



MC-1-U GPS Master Clock

Accurate. Reliable. Compact.



Masibus MC-1-U GPS Master Clock 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/SNTP, serial (RS-232/RS-485), event/relay.

MC-1-U has a 20 x 2 LCD display for viewing of time parameters, status of GNSS receiver parameters, Ethernet 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)

MC-1-U is a stratum1 GNSS based full featured NTP server for synchronizing all types of NTP and SNTP clients in LAN.

Networking Protocols

MC-1-U 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

MC-1-U is simple to install and easy to manage. Front panel controls allows network configuration and other set-up parameters. Further, MC-1-U can be configured remotely through webserver, SNMP, telnet, serial port. MC-1-U can send notifications regarding GPS Lock/Unlock alarms to remote servers through SNMP TRAP.

Features

- 22 satellite parallel tracking
- <15 ns with GPS receiver (the receiver is locked on a fixed position).
- <±0.0005 ppm (OCXO) accuracy while GPS is Unlock* (Optional)
- <±0.5 ppm (TCXO) accuracy while GPS is Unlock
- Resynchronization Delay: - < 5 Min.
- Propagation delay compensation upto 99999 ns
- During the loss of the UTC source, Unit will shift to the internal RTC time
- NTPv2/v3
- IPv4, UDP, SNMP, HTTP, TELNET, Networking Protocols
- Remote alarm notifications via SNMP
- Remote configuration using webserver, telnet
- Universal time-zone settings with offset to permit correction to local time
- Supports synchronization of IEC61850 compliant devices via NTP/SNTP protocol
- Universal (AC/DC) power supply
- Re-acquisition time is typically 1 second.
- Programmable pulse outputs
- Solid state relays for programmable events
- NTP client synchronization software
- Compact 19 " 1U rack mount enclosure
- Supporting timing protocols:
 - Serial NMEA [GPRMC], NGTS, T-FORMAT
 - IRIG-B (Modulated & Un Modulated/TTL/DCLS/PWM)
 - SNTP/NTP

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) (when receiver is locked on fixed position)
Positioning Accuracy	< 10m
Input Frequency	1575.42 MHz to 1602 MHz L1 C/A code,
Tracking	22 parallel channels Hot start < 5 sec.
Acquisition Time	Warm start < 38 sec. Cold start < 45 sec.

Antenna

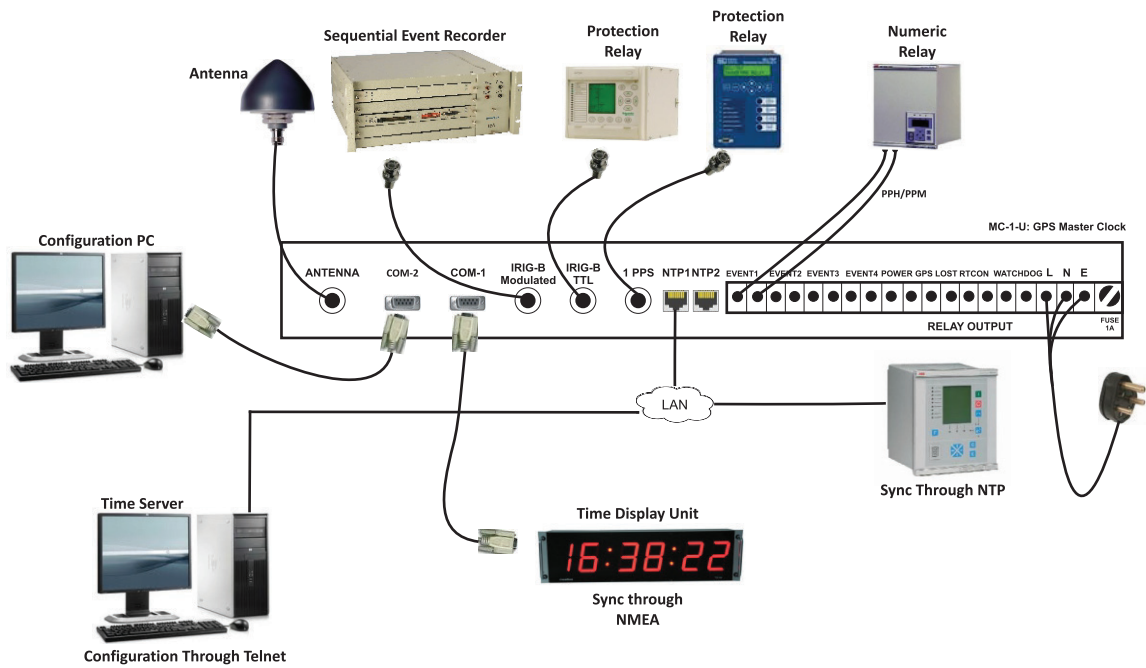
Type	Active L1 GNSS (GPS + GLOANASS) 40 dB gain
Antenna Cable Type	RG 6/RG 11
Operating Temperature	-40 to +85°C
Coverage	360 degree
Ingress Protection	IP67
Weight	150 g

Interface and Configuration

Display	2 x 20 character backlit LCD display Local / UTC time and date, Day of the week
Displayed Data	Position latitude, longitude, Status of the GNSS receiver Configuration parameters, Product Firmware Version & Date Product Serial Number
Status LEDs	Power, 1PPS, Watchdog, Event, GPS Locked Front keypad
Configuration Methods	Rear console COM-2 DB-9 port (serial RS-232) Webserver, Telnet (ethernet RJ45 port)
Keypad Configurable Parameters	Universal time zone correction Hour settings for display (12 or 24 format), UTC/LOCAL time display Data format selection (NGTS/T-FORMAT) Repetitive event generation output via potential free contact (PPS, PP5S, PPM, PPQH, PPHH, PPH,PPD) IPv4 network parameters [IP, subnet, gateway] IPv4, TCP, UDP
Network Protocols	NTP v2[RFC 1119], v3[RFC 1305] SNMP v1[RFC 1157], v2[RFC 1901-1908] with enterprise MIB file SNMP v1, v2 compatible traps with two configurable SNMP trap managers Webserver through HTTP browser based configuration Remote alarm notification through SNMP traps
NTP / SNTP Client Software	Platform support: Windows 10 & above, Windows server 2016 & above, Unix, Linux, Solaris server for Time Synchronization Using Net T Sync Software https://www.masibus.com/downloads/software/Net-T-Sync-V-1.0.2.1.rar
Firmware Upgrade	Supported via the bootloader over both Serial and Ethernet communication interfaces.
Operational Manual	https://www.masibus.com/wp-content/uploads/2025/07/m05om201_12-4.pdf



APPLICATION



Technical Specifications

Standard Time Signal Output

Output Type	Description	Connector*	Accuracy (to UTC)	No. of Output
PPS	<ul style="list-style-type: none"> 1 Pulse per second TTL into 250Ω 200 ms Pulse Width 	BNC Female	±150nSec	1
IRIG-B Modulated	<ul style="list-style-type: none"> IRIG-B(127), 1 KHz AM signal With Modulation ratio: 3:1 IRIG-B Output as per IEEE Standard C37.118 or IEEE 1344 standard Configurable 3 Vp-p, into 100Ω ±10% 	BNC Female	±10μSec	1
IRIG-B TTL	<ul style="list-style-type: none"> Format: IRIG-B (007) 100 Hz PWM signal IRIG-B Output as per IEEE Standard C37.118 or IEEE 1344 standard Configurable 5.5 Vp-p TTL signal into 50Ω 	BNC Female	±1.5μSec	1
NTP (LAN Interface)	<ul style="list-style-type: none"> Protocol support: NTP V3, SNTP, SNMP V2 Network Protocol: TCP, Telnet, UDP, IPv4 Mode: Server Network interface: RJ45, 10/100Mbps 	RJ45	±1mSec	2
COM-1	<ul style="list-style-type: none"> NMEA-GPRMC Isolated serial RS232 /485** Configuration: 9600-8-N-1 	DB9 Female	-	1
COM-2	<ul style="list-style-type: none"> Selectable between NGTS & T-Format Isolated serial RS232/485** Programmable baud rate, stop bit, parity bit and message format 	DB9 Female	-	1
Event	<ul style="list-style-type: none"> Configurable event period (PPS, PP5S, PPM, PPQH, PPHH, PPH, PPD) PMOS relay Rating: 350VDC/120mA On time programmable 	Plug in screw terminals 2.5mm ²	-	4
Relay Output	<ul style="list-style-type: none"> GPS Lock, Watchdog, Power Fail 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	-	3

**RS232/485 is site selectable default setting from Factory is RS232

*For RJ45 and DB9; 2 meter cable with mating connector supplied as standard

TECHNICAL SPECIFICATIONS

Power Supply		Environmental	
Power Supply (Std)	AC: 90-264V, 47 to 63 Hz DC: 90-300V	Operating Temperature	0 to +55 °C
Power Supply (Optional)	DC: 18-72V	Storage Temperature	-20 to +80 °C
Power Consumption	< 15 W	Humidity	20-90% Non Condensing
Isolation (Withstanding voltage)		Type test	
Between primary terminals* and secondary terminals** : At least 1500 V AC for 1 minute		Electrostatic Discharge (ESD)	IEC 61000-4-2
Between primary terminals* and grounding terminal: At least 1500 V AC for 1 minute		Radiated Susceptibility	IEC 61000-4-3
Between grounding terminal and secondary terminals** : At least 1500 V AC for 1 minute		EFT Test	IEC 61000-4-4
Between secondary terminals** : At least 500 V AC for 1 minute		Surge Test	IEC 61000-4-5
* Primary terminals indicate power terminals and relay output terminals.		Conducted Susceptibility (Conducted RF)	IEC 61000-4-6
** Secondary terminals indicate Output Ports.		Power Frequency Magnetic Field	IEC 61000-4-8
Insulation resistance: 50MΩ or more @ 500 V DC between power terminals and grounding terminal.		High Frequency Disturbance	IEC 61000-4-10
Note: No Isolation between IRIG-B-TTL and PPS Output.		Voltage Interruption/ Voltage Dips	IEC 61000-4-11
Physical		Damped Oscillator Magnetic Field	IEC 61000-4-12
Mounting	1U, 19" Rack Mount	Radiated Emission	As per CISPR-22
Depth (mm)	324	Conducted Emission	
Ingress Protection	IP20 enclosure	Vibration	IEC 68-2-6
Weight	3 Kg (Approx.)	Bump Test	IS 9002 Part-7
Panel Cut-out		Dry Heat Test	IEC 60068-2-2
<p>4 NOS. - THRU SLOTS SIZE- 7.5(W) X 10.4(L) FOR MOUNTINGS.</p> <p>FRONT VIEW</p>		Damp Heat Steady State Test	IEC 60068-2-30
		Shock Test	IEC 60255-21-2
		Dielectric Test	
		Cold Test	IEC 60068-2-1: 2007
Recommended Accessories (Optional-On Request)		Standard Accessories	
S-lineamp: Line Amplifier - 1 No.		GPS Antenna and 0.5 Meter SS Antenna mounting rod integrated - 1 No.	
mLA01: Lighting Arrestor (Surge Suppressor) - 1 No.		2 Meter RJ45 Ethernet Cable - 1 No.	
		2 Meter RS-232 GPS Configuration Cable - 1 No	
		Windows based NTP Client Synchronization software - Download from below Link https://www.masibus.com/downloads/software/Net-T-Sync-V-1.0.2.1.rar	

Ordering Code

Model	Power Supply	Antenna Cable Length
MC-1-U	X	X
	U1 90-264VAC /90-300VDC	0 None
	U2 18-72V DC	1 15 Meter
		2 30 Meter
		3 50 Meter
		4 100 Meter
		5 Special

Note:

X - Specify From Table

The standard outputs consist of:

- 1 No's PPS over BNC
- 1 No's IRIG-B (Modulated) over BNC
- 1 No's IRIG-B (TTL) over BNC
- 2 No's NTP/SNTP over RJ45 Ethernet
- 2 No's Serial over DB9 (RS232/RS485, site-selectable)
- 4 No's Event over MSTB Connector
(Programmable pulses: PPS, PP5S, PPM, PPQH, PPHH, PPH, PPD)
- 3 No's Relay over MSTB Connector
(1: GPS Lock, 2: Watchdog, 3: Power Fail)