MTS200

*mas*TER Time-Sync

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

Masibus masTER Time-Sync MTS200 is capable for the time synchronization requirements in various industries like Power, IT, Process, Telecommunication. MTS200 generates wide range of time code and pulse signals via different output ports like Serial, PPS, IRIG-B, Ethernet and PFC relay.

MTS200 has a 2 x 20 LCD display for viewing of time parameters, status of GPS receiver parameters and output ports, discrete LEDs provide at-aglance status and health information. The GPS 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)
MTS200 is a Stratum 1 GPS based full featured NTP Server that synchronizes all types of NTP and SNTP clients in a LAN. NTP v2/v3 and v4 with all modes (Unicast / Broadcast / Multicast) and all necessary MD5 based authentication mechanisms are provided in MTS200. It is also capable to record and log internal CPU clock drift and accuracy statistics and displays it graphically on MTS200 webserver.

Networking Protocols
MTS200 supports a full suite of networking protocols like IPv4, IPv6, TCP, UDP, DHCP, HTTP, HTTPS, SNMP, SSH, SCP, SYSLOG, TELNET for its own administration and configuration management.

Security Features
MTS200 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.

User Friendly Setup and Administration
MTS200 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 MTS200 easy & ready to use on site network. Further, MTS200 can be completely configured remotely through Webserver, SSH, SNMP, Telnet & Serial port. MTS200 can send notifications regarding various internal alarms to remote servers through SYSLOG and SNMP as well as logs it internally for future reference.

Features
- 12 Satellite parallel tracking
- Dual Ethernet ports (Optional 1 x 1Gbps port)
- NTPv2/v3 and NTPv4 with MD5 authentication with symmetric and autokey management
- Secured Webserver
- IPv4, IPv6, UDP, SNMP, SSH, SCP, HTTP, HTTPS, SYSLOG, Telnet, FTP, Networking protocols
- Remote Alarm notifications via SNMP, SYSLOG
- Remote configuration using SSH, Webserver, 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 crystal (OCXO Optional)
- Programmable Pulse Outputs
- Solid State relays for programmable events
- All weather water proof antenna
- NTP Client Synchronization software
- Diagnostic Relay outputs
- Supporting Time Protocols:
  - NMEA (GPRMC, GPZDA, GPGGA)
  - NGTS, T-Format, NMEA
  - IRIG-B Modulated
  - IRIG-B TTL
  - SNTP/NTP (RJ45)

Applications: Time synchronization of
- Sequence of event recorders, Disturbance recorders
- Numerical relays, Slave clocks
- UNIX, Linux, Solaris & Windows servers
- PLC/DCS/SCADA, ABT metering
- Telecommunication, Synchrophasor measurement
- EMS system, Fault Locator

TECHNICAL SPECIFICATIONS

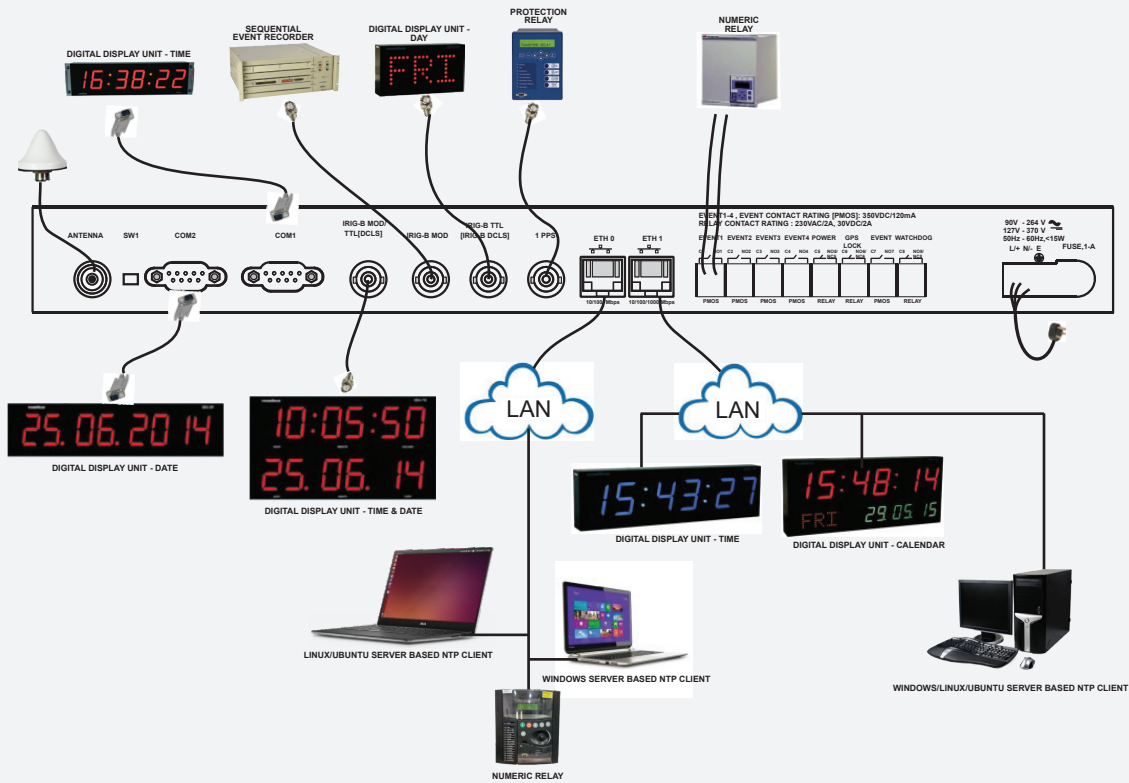| GPS Receiver	
Timing Accuracy	< 15 ns with GPS Receiver (Receiver is locked on fixed position)
Positioning Accuracy	< 10m
Input Frequency	1575.42 MHz L1 C/A code
Tracking	12 parallel channels
Acquisition time	Hot Start < 5 sec Warm Start < 38 sec Cold Start < 45 sec

Antenna	
Type	Active L1. GPS, 30 dB gain
Antenna Cable	RG 6(Std) / RG 8 (Optional) coaxial cable
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 GPS receiver Configuration parameters.
Status LEDs	Power, 1PPS, Watchdog, Event, GPS Locked
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 • Time string 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 • 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 XP(SP3) / 7 / 8 / 8.1 / 10 / Server 2003 / 2012 R2 / 2008 R2 • NTP Client Software is for easy distribution of time across the network
USB Port	• 1 x USB Port on front panel • Download/ Upload of configuration files • Install firmware upgrades
Firmware Upgrade	• Via Webserver, USB

APPLICATION

TECHNICAL SPECIFICATIONS

Time Signal Output

Output Type	Description	Connector	Accuracy (to UTC)	Available No. of Output	
				Standard	Option
PPS	• 1 Pulse per second • TTL into 250 Ω • 200 ms Pulse Width	BNC Female	±150nSec	1	-
IRIG-B Modulated	• Format : IRIG-B(127),IEEE 1344/C37.118-2005 (Field selectable) • 1 KHz AM Signal • Modulation Ratio: 3:1 • 3 Vp-p, into 100Ω ±10%	BNC Female	±10µSec	-	2 (Max 2 nos of IRIG B TTL are possible)
IRIG-B TTL	• Format: IRIG-B (007) or IEEE 1344/C37.118-2005 (Field selectable) • TTL into 50Ω	BNC Female	±1.5µSec	1	
ETHx (LAN Interface)	• TCP, UDP, IPv4, IPv6, DHCP, NTP, SNMP, Webserver (HTTP, HTTPS), SSH, Telnet, Syslog • Network Interface: RJ45, Auto-negotiation • 1 port 10/100 Mbps plus additional 10/100/1000 Mbps port (Gigabit port Optional)	RJ45	±1mSec [NTP Server]	-	2 (10/100 Mbps + 10/100/1000 Mbps)
COM-1 NMEA-0183 (RMC)	• NMEA-GPRMC & 1PPS Signal • Isolated Serial & 1PPS RS232 /485** • Fix configuration: 9600-8-N-1	DB9 Female	-	1	-
COM-2	• Isolated Serial RS232 /485** • Programmable baud rate, stop bit, parity bit and message format • Selectable NGTS, T-Format, GPZDA, GPGGA	DB9 Female	-	1	-
Event	• PMOS relay • Rating: 350VDC/120mA • On time programmable	Plug in screw terminals (2.5mm2 Conductor Size)	-	1 (Selectable PPM or PPH)	4 (Selectable PPS to PPD)

*For BNC, RJ45 and DB9 option; 2 meter cable with mating connector supplied as standard
**RS232/485 is site selectable, default setting RS232

Alarm Output

3 numbers of PFC	Rating: AC: 230 V @ 2A; DC: 30V @ 2A / 110V @ 0.3A / 220 V @ 0.12 A (max) a) GPS Sync. Lost b) Watchdog c) Power Fail

TECHNICAL SPECIFICATIONS

Power Supply

Power Supply (Std)	AC: 90-264V, 47 to 63 Hz & DC: 90-300V
Power Supply (Optional)	DC: 18-72V
Power Consumption	15W max

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 241(D)
Ingress protection	IP20 enclosure (except terminals)
Weight	2.1 Kg

Mounting Dimensions

8.0
11.0
44.5
31.5
466.0
482.6

Environmental

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

Accessories (Optional-On Request)

m-LA-01: Lighting Arrestor (Surge Suppressor)
m-AR-01-01: Antenna Rod (1 meter)
m-SR-01: RS485 Repeater
TDR-4: Time Distribution Rack
TSR: Time Signal Repeater
Netser (NGTS-NTP) Converter
DDU: Time/ Date/ Day/ Frequency

Standard Accessories

m-AN-01: Antenna	1no
m-MK-AMC-40-1: Antenna Clamp for mounting	1no

Ordering Code

Model	Output 1		Output 2		Output 3		Output 4		Power Supply		Antenna Cable Length	
MTS200R	X		X		X		X		X		X	
	0	None	0	None	0	None	0	None	U1	90-264 VAC/ 90-300 VDC	0	None
	1E	1 x 10/100Mbps port	1	IRIG-B AM	1	IRIG-B AM	1	4 Event O/P	U2	18-72 VDC	1	15 meters
	1G	1 x 1Gbps port			2	IRIG-B TTL					2	30 meters
	2E	1 x 10/100Mbps port + 1x1Gbps port									3	50 meters
	2G	2 x 1Gbps port									4	100 meters
											S	Special

X-Specify from Table