

# CX200

## SiteXpert

### General Specifications

General	
<i>Display</i>	
Size	8 in (20.3 cm)
<i>Timebase</i>	
Accuracy	0.05 ppm (0°C to 50°C)
Aging	±0.5 ppm/year
Warm-up Time	30 minutes
External Reference	10 MHz
RF Generator	
<i>Frequency</i>	
Range	1 MHz to 1 GHz (standard, usable to 250 kHz)
	1 GHz to 3 GHz (CX200-F3GHz)
Resolution	1 Hz
Accuracy	Same as timebase
<i>Output Level</i>	
RF Duplex Port Range	-135 dBm to -50 dBm (1 MHz to 3 GHz); -37 dBm for AM and Complex modulation (typical)
RF Output Port Range	-65 dBm to 0 dBm (1 MHz to 3 GHz); 10 dBm for AM and Complex modulation (typical)
Resolution	0.1 dB
Accuracy	±1.5 dB (1 MHz to 3 GHz)
Bandwidth	100 MHz
<i>VSWR</i>	
RF Duplex Port	≤ 1.2 for frequency > 1 MHz
RF Output Port	≤ 1.6 typical for frequency > 1MHz
<i>Spectral Purity (Frequency ≥ 1 MHz and Level ≤ 0 dBm)</i>	
Phase Noise	-100 dBc/Hz at 10 kHz offset at 1000 MHz
Harmonics	≤ 35 dBc (-50 dBc typical)
Non-Harmonics	≤ -50 dBc
Residual AM	< 0.5% RMS in 300 Hz to 3 kHz BW
Residual FM	< 15 Hz RMS in 300 Hz to 3 kHz BW
	< 6 Hz RMS, Typical < 800 MHz

## General Specifications continued

Analog Modulation	
<i>Modulation</i>	
Modes	AM, FM, PM, SSB
Frequency Range	20 Hz to 20 kHz
Distortion	3% (1000 Hz rate, >2 kHz Deviation, 300 Hz - 3 kHz BP filter)
<i>AM</i>	
Range	0% to 100%
Resolution	0.1%
Accuracy (internal source)	$\leq \pm 5\%$ of settings
<i>FM</i>	
Range	0 Hz to 100 kHz
Resolution	1 Hz
Accuracy (internal source)	$\leq \pm 2.5\%$ of setting
<i>PM</i>	
Range	0 rad to 6.3 rad
Resolution	0.1 rad
Accuracy	$< \pm 2.5\%$ of setting with frequency response of $\pm 0.5$ dB 20 Hz to 10 kHz
<i>SSB</i>	
Modulation Frequency	30 Hz to 20 kHz
Carrier Suppression	>70 dB
Sideband Suppression	>60 dB
Internal Modulation Sources	
Number of Sources	3
<i>Sources</i>	
Waveforms	Sine, Square, Triangle, Ramp, DTMF, DCS, CTCSS, Tone Remote, Tone Sequential, Two-Tone Sequential
<i>Sine Wave</i>	
Range	20 Hz to 20 kHz
Resolution	0.1 Hz
<i>Square Wave</i>	
Range	20 Hz to 20 kHz
CTCSS Tone	Tone 1(67) to Tone 50 (254.1) Hz
Distortion	THD <1.0%
Frequency Response	Level flatness $\leq 0.5$ dB 20 Hz to 10 kHz

## General Specifications continued

RF Receiver	
<i>Frequency</i>	
Range	1 MHz to 1 GHz (standard, usable to 250 kHz)
	1 GHz to 3 GHz (CX200-F3GHz)
<i>Maximum Input Level</i>	
RF Input Port Maximum Input Level	21 dBm (125 mW) max preamp and frequency $\geq 1$ MHz
	14 dBm (25 mW) max preamp and frequency $< 1$ MHz
RF Duplex Port Maximum Input Level	47 dBm (50 Watts) continuous, $< 35^{\circ}\text{C}$
	51 dBm (125 Watts) Cyclical (Max "ON" of 30 sec and Min "OFF" for 90 sec) for power levels $> 50$ Watts
Shutdown	Alarm sounds (no auto shutdown)
<i>VSWR</i>	
RF Duplex Port	$\leq 1.2$ (100 kHz to 1 GHz)
RF Input Port	$\leq 1.7$ (1 MHz to 3 GHz) with 10 dB input attenuation
<i>Harmonic Response</i>	
2nd Harmonic	$< -30$ dBc
3rd Harmonic	$< -45$ dBc, $< -60$ dBc (typical)
<i>Spurious Response</i>	
Input Related	$\leq -42$ dBc, $-60$ dBc (typical)
Non-Input Related	$\leq -95$ dBm (typical)
Phase Noise	$-95$ dBc/Hz at 10 kHz
Dynamic Range	$> 105$ dB
TOI	$> 42$ dBm (max gain)
DANL	$< -163$ dBm/Hz at max gain
<i>Sensitivity</i>	
Analog	$< -100$ dBm (10 dB SINAD or better with 100 kHz Bandwidth filter)
Bandwidth	100 MHz (wideband), 8 MHz (narrowband)
RF Bandpass Filter (IF Filters)	5 kHz, 6.25 kHz, 8.33 kHz, 10 kHz, 12.5 kHz, 25 kHz, 30 kHz, 100 kHz, 300 kHz
Power Meter	
<i>Frequency</i>	
Range	1 MHz to 1 GHz (Standard)
	1 GHz to 3 GHz (CX200-F3GHz)
Measurement Modes	RMS, average RMS, minimum, maximum
Bandwidth	5 kHz, 6.25 kHz, 8.33 kHz, 10 kHz, 12.5 kHz, 25 kHz, 30 kHz, 100 kHz, and 300 kHz
<i>Level</i>	
RF Duplex Port	$-67$ dBm to 45 dBm
RF Input Port	$-108$ dBm to 10 dBm

## General Specifications continued

<b>Accuracy</b>	
RF Duplex Port	$\pm 0.4$ dB (1 MHz to 1 GHz); $\pm 0.6$ dB elsewhere. Accuracy after normalizing at the measurement frequency.
RF Input Port	$\pm 0.6$ dB (1 MHz to 1 GHz), $\pm 0.9$ dB elsewhere. Accuracy after normalizing at the measurement frequency.
<b>RF Error Meter</b>	
<b>Frequency</b>	
Range	1 MHz to 3 GHz
Resolution	1 Hz
Accuracy	Same as timebase
<b>Analog Demodulation Measurements</b>	
<b>FM</b>	
Modes	RMS, $\sqrt{2}$ .RMS, +Pk, -Pk, $\pm Pk/2$
Deviation	0 Hz to 75 kHz
Accuracy	$\pm 1.0\%$ for rate $\geq 1.5$ kHz and $\leq 3$ kHz
	$\pm 2.0\%$ otherwise
FM Distortion	$\pm 0.5\%$ for rate $\leq 3$ kHz
	$\pm 1.0\%$ otherwise
Residual FM	$\leq 3$ Hz (300 Hz to 3 kHz) and frequency $< 1$ GHz
<b>AM</b>	
Modes	RMS, $\sqrt{2}$ .RMS, +Pk, -Pk, $\pm Pk/2$
Measurement Range	0% to 100%
Accuracy	$\pm 1\%$ for depth $\geq 30\%$ and $\leq 90\%$ at 1kHz rate
	$\pm 2\%$ otherwise
AM Distortion	$\pm 0.5\%$ for rate $\leq 3$ kHz
	$\pm 1.0\%$ otherwise
AF Frequency Range	10 Hz to 20 kHz
Residual AM	$< 0.1\%$ (300 Hz to 3 kHz) and RF frequency $\leq 1$ GHz
<b>PM</b>	
Range	0 radians to 6.3 radians
Resolution	0.01 rad for $\leq 5$ rad
	0.1 rad for $> 5$ rad
Accuracy	$\pm 2.0\%$ , $\pm 1.0\%$ (rate 1.5 kHz to 3 kHz)
<b>SSB</b>	
Modes	SSB-USB, SSB-LSB
Measurement Range	Frequency error, Power (RMS), Power (PEP)
<b>Audio and Demodulation Meters</b>	
<b>Distortion Meter</b>	
Frequency Range	50 Hz to 10 kHz
Measurement Range	0% to 100%
Accuracy	$< 3\%$ of reading 0.1% distortion, 1% to 20%

## General Specifications continued

<b>SINAD Meter</b>	
Frequency Range	50 Hz to 10 kHz
Measurement Range	0 dB to 60 dB
Accuracy	$\leq \pm 1$ dB @12 dB SINAD
Resolution	0.01 dB
<b>S/N Meter</b>	
Frequency Range	50 Hz to 10 kHz
Measurement Range	0 dB to 60 dB
Accuracy	$\leq 1$ dB
<b>AF Counter</b>	
Frequency Range	50 Hz to 10 kHz
Accuracy	Timebase $\pm 1$ Hz
<b>AF Tones Analyzer</b>	
Modes	DTMF, DCS, CTCSS, Two-Tone, Tone Sequential, Tone Remote
<b>Audio Level Meter</b>	
Input Impedance	100 K $\Omega$ , 600 $\Omega$ , 300 $\Omega$
<b>Level</b>	
Range	0 Vrms to 30 Vrms
<b>Audio Analyzer</b>	
Frequency Range	DC to 100 kHz
Frequency Resolutions	0.8 Hz to 2.4 Hz RBW
<b>Level</b>	
Range	50 mVrms to 30 Vrms
Accuracy	$\pm 5\%$ (Audio) $\pm 1\%$ (DC)
<b>Audio Filters</b>	
Lowpass	300 Hz, 3 kHz, 3.4 kHz, 5 kHz, 15 kHz, 20 kHz, 40 kHz, TIA 3 kHz, TIA 15 kHz
Highpass	50 Hz, 300 Hz, TIA 50 Hz, TIA 300 Hz
Other	C-MSG, CCITT
<b>FFT/Channel Analyzer</b>	
Span	2 kHz to 8 MHz
IF Bandwidth	10 MHz
RBW	1 Hz to 50 kHz
Detector	Normal, positive peak, negative peak, average (RMS)
FFT Windows	Flat top, Rectangular, Hamming, Hanning, Blackman-Harris
Accuracy	RF Duplex Port: $\pm 0.7$ dB (1 MHz to 1 GHz), $\pm 1$ dB (1 GHz to 6 GHz) for level $> -10$ dBm. Accuracy after normalizing at the measurement frequency.
	RF Input Port: $\pm 1.0$ dB (1 MHz to 1 GHz), $\pm 1.1$ dB (1 GHz to 6 GHz) for level $> -50$ dBm. Accuracy after normalizing at the measurement frequency.

## General Specifications continued

Spectrum Analyzer	
Frequency Range	1 MHz to 1 GHz (Standard)
	1 GHz to 3 GHz (CX200-F3GHz)
RBW Range	25 Hz to 6 MHz
Span Range	0 Hz to (9 kHz to max frequency of each band)
VBW Range	5 Hz to 6 MHz
Sweep Time Range	0.4 ms to 1000 s
Spurious Free Dynamic Range	≥80 dB
Display Range	1 dB/div to 20 dB/div with 10 divisions
Trigger	Free run, External
DANL	<-162 dBm/Hz (max gain)
Zero Span Analyzer	
<i>Sweep Time</i>	
Range	24 μs to 200 s
Tracking Generator	
Output Ports	RF Output Port, RF Duplex Port
<i>Level</i>	
Range	Same as RF Generator
Accuracy	Same as RF Generator
AF Generator	
<i>Output</i>	
Impedance	<4 Ω
Max Output Current	100 mA
<i>Frequency</i>	
Range	0 Hz to 100 kHz
Resolution	0.1 Hz
Accuracy	Timebase
<i>Level</i>	
Range	0 Vpk to ±8 Vpk into 600 Ω
Accuracy	±2% (level ≥200 mV and frequency from 20 Hz to 20 kHz)
Resolution	0.1 mV
<i>Distortion</i>	
THD+N	<-75 dB for frequency 1 kHz and level 1 Vrms
AF Composite Signals	Sine, Square, Triangle, Ramp, DC Plus, DC Minus, DTMF, DCS, CTCSS, Tone Remote, Tone Sequential, Two-Tone Sequential

## General Specifications continued

Oscilloscope	
<i>Display</i>	
Traces	1
Markers	6
<i>Horizontal</i>	
Sweep Per Div	1 $\mu$ s to 100 ms/div
Accuracy	<2%
<i>Vertical</i>	
Range	1 mV/div to 20 V/div
Accuracy	<5%
Bandwidth	20 kHz
Input Range	20 mV to 30 Vrms (42.4 Vpk)
Coupling	AC, DC
Input Impedance	300 $\Omega$ , 600 $\Omega$ , 100k $\Omega$ single ended, $\pm$ 1% shunted by <300 pF, 200 k $\Omega$ differential, $\pm$ 8%
<i>Trigger</i>	
Modes	Single, Normal, Automatic, Free run
Digital	
Modes	P25, P25 Phase 2, TETRA, DMR, NXDN
P25 Measurements	
<i>Accuracy</i>	
Modulation Fidelity	<5% of reading (2.5% to 12%)
Symbol Deviation	$\pm$ 1%
Frequency Error	Timebase $\pm$ 0.5 Hz
Symbol Rate Error	Timebase $\pm$ 0.1 ppm
TETRA Measurements	
<i>Modulation</i>	
Type	$\pi$ /4 DQPSK, 18 ksymbols/sec, TETRA filter (RRC with <0.35)
Accuracy	<3% RMS
	<6% peak
Residual Carrier Power	<-35 dBc
TETRA MS T1	T1 test signals (in accordance with ETSI EN 300 394-1) T1 type 7 (TCH / 7.2)
TETRA BS T1	T1 test signals (in accordance with ETSI EN 300 394-1) T1 type 7 (TCH / 7.2)
	Framed PRBS, Unframed PRBS

## General Specifications continued

DMR Measurements	
<i>FSK Error</i>	
Range	0 to 20%
Resolution	0.01%
Accuracy	<5% of reading (2.5 to 10%)
<i>Symbol Deviation</i>	
Range	1500 Hz to 2350 Hz
Resolution	0.1 Hz
Accuracy	±10 Hz (1745 to 2140 Hz)
<i>Symbol Clock Error</i>	
Range	±1000 MHz
Resolution	0.01 MHz
Accuracy	1 ppm (-48 to 48 MHz)
<i>Frequency Error</i>	
Range	±4000 Hz
Resolution	0.01 Hz
Accuracy	Frequency Standard ±1 count
<i>Magnitude Error</i>	
Range	0 to 5%
Resolution	0.01%
Accuracy	<10% of reading (0 to 2%)
<i>UUT TX/RX Bit Error Rate</i>	
Range	0 to 20%
Resolution	0.1%
<i>Signal Power/Slot Power</i>	
Range	Reference Port Range
Resolution	0.1 dB
Accuracy	±1 dB (typically better than ±0.6 dB). Accuracy after normalizing at the measurement frequency
Protocol	
Decode	Color Code, Call ID, Unit ID
Accuracy	Color Code, Call ID



General Specifications continued

Vector Network Analyzer

<i>Frequency</i>	
Range	1 MHz to 3 GHz
Resolution	0.1 Hz
Accuracy	Same as timebase
<i>Test Port Power</i>	
Port 1	0 dBm
Dynamic Range	90 dB
<i>Measurements</i>	
Parameters	S <sub>11</sub>
Graph Type	Magnitude (dB and Linear), Delay (s), Phase (Degrees), Distance (meters/feet)
Measurements	Magnitude, VSWR, Distance to Fault, Cable Loss, Insertion Loss
Calibration Type	S <sub>11</sub>
Calibration Method	Short-Open-Load, Thru
<i>Distance Domain</i>	
Maximum Distance	1000 ft (305 m)
Measurement Display	Return Loss, VSWR
Measurement Format	dB, VSWR

## General Specifications continued

### Environmental/Physical

Weight	8.6 lbs (3.9 kg)
Temperature, Not Operating	-40°C to 71°C
	Note: Battery must not be subjected to temperatures below -20°C, nor above 60°C
Temperature, Operating	0°C to 50°C
Relative Humidity	95% RH (non-condensing)
Altitude	4600 m
Vibration	MIL-PRF-28800F Class 3
Shock, functional	MIL-PRF-28800F Class 3
Bench handling	MIL-PRF-28800F Class 3
Transit Drop	MIL-PRF-28800F Class 3

#### **Battery**

Type	Lithium Ion, 14.4 V, 6.8 Ah
Operating Time	1.5 hours (typical), 3.75 hours (optional)
Battery Charging Limits	0°C to 45°C (32°F to 113°F) ≤85% RH

#### **Compliance**

EMC	EMC IEC 61000-3-2:2018
	EMC 6100-3-3:2013 +A1:2017
	CISPR 11:2015 +A1:2016 +A2:2019
Safety	EN IEC 61326-1:2021 Class A



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