LL-3760

GPS Timing Receiver

Datasheet V 3.2

LL-3760
GPS Timing Receiver Front View

Key Features

- Very precise GPS Timing Receiver
- Basic accuracy +- 5 ns with internal OCXO
- optional Rubidium Standard
- 1 pps and 10 MHz output
- RS232 Time and RS232 Test Interfaces
- Special: programmable shift of the 1 pps and frequency outputs in 25 ps steps, phase locked
- originally designed for the synchronisation of Spirent pseudolites
- Standard 19 inch 3HE equipment cabinet
- 4,3" TFT Display

Description

The LL-3760 is a very precise GPS Timing Receiver. The unit outputs 10 Mhz and 1 pulse per second (1 pps) synchronized to the Navstar GPS System.

Originally the unit was designed to provide time and frequency to Spirent Pseudolite Simulators GSS6100P (Galileo). Three capabilities to shift the system time independently could be used to build up a test time and to steer the GSS6100(P) simulator.

UTC time scale, based on a receiver that is synchronized to the United States NAVSTAR Global Positioning System (GPS) allows precise time synchronization with an accuracy in the single digit ns range.

The United States NAVSTAR Global Positioning System (GPS) is a satellitebased radio-positioning, navigation, and time-transfer system. It was installed by the United States Department of Defense and is operated by the US Naval Observatory.

GPS time Scale started on 6 January 1980 and is autonomous and differs from UTC by the integer number of leap seconds that have occurred since the GPS time scale began. Although timing specification for the GPS system accuracy to UTC is 1 microsecond, the last years the accuracy is in a range of < +/-25ns to UTC(USNO), typically +-2 ns.

Lange-Electronic GmbH
Rudolf-Diesel-Str. 29a
82216 Gernlinden
GERMANY

Tel. +49 - 8142 - 284582-0
Fax +49 - 8142 - 284582-2
www.lange-electronic.com
info@lange-electronic.com

PRECISION - OUR BUSINESS.

LL-3760 GPS Timing Receiver

Specifications:

Internal Time Base

Type:	Oven Controlled Oscillator OCXO)
Frequency:	10MHz

Frequency Stability:

Short term (1Sec) (after 2 Hours Operation)	± 2 x 10-12
Long Term (1 day)	± 3 x 10-10
Aging Rate:	± 3x10-8 / year

Optional Rubidium Standard available

In-/Outputs

10 MHz

Format:	TTL
Frequency:	10MHz
Connector:	SMA

other frequencies and sine wave outputs on request

1PPS

Format:	TTL
Duration:	200ms +-1 µsec high
On time:	rising edge
Rise/Fall:	<10ns / <10ms
Connector:	SMA

RS232 Time Interface

Format:	RS232
Baud rate:	9600
Format:	8N1 (8 Data Bits, 1 Start Bit, No parity)
Connector:	Sub D 9 Pin, male

Options

10MHz Distribution sinusiodal

1PPS Distribution

HQ Time Codes

IRIG Time Codes (A, B, H, G)

Different Pulses

1 and 5MHz outputs

GPS Antenna

Frequency:	1575,42 MHz (L1)
Bandwidth:	± 1.023 MHz
Polarization:	Right hand circular
Impedance:	50Ω
Power:	4,75 to 5,25VDC
Current:	5mA typical, 25mA maximum
Connector:	SMA

GPS Receiver

Receiver Architecture:	12 parallel channels U 1575,42 MHz
C/A code	(1.023 MHz Chip rate)

Code plus carrier tracking (carrier aided tracking)

Tracking Capability: 12 satellites simultaneous

RF Characteristics of Receiver

Dynamic Range :	27dB
Saturation:	-110dBm

Performance of the Receiver

Accuracy:

Position:	<5m rms
Velocity:	<0.02ms-1
Latency:	<200ms
1pps:	30ns rms accuracy, >10ns resolution

Dynamic Limits

Max Velocity:	515 ms-1
Max Altitude:	18000m
Max Acceleration:	4g

Warm-Up Time

After powered on, the LL-3760 GPS Receiver will pass through 5 warming up and stabilizing steps before it is ready for normal operation.

Optional GNSS Receivers

Multi-GNSS-Receiver

GPS, GLONASS, BEIDOU, GALILEO

Also posssible:
GPS military SAASM receiver. For authorized users only. Please contact factory.

Electrical

Input power	100 – 240 VAC 50 – 60 Hz
Fuse:	2,5A T
Connector:	IDC

Environmental

Temperature	0°C to + 55°C (operating) -20°C to + 70°C (storage)
Humidity:	up to 95% relative (non condensing)

Chassis

3HU, 19" rack-mount unit cabinet in reference to DIN41494-5 / IEC297-3.

Dimension:	433,0 mm x 132,5 mm x 400,0 mm (W x H x D)
front width	483,0 mm ± 0,5 mm with mounting brackets

(Switches/security glass/connectors are included)

Display

4,3" TFT Display

Special features:

The System Time can have an offset to UTC with 1 second resolution (hh.mm.ss).
The user can build his own time scale to the UTC time provided by the GPS receiver. This offset shifts the system time to the UTC time scale provided by the GPS Receiver. The Offset can be negative (earlier) or positive (late).
The earliest Date, that can be set is 01.01.2001. The Command O:SYY:MM:DD:hh:mm:ss will set a specific offset to UTC. Years are counted with 365 days, month with 30days, days with 24 hours, minutes with 60 seconds. Leap years are not calculated.

The Minor Time is the sub-second time information. It can be shifted in sub second range with a resolution of 100ns (0.0000000sec)

A trim Delay is realized with a high-resolution Phase Shifter. Range is +/- 800ns in ~0,25ps steps

A trim delay can be programmed autonomous to the System- and Minor-Time. This trim value shifts the 1PPS and the 10MHz output signal synchronous. The range is +/- 800ns. This User-Delay is built into the LL-3760 to compensate the accumulated time errors caused for example by aging or temperature drifts etc. The maximum shift rate is 100ns/sec so that for instance the internal oscillator of the GSS6100 is able to follow the incoming 10MHz. With this drift rate, a total shift over the complete range will last 16 Seconds.

Lange-Electronic GmbH
Rudolf-Diesel-Str. 29a
82216 Gernlinden
GERMANY

Tel. +49 - 8142 - 284582-0
Fax +49 - 8142 - 284582-2
www.lange-electronic.com
info@lange-electronic.com