



NAVI-TIME GPS Time & Frequency Module

Features

- GPS-SBAS based Time and Frequency Receiver
- High performance GPS
 - ◆ -162 dBm Tracking Sensitivity
 - ◆ Fast Time to First Fix
 - ◆ NMEA 0183 Message support
- Stable Frequency source
 - ◆ TCXO
 - ◆ OCXO
- Time and Frequency outputs
 - ◆ 1PPS
 - ◆ 10 MHz sine wave
 - ◆ 10 MHz square wave
 - ◆ E1/T1 (can be configured)
- Highly stable
 - ◆ Frequency Stability ADEV (Locked to GPS)
: 1.76×10^{-12} at 10000 sec
 - ◆ Frequency Stability ADEV (Holdover)
: 1×10^{-10} at 10000 sec
- Multiple interfaces
 - ◆ SMA connectors
 - ◆ Board-to-board connector
 - ◆ LED based Alarms
- Form factor
 - ◆ Navi-Time: 114.3mm x 60mm x 13.6mm



Navi-Time

The GPS module supports very quick positioning in hot start and reacquisition while providing faster location and time information under warm and cold start modes too.

For applications that require precise timing, the GPS module outputs a highly precise pulse every second that is synchronized to the GPS / UTC second boundary.

Navi-Time uses a TCXO or an OCXO as the frequency source and employs intelligent algorithms to discipline them to achieve a high stability, configurable frequency output(s).

Navi-Time can be interfaced through a 16-pin board-to-board connector. The connector provides a UART, Alarms, frequency and 1PPS outputs for easy interface with the host board.

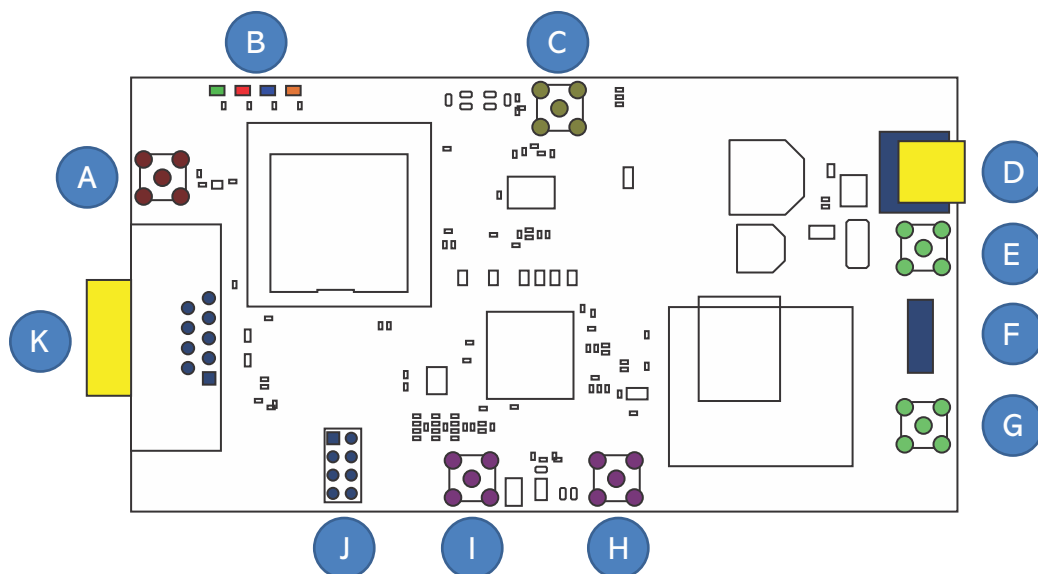
An active GPS antenna should be connected to the RF port of the Navi-Time. The unit supports cable delay compensation for longer cable lengths.

Navi-Time is meant for applications that demand stable time and frequency outputs at an affordable price point. Available in a small form-factor, Navi-Time can be seamlessly integrated on the application hardware with little real-estate.

Product Description

Navi-Time is a GPS based Time and Frequency source. In-built GPS-SBAS module used to discipline a frequency source and generate disciplined time and frequency output(s).

The Navi-Time module is built with several interface connectors to facilitate seamless connectivity to the host system. In addition, a few LED's are also provisioned to highlight the status of the module. The different connectors and LED's are marked in figure 2 and the same is explained in the table 1.



Designator	Connector / LED Type	Signal Name	Description
A	SMA Female	RF_IN	The input from the GPS active antenna should be connected here
B	SMD	GREEN	GPS position fix
		RED	Power
		BLUE	Module in Holdover
		ORANGE	Frequency & Phase Lock
C	SMA Female	Disciplined 10MHz sine wave	This is the 10MHz sine wave output after being disciplined by the GPS 1PPS
D	Power Connector	Power Supply	12 V power supply
E	SMA Female	Aux_In	External reference input
F	16-pin board-to-board connector	Pin1: PPS_IN	External 1PPS as a reference input
		Pin 2: PPS_OUT	Filtered 1PPS output from Navi-Time
		Pin 3: GND	Ground
		Pin 4: GND	Ground
		Pin 5: RX	UART Receive (input) at RS-232 level
		Pin 6: TX	UART Transmit (transmit) at RS-232 level
		Pin 7: VCC	Power supply input (12 V) 5V version is also available
		Pin 8: RF_OUT	Disciplined 10MHz output from Navi-Time
		Pin 9: LOCK	Frequency and Phase lock status 0: Not locked; 1: Locked
		Pin 10: MODULE_OK	Navi-Time module health status 0: Unhealthy; 1: Healthy
		Pin 11: MAN_HOLD	Manual holdover input 0: Do not enter holdover; 1: Enter holdover
		Pin 12: RESET	External reset (active low, > 20ms pulse width)
		Pin 13: GND	Ground
		Pin 14: GND	Ground
		Pin 15: VCC	Power supply input (12 V)
		Pin 16: VCC	Power supply input (12 V)
G	SMA Female	Filtered E1 / T1 output	This is the E1 / T1 output after being disciplined by GPS 1PPS
H	SMA Female	Disciplined 1PPS	This is the 1PPS output after being disciplined by the GPS 1PPS

Designator	Connector / LED Type	Signal Name	Description
I	SMA Female	Disciplined 10MHz	This is the 10MHz output after being disciplined by the GPS 1PPS
J	8 pin board-to-board connector	Pin1: GND	Ground
		Pin 2: RF_OUT	Customized output frequency
		Pin 3: RF_OUT	10 MHz CMOS
		Pin 4: GND	Ground
		Pin 5: GND	Ground
		Pin 6: RF_OUT	10 MHz sine wave
		Pin 7: PPS_OUT	Disciplined 1PPS output
		Pin 8: GND	Ground
K	DB-9	RS-232	RS-232 connector for User interface

Table 1: Listing and Description of interface connectors on Navi-Time

Specifications of Navi-Time

Disciplined Timing Output

1PPS	: 200 ms pulse width (configurable), SMA connector
1PPS Accuracy	: 31.4 ns
Voltage Level	: HCMOS 0 to 3.3 V / 50 ohm

Disciplined Frequency Output

Frequency	: 10 MHz square wave (0 to 3.3 V), SMA connector
	: 10 MHz sine wave (0 to 3.3 V), SMA connector
Configurable Frequency:	E1/T1 (0 to 3.3 V), SMA connector

Note : Either 10MHz or E1/T1 is available

Frequency Stability	
ADEV (Locked to GPS)	: 1.76×10^{-12} at 10000 sec
Frequency Stability	
ADEV (Holdover)	: 1×10^{-10} at 10000 sec

Inputs

GPS Antenna	: SMA connector (3V/5V available)
AUX IN	: a. 1PPS (0 to 3.3 V / 50 ohm, SMA connector) b. 10 MHz HCMOS (0 to 3.3 V / 50 ohm, SMA connector) c. E1 / T1 HCMOS (0 to 3.3 V / 50 ohm, SMA connector)

Serial Interface

Interface	: RS-232 on DB-9 connector & UART on 16 pin connector
Baud Rate	: 4800 – 115200 bps

Certifications

NPL

Environmental Characteristics

Operational Temperature Range (Ambient)	: -20°C to +70°C
Storage Temperature Range	: -40°C to +85°C
Humidity	: 95% non-condensing +30°C to 60°C
Altitude	: 18,000 meters

Electrical Characteristics

Supply Voltage	: 12 V to 40 V
Total Current	
Consumption	: 350 mA @ 12 V during OCXO warm-up 260 mA @ 12 V during steady operation (5V option available)

Output Messages

NMEA	: \$GP messages, Alarm and Status message
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Input Messages

ASCII	: NMEA message control and configuration, Elevation mask, Factory reset, Restart, 1PPS configuration Frequency selection
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Mechanical

PCB dimension	: 114.3mmx60mmx13.6mm
Weight	: 55 g

Ordering Information

PartNumber	Description
Navi-Time-GPS-100-05-01:	1PPS, 10MHz Sine Wave

