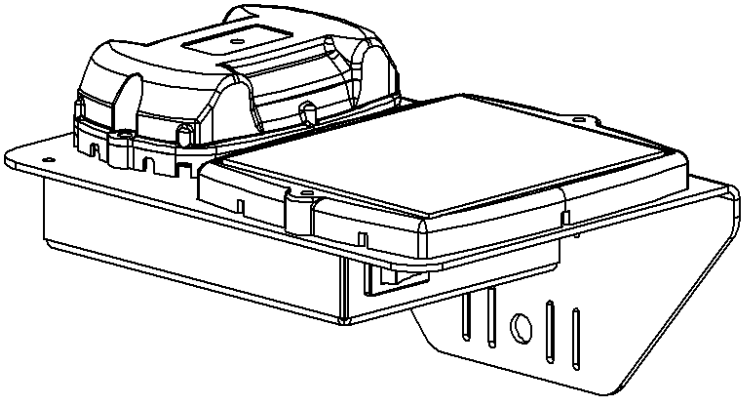
Silent Navigator

Solar Powered GPS Location Device

Procurement Specifications

(NAB-5000)



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This document presents a detailed specification for a portable solar powered tower. This specification typically requires additions and/or modifications to meet a user's specific requirements.

This specification is subject to periodic revisions as required without notice.

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General email: info @solartechnology.com

Technical Support: techsupport@solartechnology.com

Website: www.solartechnology.com

1. General

1.1 Product Description

The **Silent Navigator** is a versatile solar powered GPS Location device capable of being deployed to support the Intelligent Transportation Systems (ITS). The Silent Navigator can be used to mark and monitor the geographical boundaries of a work zone and communicate its position to navigation apps, and devices connected through SolarTech's WebSuite software.

The **Silent Navigator** consists of a rugged aluminum bracket and an imbedded photovoltaic panel capable of continuous year-round system operation.

1.2 Design Objectives

1.2.1 Maximize reliability by using generally accepted design techniques for outdoor-use electrical and electronic equipment.

1.2.2 Minimize operating cost by using a renewable energy source, requiring minimal maintenance.

1.2.3 Maximize portability, simplicity, ease and rapidity of deployment, stability, and safety.

1.3 Performance Objectives

1.3.1 Continuous, uninterrupted operation on solar power.

1.3.2 Three (3) month typical maintenance interval.

1.4 Quality Assurance Objectives

1.4.1 All manufacturing shall be carried out in a facility with a completely implemented and properly maintained ISO 9001:2015 certified quality management system.

1.4.2 All units shall be tested to ensure that they are neither susceptible to nor produce any electromagnetic interference.

2. Physical

2.1 Dimensions

2.1.1	Height	– 4.25 in. (cm)
2.1.2	Length	– 6.5 in. (cm)
2.1.3	Width	– 8.25 in. (cm)
2.1.4	Weight	– 2 lbs. (1 kg)

2.2 Environmental

2.2.1	Temperature, operating and storage	– -40 to +185 °F (-40 to +85 °C)
2.2.2	Relative Humidity	– 20% to 98%, non-condensing

3. Construction and Operation

3.1 Mounting Bracket Construction

3.1.1 Mounting bracket shall be designed to facilitate quick, easy installation and removal of the device on construction barrels, concrete barriers, construction signs or posts, and construction vehicles and trailers. No special tools shall be required for installation or removal of the device.

3.1.2 The device shall be completely assembled with removable fasteners to accommodate quick, easy maintenance and repair with standard hand tools.

3.1.3 All fasteners shall be stainless steel and equipped with nylon-insert lock nuts to prevent loosening of fasteners during normal operation.

3.1.4 Surface Preparation and Finishing

3.1.4.1 Mounting bracket shall be completely cleaned and deburred prior to finishing. All metal surfaces shall be prepared for finishing using an iron phosphate wash-down process.

3.1.4.2 Mounting bracket shall be coated with oven baked black powder coat finish.

3.1.5 Mounting bracket shall be made from 1/8” 5052 marine grade corrosion resistant aluminum.

3.1.6 Mounting bracket shall contain two 3/8" mounting holes to allow attachment to standard 2" perforated square steel sign posts (PSST) using 3/8" hardware, with hole spacing compatible with the 1" on-center perforation pattern.

3.1.7 All mounting brackets shall additionally provide slots sized to accept stainless steel band/hose clamps, enabling mounting to round or non-perforated poles of varying diameters. Slot dimensions shall accommodate clamp band widths of up to 3/4" (21 mm). Brackets shall accommodate all common pole diameters using worm-gear or band-style stainless steel clamps. A minimum of four slots shall be provided per bracket to ensure secure two-point clamping.

3.2 Control Module Construction

3.2.1 Control module shall be housed in rugged UV-stabilized polycarbonate casing.

3.2.2 Control module shall be connected to the solar array using sealed automotive style watertight plug.

3.2.3 Control module shall use LED bulb to display the module operation status.

3.2.4 Control module shall be equipped with a watertight self-regulating pressure release membrane vent to allow air circulation in any weather conditions.

3.2.5 Control module lid shall be sealed using continuous silicone O-ring. The O-ring shall be seated in a dedicated groove to ensure proper compression and alignment and shall be made of a UV and weather-resistant material suitable for continuous outdoor exposure.

4. Control Module

4.1 Physical

4.1.1 Control module shall include internal cell and GPS antennas to allow for remote communication and monitoring of the location of the module.

4.1.2 All control module wiring and cables shall be equipped with modular power and signal connectors to permit repairs without the need for any tools

4.2 Cellular Transceiver & GPS Receiver Module

4.2.1 Integrated into equipment box – proprietary

5. Power System

5.1 General

5.1.1 Operating Voltage – 4.8 Volts DC nominal

5.1.2 Operation Switch – The operation switch shall be a signal-level enable switch that provides a discrete voltage to the control module. When in the “ON” position, the Silent Navigator shall provide a signal to SmartZone enabling a work zone scenario or provide a signal to a third-party system with an active work zone notification. When in the OFF position, any active signals and notifications shall be deactivated. The switch shall be splash-proof and weather resistant.

5.2 Battery Bank

5.2.1 Number of batteries: One (1)

5.2.2 Battery type: 4.8 Volt, sealed, PTC-protected, maintenance-free, NiMH batteries

5.2.3 Energy capacity – 0.5 Amp Hours nominal

5.3 Solar Array

5.3.1 Photovoltaic module type - Single crystal (monocrystalline) silicon

5.3.2 Number of solar cells per module – 60

5.3.3 Solar array power output: 1.75 Watts.

5.4 Wiring and Cabling

5.4.1 All wiring shall be marine grade, multi-strand, tin-plated copper with PVC insulation rated for outdoor use.

5.4.2 All conduit fittings shall be sealed at bulkheads or enclosure entry points.

5.4.3 All power system wire terminals shall be silver or tin-plated copper to minimize the effects of galvanic corrosion.

5.4.4 Main power wiring shall be 22 AWG minimum.

5.4.5 All power wiring and the switch shall be enclosed with a metal cover to protect the wires from external mechanical damage.

5.4.6 All power wiring between the solar panel and control module shall be watertight at each cable entry point.

6. Documentation

6.1 Operation and Maintenance Manual – available online at www.solartechnology.com

6.1.1 Setup and Operation

6.1.2 Maintenance

6.1.3 Troubleshooting and Repair

6.1.4 Assembly Diagrams and Parts Lists

6.1.5 Specifications

6.1.6 Appendix

6.2 Integration Support Documentation – Per request from customer support (1-800-475-5442)

7. Maintenance

Solar Array - Clean with water and mild detergent as needed.

8. Warranty

Solar Panels – Ten (10) years