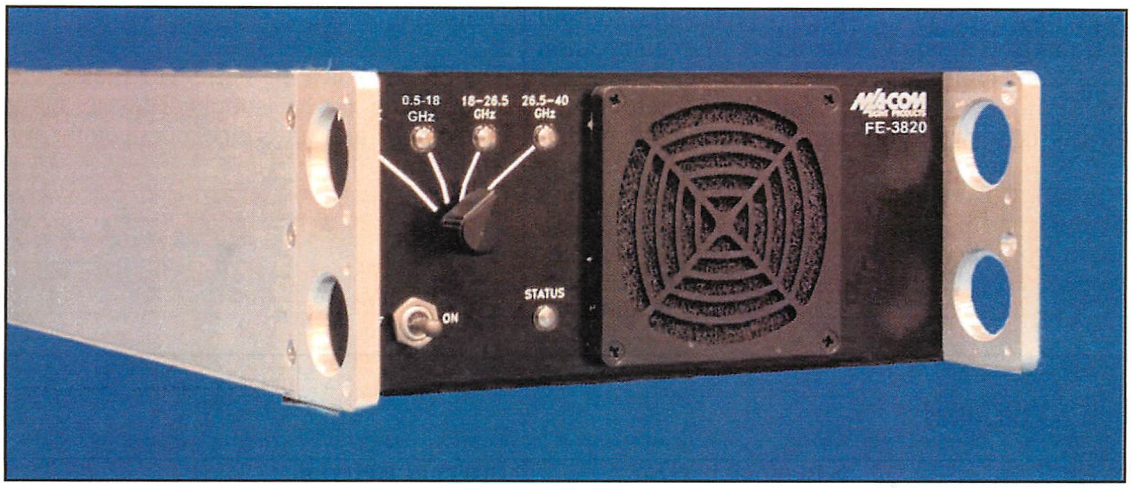
FE-3820
18-40 GHz
FREQUENCY EXTENDER



FE-3820 FRONT PANEL

FEATURES

- **Companion Unit to SMR-3822 and SMR-5550*i* Receivers**
- **Frequency Range:**
  18 to 40 GHz (Converted)
  0.5 to 20 GHz (Direct)
- **Control Modes**
  - **Remote from Companion Receiver**
  - **FE-3820 Front Panel**
  - **Remote via Ethernet or RS-232/RS-422**
- **Low Noise Figure**
- **Low Phase Noise**
- **2U, Half-rack Chassis**
- **Will Operate with Other Manufacturers Receivers**

DESCRIPTION

The FE-3820 Frequency Extender is designed for use with the SMR-5550*i* and SMR-3822 series receivers to provide frequency coverage from 18 GHz to 40 GHz in addition to the coverage provided by the receiver.

Many existing systems can use the FE-3820 with no added switches and minor cable changes. A dedicated RF input to the FE-3820 covers 0.5 to 20 GHz. When the extended range is not selected, the 0.5 to 20 GHz signal is routed through the unit to the companion microwave tuner or receiver. This RF pass-through feature allows the FE-3820 to operate transparently with other manufacturers' equipment. Separate RF inputs accept 18-26.5 and 26.5-40 GHz, which are converted to the 2 to 18 GHz range for the companion tuner.

The FE-3820 has flexible and powerful control features. The primary control source is Ethernet 10/100base-TX using TCP/IP. ASCII commands and interrogations are handled by the internal microcontroller. An auxiliary serial port on the FE-3820 is designed for routing messages from the Ethernet remote controller to a companion receiver. This reduces the number of nodes required, and can provide a serial-to-Ethernet control upgrade. For example, if a M/A-COM SMR-5550 receiver is connected to the FE-3820 auxiliary serial port, a controller at the FE's Ethernet port can operate the receiver. The entire command set for any M/A-COM unit can be routed transparently through the FE-3820.

A different control method is recommended when the FE is used with an SMR-3822 scanning receiver. In this case, the SMR-3822 with Ethernet performs the routing function to the auxiliary serial port of the FE-3820. The SMR-3822 firmware automatically recognizes the presence of the FE in this configuration, and transparently operates through the millimeter wave spectrum including F1-F2 sweep mode.

For systems with limited resources, manual controls, or systems using other manufacturers' tuners, the FE frequency can be set using the built-in local front panel.

Internally, the FE-3820 has RF paths for signals in the frequency range of 0.5-20 GHz, 18-26.5 GHz, and 26.5-40 GHz. The tuning frequency entered at the companion receiver front panel or from a remote controller determines which signal path is selected by internal switching. An SMA connector is provided for signals in the range of 0.5-20 GHz and K connectors for signals in the 18-26.5 and 26.5-40 GHz range. All signals in the 18-40 GHz range are downconverted to an IF of 2-18 GHz. The translated 2-18 GHz IF output from the FE-3820 is automatically gain linearized using stored data in the firmware. The linearization data can be uploaded to the associated receiver when in the frequency extender mode or to a remote PC via the control interface.

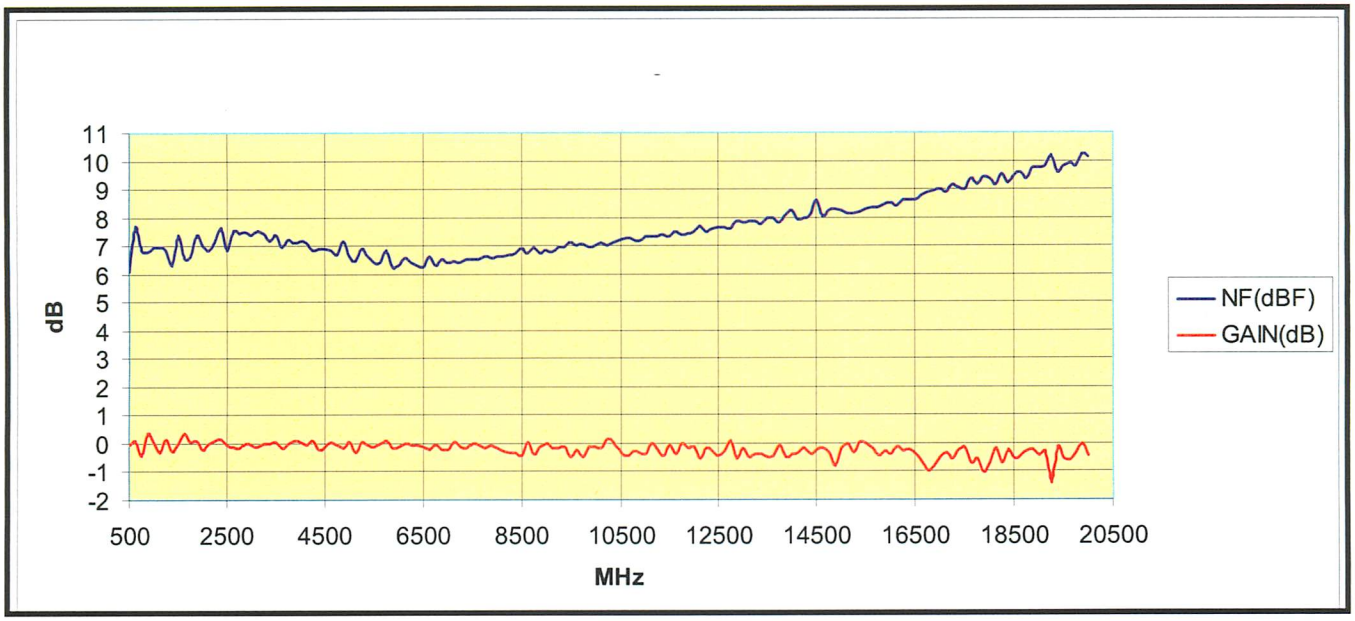
An internal crystal reference allows the FE-3820 to be used independently of other equipment. The unit automatically senses an external 10 MHz reference signal and will lock to it. Built in test (BIT) provides front panel summary indication of a fault. Power supply voltages, phase lock status, internal temperature, reference status (internal or external), RS-232 configuration, unit serial number, firmware version, operating hours, and power on self-test error codes can be displayed on a remote controller or as a separate window in the Graphical User Interface software for the companion receiver.

The FE-3820 is a 2U high, half-rack device powered by an autosensing power supply. Power, RF input and output connectors and interface connectors are located on the front panel.

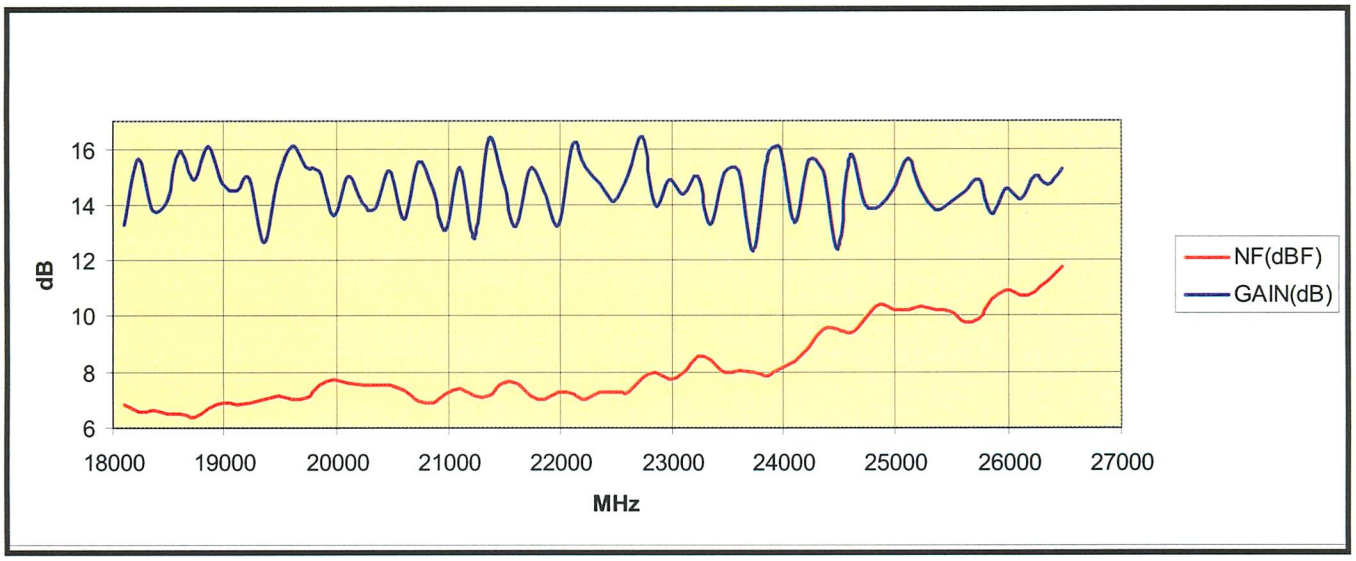
SPECIFICATIONS

RF Input	18 to 40 GHz (Down-Converter) 0.5 to 20 GHz (Direct)
RF Input Connectors	
0.5-20 GHz	SMA
18-26.5 GHz	K type
26.5-40 GHz	K type
Input VSWR	2.0:1, maximum
Input Impedance	50 ohms
LO Radiation at RF Input	-90 dBm, max.
LO Phase Noise	<0.6° rms, integrated phase noise, typical
LO Spurious	-40 dBc, maximum -60 dBc, typical
Noise Figure	<10 dB, typical
1 dB Compression Point	-10 dBm, typical
Image Rejection	75 dB, typical
Third Order Input Intercept Point	0 dBm, min. (0.5-20 GHz) -10 dBm, min. (18-40 GHz)

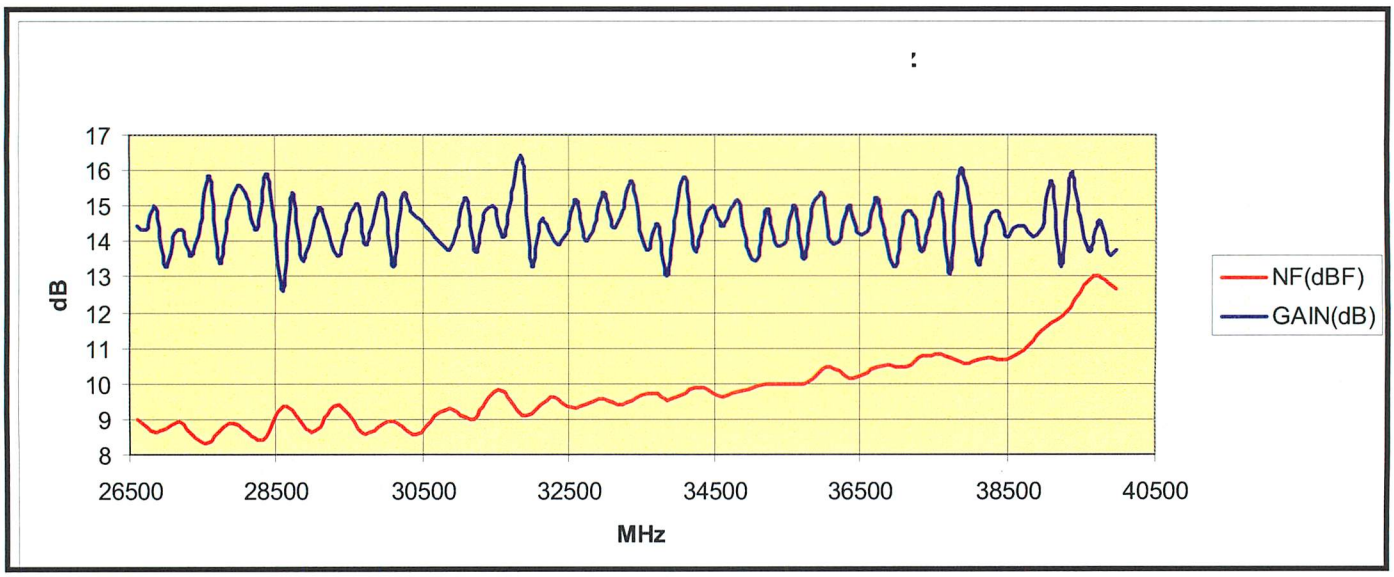
Internal Reference Accuracy	
Short Term Drift	±0.25 ppm over temp.
Long Term Drift	±0.5 ppm/year
External Reference Input	
Frequency	10 MHz
Level	0 dBm ±3 dB
Waveform	Sinewave
IF Output	0.5-20 GHz (Direct) 2.5-17.5 (Converted)
Output Impedance	50 ohms
RF to IF Gain	0 dB, nom. (0.5-20 GHz) 15 dB, nom. (18-40 GHz)
Gain Linearity	±1.5 dB
IF Output Connector	SMA
RS-232/422	9-pin subminature-D
Ethernet 10/100Base-TX	RJ-45
Band Switching Speed	<1 ms
Built-In-Test (BIT)	Power supply voltages, temperature, phase lock status
EMI Shielding	Designed to meet MIL-STD-461B, CE03 RE02



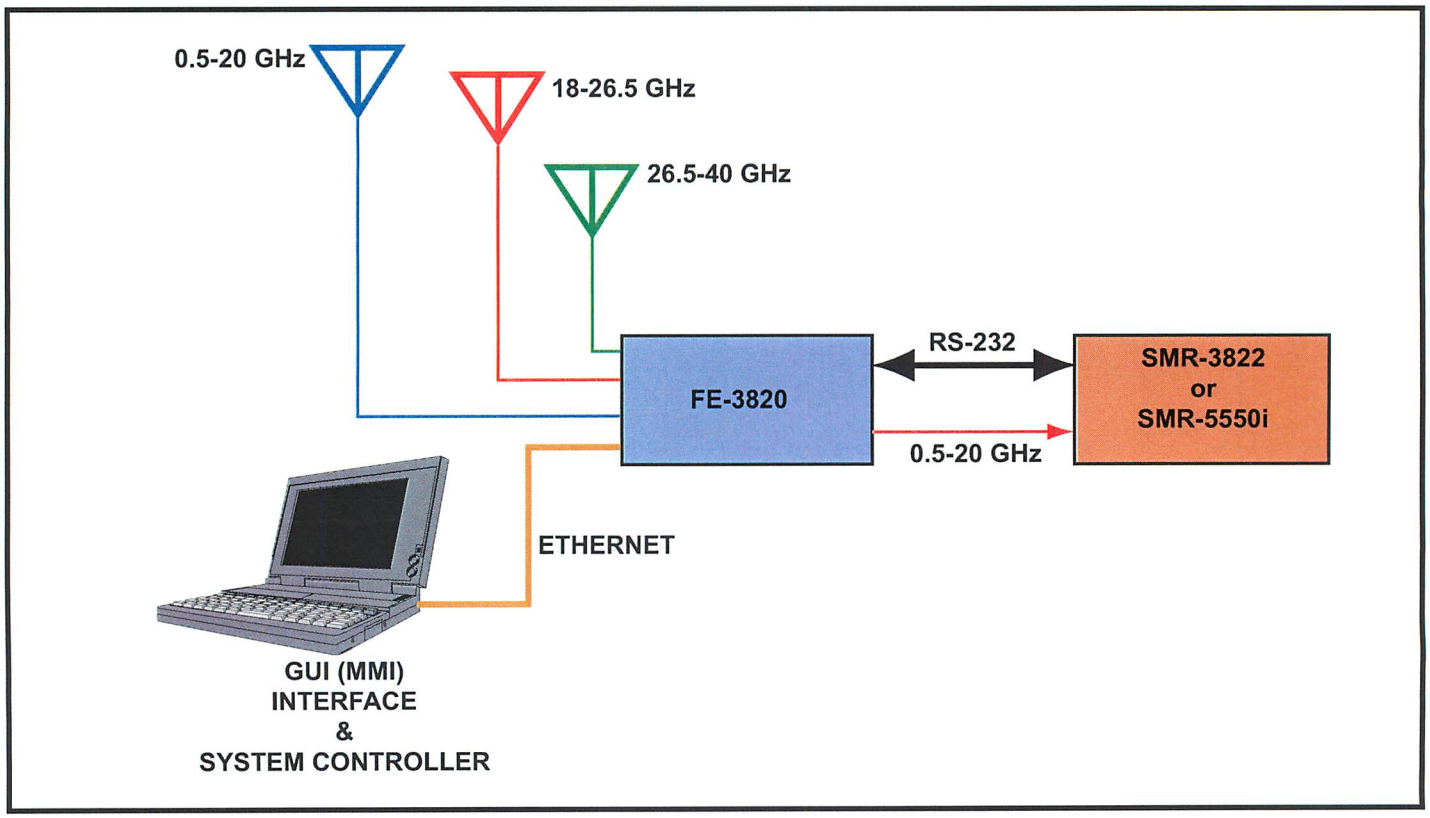
Noise Figure and Calibrated Gain for the 0.5-20 GHz



Noise Figure and Calibrated Gain for the 18-26.5 GHz



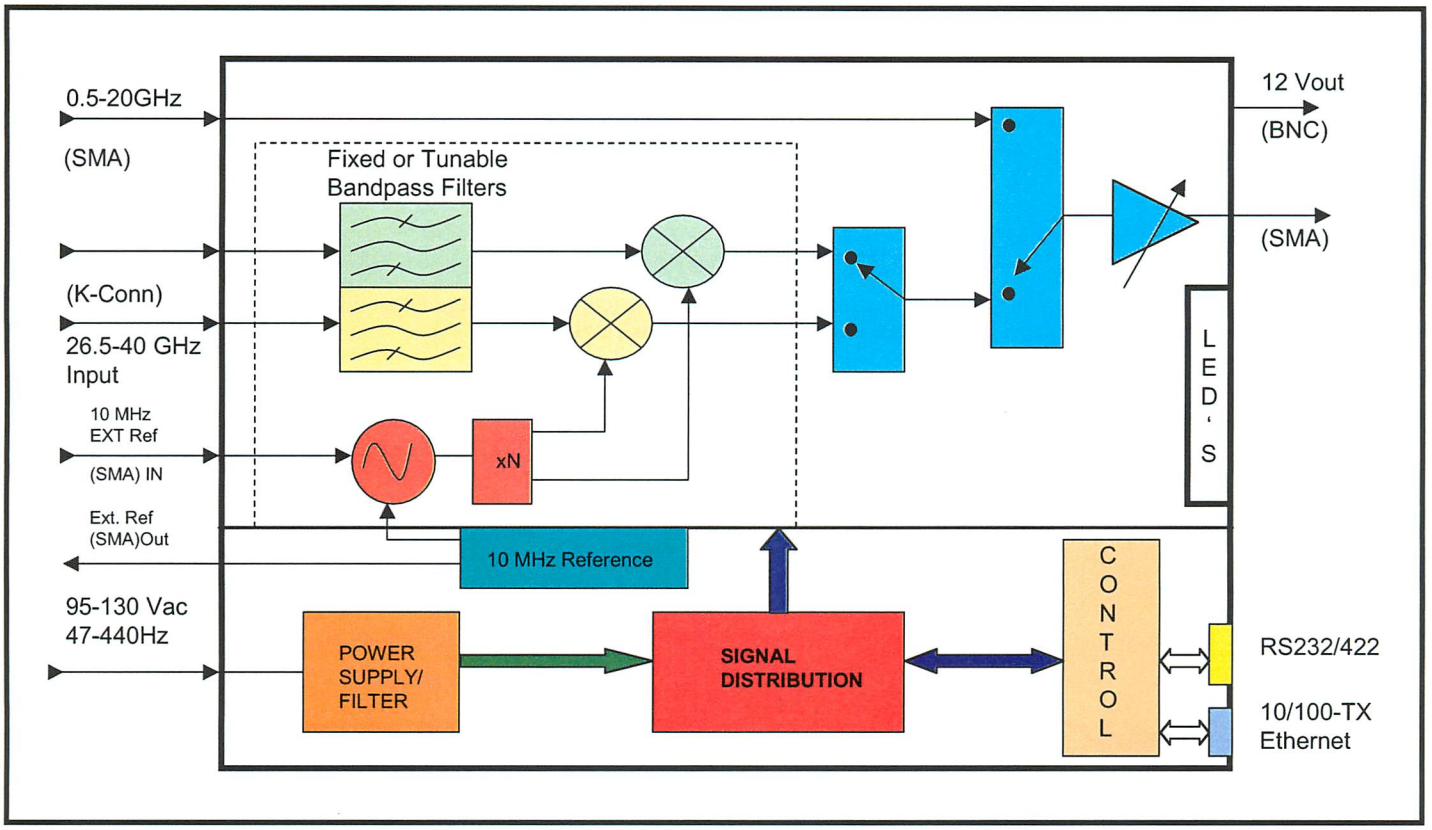
Noise Figure and Calibrated Gain for 26.5-40 GHz



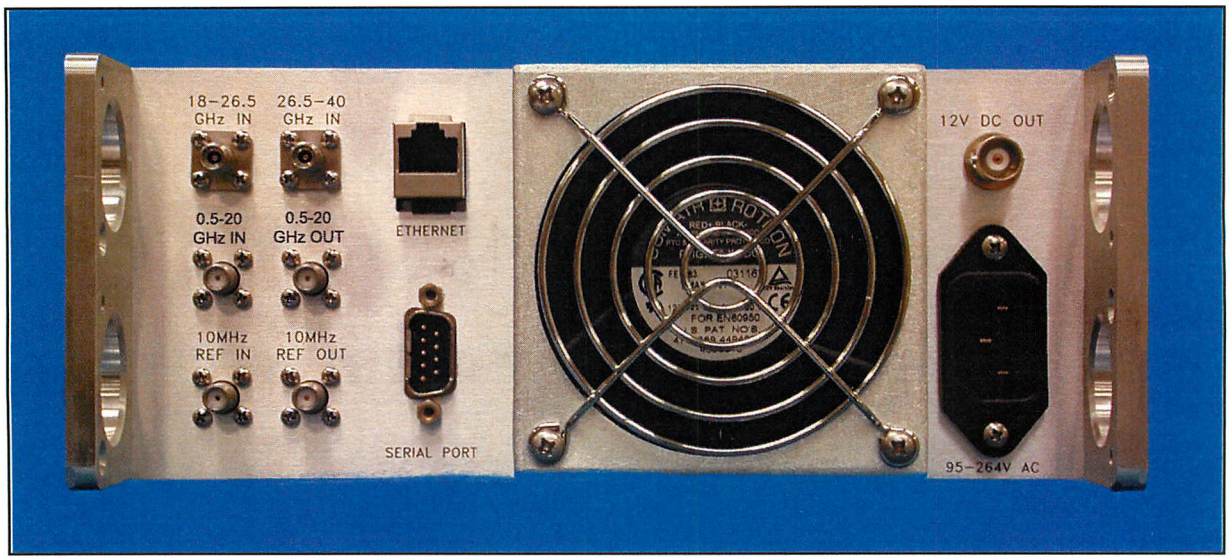
FE-3820 System Block Diagram

Temperature Range Operating	-20° to +60° C
AC Power Input	95 - 130 Vac, 47 - 440 Hz 190 - 264 Vac, 47 - 440 Hz autosensing, 50 W
DC Power Output for External Amplifier	12 Vdc @ 750 ma, BNC connector
Size	3.5 H x 8.5 W x 18 D inches (8.9 H x 21.6 W x 45.7 D cm)
Weight	10 lb (4.5 kg)

Specifications are subject to change without notice.



FE-3820 Block Diagram



FE-3820 REAR PANEL

WARRANTY

All M/A-COM SIGINT Products equipment is warranted for one year, except for damage caused by accident or misuse, provided the equipment is returned for repair to the plant in Hunt Valley, Maryland U.S.A.

M/A-COM SIGINT PRODUCTS
10713 Gilroy Road, P.O. Box 868
Hunt Valley, MD 21030 U.S.A.
Phone 410-329-7900
FAX 410-329-7990
e-mail: sigintsales@tycoelectronics.com
www.macom.com/sigint

tyco / Electronics