

Highlights

- Design provides timing to remote sites as well as smaller Customer Premise(s) Equipment (CPE) locations
- Design can be used as a primary reference source in front of existing BITS (Building Integrated Timing System) clocks already deployed in the network
- Uses a GPS constellation to synthesize accurate T1 and E1 references for use by existing BITS clock systems, SONET Network Elements (NEs), Intelligent Multiplexers, Personal Communications Service (PCS) System, and other equipment requiring synchronization
- Quartz or rubidium reference oscillator for removal of Selective Availability (S/A) and Jitter from outputs
- (4) T1 outputs
- (4) RS-422 1.544MHz Square wave outputs
- (2) Sine wave outputs, 5 or 10MHz
- (2) 2.048MHz Square wave outputs
- (2) 64Kbps Composite Clock (CC) outputs
- 1 PPS (one pulse per second)
- Fully connectorized
- Extended SuperFrame (ESF) or SuperFrame (SF) framing
- Time of Day output
- Antenna, 500 feet of coax to receiver (with built-in Low Noise Amplifier [LNA])
- RS-232D Information Management Port
- Performance or monitoring through TL-1 or menu
- Local indicators and pushbuttons for operational verification
- 24/48 VDC A & B power inputs, + or - ground
- 19-inch or 23-inch Rack mount
- TCP/IP Interface

The **CXR/Larus StarSync 5850™ GPS Primary Timing Reference Source** receiver represents an optimal solution to the problem of local synchronization for the new distributed network. By utilizing GPS Universal Time Coordinated (UTC) information to measure an ultra stable ovenized reference oscillator, or the optional rubidium reference oscillator, the information derived by Least Means Squares Estimation (LMSE) and Kalman filtering is used to develop a frequency connection by means of a 48 bit Direct Digital Frequency Synthesizer (DDFS). The outputs have less than 150nS of Maximum Time Interval Error (MTIE) over 1000 seconds for the crystal based reference and less than 5nS of MTIE over 1000 seconds for the rubidium based receiver. All outputs comply with Bellcore Technical Reference GR-2830-CORE and ANSI T1.101/1997.

The StarSync 5850 is fully connectorized so that removal and replacement may be accomplished in minutes. An RS-232D interface allows for network management, as well as local troubleshooting and performance information gathering. Outputs are used to time BITS clocks, SONET NEs or other equipment requiring synchronization.

Benefit: Save capital investment by upgrading installed timing and synchronization system to Stratum 1.

CXR/Larus Corporation • 894 Faulstich Court • San Jose, CA 95112-1361



Specifications

PHYSICAL

- Nominal Input Power: 24/48 VDC, +/- ground
- Input Voltage Power: ±20 VDC to ±57 VDC
- Dimensions (W x D x H): 17-in X 10-in X 3.5-in
- Weight: 10 lbs, fully equipped
- Standards: Meets Bellcore NEBS TR-EOP-000063 and 1089
- Connectors: Output connections on 25-pair telco style ribbon connector

ENVIRONMENTAL

- Operating Temperature: 32° to 131°F (0° to 55°C)
Slew rate not to exceed 46.4°F (8°C) per hour (32.2°F [0.13°C]/min)
- Storage Temperature: 104° to 167°F (40° to 75°C)

RELATIVE HUMIDITY

- Humidity: 0% to 95%, noncondensing

OSCILLATOR (STRATUM 2)

- Rubidium Oscillator: Exceeds ANSI T1.101/1997 and Bellcore GR-2830 specs
- Holdover Drift (after 1 month stabilization):
<7.50 x 10⁻¹¹ in one day over 41°F (±5°C) temperature range
<1 x 10⁻¹⁰ in one month over 41°F (±5°C) temperature range
- Traceability: <1 x 10⁻¹¹

OSCILLATOR (STRATUM 3E)

- Ovenized Crystal Oscillator: Exceeds Stratum 3E specs, ANSI T1.101/1997 and Bellcore GR-2830 specs
- Holdover Drift: <5 x 10⁻⁹ in one day over 50°F (±10°C) temperature range

ALPHA NUMERIC DISPLAY

Scrolls alarm status, when no alarms, displays date and time

ALARM REPORTING

- Autonomous alarm reports when selected thresholds are exceeded
- LED indicators for thresholds exceeded
- Local alarm contacts (major/minor)
- Through TCP/IP Interface

CXR/Larus StarSync 5850

SERIAL COMMUNICATION PORTS (TCP/IP INTERFACE)

- EIA RS-232D for local access by a terminal
- EIA RS-232D for remote access, supporting standard modem control leads
- Message formats (either of the following):

Lists 2 and 3	Menu Screens
Lists 0 and 1	Transaction Language 1 (TL-1)

ALARM OUTPUTS

Four floating relay contact closures (form A) for summary major, minor, audible, and visual alarms

- Major alarms:

GPS unacceptable	> 2 weeks for 2 unacceptable
	>24 hours for 3E
OR	
Clock loss of output	outputs in alarm
- Minor alarms: GPS degraded or unacceptable

ALARM RELAY CONTACT RATINGS

1 A @ 220 VAC or VDC max

CONTROLS

ACO push-button: Disables audible alarm relays but not front indicators. Auto reset on next alarm.

OUTPUTS

(4) DS1 DRIVERS

- Output Signals: DS1 framed all ones, SF (D4) or ESF framing
- Output Load Impedance: 100 ohms, resistive
- Output Pulse Amplitude: 3 V \pm 0.3 V peak; meets AT&T CB 119 and CCITT G.703 requirements

OUTPUTS (CONTINUED)

(4) RS-422 DRIVERS

- Output Signals: 1.544MHz square wave, true and complement
- Output Load Impedance: 100 ohms, nominal
- Output Pulse Amplitude: Rev EIA RS-422 specifications

(2) SINE WAVE (BNC connector [female]):

- 5MHz sine wave: 1 volt Rms \pm 10%, 50 ohms, **OR**
- 10MHz sine wave: 1 volt Rms \pm 10%, 50 ohms

(2) COMPOSITE CLOCK

- 64Kbps 5/8 duty cycle pulses, Waveform meets CCITT G.703 Standard
- Outputs are synchronized with DS1 output training
- Output Load Impedance is 133 ohms, \pm 5%

(2) 2.048MHz SQUARE WAVE

- Meets CCITT G.703 Standard
- Output Load Impedance is 120 ohms, \pm 5%

ONE PULSE PER SECOND OUTPUT

- Pulse leading edge to correlated UTC to 1ms
- Exceeds the Bellcore GR-2861 specification
- TTL output to BNC connector

TIME OF DAY OUTPUT

RS-232 level, ASCII, 9600 Baud, 8 bits, no parity, one stop bit RJ-11 Connector. Issued every 10 sec. 1ms accuracy to UTC

CERTIFICATION (COMPLIANCE/REGULATORY)

FCC Part 15, Class A, UL 1459, NEBS Level 3 Certified, GR-63 and GR-1089

Ordering Configurations

StarSync 5850

GPS Primary Timing Reference Source

Model	Description
5850-0	Network Primary Reference Source, TL-1, rubidium oscillator
5850-1	Network Primary Reference Source, Menu, rubidium oscillator
5850-4	Office Primary Reference Source, TL-1, xtal oscillator
5850-5	Office Primary Reference Source, Menu, xtal oscillator
5850-6	Network Primary Reference Source, Stratum 2, TL-1, TCP/IP
5850-7	Network Primary Reference Source, Stratum 2, Menu, TCP/IP
5850-10	Office Primary Reference Source, Stratum 3E, TL-1, TCP/IP
5850-11	Office Primary Reference Source, Stratum 3E, Menu, TCP/IP