interface: RJ45, Auto-negotiation 1st port 10/100 Mbps 2nd port 10/100 Mbps or 1 Gbps (Optional)	RJ45	±1mSec [NTP Server]	1 x 10/100 Mbps or 2 x 10/100 Mbps (Optional) or 1 x 10/100 Mbps + 1 x 10/100/1000 Mbps (Optional)
NMEA	NMEA frame – GPRMC Isolated output RS232 /RS485** Fix configuration: 9600-8-N-1	Plug in screw terminals	—	1

**RS232/RS485 in CPU Card is site selectable, default setting RS232

Output Card

Card Type	Description	Connector	Accuracy (to UTC)	Output Per Card
PPS Card	Output Status LED 1 Pulse per second Isolated outputs TTL into 250 Ω 200 ms Pulse Width	BNC Female	±150nSec	4
IRIG-B Modulated Card	Format: IRIG-B(127), IEEE 1344/C37.118-2005 1 KHz AM Signal Modulation Ratio: 3:1 3 Vp-p, into 100Ω ±10%	BNC Female	±10µSec	4
IRIG-B TTL Card	Output Status LED Format: IRIG-B (007) or IEEE1344 (selectable) TTL into 50Ω	BNC Female	±1.5µSec	4
Serial Card	Configurable Serial Frames (NMEA / NGTS / T-format) NMEA frames – GPRMC / GPZDA / GPGGA Output Status LED Isolated outputs RS232 or RS485 (Factory set to be selected from ordering code) Fix configuration: 9600-8-N-1	DB9 Female	–	2
NTP (LAN Interface)	4 nos of Isolated NTP output Protocol Support: NTP V3, SNTP Network Protocol: TCP, Telnet, UDP, IPv4 Mode: Server	RJ45	±1mSec	4
Event Card	Configurable event period (1sec to 1 Day) with ON Time from 50 milliseconds to 50% of total period PMOS relay Rating: 350V DC/120mA Output Status LED	Plug in screw terminals AWG max. 2.5 mm^2	–	4
Relay Card	GPS LOCK, Redundancy, Watchdog, Error relay Rating: 230V AC/ 30V DC @ 2A; 110V DC@0.3A; 220 V DC@ 0.12 A (max)	Plug in screw terminals AWG max. 2.5 mm^2	–	4
PTP	Protocol: IEEE 1588v2 Power Profile - IEEE C37.238-2011, IEEE C37.238-2017 Power Utility Profile - IEC-61890-9-3 (except PRP and PTP SNMP MIB) Multicast, Unicast - Layer2, Layer 3 Ethernet (L2) or UDP IPv4, IPv6 (L3) Delay Mechanism - E2E / P2P Sync Messages - Upto 128 messages/second per client PTP Modes 1 Step / 2 Step mode Protocols IPv4, IPv6, DHCP, DHCP6, PTP, VLAN tagging, FTP, Telnet, SSH Interface 1 x 10/100/1000 Mbps Freq Outputs 1 x 1PPS/10 MHz SMA connector	RJ45	<200 nSec	1
FDM Card	**Input Signal:** Mains frequency, 90 - 270VAC, 50Hz or 60Hz **Output Frame:** Serial Frame (RS232, RS485) per second Baud Rate: 9600/19200/38400/57600/115200-7/8-N/E/O-1/2 (Configurable) Frame Parameters: Power line frequency, frequency deviation, reference time, power line time, time deviation **Alarm Outputs:** 2 PMOS Relay Alarm [Overflow, Watchdog/Fail] Contact capacity: 350V DC, 120mA maximum	Input: 2-Way Terminal Strip DB-9 (RS232) 2 pin plug (RS485) 4 pin plug (Alarm)	Frequency: Accuracy of reference (Clock freq) ±1MHz Time deviation: Accuracy of reference (PPS) ±1ms	1
Fiber Optic (pulse)	Signal Type: IRIG-B (007)/PPS/PPM/PPH/PPD – configurable Transmission: Simplex Fiber Size: 62.5/125 µm Wavelength: 820 nm Distance: 1750 meters	Multimode ST connector	As per Signal type	4
Frequency out (2.048 MHz)	ITU-T G.703 (E1), Unbalanced, BNC into 75 ohms (Confirms to ITU-T G.811)	BNC Female	As per ITU-T G.703	1

APPLICATION



Ordering Code

Model	Receiver Clock Module		Power supply PS Card1		PS Card2		CPU with Ethernet o/p		Output Card (select code for card type from Table1.1) Card-1	Card-2	Card-3	Card-4	Card-5	Card-6	Card-7	Card-8	Card-9	Antenna Cable Length	
MTS300R	X		X		X		X		X	X	X	X	X	X	X	X	X	X	
	1	1 x Clock Module	1	90 - 264 V AC/ 125- 370 V DC	N	None	C1	1 x 10/100 Mbps										0	None
	2	2 x Clock Module	2	18-36 V DC	1	90 - 264 V AC/ 125- 370 V DC	C2	1 x 10/100 Mbps + 1 x 1Gbps										1	15 meters
			3	36-75 V DC	2	18-36 V DC	C3	2 x 10/100 Mbps										2	30 meters
					3	36-75 V DC												3	50 meters
																		4	100 meters
																		S	Special

Output Card Table1.1

Code-X	Card Type	Card Size*
N	None	0
1	IRIG-AM	4T
2	IRIG-TTL	4T
3	1PPS	4T
4	Serial	4T
5	Event	4T
6	NTP	4T
7	Relay	4T
8	PTP	4T
9	FDM	8T
A	Pulse FO	4T
B	ETH(1Gbps)	8T
E	E1	4T
S	Special	8T

Note:

***Max total 36T possible in one unit**

For unit with AC Power I/P: Max upto 4 NTP cards possible
& with DC Power I/P: Max upto 3 NTP cards possible

Standard Accessories

m-AN-01	Antenna – 1 no
m-AR-01-01	Antenna Rod (1 meter)

Optional Accessories (Extra cost)

m-LA-01	Lighting Arrestor (Surge Suppressor)
m-SR-01	RS485 Repeater
TDR-4	Time Distribution Rack
TSR	Time Signal Repeater

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