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masibus

MC-1-DE/ MC-1-DH

GPS Time Sync Unit

Accurate. Reliable. Compact.

RoHS

Masibus MC-1-DE & MC-1-DH GPS Time Synchronization Units are the most compact and accurate time synchronization units developed for various industries like the power and process industry. It has the options of various output types, required for interface with various systems and devices. MC-1-DH model has 7-segment LED display (date/time configuration). The unit is constructed in a form factor suitable for DIN-Rail, Wall mount or panel mount option. GPS time sync unit is designed for reliability and provides base time accuracy of 150nsec.

GPS time sync unit supports time code and pulse signals complying with standards like PPS, IRIG-B, NTP/SNTP, 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.

GPS time sync unit has discrete LEDs that provide at-glance status and health information. Parameters like IP, gateway and subnet mask are programmable through ethernet port.

In case of more than one ethernet port, each port is individually programmable only for network related parameters.

Masibus has four decades of design experience and has supplied hundreds of GPS clocks for the most demanding applications in the power and process industries. 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 solution
- Compact DIN-Rail /Panel/Wall mount enclosure
- 6 digits, 0.56" 7-segment LED Display for time/date in MC-1-DH model
- 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, TELNET, Networking Protocols
- Remote alarm notifications via SNMP
- Remote configuration using telnet
- Universal time-zone settings with offset to permit correction to local time
- 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) in MC-1-DE model
- Supporting Protocols:
    - o IRIG-B Modulated
    - o IRIG-B TTL
    - o SNTP/NTP (Over RJ45)

Applications: Time synchronization of

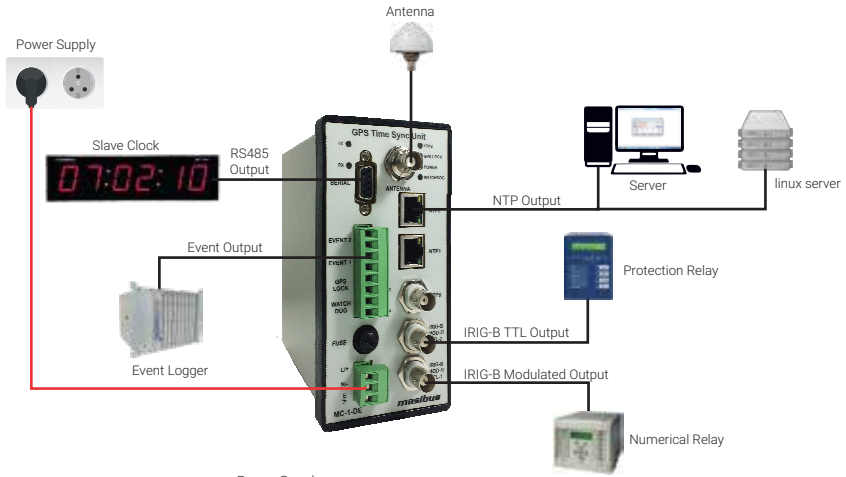
- Sequence of Event Recorders, Disturbance Recorders, PMU
- Numerical Relays, Slave Clocks
- UNIX, Linux, Solaris & Windows Servers
- PLC/DCS/SCADA, ABT Metering
- Telecommunication, Synchrophasor Measurement
- EMS system, Fault Locator

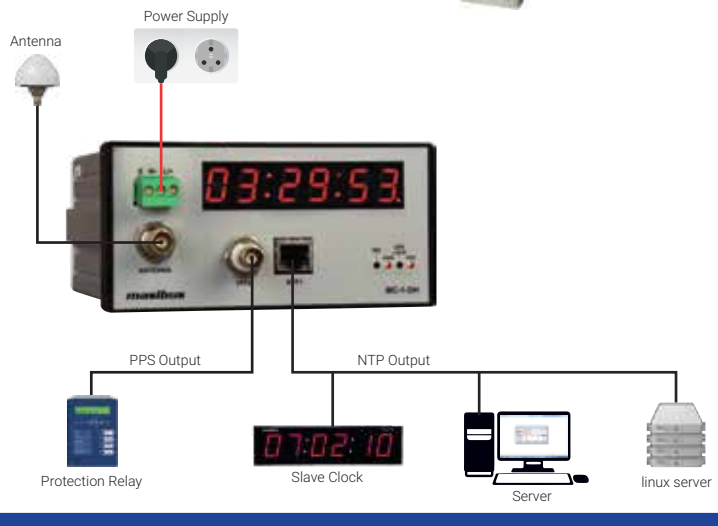
TECHNICAL SPECIFICATIONS

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
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/RG 11
Operating Temperature	-40 to +85°C
Coverage	360 degree
Ingress Protection	IP67
Weight	150 g

Interface and Configuration	
Display (available in MC-1-DH model only)	6 Digits, 0.56"(14mm) seven segment LED display (Red)
Displayed Data (Available in MC-1-DH model only)	Local/UTC time and date Lock/Unlock indication
Status LEDs	Power, 1PPS, Watchdog, GPS locked
Configuration Programming	• In MC-1-DH: Ethernet parameters and display parameters using TELNET (Ethernet RJ45 port) • In MC-1-DE: Ethernet parameters using TELNET (Ethernet RJ45 Port)
Programmable Parameters (via TELNET)	• Network parameters (IP, Gateway, Subnet Mask) - via TELNET only • Global time zone correction • Manual time setting • Propagation delay correction (Compensate for antenna cable length) • Date/time selection [MC-1-DH model only] • Additional event configuration (Total & On time of Events) - [MC-1-DE model only]
NTP / SNTP Client Software	• Platform support: Windows 10 & above, Windows server 2016 & above, Unix, Linux, Solaris server for time synchronization https://www.masibus.com/downloads/softwares//Net-T-Sync-V-1.0.2.1.rar
Operational Manual	MC-1-DE: https://www.masibus.com/wp-content/uploads/2019/05/m05dom102_01.pdf MC-1-DH: https://www.masibus.com/wp-content/uploads/2019/05/m05dom102_rev01C-141727.pdf





TECHNICAL SPECIFICATIONS

Time Signal Output

Output Type	Description	Connector*	Accuracy (to UTC)	MC-1-DE Standard	MC-1-DE Option	MC-1-DH Standard	MC-1-DH Option
PPS	• 1 Pulse per second • TTL into 250Ω • 200 ms Pulse width	BNC Female	±150nSec.	1	-	1	-
IRIG-B Modulated	• 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	• Format: IRIG-B (007) 100 Hz PWM signal • IRIG-B Output as per IEEE Standard C37.118 or EEE 1344 standard Configurable • 5.5 Vp-p TTL signal into 50Ω	BNC Female	±1.5µSec.	1	-	1	-
NTP (LAN Interface)	• Protocol support: NTP V3, SNTP, SNMP V2 • Network Protocol: TCP, Telnet, UDP, IPv4 • Mode: Server • Network interface: RJ45, 10/100Mbps	RJ45	±1mSec.	2	-	2	-
Event + Alarm Output	• PMOS relay • Event Rating: 350VDC/120mA • On time programmable • Alarm Rating: AC: 230 V @ 2A DC: 30V @ 2A, 110V @ 0.3A, 220 V @ 0.12 A (max) • a) GPS Lock b) Watchdog	Plug in screw terminals (2.5mm² cable size)	-	2 (Selectable PPS to PPD)	-	NA	NA

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

Power Supply

Power Supply (Std.)	90-264V AC, 47 to 63 Hz / 90-300V 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 (MC-1-DE) 72 X 144 X 140 (MC-1-DH)
Ingress Protection	IP20 enclosure
Weight	900 g (approx.) (MC-1-DE) 800 g (approx.) (MC-1-DH)

Environmental

Operating Temperature	-10 to+55 °C
Storage Temperature	-20 to+80 °C
Humidity	20-90 % Non Condensing

Directive Conformity

Electromagnetic Compatibility Directive 2014/30/EU	*IEC 61000-6-2: 2016, IEC 61000-6-4: 2018
Low Voltage Directive 2014/68/EU	*IEC 62368-1: 2018

*Applicable only for CE marked MC-1-DE Model.

TECHNICAL SPECIFICATIONS

Ordering Code

Model	Option (Additional O/p)		Power Supply		Mounting		Antenna Cable Length	
	X		X		XX		X	
MC-1-DE	N	None	U1	90-264V AC / 90-300V DC	D0	DIN Rail Mount	N	None
	1	IRIG-B AM	U2	18-75V DC	W0	Wall Mount	1	15 Meter
	2	IRIG-B TTL			P0	Panel Mount	2	30 Meter
							3	50 Meter
							4	100 Meter
							S	Special

X - Specify from table

The standard outputs consist of:

- 1 No's PPS over BNC
- 1 No's IRIG-B (TTL) over BNC
- 2 No's NTP/SNTP over RJ45 Ethernet
- 2 No's Event over MSTB Connector
  (Programmable pulses: PPS, PP5S, PPM, PPQH, PPHH, PPH, PPD)
- 2 No's Relay over MSTB Connector
  (1: GPS Lock, 2: Watchdog)

Ordering Code

Model	Power Supply		Mounting		Antenna Cable Length	
	X		XX		X	
MC-1-DH	U1	90-264V AC / 90-300V DC	D0	DIN-Rail Mount	N	None
	U2	18-75V DC	W0	Wall Mount	1	15 Meter
			P0	Panel Mount	2	30 Meter
					3	50 Meter
					4	100 Meter
					S	Special

X - Specify from table

The standard outputs consist of:

- 1 No's PPS over BNC
- 1 No's IRIG-B (TTL) over BNC
- 2 No's NTP/SNTP over RJ45 Ethernet

Standard Accessories	Optional Accessory (extra cost)
GPS Antenna and 0.5 Meter SS Antenna mounting rod integrated - 1 No.	m-LA-01: Lighting Arrestor (Surge Suppressor)
2 Meter RJ45 Ethernet Cable - 1 No.	S-lineamp: Line Amplifier - 1 No.
Windows based NTP Client Syncronization software - Download from below Link	
https://www.masibus.com/downloads/softwares//Net-T-Sync-V-1.0.2.1.rar	

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