



A Bird Technologies Co.

# IQC5000B

## RF Record & Playback System

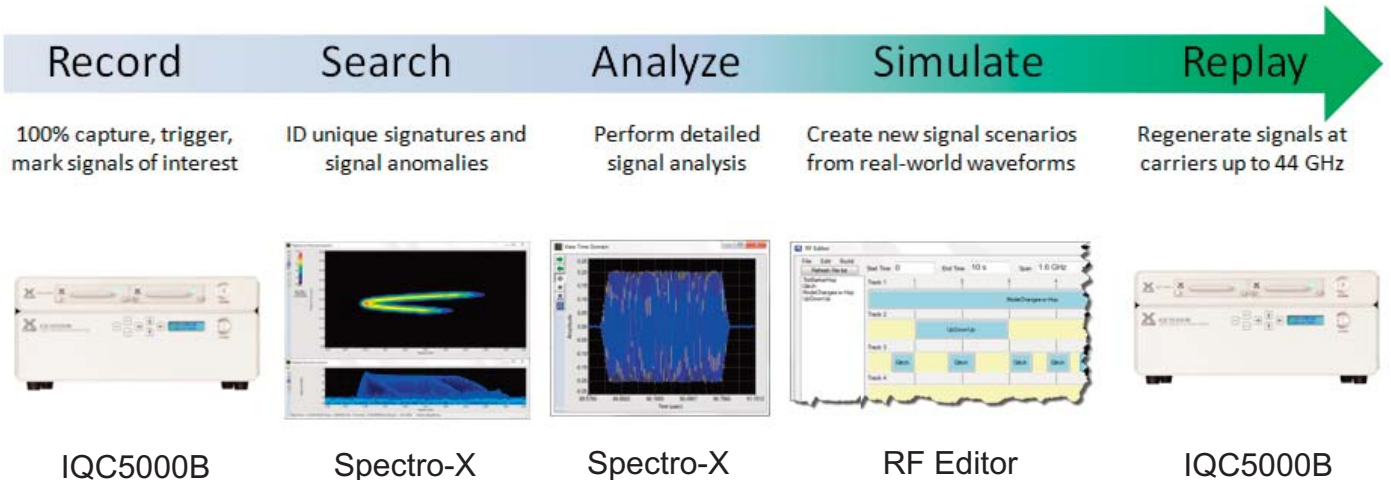


### FEATURES

- ▶ 255 MHz RF streaming bandwidth on record and playback
- ▶ Low-cost, removable storage options
- ▶ Time-synchronous dual channel recording
- ▶ Fast offload speeds using cabled PCI Express
- ▶ Compatible with Keysight, Rhode & Schwarz and Tektronix Signal Analyzers

**X-COM Systems' IQC5000B Series** is the industry's smallest high-fidelity dual-channel RF Record & Playback System. With up to 255 MHz of record and playback bandwidth, the IQC5000B can meet recording needs from HF to millimeter wavelengths in mission-critical applications.

The IQC5000B has been designed to support operational security with removable memory for a total of 4TB of storage within the IQC5000B-MEM module, which can provide up to 50 minutes of single-channel record time at full bandwidth. The system's external datapacks (up to 15 TB) also give users over 3 hours of single-channel record time at full bandwidth. The IQC5000B Record & Playback System is suited for laboratory, production, or field applications.



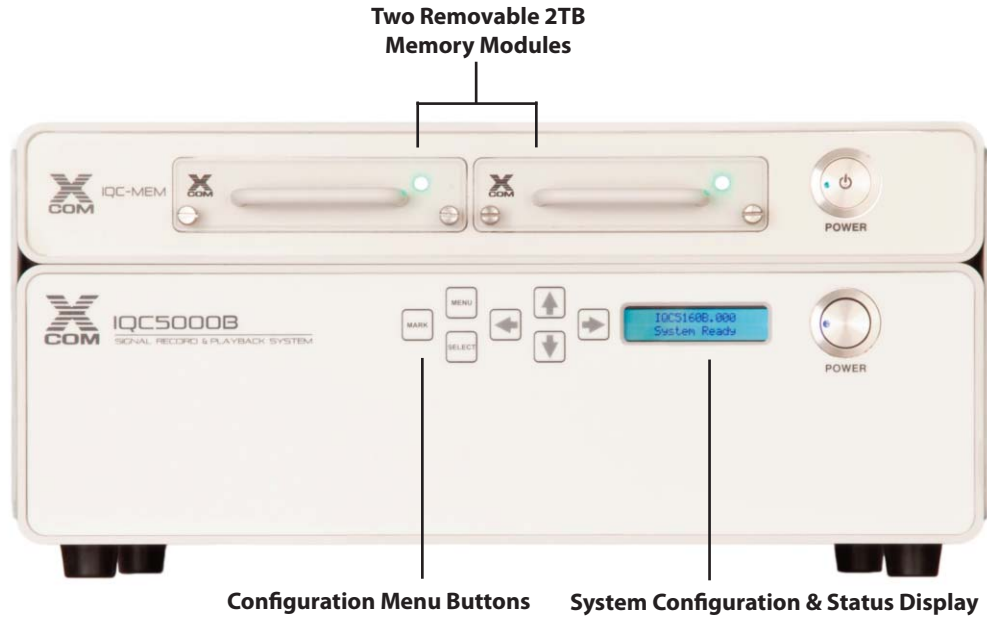
The RF environment is growing increasingly complex. The IQC5000B can be used to bring large datasets back into the laboratory for real-world analysis using X-COM's and other key vendors' signal analysis tools. The data can be used as-is or modified to margin and stress test system designs for compliance. Whether recording several seconds, hours, or even days of RF data, X-COM has the hardware and software tools to get the job done.



# IQC5000B

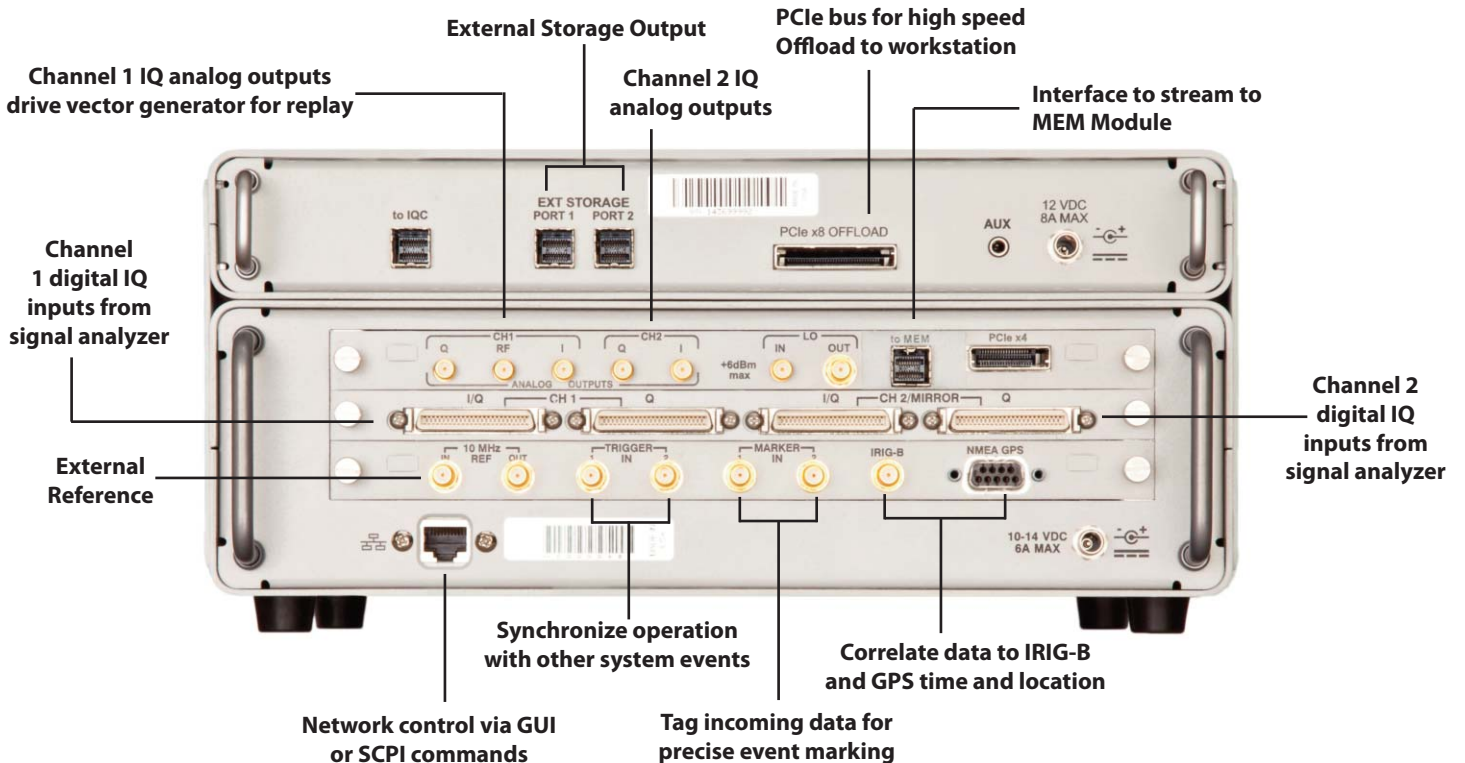
RF Record & Playback System

## IQC5000B FRONT PANEL FUNCTIONS AND INTERFACES



The IQC5000B front panel provides local control of basic system functions.

## IQC5000B FRONT PANEL FUNCTIONS AND INTERFACES



Rear panel interfaces include two analog I&Q Channel Outputs and two digital I&Q Channel Inputs, PCIe data offload, and IRIG-B and GPS inputs.

## APPLICATIONS

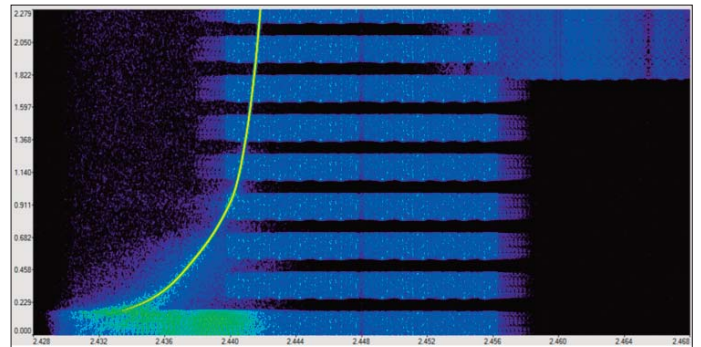
### ELECTRONIC WARFARE

Record, store, and playback real-world RF signals for threat analysis and to build EW libraries.



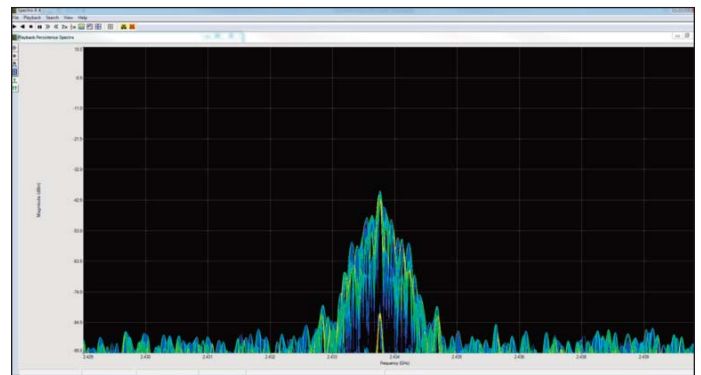
### INTERFERENCE ANALYSIS

It is not always easy to record interfering signals. With the IQC5000B's sophisticated triggering capability, you can use up to two external triggers to start recording when the interference occurs. This allows for efficient use of the onboard memory as well as being able to record those elusive interferers.



### SURVEILLANCE

With the IQC5000B, you can record in-theater RF signal activity for later offload and analysis in a laboratory.



### SPECTRUM MANAGEMENT

Ensuring that critical communications, radars, and other RF systems have a fighting chance to survive in harsh electromagnetic environments can be an almost impossible task. X-COM Systems provides Spectrum Managers with systems and analysis tools that help to deconflict the RF world we live in to make the impossible...possible.

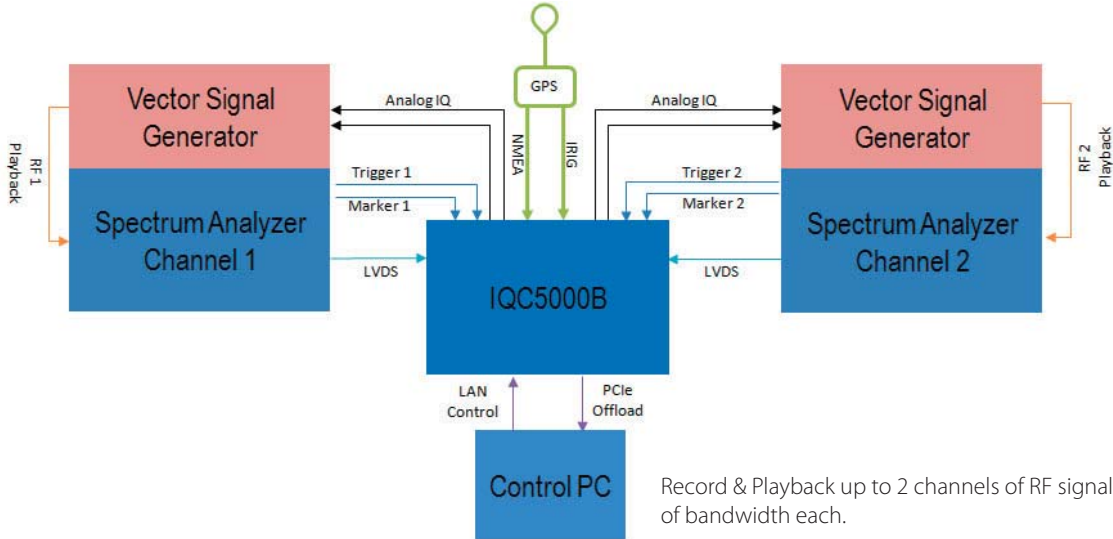




# IQC5000B

RF Record & Playback System

## IQC5000B DUAL-CHANNEL CONFIGURATION

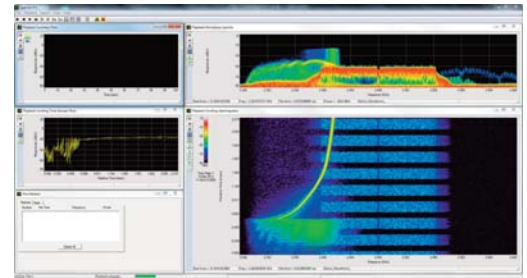


Record & Playback up to 2 channels of RF signals with 160 MHz of bandwidth each.

## SUPPORTING PRODUCTS FOR THE IQC5000B SERIES

### SPECTRO-X SIGNAL ANALYSIS TOOLKIT

Spectro-X software allows users to visualize and analyze up to four recorded RF and microwave spectrum files at the same time. You can parse through very large files of RF data with its four powerful search functions to get to the signal or area in the file that interests you the most. Then, export only those smaller portions of the file that require deeper analysis. Several file formats are supported such as .bin (KEYSIGHT®), .mat (MATLAB®), .tiq (Tektronix®) and .txt (ASCII).



### RF EDITOR SIGNAL EDITING SOFTWARE

RF Editor is a drag-and drop graphical editing tool that lets you easily modify I&Q signals of any length or create entirely new ones. Users can modify and build signal waveforms in the time and frequency domains make many frequency domain signal modifications, and move any signal or slice of spectrum anywhere among 10 time domain tracks in the recording. Snippets of recorded data can be dragged and dropped onto any track and delayed, filtered, and shifted in frequency before playback.



### SIGNAL ANALYSIS WORKSTATION

X-COM's signal analysis workstation is designed to provide an optimum environment for storage, analysis, and editing of files record by the IQC5000B. The Windows 7™ system configuration includes a dual-Quad core Xeon processor, high-resolution graphics, and large SATA hard drive. It can be custom tailored to individual needs, including pre-installed Spectro-X and RF Editor software.





## IQC5000B SPECIFICATIONS

### RF RECORD INTERFACE

#### I&Q INPUTS

Logic level	LVDS
Sample depth	16-bit I&Q
Number of channels	2 I&Q channels running concurrently
Connector	Four 50-pin 3M MDR
Maximum data rate	400 (MBytes/s) at each connector
Spectrum analyzer compatibility	Keysight® X-Series: N9040B, N9030B/A, N9020B/A, N9010B/A Rohde & Schwarz®: FSV, FSVR, and FSW Tektronix®: RSA5100/6100
Minimum record bandwidth (kHz)	19.531 (24.4140625 ksamples/s, 16 bits, I&Q)
Maximum record bandwidth (MHz)	255 MHz (300 Msamples/s, 16 bits, I/Q)

### PLAYBACK INTERFACE

#### ANALOG I&Q OUTPUTS

1-dB bandwidth (MHz)	255 MHz centered at 0 Hz (single channel) 160 MHz (dual channel)
Power level (dBm)	0 (fixed)
Amplitude flatness across 255 MHz bandwidth (dB)	+/-2
VSWR	≤ 1.8:1
Impedance (ohms)	50
Connector	SMA female

#### RF OUTPUTS

Channel 1 Only	
Center frequency (MHz)	2400
1-dB bandwidth (MHz)	225 MHz
Power level (dBm)	0 nominal (for full scale recordings)
VSWR	≤ 1.8:1
Impedance (ohms)	50
Connector	SMA female

### WAVEFORM STORAGE INTERFACE

Digital I/O Record and Playback Interface	High-speed serial link to/from External IQC5000B-MEM
---	--

### GENERAL SPECIFICATIONS

#### GPS

Protocol	ASCII, 8-bit data, one start and one stop bit, no parity
Supported Speeds	4800, 9600 and 115200 baud
Supported NEMA Sentences	GPGGA, GPVTG, GPZDA
Connector	9-pin D female

#### IRIG-B

Accuracy	IRIG-B122
Signal Format	Amplitude modulated sine wave
Connector	SMA female

#### MARKERS

MARKERS	2 inputs
Voltage levels (VDC)	0 to 3.3 threshold, 5 maximum
Impedance (ohms)	10,000
Connector	SMA female
Maximum allowed per record	Maximum quantity 100,000 per recording
Marker content	Date, time of day, latitude, longitude, altitude, Ground Speed, sample number
Latency (µs)	<1 from marker valid at connector to insertion in record file
Maximum Marker Record Speed (per second)	1000 per marker input per marker edge

#### TRIGGER FUNCTIONS

TRIGGER FUNCTIONS	2 inputs
Voltage levels (VDC)	0 to 3 threshold, 5 maximum
Impedance (ohms)	10,000
Connector	SMA female
Latency (µs)	0.4 from valid trigger applied to first recorded sample
Re-arm time (ms)	<1
Pre-record memory (µs)	0

#### START/STOP RECORD

Record Types	Manual, duration, time of day, and event
Port configurations	Port 1, port 2, ports 1 and 2, ports 1 or 2
Logic (user-specified)	Leading edge valid, trailing edge valid (after start pulse or same pulse)

#### START/STOP PLAYBACK

Playback modes	Timed, manual, looped until trigger, play between markers
Port configurations	Port 1, port 2, ports 1 and 2, ports 1 or 2
Logic (user-specified)	Leading edge valid, trailing edge valid (after start pulse or same pulse)



# IQC5000B

## RF Record & Playback System

### IQC5000B GENERAL SPECIFICATIONS CONTINUED

#### REFERENCE CLOCKS

	INTERNAL	
Frequency (MHz, +/-ppm)	10, +/-10	
	EXTERNAL	Provided by external input port if active. Otherwise internal clock signal is used
Required level (dBm)	> 0 into 50 ohms	
Frequency (MHz, +/-ppm)	10, +/-10	
Connector	SMA female	

#### INSTRUMENT CONTROL

X-COM Control software	Graphical user interface, full control of record, playback, file offload and upload
Operating environment	Dual-core desktop or laptop, Windows 7, 64bit, 2Gbytes RAM, 100 Mbytes free disk space, mouse
Remote API	RJ-45 connection to LAN switch
Front Panel	Display of instrument parameters and manual marker insertion via membrane switches and 2-line LCD

#### ENVIRONMENTAL

	MIL-PRF-28880F Class 3 except where noted by*
Temperature	0° to +50° C operating, -20° C to +71° C storage. 95% relative humidity (non-condensing)
Vibration	Sinusoidal: 5 to 55 Hz, 0.33 mm amplitude. Random with solid-state drives installed: in conformance with MIL-PRF-28880F Class 3
Shock (non-operating)	30g

#### POWER

AC	External AC/DC, 100 to 240V +/-10%, 50 to 60 Hz +/-5%, at 1.1 to 2.5 A (72 W)
DC	12 VDC, 6 A maximum (72 W)

#### DIMENSIONS

Width x Height x Depth (in., mm)	12 x 3.5 x 10.5, 305 x 89 x 266
Weight (lb., kg)	8.5, 3.85

#### PRODUCT CONFORMITY

Electromagnetic conformance	EMC Directive 2004/108/EC EN 61326-1 and electrical equipment for measurement, control, and laboratory use ICES-003 Issue 5, August 2012 for a Class A device FCC Title 47 of the Code of Federal Regulations (CFR), Part 15 Subpart B for a Class A digital device
Electrical safety conformance	CE Compliant IAW EN60950-1: 2006

#### IQC5000B-MEM WAVEFORM STORAGE

<b>DIGITAL I/O RECORD AND PLAYBACK INTERFACE</b>	Aurora Link from/to External IQC5000B-MEM
--	---

Connector	Mini SAS SFF-8644
-----------	-------------------

#### EXTERNAL STORAGE INTERFACE

Serial Attached SCSI (SAS)	2 Connections of 4 lanes each
Connector	Mini-SAS SFF-8088

#### INTERNAL STORAGE

Removable Solid State Media Modules	Two Modules, RAID 0
Capacity (TBytes)	2, 4

#### EXTERNAL STORAGE

Solid State Media	RAID 0, 16 drives
Capacity (TBytes)	8, 15

#### PCIe (DATA OFFLOAD)

Specification	PCIe Gen2
Lanes	8

#### ENVIRONMENTAL

	MIL-PRF-28880F Class 3 except where noted by*
Temperature	0° to +50° C operating, -20° C to +71° C storage. 95% relative humidity (non-condensing)
Vibration	Sinusoidal: 5 to 55 Hz, 0.33 mm amplitude. Random with solid-state drives installed: in conformance with MIL-PRF-28880F Class 3
Shock (non-operating)	30g

#### POWER

AC	External AC/DC, 100 to 240V +/-10%, 50 to 60 Hz +/-5%, at 1.1 to 2.5 A (72 W)
DC	12 VDC, 6 A maximum (72 W)

#### DIMENSIONS

Width x Height x Depth (in., mm)	12 x 1.75 x 10.5, 305 x 45 x 266
Weight (lb., kg)	5, 2.68

#### PRODUCT CONFORMITY

Electromagnetic conformance	EMC Directive 2004/108/EC EN 61326-1 and electrical equipment for measurement, control, and laboratory use ICES-003 Issue 5, August 2012 for a Class A device FCC Title 47 of the Code of Federal Regulations (CFR), Part 15 Subpart B for a Class A digital device
Electrical safety conformance	CE Compliant IAW EN60950-1: 2006

### IQC5000B ORDERING INFORMATION

Model Number	Description
<b>IQC5040B</b>	Signal recorder with up to 40 MHz record bandwidth. Two each LVDS inputs (I & Q) with a maximum data rate per connector of 100 MB/sec. Includes an IQC5000B-MEM interface module, removable AC power supply, X-COM Control SW and documentation on CD.
<b>IQC5160B</b>	Signal recorder with up to 160 MHz record bandwidth. Two each LVDS inputs (I & Q) with a maximum data rate per connector of 400 MB/sec. Includes an IQC5000B-MEM interface module, removable AC power supply, X-COM Control SW and documentation on CD.
<b>IQC5255B</b>	Signal recorder with up to 255 MHz record bandwidth. Two each LVDS inputs (I & Q) with a maximum data rate per connector of 600 MB/sec. Includes an IQC5000B-MEM interface module, removable AC power supply, X-COM Control SW and documentation on CD.
<b>IQC5000B-MEM</b>	Memory interface module for RAID0 storage units
<b>IQC5000B-ME2</b>	Internal RAID0 SSD disk storage: 2 TB. Supports single channel operation up to 160 MHz bandwidth. Two units of option ME2 must be purchased for dual channel operation at bandwidths of 160 MHz or single channel operation at 255MHz.
<b>IQC5000B-MEO</b>	Additional blank memory module cover for the IQC5000B-MEM interface module.
<b>IQC5000B-S08</b>	External RAID0 SSD external disk storage: 8 TB. Supports both single and dual channel operation up to 160 MHz bandwidth
<b>IQC5000B-S15</b>	External RAID0 SSD external disk storage: 15 TB. Supports both single and dual channel operation up to 160 MHz bandwidth
<b>IQC5000B-042</b>	Adds second recording channel to support up to 40 MHz capture bandwidth.
<b>IQC5000B-162</b>	Adds second recording channel to support up to 160 MHz capture bandwidth.
<b>IQC5000B-101</b>	Adds single playback channel to support up to 160 MHz; Baseband I & Q (2ea SMA female) and RF Out at 2.4 GHz, 0dBm (1ea SMA female). Not compatible with options 042 or 162.
<b>IQC5000B-102</b>	Adds second playback channel to support up to 160 MHz; Baseband I & Q (4ea SMA female) and one RF Out at 2.4 GHz, 0dBm (1ea SMA female). Requires option 042 or 162.
<b>IQC5000B-XCB</b>	LVDS Cable pair (2ea) for Signal Analyzers supporting up to 255 MHz bandwidth.
<b>IQC5000B-ACB</b>	LVDS Cable (1ea) for Keysight X-series Signal Analyzers supporting 40 MHz bandwidth.
<b>IQC5000B-GPS</b>	GPS/IRIG-B Timing Standard. Includes GPS antenna and interface cable.
<b>IQC5000B-BKT</b>	Non-rackmount bracket for affixing the IQC5000B to the IQC5000B-MEM interface module.
<b>IQC5000B-RM1</b>	19 inch Rack Mount Kit for IQC5000B only (2U)
<b>IQC5000B-RM2</b>	19 inch Rack Mount Kit for IQC5000B and option – MEM Adapter Combined (3U)
<b>IQC5000B-RM3</b>	19 inch Rack Mount Kit for IQC5000B option MEM only (1U)
<b>IQC5000B-PC3</b>	PCIe x4 Express Card 34 host cable adapter for use in laptop computers and systems that use option MEM. Includes 2 meter cable.
<b>IQC5000B-PC4</b>	PCIe x8 host cable adapter for use in desk top computers and systems that use option MEM; Full Height Bracket. Includes 2 meter cable.
<b>IQC5000B-PC7</b>	PCIe x8 to x4 cable 2 meters in length.
<b>IQC5000B-EX1</b>	Extends factory warranty of IQC5000B by one additional year
<b>IQC5000B-EX2</b>	Extends factory warranty of IQC5000B by two additional years
<b>IQC5000B-EX3</b>	Extends factory warranty of IQC5000B by three additional years
<b>IQC5000B-EX4</b>	Extends factory warranty of IQC5000B by four additional years
<b>IQC5000B-TRN</b>	Daily rate for onsite training and consulting by X-COM Applications Engineer.
<b>IQC5000B-CBL</b>	Adds one pair (2ea) of SMA-male to BNC-male cables for IQ analog playback. Each cable is 5 feet long
<b>IQC5000B-1A5</b>	Transit Case for IQC5000B series. Case can hold the IQC5000B, IQC5000B-MEM and related accessories.

## IQC5000B ORDERING INFORMATION CONTINUED

<b>Model Number</b>	<b>Description</b>
<b>IQC5000B-3UP</b>	Upgrade from 160 MHz to 255 MHz capture bandwidth. Requires option -162 or option -5UP.
<b>IQC5000B-4UP</b>	Upgrade from 40 MHz single channel to 40 MHz dual channel operation.
<b>IQC5000B-5UP</b>	Upgrade from 160 MHz single channel to 160 MHz dual channel operation.
<b>IQC5000B-6UP</b>	Upgrade from 40 MHz single channel to 160 MHz single channel operation.
<b>IQC5000B-WS1</b>	Rackmounted SigAnalyst Workstation Dual Xeon, Quad-Core Workstation, 64GB RAM with 128 TB HDD Storage Archive (96 TB usable)
<b>IQC5000B-WS2</b>	Rackmounted SigAnalyst Workstation Dual Xeon, Quad-Core Workstation, 64GB RAM with 128 TB HDD Storage Archive (96 TB usable), Spectro-X and RF Editor software packages
<b>IQC5000B-ENL</b>	Rack enclosure to house IQC5000B, down converter, 2ea solid state data packs, upconverter, workstation, storage archive and power distribution

### SOFTWARE

<b>WC-RF-EDITOR</b>	RF Editor Signal Generation software
<b>Spectro-X</b>	Spectro-X Advanced Signal Analysis software



A Bird Technologies® Company



12345-B Sunrise Valley Drive Reston, VA 20191 703.390.1087 [www.xcomsystems.com](http://www.xcomsystems.com)

