The Trimble® SEGR is a family of Embedded GPS Receivers (EGR) that support airborne and other high accuracy applications. The SEGR family is comprised of the Force™ 27 and Force™ 28. They share common performance and key characteristics to our flagship embedded GPS receiver, the Force 524D, but in a significantly smaller form-factor.

The SEGR incorporates the same SGE-41 24 channel SAASM found in the Force 524D, capable of simultaneous tracking twelve L1, twelve L2 or a combination of Y-Code and C/A code channels.

The GPS receiver includes a massive correlator bank to enable Fast Direct Y-Code acquisition operation even in jamming environments. Its advanced digital signal processing, software architecture, and Oven Controlled Crystal Oscillator (OCXO), provide precise measurement data even under high dynamics and adverse RF environments.

The SEGR has performance equivalent to the Force 524D EGR – the industry standard for carrier phase and velocity. The SEGR retains interface compatibility with both legacy antenna and advanced Digital Antenna Electronics (DAE). The host platform can select the RF or DAE interface. In the DAE mode, the SEGR is capable of controlling up to 16 independent beams, thereby significantly enhancing AJ immunity.

The SEGR supports certification for airborne applications, including CNS/ATM, NAVWAR, and precision approach/landing (JPALS). The software is common to Force 524D; it is compliant to DO-178B, Level C. It incorporates an SPS/PPS Firewall and Switch to support SPS operation in civil controlled airspace. Fault Detection and Exclusion (FDE) and Step Detector functions are implemented in accordance with RTCA DO-229B to ensure the integrity of the GPS solution.

The Trimble Force 27 and Force 28 GPS receivers have been granted security approval by the GPS Directorate.

The SEGR can be integrated as a stand-alone GPS receiver or embedded with inertial navigation systems or other sensors. The SEGR provides a single logistics solution for RF and DAE applications.

**SPS (non-SAASM) Version Available for Export**
Features
• 24-channel continuous tracking; L1 & L2 frequency; C/A-, P-, and Y-Code
• SPS/PPS Firewall and Switch for civil airspace operation
• Fault Detection and Exclusion and Step Detector per RTCA DO-229B
• Enroute, Terminal, Oceanic, and Non-Precision Approach flight phases supported per TSO C-129a
• Fast Direct Y-Code acquisition
• SPS differential GPS per RTCM-104 Version 2.1
• Stand-alone (unaided) or integrated (aided) operation
• Code loop aiding (1–50 Hz aiding rate)
• Selectable unfiltered or filtered position/velocity/time (PVT) solution
• Field reprogrammable

Performance Specifications (Authorized Users)
Dynamics
Altitude: –701 to +22,860 m (–2,300 to +75,000 ft) MSL
Velocity: ±1,200 m/sec per axis
Acceleration: ±100 m/sec² per axis

Performance
Autonomous: PPS position accuracy: 16 m SEP
PPS velocity accuracy: ±0.1 m/sec, RMS per axis
PPS time accuracy: 100 nsec, 1 sigma wrt UTC
DGPS: Position accuracy: ±5 m SEP
Velocity accuracy: ±0.1 m/sec, RMS per axis
Anti-Jam: See Specifications for details.

Interfaces
RF Antenna Input: L1 & L2 frequencies; +0 to +35 dB ±5 dB;
+5 Vdc ±5%, 100 mA max provided on coaxial
cable center conductor, switchable by Host
Primary Power: +5.2 Vdc ±3% & +3.3 Vdc ±3%; 6 W max,
4 W typical
Auxiliary Power: +2.5 to +5.0 Vdc
Host Control Interface: Auxiliary Serial Interface (RS-422)
Instrumentation Port: RS-422
Hot Start/DGPS Port: RS-232
Input/Output Protocols: ICD-TMAS-167, ICD-TMAS-153C,
ICD-GPS-150, TIPY, NMEA-0183
Input Protocols: RTCM-104 Version 2.1 for differential
operation
Precise Timing Interfaces: 1PPS IN/OUT, HAVEQUICK OUT,
TIME MARK IN/OUT, Data Capture

Physical Characteristics
Dimensions: 3.915” x 4.920” x 0.620”
Weight: 0.5 lbs
Host Connector: Airborne P/N RM-252-080-311-5570
Host RF Contact: AEP P/N 7110-1511-050
Wedgelocks: Calmark P/N A265-2.80 T2 L

Environmental Specifications
Operating temp: –54°C to +85°C; +85°C to +100°C,
30-minute linear excursion up to +100°C
Storage temp: –62°C to +95°C
Vibration: See Specifications for details.
Shock: Service Shock: 35 g, half-sine, 3 m/sec
Catapult Shock: 15 g, half-sine, 40 m/sec
Altitude: Operating: –2,300 to +75,000 ft MSL
Non-operating: 80,000 ft MSL for 2 minutes
Humidity: Up to 100% relative humidity, non-condensing
EMIC: MIL-STD-461E: CE106, CS103, CS104
(antenna ports)
Predicted Reliability: >16,700 hours, AUF Environment at 45°C
ESD Protection: MIL-STD-1686, Class 3 (Human Body Model)

Part Numbers:
Force 27 82601-10-Uxxx, 82601-10-Cxxx
Force 27 SPS 79050-00
Force 28 85720-10-Uxxx, 85720-10-Cxxx
Force 28 SPS 79340-00
Force 28 SPS 79340-00

Available Documentation:
Specifications: TMAS-GPS-F27
TMAS-GPS-F27-SPS
TMAS-GPS-F28
TMAS-GPS-F28-SPS
ICDs: ICD-TMAS-167
ICD-TMAS-153C

Specifications subject to change without notice.

Made in U.S.A.

Please visit our website at www.trimble.com/defense for sales information.

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Note: U.S. Government policy restricts the sale of Precise Positioning Service (PPS) equipment to those authorized by the U.S. Department of Defense. Non-U.S. authorized users must purchase PPS equipment through the Foreign Military Sales (FMS) process. Specifications subject to change without notice.

Approved for public release under case# 12-162.