

Masterclock®

Sequence of Events Recorders

POWERED BY **CYBER SCIENCES™**

SER-3200 / SER-2408

The **CyTime™ Sequence of Events Recorder** from Cyber Sciences monitors the status of 32 channels and records state changes with 1ms accuracy. Up to 8192 events are stored in nonvolatile memory. Two models are available: the SER-3200 features 32 high-speed digital inputs, while the SER-2408 has 24 inputs and 8 relay outputs. An embedded web server enables setup and monitoring over an Ethernet network using a standard web browser. Custom web pages can be created for specific applications and added functionality. With the **GMR5000 GPS Master Clock** and Modbus TCP communications, integration with supervisory systems such as an electrical power monitoring system (EPMS) is simple.

SPECIFICATIONS

Available Configurations

- > SER-3200 - 32 high-speed digital inputs
- > SER-2408 - 24 high-speed digital inputs and 8 control relay outputs

Time Reference Sources

- > PTP (IEEE 1588) Master/Slave via Ethernet (option)
- > Primary and secondary NTP servers via Ethernet
- > IRIG-B0 or DCF77 via optional EZC
- > IRIG-B0 or DCF77 via RS-485 (from another SER)

High-Speed Digital Inputs

- > Turn on/off time (max.) 0.5 ms / 0.5 ms
- > Each input is optically isolated
- > 24 Vdc nominal voltage

Digital Relay Outputs

- > Controllable via Modbus TCP
- > Form A solid-state relay
- > Normally open, true high signal
- > 24 Vdc nominal voltage
- > 2.0A rated contacts
- > Response time: <0.1 ms OFF to ON, < 0.1 ms ON to OFF



The GMR5000 can act as a Stratum 1 PTP or NTP server or provide an IRIG-B time code source.



Other Features

- > Embedded web server
- > LCD display and keypad
- > 4 GB SD memory card
- > Trigger relay output contact closure duration: 100 ms
- > Status available via LCD, Modbus TCP and Web page
- > Standard DIN-rail mount hardware

Other Options

- > 32 GB memory option
- > EZ Connector for IRIG-B or DCF77

Power, Physical Dimensions, Operating Parameters

- > DC input (24 Vdc), 10 W max
- > Size: 11.25 x 4.75 x 3.13 in (286 x 121 x 79 mm)
- > Weight: 3.0 lb (1.4 kg)
- > Temperature: -25 to 70°C
- > Humidity: Up to 95% (non-condensing)

Compliance

- > FCC, ROHS, CE Marked, UL, cUL, RCM

MASTERCLOCK, INC.

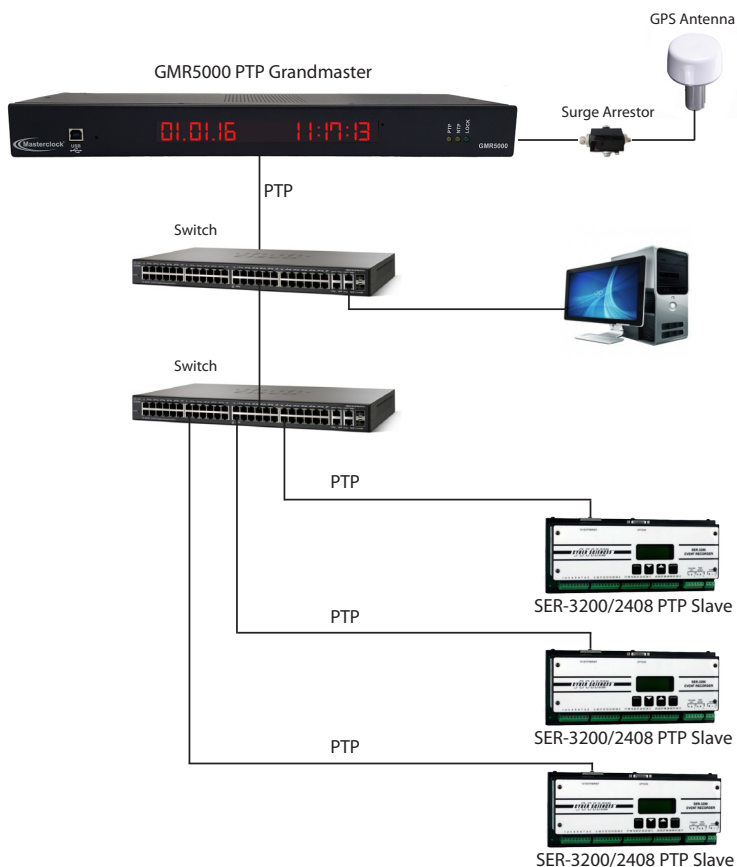
MADE IN THE USA

GMR5000 and SER-3200/2408

Simple and Affordable: Hi-Res Time Sync Over Ethernet

Achieve high-resolution time synchronization without expensive infrastructure changes. The **GMR5000 Master Clock** and the **CyTime™ Sequence of Events Recorder** utilize PTP IEEE1588 to greatly improve timing accuracies over an existing Ethernet network without the need for special PTP-aware equipment or additional wiring. The system provides the exact time of power system events, enabling root-cause analysis, identifying slow breakers and allowing operators to verify proper system operation. The PTP-enabled solution is simple, affordable and completely scalable, from a few devices to the largest installation. Now engineers can expect more from their investment in power monitoring and know what happened and when – to one millisecond – and without all the extra wires.

Example PTP IEEE1588 Time Synchronization



Solution Benefits

Stratum 1 PTP synchronization

- > Accurate timing reference to within ± 15 ns of UTC using 24-channel GPS/GLONASS receiver

Holdover stability in case of GPS signal loss

- > Internal high-stability OCXO oscillator provides accuracy of ± 0.25 seconds/year

Time-critical information for root-cause analysis (1 ms)

- > Time-stamped records of events—up to 8192 events stored in non-volatile memory

Reliable event recording

- > Isolated digital inputs with user-configurable filter, debounce and chatter functions

Command relays over the network (model SER-2408)

- > Open/close relay outputs remotely over an Ethernet network using Modbus TCP

Advanced troubleshooting

- > High-speed trigger output to capture waveforms by a compatible power meter

Operations counters

- > Counts each input/output transition, with date/time of last reset

Simple setup using a web browser—no proprietary software

- > Embedded web server hosts user-friendly pages for setup and monitoring

Easy system integration

- > Integrate with multiple systems via Ethernet, Modbus TCP, and web technologies

EPSS generator test-compliance reports enabled

- > 16 data logs: when any group member changes state, all members' states are recorded