iQ2010

TECHNICAL SPECIFICATIONS

LitePoint IQ2010™
Connectivity Test System

LITEPOINT

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General Technical Specifications

Analyzer

Parameter	Port Designations	Range
Input Frequency Range	NFC Ports - DIG1, DIG2	DC to 30 MHz
	FM Port	76 to 108 MHz
	RF1 / RF2 Ports	2150 - 2700 MHz 3300 - 3800 MHz 4900 - 6000 MHz
Input Power Range	NFC Ports - DIG1, DIG2	Up to 1000 mV RMS
	FM Port	-60 to -110 dBm
	RF1 / RF2 Ports	+30 to -148 dBm/Hz
Control Interface		USB 2.0 type B
Power Requirements		100-240 VAC, < 300 W, 50-60 Hz

Analyzer—Signal Trigger

Parameter	Range
Absolute Minimum Value	-40 dBm
Absolute Maximum Value	Limited by the Maximum Input Power
Accuracy	< +/- 2 dB

Generator

Parameter	Port Designations	Range
Output Frequency Range	NFC Ports - DIG1, DIG2	DC to 35 MHz
	FM Port	76 to 108 MHz
	RF1 / RF2 Ports	2150 - 2700 MHz 3300 - 3800 MHz 4900 - 6000 MHz
	GPS Port	1.57542 GHz (fixed)
Output Power Range	NFC Ports - DIG1, DIG2	5 to 1000 mV RMS
	FM Port	-60 to -110 dBm
	RF1 / RF2 Ports (CW)	+10 to -95 dBm (1 Hz BW)
	GPS Port	-60 to -145 dBm

Timebase

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

Wireless LAN (802.11 a/b/g/n/p) Hardware Technical Specifications

Analyzer

Input frequency range	2400 - 2500 MHz 4900 - 6000 MHz
Input power range	+30 to -148 dBm/Hz
Measurement Bandwidth	60 MHz (± 30 MHz quadrature)
Quantization	14 bits
Input Return Loss	> 10 dB
Spurious	< -55dBc (50 kHz RBW)
Harmonics	out-of-band: ≤ -45 dB in-band: ≤ -55 dB (100 kHz resolution BW)
Integrated Phase Noise	< 0.5 degrees (f<2.5 GHz) < 0.8 degrees (f<6 GHz) 0.5 degrees (100 Hz – 1 MHz) (typical)
Signal to Noise Ratio	≥ 55 dB (measured in 100 kHz resolution bandwidth)
Waveform Capture Duration	400 ms

Generator

Output frequency range	2400 - 2500 MHz 4900 - 6000 MHz
Output power range	-95 to 0 dBm (modulated) -95 to +10 dBm (CW)
Output power accuracy	± 1.0 dB (+ 5 to -95 dBm) ± 0.5 dB typical
Signal Bandwidth	70 MHz (± 35 MHz quadrature)
Quantization	14 bits
Output Return Loss	> 10 dB
Spurious	Specification: ≤ -20 dBc out-of-band (harmonics, to 0 dBm output level) ≤ -35 dBc or ≤ -80 dBm (whichever is higher) out-of-band (non-harmonic) Typical: ≤ -50 dBc (in-band)
Harmonics	Out-of-band: ≤ -45 dB in-band: ≤ -55 dB (100 kHz resolution BW)
Integrated Phase Noise	< 0.5 degrees (100 Hz – 1 MHz) (typical)
Signal to Noise Ratio	≥ 55 dB (measured in 100 kHz resolution bandwidth) (specification) ≥ 70 dB (measured in 100 kHz resolution bandwidth) (typical)
Carrier leakage	≤ -45 dBc (CW output) ≤ -90 dBm (between packets, when enhanced gap rejection condition enabled)
Waveform Duration	400 ms

Wireless LAN (802.11 a/b/g/n/p) Measurement Specifications

Measurement	Description	Performance
EVM	All: EVM averaged over all symbols and all subcarriers (dB) 802.11a/g/n/p OFDM signals only	Residual VSA EVM: ≤ -35 dB (1.78%) (-5 dBm to -35 dBm) ≤ -41 dB (0.89%) typical Residual VSG EVM: ≤ -38 dB (-95 to -10 dBm output power) ≤ -35 dB (-10 to -5 dBm output power)
	Data: EVM averaged over all symbols and all subcarriers (dB) 802.11a/g/n/p OFDM signals only	
	Pilots: EVM averaged over all symbols and all subcarriers (dB) 802.11a/g/n/p OFDM signals only	
	PSDA EVM Average: EVM averaged over all PSDU data symbols (or, if "11b std Tx mod acc" is selected, over last 1000 chips) (dB) 802.11b/g DSSS signals only	
	PSDA EVM Average Peak: EVM value (dB) 802.11b/g DSSS signals only	
Peak power	Peak power over all symbols (dBm)	± 1.0 dB (specification) ± 0.5 dB (typical)
RMS Power	All: Average power of complete data capture (dBm)	
	No Gap: Average power over all symbols after removal of any gap between packets (dBm)	
Max avg power	Peak value of the amplitude as a moving average over 40 samples (dBm)	

Measurement	Description	Performance
I/Q amplitude error	I/Q amplitude imbalance (%) and approximate contribution to EVM (dB)	
I/Q phase error	I/Q phase imbalance (degrees) and approximate contribution to EVM (dB)	
Frequency error	Carrier frequency error (kHz)	
Symbol clock error	Symbol clock frequency error (ppm)	
RMS phase noise	Integrated phase noise (degrees)	
PSD	Power spectral density (dBm/Hz) versus frequency offset Center frequency ± 40 MHz LitePoint API produces 1024-point FFT	
Spectral flatness	Reflects variation of signal energy as a function of OFDM subcarrier number 802.11a/g/p OFDM signals only	
Sidelobe analysis (spectral mask, LO leakage)	Center peak and peaks of 1st and 2nd upper/lower sidelobes (dB) 802.11b/g DSSS signals only	
CCDF (complementary cumulative distribution function)	Probability of peak signal power being greater than a given power level versus peak-to-average power ratio (dB)	
Power on / Power down ramp	On: Relative power level (% of average) versus time Power-on time from 10% to 90% Power-on time from 90% power level to detected start of packet (not provided for 802.11a/g/p OFDM signals)	
	Off: Relative power level (% of average) versus time (802.11b/g CCK signals only) Power-off time from 90% to 10% (not reliable for 802.11a/g/p OFDM signals) Power-off time from _ 90% power level to detected end of packet (not provided for 802.11a/g/p OFDM signals)	
Eye diagram	I and Q channels versus time (802.11b/g DSSS signals only)	
PSDU data	Recovered binary data sequence, including the MAC header and Frame Check Sequence, if present	
Raw Capture Data	I and Q signals versus time	
General waveform analysis	DC offset, RMS level, minimum/maximum amplitude, peak-to-peak amplitude, RMS I- and Q-channel levels	
CW frequency analysis	Frequency of CW tone	
Adjacent Channel Rejection (ACR)	802.11p OFDM signals only	

Bluetooth (1.0, 2.0, 2.1, 3.0, 4.0) Hardware Technical Specifications

Analyzer

Input frequency range	2400 - 2500 MHz
Input power range	+30 to -148 dBm (1 Hz BW)
Measurement Bandwidth	60 MHz (± 30 MHz quadrature)
Quantization	14 bits
Input Return Loss	> 10 dB
Spurious	< -55dBc (50 kHz RBW)
Harmonics	out-of-band: ≤ -45 dB in-band: ≤ -55 dB (100 kHz resolution BW)
Integrated Phase Noise	0.5 degrees (100 Hz – 1 MHz) (typical)
Signal to Noise Ratio	≥ 55 dB (measured in 100 kHz resolution bandwidth)
Power Measurement Accuracy	± 1.0 dB (specification) ± 0.5 dB (typical)
Waveform Capture Duration	400 ms

Generator

Output frequency range	2400 - 2500 MHz
Output power range	-95 to 0 dBm (modulated) -95 to +10 dBm (CW)
Signal Bandwidth	70 MHz (± 35 MHz quadrature)
Quantization	14 bits
Output Return Loss	> 10 dB
Spurious	Specification: ≤ -50 dBc (in-band) Typical ≤ -20 dBc out-of-band (harmonics, to 0 dBm output level) ≤ -35 dBc or ≤ -80 dBm (whichever is higher) out-of-band (non-harmonic)
Harmonics	Out-of-band: ≤ -45 dB In-band: ≤ -55 dB (100 kHz resolution BW)
Integrated Phase Noise	< 0.5 degrees (f<2.5 GHz) < 0.8 degrees (f<6 GHz) 0.5 degrees (100 Hz – 1 MHz) (typical)
Signal to Noise Ratio	≥ 55 dB (measured in 100 kHz resolution bandwidth) (specification) ≥ 70 dB (measured in 100 kHz resolution bandwidth) (typical)
Carrier leakage	≤ -45 dBc (CW output) ≤ -90 dBm (between packets, when enhanced gap rejection condition enabled)
Power Accuracy	± 1.0 dB (specification) ± 0.6 dB (typical)
Waveform Duration	400 ms

Bluetooth (1.0, 2.0, 2.1, 3.0) Measurement Specifications

Measurement	Description	Performance
TX output power	Transmit DUT output power (dBm)	VSA Measure Power Accuracy: ± 1.0 dB (specification) ± 0.5 dB (typical)
TX output spectrum	Transmit DUT power spectral density	
20 dB bandwidth	Bandwidth between the +/- 20 dB down points of the modulation waveform	
In-band emissions (Adjacent Channel)	Spurious emission measured at +/- 5 MHz of DUT TX frequency only.	
Modulation Characteristics	Average and Peak Frequency deviation (Hz)	
Carrier frequency Tolerance	Carrier frequency offset (Hz)	
Carrier frequency Drift	Carrier frequency change over the Bluetooth burst (Hz)	
Relative transmit Power (EDR)	Average power of complete data capture (dBm)	VSA Measure Power Accuracy: ± 1.0 dB (specification) ± 0.5 dB (typical)
Carrier frequency stability (EDR)	Frequency drift over the Bluetooth EDR burst duration (Hz)	
Receive sensitivity	Receive sensitivity test using LitePoint or user-generated waveforms	Source Power Accuracy: ± 1.0 dB (specification) ± 0.6 dB (typical)
Maximum Input Signal Level	Assuming single-ended BER measurement	
C/I and Receiver Selectivity Performance	IQ2010 capability provides the wanted signal only. No interfering signal is available.	
Blocking Performance	IQ2010 capability provides the wanted signal only. No interfering signal is available.	
Intermodulation Performance	IQ2010 capability provides the wanted signal only. No interfering signal is available.	
Bit error rate (BER)	Bit error rate for 1 and 3 Mbps data rates	Source Power Accuracy: ± 1.0 dB (specification) ± 0.6 dB (typical)
RMS EVM (EDR)	RMS EVM for Bluetooth EDR	Residual VSA EVM: ≤ -30 dB (3.1%) (≥ -35 dBm power to + 10 dBm) Residual VSG EVM: ≤ -30 dB (3.1%) (≥ -35 dBm power to + 10 dBm)
Peak EVM (EDR)	Peak EVM for Bluetooth EDR	

WiMAX (802.16 d/e) Hardware Technical Specifications

Analyzer

Input Frequency Range	2150 - 2700 MHz 3300 - 3800 MHz 4900 - 6000 MHz
Input Power Range	+30 to -148 dBm/Hz
Measurement Bandwidth	60 MHz (± 30 MHz quadrature)
Quantization	14 bits
Input Return Loss	> 10 dB
Spurious	< -55 dBc (50 kHz RBW)
Harmonics	Out-of-band: ≤ -45 dB In-band: ≤ -55 dB (100 kHz resolution BW)
Integrated Phase Noise	< 0.5 degrees (100 Hz – 1 MHz) (typical)
Signal To Noise Ratio	≥ 55 dB (measured in 100 kHz resolution bandwidth)
Waveform Capture Duration	400 ms

Generator

Output frequency range	2150 - 2700 MHz 3300 - 3800 MHz 4900 - 6000 MHz
Output power range	-95 to 0 dBm (modulated) -95 to +10 dBm (CW)
Signal Bandwidth	70 MHz (± 35 MHz quadrature)
Quantization	14 bits
Output Return Loss	> 10 dB
Spurious	specification: ≤ -50 dBc (in-band) typical ≤ -20 dBc out-of-band (harmonics, to 0 dBm output level) ≤ -35 dBc or ≤ -80 dBm (whichever is higher) out-of-band (non-harmonic)
Harmonics	out-of-band: ≤ -45 dB in-band: ≤ -55 dB (100 kHz resolution BW)
Integrated Phase Noise	0.5 degrees (100 Hz – 1 MHz) (typical)
Signal to Noise Ratio	≥ 55 dB (measured in 100 kHz resolution bandwidth) (specification) ≥ 70 dB (measured in 100 kHz resolution bandwidth) (typical)
Carrier leakage	≤ -45 dBc (CW output) ≤ -90 dBm (between packets, when enhanced gap rejection condition enabled)
Waveform Duration	400 ms

WiMAX (802.16 d/e) Measurement Specifications

Measurement	Description	Performance
Power	Peak Power: Peak power over all symbols (dBm)	± 1.0 dB (specification) ± 0.5 dB (typical)
	Average Power (all): Average power of complete data capture (dBm)	
	Average Power (no gap): Average power over all symbols after removal of any gap between packets (dBm)	
	Average power (preamble): Average preamble power (dBm)	
	Average power (syms): Average power over all symbols, excluding preamble (dBm)	
EVM	EVM (all): EVM averaged over all symbols and all subcarriers (dB; %)	Residual VSA EVM: ≤ -40 dB (1.00%) (at ≥ -30 dBm to -10 dBm input) ≤ -46 dB (0.50%) typical Residual VSG EVM: ≤ -43 dB (>-30 dBm to -10 dBm output)
	EVM (data): EVM averaged over all symbols and all data subcarriers (dB; %)	
	EVM (pilots): EVM averaged over all symbols and all pilot subcarriers (dB; %)	
	EVM (unmod): EVM averaged over all un-modulated subcarriers (dB; %) (802.16e only)	
	EVM (carrier): Error Vector Magnitude averaged over all symbols for each subcarrier (dB) versus OFDM subcarrier number	
	EVM (time): Error Vector Magnitude averaged over all subcarriers (dB) versus time	
Capture Mode	Selects one-shot or streaming data analysis (single / continuous)	
Sample Interval	Sample Interval time: 100 µs, 200 µs, 300 µs, 400 µs, 500 µs, 1 ms, 2 ms, 3 ms, 4 ms, 5 ms, 10 ms (The sample interval is limited by the 220 buffer size and 80 MHz A/D sample rate)	
Signal Type	Automatically detected: Signal type (up- / downlink subframe), Bandwidth, Modulation / coding, Cyclic Prefix length (802.16d)	
	Automatically detected: Signal type (up- / downlink subframe), Bandwidth, Modulation / coding, Cyclic Prefix length, Uplink fields. Supported modes: PUSC, FUSC, AMC2x3. The software can be set to do automatic detection of the up- and downlink maps, or these can be user-defined (GUI) (802.16e-2005 / WirelessMAN-OFDMA mobile WiMAX)	
Amplitude vs. Time	Instantaneous, and peak power averaged over a symbol duration (dBm) versus time	
Spectrogram	3D plot of power spectral density versus time. Time is displayed on x-axis; frequency offset on y-axis; color coding represents power (maximum strength is red; minimum strength is green)	

Bluetooth (4 .0) Measurement Specifications

Measurement	Description	Performance
Output Power at NOC[1]		VSA Measure Power Accuracy: ± 1.0 dB (specification) ± 0.5 dB (typical)
Output power at EOC[1]		
In-band emissions at NOC[1]	Spurious emission measured at +/- 5 MHz of DUT TX frequency only.	
In-band emissions at EOC[1]		
Modulation Characteristics	Average and Peak Frequency deviation (Hz)	
Carrier frequency offset and drift at NOC[1]	Carrier frequency offset (Hz) and change over the Bluetooth burst (Hz)	
Carrier frequency offset and drift at EOC[1]		
Receiver sensitivity at NOC[1,2]	Receive sensitivity test using LitePoint or user-generated waveforms.	Source Power Accuracy: ± 1.0 dB (specification) ± 0.6 dB (typical)
Receiver sensitivity at EOC[1,2]		
C/I and receiver selectivity performance[3]		
Blocking performance[3]		
Intermodulation performance		
Maximum Input Signal Level	Assuming single-ended BER measurement	
PER Report Integrity	Verifies the DUT PER report mechanism	

Note 1: NOC and EOC tests are the same except for the operating conditions which do not impact the test equipment requirements.
Note 2: IQ201X supports testing sensitivity with Dirty Packets.
Note 3: IQ201X provides the wanted signal only. No interfering signal is available.

Measurement	Description	Performance
PSD	Power spectral density (dBm/Hz) versus frequency offset along with spectral mask per IEEE 802.16 for 10 and 20 MHz channels (scaled for other bandwidths) Resolution bandwidth 100 kHz (LitePoint API produces 1024-point FFT)	
Symbol Constellation	Visual display of each demodulated symbol in the I/Q complex plane. The color of data symbols depends on stream; pilot tones are green. Shown for individual (selected) burst or all combined	
Spectral Flatness	Variation from average energy as a function of OFDM subcarrier number (dB).	
Spectral Delta	Power delta between adjacent subcarriers (dB).	
Phase Noise (PSD)	Phase noise power spectral density (dBc/Hz) versus frequency offset	
Phase Error (time)	Integrated phase error of pilot tones (degrees) versus time	
CCDF (complementary cumulative distribution function)	Probability of peak signal power being greater than a given power level versus peak-to-average power ratio (dB). Shown over all data or payload only.	
I & Q Signals	I/Q signal voltages (Vrms) versus time	
I/Q Phase Error	I/Q phase imbalance (degrees)	
I/Q Amplitude Error	I/Q amplitude imbalance (%)	
Frequency Error	frequency error (kHz) versus time	
LO (DC) Leakage	Relative power to center carrier (dBc)	
CINR (preamble)	Carrier to Interference plus Noise Ratio (dB) of preamble	
CINR (data)	Carrier to Interference plus Noise Ratio (dB) of data zone	
OFDMA Ranging	Ranging code and power level of initial and periodic ranging bursts (mobile WiMAX and if present only)	
Reed-Solomon Errors	Number of symbols with RS errors (valid only if payload decoding is enabled; fixed WiMAX only)	

WiMAX (802.16 d/e) Signal Settings

Measurement	Description	Performance
TX Mode	Selects continuous or specified number of packets to be transmitted (continuous / # packets (1 to 65,334))	
RF Channel	Center frequency of channel to be transmitted (MHz)	
CW Signal	Selects a CW signal to transmit	
Signal Level	Sets average power of transmitted signal (-98.0 dBm to 10.0 dBm with 0.1 dB resolution)	± 1.0 dB (specification) ± 0.6 dB (typical)
Transmit Trigger	Selects trigger mode (free run / external trigger)	
Gap Power Off	Sets transmitted power to minimum during gaps between data packets (On / Off)	
Signal Impairments	• I/Q amplitude imbalance: -10.00% to +10.00% with resolution of 0.01% • I/Q phase imbalance: -10.00 degrees to +10.00 degrees with resolution of 0.01 degrees • I/Q group delay imbalance: -1.00 ns to +1.00 ns with resolution of 0.01 ns • I-channel DC offset: -1.00 to +1.00 with resolution of 0.001 (units of Volts for baseband output; dBV for RF output) • Q-channel DC offset: -1.00 to +1.00 with resolution of 0.001 (units of Volts for baseband output; dBV for RF output)	

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	± 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 Interference Source

Parameter	Specification	Notes
Interference Source	CW / Mono FM	
Interference Source Frequency Range	- 5 to 5 MHz	Relative to Carrier
Output Power Range	-30 dB to +40 dB	Relative to Carrier
Output Power Accuracy	+/- 1 dB	Relative to Carrier
Peak Deviation	1 kHz to 75 kHz (1 kHz resolution)	
Deviation Accuracy	100 Hz	
Number of Audio Tones	1	
Audio Frequency Range	200 Hz to 15 kHz in steps of 200 Hz	

Audio Analyzer

Audio Frequency Range	10 Hz to 15.5 kHz
Minimum Resolution Bandwidth	200 Hz
Maximum Resolution Bandwidth	100 kHz
FFT Side Range	32 to 32,768 points
De-emphasis	25, 50, 75 µs
Total Harmonic Distortion	<0.01%
Signal to Noise Measurement Range	< 80 dB
Signal to Noise Measurement Resolution	0.1 dB
Signal to Noise Measurement Accuracy	+/- 2 dB
Stereo Separation	60 dB

Audio Generator (internal source)

Parameter	Specification	Notes
Audio Frequency Range	10 Hz to 15.5 kHz	
Frequency Resolution	1 Hz	
Total Harmonic Distortion	<0.01%	
Stereo Separation	60 dB	
Pilot Signal Frequency	19 kHz (+/- 1Hz)	
Pilot Frequency Deviation	≤ 10 kHz	
Audio Weighting	ITUR 468, C-message, A-weighting, C-weighting	
Number of audio tones	12	Maximum 8 tones in right channel
Minimum tone separation	10 Hz	
Amplitude range	-36 dB to 0 dB	
Pre-emphasis	0, 25, 50, 75 µs	

RDS / RBDS Specifications

Subcarrier Frequency	57 kHz (+/- 3 Hz)
Frequency Deviation	≤ 10 KHz
Subcarrier Phase	0 or 90 degrees
Number of RDS Groups (TX)	1 (up to 4 blocks)
Number of RDS Groups (RX)	2 (up to 8 blocks)
User Defined Information Bits	≤ 64

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)
RDS Block Error Rate	Measures RDS block error rate	

GPS Hardware Technical Specifications

Frequency	1575.42 MHz (L1 block)
Output Power Range	-60 dBm to -145 dBm
Number of Channels	6
Power Resolution	0.25 dB
Power Accuracy	+/- 1.0 dB
Frequency Accuracy	+/-0.01 ppm
Doppler Offset	+/- 10 kHz (1 Hz step)
Spurious	< -40 dBc
Carrier Phase Noise	< 1 degree RMS

Near Field Communication (NFC) Hardware Technical Specifications

Analyzer

Channels	2
Voltage Range	5 to 1000 mV RMS (50 Ohm)
Analog Bandwidth	30 MHz
Quantization	14 bits
Sampling Rate	80 MHz
Waveform Capture Duration	400 ms

Generator

Channels	2
Voltage Range	< 1000 mV RMS (50 Ohm)
Analog Bandwidth	35 MHz
Quantization	14 bits
Sampling Rate	80 MHz
Waveform Duration	400 ms

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
RF Port 1	WiFi, WiMAX, Bluetooth	N female
RF Port 2	WiFi, WiMAX, Bluetooth	N female
FM Port	FM TX / RX	N female
GPS Port	GPS 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	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 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
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	WiFi (802.11) WiMAX (802.16 d/e) GPS FM (TX / RX) Bluetooth (1.0, 2.0, 2.1, 3.0, 4.0) NFC (ISO 18092) ZigBee (802.15.3) WAVE (802.11p)	GUI supports built-in measurement and signal generation functions per standard as appropriate

Ordering Information

Order Code	Description
IQ2010	IQ2010 Hardware with WiFi, Bluetooth, FM (TX/RX) and GPS.
IQ2010-WLAN-BT	IQ2010 Hardware with WiFi and Bluetooth.
IQ2010-GPS	GPS Software Option for IQ2010-WLAN-BT.
IQ2010-FM	FM Software Option for IQ2010-WLAN-BT.
IQ2010-FMAUD	Audio Analysis Option Requires IQ2010-FM Option Includes LitePoint Audio Interface Module (AiM) Hardware Includes Audio Analysis Software (API and GUI)
IQ2010-NFC	NFC Software Option
IQ2010-WiMAX	WiMAX Software Option
ZBSW	ZigBee Software Package CD

Upgrades

Order Code	Description
IQ2010-GPS-UG	Field Upgrade: GPS Software Option for IQ2010-WLAN-BT.
IQ2010-FM-UG	Field Upgrade: FM Software Option for IQ2010-WLAN-BT.
IQ2010-NFC-UG	Field Upgrade: NFC Software Option
IQ2010-WiMAX-UG	Field Upgrade: WiMAX Software Option

Calibration and Warranties

Order Code	Description
IQ2010-CAL	IQ2010 One Annual Calibration
IQ2010-XWR	1 Year Extended warranty (includes 1 calibration) Must be ordered within 90 days of original instrument purchase
IQ2010-XWR2	2 Year Extended warranty (includes 2 calibrations) Must be ordered within 90 days of original instrument purchase

Order Codes

Code	Product
0100-2010-000	IQ2010 Connectivity Test System with WiFi/Bluetooth Software License Can be Software License upgraded to include GPS, FM, NFC, and WiMAX
0300-20XX-001	IQ2010 GPS Software License
0300-20XX-002	IQ2010 FM Software License
0300-20XX-012	IQ2010 GPS/FM Software License (bundle)
0300-20XX-003	IQ2010 FM AUDIO Analysis Option for the FM Software License Includes the Audio Interface Module (hardware add-on) Requires IQ2010 base system and FM option
0300-20XX-004	IQ2010 Near Field Communication Software License
0300-20XX-005	IQ2010 WiMAX Software License

Compatible Software Products

Code	Product
0300-ZIGB-001	ZigBee Software Package
0300-WAVE-001	IQwave 802.11 Waveform Generator Software

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