## A. Spar Receiver Hardware

| Item | Parameter |
|---|---|
| Construction | High impact thermoplastic (ABS) injection molded housing<br>32-mm (1.25") diameter carbon-fiber reinforced pole separating two sensors<br>Brass inserts hold two quick-release stainless steel spuds |
| Weight | 1.4 kg (3.1 lb) |
| Dimensions | 61 cm X 11 cm (24" X 4.5") |
| Antennas | Total of six antennas |
| Host Interface | RS-232 or Bluetooth, fixed baud rate: 115,200 bits per second |
| Other I/O | USB device for Spar software updates, option upgrades, (internal USB hub) |
| Approvals | CE:<br>- Radiated emissions: EN61000-6-4<br>- Electrostatic discharge: EN61000-4-2<br>- Radiated RF immunity, EN 61000-4-3<br>- Power frequency magnetic field immunity: EN61000-4-8<br>FCC Part 15, Class A digital device, unintentional radiator |
| Fully qualified Class 1 Bluetooth 2.1/2.0/1.2/1.1 module | Model: RN41<br>- Contains Transmitter Module FCC ID: T9JRN41-3<br>- EUROPE EN 300 328-1, EN 300 328-2 2.4GHz<br>- CANADA IC Contains transmitter module IC: 6514A-RN413<br>- Bluetooth LISTED B013180 |
| Other | RoHS compliant<br>IEEE 802.15.4<br>- Model: JN5148-001-M03<br>- Contains FCC ID: TYOJN5148M3<br>- CANADA IC Contains IC: 7438A-CYO5148M3 |
| Accessories | - Two 4,000mAh camcorder battery, replaceable, allows for approximately 10 hours of operation<br>- 1-hour dual-battery quick charger with AC/12VDC input<br>- USB data cable<br>- Soft carry bag |
| Software | Trimble Access™ (available from Trimble) |
| Optional Accessories | Vivax-Metrotech 10W Transmitter Loc-10Tx, with special low 32 Hz frequency |
| Custom Accessories | 982 Hz high power sonde for geospatial positioning of ducts and pipes |
| Third-Party Accessories | - Carbon fiber range pole with brackets for Spar, Tablet, and GNSS antenna<br>- Mounting brackets and quick-release clamps |

## B. Spar Measurement Features

| Item | Parameter |
|---|---|
| Construction | - Single Spar mode supported by both Spar 300 and Spar 300 PPS<br>- Dual Spar mode supported only by Spar 300 PPS with built-in PPS module for signal synchronization<br>- Sonde or line geospatial mapping<br>- Spar height above ground<br>- Units of measure (feet/meter)<br>- Language |
| Operating Frequencies | 22, 32, 50, 60, 64, 80, 98, 100, 120, 128, 491, 512, 640, 577, 815, 982, 1024<br>1520, 8192, 8440, 9820 Hz |

| | |
|---|---|
| **Pinpointing Performance (with undistorted signal source)** | *Single Spar*<br>Geospatial position pinpointing accuracy:<br>- Up to 9ft (3m) – 5% of radial distance to targeted utility or Sonde[1]<br>Current measurement accuracy:<br>- Up to 9ft (3m) – 5% of actual current<br>***Dual Spar***<br>Geospatial position pinpointing accuracy:<br>- Up to 33ft (10m) – 5% of radial distance to targeted utility or Sonde[1]<br>Current measurement accuracy:<br>- Up to 33ft (10m) – 5% of actual current |
| **Geospatial Information** | - Geospatial solution data logging is always active. All results (depth, offset, range, yaw, and AC current are stored in the selected folder, based on:<br>  • User selected update on time interval (200 msec to 10 sec), distance step (centimeters to meters), or manual command.<br>  • User selected tolerance mask for both horizontal and vertical expected error. Locate confidence can be merged with the GNSS RMS error. Points will only be logged if the aggregate error is less than the specified values.<br>- All raw field and body orientation data is logged: enables playback offline with different settings (averaging, logging interval, tolerances) |
| **Locating Information (descriptions may refer to optional software components)** | - Signal strength: screen-based spatial locating tiles the map view with color representing signal strength. Permits a rapid acquisition of the utility target to begin model-based location.<br>- Compass: line direction indicator for both upper and lower 3-axis sensors<br>- Internal battery condition<br>- Operating frequency |
| **Transmitter Compatibility** | Any standard locating transmitter is supported at the above stated frequencies. No special modulation method is required. No line transmitter is required when tracking Sondes |
| | Using the SONDH982 sonde transmitter, a high power, current stabilized 982 Hz sonde accessory |

## C. Spar Receiver Sensitivity1 (at 1 meter, or 3.2 feet)

| Item | Parameter | | |
|---|---|---|---|
| **Sensitivity** | Item | Locate[2] | 3-D Geospatial Solution[3] |
| | 50/60 Hz Power | 5 mA | 50 mA |
| | 491, 512,640 Hz | 500 µA | 5 mA |
| | 8192, 8440, 9820 Hz | 25 µA | 250 µA |
| | - Sensitivity is dependent on field conditions, primarily interference sources. Spar results are always presented with expected RMS accuracy, which will take into account all on-site field conditions<br>- 2. Sensitivity at which spatial locating can distinguish a doubling of signal level.<br>- 3. 3-D Geospatial solution sensitivity is the level at which a 5% accurate solution is attainable in ideal (undistorted) field conditions | | |

## D. Spar Environmental Specifications

| Item | Parameter |
|---|---|
| **Temperature Range** | Operating: -4ºF to 122ºF (-20ºC to 50ºC) |
| | Storage: -40ºF to 140ºF (-40ºC to 60ºC) |
| **Weather** | IP54 and NEMA 4 |
| **Shipping Weight** | 4kg |

All products are designed and manufactured in accordance with ISO 9001:2008

Updated: October 2017

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|---|---|
| **Shipping Dimension** | 72 X 15 X 20 cm (28 X 6 X 8 inches) |
| **Humidity** | 95% non-condensing |
| **Shock** | MIL-STD 810F, Fig. 516.5-10 |
| | (40g, 11ms, saw-tooth) |
| **Vibration** | MIL-STD 810F, Fig. 514.5C-17 |

## E. Spar Warranty

| Item | Parameter |
|---|---|
| **Warranty** | 12 months |

## F. Overall Geospatial Positioning Accuracy

| Item | Parameter |
|---|---|
| **For spar versions with internal Ashtech MB100 GNSS Board** | Total accuracy is derived by taking the square root of the sum-of-squares of the GNSS accuracy and the locating accuracy. This is done on every measurement result automatically, and presented as the effective tolerance of the 3-D utility position. |

Disclaimer: Product and accessory specification and availability information is subject to change without prior notice.