

RoHS Compliant

SSR-6T+ Series High Performance GPS Precision Timing Receivers
 Tested to demanding Telecom, Rail and Defense Industry Standards

Introduction:

Shipping since 2011, the SSR-6T Precision Timing receivers embed a state-of-the-art u-Blox 50 channel, SBAS enabled, LEA-6T Flash or an LEA-6T ROM based GPS precision timing module.



Features:

- Designed specifically for precision timing applications
- u-Blox Binary and NMEA messages
- Motorola binary message emulation at 9600 baud for backward compatibility with legacy Motorola 12 channel M12+ receivers
- Super-Fast TTFF and State-of-the-Art Sensitivity
- Two User Configurable PPS Outputs
- Anti-Jamming Performance in EMI Environments
- Jamming Signal Indicator (u-Blox mode only)
- User selectable Motorola binary or u-Blox mode retained through a power cycle

Physical Characteristics:

SSR+ Series Flash and ROM based receivers use Motorola's industry standard, 60 mm x 40 mm size, mounting hole locations, connector types and positions. These are backward compatible with Synergy's legacy SS-12 Sony based receiver, u-Blox based SSR-4S, SSR-5H, Motorola's M12+ and iLotus M12 receivers.

Electrical Characteristics:

The high performance SSR-6Tf+ boards embed popular u-Blox LEA-6T Series Flash and ROM based GPS modules. Full performance specifications and features are listed at: <https://www.u-blox.com>

SSR Series receivers feature an on-board microprocessor to generate emulated 6, 8 and 12 channel Motorola binary messages. SSR-6T receivers incorporate an Antenna Power Management System with antenna under current alert and over current protection designed for both 3V and 5V antennas.

Notes: Power-On default condition: Outputs messages as when powered-down. See page 2 note 2 for more backup battery and Real Time Clock details.

PHYSICAL CONSTRUCTION	
Dimensions	40mm x 60mm x 4.5mm
Weight	12 grams
Data/Power Header	10 Pin, 2x5 header, 1.27mm pitch
Antenna Connector	MMCX end-Launch jack

OPERATIONAL CHARACTERISTICS - u-Blox Mode	
Architecture	50 channels with over 2 million correlators
Acquisition Channels	32 channels
Tracking Channels	16 channels (12 channels for Motorola M12x compatibility)
Frequency	1575.42 MHz, C/A code
Acquisition Times:	
Hot Start	< 1s
Cold Start	26 seconds typical
SBAS*	Supports RTCM-104 DGPS, WAAS, EGNOS, MSAS
Position Accuracy	<2.5m Autonomous - <2.0m SBAS - <2.0m RTCM-104
Sensitivity	-148 dBm at cold start -162 dBm while tracking (-160 dBm Reacquisition)
Power Supply	2.7-3.6 VDC 123 mW @ 3.0 V
Backup Power	+1.4 to +3.6V at 22 uA Max
Temperature Range	-40 Degrees to + 85 Degrees (-20/+60 with battery)
Storage Temperature	-40 Degrees to + 85 Degrees (-20/+60 with battery)
Humidity	95% over dry bulb range of +38°C to +85°C

* SBAS - Satellite Based Augmentation System

1PPS Timing Pulse	
Accuracy of 1PPS	30 ns RMS, <60 ns 99%
Granularity	21 ns
Compensated	<15 ns (Quantization Error Applied)

COMMUNICATIONS INTERFACE	
Default Protocol	User defined - Motorola binary or u-Blox binary\NMEA
Motorola Protocol	Motorola 12 channel Binary emulation at 9600 baud
u-Blox Protocol	u-Blox binary and NMEA-0183 v2.3 at 57600 baud
Update Rate	1Hz default, 2 Hz option (user selectable)

Refer to Synergy's SSR Integration Guide and u-Blox LEA-6T User's Guide for full module technical and performance specifications. The "u-Blox u-Blox 6 Receiver Description Protocol Spec" is copyright by u-Blox and available here: <https://www.u-blox.com>. u-Center software required. Refer to Motorola's M12x User's Guide for Motorola binary message details. For Motorola messages, find SynTAC, WinOncore and SiRF Oncore at the Synergy web site listed below.

SSR-6Tf+ OEM Precision Timing Board Ordering Information:

Part Number	Configuration Description
16054423G-1	SSR-6Tf no batt, w/UBX Bin & NMEA and Motorola 6, 8 and 12 Chan bin
16054323G-1	SSR-6Tf w/Batt - UBX Bin & NMEA and Motorola 6, 8 and 12 Chan bin
16064423G-1	SSR-6Tr no batt, w/UBX Bin & NMEA and Motorola 6, 8 and 12 Chan bin
16064323G-1	SSR-6Tr w/Batt - UBX Bin & NMEA and Motorola 6, 8 and 12 Chan bin
16054423G P2	Motorola M12+ Clone with Motorola 12 channel Binary Emulation
16054423G P3	iLotus M12M Clone with Motorola 12 channel Binary Emulation

For configuration assistance, order placement and technical support call or Email:

 <p>SYNERGY SYSTEMS, LLC Time proven products and support</p>	<p>Phone: (858) 566-0666 · Fax (858) 566-0768</p> <p>E-Mail: oeinfo@synergy-gps.com</p> <p>Web: www.synergy-gps.com</p>
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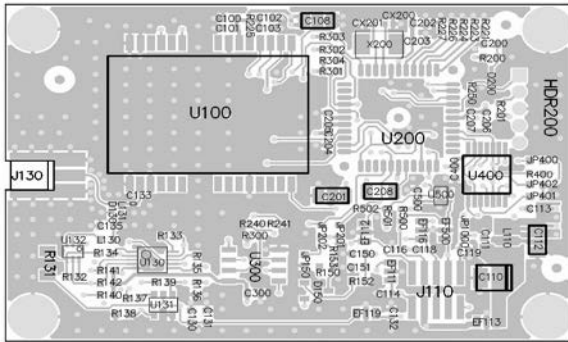
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Model SSR-6T+, RoHS Compliant, GPS Precision Timing Receiver

Component Layout

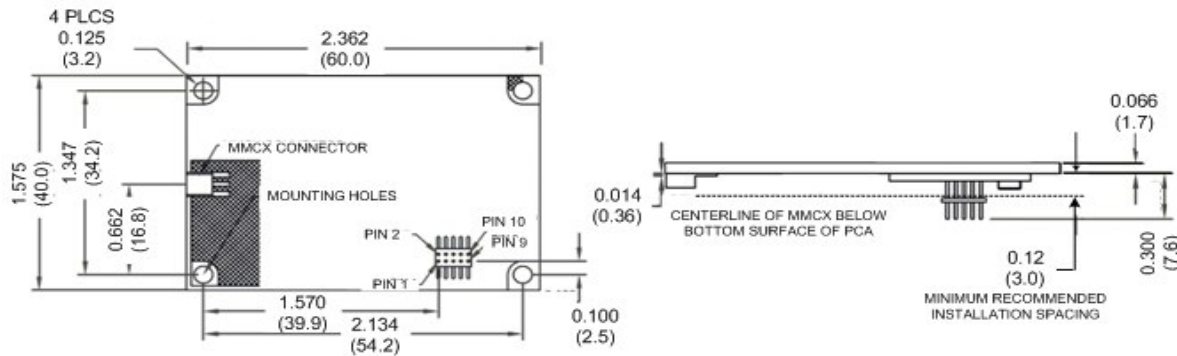


J110 Pin-Out Detail

Pin #	Signal Name	Description
1	TxD	Transmit Data
2	RxD	Receive Commands
3	Power	Regulated 3.0-3.3 volts
4	1PPS	1PPS Output
5	Ground	Signal/Power Ground
6	Battery	Backup Battery Input
7	No Connect	No Connect
8	RTCM In *	RTCM Data Input
9	Ant. Bias	3.0-5.0 Ant. Bias Voltage
10	1PPS-2	.25Hz to 10MHz

* RTCM Correction Input Special Order as of 1 January 2018

SSR Series board layout and connector position detail



Note: 1. PC Board - The basic SSR-xxx PCB outlined above is used for several OEM precision timing and navigation boards. Precision timing boards do not use RTCM input on pin 8. The SSR-6Tf+ with 128K emulation processor, and Legacy 64K versions, also provide full u-Blox LEA-6 binary and NMEA messages at various baud rates. The user selectable Motorola binary or u-Blox binary/NMEA protocol is maintained through a power cycle.

2. Real-Time Clock (RTC) - An external backup voltage may be applied to pin 6 to run the Real Time Clock (RTC) during long power-off periods. Optional SSR versions are available with an on-board 11 mAh rechargeable battery to operate the RTC for 2 to 3 weeks when the receiver is powered down. Rechargeable LiOn Battery life is specified at 10 years depending on many factors including temperature extremes encountered, number of charge cycles, etc. The on-board battery reduces the normal SSR board operating and storage temperature range from -40°C to +85°C to -20°C to +60°C. When an on-board back-up battery is not used, connect pin 6 to ground.

3. Backward Compatibility - For interface to Motorola legacy 6 and 8 channel VP, GT+ and UT+ receivers with larger form factors of 2.00 x 3.25 x 0.64 inches (50.8 x 82.6 x 16.3 mm), specify the SSR-VP/UT+ OEM board. Refer to SSR-VP/UT+ datasheet Tech-Note #485.

4. Custom SSR board Shapes and functions - Form factor options and custom firmware designed and quoted on request (minimum quantities or NRE apply).

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