

iQnav plus™

Navigation and FM Test System



GPS, GLONASS (GNSS) Hardware Technical Specifications

Parameters	Value
Frequency (GPS)	L1 – 1575.42 MHz (fixed)
Frequency (GLONASS)	L1 – 1598 to 1606 MHz (user settable in 0.5625 MHz steps)
Modulation	BPSK (GPS, GLONASS), CW (no modulation)
Number of simultaneous channels	6 (GPS), 1 (GLONASS)
Simulated signals	1 to 32 selectable (GPS), -7 to +6 (GLONASS)
Output power level	-60 to -145 dBm
Power resolution	0.1dB
Power accuracy	-60 to -100 dBm ± 0.7 dB RSS
-100 to -145 dBm ± 1 dB RSS	Displays RDS binary data
Frequency accuracy	± 0.002 ppm / day ($\pm 2 \times 10^{-9}$)
GPS Navigation Data	C/A @1.023 MHz with 50 bps
GLONASS Navigation Data	C/A@511 kHz with 50 bps
Carrier + Data Doppler	Frequency offset +/-10.0 kHz with 1 Hz resolution
Transmitted signal quality	Harmonic: < -40dBc Non-Harmonic: < -40 dBc (+/- 10 MHz) 1 deg RMS (1 kHz to 1 MHz SSB)
Carrier phase noise	

FM Hardware Technical Specifications

FM Analyzer

Parameter	Specification	Accuracy
Input Frequency Range	76 to 108 MHz	
Input Power Range	+10 to -40 dBm	± 1.0 dB (specification) ± 0.5 dB (typical)
Input Impedance	50 Ω	$\pm 5\%$
Input Power Resolution	0.1 dB Step	
Input Deviation Range	1 k Hz to 100 kHz (10 Hz step)	
Frequency Accuracy	Same as Reference Timebase	

Harmonic Performance (in band, <+/- 100 kHz)	-65 dBc	
Harmonic Performance (out of band, > +/- 100 kHz)	-40 dBc	
Spurious (in band, <+/- 100 kHz)	-65 dBc	
Spurious (out of band, > +/- 100 kHz)	-40 dBc	

FM Generator

Parameter	Specification	Performance
Output Frequency Range	76 to 108 MHz	
Frequency Resolution	1 Hz	
Output Power Range	-40 to -110 dBm	± 1.0 dB (levels ≥ -100 dBm to -40 dBm)
Output Power Resolution	0.1 dB Step	
Output Impedance	50 Ω	±5%
FM Deviation Range	1 k Hz to 75 kHz	
FM Deviation Resolution	10 Hz	
Frequency Deviation Accuracy	+/- 3%	
AM Modulation Index	0 to 75%	
AM Modulation Frequency	0 to 1 MHz	
Phase Noise	-80 dBc/Hz at 10 kHz offset	
Harmonic Performance (in band)	-65 dBc	
Harmonic Performance (out of band)	-40 dBc	
Spurious (in band)	-60 dBc	
Spurious (out of band)	-40 dBc	
Modulation Accuracy	+/- 10 Hz	

FM Measurement Specifications

Measurement	Description	Performance
Signal into Noise and Distortion (SINAD)		< 80 dB
Total Harmonic Distortion + Noise (THD+N)	THD measurement	< 80 dB
Audio Frequency	Audio frequency measurement	<15 kHz (Resolution 500 Hz)
RMS Frequency Deviation	Frequency Deviation (RMS)	< 100 kHz (Resolution 1 Hz), +/- 10%
Peak Frequency Deviation	Frequency Deviation (Peak)	< 100 kHz (Resolution 1 Hz), +/- 10%
Carrier Power Measurement	Average power value of carrier	+/- 2 dB
Power Spectral Density (PSD)	Spectrum of RF signal	+/- 1 MHz
Measurement Resolution	Resolution Bandwidth	1 kHz to 300 kHz
RDS Data Decode	Displays RDS binary data	Up to 2 groups (128 bits)

Timebase

Oscillator type	OCXO
Frequency	10MHz
Initial accuracy (25°C after 60 min. warm-up)	< +/- 0.05ppm
Maximum aging	< +/- 0.1ppm per year
Temperature stability	< +/-0.05ppm over 0oC to 50°C range, referenced to 25°C
Warm-up time (to within +/-0.1ppm at 25°C)	< 30 minutes

Port Descriptions

Front Panel

I/O	Function	Type
Power Switch	Power on/off	Pushbutton switch
Power Indicator	LED red – powered up, standby LED green – powered up, running	LED indicator
FM Port	FM TX / RX	N female
GPS, GNSS Port	GPS, GNSS TX	N female

Rear Panel

I/O	Function	Type
Trigger 1 input	TTL compatible trigger input	BNC female
Trigger 2 input	TTL compatible trigger output	BNC female
10MHz Ref Input	10MHz reference input	BNC female
Marker Out	TTL compatible trigger output	BNC female
AWG CH1 Out	NFC Signal output 1	BNC female
AWG CH2 Out	NFC Signal output 2	BNC female
DIG CH1 IN	NFC Signal input 1	BNC female
DIG CH2 IN	NFC Signal input 2	BNC female
USB	USB 2.0 compatible connection to external PC Controller	USB type B
AC in	AC power input	100-240VAC (automatically switched) 50 - 60 Hz Includes hard power switch

Physical and Environmental

Dimensions	<p>Measurement in Inches Unit with Handle: 15.5" W x 4" H x 20" D Unit without Handle: 14.7" W x 3.3" H x 17.1" D</p> <p>Measurement in Millimeters Unit with Handle: 393 mm W x 102 mm H x 508 mm D Unit without Handle: 373 mm W x 84 mm H x 434 mm D</p>
Weight	6.8 kg
Power consumption	<300 W
Operating temperature	+10°C to +55°C (IEC EN60068-2-1, 2, 14)
Guaranteed Specification	+20°C to +30°C ambient
Storage temperature	-20°C to +70°C (IEC EN60068-2-1, 2, 14)
Operating humidity	15% to 95% relative humidity, non-condensing (IEC EN60068-2-30)
EMC	EN 61326 Immunity for industrial environment, Class B emissions
Safety	IEC 61010-1, EN61010-1, UL3111-1, CAN/CSA-C22.2 No. 1010.1
Mechanical vibration	IEC 60068, IEC 61010 and MIL-T-28800D, class 5
Mechanical shock	ASTM D3332-99, Method B
Recommended calibration cycle	12 months
Warranty	12 months hardware 12 months software updates

Control PC Minimum Requirements

PC	Intel Pentium dual core processor or compatible, 1GHz (2 GHz or higher recommended)
Operating system	Windows XP (SP2 or higher), US English versions
Memory	1024MB of RAM
Disk space	500MB of available hard disk space
Monitor	1024 x 768 resolution
Connectivity	USB 2.0

Programming Interface and Graphical User Interface (GUI)

Programming Interface and Compatibility

Programmatic interface	C++ API (LitePoint IQapi)
Driver compatibility	C++ LabVIEW 8.5 (using LitePoint supplied driver)

Graphical User Interface (GUI)

IQ 201X Applications	GPS, GNSS FM (TX / RX)	GUI supports built-in measurement and signal generation functions per standard as appropriate
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Ordering Information

Order Code	Description
0100-0NAV-002	IQnav ^{plus} test system with GPS, GLONASS
0300-0NAV-001	FM (TR/RX) License

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CONTACT INFORMATION

LitePoint Corporation
575 Maude Court
Sunnyvale, CA 94085-2803
United States of America

Telephone: +1.408.456.5000

Facsimile: +1.408.456.0106

LITEPOINT TECHNICAL SUPPORT

www.litepoint.com/support

Telephone: +1.408.456.5000

Available: weekdays 8am to 6pm,
Pacific Standard Time.

E-mail: support@litepoint.com

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