PRODUCT BRIEF

CW46S GPS Sensor

Description

The CW46S GPS sensor is a fully integrated module that includes a CW25 GPS receiver, DC/DC converter, RS232 or RS422 interface options and active GPS antenna — all housed in a small weatherproof (IP67 rated) enclosure. The CW46S can be easily mounted on a pole or wall (bracket available).

When mounted with a good sky view the CW46S receiver can provide high quality timing and synchronization. The 1 Pulse Per Second timing signal can provide accuracies to within 30nS RMS of Coordinated Universal Time (UTC). The 1PPS is transmitted via RS422 signal format; this 2 wire method allows the pulse to be transmitted with cable lengths exceeding 100 metres.

The CW46S utilizes the CW25-TIM GPS receiver, the CW25-TIM's well established and proven timing performance allows the CW46S to act as a complete timing module and is capable of outputting a GPS disciplined 10MHz frequency. The frequency can achieve full PRC MTIE performance in good signal areas. The 10MHz is converted to a 100Ω sine wave before transmission, ideal for a 100Ω twisted pair cable. (Note: Contact NavSync before using this frequency option)

The CW46 module can be sold with or without the cable assembly. This allows customers to make their own cable, potentially reducing upfront costs and shipping charges. NavSync can provide and customize the standard cable assembly (see appendix) on request, if a cable is required.

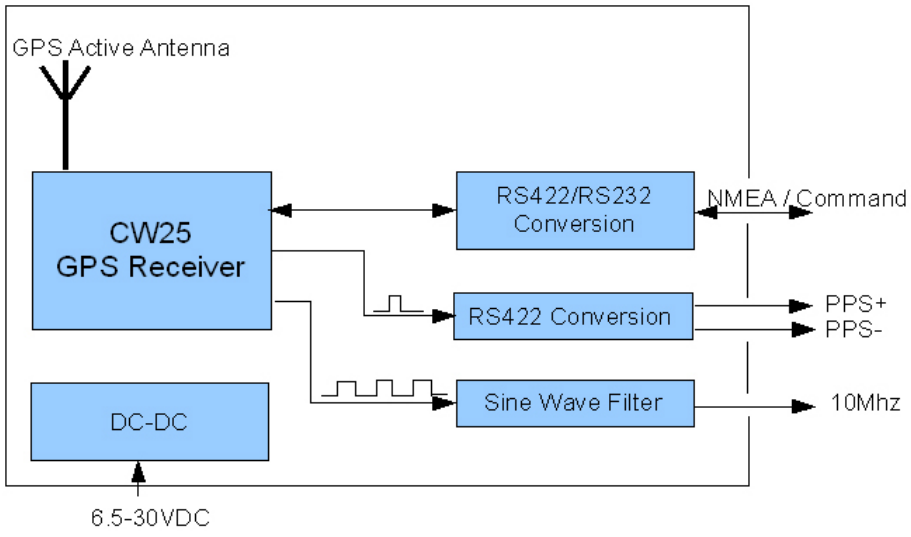
Features

- 1 PPS Aligned to UTC Second
- GPS Disciplined 10 MHz
- Wide DC Power Range
- IP67 Rated Waterproof Box
- RoHS Compliant

Applications

- Stratum 1 Timing Source
- Synchronizing Wireless Networks
- Synchronizing Remote Switch Sites

Block Diagram



Bulletin	NS49-PB
Revision	P01
Date	11 Jan 2011

NAVSYNC

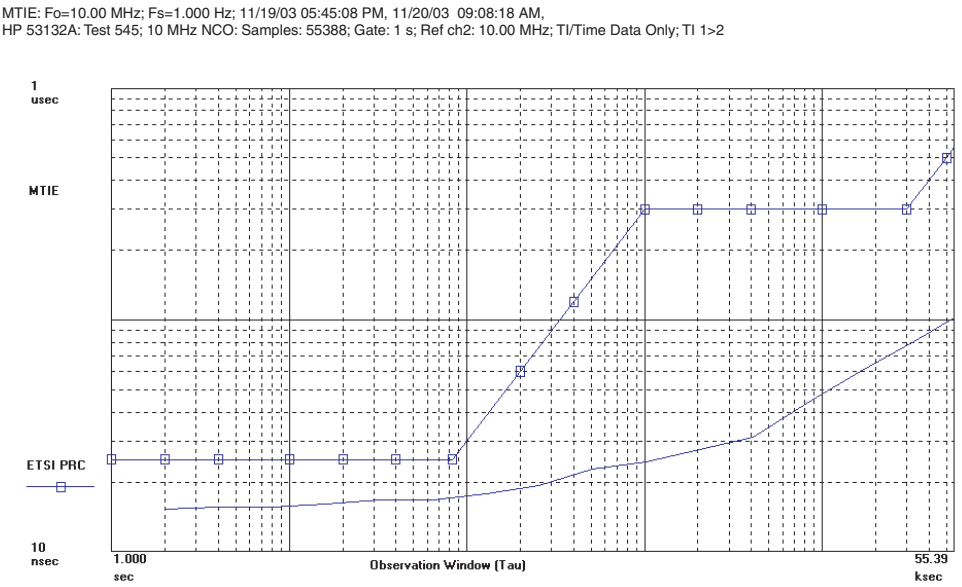
CW46S GPS SENSOR SPECIFICATIONS

SPECIFICATIONS[1]

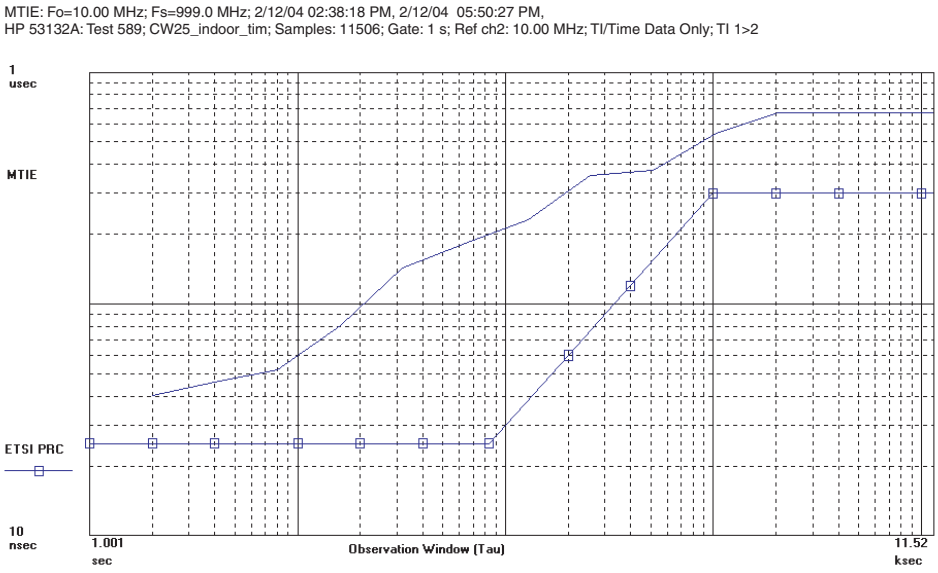
Physical	Module Dimensions	140mm (length) x 91mm (width) x 43mm (height)
	Module Rating	IP67
	Supply Voltage	6.5V — 30 VDC (48 VDC option also available)
	Operating / Storage Temp	-30°C to 75°C / -40°C to 85°C
	Humidity	5% to 95% non-condensing
	Max Velocity / Altitude	515ms^{-1} / 18,000m
	Max Acceleration / Jerk	4g / 1gs^{-1} (sustained for less than 5 seconds)
Sensitivity	Acquisition/Tracking	-155dBW / -155dBW
Acquisition Time		Cold: <45s Warm: <38s Hot: <5s Re-acquisition: <0.5s (90% confidence)
Accuracy	Position: Outdoor	<5m rms
	Velocity	<0.05ms^{-1}
	Latency	<200ms
	Raw Measurement Accuracy	Pseudorange <0.3m rms, Carrier phase <5mm rms
	Tracking	Code and carrier coherent
Power	1 Fix Per Second	1.5W typically (dependant of software build)
Interfaces	Serial	RS232, RS422 – Programmable Baud Rate up to 38400; default baud set to 38400
	Protocols	NMEA 0183, Proprietary ASCII
	1pps Timing Output	30ns rms accuracy, <5ns resolution RS422 Format
	Frequency Output	10 MHz, “Sine Wave” 3.1Vp-p into 100 ohms
	Receiver Type	12 parallel channel x 32 taps up to 32 point FFT. Channels, taps and FFT can be switched off to minimize power or simulate simpler designs.
General	Processor	ARM 966E-S on a 0.18 micron process at up to 120 MHz.

CW46S GPS MTIE PERFORMANCE

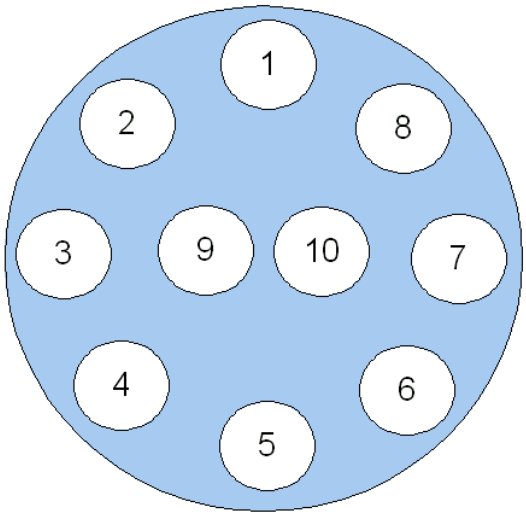
The graph below demonstrates the MTIE performance of the CW46S output frequency relative to a Caesium atomic clock, with the CW46S operating with a clear view of the sky.



The graph below demonstrates the ability of the CW46S to continue to provide a GPS disciplined output frequency with the GPS aerial located completely inside a building (the degradation of MTIE performance is due to the effects of signal multi-path)



CW46S-RS232 Pin-Out



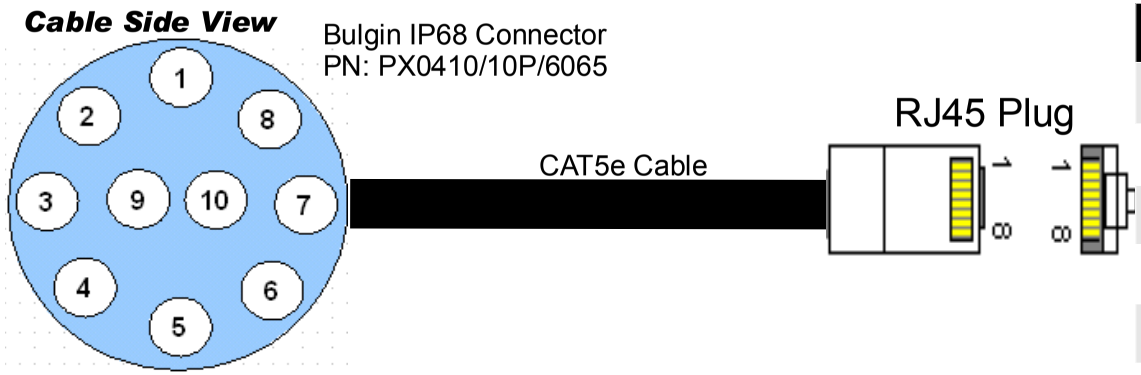
View: Looking into CW46S Connector

Pin	Name	Description
1	NC	Not Connected
2	TX	Serial Transmit (RS232) Output
3	RX	Serial Receive (RS232) Input
4	PPS+	1 Pulse Per Second Signal (RS422, Non-Inverted) Output
5	PPS-	1 Pulse Per Second Signal (RS422, Inverted) Output
6	10M	10 MHz Freq Output, “Sine Wave” ~3.1Vp-p into 100 ohm
7	C Shield	Cable Shield Option, Can help reduce noise on timing signals
8	NC	Not Connected
9	Vin	Voltage Supply Input: +6.5V to +30VDC to be supplied here
10	GND	Ground, Power Supply Return

Setup Instructions — Place the CW46S where it has a good view of the sky.

1	Secure cable assembly to CW46S
2	Connect the comms and timing signals to appropriate device(s).
3	Apply power supply voltage (6.5V to 30V DC)
4	Data should start to stream at 38400 Baud, 8 Bits, no party, 1 stop Bit.
5	Wait for GPS lock.
6	The 1PPS is now available. The 10Mhz is off by default, if required, this can be turned on with the command: $PRTHS,FRQD,10 <CR> <LF>. After GPS lock is achieved, the receive will complete a self-survey of its location. The self-survey will take 10min(approx) to complete. When complete, timing performance is optimised and the 10Mhz frequency reference is available

For more information on the details of the NMEA stream and serial commands, see NavSync's CW25 User Manual.



Pin	Name	Description
1	NC	
2	TX	BROWN/WHITE
3	RX	BLUE
4	PPS+	ORANGE
5	PPS-	ORANGE/WHITE
6	10M	GREEN/WHITE
7	Shield	Silver Wire
8	NC	
9	Vin	BROWN
10	Gnd	GREEN

Pin	Name	
1	TX	BROWN/WHITE
2	RX	BLUE
3	PPS+	ORANGE
4	PPS-	ORANGE/WHITE
5	10M	GREEN/WHITE
6	Gnd	GREEN
7	Vin	BROWN
8		

Standard Cable Lengths available:
5,10,20,30 Meters

Cable Assembly and Cable Length can be customized as required

CW46S-RS232
Cable Assembly Drawing
55.40031 RevA

CW46S GPS Sensor

Revision	Revision Date	Note
P00	08/06/10	Preliminary Release
P01	01/11/11	New Block Diagram and Description Text

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