

MC-1-C GPS Master Clock



Masibus' GPS Master Clock model MC-I-C has been developed to address key power and process industry time synchronization requirements. Whether it's the monitoring, control or analysis of the power system, the GPS Master Clock model MC-I-C is the most featured and cost-effective GPS time synchronization solution.

MC-I-C generates a wide range of timing signals via std six different output ports. The MC-I-C has standard output of two serial ports, one PPS Port and four relay outputs. Fixed serial port provides NMEA format data and second serial port is configurable for NGTS or T-format, IRIG-B-000/002, IRIG-B-112/120 & configurable PMOS event output. MC-I-C unit feature a front panel display, providing both installation and user teams a visual feedback about the time and position. LED indicators provide "at a glance" status information. MC-I-C synchronizes a wide variety of microprocessor-based power system equipment including: SCADA systems, RTUs, protection relays, sequence of event recorders, digital fault recorders, tariff meters, Slave Display Units, Data Loggers and other Intelligent Electronic Devices (IEDs).

MC-I-C is having a dual processor design that used for NTP generation. It can provide facility to configure the parameters by local PC hyper terminal connection via serial port. Time zone correction, hour setting, serial data format selection are password protected configurations to avoid unauthorized access.

MC-I-C occupies the size of 19" rack mount, 1U height. It is supplied complete with all hardware and software required for the installation, including the antenna, antenna mounting kit, 30 meters antenna cable, 3 meters RS-232 cable and 3 meters RG58 co-axial cable with BNC connector. MC-I-C provides time synchronization accuracy better than 1 microsecond between distant locations. MC-1-C comply IEC standards for type testing requirement.

Output & Protocol Support:

- Two Nos RS 232 , One on NMEA & Other on NGTS/T-format
- 1 Pulse per second output.
- 1 Event output configurable to 1 Pulse per min or 1 pulse per hour,
- IRIG-B-000/002 unmodulated & IRIG-B 120/122 modulated output
- IRIG-B unmodulated optical output.
- 2 X LAN output Supports SNTP/NTP protocol time synchronization on LAN.
- Supports network protocol TCP, SNMP & Telnet.
- DCF77 electrical output
- Support PTP(IEEE 1588 V2)
- Four PMOS relay output configurable from 1 min to 24 Hrs.

Features

- *Reliable GPS receiver with 12 parallel channel tracking.*
- *Multiple time code output formats.*
- *Front panel display of local time & position.*
- *Electrical / Optical Isolated Outputs & Inputs.*
- *Multiple format RS232 serial communication.*
- *Password protected configuration.*
- *Data retention even if GPS is unlocked.*

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MC-1-C

TECHNICAL SPECIFICATIONS MC-1-C

INPUT	
Timing accuracy	UTC/ USNO <20 ns with Selective Availability.
Selective Availability (SA)	12 satellites and tracking.
Positioning Accuracy	<25m SEP without SA.
Receiver input	1575.42 MHz L1 C/A code.
Tracking	12 parallel channels.
Acquisition time	Hot start < 15 sec Warm start < 45 sec Cold start < 50 sec
Input sensitivity	-154 dBm (tracking) -142 dBm (Acquisition)

Physical Dimension

Physical Dimension	1U Rack Mount ,19" rack mount
Depth	300 mm.
Ingress Protection	IP 20 enclosure
Weight	4 Kg (approx.)

Interface

Display	2 x 20 Character backlit LCD Display
Displayed Data	Local/ UTC time and date. Day of the year, days of the week. Position latitude, longitude. Status of the GPS receiver Available Current data Format COM2
Status LEDs	Power, 1PPS, Watchdog, Event, GPS Receiver Status

Power Supply

Power supply Voltage Range	AC: 85 to 260 V, 47 to 55 Hz, 1φ DC: 90 -370V <15W
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Power Consumption
The power supply of GPS Master Clock complies with FCC - B, CISPR22 - B, EN55022 -B, VCCI - B

Environment

Operating temperature	-5° C to +55° C
Storage temperature	-40° C to +85° C
Humidity	95% (non-condensing)

Antenna

Type	Active , L 1, GPS, 25 dB gain
Antenna Cable	RG 58/ 8, RG 6 (Optional) coaxial cable
Maximum length	100 mts
Operating Temperature	-40° C to +85° C

Outputs

1 PPS: 1 NO, 1 PPS One pulse per second, accuracy ±1μs with GPS Locked at 12 satellites available.
I/O isolation 500V DC,
Connection BNC Female Connector.

Serial: Two isolated RS232 ports
COM1 & COM2 are programmable baud rate, stop and parity bits and message format.
Serial connection DB-9 Female connectors
Maximum Distance 15 m

COM 1: NMEA (GPRMC) -0183 Protocol Frame UTC
Time when GPS locked parameters
Parameters selectable Baud Rate: 1200, 2400,4800, 9600 ,19200 & 38400 Kbps
Accuracy < 200 microsec to UTC

COM 2: Selectable in between T-Format & NGTS.
Programmable COM Port
Parameters Baud Rate: 4800, 9600 & 19200

Event output: Std. One No event (configurable between 1 PPM / 1 PPH)

Event Output (Optional) : Four configurable event output
Time period 1 sec to 24 hrs max configurable.
Voltage rating: 350V DC level, 150mAmp.
Number of o/p: 4 (max)

IRIG-B Output:Serial time code output Modulated & DC level standard (acc. IEEE C37.118)

IRIG-B Modulated: IRIG-B modulated output, Carrier 1 KHz
Format IRIG-B120/ IRIG-B122
Modulation Ratio 3: 1
0 – 10V (p-p) unloaded
0 – 3V (p-p) 50 Ω load
Accuracy < 2 micro sec to UTC
No. of outputs 1 (Std.) / 4 (max)
Maximum Distance 3 Km

TECHNICAL SPECIFICATIONS MC-1-C

IRIG-B TTL/ Unmodulated:	IRIG-B TTL/unmodulated output 0 and 5.2 Volts at logic 0 and logic 1 respectively Format IRIG-B000/ IRIG-B002 Accuracy < 200 nSec to UTC No. of outputs 1 (Std.)/ 4 (max) Rise Time < 15ns Maximum Distance 50 m
IRIG-B TTL Optical (optional):	IRIG-B TTL optical output (acc. IEEE C37.118) Accuracy < 200 nSec to UTC No. of outputs: upto 4 (max)
DCF electrical output (optional):	DCF77 electrical output No of output: 1No maximum Connector: BNC type Signal level: 3-5 mVss on 500hm
LAN output (optional):	1XLAN interface with RJ-45 connector. 2XLAN interface (Optional) Link activity and 10/100 T Mbit LED. Accuracy < 180 nsec to UTC Time sync Protocol: NTP,SNTP Network Protocol: SNMP, TCP, Telnet, UDP, FTP It supports synchronization of IEC 61850 compliant devices Via NTP/SNTP protocol through LAN. IEEE 1588 V2 support,

PTP-IEEE 1588 V2 support(Optional) PTP (IEEE 1588) v2 operation
Grandmaster (GPS) Function determined via BMC algorithm.
Peer to Peer & End to End delay support.
Multicast operation

Alarms: All isolated volt free contacts to 230 VAC, 2A maximum
1. GPS Sync lost.
2. Watchdog.
3. Power Fail.

Configuration/ Programming

Programming:

Parameters programmable by keypad on front
COM 1 NMEA 0183 Baud Rate settings
COM 2 Time zone correction (UTC OR IST).
Hour setting for Display (12 OR 24 Hrs).
COM2 serial port setting.
COM2 data format selection (NGTS or T-FORMAT)
Programmable repetitive event generation output via dry Contact (Per Minute or Hour).

Type Test

Electrostatic Discharge (ESD)	: IEC 61000-4-2
Radiated Susceptibility	: IEC 61000-4-3
EFT Test	: IEC 61000-4-4
Surge Test	: IEC 61000-4-5
Conducted Susceptibility(Conducted RF)	: IEC 61000-4-6
Power Frequency Magnetic Field	: IEC 61000-4-8
Voltage Interruption/voltage dips	: IEC 61000-4-11
Damped Oscillator Magnetic Field	: IEC 61000-4-12
Radiated Emission	: As per CISPR -22
Conducted Emission	
Vibration	: IEC 68-2-6
Bump Test	

Accessories

Antenna mounting clamp,
Surge suppressor,
Signal Amplifier,
RS 232/485 Repeater,
TDR- 4 (Time distribution rack),
TDU64 (Time display unit)

ORDERING CODE

Model	IRIG-B Modulated	Prog Event	LAN output	DCF77 op	IRIG-B TTL Optical	IRIG-B demodulated
MC-1-C	X	X	X	X	X	X
	0 None	0 None	0 None	0 None	0 None	0 None
	1 1 output	1 4 events	1 1 output	1 1 Output	1 1 output	1 1 output
	2 2 output		2 2 Output		2 2 output	2 2 output
	3 3 output				3 3 output	3 3 output
	4 4 output				4 4 output	4 4 output