

The user is referred at this point to the applicable Motorola M12 ONCORE User's Manual for details on operation of the **M12+** contained in the **G-SynQ** antenna.

Software— Windows based software to communicate with the G-SynQ is available on the Synergy Systems website.

Motorola's *WinOncore12* program is a free download that may be accessed from the home page. An evaluation copy of Synergy's *SynTaC* software is available from the *Technical Support* page of the website.

Support—If you have any problems at all, please do not hesitate to contact Synergy's technical support team, either by the phone number on the front of this document, or by email at: tech@synergy-gps.com

G-SynQ Antenna Evaluation Kit

USER'S GUIDE



SYNERGY SYSTEMS, LLC

Time proven products and support

P.O. Box 262250
San Diego, CA 92196

TEL: 858.566.0666
FAX: 858.566.0768

Internet: <http://www.synergy-gps.com>
E-Mail: info@synergy-gps.com

LIMITED WARRANTY

Synergy Systems, LLC warrants the **G-SynQ Antenna and Evaluation Kit Components** 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 M12+ GPS receiver contained in the **G-SynQ** Sensor is trademarked and manufactured by Motorola, Inc. (Motorola.)

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. Neither Synergy Systems nor Motorola warrant or control GPS availability or performance.

OPERATION

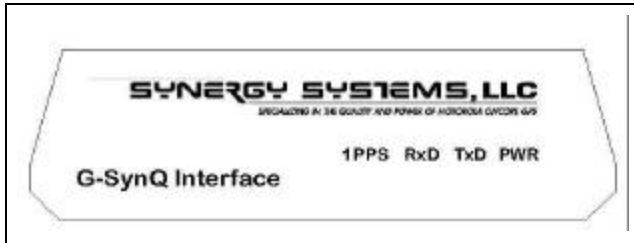
Operation of the **G-SynQ** Evaluation Kit is straight forward. For operational details of the M12+ receiver contained in the **G-SynQ** the user is referred to the M12 User's Guide. Basic connection details are as follows:

- 1 - The 2 meter serial cable is connected between the Interface Assembly and the serial port on the host computer.
- 2 - (Optional) The 2 meter 1PPS coax is connected between the RCA jack on the back of the Interface Assembly and whatever equipment is being used to monitor the 1PPS pulse (oscilloscope, time interval analyzer, etc.)
- 3 - The 15 meter Interface cable is connected between the **G-SynQ** antenna and the Interface Assembly. The cable may be run in either direction, the connectors on both ends are identical.
- 4 - The DC power plug is plugged into the Interface Assembly, and then the power supply is plugged into any convenient 110/240 VAC source. Note that the power supply is supplied with four mains connectors, allowing it to operate almost anywhere in the world with the proper adapter installed.

As soon as power is applied, the **PWR** LED on the front panel should illuminate. Also, the **1PPS** LED will illuminate for several seconds as the M12+ receiver goes through its initialization routine. Once complete, the **1PPS** LED will begin flashing at a nominal 1 Hz rate. Note that this 1PPS output is generated by the internal real time clock and will not be accurate until the receiver has achieved a fix. It is, however, an indication that the system is hooked up properly and that the receiver is going through its' normal house-keeping routines.

POWER/DATA INDICATORS

Behind the IR transparent front panel of the Interface Assembly are four LEDs which serve to alert the user to current system status. The four LEDs are described briefly as follows:



PWR - Illuminated whenever the internal +5V supply is present.

TxD - Briefly flashes whenever data is being transmitted to the host computer from the **G-SynQ** antenna.

RxD - Flashes whenever commands are sent from the host to the **G-SynQ**.

NOTE: If this LED is illuminated continuously, the serial link between the host computer and the Interface Assembly is probably disconnected. Check the cabling carefully.

1PPS - Flashes whenever the 1PPS pulse is transmitted by the **G-SynQ** antenna.

NOTE: Timing versions of the M12+ receiver support a 100 PPS output option. If the 100PPS pulse option is selected by the user, this LED will appear to be glowing constantly at decreased brightness as the eye cannot follow the 100PPS switching of the LED.

PRODUCT DESCRIPTION

The **G-SynQ** Evaluation Kit comprises all of the components necessary for the system integrator to evaluate the performance of the Synergy Systems **G-SynQ** antenna. These components include the **G-SynQ** antenna itself, an Interface Electronics Assembly that supplies power to the antenna and provides RS-232 to RS-422 level translation, a 15 meter Interface Cable, DC power supply, and associated interconnect cabling.

G-SynQ INTERFACE ASSEMBLY

PHYSICAL CHARACTERISTICS

Size: 5.0" W x 5.3"L x 1.5"H
(127mm x 135mm x 38mm)
Weight: 6 oz (0.2 kg)
Housing: Cylolac

ELECTRICAL INTERFACE

Power: 2.1mm Coaxial DC
Data: DB-9F Connector
G-SynQ Antenna: Deutsch MMP26
1PPS Out: RCA Phono Jack

ENVIRONMENTAL CONDITIONS

Operating Temp: -20°C to +55°C
Storage Temp: -40°C to +65°C
Relative Humidity: 10% to 90%, non-condensing

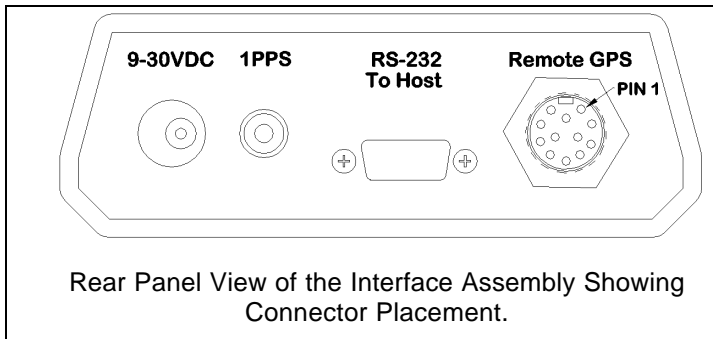
POWER REQUIREMENTS

+9 to +30VDC (250 mA max)

POWER/DATA INTERFACE

The **G-SynQ** Evaluation Kit is supplied with a wall-mounted DC power supply and all required interconnect cables. The power supply is rated at 12VDC (unregulated) and is sufficient to power the antenna through up to approximately 75 meters of the type of cable supplied in the Evaluation Kit. If longer cable lengths are utilized, the power supply voltage may be increased up to a level of 30VDC to allow for the extra IR drop in the Interface Cable. The power connector on the rear panel of the Interface Assembly is a standard 2.5mm coaxial DC power connector (center pin positive.)

In the event that the unit is accidentally shorted, a self-resetting polymer fuse opens, protecting the Interface Electronics and **G-SynQ** antenna from possible damage. Once activated, the fuse should be allowed to cool for several minutes before power is reapplied.



SERIAL PORT - User interface with the **G-SynQ** antenna is accomplished through the DB9 connector located on the housing endplate. The serial port extension cable supplied with the Evaluation Kit is used to connect the Interface Assembly to the host computer serial port. All communications on this connector occur at nominal RS-232 levels. For reference, Interface Assembly connector pinouts are as follows:

<u>PIN</u>	<u>SIGNAL</u>
Pin 1	1PPS (To Host)
Pin 2	TxD (Data To Host)
Pin 3	RxD (Data to G-SynQ)
Pin 5	Signal Common

1PPS - The 1PPS signal from the **G-SynQ** antenna is present on the RCA phono jack located on the back panel of the Interface Assembly. The Evaluation Kit is supplied with a 2meter long coaxial 1PPS monitoring cable terminated in a standard RCA plug on one end, and a BNC plug on the other. The 1PPS signal is internally buffered by an "ACT" series CMOS inverter with a 27 ohm resistor in series with the output lead. Due to the extremely fast rise time of the pulse (10 nS) the BNC connector should be terminated into 50 ohms in order to minimize reflections in the cable.

The Evaluation Kit is normally supplied with the 1PPS output as a positive going pulse. If desired by the user, the 1PPS pulse may be switched over to a negative going pulse by removing the top of the Interface Assembly and moving the jumper strip at position **JP1** on the printed circuit board to the alternate location.

Also, when calculating the offset of the 1PPS output, the propagation delay through the CMOS buffers on the interface PWA should be considered. A negative going 1PPS will exhibit approximately a 6 nS delay (1 buffer section) while a positive going pulse will exhibit a delay of approximately 12 nS (2 buffer sections.)