

# Replacing ProTime SER devices with Trystar SER-3200 Event Recorders

## Summary

The question often arises: “How can I replace an existing ProTime Event Recorder with a Trystar SER-3200?” Trystar SER-3200 Event Recorders are functional replacements for ProTime Event Recorders from Monaghan Engineering, with several additional features.

This paper describes the application considerations for making such a substitution and gives a brief description of new functionality available once the ProTime is replaced by the Trystar SER-3200.

## Introduction

Trystar SER-3200 Event Recorders from Trystar and ProTime Event Recorders from Monaghan Engineering each provide 1-ms event recording for 32 digital inputs with data accessible over Ethernet using Modbus TCP. Both devices support 24Vdc control power and digital inputs, and both use standard DIN-rail mounting. The wiring terminals for inputs also share a similar orientation at the bottom of each device.

When replacing a ProTime Event Recorder with a Trystar SER-3200 Event Recorder, the time-sync input may need to be considered. Three scenarios are described below, with application considerations and possible workarounds where necessary.

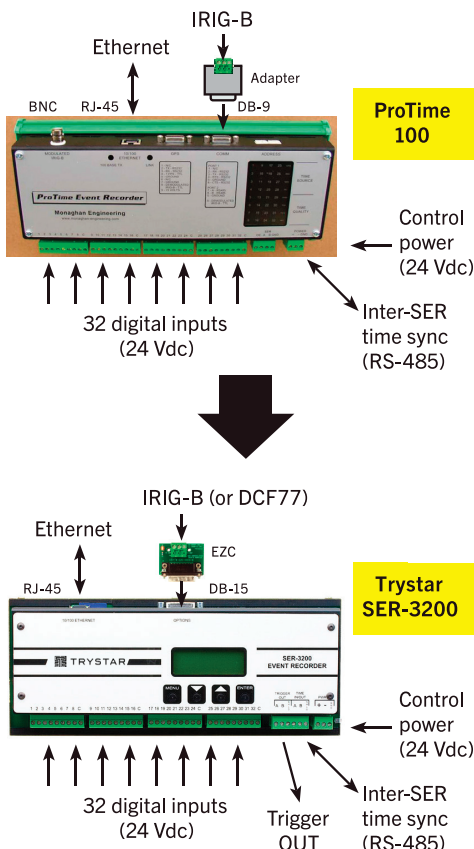
## Application Considerations

The ProTime has many of the same basic features as the Trystar SER-3200. Existing installations with the following characteristics should allow direct form-fit-feature replacement:

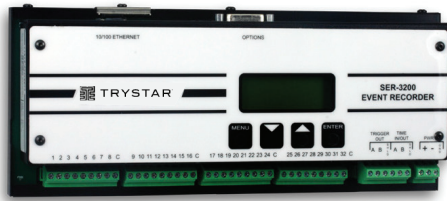
- Standard DIN-rail mounting
- Ethernet interface (Modbus TCP)
- 24 Vdc control power
- 32 digital inputs (also rated 24 Vdc)
- Time source: IRIG-B (DCLS, or “Unmodulated”)

**CASE A—Unmodulated IRIG-B input.** The most commonly used method to timesync ProTime is IRIG-B, type DC Level Shift (DCLS), more commonly known as “Unmodulated IRIG-B” (also called “Demodulated”). If the time-sync method used by the existing ProTime Event Recorder is Unmodulated IRIG-B, then the SER-3200 may be substituted without changes to existing wiring. Just as the ProTime accepts the IRIG-B twisted-pair cable via an adapter to its (DB-9) connector at the top, the SER-3200 accepts the IRIG-B signal via an (optional) EZC-IRIG-B connector to its own (DB-15) connector as shown. The EZC-IRIG-B also has a diagnostics LED which flashes when a valid IRIG-B signal is present, to facilitate commissioning or troubleshooting.

**CASE B—Modulated IRIG-B (less common).** If the time-sync method used by the existing ProTime Event Recorder is Modulated IRIG-B (via its BNC connector), then an alternate time source should be found for the SER-3200. The SER-3200 accepts PTP (IEEE 1588), Unmodulated IRIG-B, DCF77, or NTP, as well as its own RS-485 inter-SER time-sync subnet.



**CASE C—ProTime Inter-SER Time Sync (Proprietary).** Both the ProTime and Trystar event recorders can serve as a time-sync master to additional SER devices through an RS-485 sub-network. The ProTime uses a proprietary protocol over RS-485, whereas the Trystar uses IRIG-B or DCF77 standard time codes (matching the time source of the master). This difference makes the two types of “Inter-SER Time Sync” incompatible; ProTime and Trystar cannot be mixed on the same RS-485 Inter-SER daisy-chain. In such cases, all ProTime devices on the daisy-chain can be replaced with Trystar SER-3200 units (no changes to the existing RS-485 cabling); OR the target device can be replaced with a Trystar SER-3200, and an alternate time-sync method used (PTP, Unmodulated IRIG-B or DCF77). Often one of these signals is already present within the same enclosure to sync other devices. Two new Trystar SERs with PTP option (one as PTP master, the other as PTP slave) may also be used.



*Trystar SER-3200*

### Incremental Features of the SER-3200

- The Trystar SER-3200 has many features not available with ProTime devices:
- Standards compliance: UL-Listed (UL 61010), CSA, CE Mark, RCM, RoHS
- Embedded web server for setup, test and monitoring via web browser
- PTP (IEEE 1588) time-sync (either PTP master or PTP slave)
- DCF77 time-sync
- NTP time-sync
- Trigger output for waveform capture by a compatible power meter
- Counters, with date/time of last reset stored individually per channel.
- Time-sync output (ASCII RS-485) to ION7550/7650 and PM8000 meters from
- Schneider Electric and ION9510/9610 meters from Siemens.
- Standard software drivers available for several major EPMS platforms

The Trystar SER-3200 also differs from the ProTime as follows:

- SER-3200 setup via Ethernet using a standard web browser; ProTime setup requires RS-232 serial connection and proprietary setup software.
- SER-3200 supports 44 simultaneous TCP connections; ProTime supports 12.
- SER-3200 supports access to event log via multiple masters; with ProTime, once data is read, the event-buffer is cleared

For a complete list and descriptions of Trystar SER-3200 features, please refer to the documents referenced below, or contact Cyber Sciences for assistance.

**For More Information**

Trystar SER-3200/2408 Data Sheet  
 Trystar SER-3200/2408 User’s Guide  
 Trystar SER Reference Guide  
 Tech Note: Hi-res Time Sync using PTP/1588  
 Tech Note: SER System Architectures

The screenshot shows the Trystar SER-3200 web interface. At the top, there is a navigation bar with 'Home | CSI web site' and 'SER-3200'. Below this is a menu with 'Event Recorder', 'MONITORING', 'CONTROL', 'DIAGNOSTICS', and 'SETUP'. The main content area features a table of events and a sidebar with sorting options.

| Event | Date and Time           | Channel  | Event Type          | Status   | Time Quality    | Delta Time |
|-------|-------------------------|----------|---------------------|----------|-----------------|------------|
| 1204  | 09/19/2015 13:23:51.515 | Input 04 | Input Status Change | On → Off | 0 Good (< 1 ms) | 0.070      |
| 1203  | 09/19/2015 13:23:51.446 | Input 03 | Input Status Change | On → Off | 0 Good (< 1 ms) | 0.188      |
| 1202  | 09/19/2015 13:23:51.258 | Input 02 | Input Status Change | On → Off | 0 Good (< 1 ms) | 0.070      |
| 1201  | 09/19/2015 13:23:51.168 | Input 01 | Input Status Change | On → Off | 0 Good (< 1 ms) | 415 days   |
| 1200  | 07/30/2014 14:07:17.398 | Input 24 | Input Status Change | Off → On | 0 Good (< 1 ms) | 1.260      |
| 1199  | 07/30/2014 14:07:16.137 | Input 23 | Input Status Change | Off → On | 0 Good (< 1 ms) | 42.359     |
| 1198  | 07/30/2014 14:06:33.777 | Input 22 | Input Status Change | Off → On | 0 Good (< 1 ms) | 0.869      |
| 1197  | 07/30/2014 14:06:32.908 | Input 21 | Input Status Change | Off → On | 0 Good (< 1 ms) | 37.005     |
| 1196  | 07/30/2014 14:05:55.903 | Input 20 | Input Status Change | Off → On | 0 Good (< 1 ms) | 0.991      |
| 1195  | 07/30/2014 14:05:54.912 | Input 19 | Input Status Change | Off → On | 0 Good (< 1 ms) | 43.094     |
| 1194  | 07/30/2014 14:05:11.818 | Input 18 | Input Status Change | Off → On | 0 Good (< 1 ms) | 1.659      |
| 1193  | 07/30/2014 14:05:10.158 | Input 17 | Input Status Change | Off → On | 0 Good (< 1 ms) | 02:12.836  |
| 1192  | 07/30/2014 14:02:57.321 | Input 16 | Input Status Change | Off → On | 0 Good (< 1 ms) | 0.446      |
| 1191  | 07/30/2014 14:02:56.875 | Input 15 | Input Status Change | Off → On | 0 Good (< 1 ms) | 43.283     |
| 1190  | 07/30/2014 14:02:13.591 | Input 14 | Input Status Change | Off → On | 0 Good (< 1 ms) | 1.096      |
| 1189  | 07/30/2014 14:02:12.495 | Input 13 | Input Status Change | Off → On | 0 Good (< 1 ms) | 43.380     |
| 1188  | 07/30/2014 14:01:29.134 | Input 12 | Input Status Change | Off → On | 0 Good (< 1 ms) | 0.555      |
| 1187  | 07/30/2014 14:01:28.579 | Input 11 | Input Status Change | Off → On | 0 Good (< 1 ms) | 37.412     |
| 1186  | 07/30/2014 14:00:51.166 | Input 10 | Input Status Change | Off → On | 0 Good (< 1 ms) | 0.303      |
| 1185  | 07/30/2014 14:00:50.863 | Input 09 | Input Status Change | Off → On | 0 Good (< 1 ms) | 02:19.188  |

Displaying Events: 1101 to 1204 Total Events: 1204  
 Load all events   Hide Seq #  Auto

Trystar SER-3200 Events web page

Technical details for the Monaghan ProTime 100 SER were taken from the published instruction bulletin, v. 1.10, and are provided solely to assist customers wishing to replace a ProTime unit with a Trystar SER-3200 from Trystar. Information is subject to change without notice.

