VIAVI Solutions

Data Sheet

VIAVI

Specifications for the

GPSG-1000

GPS/Galileo Portable Positional Simulator

User Interface

Display	12" color LCD, sunlight readable with back light
Controls	Touch screen

Antenna Coupler

Coupler Type	Cavity, patch
Coupling Loss	21.5 dB typical at 1575.42 MHz
Isolation	>25 dB at 1575.42 MHz

Direct Connection Ports

Impedance	50 Ω
SWR	1.3:1 maximum
Connector	TNC x 2
Coupling	AC (maximum DC input 50 V)

Generator

GPS Frequencies	
L1:	1575.42 MHz (C/A, pseuo P(Y), SBAS)
L1C:	1575.42 MHz
L2:	1227.60 MHz (pseudo P(Y))
L2C:	1227.60 MHz
L5:	1176.45 MHz (New Civil SoL)

Galileo Frequencies	
E1:	1575.42 MHz (pseudo-PRS, [pseudo-G/NAV]), (OS, CS, SoL, [I/ NAV])
E5:	1191.795 MHz center frequency
E5a:	1176.45 MHz (OS, (F/NAV))
E5b:	1207.14 MHz (CS, SoL, (I/NAV))
Accuracy	Same as master oscillator
Inter Channel Bias	Zero (digital design)
Frame Sync Output	LVTTL
Channels	1-12 SV simulation, selectable
	GPS: PRN = 1 to 32
	Galileo: PRN = 1 to 36
	SBAS: PRN = 120 to 138
Positional Simulation	
Static: Via user entry of Latitude/Longitude/Altitude or selectable from waypoint database	
Dynamic: Create, store, and recall routes consisting of multiple route points.	
Trajectory: Record and playback GPS receiver data.	
User Defined Doppler Error	
Selectable frequency offset	±5.0 kHz, 1 Hz increment
Amplitude Offset	Sets SV carrier amplitude offset from main attenuator setting ±15 dB in 1 dB increments.
Step Error	Sets SV pseudo range error ±10 km in 1 m increments (used for RAIM testing)
Satellite Health	Allows selection of GOOD or BAD
Code Carrier Coherence	
Sets frequency variation between code carriers	
Range	2 m/S
Increment	1 mm/S

GPS Codes

L1 C/A	
Code Rate	1.023 Mc/s
Primary Seq. Length	1023 bits
Modulation	BPSK
Symbol Rate	50 sps
SBAS	WAAS/EGNOS L1, L5
L2C	
Code Rate	0.5115 Mc/s
Sequence Length	10230/767250 bits
Modulation	BPSK
Symbol Rate	50 sps
L1 P(Y) (not encrypted) Long random codes simulated	
Code Rate	10.230 Mc/s
Sequence Length	15345000 bits
Modulation	BPSK
L1C	
Code Rate	10.230 Mc/s
Sequence Length	10230 bits
Modulation	BOC (1, 1)
L5	
Code Rate	10.230 Mc/s
Sequence Length	10230 bits
Modulation	QPSK
Almanac	Obtainable from built-in GPS receiver or external file load in .alm format

Galileo Services

E1 PRS not supported	
Pseudo G/NAV	Long random codes simulated
Code Rate	2.5575 Mc/s
Sequence Length	25575 bits
Symbol Rate	100 sps
Modulation	Interplex/CBOC
Sub Modulation	BOC (15, 2.5)
E1	
OS	Complete implementation (I/NAV)
CS	Null message content (pseudo I/NAV)
SoL	Compliant, no integrity alerts (I/NAV)
Code Rate	1.023 Mc/s
Sequence Length	4092 (primary) x 1 (secondary) bits
Symbol Rate	250 sps
Modulation	Interplex/CBOC
Sub Modulation	CBOC(6,1,1)

E5a	
OS	Complete implementation (F/NAV)
Code Rate	10.23 Mc/s
Sequence Length	10230 (primary) x 20 (secondary) bits
Symbol Rate	50 sps
Modulation	ALTBOC
Sub Modulation	None
E5b	
OS	Complete implementation (F/NAV)
CS	Null message content (pseudo I/NAV)
SoL	Compliant, no integrity alerts (I/NAV)
Code Rate	10.23 Mc/s
Sequence Length	10230 (primary) x 4 (secondary) bits
Symbol Rate	250 sps
Modulation	ALTBOC
Sub Modulation	None

Additional Characteristics

NAV Data	Navigation data is computed in real-time to match the simulation.
Positional Simulation	
Max Relative Velocity	±1000 Kts (514 m/s)
Max Relative Acceleration	±98 m/s2
Max Relative Jerk	±20 m/s3
Max Altitude	100,000 ft.
Error Models	Atmospheric
Positional Simulation Accuracy	
Pseudorange	<0.1 m
Pseudorange Rate	±0.01 m/s (RMS) with respect to master oscillator
RF Output Level Direct	-93 to -155 in 1 dB step
RF Output Level ANT Coupler	-68 to -130 in 1 dB step ±2 dB accuracy into 50 Ω (AC coupled) standard cable, 4 dB loss
Signal Quality Spurious	<-35 dBc over the bandwidth (40 MHz)
Harmonics	<-45 dBc

Master Oscillator

Frequency	10 MHz nominal
Temperature Stability	±0.05 ppm
Aging Rate	±0.3 ppm /yr., ±2.5 ppm /10 yr.
Uncertainty	±1 ppm
External Reference Input	
Input Level	0.25 to 6.0 Vp-p
Input Impedance	50 ohm nominal
Input Frequency	10.0 MHz ±10 Hz

Master Oscillator (continued)

External Reference Output		
Output Level	1.5 Vp-p nominal into 50 Ω	
Output Frequency	10.0 MHz nominal	
Battery		
14.4V 6.75 Ah Lithium Ion		
Battery Temperature Range for Charging		
0° to 45°C (32° to 113°F)		
DC Input		
11-32 VDC	75 W max.	5 A max.

Environmental

Test Set	
Operational Temperature	-20° to 55° C (-4° to 131°F)
Storage Temperature	-30° to 71° C (-22° to 159.8°F)
Operational Humidity	MIL-PRF-28800F Class 2
Storage Humidity	MIL-PRF-28800F Class 2
Altitude	10,000 feet
Supplied External AC to DC Converter	
Use	Indoors
Altitude	10,000 feet
Operating Temperature	5°C to 40°C (41° to 104°F)
Storage Temperature	-20°C to 71°C (-4° to 159.8°F)

Physical Characteristics

Dimensions (H x W x D)	11.22 x 15.15 x 3.54 in (28.5 x 38.5 x 9 cm)
Dimensions (Shipping Case)	20.8 x 31.5 x 13 in (53 x 80 x 33 cm)
Weight	15.5 lb (7 kg) Test set only
	52 lb (23.5 kg) kit with shipping case
Antenna Coupler	
Dimensions	7.54 x 7.46 x 7.46 in (19.15 x 18.95 x 18.95 cm)
(Note: Maximum antenna height accommodated 1.5 in)	
RF Gasket	Flexible seal
Connector	TNC
Positioning	By hand or with optional 8 ft placement pole via hook.
Placement Security	Weighted peripheral bag
Multiple GPS Antenna Support	
Supports two to three GPS antennas using optional antenna coupler kits.	

Certifications

Test Set	
Vibration Limits	MIL-PRF-28800F Class 2
Shock, Functional	MIL-PRF-28800F Class 2
Transit Drop	MIL-PRF-28800F Class 2
Drip Proof	MIL-PRF-28800F Class 2
Dust	MIL-PRF-28800F Class 2
Explosive Atmosphere	MIL-PRF-28800F Class 2
Safety Compliance	UL-61010-1 EN-61010-1
WEEE, ROHS	
EMC	
Emissions	MIL-PRF-28800F Class 2 EN 61326-1 Class A EN 61000-3-2 EN 61000-3-3
Immunity	MIL-PRF-28800F Class 2 EN 61326-1 Class A
External AC-DC Converter	
Safety Compliance	UL 1950 DS CSA 22.2 No. 234 VDE EN 60 950
EMI/RFI Compliance	FCC Docket 20780 Curve "B" EMC EN 61326
Transit Case	
Drop Test	FED-STD-101C, Method 5007.1 Paragraph 6.3, Procedure A, Level A
Falling Dart Impact	ATA 300 Category I
Vibration, Loose Cargo	FED-STD-101C Method 5019
Vibration, Sweep	ATA 300 Category I
Simulated Rainfall	MIL-STD-810F Method 506.4 Procedure II of 4.1.2 FED-STD-101C Method 5009.1 Sec 6.7.1
Immersion	MIL-STD-810F Method 512.4

VIAVI Solutions

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