GPS Time & Frequency System

Tactical GPS

Model: 8836



Features

- GPS Disciplined Rubidium Oscillator
- Internal or External GPS Reference
- Internal SAASM GB-GRAM GPS Receiver
- Remote Control and Monitor through Ethernet or RS-232
- Network Time Server
- Outputs 10 MHz, 5 MHz, 1 PPS
- Ground Mobile Operating Environment
- Optical IRIG B Time Code
- Low Phase Noise 10 MHz Cleanup Oscillator

Application - Defense (Military) - SatCom-Wireless

- Mobile Radio Synchronization
- Secured Communications

Options

• 1 Hz to 50 MHz Frequency Synthesizer 1 Hz steps

General Description:

The Model 8836 is a tactical GPS Time and Frequency System that incorporates a Selective Availability Anti-Spoofing Module (SAASM) Ground-Based GPS Receiver Module (GB-GRAM) rubidium oscillator, time and frequency signal generation and control/status circuitry in a compact ruggedized enclosure. Standard outputs include 1PPS, 10 MHz Network Time Protocol (NTP) and two IRIG B outputs over multi-mode fiber.

The 8836 can be synchronized from the internal GPS receiver or from an external GPS 1PPS.

When tracking GPS with a TFOM of 3 or better, the discipline algorithm steers the internal oscillator providing 1 PPS time accuracy of < 30 nS to UTC and long term frequency stability of < 1E-12 averaged over 24 hours. In the absence of GPS the unit transitions into holdover mode providing an accumulated time drift of < $\pm 2 \mu$ S in 24 hours.

An Ethernet interface provides NTP, SNMP v1,v2 and v3, SSH, syslog and telnet. An RS-232 I/O interface is also provided for control and status.

Three GPS Standard Serial Interface Protocol (GSSIP) ports are provided from the GB-GRAM. Two ports are configured to automatically output ICD-GPS-153 messages and the third port is configured to automatically output NMEA-0183 messages.

Notice: U.S. Government policy restricts the sale of Precise Position Service (PPS) equipment to those authorized by the Department of Defense. Non-U.S. authorized users must purchase PPS equipment through the Foreign Military Sales (FMS) process.

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Specifications subject to change without notice.



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| Iduliudi GPS | | | |
|-----------------------------|--|-----------------------|---|
| Specifications: | | Output Level | RS-232 |
| SAASM GPS Receiver | | Baud Rate & Format | 9600 Baud |
| Туре | 12 Channel Parallel Tracking | | 8-data bits, 1-stop bit, no parity |
| Frequency | 1575.42 MHz (L1) & 1227.60 MHz (L2) | Connector | Circulator JD38999/20WD35SN |
| Code | C/A & P(Y) | GSSIP Port 2 Output (| (Com 1) |
| Keyload Interface | DS-102 | | Automatically outputs position, |
| Optical Time Code | | Function | velocity and time (PVT) and status |
| Format | IRIG-B | | data IAW GPS-ICD-153C |
| Optical Wavelength: | 280nM | | Message ID3 Time Mark Data (once |
| Optical Cable: | Multimode | per second | per second) |
| Max Cable Length: | 2,000 meters | | Message ID 5040 Current Status |
| Connector: | ST | Message Outputs | (once per second) |
| Number of Outputs: | Two | 0 | Message ID 5044 Warning Messages |
| Low Noise 10 MHz Outp | out | | Message ID 253 Buffer Box (once per |
| Waveform | Sinusoidal | | 6- seconds) |
| Output Level | +11 dBm ± 2dB | | seconds) |
| Harmonic Distortion | -30 dBc | Output Levels | RS-422 |
| Spurious | -80 dBc | Baud Rate & Format | 9600 Baud |
| Frequency Accuracy | <1E-12 24 Hr avg. while locked to GPS | Dadd Mate & Format | 8-data bits, 1-stop bit, no parity |
| Trequency Accuracy | <1E-11 in 24 hours during holdover. | Connector | Circular JD38999/20WD35SN |
| | @ 1Hz offset -90 dBc | NMEA-0183 Port (Con | |
| | @ 10 Hz offset -125 dBc | | Automatically outputs position, |
| Phase Noise (static) | @ 100 Hz offset -145 dBc | Function | velocity and time (PVT) and status |
| | @ 1 kHz offset -160 dBc | | - · · · |
| | @ 10 kHz offset -165 dBc | Massaga Outputs | data IAW NMEA-0183 |
| | @ 100 kHz offset -167 dBc | Message Outputs | GGA - Global Positioning Syste Fixed Data |
| Connector | SMA female | | RMC - Recommended Minimum |
| 1 PPS Output | | | |
| Pulse width | 100 μ S ± μ S positive edge on-time | Outrast Laurel | Specific GNSS Data |
| Output Level | TTL into 50 ohms | Output Level | RS-232 |
| Accuracy | < ±30 nS RMS to UTC while locked to GPS | Baud Rate & Format | 4800 Baud |
| | | Connoctor | 8-data bits, 1-stop bit, no parity |
| | $< \pm 2 \mu$ S in 24 hours during holdover after three days of oscillator training | Connector | Circular JD38999/20WD35SN |
| Connector | Circular JD38999/20WD35SN | RS-232 Interface | Remote control and status of unit |
| GSSIP Port 1 Output (B | DDP) | Interface protocol | TRAK proprietary interface |
| Function Message Outputs | Automatically outputs position, velocity and time (PVT) and status data IAW GPS- ICD-153C Message ID 4 24-CH Time Mark Data (once per second) | Output Level | |
| | | Baud Rate & Format | RS-232 9600 Baud |
| | | Dauu Rale & Fuimal | 8-data bits, 1-stop bit, no parity |
| | | Connector | Circulator JD38999/20WD35SN |
| | Message ID 5040 Current Status (once per second) | Connector | Circulator 3D36999/20002530 |
| | Message ID 5044 Warning Messages | | |
| | Message ID 5101 Time transfer Data (once per second) | | |
| | Message ID 253 Buffer Box (once per | Spe | cifications subject to change without notice. |
| | 6-seconds | - 1 | TRAK Microwave Corporation |
| | | | |

| od 514, category 20, Figure 514.5C-4Operational Shock:Per MIL-STD-810F, Method 516.5, Procedure I, Figure 516.5-10, Table II. Terminal peak sawtooth pulse of 40 g s, 11 mS. | Ethernet Interface | | | |
|--|-----------------------|-----------|--|--|
| Supported Protocols SSH Supported Protocols SNMP v1, v2, v3 Telnet HTTP DHCP DHCP Speed 10/100 Base-T Connector Circular MS with integrated RJ-45 (amphenol Pt #RJFTV21N) Environmental Operating temperature -30°C TO +65°C Rate of change 10°C per hour Storage Temperature -30°C TO +65°C Rate of change 10°C per hour Storage Temperature -45°C to +85°C Humidity: o to 95% non-condensing Operating Vibration: Figure 514.5C-3 and Table 514.5C-VII Tracked Vehicle per MIL-STD-810F, Method 514., Category 20, Figure 514.5C-4 Operational Shock: Per MIL-STD-810F, Method 516.5, Procedure 1, Figure 516.5-10, Table II. Terminal peak sawtooth pulse of 40 g s, 11 mS. 47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision F, Notice 2 Physical Size:10.5''L x 8.2''W x 1.74''H Weight: 5.8 lbs Size:10.5''L x 8.2''W x 1.74''H | Function | | Remote control and status of unit and NTP server | |
| Supported Protocols SNMP v1, v2, v3 Telnet HTTP DHCP DHCP Speed Connector Circular MS with integrated RJ-45 (amphenol Pt #RJFTV21N) Environmental Operating temperature -30°C TO +65°C Rate of change 10°C per hour Storage Temperature -45°C to +85°C Humidity: o to 95% non-condensing Wheeled Vehicle per MIL-STD-810F Method 514.5, Procedure 1. Category 20, Figure 514.5C-VII Tracked Vehicle per MIL-STD-810F, Method 514.5, Procedure 1. Category 20, Figure 514.5C-3 and Table 514.5C-VII Tracked Vehicle per MIL-STD-810F, Method 516.5, Procedure 1. Category 20, Figure 514.5C-4 Operational Shock: Per MIL-STD-810F, Method 516.5, Procedure 1. Category 20, Figure 514.5C-4 Operational Shock: Per MIL-STD-810F, Method 516.5, Procedure 1. Terminal peak sawtooth pulse of 40 g s, 11 mS. MTBF Aroo hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision F, Notice 2 Physical Size:10.5°L x 8.2°W x 1.74°H Weight: 5.8 lbs | | | SNTP, NTP v3, v4 | |
| Supported Protocols Telnet HTTP DHCP Speed 10/100 Base-T Connector Circular MS with integrated RJ-45 (amphenol Pt #RJFTV21N) Environmental -30°C TO +65°C Rate of change 10°C per hour Operating temperature -30°C to +85°C Humidity: 0 to 95% non-condensing Operating Vibration: Figure 514.5C-3 and Table 514.5C-VII Tracked Vehicle per MIL-STD-810F, Method 514., category 20, Figure 514.5C-4 Operational Shock: Per MIL-STD-810F, Method 516.5, Procedure I, Figure 516.5-10, Table II. Terminal peak sawtooth pulse of 40 g s, 11 mS. 47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision F, Notice 2 Physical Size:10.5″L x 8.2″W x 1.74″H Weight: 5.8 lbs Size:10.5″L x 8.2″W x 1.74″H | | | SSH | |
| Telnet HTTP DHCP Speed 10/100 Base-T Connector Circular MS with integrated RJ-45 (amphenol Pt #RJFTV21N) Environmental | Cuerented Dreteenle | - | SNMP v1, v2, v3 | |
| DHCP Speed 10/100 Base-T Connector Circular MS with integrated RJ-45 (amphenol Pt #RJFTV21N) Environmental -30°C TO +65°C Rate of change 10°C per hour Storage Temperature -30°C TO +65°C Rate of change 10°C per hour Storage Temperature -45°C to +85°C Humidity: o to 95% non-condensing V Vheeled Vehicle per MIL-STD-810F Method 514.5, Procedure 1. Category 20, Figure 514.5C-3 and Table 514.5C-VII Tracked Vehicle per MIL-STD-810F, Method 514, category 20, Figure 514.5C-4 Operational Shock: Per MIL-STD-810F, Method 516.5, Procedure I, Figure 516.5-10, Table II. Terminal peak sawtooth pulse of 40 g s, 11 mS. 47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision F, Notice 2 Physical Size:10.5″L x 8.2″W x 1.74″H Weight: 5.8 lbs | Supported Protocols | | Telnet | |
| Speed 10/100 Base-T Connector Circular MS with integrated RJ-45 (amphenol Pt #RJFTV21N) Environmental -30°C TO +65°C Rate of change 10°C per hour Operating temperature -30°C TO +65°C Rate of change 10°C per hour Storage Temperature -45°C to +85°C Humidity: o to 95% non-condensing Operating Vibration: Figure 514.5C-3 and Table 514.5C-VII Tracked Vehicle per MIL-STD-810F, Method 514.5, Procedure 1. Category 20, Figure 514.5C-4 Operational Shock: Per MIL-STD-810F, Method 516.5, Procedure 1, Figure 516.5-10, Table II. Terminal peak sawtooth pulse of 40 g s, 11 mS. 47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision F, Notice 2 Physical Size:10.5″L x 8.2″W x 1.74″H Weight: 5.8 lbs Size:10.5″L x 8.2″W x 1.74″H | | - | HTTP | |
| Connector Circular MS with integrated RJ-45 (amphenol Pt #RJFTV21N) Environmental -30°C TO +65°C Rate of change 10°C per hour Operating temperature -30°C TO +65°C Rate of change 10°C per hour Storage Temperature -45°C to +85°C Humidity: o to 95% non-condensing Operating Vibration: Wheeled Vehicle per MIL-STD-810F Method 514.5, Procedure 1. Category 20, Figure 514.5C-3 and Table 514.5C-VII Tracked Vehicle per MIL-STD-810F, Method 514, category 20, Figure 514.5C-4 Operational Shock: Per MIL-STD-810F, Method 516.5, Procedure I, Figure 516.5-10, Table II. Terminal peak sawtooth pulse of 40 g s, 11 mS. MTBF 47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision F, Notice 2 Physical Size:10.5″L x 8.2″W x 1.74″H Weight: 5.8 lbs Size:10.5″L x 8.2″W x 1.74″H | | _ | DHCP | |
| Connector Circular MS with integrated RJ-45 (amphenol Pt #RJFTV21N) Environmental -30°C TO +65°C Rate of change 10°C per hour Operating temperature -30°C TO +65°C Rate of change 10°C per hour Storage Temperature -45°C to +85°C Humidity: o to 95% non-condensing Operating Vibration: Wheeled Vehicle per MIL-STD-810F Method 514.5, Procedure 1. Category 20, Figure 514.5C-3 and Table 514.5C-VII Tracked Vehicle per MIL-STD-810F, Method 514, category 20, Figure 514.5C-4 Operational Shock: Per MIL-STD-810F, Method 516.5, Procedure I, Figure 516.5-10, Table II. MTBF 47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision F, Notice 2 Physical Size:10.5"L x 8.2"W x 1.74"H Weight: 5.8 lbs Size:10.5"L x 8.2"W x 1.74"H | | | | |
| Environmental Operating temperature -30°C TO +65°C Rate of change 10°C per hour Storage Temperature -45°C to +85°C Humidity: o to 95% non-condensing Operating Vibration: Wheeled Vehicle per MIL-STD-81oF Method 514.5, Procedure 1. Category 20, Figure 514.5C-3 and Table 514.5C-VII Tracked Vehicle per MIL-STD-81oF, Method 514, category 20, Figure 514.5C-4 Operational Shock: Per MIL-STD-81oF, Method 516.5, Procedure I, Figure 516.5-10, Table II. Terminal peak sawtooth pulse of 40 g s, 11 mS. MTBF 47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision F, Notice 2 Physical Size:10.5″L x 8.2″W x 1.74″H Weight: 5.8 lbs Veight: 5.8 lbs | Speed | | 10/100 Base-T | |
| Operating temperature-30°C TO +65°C Rate of change 10°C per hourStorage Temperature-45°C to +85°CHumidity:o to 95% non-condensingOperating Vibration:Wheeled Vehicle per MIL-STD-810F Method 514.5, Procedure 1. Category 20, Figure 514.5C-3 and Table 514.5C-VII Tracked Vehicle per MIL-STD-810F, Method 514, category 20, Figure 514.5C-4Operational Shock:Per MIL-STD-810F, Method 516.5, Procedure I, Figure 516.5-10, Table II. Terminal peak sawtooth pulse of 40 g s, 11 mS.MTBF47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision F, Notice 2PhysicalSize:10.5″L x 8.2″W x 1.74″H Weight: 5.8 lbs | Connector | | Circular MS with integrated RJ-45 (amphenol Pt #RJFTV21N) | |
| Operating temperature-30°C TO +65°C Rate of change 10°C per hourStorage Temperature-45°C to +85°CHumidity:o to 95% non-condensingOperating Vibration:Wheeled Vehicle per MIL-STD-810F Method 514.5, Procedure 1. Category 20, Figure 514.5C-3 and Table 514.5C-VII Tracked Vehicle per MIL-STD-810F, Method 514, category 20, Figure 514.5C-4Operational Shock:Per MIL-STD-810F, Method 516.5, Procedure I, Figure 516.5-10, Table II. Terminal peak sawtooth pulse of 40 g s, 11 mS.MTBF47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision F, Notice 2PhysicalSize:10.5″L x 8.2″W x 1.74″H Weight: 5.8 lbs | | | | |
| Storage Temperature -45°C to +85°C Humidity: o to 95% non-condensing Operating Vibration: Wheeled Vehicle per MIL-STD-81oF Method 514.5, Procedure 1. Category 20, Figure 514.5C-3 and Table 514.5C-VII Tracked Vehicle per MIL-STD-81oF, Method 514, category 20, Figure 514.5C-4 Operational Shock: Per MIL-STD-81oF, Method 516.5, Procedure I, Figure 516.5-10, Table II. Terminal peak sawtooth pulse of 40 g s, 11 mS. 47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision F, Notice 2 Physical Size:10.5"L x 8.2"W x 1.74"H Weight: 5.8 lbs Weight: 5.8 lbs | Environmental | | | |
| Humidity: o to 95% non-condensing Humidity: o to 95% non-condensing Operating Vibration: Wheeled Vehicle per MIL-STD-810F Method 514.5, Procedure 1. Category 20, Figure 514.5C-3 and Table 514.5C-VII Tracked Vehicle per MIL-STD-810F, Method od 514, category 20, Figure 514.5C-4 Operational Shock: Per MIL-STD-810F, Method 516.5, Procedure I, Figure 516.5-10, Table II. Terminal peak sawtooth pulse of 40 g s, 11 mS. 47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision F, Notice 2 Physical Size:10.5"L x 8.2"W x 1.74"H Weight: 5.8 lbs Weight: 5.8 lbs | Operating temperature | | -30°C TO +65°C Rate of change 10°C per hour | |
| Operating Vibration: Wheeled Vehicle per MIL-STD-810F Method 514.5, Procedure 1. Category 20, Figure 514.5C-3 and Table 514.5C-VII Tracked Vehicle per MIL-STD-810F, Method 514, category 20, Figure 514.5C-4 Operational Shock: Per MIL-STD-810F, Method 516.5, Procedure I, Figure 516.5-10, Table II. Terminal peak sawtooth pulse of 40 g s, 11 mS. 47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision F, Notice 2 Physical Size:10.5″L x 8.2″W x 1.74″H Weight: 5.8 lbs Weight: 5.8 lbs | Storage Temperature | | -45°C to +85°C | |
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| Operational Shock: Per MIL-STD-810F, Method 516.5, Procedure I, Figure 516.5-10, Table II. Terminal peak sawtooth pulse of 40 g s, 11 mS. 47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision MTBF F, Notice 2 Physical Size:10.5"L x 8.2"W x 1.74"H Weight: 5.8 lbs Weight: 5.8 lbs | Operating Vibration: | | Figure 514.5C-3 and Table 514.5C-VII Tracked Vehicle per MIL-STD-810F, Meth- | |
| Operational Shock: Terminal peak sawtooth pulse of 40 g s, 11 mS. MTBF 47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision Physical Size:10.5"L x 8.2"W x 1.74"H Weight: 5.8 lbs Weight: 5.8 lbs | | | od 514, category 20, Figure 514.5C-4 | |
| MTBF 47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision Physical Size:10.5"L x 8.2"W x 1.74"H Weight: 5.8 lbs Weight: 5.8 lbs | | | Per MIL-STD-810F, Method 516.5, Procedure I, Figure 516.5-10, Table II. | |
| MTBF F, Notice 2 Physical Size:10.5"L x 8.2"W x 1.74"H Weight: 5.8 lbs Weight: 5.8 lbs | Operational Shock: | | Terminal peak sawtooth pulse of 40 g s, 11 mS. | |
| F, Notice 2 Physical Size:10.5"L x 8.2"W x 1.74"H Weight: 5.8 lbs | | | 47,000 hours @ +25°C, Ground Mobile environment per MIL-HDBK 217 Revision | |
| Weight: 5.8 lbs | MIBF | | F, Notice 2 | |
| | Physical | | Size:10.5"L x 8.2"W x 1.74"H | |
| Power | | | Weight: 5.8 lbs | |
| | Power | | | |
| Voltage: +19 - +36 DVC | | Voltage: | +19 - +36 DVC | |
| Current: 38 Watts Warm-up | | Current: | 38 Watts Warm-up | |
| 25 Watts Steady State | | | 25 Watts Steady State | |
| Connector: D38999/20wA35PA | С | onnector: | D38999/20wA35PA | |
| | | | | |
| | | | | |

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