

## GUIDE SPECIFICATION SER-3200 SEQUENCE OF EVENTS RECORDER

*All or part of this text may be copied and inserted into a project specification, as desired. In the US, Sequence of Events Recording (SER) is typically part of CSI spec section 26 09 13—Electrical Power Monitoring and Control.*

### A. EVENT RECORDER

The Event Recorder shall provide precision time-stamped event reporting for 32 high-speed digital input channels. The Event Recorder shall be CyTime™ model SER-3200 from Cyber Sciences, or approved equal.

1. **Precision time reference.** The Event Recorder shall accept a precision time reference signal from a Global Positioning System (GPS) receiver or other device as follows:
  - a. Unmodulated IRIG-B time code signal (accepts types B004 thru B007).
  - b. DCF77 precision time reference (24 Vdc nominal)
  - c. Multi-point IRIG-B time signal (RS-485) from another Event Recorder (time sync master).
  - d. NTP (from network time server).
2. **Digital input channels.** The Event Recorder shall have 32 electrically-isolated digital inputs for sensing the status of power system components, such as circuit breaker position (open/closed), relay status (normal/tripped), etc.
3. **Event recording.** The Event Recorder shall monitor the status of all input channels and record up to 8192 events in non-volatile memory corresponding to state changes. To ensure reliable operation and avoid “nuisance” event recording due to over-sensitivity, each input channel shall be individually configurable as follows:
  - a. Filter (minimum time delay to avoid false events caused by noise)
  - b. Debounce (time to temporarily disable event recording following an event, to prevent generation of multiple event records for a single state change)
  - c. Chatter (max. number of events for a given input channel, to avoid filling memory with erroneous events associated with a faulty input signal)
  - d. Scan Status (0 = disabled, 1 = enabled)
  - e. Input Description (32 characters)
  - f. Off-state Description (16 characters)
  - g. On-state Description (16 characters)
  - h. Trigger Status (0 = disabled, 1 = enabled)
4. **Local display.** The Event Recorder shall have an LCD backlit display, 4-line by 20 characters to provide key data to facilitate commissioning. Displayed items shall include time signal status, current date and time, and confirmation of time synchronization input.
5. **Ethernet network communications.** The Event Recorder shall have an RJ-45 connector for interface to an Ethernet network. The device shall automatically sense network operating parameters, such as network speed (10/100 Mbps) and wiring polarity.
6. **Embedded web server.** The Event Recorder shall feature an embedded web server to allow monitoring and setup over an Ethernet network using a standard web browser. The following functionality shall be provided via the web interface, even over a network:
  - a. Status Monitoring page shall display on/off status of each input.
  - b. Events Monitoring page shall display event log, with sortable columns for event time and date, input channel, type, status, time quality, and unique event sequence number.

- c. Control page shall provide a means for performing a simulation test to override status of inputs to test application software.
  - d. Diagnostics page shall provide device information and statistics to aid analysis and troubleshooting.
  - e. Setup pages shall allow the user to change setup parameters and store them back to the device in non-volatile memory.
  - f. Custom page(s). In addition to the standard web pages above, the Event Recorder shall provide one or more custom web pages which can be used as-is or further customized by the user to provide additional functionality while maintaining its navigation framework.
7. **SD flash memory card.** The Event Recorder shall store all setup parameters in an XML file format on a removable 1GB SD flash memory card to facilitate setup of multiple devices using templates, and to allow rapid device replacement since setup data is on removable SD card. [Optional: Expand on-board memory to 32GB.]
  8. **Programmable trigger output.** The Event Recorder shall have a programmable output to trigger an action coincident with an event, such as the waveform capture (WFC) feature of compatible power monitors, including PowerLogic CM4000 series circuit monitors by Schneider Electric, PowerXpert 4000/6000 meters by Eaton, or EPM 9450/9650 meters from GE/Multilin.
  9. **Time sync master.** The Event Recorder shall be capable of serving as a time sync master for additional Event Recorders via a multi-point RS-485 signal, using the IRIG-B006 time code or DCF77 signal, depending on its input.
  10. **DB15 to screw-terminal adapter.** As an option to facilitate wiring of the precision time input, an adapter shall be provided to connect to the Event Recorder's DB15 connector and offer a screw-type terminal to facilitate wiring and a diagnostics LED to indicate the presence (or absence) of a valid IRIG-B or DCF77 signal, to assist in commissioning.
  11. **DIN-rail mounting.** The Event Recorder shall be designed to mount on a standard DIN rail.
  12. **Multiple masters.** The Event Recorder shall be capable of operating with multiple masters.
  13. **Regulatory compliance.** The Event Recorder shall be tested to applicable standards as follows:
    - a. Listed per UL-508, Industrial Control Equipment.
    - b. Listed per Canadian National Standard C22.2 142-M1987.
    - c. IEEE Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems (ANSI/IEEE C.37-90.1-1989) (All inputs except communications ports.)
    - d. ANSI C62.41 Surge Immunity.
    - e. FCC compliance: FCC Part 15 Subpart B, Class A Digital Device, Radiated Emissions.
  14. **Technical specifications. The Event Recorder shall meet or exceed the following:**
    - a. Inputs. Rated for 24Vdc.
    - b. Control power. Nominal rating of 24Vdc.
    - c. Operating temperature. -25C to +70C.
    - d. Storage temperature. -40C to +85C.
    - e. Humidity: 5 to 95% non-condensing (at 40C).
    - f. RoHS-compliant and lead-free to meet environmental requirements.
    - g. For a complete listing of technical specifications, please refer to SER-3200 instruction bulletin, IB-SER-01.