

# PX469S PXI GPS Timing Module

Assembly P/N 11030280

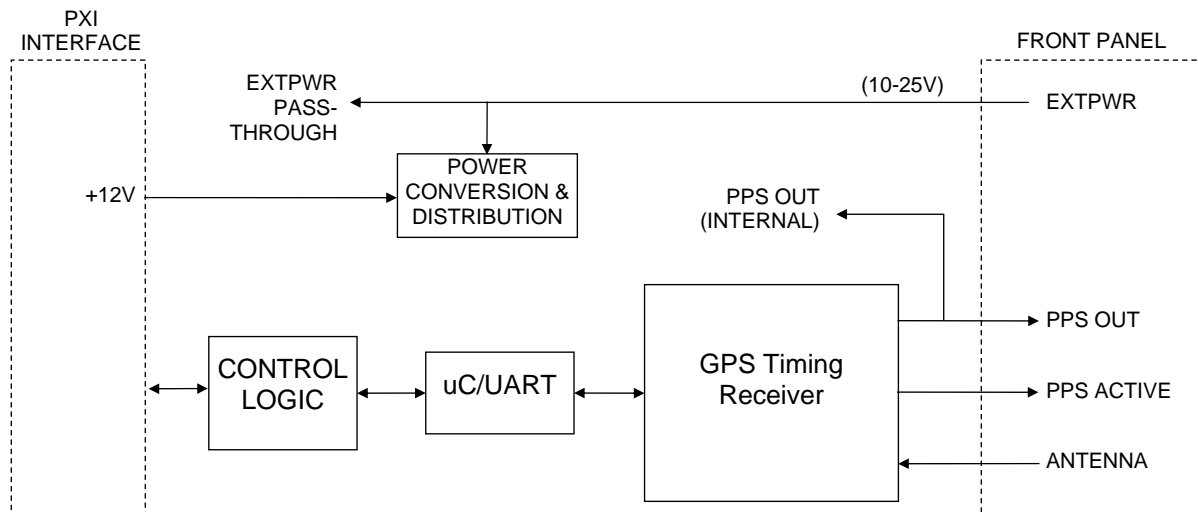
## DESCRIPTION

The PX469S provides GPS timing capability in a PXI format. The module's GPS timing receiver provides simultaneous tracking of up to 12 satellites and outputs precision 1PPS or 100PPS signals. The module can be used to discipline precision oscillators to provide long-term clock stability. The PPS output signal is software controlled to be always ON, always, OFF, or only ON when certain accuracy conditions are met.

The module provides extensive control and status including:

- Satellite tracking
- Latitude and longitude
- Height
- Time
- Automatic Site Survey

The PPS output is actively monitored and its status is provided visually through a front panel LED, electrically through a front panel signal, and via software through a register or interrupt. A TRAIM (Time-Receiver Autonomous Integrity Monitoring) algorithm can be enabled to ensure the timing solution integrity. The module has an active antenna circuit with external gain of 18-36dBm measured at the GPS receiver RF connector. Bias power is switch selectable for 3V or 5V operation (80mA maximum current draw). A functional block diagram is shown below.



## DOCUMENTATION

The PX469S is an integration of a M213 M-Module and an AMi3002 PXI M-module carrier. This document discusses the general use of the PX469S integrated module. For full details on each of the individual modules used in the PX469S, please refer to the User Manual for that particular module.

<u>Document Description</u>	<u>Website</u>
M213 User Manual	<a href="http://www.chtech.com">www.chtech.com</a> -> Support -> Product Manuals -> Source -> M213
i3002 User Manual	<a href="http://www.acq.nl">www.acq.nl</a> -> Products -> Carrier -> i3002-> Manual

## SOFTWARE CONFIGURATION AND CONTROL

The GPS timing functions of the PX469S are fully controlled by the integrated M213 M-Module. Therefore, a PX469S user should use the M213 software driver which is available for download on C&H's website. This driver fully supports the PX469S. The driver uses the VISA I/O library and includes an interactive soft front panel that can be used to operate the PX469S. The driver provides a library of function calls for initializing, configuring, and operating the instrument. The library is provided in formats for most popular development environments as well as in a Windows DLL format. In addition, ANSI-C source code is provided and is written in a manner to allow the driver to be easily ported to operating systems that do not support VISA.

## SPECIFICATIONS

### GPS Timing Receiver Characteristics:

Receiver channels	12
Tracking capability (simultaneous satellites)	12
Operating Frequency	1575.42MHz
Position Accuracy	<25 meter SEP <sup>1</sup>

### Acquisition Time:

Hot	<25 sec
Warm	<50 sec
Cold	<200 sec
Internal Reacquisition	<1 sec

### Position Accuracy:

Selective availability disabled	<25 meters SEP <sup>1</sup>
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### Timing Accuracy:<sup>2</sup>

Using clock granularity message	
1 $\sigma$ average	<2ns
6 $\sigma$ average	<6ns
Without clock granularity message	
1 $\sigma$ average	<10ns
6 $\sigma$ average	<20ns

### PPS ACT Output Electrical Characteristics:

Output Level	V <sub>OH</sub> into high-Z	2.4V min
	V <sub>OL</sub> into high-Z	0.5V max
Output Impedance		3 - 7 $\Omega$ typ
Output Source/Sink Current		$\pm$ 24mA

### PPS Output Electrical Characteristics:

Output Level	V <sub>OH</sub> into 50 $\Omega$	2.0V min
	V <sub>OL</sub> into 50 $\Omega$	0.4V max
Output Impedance		50 $\pm$ 3 $\Omega$
Output Source/Sink Current		$\pm$ 50mA
Propagation delay from M12+ output		3.5-9.0ns
Skew (FP output to internal output)		300ps max
Rise/Fall (0.8V to 2.0V / 2.0V to 0.8V)		1.5ns max

### External Power Supply:<sup>3</sup>

Input Voltage	+10 to +30Vdc
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### Power:

+5V	0.4 A
+12V	0.13 A
-12V	0 A
EXTPWR Input Voltage <sup>4</sup>	40V max
EXTPWR Pass-through current	2A max

### Temperature:

Operating	0°C to 50°C
Storage	-40°C to 70°C

### Notes:

1. SEP (Spherical Error Probability)
2. 1PPS or 100PPS with position-hold active
3. Module power can be supplied from the PXI I/F +12V connection or from an external power supply
4. Absolute maximum to prevent damage

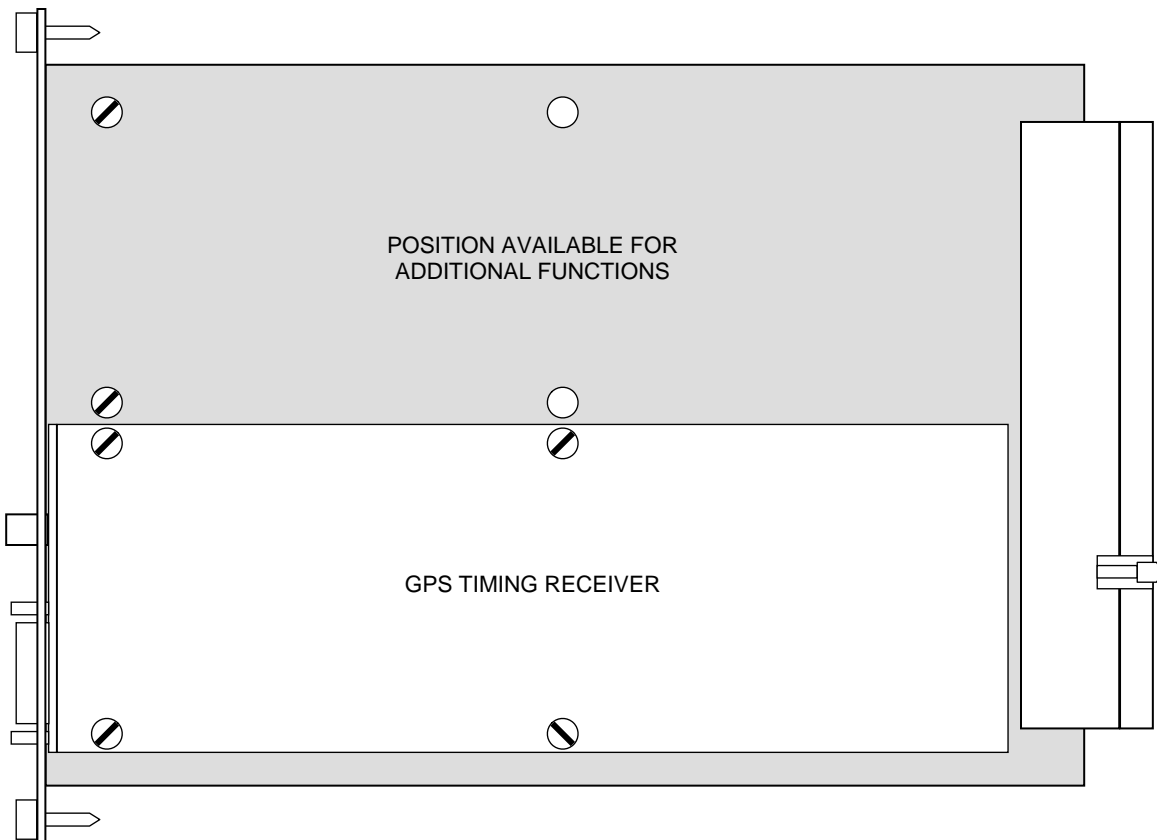
## ELECTRICAL

The electrical interface is compliant with the PXI bus specification Rev 2.1, cPCI Specification 2.0 R3.0, and PCI Specification 2.2 (slave only). The module supports both 5V and 3.3V signaling voltages (VIO). Five PXI compliant trigger lines are supported.

## MECHANICAL

The PX469S is an integration of a M213 M-Module and an AMi3002 PXI M-module carrier as shown below. The M213 provides the GPS Timing capability and the AMi3002 provides the electrical and mechanical interface to a PXI backplane and chassis. An unused M-Module position is available for the addition of functionality. For a list of available M-Modules, visit C&H's website.

To allow the use of two M-modules in a standard 3U cPCI (PXI) system, the module is slightly higher than the 3U standard. The card guide rails for the slot the module will be used in must be replaced with the special card guide rails supplied with the PX469S. The rails easily snap out using a flat screwdriver.



## I/O CONNECTOR

Below is the signal list for the two connectors located on the front panel of the PX469S. For more details on each signal, refer to the M213 User Manual.

