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Find the *NoiseCom UFX-NPR-22* at our website: ***Click HERE***

Data Sheet

NOISE/COM
A WIRELESS TELECOM GROUP COMPANY

UFX-E_bN_0 Series Precision Generators



Count on the Noise Leader. Count on Noise Com.

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UFX-E_bN_o Series Precision E_b/N_o (C/N)Generators

The UFX-E_bN_o is a fully automated instrument that sets and maintains a highly accurate ratio between a user-supplied carrier and internally generated noise, over a wide range of signal power levels and frequencies.

The UFX-E_bN_o gives system, design, and test engineers in the cellular/PCS, satellite and military communication industries a cost-effective means of obtaining higher yield through automated testing, plus increased confidence from repeatable, accurate test results.



Features

Multiple Operating Modes

The UFX-E_bN_o provides five operating modes: carrier-tonoise (C/N), carrier-to-noise density (C/N_o), bit energy-tonoise density (E_b/N_o), carrier-to-interferer (C/I), and power meter. The instrument can also be used as a precision noise generator.

Custom Configurations

The UFX-E_bN_o is available in a variety of configurations to meet your specific testing needs. Applications include: military communications, WCDMA, SATCOM, NASA TDRSS, CableTV, HDTV, IS-95, CDMA, TDMA, UMTS, GPRS L-band modems, Milstar, Inmarsat, Intelsat, and general purpose.

Direct Display of E_b/N_o, C/N, C/I, or C/N_o

The 4 x 20 VFD screen provides simultaneous readout of all significant input and output signal levels relating to the chosen operating mode, including carrier-to-noise ratios.

Accuracy of 0.2 dB RSS

A special, large-dynamic-range power meter measures both the signal and the noise, which allows the UFX-E_bN_o to set the desired ration to within ±0.2 dB. Special configurations can provide improved accuracy.

Bit Rate Entry of 1 bps to 999 Mbps and above

In bit energy-to-noise density testing (E_b/N_o), the instrument automatically calculates noise density based on the userspecified bit rate.

Variable Output Power

Output power is user-specified and can be set within the range of –55 dBm to +5 dBm.

True RMS Power Meter

The digital power meter is custom designed to cover the frequency range of the particular instrument. It can measure signals and noise accurately with Gaussian Noise crest factors up to 18 db.

Direct Testing at both RF and Microwave Frequencies

In configurations that cover two separate frequency ranges, measurements can be made directly with out the need for special conversion circuitry.

Optional Tracking Feature

This function is intended for users with an unstable input signal source who wish to perform accurate long-term testing at a specified E_b/N_o ratio. The tracking option works as an automated gain control (AGC) device, correction for input signal drift up to 0.2 dB resolution. The carrier output level is kept constant and, therefore, so is the E_b/N_o ratio.

Setting Precision C/N Ratios

The UFX-E_bN_o accurately sets carrier-to-noise ratios using the substitution calibration method. This method eliminates the effects of any non-linearity in the measuring device, in this case the power meter, by setting the signal and the noise to the same power level at the power meter input. (See the functional block diagram). The noise power is then offset by the desired ratio. The primary source of inaccuracy within the unit is the attenuator that varies the noise power, and Noise Com uses the most accurate components available. Secondary effects such as thermal drift are negligible since the noise and the power are measured within a very short time frame.

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Active components in the instrument that could be attributed to long-term drift are common to both the signal and noise path, so variations in these components do not affect the calibrated ratio. The unit's linear phase and amplitude signal path ensures that the desired signal passes through undistorted.

Since the UFX-E_bN_O automatically compensates for parameters like bit rates and bandwidth, taking measurement is as simple as pressing a button. Operating modes, function and parameters are set using the front panel controls.

Meter – In this mode, the instrument functions as a true RMS power meter, and uses various averaging methods to ensure more accurate readings.

Measurements are made through couplers, allowing the signal to pass through to the output connector unaltered by the meter circuitry.

E_b/N_O – The instrument automatically sets up a desired Eb/No quickly and accurately. Based on the user-specified carrier output level, output E_b/N_O ratio, and bit rate, the instrument automatically calculates the required noise density.

C/N – This mode sets the specified carrier output level and the total noise power in the system bandwidth to the desired ratio.

C/N_O – To obtain a specific C/N_O ratio, set the instrument to E_b/N_O mode and enter zero for the bit rate. All other functions are the same as the E_b/N_O mode.

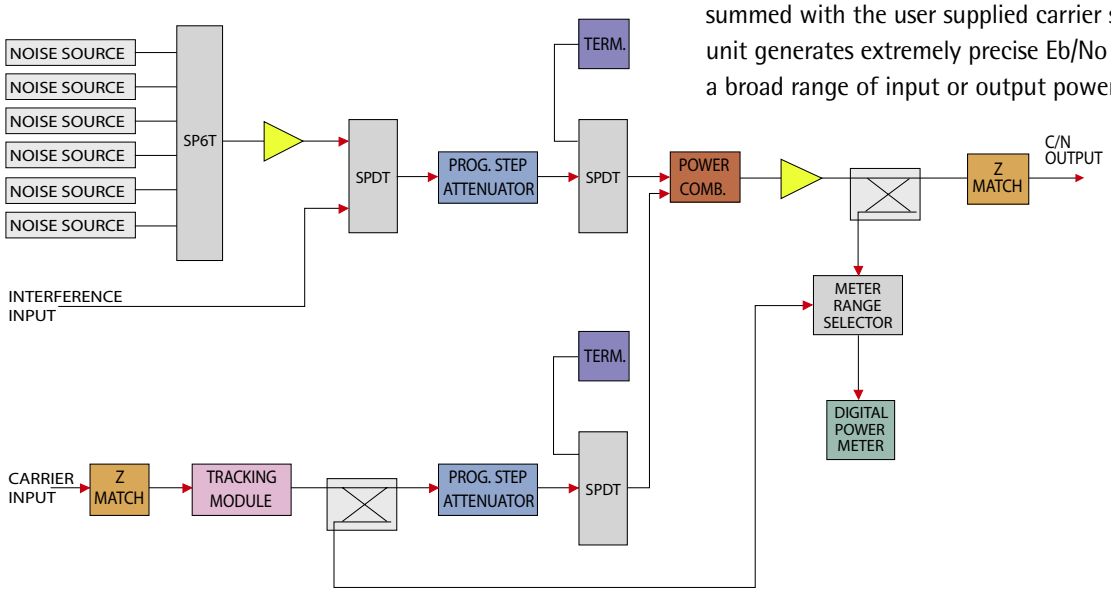
GEN – The instrument can also function as a precision noise generator. Simply select the mode and enter the required noise density. The unit's internal noise source provides the desired signal.

Status Indicators and Display Screen – Front panel indicators and the 4 x 20 VFD display provide constant feedback on the instrument state and settings.

Data Entry and Function Selection – Instructions and data are easily entered through the front panel keypad. The instrument can also be controlled through the standard rear panel IEEE-488-2, optional Ethernet, TCP/IP,or optional RS-232C, RS-422 or RS-423 interfaces.

Simplified Functional Block Diagram

The internal AWGN precision noise source is summed with the user supplied carrier signal. The unit generates extremely precise Eb/No ratios over a broad range of input or output power.



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Specifications

Operating modes	
Carrier-to-noise (C/N), carrier-to-noise density (C/N_0), bit energy-to-noise density (E_b/N_0), carrier-to-interferer (C/I), noise generator, power meter.	
Carrier Path	
Input power range:	-55 dBm to +5 dBm
Maximum input power:	+21 dBm (with no damage)
Output power range:	-55 dBm to +5 dBm
Nominal gain:	±1.0 dB
Gain resolution:	0 to –60 dB in 0.1 dB steps
Gain flatness:	±0.2 dB for 70 MHz ±20 MHz ±0.3 dB for 140 MHz ±40 MHz ±0.4 dB for others
Group delay:	±0.20 ns/40 MHz for frequencies above 20 MHz
Third-order intercept point:	+29 dBm typical
Tracking range (Ubopt01):	+4 dB to –4 dB
Tracking update rate:	100 milliseconds, nominal
Noise path	
Output power range:	-55 dBm to +5 dBm
Flatness:	±0.2 dB/40 MHz ±0.3 dB/80 MHz ±0.4 dB/200 MHz ±0.5 dB/300 MHz
Attenuation range:	60 dB in 0.25 dB steps (0.1 dB steps with Ubopt06)
Ratio accuracy	±0.2 dB RSS, ±0.3 dB WCU
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
Control	Local and IEEE-488
Baud rate (Ubopt04)	150, 300, 600, 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 ±2 dB. Frequency range is equal to the noise bandwidth.
RF connectors	BNC-75ø below 800 MHz, N-type female 50ø above 800 MHz
DC on RF connectors	0 volts, maximum
Primary power	
Voltage	85 to 264 VAC
Frequency	47 to 63 Hz
Consumption	2 amps, maximum
Fuse	2 A
Operating temperature	0° to 50° C
Dimensions	17" W x 5.25" H x 17.5" D

Specification values apply following a 30 minute warmup.
Specifications subject to change without notice.

Ordering Information

Model Number*	Frequency Range	Applications
UFX-EbNo-45	5 to 90 MHz	General Purpose
UFX-EbNo-70	50 to 90 MHz	General purpose/ SATCOM
UFX-EbNo-IF1	50 to 90 MHz and 100 to 180 MHz	Intelsat, SATCOM
UFX-EbNo-IBS/IDR	50 to 90 MHz, 68 to 72 MHz, and 100 to 180 MHz	Intelsat, SATCOM
UFX-EbNo-255	240 to 270 MHz	SATCOM
UFX-EbNo-370	350 to 390 MHz	NASA TDRSS
UFX-EbNo-CATV	50 to 860 MHz in 4 bands	Cable TV
UFX-EbNo-750	650 to 850 MHz	Iridium
UFX-EbNo-892	822 to 962 MHz	IS-95 (CDMA), IS-136 (TDMA)
UFX-EbNo-892/1850	822 to 962 MHz & 1710 to 1990 MHz	Dual-band CDMA
UFX-EbNo-1200	950 to 1210 MHz & 1190 to 1450 MHz	L-band modems
UFX-EbNo-1545	1530 to 1560 MHz	Inmarsat
UFX-EbNo-1850	1710 to 1990 MHz	J-STD-008 (CDMA)
UFX-EbNo-2050	1900 to 2200 MHz	Wideband CDMA
UFX-EbNo-2442	2400 to 2484 MHz	802.11b Wireless LAN
UFX-EbNo-5500	5000 to 6000 MHz	802.11a Wireless LAN
UFX-EbNo-WiMAX	3,400 to 5800 MHz	802.16 WiMax
UFX-EbNo-20000	18 to 22 GHz	Military

Custom Frequency Ranges to 44GHz

Option Number	Description
UEopt01	Automatic gain control to maintain constant carrier power level (Tracking)
UEopt03	50ø input and output impedance**
UEopt04	RS-232C, RS-422, or RS-423 interface***
UEopt05	230 VAC, 50 Hz
UEopt06	0.1 dB/step on output noise and C/N
UEopt09	Ethernet, TCP/IP remote interface

* Call Noise Com regarding custom configurations
** Below 800 MHz, standard impedance is 75ø. Above 800 MHz, 50ø is assumed.
*** In addition to standard IEEE-488-2

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