

## Product Presentation

# **CyTime™** Sequence of Events Recorders **SER-3200/2408**

I ♥ 1588<sup>SM</sup>



**CYBER SCIENCES™**

Precision Timing for Reliable Power. *Simplified.*<sup>SM</sup>

# Know what happened and when—to 1 msec!

## 1

### ***Understand***—Forensics tool

- Perform root-cause analysis based on reliable data.
- View current and voltage waveforms captured with each event.
- Determine if the initial source was internal or external.

## 2

### ***Respond***—Act quickly

- Evaluate control sequences, timing, and operator actions.
- Confirm protective device time-current coordination.
- Restore service quickly if an outage does occur.

## 3

### ***Prevent***—Take corrective actions

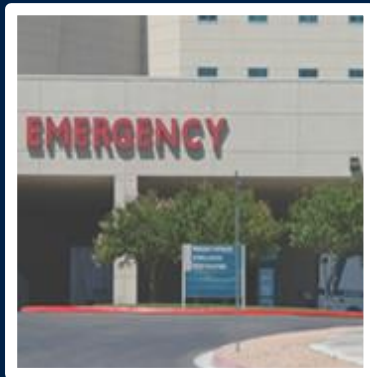
- Resolve or mitigate persistent problems.
- Provide documentation for the electric utility, legal, insurance, etc.
- Identify slow breakers before they can cause an arc flash hazard.



# SER is essential where reliable power is important:



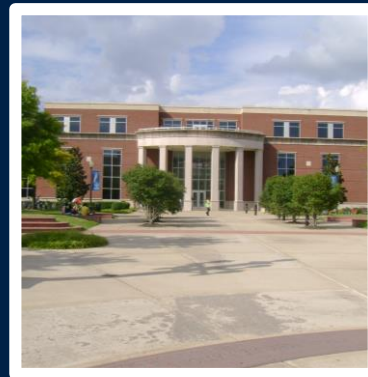
- Data centers



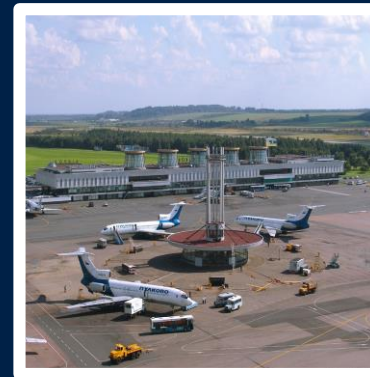
- Hospitals



- Industrial facilities



- Universities



- Airports

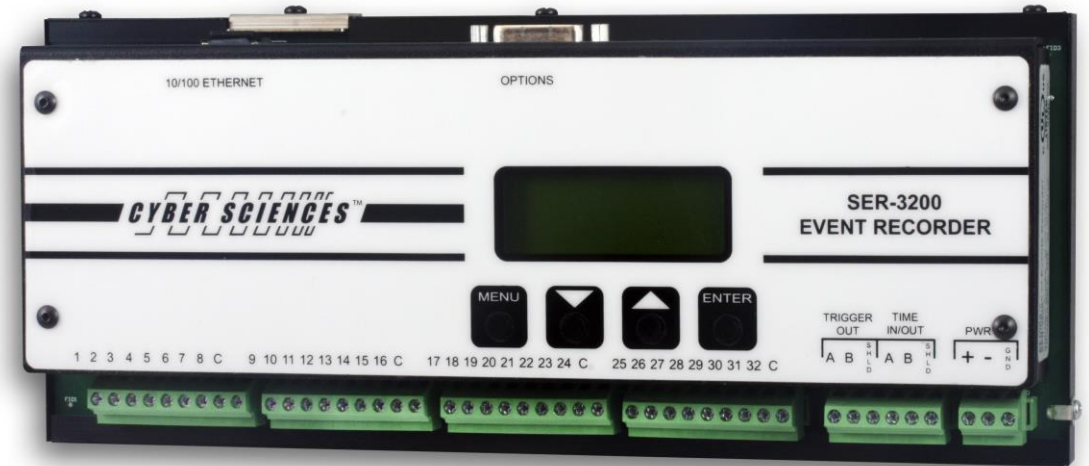


- Microgrids & alternative energy

# CyTime™ Sequence of Events Recorders

SER-3200 and SER-2408

- Status monitoring of 32 channels:
  - 32 high-speed digital inputs (SER-3200)
  - 24 inputs, 8 relay outputs (SER-2408)
- Event recording, 1 msec timestamps:
  - 8192 events in non-volatile memory
  - Stopwatch function (elapsed time)
  - Operations counters
  - Trigger output for waveform capture
- Remote control of 8 outputs:
  - Over Ethernet, via Modbus TCP (SER-2408)



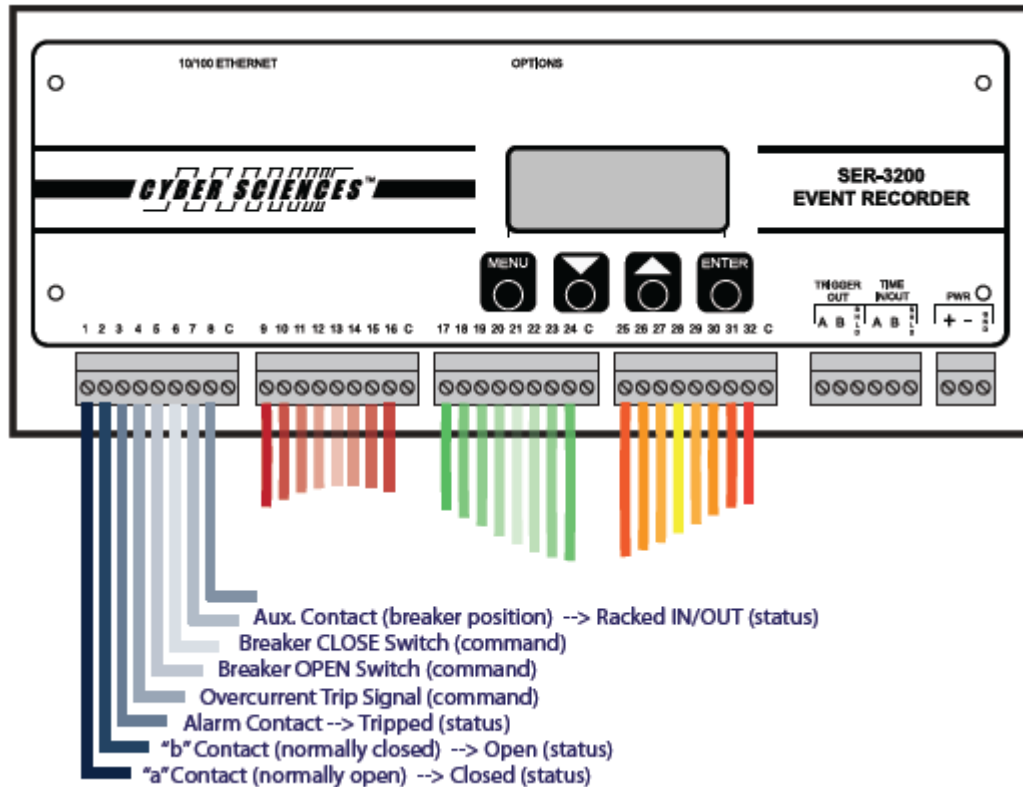
CONSULTING - SPECIFYING  
**engineer.**  
—2016  
**PRODUCT**  
OF THE **YEAR** | Silver

# Get the visibility you need throughout your electrical power distribution system

- Typical monitored points:
  - Breaker status: open/closed/tripped
  - Relay trip signal: normal/trip
  - Control switches: open/close commands
  - Control scheme status: auto/manual/test
  - Auto-transfer switch (ATS) status:
    - normal/emergency/test
  - UPS status: normal/transfer/bypass
  - Generator status: stopped/running
  - Battery status: normal/alarm
  - TVSS, transformer temperature, fan status and other auxiliary contacts and alarms



# Circuit breaker monitoring options



- Economical breaker monitoring
  - One input per breaker (open/closed)
  - Best for branch breakers closest the loads
- Basic breaker monitoring
  - 2 inputs per breaker (open/closed + tripped)
- Reliable breaker monitoring
  - 3 inputs per breaker (open + closed + tripped)
  - Separate monitoring of "a" and "b" contacts to distinguish "open" vs. control power loss
- Other contacts:
  - open/close commands (from control switch)
  - cradle position (drawout breakers)

# SER: the “black box” recorder for power systems

- Root-cause analysis: event reconstruction
- Reliability: control systems timing confirmation
- Availability: avoid downtime, or reduce duration
- Arc-flash safety: early warning of slow breakers



The screenshot displays the CyTime Event Recorder interface. The main window shows a table of events with columns for Event ID, Time, Event Type, Status, Time Quantity, and Delta Time. A magnifying glass is positioned over the event entry with ID 1116, which occurred at 16:41:45.140. The interface also includes a sidebar with navigation options (Status, Data, Events, Custom) and a top navigation bar with tabs for CONTROL, DIAGNOSTICS, and SETUP.

Event ID	Time	Event Type	Status	Time Quantity	Delta Time
1116	2016 16:41:45.468	Input Status Change	Off -> On	0 Good (s Time)	0.094
1115	2016 16:41:45.374	Input Status Change	Off -> On	0 Good (s Time)	0.142
1114	2016 16:41:45.334	Input Status Change	Off -> On	0 Good (s Time)	0.254
1113	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	197.616
1112	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	0.533
1111	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	25.192
1110	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	0.830
1109	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	24.367
1108	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	0.606
1107	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	26.762
1106	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	1.000
1105	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	24.853
1104	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	0.742
1103	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	25.388
1102	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	0.297
1101	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	26.293
1100	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	0.587
1099	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	26.512
1098	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	1.248
1097	2016 16:41:45.140	Input Status Change	Off -> On	0 Good (s Time)	24.783

This black-box recorder's data is used again and again...



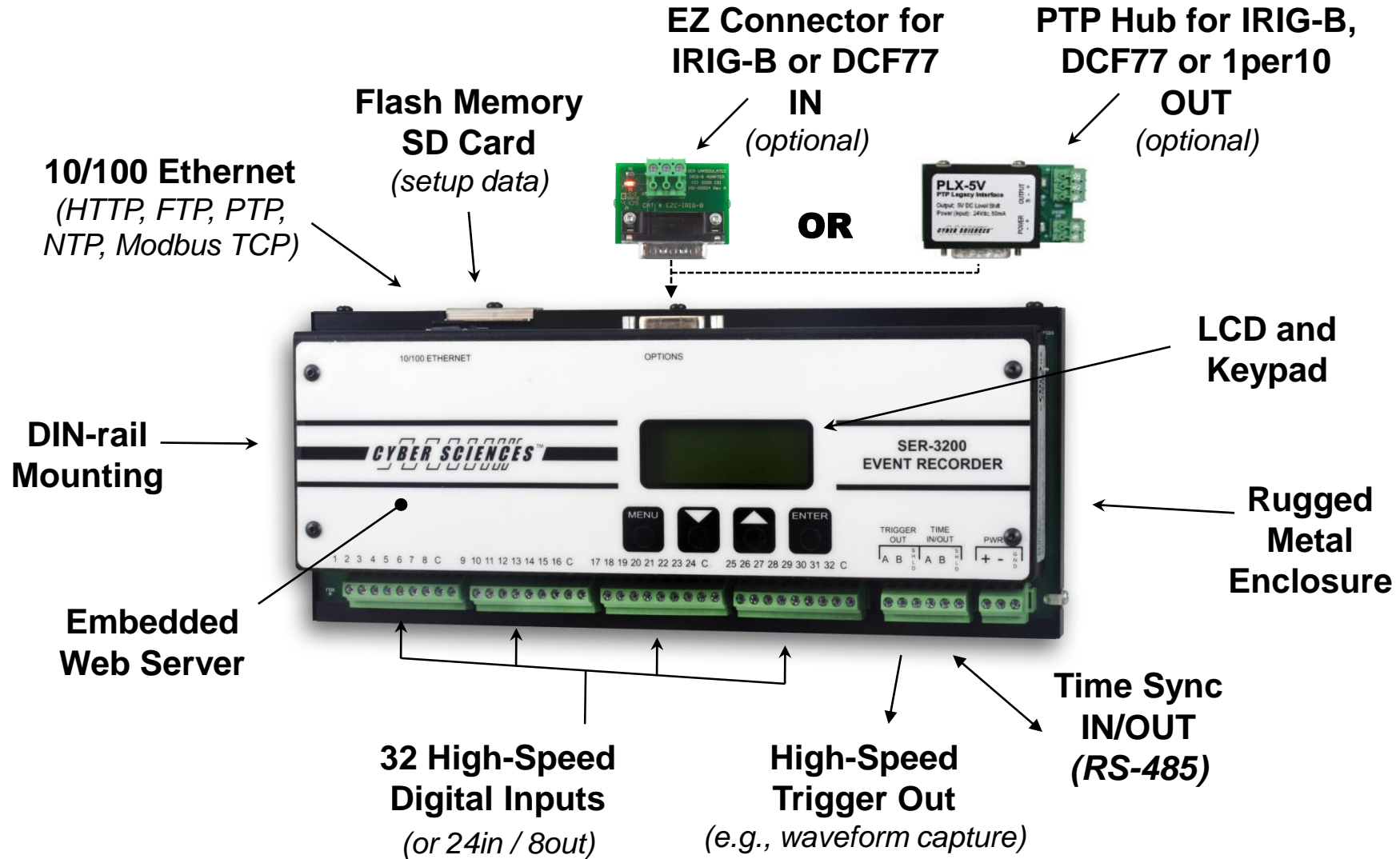
## Consider a typical incident...

- Here's what you know:
  - The approximate time of the incident
  - The equipment affected
- Here's what you may not know:
  1. What caused the incident?
  2. The exact time things began?
  3. The exact time the loads were affected?
  4. What happened between #2 and #3?
    - What equipment did or did not operate?
    - In what order did everything happen?

**SER gives you the answers.**



# CyTime™ Event Recorder—Key Features



# Monitoring and setup over a network using a standard web browser

Home | CSI web site

**CYBER SCIENCES™**

SER-3200

CyTime Event Recorder

MONITORING CONTROL DIAGNOSTICS SETUP

#	Channel Name	Status	#	Channel Name	Status
01	Input 01	<input checked="" type="checkbox"/> On	17	Input 17	<input type="checkbox"/> Off
02	Input 02	<input checked="" type="checkbox"/> On	18	Input 18	<input type="checkbox"/> Off
03	Input 03	<input checked="" type="checkbox"/> On	19	Input 19	<input type="checkbox"/> Off
04	Input 04	<input type="checkbox"/> Off	20	Input 20	<input type="checkbox"/> Off
05	Input 05	<input checked="" type="checkbox"/> On	21	Input 21	<input type="checkbox"/> Off
06	Input 06	<input type="checkbox"/> Off	22	Input 22	<input type="checkbox"/> Off
07	Input 07	<input type="checkbox"/> Off	23	Input 23	<input type="checkbox"/> Off
08	Input 08	<input type="checkbox"/> Off	24	Input 24	<input type="checkbox"/> Off
09	Input 09	<input type="checkbox"/> Off	25	Input 25	<input type="checkbox"/> Off
10	Input 10	<input type="checkbox"/> Off	26	Input 26	<input type="checkbox"/> Off
11	Input 11	<input type="checkbox"/> Off	27	Input 27	<input type="checkbox"/> Off
12	Input 12	<input type="checkbox"/> Off	28	Input 28	<input type="checkbox"/> Off
13	Input 13	<input type="checkbox"/> Off	29	Input 29	<input type="checkbox"/> Off
14	Input 14	<input type="checkbox"/> Off	30	Input 30	<input type="checkbox"/> Off
15	Input 15	<input type="checkbox"/> Off	31	Input 31	<input type="checkbox"/> Off
16	Input 16	<input type="checkbox"/> Off	32	Input 32	<input type="checkbox"/> Off

Status:  = Off  = On  = Inverted  = Forced

Inputs: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

DATA (flashing = update)

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# Embedded Web Server—Events Page

The screenshot shows the 'Events Page' of an Embedded Web Server. The page header includes 'Home | CSI web site' and 'Cyber Sciences™'. The main content is a table of events recorded by the 'CyTime Event Recorder'. The table has columns for Event #, Date and Time, Channel, Event Type, Status, Time Quality, and Delta Time. Annotations with arrows point to specific columns: 'Event #' points to the first column, 'Channel name (user-defined)' points to the 'Channel' column, 'I/O status (user-defined labels for off/on)' points to the 'Status' column, 'Delta Time (elapsed time since previous event)' points to the 'Delta Time' column, 'Date/Time of event (1 ms resolution)' points to the 'Date and Time' column, 'Event type (e.g., status change, time sync lock/fail, etc.)' points to the 'Event Type' column, and 'Time quality at time of event (indicates accuracy)' points to the 'Time Quality' column.

Event	Date and Time	Channel	Event Type	Status	Time Quality	Delta Time
1204	04/18/2016 11:03:31.468	Fdr FCB3 Trip Contact	Input Status Change	Normal --> TRIPPED	0:Good (< 1ms)	0.094
1203	04/18/2016 11:03:31.374	Fdr FCB3 OC Relay	Input Status Change	Off --> Trip Signal	0:Good (< 1ms)	0.140
1202	04/18/2016 11:03:31.234	Fdr FCB2 Status	Input Status Change	Open --> Closed	0:Good (< 1ms)	0.094
1201	04/18/2016 11:03:31.140	Fdr FCB2 Switch	Input Status Change	Open --> Close	0:Good (< 1ms)	204 days

# Monitoring—Status

Home | CSI web site

**CYBER SCIENCES™**

SER-3200

CyTime Event Recorder

MONITORING CONTROL DIAGNOSTICS SETUP

#	Channel Name	Status	#	Channel Name	Status
01	Input 01	■ On	17	Input 17	□ Off
02	Input 02	■ On	18	Input 18	□ Off
03	Input 03	■ On	19	Input 19	□ Off
04	Input 04	□ Off	20	Input 20	□ Off
05	Input 05	■ On	21	Input 21	□ Off
06	Input 06	□ Off	22	Input 22	□ Off
07	Input 07	□ Off	23	Input 23	□ Off
08	Input 08	□ Off	24	Input 24	□ Off
09	Input 09	□ Off	25	Input 25	□ Off
10	Input 10	□ Off	26	Input 26	□ Off
11	Input 11	□ Off	27	Input 27	□ Off
12	Input 12	□ Off	28	Input 28	□ Off
13	Input 13	□ Off	29	Input 29	□ Off
14	Input 14	□ Off	30	Input 30	□ Off
15	Input 15	□ Off	31	Input 31	□ Off
16	Input 16	□ Off	32	Input 32	□ Off

**Status:**      **Inputs:**      **DATA**

= Off     = Inverted    1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32    (flashing = update)
   
 = On     = Forced

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*The Status page displays real-time status of all inputs/outputs.*

# Setup—Communications

Home | CSI web site

**CYBER SCIENCES™**

SER-3200

CyTime Event Recorder

MONITORING CONTROL **DIAGNOSTICS** SETUP

Communications  
Time  
Inputs  
Groups  
Administration

MAC Address: 00-03-F4-03-93-1D  
Media Type: 10/100BaseTx Auto  
DHCP Enabled:  [ Obtain IP address automatically. ]  
IP Address: 169 . 254 . 0 . 10  
Subnet Mask: 255 . 255 . 0 . 0  
Default Gateway: 0 . 0 . 0 . 0  
FTP Server Enabled:

NOTE: Changing network settings will cause the device to restart.

Device ID: CyTime SER [ 12 characters max. ]  
Device Name: CyTime Event Recorder [ 32 characters max. ]

Cancel Defaults Apply

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*Easy setup over a network using a standard web browser*



# Setup—Time

Home | CSI web site

**CYBER SCIENCES™**

SER-3200

CyTime Event Recorder

**MONITORING**   **CONTROL**   **DIAGNOSTICS**   **SETUP**

**Communications**

**Time**

**Inputs**

**Groups**

**Administration**

Date and Time: 07/26/2017 16:01:07 (UTC+00:00)  Use alternate date format (dd/mm/yyyy)

Time Source (IN): IRIG-B

Time Sync Master (OUT):  Time-Sync Output: PTP (over Ethernet)

Time Zone Offset: UTC+00:00 Apply to Output:  IRIG-B or DCF77 (via PLX)  ASCII (RS-485)

Daylight Saving Time (DST):  Start: Mar 2nd Sun 02:00

End: Nov 1st Sun 02:00

Hourly Test Event:

NTP Polling Interval: 1 hour

Primary NTP Server: 24 . 56 . 178 . 140

Secondary NTP Server: 129 . 6 . 15 . 30

Last Successful NTP Sync: ---

PTP License: Valid

PTP Domain Number: 0

PTP Priority1: 128

PTP Priority2: 128

Manual Time Set: 2000 . 1 . 1 . 0 . 0 . 0 ← Copy PC Clock

Year Month Day Hour Minute Second

Cancel Defaults Apply

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*The Time Setup page offers flexible time sync options—both IN and OUT*

# Setup—Inputs

Home | CSI web site

**CYBER SCIENCES™**

SER-3200

CyTime Event Recorder

MONITORING CONTROL DIAGNOSTICS **SETUP**

Communications  
Time  
**Inputs**  
Groups  
Administration

Enabled	Input Name	Filter	Debounce	Chatter	Off Text	On Text	Trigger	Inverted	Data Log Group
<input checked="" type="checkbox"/>	01 Main Breaker M1	20	20	0	Open	CLOSED	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Group 01
<input checked="" type="checkbox"/>	02 Main Breaker M1	20	20	0	CLOSED	Open	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Group 01
<input checked="" type="checkbox"/>	03 Main Breaker M1	20	20	0	ok	TRIPPED	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Group 01
<input checked="" type="checkbox"/>	04 Main Breaker M1	20	20	0	Racked Out	Racked IN	<input type="checkbox"/>	<input type="checkbox"/>	Group 01
<input checked="" type="checkbox"/>	05 Main Breaker M2	20	20	0	Open	CLOSED	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Group 02
<input checked="" type="checkbox"/>	06 Main Breaker M2	20	20	0	CLOSED	Open	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Group 02
<input checked="" type="checkbox"/>	07 Main Breaker M2	20	20	0	ok	TRIPPED	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Group 02
<input checked="" type="checkbox"/>	08 Main Breaker M2	20	20	0	Racked Out	Racked IN	<input type="checkbox"/>	<input type="checkbox"/>	Group 02
<input checked="" type="checkbox"/>	09 Tie Breaker	20	20	0	Open	CLOSED	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Group 03
<input checked="" type="checkbox"/>	10 Tie Breaker	20	20	0	CLOSED	Open	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Group 03
<input checked="" type="checkbox"/>	11 Tie Breaker	20	20	0	ok	TRIPPED	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Group 03
<input checked="" type="checkbox"/>	12 Tie Breaker	20	20	0	Racked Out	Racked IN	<input type="checkbox"/>	<input type="checkbox"/>	Group 03
<input checked="" type="checkbox"/>	13 Feeder Breaker F1	20	20	0	Open	CLOSED	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Group 04
<input checked="" type="checkbox"/>	14 Feeder Breaker F1	20	20	0	CLOSED	Open	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Group 04
<input checked="" type="checkbox"/>	15 Feeder Breaker F1	20	20	0	ok	TRIPPED	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Group 04
<input checked="" type="checkbox"/>	16 Feeder Breaker F1	20	20	0	Racked Out	Racked IN	<input type="checkbox"/>	<input type="checkbox"/>	Group 04

▲ [ 1 to 16 ] ▼ [ 17 to 32 ]

Cancel Defaults Apply

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*Each input has user-configurable descriptive text, filter, debounce, chatter, and other settings*

# Setup—Groups

Home | CSI web site

**CYBER SCIENCES™**

SER-2408

CyTime Event Recorder

MONITORING
CONTROL
DIAGNOSTICS
SETUP

Enabled <input checked="" type="checkbox"/>	Group Name	Group Members	Records	Registers	Start	End
<input checked="" type="checkbox"/>	ATS 01	01, 02, 03, R1	874	7000	409501	416500
<input checked="" type="checkbox"/>	ATS 02	04, 05, 06, R2	874	7000	416501	423500
<input checked="" type="checkbox"/>	ATS 03	07, 08, 09, R3	874	7000	423501	430500
<input checked="" type="checkbox"/>	ATS 04	10, 11, 12, R4	874	7000	430501	437500
<input checked="" type="checkbox"/>	ATS 05	13, 14, 15, R5	874	7000	437501	444500
<input checked="" type="checkbox"/>	ATS 06	16, 17, 18, R6	874	7000	444501	451500
<input checked="" type="checkbox"/>	ATS 07	19, 20, 21, R7	874	7000	451501	458500
<input checked="" type="checkbox"/>	ATS 08	22, 23, 24, R8	874	7000	458501	465500
<input type="checkbox"/>	Group 09	---	0	0	---	---
<input type="checkbox"/>	Group 10	---	0	0	---	---
<input type="checkbox"/>	Group 11	---	0	0	---	---
<input type="checkbox"/>	Group 12	---	0	0	---	---
<input type="checkbox"/>	Group 13	---	0	0	---	---
<input type="checkbox"/>	Group 14	---	0	0	---	---
<input type="checkbox"/>	Group 15	---	0	0	---	---
<input type="checkbox"/>	Group 16	---	0	0	---	---

Auto-Allocate:     Total: 56000 (Max = 56000 registers)

Cancel
Defaults
Apply

**Communications**

**Time**

**Inputs**

**Inputs (Group)**

**Outputs**

**Groups**

**Administration**

*Group members must be assigned before group data logs can be activated.*

**The Setup-Groups page allows customization of up to 16 EPSS data logs.**

# Control—Test

The screenshot shows the 'Control-Test' interface of the CyTime Event Recorder. At the top, there is a navigation bar with 'Home | CSI web site' and 'SER-3200'. Below this is a menu with 'MONITORING', 'CONTROL', 'DIAGNOSTICS', and 'SETUP'. The 'CONTROL' tab is active. On the left, a sidebar contains 'Simulation test' and 'Resets'. The main area features a 'SIMULATION TEST' section with a description: 'The test function simulates status changes to facilitate testing of application software. Each status change is reflected in Modbus TCP status registers and recorded as a test event in the event log. Test events are also recorded to mark the start and end of test mode.' Below this is a 'Start Test' button and two radio buttons: 'Auto' (selected) and 'Manual'. The 'Auto' option is described as '[ Sets channels to ON--and then back to OFF--in 1 ms intervals. ]' and the 'Manual' option as '[ Forces channel status to user selections below. ]'. A large control panel contains 'Force OFF' and 'Force ON' rows, each with 32 checkboxes. The 'Force OFF' row has checkboxes 9-16, 17-24, and 25-32 checked. The 'Force ON' row has checkboxes 1-8 checked. An 'Apply' button is to the right of these rows. Below the control panel is an 'End Test' button. At the bottom, a 'Status:' section shows a legend: a white box for 'Off', a blue box for 'On', a blue box with a slash for 'Inverted', and a red box for 'Forced'. An 'Inputs:' section shows 32 status indicators, with the first 8 being blue (On) and the rest being red (Forced). A 'TEST' indicator is in the top right of this section. A copyright notice is at the very bottom: '© Copyright 2009-2017. Cyber Sciences, Inc. All rights reserved.'

*The Control-Test simulates status changes for testing with application software.*



# Diagnostics web page


Home | CSI web site

**CYBER SCIENCES™**

SER-3200

CyTime Event Recorder

**MONITORING** **CONTROL** **DIAGNOSTICS** **SETUP**

Device	
Device Name: CyTime Event Recorder	Date / Time: 09/02/2016 15:04:40 (UTC+00:00)
Device ID: CyTime SER	Time Source (Setup): IRIG-B
MAC Address: 00-03-F4-03-93-1D	Time Source (Actual): IRIG-B
Catalog No: SER-3200-PTP	Time Quality: 0:Good (< 1ms)
Date of Manufacture: 08-2016	PTP License: Valid 
Serial Number: 7777	PTP Domain Number: 0
Hardware Version: B1	PTP Port State: 6 (Master)
Firmware Version: 2.12 [Build: 1]	Clock Class: 13 (Normal: UTC)
Time Processor: 2.07	Clock Accuracy: 39 (100 µs)
Event Processor: 2.00	Clock Source: 32 (GPS)
System Processor: 2.12	TCP Sockets: 44
SD Card, Flash Memory: 4 GB	Used: 6
Total Capacity: 3,975,287,808 bytes	Free: 38
Used: 35,848,192 bytes	Self-Diagnostics: OK [ <a href="#">Details</a> ]
Free: 3,939,439,616 bytes (99%)	Support: <a href="http://www.cyber-sciences.com/support">www.cyber-sciences.com/support</a>

*The Diagnostics page displays data about the CyTime itself, its operation and status.*



# Custom web page(s)

Home | CSI web site

**CYBER SCIENCES™**

SER-3200

CyTime Event Recorder

MONITORING CONTROL DIAGNOSTICS SETUP

Status
Data
Events
Custom


**Note:** To enable hyperlinks, set pop-up blockers to allow pop-ups from this site.

**Custom page -- reserved for user applications**

This page is reserved for users to create their own web page(s) customized for a given application. For example, you may want to add instruction bulletins or project drawings to the SER-3200 online storage system, and then create a custom web page with links to these documents. Just modify or replace this page with your own custom web page (htm).

For more information, please refer to:  
[SER-3200 Instruction Bulletin -- User's Guide](#)  
[SER-3200 Instruction Bulletin -- Reference Guide](#)

or visit:  
[www.cyber-sciences.com](http://www.cyber-sciences.com)

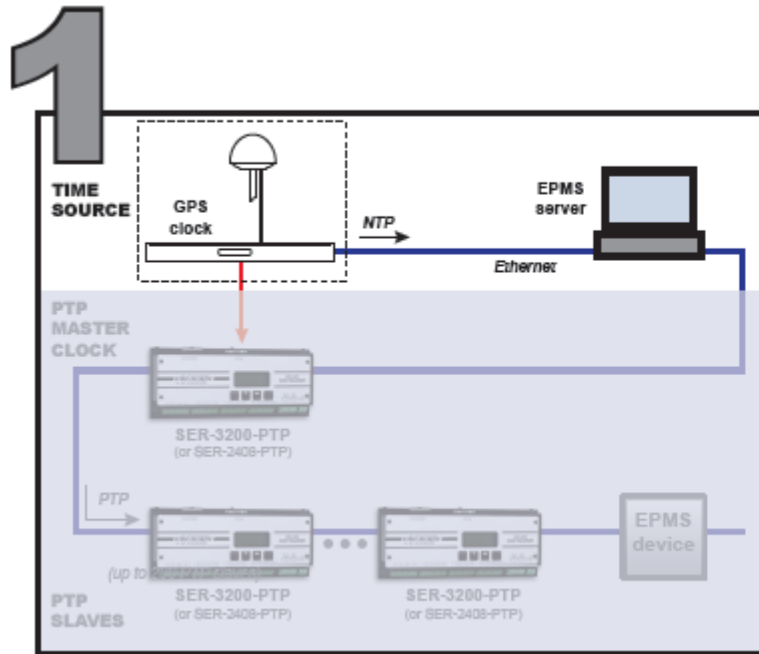


**CyTime™**  
Sequence of Events Recorder  
SER-3200

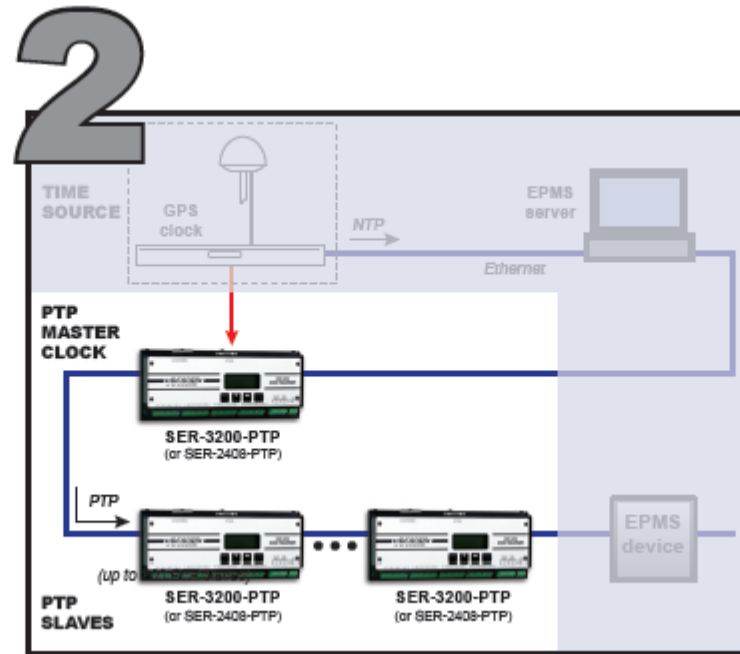
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**Create your own Custom pages, such as linking to drawings stored on SD card.**

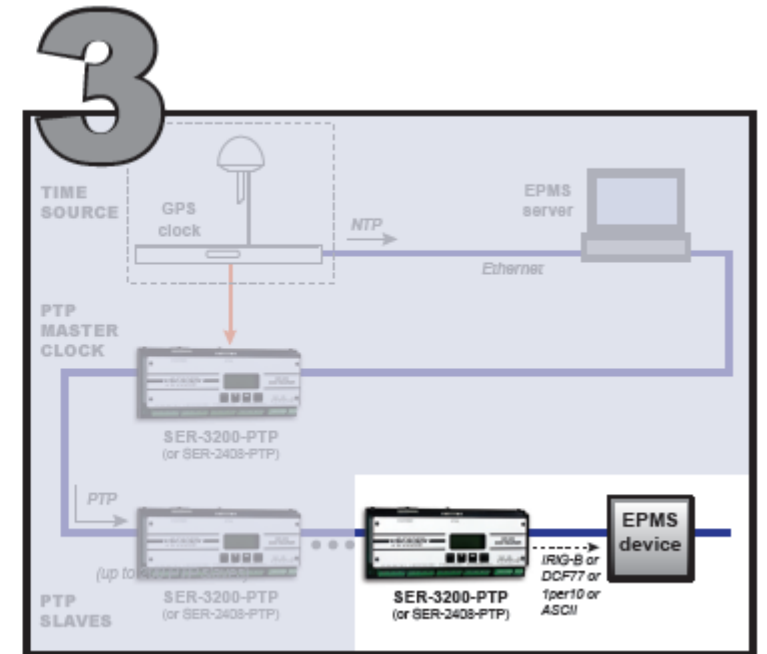
# Time sync—easy as 1-2-3



Choose time source

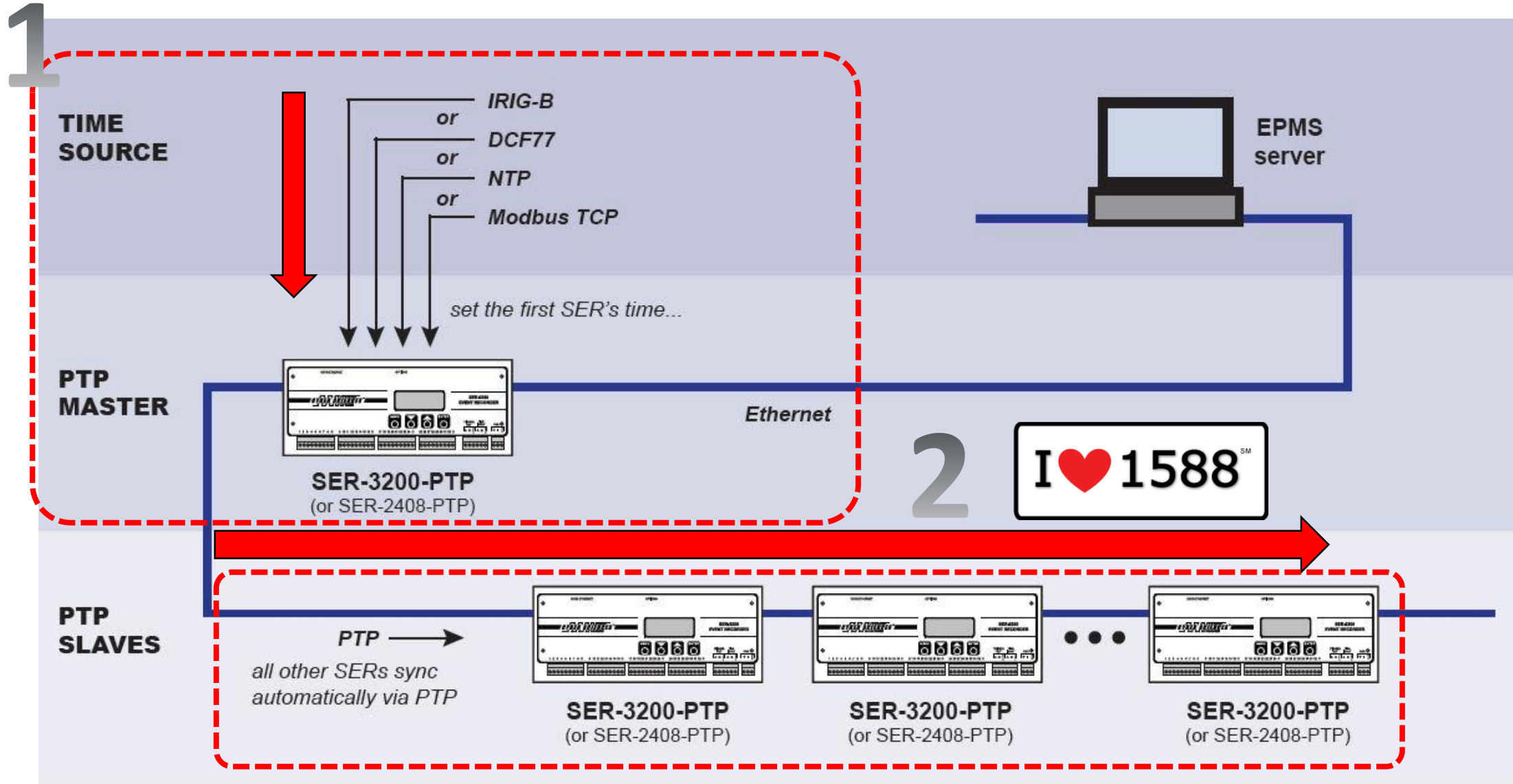


Time sync via PTP



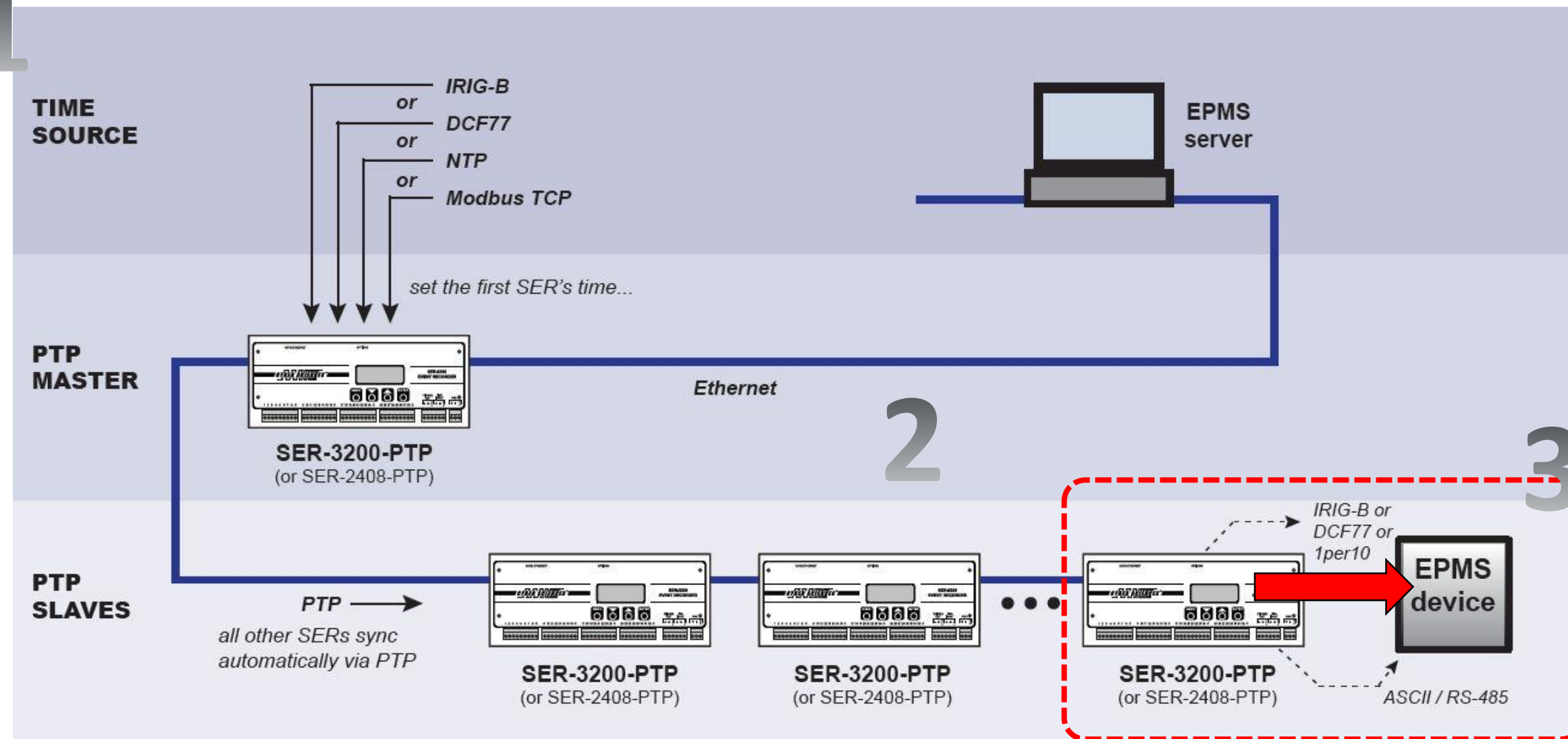
Sync non-PTP devices

# PTP (IEEE 1588): Precision time sync over Ethernet



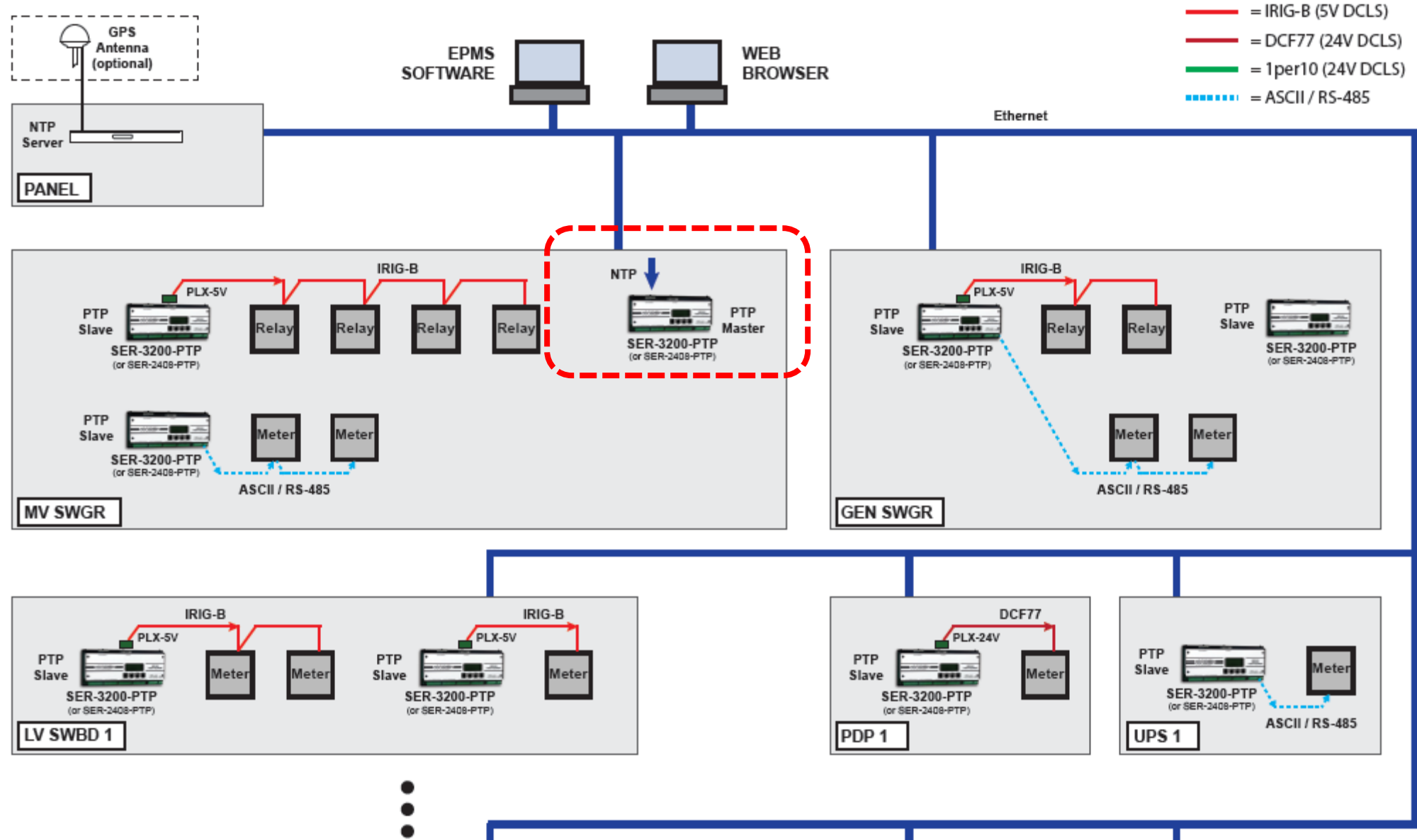
# PTP-enabling other EPMS devices (via legacy protocols)

1



# Example: sync first SER from **NTP** server (GPS optional)

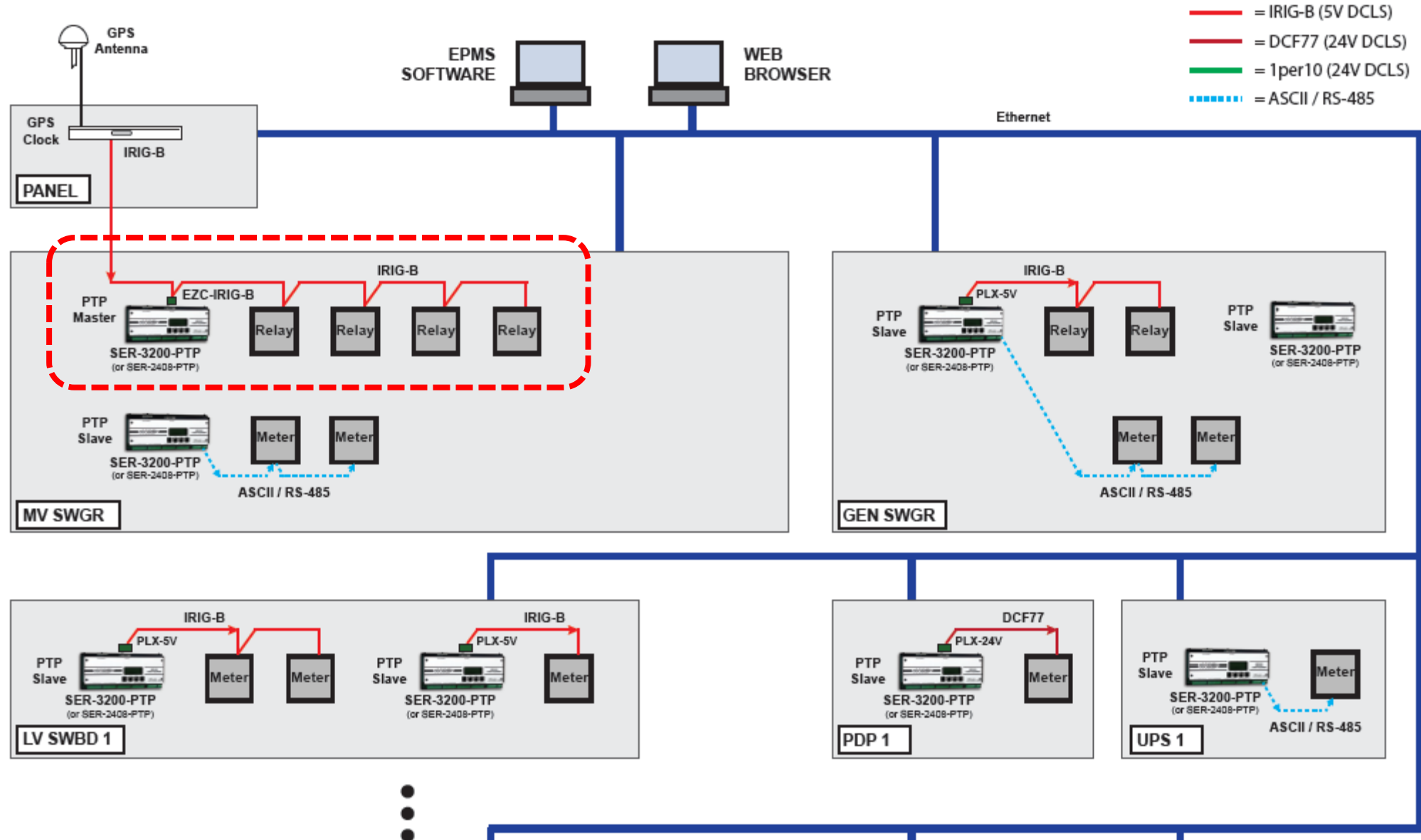
—*first SER is located in MV switchgear*





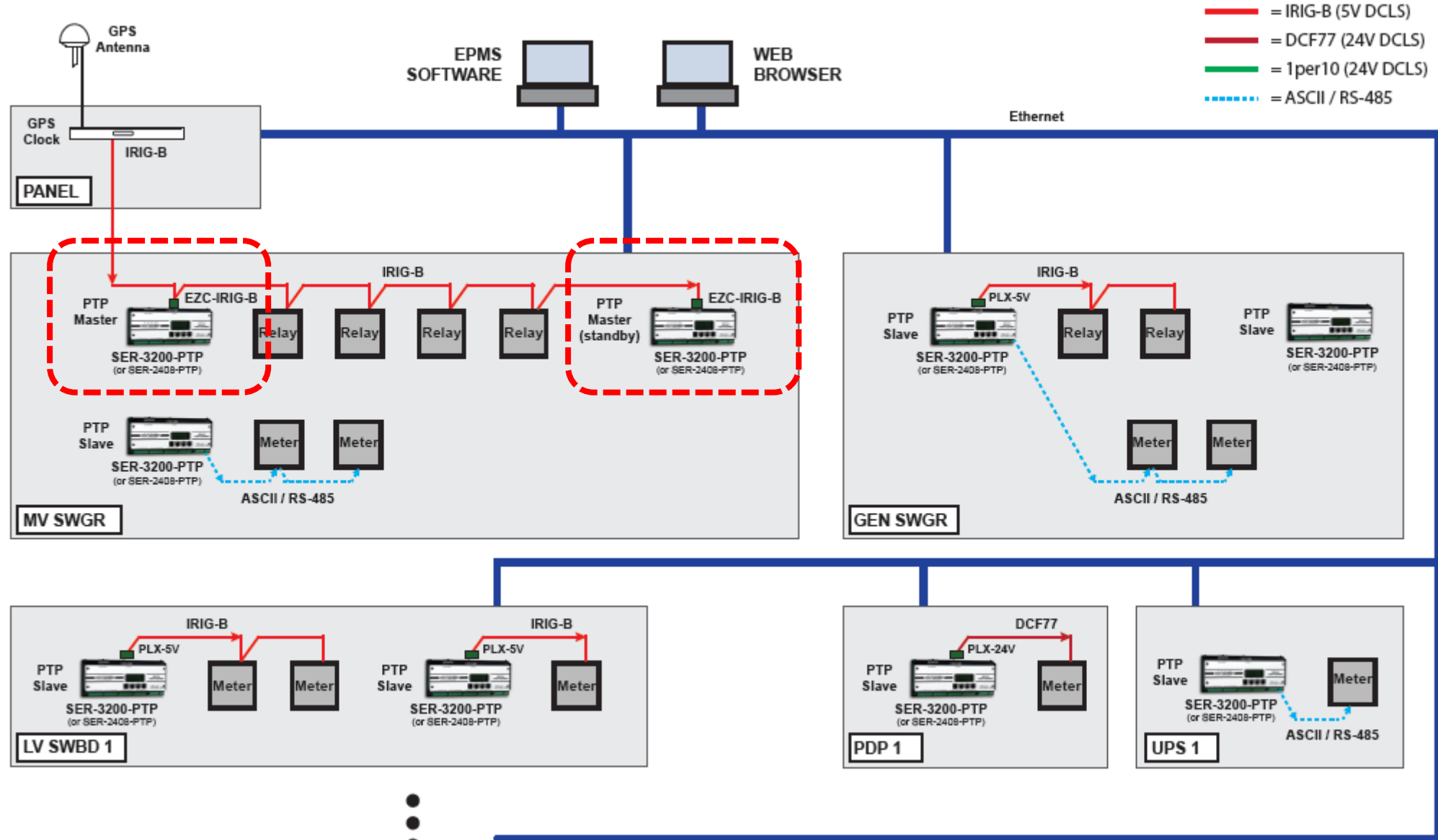
# Example: sync first SER from GPS clock (via **IRIG-B**)

—IRIG-B to first SER and to relays and meters that support it



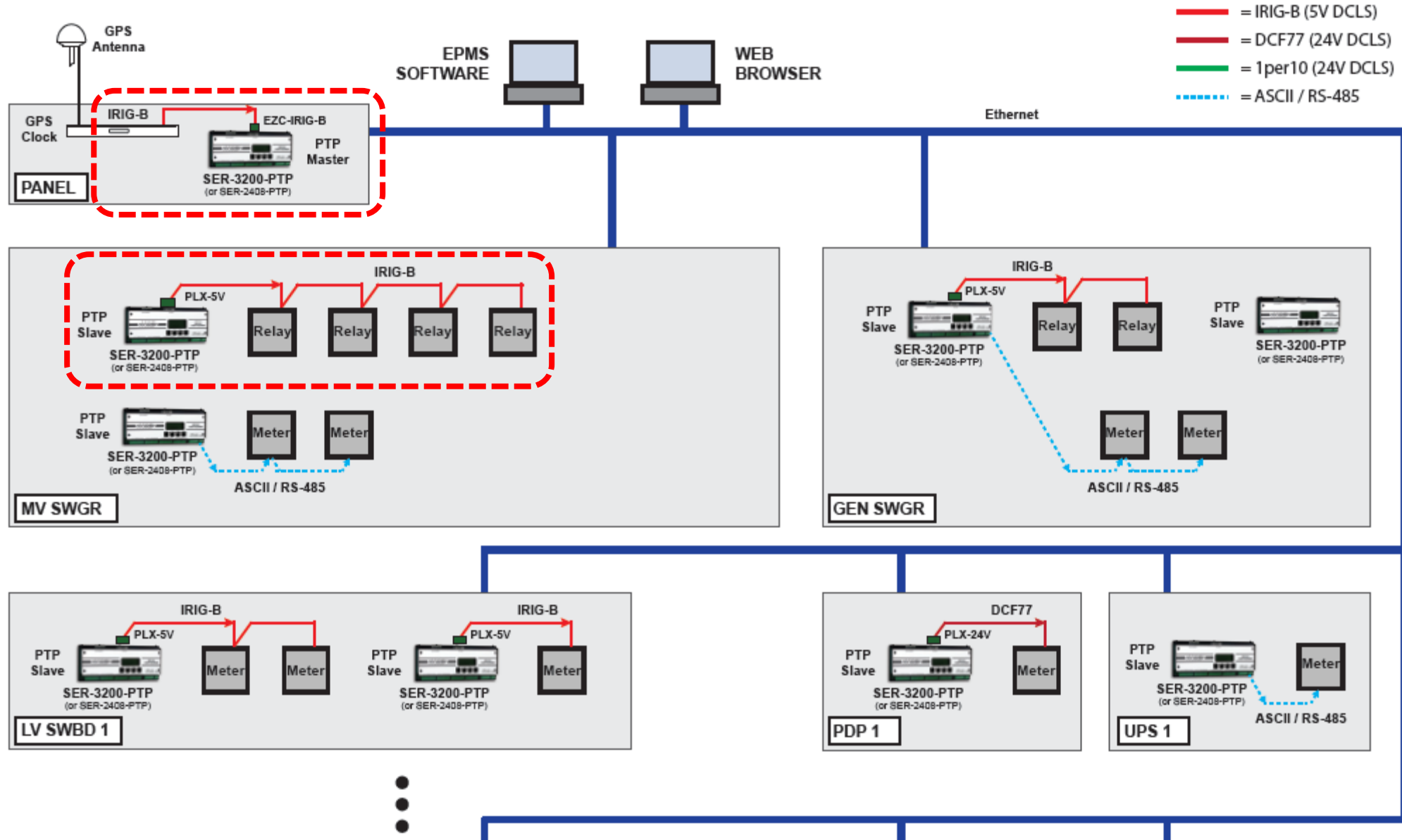
# Example: SER #1 as PTP Master, SER #2 as standby

—IRIG-B to both SERs (and others if desired)



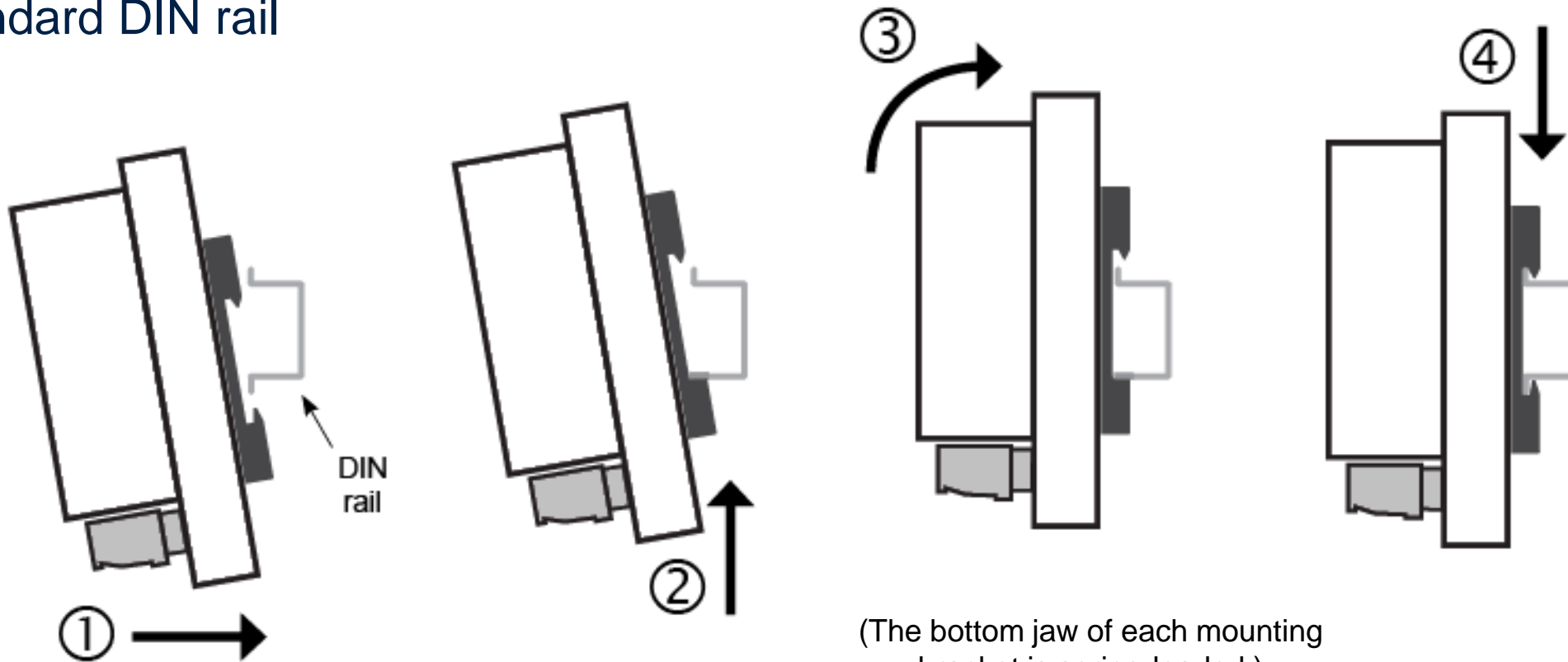
# Example: sync first SER from GPS clock (IRIG-B)

— *first SER in same panel as clock, relays sync via IRIG-B*



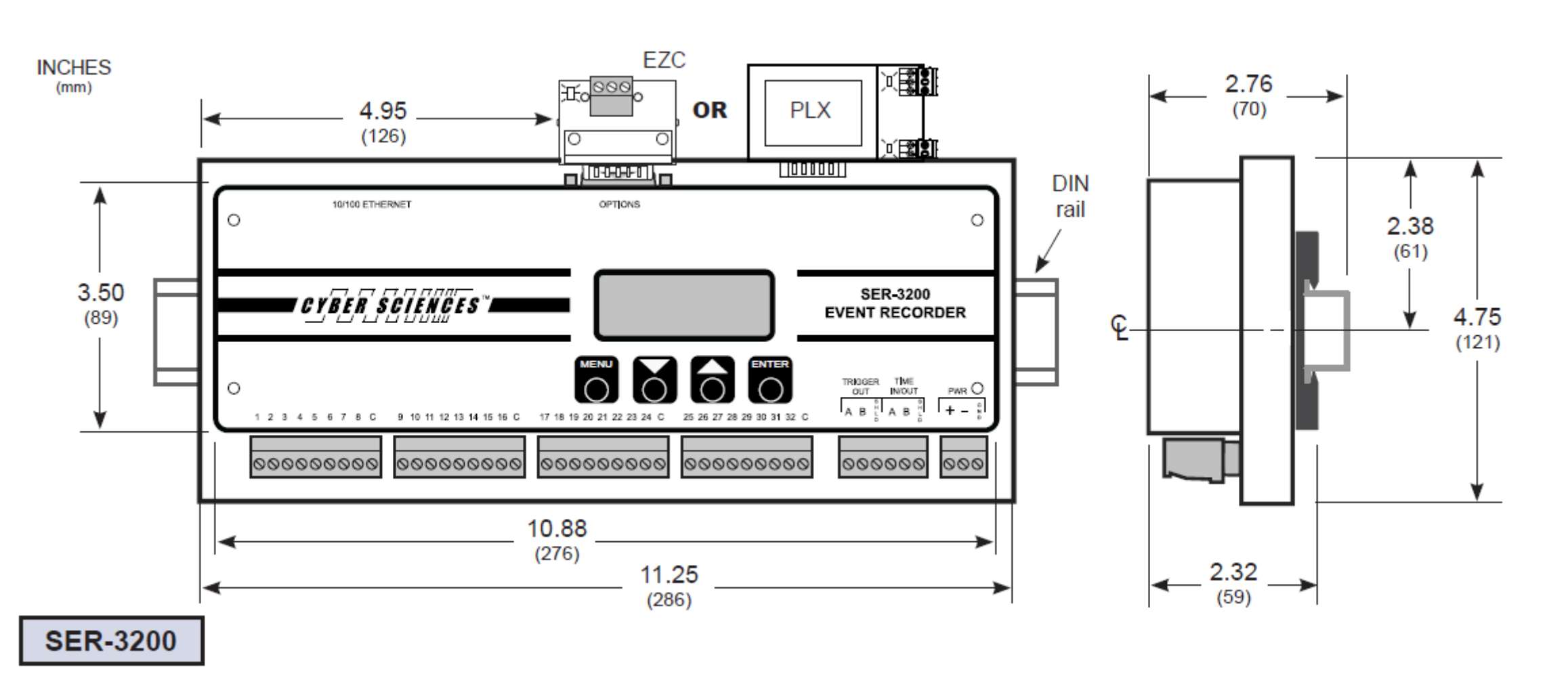
# Mounting—SER-3200/2408

- Standard DIN rail



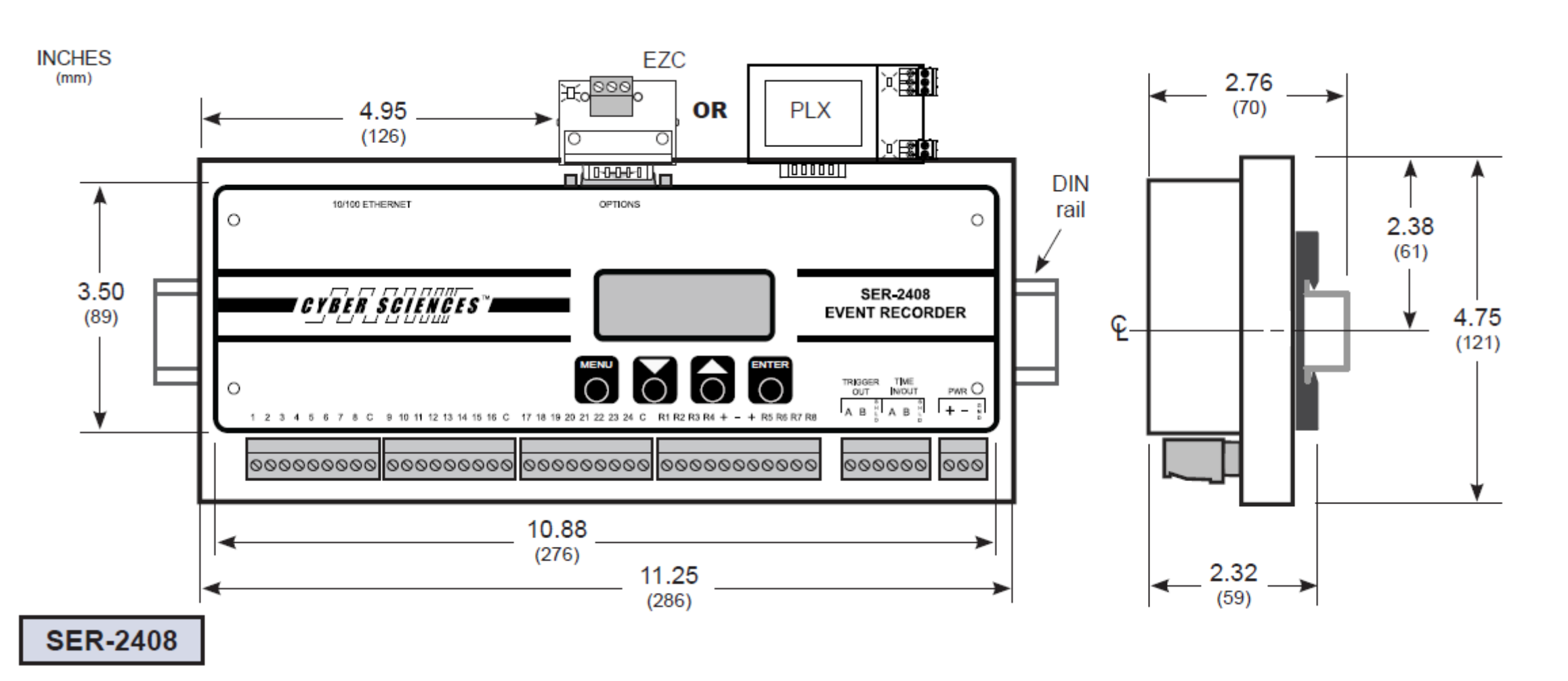
(The bottom jaw of each mounting bracket is spring-loaded.)

# Dimensions—SER-3200

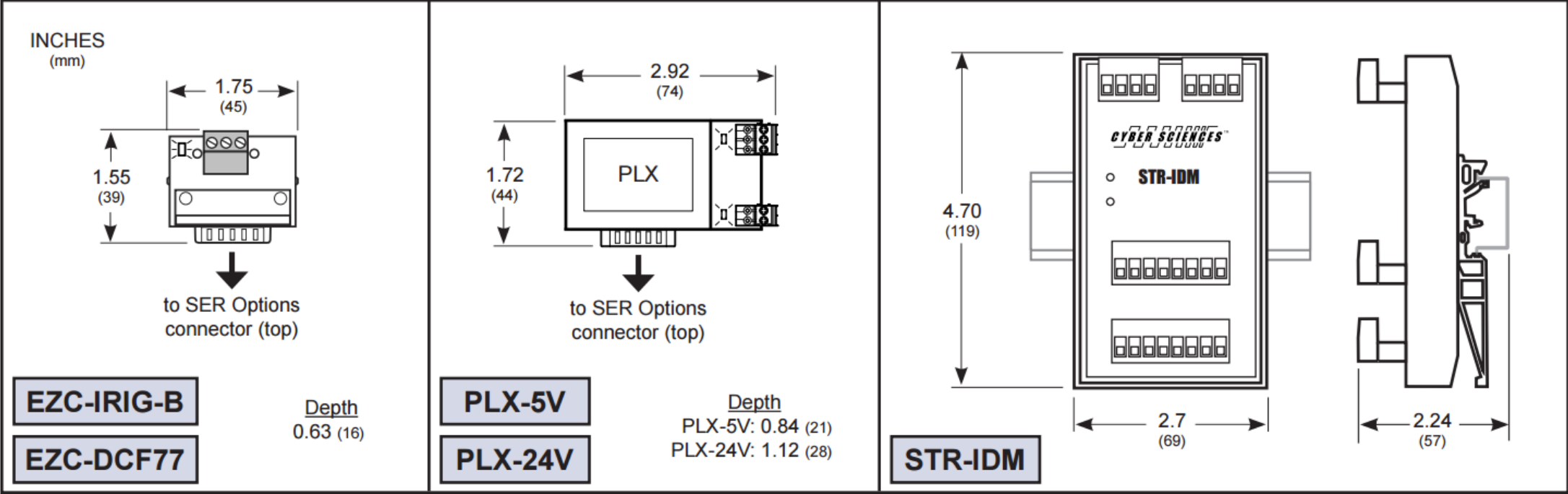




# Dimensions—SER-2408



# Dimensions—accessories



# Specifications—SER-3200/2408

## • Certifications

- UL-Listed, cULus (UL 61010)
- CE Mark
- FCC, class A
- RCM
- RoHS compliant, lead free
- W3C compliant web pages
- UNH InterOperability Lab
- Made in USA

## • Key specifications

- Inputs/outputs, 32 channels: 24 Vdc
- Control power: 24 Vdc, 10 watts
- Time sync inputs: PTP, NTP, IRIG-B, DCF77
- Time sync outputs: PTP, IRIG-B, DCF77, 1per10, ASCII/RS-485
- Communications: Ethernet, Modbus TCP
- Memory: 8 GB (standard), 32 GB (optional)

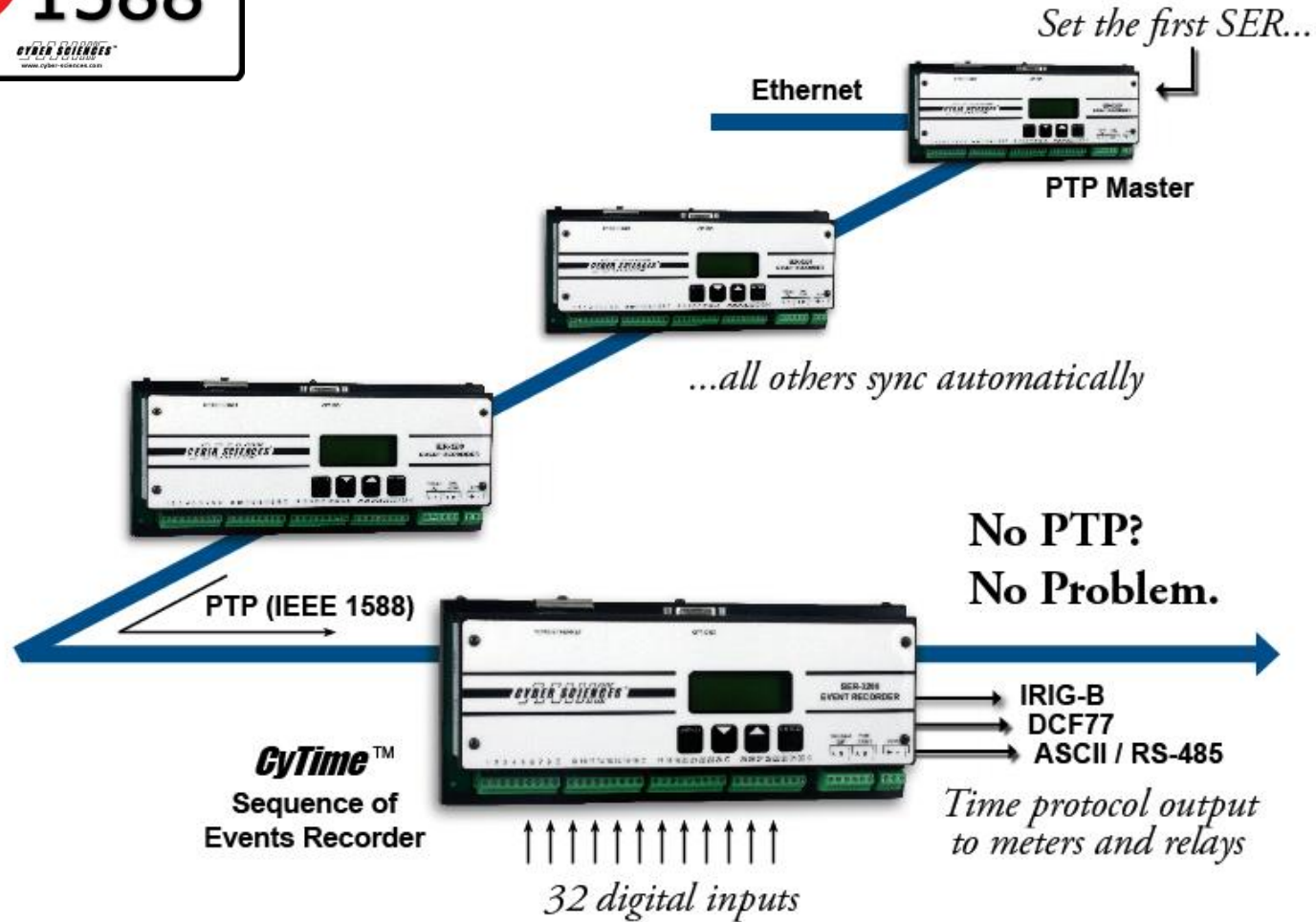


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InterOperability  
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# Ordering info

	Catalog no.	Description
CyTime Sequence of Events Recorders (SER)	SER-3200-P2X2	CyTime SER-3200 Event Recorder, base model, 32-inputs
	SER-3200-PTP	CyTime SER-3200 Event Recorder, 32-inputs and PTP option
	SER-3200-32GB	CyTime SER-3200 Event Recorder, 32-inputs, PTP and 32GB options
	SER-2408-P2X2	CyTime SER-2408 Event Recorder, 24-inputs and 8 relay outputs
	SER-2408-PTP	CyTime SER-2408 Event Recorder, 24-inputs, 8 outputs and PTP option
	SER-2408-32GB	CyTime SER-2408 Event Recorder, 24-inputs, 8 outputs, PTP and 32GB options
	PTP-UPGRADE	PTP (IEEE 1588) Field Upgrade Kit for CyTime SER-3200/SER-2408
Accessories (for SER)	EZC-IRIG-B	EZ connector for SER (IRIG-B input, 5 Vdc)
	EZC-DCF77	EZ connector for SER (DCF77 input, 24 Vdc)
	PLX-5V	PTP Legacy Interface (5V DCLS, for unmodulated IRIG-B output)
	PLX-24V	PTP Legacy Interface (24V DCLS, for DCF77, 1per10 or 24V IRIG-B output to STR-IDM)
	STR-IDM	IRIG-B Distribution Module (requires STR-100/IRIG-B or PLX-24V)

# PTP-enabled SER: Simple. Affordable. Scalable.





For more info...

- SER product page:
  - [www.cyber-sciences.com/ser.php](http://www.cyber-sciences.com/ser.php)
- Tech library:
  - [www.cyber-sciences.com/library.php](http://www.cyber-sciences.com/library.php)

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Home » Support » Tech Library (Documents)

### Technical Library

Documents Images

Product	Doc No.	Document Title	Date	Size	Type
General	PL-CSI-2017	CYBER SCIENCES 2017 Price List	Jan-2017	234 KB	
General	DS-PTP-01	EPMS-HD: Power Management in High Definition Data Sheet	Jul-2017	3.13 MB	
General	PP-PTP-01	PTP-Enabled Sequence of Events Recording (SER) Presentation	May-2016	1.76 MB	
General	PS-PTP-01	Poster: Precision Time Using PTP (IEEE 1588)	Jul-2016	1.15 MB	
Technical	TN-100	Tech Note: Hi-Res Time-Sync Using PTP (IEEE 1588)	Nov-2016	3.07 MB	
Technical	TN-101	Tech Note: SER System Architectures	Nov-2016	3.50 MB	
Technical	TN-102	Tech Note: Overview of IRIG-B Time Code Standard	May-2016	1.62 MB	
Technical	TN-103	Tech Note: Overview of DCF77 Time Protocol	May-2016	1.09 MB	
Technical	TN-104	Tech Note: Overview of 1per10 Time Protocol	May-2016	1.16 MB	
Technical	TN-105	Tech Note: Multiple STRs Can Share a Single GPS Antenna	Jan-2014	532 KB	
Technical	TN-106	Tech Note: Mixing RS485 2-Wire/4-Wire Systems with CNV-100	May-2016	837 KB	
Technical	TN-107	Tech Note: SER Device Selection Guide	Mar-2014	1.08 MB	
Technical	TN-201	Tech Note: SER Export Events to CSV	Apr-2014	852 KB	
Technical	TN-202	Tech Note: Measuring Breaker Opening Times with CyTime SER-3200/2408	Oct-2015	2.58 MB	

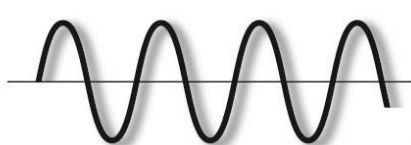
per-sciences.com/library.php# hical

# Events Happen...

(in milliseconds)

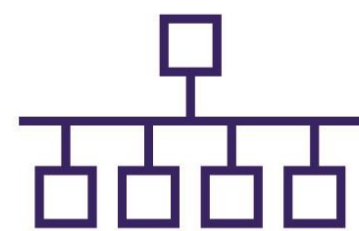


## The History of Power Monitoring...



Waveform capture


**1990s**



Web-enabled

**2000s**

**1 ms**



Precision timing

**Today**

**CyTime™**  
Sequence of  
Events Recorder



Power monitoring at the speed of **NOW!**



[www.cyber-sciences.com](http://www.cyber-sciences.com)