

MC-1-DE GPS Time Sync Unit

Accurate. Reliable. Compact.

Masibus MC-1-DE GPS Time Sync Unit is the most compact and Accurate Time synchronization Unit developed for the Power and Process industry, it has the options of all output types required for interface with various systems and devices. The unit is constructed in a form factor suitable for Din Rail, Panel or Wall mount. MC-1-DE is designed for Reliability and provides base time accuracy of 150nsec.

MC-1-DE supports wide range of time code and pulse signals complying to standards like RS232 serial, PPS, IRIG-B, Ethernet and PFC relay; these outputs have ample drive capability to drive multiple loads in parallel and its parameters are fully configurable. 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, it also has very low ppm crystal to maintain accurate time when GPS signal is lost.

MC-1-DE has diagnostic LEDs and digital outputs for status monitoring, the unit is programmable by connecting a hyper-terminal on the serial port, Ethernet parameters like IP gateway and subnet mask are programmable via the Ethernet port using Telnet, for more than one Ethernet port each port is individually programmable for IP and subnet.

Masibus has four decades of design experience and have supplied hundreds of GPS clocks for the most demanding applications in the power and process industry, Masibus clocks have been successfully interfaced with all types of devices like DFR, SOE, Relays, PLC, DCS, IEDs, servers and many more.

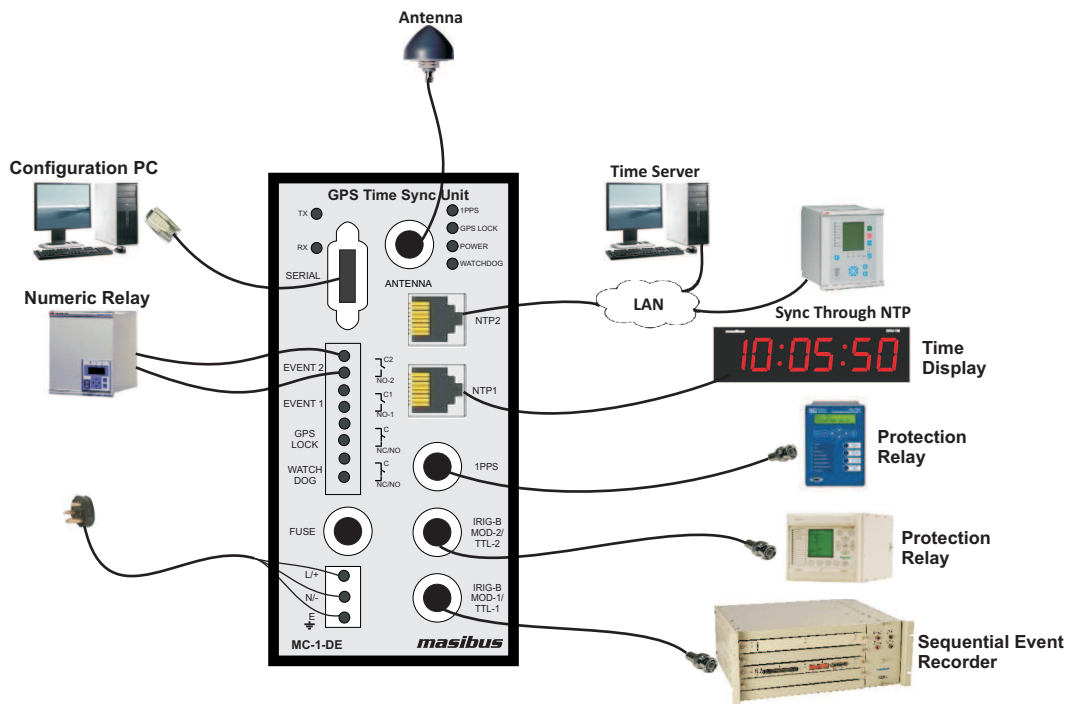
Features

- Cost effective
- Compact DIN Rail /Panel/Wall Mount Enclosure
- 7 time-formats over 6 output ports
- 12 Satellite parallel tracking
- Universal (AC/DC) Power supply input
- Supports synchronization of IEC61850 compliant devices via NTP/SNTP protocol
- All weather water proof antenna
- Synchronization software for Server & Client
- Optional Diagnostic Relay outputs (Watch dog, GPS Lock)
- Solid state relay for programmable event
- Supporting Protocols:
 - IRIG-B Modulated
 - IRIG-B TTL
 - SNTP/NTP
 - NMEA/ T-Format/ NGTS

Applications: Time Synchronization of

- Sequence of event recorders
- Disturbance recorders
- Numerical relays
- UNIX, Linux & Windows servers
- Slave clocks
- PLC/DCS/SCADA
- ABT metering
- EMS system
- Telecommunication
- PMU
- Fault Locator
- IEDs
- RTU

Application



Technical Specifications

GPS Receiver

Timing Accuracy	< 15 ns with GPS Receiver (Receiver is locked on fixed position)
Positioning Accuracy	< 10 m
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 °C
Ingress Protection	IP67
Weight	150 g

Interface and Configuration

Status LEDs	Power, 1PPS, Watchdog, GPS Locked
Configuration Programming	Parameters programmable by <ul style="list-style-type: none"> Hyper Terminal (Serial RS232) Ethernet Parameters using TELNET (Ethernet RJ45 Port)
Programmable Parameters (via Hyper Terminal only)	<ul style="list-style-type: none"> Global time zone correction Data format selection (NMEA-GPRMC, NGTS or T-FORMAT) Additional Event Configuration (Total & On time of Events) Manual Time setting Propagation delay correction (compensate for antenna cable length)
Configurable Parameters via TELNET	IP, Gateway and Subnet
NTP Client Software	<ul style="list-style-type: none"> Platform Support: Windows 98/NT/2000/XP/7 server synchronization NTP Client Software is for easy distribution of time across the network
Display (Option) *	External display device available to display Time & Date parameters

*Contact factory for External Display Unit if required

Technical Specifications

Time Signal Output

Output Type	Description	Connector*	Accuracy (to UTC)	Available Output	
				Standard	Option
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) or IEEE 1344/C37.118-2005 1 KHz AM Signal Modulation Ratio - 3:1 3 Vp-p into 100Ω ±10% 	BNC Female	±10μSec	-	2 (Either IRIG B Mod or IRIG TTL)
IRIG-B TTL	<ul style="list-style-type: none"> IRIG-B (007) or IEEE 1344/C37.118-2005 TTL into 50 Ω 	BNC Female	±1.5μSec	-	
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"> Selectable between NMEA-GPRMC, NGTS or T-Format Isolated Serial RS232 or RS485 (factory set) Programmable baud rate, stop bit, parity bit and message format 	DB9 Female	-	1	1
Event	<ul style="list-style-type: none"> PMOS relay Rating: 350VDC/120mA On time programmable 	Plug in screw terminals (2.5mm ² cable size)	-	-	2 (Selectable PPS to PPD)

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

Alarm Output (Optional)

2 Numbers of PFC

Rating: AC: 230 V @ 2A; DC: 30V @ 2A /110V @ 0.3A/ 220 V @ 0.12 A (max)
a) GPS lock b) Watchdog

Power Supply

Power Supply (Std) 85-264V AC, 47 to 63 Hz / 120-300V DC

Power Supply (Optional) 18-75V DC

Power Consumption <10 W

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 DIN Rail (35mm) / Panel Mount / Wall Mount

Dimensions (mm) H x W x D 144 X 72 X 140

Ingress protection IP 20

Weight 900 g (approx)

Environmental

Operating temperature 0 to +55°C

Storage temperature -20 to +80°C

Humidity 20-90 % Non Condensing

Technical Specifications

Standard Accessories

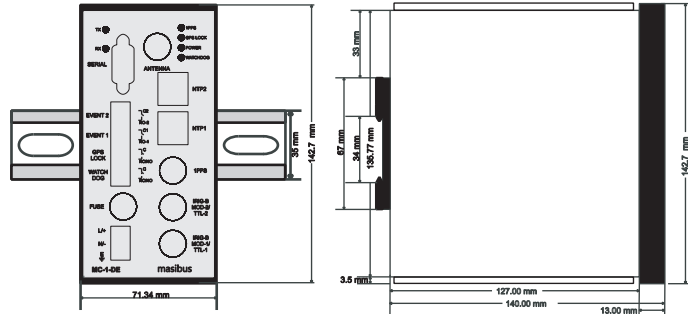
m-AN-01: Antenna	1 no
m-MK-AMC-40-1: Antenna Clamp for mounting	1 no
Mounting Kit	1 set
DIN Rail Mount Kit : m-MK-RC-41-1	
Panel Mount Kit : m-MK-FPL-41-1	
Wall Mount Kit : m-MK-FW-41-1	

Accessories (Optional-On Request)

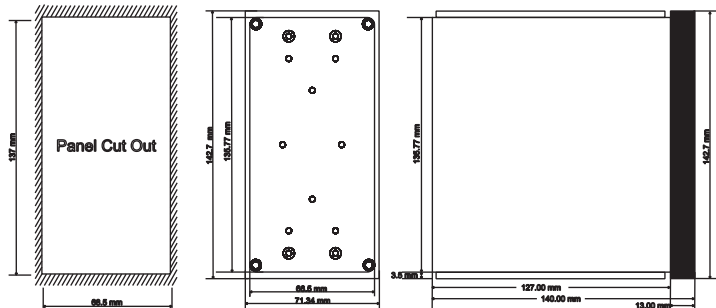
m-LA-01: Lighting Arrestor (Surge Suppressor)
m-AR-01-01: Antenna Rod (1 meter)
m-SR-01: RS485 Repeater
TDR-4: Time Distribution Rack
TSR-4: Time Signal Repeater
Netser (NGTS-NTP) Converter

Mounting Type

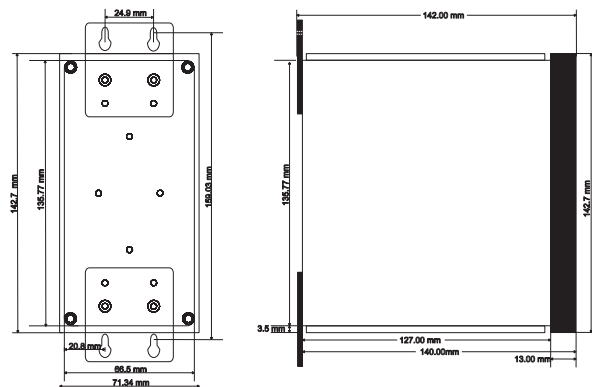
DIN RAIL MOUNT



PANEL MOUNT



WALL MOUNT



Ordering Code

Model	Output 1		Output 2 [#]		Output 3 [#]		Output 4		Output 5 [▲]		Power Supply		Antenna Cable Length		
	X		X		X		X		X		X		X		
MC-1-DE	0	None	0	None	0	None	0	None	0	None	U1	85-264V AC / 120-300V DC	1	15 Meter	
	1	1 NTP	1	IRIG-B AM	1	IRIG-B AM	1	RS232	1	2 Event o/p [▲]	U2	18-75V DC	2	30 Meter	
	2	2 NTP	2	IRIG-B TTL	2	IRIG-B TTL	2	RS485	2	2 Event o/p [▲] + Alarm o/p				3	50 Meter
										3 Alarm o/p				4	100 Meter
													S	Special	

X - Specify from table

*Contact factory for External Display Unit if required

IRIG B IEEE1344 option will work along with NTP o/p or Serial o/p only

▲ Event o/p option will work along with Serial o/p only