SynPaQ/III GPS Sensor

PART NUMBER 47025181G

USER'S GUIDE

SYNERGY SYSTEMS, LLC

Time proven products and support

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LIMITED WARRANTY

Synergy Systems, LLC warrants the SynPaQ/III^{TM} GPS Sensor against defects in material and workmanship, under normal use and service, for a period of one year from the product's ship date from Synergy Systems.

The SynPaQ/III houses different receivers based on the customers application. All receivers are warranted products, but such warranty is extended to Synergy Systems only, and is not assignable or transferable to any other party. The receiver manufacturers will not accept warranty returns directly from purchasers of the SynPaQ/III.

Any returned product must be accompanied by a return material authorization (RMA) number issued by Synergy Systems. Deliver or send the product, transportation and insurance prepaid, to:

Synergy Systems, LLC
9950 Scripps Lake Drive, Suite 106
San Diego, CA 92131 USA
TEL: (858) 566-0666
FAX: (858) 566-0768

GPS PERFORMANCE

The Global Positioning System (GPS) is operated and supported by the U.S. Department of Defense and is made available for civilian use solely at its discretion. The GPS is subject to degradation of position and velocity accuracies by the Department of Defense. Synergy Systems does not warrant or control GPS availability or performance.

PRODUCT DESCRIPTION

The SynPaQ/III is a self contained GPS Sensor comprising a GPS receiver and required support electronics in a protective aluminum housing. The support electronics include ESD tolerant RS-232 and USB compatible communications links, input power regulation and filtering, and Power/Data display LEDs.

The GPS receiver can be selected from several types depending on the users requirements. This document does not cover the differences in the available receivers, it is only intended as a User Guide for the SynPaQ/III regardless of receiver installed.

The "USB" version provides for a connection where a DB9 UART does not exist.

PHYSICAL CHARACTERISTICS

Size: 2.75" W x 5.5"L x 1.15"H
                    (70mm x 140mm x 29mm)
Weight: 10 oz *(0.28 kg)*
Housing: Anodized Aluminum, Gray Paint

ELECTRICAL INTERFACE (RS232)

Power: 2.1mm Coaxial
Data to Host: DB-9F Connector
Differential Port: 2.5mm phone jack
GPS Antenna: BNC *(TNC optional)*
1PPS Out: RCA Phono Jack

ELECTRICAL INTERFACE (USB)

Power: USB
Data to Host: USB
Differential Port: 2.5mm phone jack
GPS Antenna: BNC *(TNC optional)*
1PPS Out: RCA Phone Jack

ENVIRONMENTAL CONDITIONS

Operating Temp: wo/Batt -40°C to $+85^{o}$C
Storage Temp: wo/Batt -40°C to $+85^{o}$C
Operating Temp: w/Batt -20°C to $+60^{o}$C
Storage Temp: w/Batt -20°C to $+60^{o}$C
Relative Humidity: 10% to 90%, non-condensing

POWER REQUIREMENTS

+8 to +32VDC (200 mA max)
Constant 1.6W max

POWER

RS232 Version: The power connector is a standard 2.1mm coaxial power jack. Allowable input voltage range is 8-32VDC. Regulation of the input power is not required as voltage regulation, reverse voltage, over-current and over-voltage protection circuitry is provided by the SynPaQ/III internal electronics.

A resettable fuse is contained in the SynPaQ/III assembly. Since the resettable fuse is a thermally activated device, if it opens due to application of excessive input voltage, the unit should be allowed to cool for several minutes before power is re-applied. Repeated opening of this device under conditions of proper input power indicate a probable internal problem, and the SynPaQ/III should be returned to Synergy Systems for repair

USB Version: The USB version is powered by the USB-VCC. If USB-VCC can not be used then the Power Connector option may be requested at time of purchase. All other characteristics are identical to those of the standard version.

FRONT PANEL INDICATORS
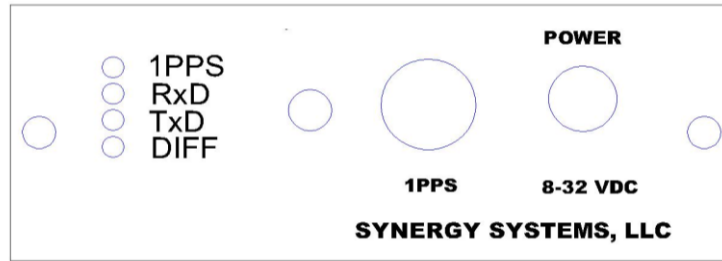
The front panel of the SynPaQ/III contains four LEDs for status display. Details are as follows:

1PPS—The **1PPS** indicator will flash RED whenever a **1PPS** pulse is output from the GPS receiver. There are **2 Modes** of operation for the **1PPS** flashing. In **Mode-1** the **1PPS** will start to flash whether satellites are being actively tracked and the receiver has developed a position fix or not. In **Mode-2** the **1PPS** will only flash if satellites are being actively tracked and the receiver has developed a position fix. The **Mode** is determined by the Receiver selected at time of purchase. This indicator also serves as a "happy light", giving the user visual feedback that the receiver's processor is powered up and accomplishing normal housekeeping routines, unless the user has previously disabled the **1PPS** output through software control of the receiver.

RxD—The **RxD** indicator will flash RED whenever commands are received from the host computer.

TxD—The **TxD** indicator provides the user with visual feedback concerning data output from the receiver. The **TxD** LED will momentarily flash RED whenever the SynPaQ/III is sending GPS data to the host.

DIFF— DIFFERENTIAL INPUT - The 2.5mm phone jack connector (J3) on the front endplate is used for inputting differential corrections into the GPS receiver. This connector is only used with RTCM enabled receivers.
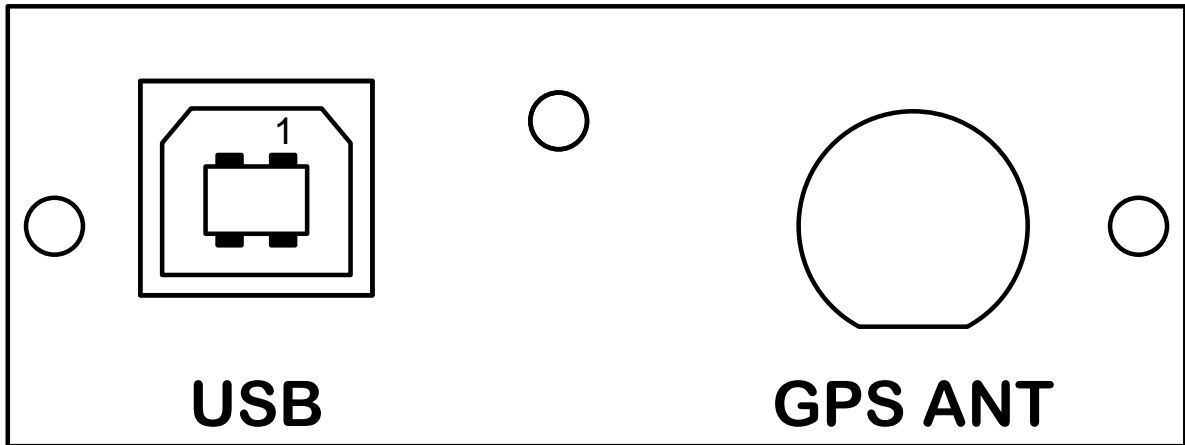
REAR PANEL CONNECTORS

RS232/DB9 Interface
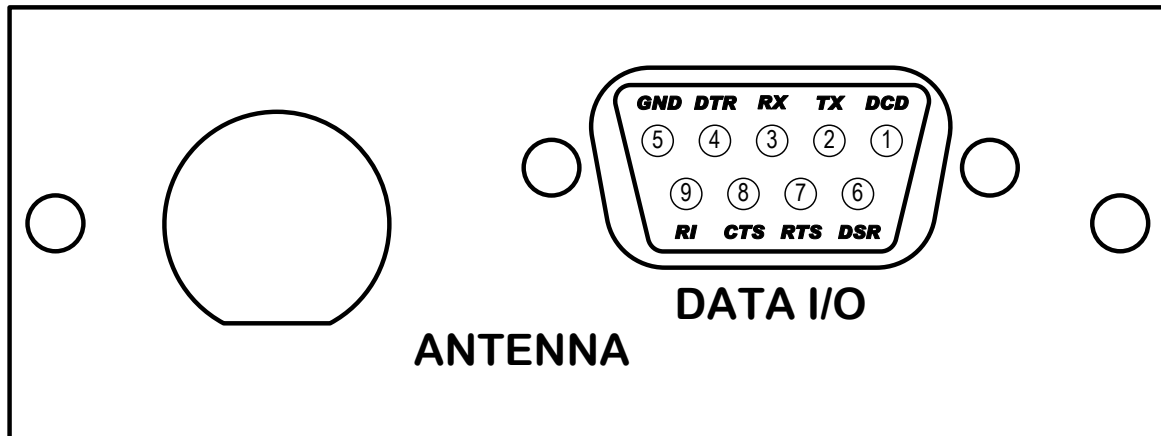
The rear panel of the RS232 SynPaQ/III contains both a BNC connector for antenna connection and a DB-9 Data connector. Pin functions are as follows:

<u>PIN</u>   <u>FUNCTION</u>

  1   1PPS Out, RS-232 levels
  2   TxD1 - Data Out, RS-232 levels
  3   RxD1 - Commands In, RS-232 levels
  5   Signal Ground

USB Interface

The "USB" version of the SynPaQ/III uses a standard USB Type B connector for data and power.
Pin functions are as follows:

PIN	FUNCTION
1	Red: +5V / Voltage + / VCC
2	White: D - / Data - / USB -
3	Green: D + / Data + / USB +
4	Black: GND / Voltage - / Ground

SYNPAQ/III OPERATION

With power applied, the SynPaQ/III is ready for immediate operation. Communications with the unit may be established with windows based GPS programs, the SW included with the kit is dependent on the receiver ordered with the SynPaQ/III. Communication SW may also be downloaded from Synergy's website at: Home - Tech Support - Software.

The actual performance parameters and supported commands of each SynPaQ/III are totally dependent upon the GPS receiver installed in the unit. Please refer to the relevant GPS Receiver User's Guide in order to determine which commands are supported by each receiver.

ANTENNA INSTALLATION

The standard SynPaQ/III allows for connection to a GPS antenna through a standard TNC or a BNC jack on the housing endplate.

Synergy provides several types of antennas depending on the customer requirements.

Synergy can provide various cable types with different lengths and connectors based on the customer's requirements.

Email your requirements to OEMtech@synergy-gps.com.

INSTALLATION INSTRUCTIONS

Plug USB cable and the antenna (BNC connector) into SynPaQ III unit.

1) Install USB 2.0 driver, if needed. If there is a conflict between the Serial Mouse Driver and the USB driver navigate to the Start menu on your computer>Control Panel>Device Manager> Mice>Select the Serial mouse and right click and Disable device.

2) To find available USB port, navigate to Start menu of the computer. Select Control Panel> System> Device manager > Ports.   Find the USB Serial Port(COM4 is used in screenshot below however may be a different port number on the computer you are using). This will be the COM port used when using the SiRFOncore software.
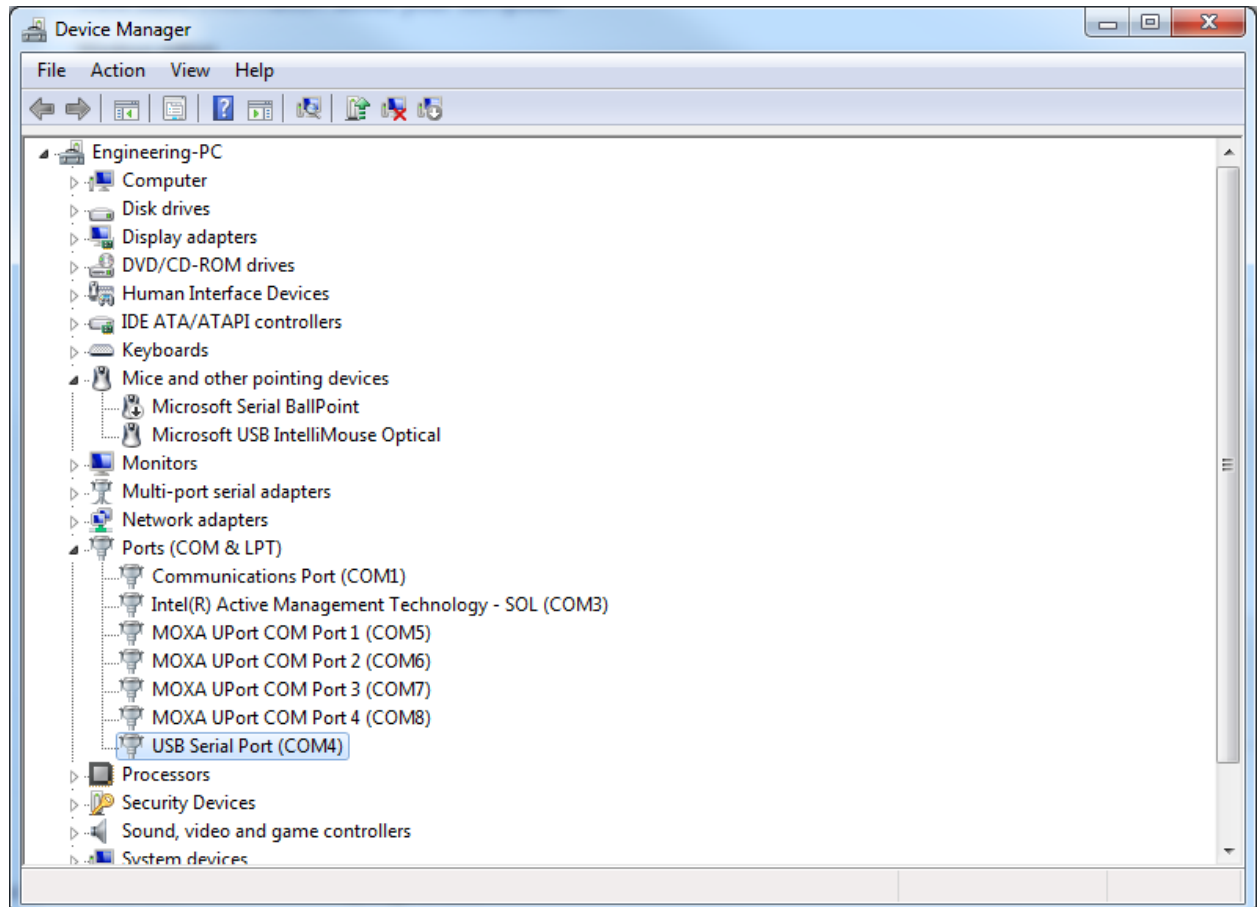
3) Launch SiRF Oncore software . See screenshot below. The SiRF Oncore software is available for download at

http://www.synergy-gps.com/index.php?option=com_content&task=view&id=185&Itemid=196
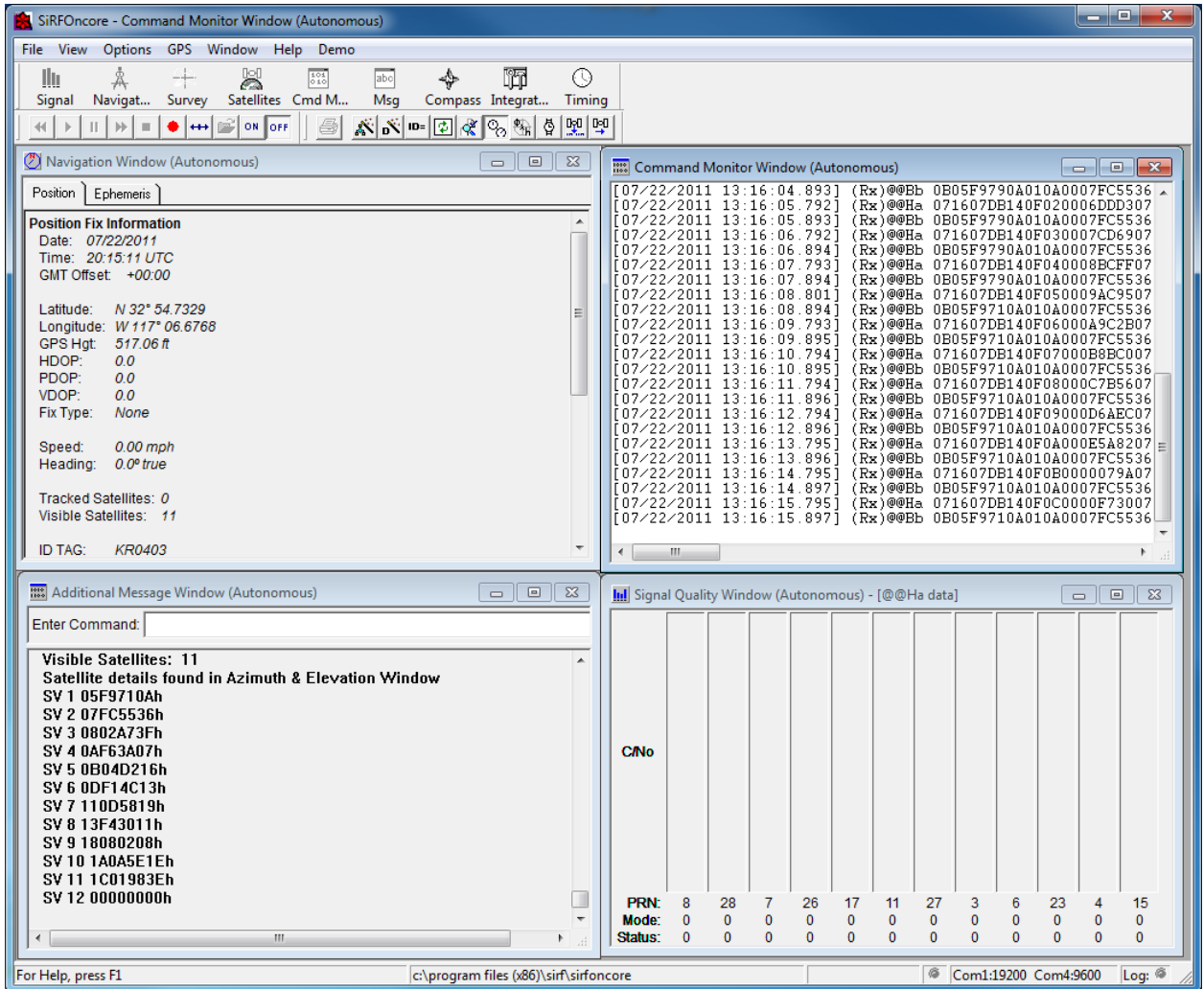
4) Navigate to Options menu> Communications> Serial Port Setup. The Autonomous settings should be used for the receiver setup.   See screenshot below.

5) Use the drop down arrow on the Comm Port setting to select the port available for use.   Note: the Comm port is the same

one defined previously through the Device Mangager.   See screenshot below.

6) Set the Receiver Type to Oncore.   See screenshot below.
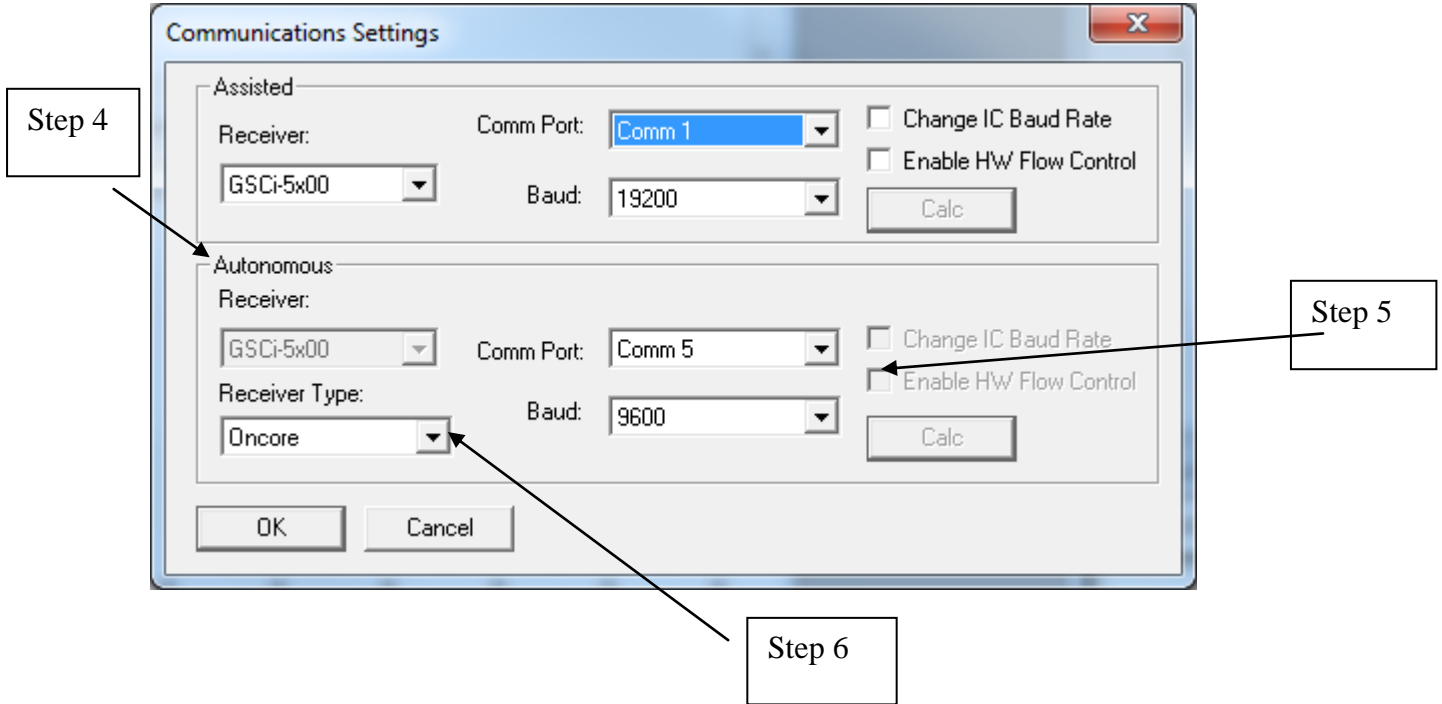
7) Navigate to the View menu> Autonomous toolbar. The Navigation Window(Automous), Command Monitor Window(Autonomous), Azimuth & Elevation Window(Automonous) and the Signal Quality Window(Autonomous) can be enabled using the toolbar. The SiRFOncore software can be configured with different settings for the receiver depending on the application.