

MTS200L *mas*TER Time-Sync

Accurate. Reliable. Compact.

Masibus *mas*TER T-Sync MTS200L is capable for the time synchronization requirements in various industries like power, process, IT, telecommunications, cement, education, finance. It generates wide range of time code and pulse signals via different output ports like 1PPS, IRIG-B TTL/AM, NTP, serial (RS232/RS485), event/relay, PTP, pulse FO.

Masibus MTS200L is a GNSS based time server has redundant and non-redundant options for power supply. MTS200L 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)

MTS200L is a stratum1 GNSS based full featured NTP server for synchronizing all types of NTP and SNTP clients in LAN. NTPv2, v3 and v4 with unicast alongwith NTP related necessary MD5/SHA symmetric key based authentication mechanisms are provided in this device.

Networking Protocols

MTS200L supports a suite of networking protocols for its own administration and configuration management. These are IPv4 TCP, UDP, HTTP, SNMP, and TELNET.

User Friendly Setup and Administration

MTS200L is simple to install and easy to manage. Front panel controls allows network configuration and other set-up parameters. Further, MTS200L can be configured remotely through webserver, SNMP, telnet, serial port. MTS200L can send notifications regarding GPS Lock/Unlock alarms to remote servers through SNMP TRAP.

Features

- 22 satellite parallel tracking
- NTPv2/v3 and NTPv4 with MD5 symmetric key management
- IPv4, UDP, SNMP, HTTP, telnet, networking protocols
- Remote alarm notifications via SNMP
- Remote configuration using webserver, telnet
- Universal time-zone settings
- Supports synchronization of IEC61850 compliant devices via NTP/SNTP protocol
- 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
- 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 L1 C/A code |
| Tracking | 22 arallel channels |
| Acquisition Time | Hot start < 5 sec |
| | Warm start < 38 sec |
| | Cold start < 45 sec |

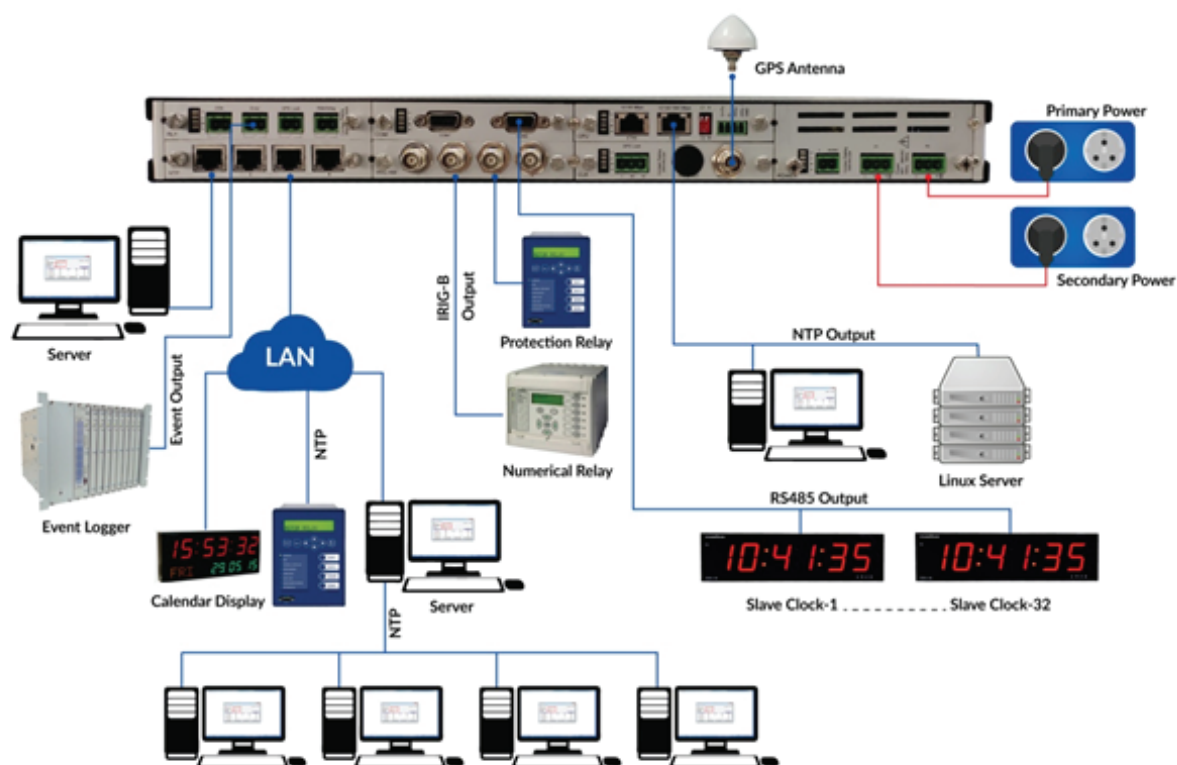
Antenna

| | |
|-----------------------|--|
| 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 | <ul style="list-style-type: none"> • 2 x 20 character backlit LCD display • Local / UTC time and date • Day of the week |
| Displayed Data | <ul style="list-style-type: none"> • Position latitude, longitude • Status of the GNSS receiver • Configuration parameters. |
| Status LEDs | <ul style="list-style-type: none"> • Power, 1PPS, watchdog, error, GPS locked |
| Configuration Methods | <ul style="list-style-type: none"> • Front keypad • Front console DB-9 port (serial RS232) • WEBSERVER, TELNET (ethernet RJ45 port) |
| Keypad Configurable Parameters | <ul style="list-style-type: none"> • Hour settings for display (12 or 24 format), UTC/LOCAL time display • Data format selection (NGTS/T-FORMAT) • Additional event configuration (total & on time of events) • IPv4 network parameters [IP, subnet, gateway] |
| Network Protocols | <ul style="list-style-type: none"> • IPv4, TCP, UDP • NTP v2[RFC 1119], v3[RFC 1305] and v4[RFC 5905] • NTP v3,v4 MD5 authentication with symmetric key management • SNMP v1[RFC 1157], v2[RFC 1901-1908] with enterprise MIB file • SNMP v1, v2 compatible traps with two configurable SNMP trap managers • PTPv2 Master - IEEE C37.238-2011, IEEE C37.238-2017, IEC 61890-3 (except SNMP & PRP) • Webserver through HTTP browser based configuration • Remote alarm notification through SNMP traps |
| NTP / SNTP Client Software | <ul style="list-style-type: none"> • Platform support: windows 10/8.1/7 SP1/ windows server 2012 R2/ 2008 R2 SP1 unix linux, solaris server synchronization |

Application Daigram



TECHNICAL SPECIFICATIONS

CPU Card

| Output | Description | Connector | Accuracy (to UTC) | Output per card |
|------------|--|-------------------------|------------------------|-----------------|
| ETHx (LAN) | <ul style="list-style-type: none"> IPv4, NTP, SNMP, webserver, telnet Mode: server Network interface: RJ45, auto-negotiation Both port 10/100 Mbps | RJ45 | ±1mSec [NTP server] | 2 x 10/100 Mbps |
| NMEA | <ul style="list-style-type: none"> NMEA frame – GPRMC Isolated output RS232 /RS485** Fix configuration: 9600-8-N-1 | Plug in screw terminals | ±100nSec (PPS o/p) | 1 |

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

Time Signal Output

| Output Card Type | Description | Connector | Accuracy (to UTC) | Output per card Optional | |
|---------------------------------|--|--|-------------------------------|--|----------|
| | | | | Option-1 | Option-2 |
| PPS Card | <ul style="list-style-type: none"> 1 Pulse per second TTL into 250 Ω 200 ms pulse width | BNC female | ±100nSec | 2 nos | 4 nos |
| IRIG-B Modulated Card | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Format: IRIG-B (007) or IEEE1344 (field set) TTL into 50Ω | BNC female | ±1.5μSec | 2 nos | 4 nos |
| NTP (LAN Interface) | <ul style="list-style-type: none"> Protocol support: NTP V3, SNTP Network protocol: TCP, telnet, UDP, IPv4 Mode: server | RJ45 | ±1mSec [NTP server] | 2 nos | 4 nos |
| Serial Card | <ul style="list-style-type: none"> Configurable serial frames (NMEA / NGTS / T-format) 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 nos | NA |
| Event Card | <ul style="list-style-type: none"> 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 | - | 2 nos | 4 nos |
| Relay Card | <ul style="list-style-type: none"> 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 mm ² | - | - | 4 nos |
| PTP Card | <ul style="list-style-type: none"> 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 2 x 10/100/1000 Mbps Freq output 1 x 1PPS | RJ45 | <200 nSec | 1 no | 2 nos |
| Pulse o/p Card (Fiber Optic) | <ul style="list-style-type: none"> 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)# | <ul style="list-style-type: none"> 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)# | <ul style="list-style-type: none"> 1 no 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 | |

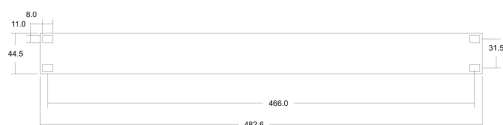
TECHNICAL SPECIFICATIONS

| Power Supply | | Environmental | |
|--|---|---|---------------------------|
| Standard | 90 - 264 V AC / 125- 370 V DC, 35W | Operating Temperature | 0 to +55°C |
| Option-1 | 18 - 36 V DC, 30W | Storage Temperature | -20 to +80°C |
| Option-2 | 36 - 75 V DC, 30W | Humidity | 20-95 % RH non condensing |
| Output Status | Power LED status, power fail relay output | Type test [▲] | |
| 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. | | 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 |
| | | Radiated Emission | As per CISPR-22 |
| | | Conducted Emission | |
| | | 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 |
| | | ▲ Under Certification | |

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



Ordering Code

| Model | Power Supply | | CPU with Ethernet o/p | Output Card (Select Code for Card Type from Table 1.1) | | | | Antenna Cable Length | |
|---------|------------------------------|------|------------------------------|--|-----------------|--------|---------|----------------------|------------|
| | PS-1 | PS-2 | | Card-1 | Card-2 | Card-3 | Card-4* | | |
| MTS200L | X | X | X | X | X | X | X | X | |
| 1 | 90 - 264 V AC/ 125- 370 V DC | N | None | C1 | 1 x 10/100 Mbps | | | 0 | None |
| 2 | 18-36 V DC | 1 | 90 - 264 V AC/ 125- 370 V DC | C2 | 2 x 10/100 Mbps | | | 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 Table 1.1

| 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 O/P Card |

Standard Accessories

| |
|--|
| m-AN-01: Antenna – 1 no |
| m-AR-01-01: Antenna rod (0.5 meter) – 1 no |

Optional Accessories (Extra cost)

| |
|---|
| m-LA-01: Lighting arrestor (surge suppressor) |
| m-SR-01: RS485 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