masibus
A Sonepar Company

MC-1-DE/ MC-1-DH

GPS Time Sync Unit

Accurate. Reliable. Compact.

Masibus MC-1-DE & MC-1-DH GPS Time Sync 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 RS232/485 serial, PPS, IRIG-B, NTP, 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. MC-1-DE is also programmable via hyper terminal on the serial 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.

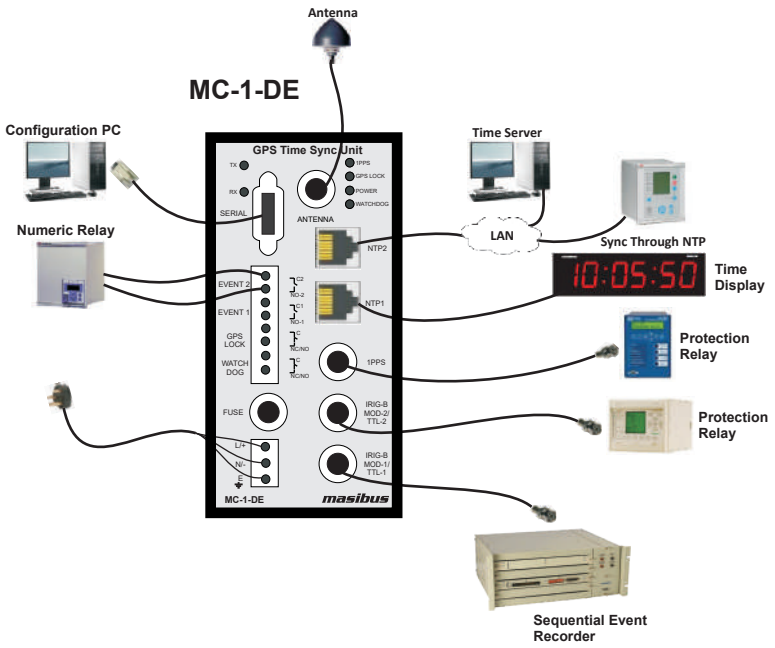
Features

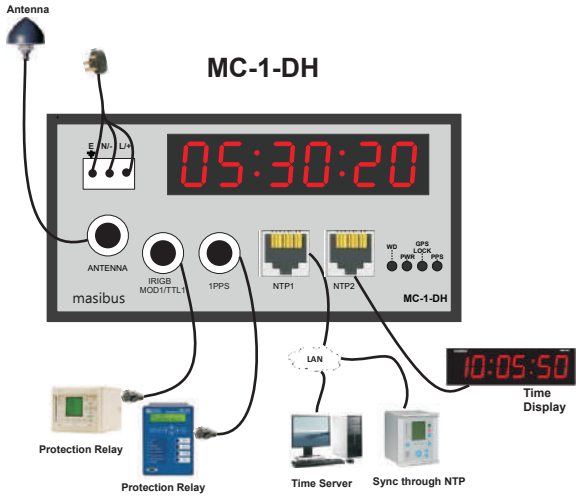
- Cost effective solution
- Compact DIN Rail /Panel/Wall Mount Enclosure
- 6 digits, 0.56" 7-segment LED Display for Time/Date in MC-1-DH model
- 12 Satellite parallel tracking
- Universal (AC/DC) Power supply input
- Supports synchronization of IEC61850 compliant devices via NTP/SNTP protocol
- All weather water proof antenna
- Synchronization software for Server & Client
- Optional Diagnostic Relay outputs (Watch dog, GPS Lock) in MC-1-DE model
- Supporting Protocols:
    - o IRIG-B Modulated
    - o IRIG-B TTL
    - o SNTP/NTP
    - o 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
- Synchrophasor measurement
- Fault Locator

APPLICATION





TECHNICAL SPECIFICATION

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 (*to be ordered separately*)	RG 6 (Std) (Optional coaxial cable)
Operating Temperature	-40 to +85 °C
Coverage	360 °C
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); Hyper-terminal (Serial RS232)
Programmable Parameters (via TELNET / Hyper-terminal*) **Via Hyper-terminal is possible in MC-1-DE only*	• 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] • Data format selection (NMEA-GPRMC, NGTS or T-FORMAT) - [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 98/NT/2000/XP/7 server synchronization • NTP Client Software is for easy distribution of time across the network

TECHNICAL SPECIFICATIONS

Time Signal Output

Output Type	Description	Connector*	Accuracy (to UTC)	Available No. of Output Standard	Available No. of Output Option	Available No. of Output Standard	Available No. of Output Option
PPS	• 1 Pulse per second • TTL into 250Ω • 200 ms Pulse Width	BNC Female	±150nSec	1	-	1	-
IRIG-B Modulated	• 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)	-	1 (Either IRIG B Mod or IRIG TTL)
IRIG-B TTL	• IRIG-B (007) or IEEE 1344/C37.118-2005 • TTL into 50Ω	BNC Female	±1.5µSec	-		-	
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	1	1
COM-1	• 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	NA	NA
Event	• PMOS relay • Rating: 350VDC/120mA • On time programmable	Plug in screw terminals (2.5mm^2 cable size)	-	-	2 (Selectable PPS to PPD)	NA	NA
Alarm Output	• Rating: AC: 230 V @ 2A DC: 30V @ 2A, 110V @ 0.3A, 220 V @ 0.12 A (max) • a) GPS Sync. Lost b) Watchdog	Plug in screw terminals (2.5mm^2 cable size)	-	-	2 Numbers of PFC	NA	NA

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

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

TECHNICAL SPECIFICATIONS

ORDERING CODE

Model	Output 1		Output 2#		Output 3#		Output 4		Output 5▲		Power Supply		Mounting		Antenna Cable Length	
	X		X		X		X		X		X		XX		X	
MC-1-DE	0	None	0	None	0	None	0	None	0	None	U1	85-264V AC / 120-300V DC	D0	DIN Rail Mount	1	15 Meter
	1	1 NTP	1	IRIG-B AM	1	IRIG-B AM	1	RS232	1	2 Event o/p + Alarm	U2	18-75V DC	W0	Wall Mount	2	30 Meter
	2	2 NTP	2	IRIG-B TTL	2	IRIG-B TTL	2	RS485					P0	Panel Mount	3	50 Meter
															4	100 Meter
															S	Special

X - Specify from table
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

ORDERING CODE

Model	Output 1		Output 2#		Power Supply		Mounting		Antenna Cable Length	
	X		X		X		XX		X	
MC-1-DH	1	1 NTP	0	None	U1	85-264V AC / 120-300V DC	D0	DIN Rail Mount	1	15 Meter
	2	2 NTP	1	IRIG-B AM	U2	18-75V DC	W0	Wall Mount	2	30 Meter
			2	IRIG-B TTL			P0	Panel Mount	3	50 Meter
									4	100 Meter
									S	Special

X - Specify from table
IRIG B IEEE1344 option will work along with NTP o/p

Standard Accessories		Optional Accessory (extra cost)
m-AN-01: Antenna	1 no	m-LA-01: Lighting Arrestor (Surge Suppressor)
m-MK-AMC-40-1: Antenna Clamp for mounting	1 no	m-AR-01-01: Antenna Rod (1 meter)
Mounting Kit	1 set	m-SR-01: RS485 Repeater
		TDR-4: Time Distribution Rack
		TSR: Time Signal Repeater
		Netser (NGTS-NTP) Converter

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