LORD Technical Note

3DM-RQ1™-45

Using a Furuno AU-117A Marine-Grade GPS Antenna

Overview

The LORD MicroStrain® 3DM-RQ1™-45 is a high-performance, ruggedized Inertial-Aided GPS Navigation System (GPS/INS) that combines MEMS inertial sensors and a high-sensitivity embedded Global Positioning System (GPS) receiver for use in a wide range of tactical grade applications. The 3DM-RQ1™-45 has been tested to meet the DO-160G Environmental Conditions and Test Procedures for Airborne Equipment, making it suitable for outdoor and harsh environments.

The Furuno AU-117A is a marine-grade, L1 band GPS antenna, ideal for use in the harshest environments.

The Mini-Circuits® ZA3PD-2DC-11 is an aerospace-grade, antenna power splitter that provides separate power and GPS antenna inputs, and services one or two GPS receivers.

In shipboard, marine, boating, salt or fresh water, and other such environments, the Furuno GPS antenna can be easily and successfully deployed to service the 3DM-RQ1™-45 GPS receiver. This technical note discusses this integration.

Details

The 3DM-RQ1™-45 is shipped with a general purpose GPS antenna which may be deployed in the elements but is not suitable for the harsh environments found in marine applications. The Furuno AU-117A GPS antenna is marine-ready.

The 3DM-RQ1™-45 provides 3 volt DC power to active GPS antennas connected directly to it. The Furuno AU-117A is an active GPS antenna which requires 5 volt DC power.

In order to integrate the 3DM-RQ1™-45 and the AU-117A, an antenna power splitter must be employed. The antenna power splitter serves three purposes: 1) it blocks the 3 volt DC power circuit in the 3DM-RQ1™-45 so that this power is not fed to the AU-117A, 2) it accepts a 5 volt DC power input from a power supply of the user's choice, and in turn, feeds the 5 volts DC to the AU-117A, and 3) it routes the GPS signal from the AU-117A to the antenna port on the 3DM-RQ1™-45. Figure 1 shows a block diagram of the system.

Connectors and cables:

1. The power splitter has 4 female TNC ports.
2. The AU-117A has a short cable terminating in a female TNC; this connects to port S,V on the power splitter by use of a male TNC-to-male TNC bridging cable; this bridging cable can be used to run the antenna at distance from the splitter. These long run bridging cables can be procured with the Furuno antenna.
3. The 5 volt power from the DC Power Supply should terminate in a male TNC and connect to port 1,V on the power splitter. Pasternack Enterprises is a good source for these cables.
4. The 3DM-RQ1™-45 presents a female SMA for its GPS antenna connection. A male SMA-to-male TNC cable is required to connect the 3DM-RQ1™-45 to the splitter. Pasternack Enterprises is a good source for these cables.

As in all marine operations, electrical connections which are exposed to the elements, should be protected with waterproof taping or other waterproofing.

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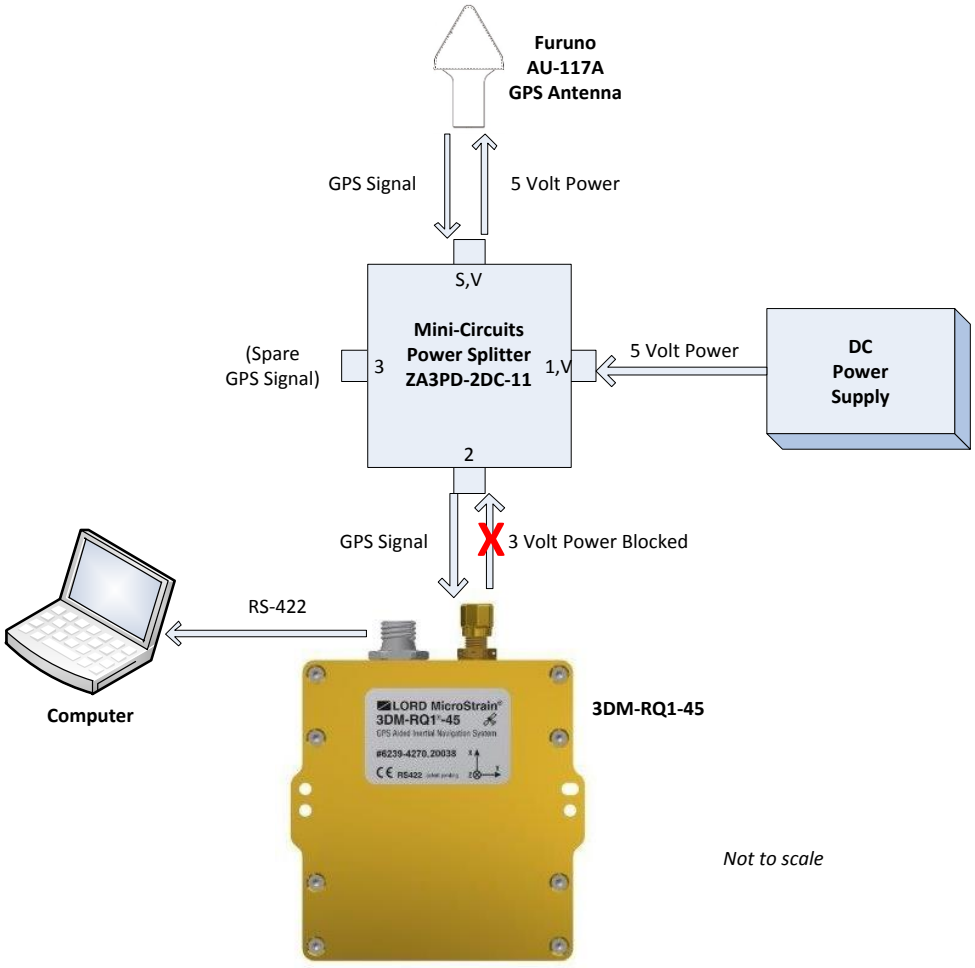

Figure 1: *Block diagram of inertial sensor, GPS antenna and antenna splitter connections*

Support

LORD MicroStrain® support engineers are always available to expand on this subject and support you in any way we can.

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