

## I. GENERAL INFORMATION

### 1-1 INTRODUCTION

This manual provides general, installation, and operation information for the Model UFX-BER Precision C/N Generating Instrument.

### 1-2 DESCRIPTION OF THE UFX-BER

Noise Com, Inc. Series UFX-BER Precision C/N Generating Instruments are capable of setting and maintaining a very accurate ratio between a user provided carrier and internally generated noise. The instrument can calibrate and display the ratio as either C/N, C/No, or Eb/No. It also is capable of calibrating and displaying C/I for an externally injected interference signal. The UFX-BER can be used as a noise generating instrument and as a power meter to measure signal power at the carrier input.

A tracking option is available which maintains constant output carrier power with varying input carrier power.

The case is 17" wide, 5.25" high and 22.5" deep. It is equipped with front panel handles and removable feet. Rack mounting brackets for 19" rack mounting are included. Brackets are mounted at the factory.

The NOISE/COM instrument controller board uses a powerful single-chip microprocessor to accurately control the amplitude, bandwidth, center frequency, and power ratio of its internal broad-band noise source and an externally applied signal.

Commands to the instrument can be entered via a front-panel dedicated keypad. Alternately, commands can be downloaded from any computer using the GPIB (HP-IB) IEEE-488 instrumentation bus (as a talker), or by the optional RS-232, RS-422, or RS-423 adapters allowing connection to any asynchronous serial interface. A front panel alphanumeric display and lighting status indicators give the operator visual verification of the programming process and functional state of the device.

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1-3 OPTIONS AND OPTIONAL CONFIGURATIONS

Available options for the UFX-BER are as follows:

1. Automatic gain control module to maintain constant output carrier power.
2. Other custom configurations
3. 50 ohm input and output impedance.
4. RS-232C, RS-422, or RS-423 interface in addition to IEEE-488 interface.
5. 220 VAC, 50 Hz input.
6. 0.1 dB/step on output noise and C/N
7. Switched filter bank for up to six customer specified filters.

1-4 SELECTION OF LINE VOLTAGE and FUSE

1. Disconnect power cord
2. Open door of Power Entry module with a small screwdriver
3. Pull fuse carrier out. Replace fuse.  
(values for different voltages listed below)
4. Pull voltage select wheel out and rotate until correct voltage appears in the window when the door is closed

(DO NOT ATTEMPT TO ROTATE WHEEL IN PLACE.)

OPERATING VOLTAGE	SUPPLY CURRENT	TYPE OF FUSE
100 VAC	3.0 Amp	medium-blow
120 VAC	3.0 Amp	medium-blow
220 VAC	1.5 Amp	medium-blow
240 VAC	1.5 Amp	medium-blow

1-5 ENVIRONMENTAL CONDITIONS

0 to 50 degrees C, and 90 % relative humidity in operating mode, and -10 to 60 degrees C for storage. DO NOT BLOCK THE FREE FLOW OF AIR TO THE THE VENTS AT THE REAR OF THE INSTRUMENT.

1-6 LINE CORD

Line cord must be NEMA type and 'CE' marked. Maximum current drawn by the unit is 2 Amps with operating voltage 85 to 264 VAC.

## II. SPECIFICATIONS

Operational Modes: Carrier to Noise (C/N), Carrier to Noise Density (C/No), Bit Energy to Noise Density (Eb/No), Carrier to Interferer (C/I), Noise Generator, Power Meter.

Available Frequency Range: 100 kHz to 1000 MHz  
(Specified by customer)

### CARRIER PATH

Input Power Range: -55 dBm to +5 dBm  
Absolute Maximum Input Power: +21 dBm  
Output Power Range: -55 dBm to +5 dBm  
Gain: 0 to -60 dB in 0.1 dB steps  
Flatness: +/- 0.2 dB/40 MHz maximum  
Group Delay: +/-0.2 ns/40 MHz maximum  
Tracking Range: +5 dB to -10 dB  
Tracking Update Rate: 10 milliseconds

### NOISE PATH

Output Power Range: -55 dBm to +5 dBm  
Bandwidth: 0.1 MHz up to 200 MHz  
Flatness: +/- 0.5 dB  
Attenuation Range: 60 dB in 0.25 dB steps  
Crest factor: 14 dB minimum  
Noise Bandwidth Accuracy: +/- 0.1 dB  
Ratio Accuracy: +/-0.21 dB RSS for carrier attenuation less than 40 dB.  
Power Meter Range: -55 dBm to +5 dBm  
Power Meter Accuracy: +/-0.5 dB  
Power Meter Averaging: 10 to 65,535. Each sample requires approximately 2.2 milliseconds.  
Baud Rate: 0150,300,0600,1200,2400,4800 and 9600 to be used with optional serial interface ports ( 8 data bits, no parity 1 stop bit).  
Interferer Input: -4 dBm  $\pm$  2 dB. Frequency range is equal to the noise bandwidth.

AC Power: 85 to 264 VAC, 2 Amps max, 47-63 Hz

Maximum DC voltage on RF connectors is 5 Volts.

### III. INSTALLATION

#### 3-1 INITIAL INSPECTION

Inspect the shipping container for damage. If the container is damaged, retain until the contents of the shipment have been checked against the packing list and the instrument has been checked for mechanical and electrical operation.

If the instrument has been damaged in transit, notify the carrier as well as Noise Com, Inc. Verify that the AC input is set to the desired voltage and unit has the right fuse. Please refer to section 1-4 on page 4.

#### 3-2 GPIB (IEEE 488 BUS) Interconnection

The only interconnection required for GPIB operation is between the UFX-BER Instrument and the controller. This is accomplished by means of a standard GPIB 24 wire interface cable.

Restrictions on use of GPIB interconnections are as follows:

1. No more than 15 instruments may be installed on the bus.
2. Total accumulative cable length in meters may not exceed two times the number of bus instruments, or, 20 meters, whichever is less.

#### 3-3 GPIB (IEEE 488 BUS) ADDRESS

The UFX-BER instrument as shipped from the factory is preset to address 5.

#### 3-4 RS-232, RS-422, RS-423 INTERCONNECTION (optional)

RS-232, interconnections are made by means of a DB25S connector mounted on the rear panel. It is wired as DTE. Pin 3 is Receive, Pin 7 is Ground and Pins 4, 5 (RTS-CSD) and Pins 6, 8, 20 (DSR, DCD, DTR) are jumper connected.

Interconnections for RS-422 and RS-423 are made as follows: Use Pin 12 for positive data connection and Pin 13 for negative data connection.