SyncStar

Precision Time & Frequency Reference

Features

- **1 Slot wide Rubidium pluggable module**
- **GPS disciplining**
- **VME rack compatibility**
- **Precise Rb backup oscillator**
- **Up to 4 custom frequency outputs**
- **E1, T1, 1PPS and other frequencies available**

The SyncStar is a precision GPS time & frequency reference unit. The unit is designed as a pluggable module 1 slot wide and 6U high for a VME rack.

SyncStar incorporates an advanced eight-channel GPS receiver and a Rubidium oscillator as the master oscillator, which is locked to a GPS reference. The GPS receiver receives L1 C/A coded signals through its TNC connector on the front panel from visible GPS satellites using an antenna/preamplifier unit mounted on the roof of a basestation. This antenna incorporates a built-in LNA powered off the center feed of the coax, with an additional 5 Vdc provided by the SyncStar unit. The antenna cable length can be between 100 and 350 feet long (cable lengths in excess of 100' may require additional antenna amplification).

At unit power up the system firmware begins collecting data to build the timing almanac and ephemeris for satellite coordinates. These data are used to create the initial reference position. Afterwards, the GPS receiver automatically acquires satellites as they become visible and accesses their data to perform the necessary position and timing calculations.

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Electrical Specifications

Front Panel Input:	L1 GPS (1575.42 MHz) C/A code (from GPS antenna)
Input Voltage:	+5 Vdc @ 6 amp. (start-up) +5 Vdc @ 2.2 amp (steady state) Low current 5 and 12Volt option available.
Standard Frequency Outputs @ 50 Ohms:	1 PPS TTL 10.000000 MHz Sine Custom frequencies available from 1KHz to 100MHz
GPS Disciplined Accuracy:	Frequency <1E-12 (24 hr average) Timing <20 ns RMS after 6 hr
Rb Holdover: Standard:	< 7 µs over 24 hours +/-3˚C
Extended:	< 7 µs over 48 hours +/-3˚C
Phase Noise @ 10MHz:	-85 dBc/sqHz at 10 Hz -120 dB/sqHz at 100 Hz -130 dB/sqHz at 1 KHz
Jitter:	<10pSec RMS @ 10MHz
Spurious:	Harmonic: <-55 dBc Non-Harmonic: <-60 dBc
Warm-up Time:	<30 min. 4 to 24 hrs (to achieve <±2µs) <24 hrs. (to achieve <1±1µs)
Antenna:	Voltage: +5V@80ma for antenna amplifier. Cable: 0 - 350 ft. SyncStar antenna kit P/N 105551-001
Serial Interface:	RS-232

Environmental Specifications:

Operational Humidity:	<90%, non-condensing
Operational Altitude:	-200 ft to 40,000 ft (12,200 meters)[2]
Operating Temperature:	0˚C to 65˚C warm-up -40˚C to +50˚C after 15 minute warm-up
Non-Operating Temperature:	-55˚C to +85˚C

***ESD Advisory**: ESD sensitive. Observe precautions and wear grounding devices when removing modules or connectors.*

Physical Specifications:

Size:	6U high, 1 VME slot wide
Weight:	20 ounces (567 grams)
Fault Indicators:	Software controlled
Status:	LED
Description:	GPS Lock Color: yellow/green Power Color: green/off Fault Color: red/off Rb Lock Color: yellow/green
Antenna Input:	TNC connector
Outputs:	J1 through J4: SMA connectors RS-232: DB-9M

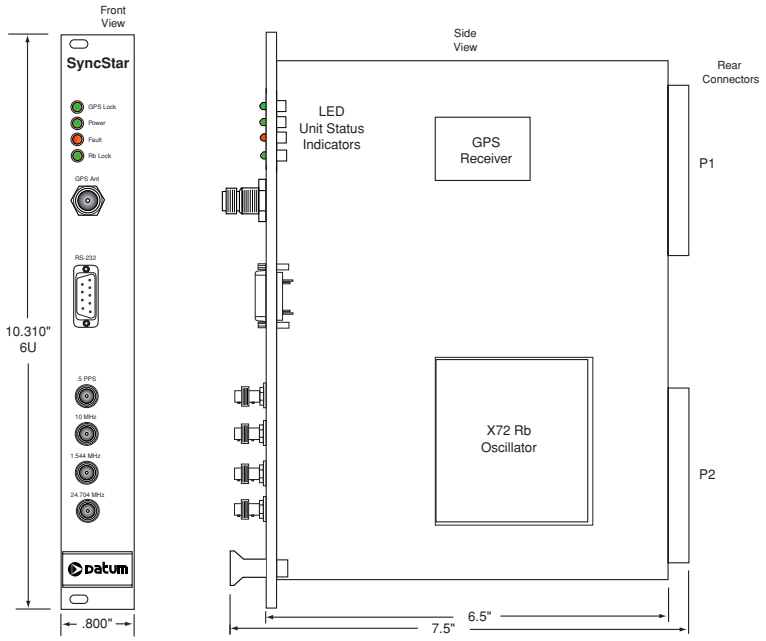

Figure 3. SyncStar Outline Dimensions

[1] Holdover refers to operation without GPS signals after an initial period of 8 hours of proper GPS reception.

[2] Above 5,000 ft, the upper operational temperature requirement is derated 1˚C per 1,000 ft above 5,000 ft.

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