masibus
A Sonepar Company

MTS200R

masTER Time-Sync

High Performance. Enhanced Security.
Accurate. Reliable. Compact. Redundant

Masibus masTER Time-Sync MTS200R is capable for the time synchronization requirements in various industries like power, process, IT, telecommunications etc. It generates wide range of time code and pulse signals via different output ports like 1PPS, IRIG-B TTL/AM, NTP, serial (RS-232/RS-485), event/relay, PTP, pulse FO.

Masibus MTS200R is a GNSS based time server has redundant and non-redundant options for power supply and GNSS receiver functionality. MTS200R has a 20 x 2 LCD display for viewing of time parameters, status of GNSS receiver parameters, and output ports, discrete LEDs provide at-a-glance status and health information. The GNSS receiver has built-in RTC backed up with on board battery to maintain time during power loss and instant recovery on power resumption.

Network Time Protocol (NTP)
MTS200R is a stratum1 GNSS 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 NTP related all necessary MD5 authentication mechanisms are provided in this device. It is also capable to record and log internal CPU clock drift and accuracy statistics and displays it graphically on MTS200R webserver.

Networking Protocols
MTS200R supports a full suite of networking protocols for its own administration and configuration management. These are IPv4/v6, TCP, UDP, DHCP, HTTP, HTTPS, SNMP, SSH, SCP, SYSLOG, TELNET.

Security Features
MTS200R provides secured access for configuration and management through SSH, SCP, HTTPS. Full featured SNMP protocol with encryption DES/AES and authentication SHA/MD5 mechanisms. User accesses for console and web program are encrypted password supported.

User Friendly Setup and Administration
MTS200R 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 MTS200R easy & ready to use on site network. Further, MTS200R can be completely configured remotely through webserver, SSH, SNMP, telnet & serial port. MTS200R can send notifications regarding various internal alarms to remote servers through SYSLOG and SNMP as well as logs it internally for future reference.

Features

- 22 Satellite parallel tracking
- GNSS based time server available in redundant & non-redundant options
- Ethernet ports
- NTPv2/v3 and NTPv4 with MD5 authentication & symmetric and autokey management
- Secured web server
- IPv4, IPv6, UDP, SNMP, SSH, SCP, HTTP, HTTPS, SYSLOG, telnet, FTP, networking protocols
- Remote alarm notifications via SNMP, SYSLOG
- Remote configuration using SSH, Web, SNMP, telnet
- Universal time-zone and DST settings
- Supports synchronization of IEC61850 compliant devices via NTP/SNTP protocol
- USB port
- Universal (AC/DC) power supply
- Highly accurate TCXO type crystal (OCXO Optional)
- Programmable pulse outputs
- Solid state relays for programmable events
- NTP client synchronization software
- Diagnostic relay outputs
- Supporting timing protocols:
  - NMEA [GPRMC, GPZDA, GPGGA], NGTS, T-FORMAT
  - IRIG-B modulated
  - IRIG-B TTL
  - SNTP/NTP
  - PTPv2

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

GNSS Receiver	
Timing Accuracy	< 15 ns with GNSS (GPS + GLOANASS) receiver (Receiver is locked on fixed position)
Positioning Accuracy	< 10m
Input Frequency	1575.42 MHz + 1602 MHz L1 C/A code
Tracking	22 parallel channels
Acquisition Time	Hot start < 5 sec Warm start < 38 sec Cold start < 45 sec

Antenna	
Type	Active L1. GNSS (GPS + GLOANASS), 40 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	2 x 20 Character backlit LCD display
Displayed Data	Local / UTC time and date Day of the week Position latitude, longitude Status of the GNSS receiver Configuration parameters.
Status LEDs	Power, 1PPS, watchdog, error, GPS locked
Configuration Methods	• Front keypad • Front console DB-9 port (Serial RS-232) • 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) • Repetitive event generation output via potential free contact (Per minute or hour) • 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 • Ethernet protocols (NTP, SNMP, Syslog, SSH, HTTP, HTTPS) service setting
Network Protocols	• IPv4, IPv6 • TCP, UDP, DHCP, AUTOCONF(IPv6) • 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 61850-9-3 (except SNMP) • 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 • SNMP v3 with no-auth / auth / priv security feature • Configurable SSH v1, v2 with configurable 768 / 1024 / 2048 bits size security keys • Configurable HTTPS SSL certificate
Logging & Alarms	• Alarms and system messages logging using SYSLOG • 100Kbytes of internal log memory • Remote logging feature 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, Solarisserver synchronization
USB Port	• 1 x USB Port on front panel • Download/ upload of configuration files • Install firmware upgrades
Firmware Upgrade	• Via webserver, USB (All binaries + configuration)

TECHNICAL SPECIFICATIONS

CPU Card

Output	Description	Connector	Accuracy (to UTC)	Output per card
ETH x (LAN)	IPv4, IPv6, DHCP, NTP, SNMP, webserver, SSH, telnet Mode: Server Network interface: RJ45, auto-negotiation, 1st port 10/100 Mbps	RJ45	±1mSec [NTP server]	1 x 10/100 Mbps 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	±100nSec (PPS o/p)	1 no

**RS-232/RS-485 in CPU Card is site selectable, default setting RS-232

Time Signal Output

Output Card Type	Description	Connector	Accuracy (to UTC)	Output per card Optional	
				Option-1	Option-2
PPS Card	• 1 Pulse per second • TTL into 250 Ω • 200 ms Pulse width	BNC Female	±100nSec	2 nos.	4 nos.
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	2 nos.	4 nos.
IRIG-B TTL Card	• Format: IRIG-B (007) or IEEE1344 (field set) • TTL into 50Ω	BNC Female	±1.5µSec	2 nos.	4 nos.
NTP (LAN Interface)	• Protocol support: NTP V3, SNTP • Network protocol: TCP, telnet, UDP, IPv4 • Mode: Server	RJ45	±1mSec [NTP server]	2 no.s	4 nos.
Serial Card	• Configurable serial frames (NMEA / NGTS / T-format) • NMEA frames – GPRMC / GPZDA / GPGGA • Output status LED • Isolated outputs • RS-232 or RS-485 (Factory set to be selected from ordering code) • Fix configuration: 9600-8-N-1	DB9 Female	-	2 nos.	NA
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 mm2	-	2 nos.	4 nos.
Relay Card	• GPS LOCK, redundancy, watchdog, error relay • Rating: 230V AC/ 30V DC @ 2A; 110V DC@ 0.3A; • 220V DC@ 0.12 A (max.)	Plug in screw terminals AWG max. 2.5 mm2	-	-	4 nos.
PTP Card	• Protocol: IEEE 1588v2, NTP, SNTP • Power profile-IEEE C37.238-2011, IEEE C37.238-2017 (except SNMP) • Power utility profile-IEC-61850-9-3 (except SNMP) • 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 FTP, telnet, SSH • Interface 1 x 10/100/1000 Mbps • Freq output 1 x 1PPS	RJ45	<200 nSec	1 no.	2 nos.
Pulse o/p Card (Fiber Optic)	• Signal type: IRIG-B TTL (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	2 nos.	4 nos.
Multi-Port Output Card (M1)#	• 2 Nos. IRIG-B AM /TTL / PPS (Any one factory set) • 2 Nos. event o/p • 2 Nos. Alarm (GPS lock and watchdog)	As defined above respectively	As defined above respectively	Max 2 nos. IRIG-B AM or TTL or PPS (Any one factory set), 2 nos. event & 2 nos. alarm in one card	
Multi-Port Output Card (M2)#	• 1 Nos. IRIG-B AM /TTL / PPS (Any one factory set) • 2 Nos. Event o/p • 2 Nos. FO over IRIG-B TTL (007)/PPS/PPM/PPH/PPD – factory configurable • 2 Nos. alarm (GPS lock and watchdog)	As defined above respectively	As defined above respectively	Max. 1 no IRIG-B AM or TTL or PPS (Any one factory set,2 nos. FO over IRIG-B TTL/PPS /PPM/PPH/PPD - factory set, 2 nos. event & 2 nos. alarm in one card	

TECHNICAL SPECIFICATIONS

Power Supply

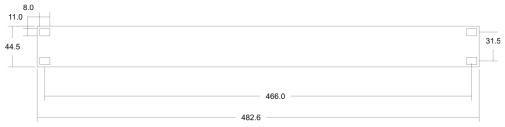
Standard	90 - 264 V AC / 90- 300 V DC, 35W
Option-1	18 - 36 V DC, 30W
Option-2	36 - 75 V DC, 30W
Output Status	Power LED status, power fail relay output

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.
Note: No isolation between IRIGB-TTL and PPS output.

Physical

Mounting	1U, 19" rack mount
Dimensions (mm)	45(H) x 483(W) x 251(D)
Ingress Protection	IP20 enclosure
Weight	3 Kg

Mounting Dimensions



Environmental

Operating Temperature	0 to +55°C
Storage Temperature	-20 to +80°C
Humidity	20-95 % RH non condensing

Type Test

Electrostatic Discharge (ESD)	IEC 61000-4-2
Radiated Susceptibility	IEC 61000-4-3
EFT Test	IEC 61000-4-4
Surge Test	IEC 61000-4-5
Conducted Susceptibility (Conducted RF)	IEC 61000-4-6
Power Frequency Magnetic Field	IEC 61000-4-8
High Frequency Disturbance	IEC 61000-4-10
Voltage Interruption/Voltage Dips	IEC 61000-4-11
Ringwave Immunity Test	IEC 61000-4-12
Radiated Emission Conducted Emission	As per CISPR 11
Vibration	IEC 68-2-6
Bump Test	IS 9002 Part-7
Dry Heat Test	IEC 60068-2-2
Damp Heat Steady State Test	IEC 60068-2-30
Shock Test	IEC 60255-21-2
Dielectric Test	
Cold Test	IEC 60068-2-1: 2007

Ordering Code

Model	Receiver Clock Module		Power Supply PS-1		Power Supply PS-2		CPU with Ethernet o/p		Output Card (Select code for card type from table1.1) Card-1	Card-2	Card-3	Card-4*	Antenna Cable Length	
MTS200R	X		X		X		X		X	X	X	X	X	
	1	1 x Clock module	1	90 - 264 V AC/ 90- 300 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/ 90- 300 V DC	C2	1 x 10/100 Mbps + 1 x 1Gbps					1	15 Meters
			3	36-75 V DC	2	18-36 V DC							2	30 Meters
					3	36-75 V DC							3	50 Meters
													4	100 Meters
													S	Special

Output Card Table1.1

Code-X	Card Type/ No. of Ports
N	None
1B	IRIG-AM (2 Ports)
1C	IRIG-AM (4 Ports)
2B	IRIG-TTL (2 Ports)
2C	IRIG-TTL (4 Ports)
3B	1PPS (2 Ports)
3C	1PPS (4 Ports)
4B	Serial (2 Ports)
5B	Event/ pulse (Electrical) (2 Ports)
5C	Event/ pulse (Electrical) (4 Ports)
6B	NTP (2 Ports)
6C	NTP (4 Ports)
7C	Relay (4 Ports)
8A	PTP (1 Port)
8B	PTP (2 Ports)
AB	Pulse FO (2 Ports)
AC	Pulse FO (4 Ports)
M1	Multiport card#
M2	Multiport card#
S	Special output card

Standard Accessories
m-AN-01: Antenna – 1 no.
m-AR-01-01: Antenna rod (0.5 Meter) - 1no.

Optional Accessories (Extra Cost)
m-LA-01: Lighting arrestor (Surge suppressor)
m-SR-01: RS-485 repeater
TDR-4: Time distribution rack
TSR-4: Time signal repeater

#Customer to specify the required o/p type in Multiport Card while ordering

*When Redundant Receiver Clock module is selected, only 3 Output Cards possible

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