

FREEDOM Communications System Analyzer **R8000C**



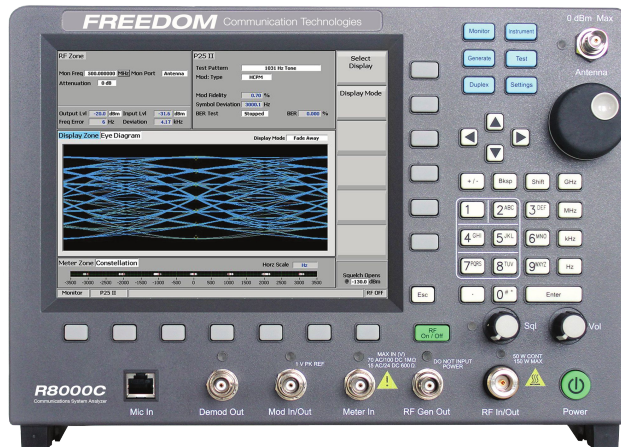
DATA SHEET

Table of Contents

Operating/Display Modes	3
General	3
Generator (Receiver Test)	4
Receiver (Transmitter Test)	5
Spectrum Analyzer	6
Oscilloscope	7
Audio Modulation Synthesizer	7
Tracking Generator	8
Digital Voltmeter (DVM)	8
Timebase	8
Display	8
Remote Interface (Optional Feature)	8

Operating/Display Modes

AM/FM Duplex Monitor and Generator
 Audio Synthesizer
 Tracking Generator (Opt.)
 Dual Display (Opt.)
 Cable Fault Locator (Opt.)
 Spectrum Analyzer
 Frequency Counter
 Frequency Error Meter
 Digital Voltmeter
 Power Meter
 Oscilloscope
 Signal Strength Meter
 SINAD/Distortion Meter



General

Displayed Average Noise:

Level (DANL):	-140 dBm (50 Ohm input termination)
Dynamic Range:	80 dB
Input Related Spurious:	-60 dBc max
Residual Spurious (non-input related):	-70 dBm

Power

DC Power Requirements:	24 VDC @ 5.0 A max
AC Adapter Specs:	100-240 VAC, 2.5 A max, 50-60 Hz
Battery Power:	Optional External Battery
Battery Operation:	1 hour minimum

MECHANICAL/ENVIRONMENTAL

Weight:	<14 lbs (6.4 kg)
Dimensions:	9.4" (23.9 cm) H, 12.7" (32.3 cm) W, 7.5" (19.1 cm) D
Operating Altitude:	Up to 10,000 ft (3048 m)
Humidity:	80% maximum relative humidity
Operating Temperature:	0° to 50° C
Storage Temperature:	-30° to +80° C

WARRANTY

Standard Warranty:	Two years
Three Year Service Plan:	Optional
Five Year Service Plan:	Optional

Generator (Receiver Test)

Port Protection Limit	5W for 30 seconds
Frequency Range:	1MHz to 1GHz (250kHz to 1GHz typical); Optional to 3GHz
Extended Frequency Range (Optional):	1 MHz to 3GHz (250 kHz to 3 GHz typical)
Frequency Resolution:	1 Hz

OUTPUT LEVEL GENERATE PORT

Range FM:	+5 dBm to -95 dBm below 2 GHz -5 dBm to -95 dBm above 2 GHz
Range AM:	-1 dBm to -95 dBm below 2 GHz -11 dBm to -95 dBm above 2 GHz
Resolution:	0.1 dB
Accuracy:	±2 dB

OUTPUT LEVEL RF I/O PORT

Range FM:	-30 dBm to -130 dBm below 2 GHz -40 dBm to -130 dBm above 2 GHz
Range AM:	-36 dBm to -130 dBm below 2 GHz -46 dBm to -130 dBm above 2 GHz
Resolution:	0.1 dB
Accuracy:	±1dB to 1GHz ; ±2dB > 1GHz

SPECTRAL PURITY

Harmonic Spurious:	-20 dBc max
Non-Harmonic Spurious:	-35 dBc max
Residual FM:	4Hz, 300 Hz to 3 kHz (<1GHz) 5 Hz, 300 Hz to 3 kHz (> 1 GHz)
Residual AM:	1.0% max, 300 Hz to 3 kHz
SSB Phase Noise (20 kHz Offset):	-95 dBc/Hz max below 1 GHz (15° to 35° C) -93 dBc/Hz max all frequencies (0° to 50° C)

FM MODULATION

Deviation Accuracy:	5% of setting
Deviation Range:	0 to 75 kHz
Deviation Resolution:	1 Hz
Pre-emphasis:	750 μs (selectable)
Modulation Bandwidth:	5 Hz to 20 kHz

AM MODULATION

AM Depth Range:	0 to 90%
Deviation Resolution:	1% of setting
Modulation Bandwidth:	100 Hz to 10 kHz
Deviation Accuracy:	5% of setting

Receiver (Transmitter Test)

Frequency Range: 250 kHz – 1 GHz (3 GHz optional)

SENSITIVITY

Narrowband FM:	2.0 uV for 10 dB EIA SINAD
Wideband FM:	10 uV for 10 dB EIA SINAD
AM:	10 uV for 10 dB EIA SINAD

RF I/O PORT

VSWR:	< 1.2 to 2 GHz, ≤ 1.5 to 3 GHz
Max Power:	50 W for 5 minutes 150 W for 30 seconds (30 sec. on, 5 min. off)
Absolute Max Power:	150 W
Alarm:	Internal temperature alarm

ANTENNA PORT

Maximum Power:	0 dBm
Alarm:	+10 dBm

IF FILTERS:

6.25 kHz, 12.5 kHz, 25 kHz, 50 kHz, 100 kHz, 200 kHz

FREQUENCY ERROR MEASUREMENT

Type of Display:	Autoranging
Resolution:	1 Hz

FM DEVIATION MEASUREMENT

Demodulation Range:	Up to ±75 kHz
Accuracy:	±5% plus residual FM
Frequency Response:	Selectable per the following: Low Pass Filters: 300 Hz, 3 kHz, 20 kHz High Pass Filters: 1 Hz, 300 Hz, 3 kHz

DEMOD HARDWARE CHARACTERISTICS

Demodulation Output Level:	6.25 kHz B/W: 2.56V / 1 kHz 12.5 kHz B/W: 1.28V / 1 kHz 25 kHz B/W: 0.64V / 1 kHz 50 kHz B/W: 0.32V / 1 kHz 100 kHz B/W: 1.6V / 10 kHz 200 kHz B/W: 0.8V / 10 kHz
Demodulation Output Amplitude Flatness:	±0.2 dB (300 Hz to 3 kHz), 1dB point @ 20kHz
Demodulation Output Impedance:	100 ohms nominal

AUDIO WEIGHTING FILTERS

Filters:	none, C-message, CCITT
De-emphasis:	750 μs (selectable)

AM MODULATION MEASUREMENTS

Demodulation Range:	0 to 100%
Accuracy:	±5% for levels below 80%
Frequency Response:	Selectable per the following: Low Pass Filters: 300 Hz, 3kHz, 20kHz High Pass Filters: 1 Hz, 300 Hz, 3 kHz
Demodulation Output Level:	0.8 V peak per 10% AM Modulation
Demodulation Output Amplitude Flatness:	±0.2 dB (300 Hz to 3 kHz), 1dB point @ 20kHz
Output Impedance:	100 ohms nominal

RECEIVE SIGNAL STRENGTH LEVEL METER

Frequency Range:	1MHz to 1GHz (250kHz to 1GHz typical); Optional to 3GHz
Accuracy:	±2 dB
Sensitivity:	-120 dBm (Antenna Port; Preamplifier on; 6.25 kHz IF B/W)

BROADBAND POWER METER (RF In/Out Port)

Frequency Range:	1MHz to 1GHz (250kHz to 1GHz typical); Optional to 3GHz
Measurement Range:	0.1Wto150W
Input Impedance:	50 Ohms
Accuracy:	±10% (2 kHz – 1 GHz); ±10% (1 GHz – 3 GHz < 2.5W)
Protection:	Over temperature alarms

FREQUENCY COUNTER

Frequency Range:	5 Hz to 100 kHz
Period Counter Range:	5 Hz to 20 kHz
Input Level:	0.1 V rms min

SINAD METER

Accuracy:	±1 dB @ 12 dB SINAD
Input Level:	0.1 V rms min

DISTORTION METER

Range:	1% to 20%
Distortion Accuracy:	The greater of: ±0.5% of distortion or ±10% of reading
Input Level:	0.1 V rms min

OPTIONAL MODES

DMR (MOTOTRBO™), NXDN Type - C Trunk, P25 Phase I Trunk, P25 Phase II, TETRA, PTC (ITCR)

P25 MEASUREMENT MODULATION FIDELITY

Range:	0 to 10%
Resolution:	0.01%
Accuracy:	<5.0% of reading for 2.0 % and higher

DMR MEASUREMENT FSK-ERROR

Range:	0 to 10%
Distortion Accuracy:	0.01%
Input Level:	<5.0 % of reading for 2.0% and higher

Spectrum Analyzer

SWEEP

Frequency Range:	1MHz to 1GHz (250kHz to 1GHz typical); Optional to 3GHz
Frequency Resolution:	1 Hz
Span Accuracy:	5%
Update Rate:	~10 times per second (depending on span)

AMPLITUDE

Level Accuracy:	±2 dB
Scales (dB/div):	10 (1,2, & 5 w/ESA option)
Log Linearity Accuracy:	<0.1dB
Reference Level Resolution:	1dB
Reference Level Range:	+60 to -70 dB
T/R Port Dynamic Range:	80 dB
Typical Noise Floor Performance:	-140 dBm
SSB Phase Noise (20 kHz Offset):	-95 dBc/Hz max below 1 GHz (15° to 35° C) -93 dBc/Hz max all frequencies (0° to 50° C)

Resolution Bandwidth

Auto Selected

Harmonic Spurious (Antenna Port, No Attenuation):

-20 dBc max

Non-Harmonic Spurious (Antenna Port, No Attenuation):

-60 dBc max

Residual Spurious (Input Terminated):

-70 dBm

Markers:

Delta, Absolute, and Frequency

Modes:

Standard, Average, Freeze, Max Hold, and Peak Hold

Oscilloscope

VERTICAL INPUT

Input Impedance:	1 Meg Ohm / 600 Ohm (Selectable)
Range:	±100 VDC, ±70 Vrms AC
Accuracy:	5% of full scale
Bandwidth:	0 to 50 kHz

HORIZONTAL SWEEP

Range:	20 uSec to 1 Sec / div. (Selectable)
--------	--------------------------------------

TRIGGER SELECTION

Normal, Auto (Free Running), Single Sweep and Freeze

SPECIAL FUNCTIONS

Markers:	Absolute Voltage, Delta Voltage, Delta Frequency and Delta Period
----------	---

Audio Modulation Synthesizer

Modulation Types:	1 kHz tone, Private Line, Digital Private Line (w/ DPL Invert), Single Tone, DTMF, Two-Tone Paging, 5/6 Tone Paging, POCSAG, A&B Independent Synths., EURO Tones, User Defined Tone Sequences, and External inputs from both a supplied micro-phone and BNC input.
-------------------	--

Modulation Output Level:	Programmable to ± 8 V peak
Amplitude Flatness:	± 0.2 dB (300 Hz to 3 kHz), 1 dB point @ 20 kHz
1 kHz Tone Distortion:	Not to exceed 1% THD
Impedance:	100 Ohms
External Modulation Input Level:	± 1 V peak reference
Amplitude Flatness:	± 0.2 dB (300 Hz to 3 kHz), 1 dB point @ 20 kHz
Impedance:	600 Ohms
External Microphone Input Amplitude Flatness:	± 0.2 dB (300 Hz to 3 kHz), 1 dB point @ 20 kHz

Tracking Generator

Frequency Range: 1MHz to 1GHz (250kHz to 1GHz typical); Optional to 3GHz

Digital Voltmeter (DVM)

Input Impedance:	1 Meg Ohm / 600 Ohm (Selectable)
Voltage Range:	1V, 10V, 70V full scale
Frequency Range:	50 Hz to 20 kHz
DC Accuracy:	1% full scale ± 1 LSB
AC Accuracy:	5% full scale ± 1 LSB

Timebase

Output Frequency:	10 MHz
Stability:	Aging: ± 0.1 ppm / year Temp.: ± 0.01 ppm
Output Level:	Minimum 0 dBm into 50 Ohms
Warm Up:	3 minutes: within ± 0.1 ppm

Display

FRONT PANEL DISPLAY	
Resolution:	800 x 600
Size:	Size: 8.4" (21.3 cm) Full Color LCD

EXTERNAL DISPLAY	
External Display:	VGA

Remote Interface (Optional Feature)

Remote Front Panel	
	Available over Ethernet

FREEDOM

Communication Technologies

2002 Synergy Blvd, Suite 200, Kilgore, Texas 75662

Toll Free Phone: (844)-90-FREEDOM or (844)-903-7333

Phone: 903-985-8999 Fax: 903-985-8998 Email: sales@freedomcte.com

Please visit our web site at www.freedomcte.com



Complies With
UL 61010-1
CSA C22.2 No. 61010-1

All trademarks indicated as such herein are trademarks of Freedom Communication Technologies® Reg. U.S. Pat. & Tm. Off. MOTORBO is registered in the U.S. Patent and Trademark Office by Motorola, Inc. All other product or service names are the property of their respective owners. © 2015 Freedom Communication Technologies . All rights reserved. Freedom Communication Technologies reserves the right to make changes in its products and specifications at any time and without notice.