

Special Specification 6061

Global Positioning System (GPS) Communication Unit



1. DESCRIPTION

Furnish, install, and make fully operational a GPS Communication Unit (GPSCU) at designated locations as shown on the plans and as detailed in accordance with this specification. Use the same manufacturer and model for each GPSCU. The GPSCU provides a reliable and independent GPS time reference for every traffic signal controller application.

2. MATERIALS

Provide only equipment that is new, corrosion resistant, and in strict accordance with the details shown on the plans, in this specification, and the pertinent requirements of the following items:

- Item 680, "Installation of Highway Traffic Signals"
- Item 681, "Temporary Traffic Signals"

Provide a GPSCU that is fully compatible with a Type 1 or Type 2 NEMA (National Electrical Manufacturers Association) traffic signal controller.

2.1. **GPS Communication Module.** Provide a GPS Communication Module (GPSCM) that has the following traffic signal controller interface features:

- Microwave clock update application included (operates with any traffic signal controller)
- Tracking LED that indicates GPS satellite acquisition status
- -34°C to +74°C operating temperature range
- A power consumption of 125mA at 12V
- LED power status indicator
- Complies with Part 15 of FCC rules
- Mounted inside of the traffic signal controller cabinet
- RS 232 communication to the NEMA signal controller

2.2. **GPS Antenna.** Provide a GPS Antenna that has the following features:

- 28dB gain
- 3m cable
- SMA Male
- Compliant with National Marine Electronics Association (NMEA) 0183 devices
- Water and dust resistant
- Mounted externally on the traffic signal controller cabinet

3. OPERATION

Once the GPSCM acquires satellite communication (as shown by LED indicator), ensure the GPSCU then operates as follows:

- It uses the operating software of the traffic signal controller interface with the GPSCU to sync the date and time of the traffic signal controller once per minute.

4. CONSTRUCTION

Provide equipment that utilizes the latest available techniques for design and construction with a minimum number of parts, subassemblies, circuits, cards, and modules to maximize standardization and commonality.

Design the equipment for ease of maintenance. Provide component parts that are readily accessible for inspection and maintenance. Provide test points that are for checking essential voltages and waveforms.

- 4.1. **Electronic Components.** Provide this item in accordance with Special Specification "Electronic Components."
- 4.2. **Mechanical Components.** Provide external screws, nuts, and locking washers that are stainless steel; no self-tapping screws will be allowed. Provide parts made of corrosion resistant material, such as plastic, stainless steel, anodized aluminum, or brass. Protect materials from fungus growth and moisture deterioration. Separate dissimilar metals by an inert dielectric material.
- 4.3. **Documentation Requirements.** Provide one copy of the manufacturer's operation manual at each installation location.
- 4.4. **Testing.** The Department reserves the right to test the GPSCU to ensure quality assurance before installations and random sampling of units being provided to the Department. The Department's testing procedures will include the following:
- The GPSCU will meet the criteria of the specification.
 - The GPSCU demonstrates the operations described in Section 3 of this specification.
 - The GPSCU and its components will be tested in an environmental chamber (temperature ranges from -34 °C to +74 °C).
- 4.5. **Technical Assistance.** Ensure that a manufacturer's technical representative is available on site to assist the technical personnel at each installation site and with GPS equipment installation and communication system configuration.
- Do not execute the initial powering up of the GPS equipment without the permission of the manufacturer's representative.
- 4.6. **Warranty.** Guarantee equipment furnished and installed to perform according to the manufacturer's published specifications prior to the acceptance of the system by the Department. Warrant equipment against defects or failure in design, materials, and workmanship in accordance with the manufacturer's standard warranty for a minimum of 5 years.

5. SUBMITTALS

Submit manufacturers' cut sheets / specifications and software for the equipment proposed under these specifications to the Department's Traffic Operations section for approval at the following e-mail address: HOU-TrfShpDrwgs@txdot.gov.

6. MEASUREMENT

This Item will be measured as each unit furnished, installed, made fully functional, and tested in accordance with these special specifications or as directed. A unit will include one GPSCU meeting the specifications, standards, and requirements contained herein, module, antenna, and antenna cabling back to the module, mounting hardware, manufacturer's operation manual, required testing results, manufacturer's technical specification, and the cost of the materials, training, warranty, equipment, and accessories necessary to the complete installation of the unit.

7. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "GPS Communication Unit." This price is full compensation for the equipment described under this Item with module, antenna, cables, and connectors; for documentation and testing, and for the cost of furnishing labor, materials, software, warranty, training, equipment, and incidentals.