



SIR-4002

MICROWAVE WIDEBAND DSP RECEIVERS UP TO 26.5 GHz



WIDE FREQUENCY RANGE: 0.5 – 26.5 GHz

FEATURES

- Advanced Front Panel Alphanumeric Display
- High Dynamic Range: In band Input IP3 > 0 dBm, NF < 15 dB
- DSP Based AM, FM Video Demodulation
- Optional I/Q Digital Over Ethernet
- Fast Switching Synthesizer with 10 Hz Tuning Resolution
- Sweep and Scan Functions up to 512 Channels per Second
- Excellent Phase Noise Performance: < 0.5° RMS
- 500 MHz Bandwidth 1.0 GHz CF L Band IF Output (OPT-109)
- 70, 140, 160 MHz IF Outputs with Selectable Bandwidth from 3.2kHz to 80 MHz
- Manual and Automatic Gain Control with Adjustable Threshold
- Ethernet 10/100 Base T, RS232, RS422/RS485
- 1U 19" Rack Standard*

APPLICATIONS

- ELINT
- Synthetic Instrumentation
- Radio Monitoring of Broadcast Station and IARU-monitoring
- Emission Compliancy Testing
- Direction Finding (DF) Systems
- Telecommunication
- SATCOM
- Radar Warning Receivers (RWR)



SPECIFICATIONS AT 25°C

FREQUENCY

Frequency Range:	0.5 – 26.5 GHz
Impedance:	50 ohms
Tuning Resolution:	10 Hz
Preselector:	YIG Tuned Preselector
Frequency Accuracy vs. Temp (Internal Ref):	$< \pm 0.1$ PPM
Long Term Aging (Internal Ref):	$< \pm 1$ PPM per year.
External Reference Input:	10 MHz at 0 ± 3 dBm, Auto locking
Phase Noise (Typical):	0.5° RMS Integrated from 100 Hz to 10 MHz
Offset 100 Hz:	-70 dBc/Hz
Offset 1 KHz:	-90 dBc/Hz
Offset 10 KHz:	-96 dBc/Hz
Offset 100 KHz:	-104 dBc/Hz
Offset 1 MHz:	-125 dBc/Hz
Offset 10 MHz:	-140 dBc/Hz

SCAN AND SWEEP

Sweep Mode:	F1 to F2 at Selected Frequency Step
Scan Mode:	Up to 512 Channels
Dwell Time:	From 5 millisecond to 60 Seconds, or Stop on Detection
Sweep Rate:	1 GHz per 2.5 milliseconds (In-Band)

RF SECTION

Input VSWR:	2.5 : 1
Input Level:	-35 dBm optimal
RF Input Maximum Level:	+25 dBm with no damage
Noise Figure @ 70 MHz IF Output	
And 1 GHz Output:	15 dB max (measured at max gain)
Conversion Sense:	Inverting / Non Inverting Selectable for L Band and IF Output
RF Gain Variation:	± 1.5 dB vs. RF Input Frequency Range

DYNAMIC RANGE

Spurious Free Dynamic Range:	65 dB (Including Non-Carrier Related Spurious, Carrier Related, IP3, IP2) per 1MHz BW
Image Rejection:	>70 dB
LO Reradiation:	< -95 dBm max at RF Input
LO Spurious:	< -70 dB



In band Input IP3:	0 dBm at 20 dB gain setting
Input P1dB:	-10 dBm (20 dB gain)
Output IP3 (Applied for Wideband IF only):	+28 dBm @ 30 dB gain
Output P1dB:	+18 dBm @ 30 dB gain

WIDEBAND IF OUTPUT

Center Frequency:	1.0 GHz (includes OPT 109)
Bandwidth (3dB):	500 MHz
RF to IF Gain:	30 dB (0 dB Attenuation)
Gain Flatness Over 80%IF BW:	± 1.2 dB max
Group Delay Variation:	3 nsec max over 80% of 3 dB BW (Meet IESS 308 SATCOM Standard)
Manual Gain Control:	Programmed 30 dB, 1 dB Resolution
1.0 GHz IF Signal Monitor Output Level:	-20 dBc
Impedance:	50 ohms
VSWR:	2:1 Max

RECONSTRUCTED IF OUTPUT

Frequency:	70 MHz
Bandwidth (3 dB):	3.2kHz, 6.4kHz, 10kHz, 15kHz, 20kHz, 30kHz, 50kHz, 100kHz, 200kHz, 300kHz, 400kHz, 1MHz, 2MHz, 5MHz, 10MHz, 20MHz, 40MHz
Group Delay:	Linear phase FIR design for 3.2kHz to 40 MHz IF BW's (all above)
Gain Flatness over 80% of IF BW:	± 0.4 dB (Typ.), ± 0.6 dB (Max.)
70 MHz IF Output Level:	Adjustable in AGC mode (see below)
Manual Gain Control (MGC):	Programmed 70 dB, 1 dB Resolution
Automatic Gain Control (AGC):	70 dB Range, Fast Attack, Programmed Decay
Fast Attack:	2 msec for 50 dB Change, 2 msec During Sweep or Scan
Decay Time:	Programmed from 1 msec to 1 second
IF Output Level:	Programmed from +7 dBm to -35 dBm, 1 dB Step

ANALOG IF OUTPUT

Frequency:	140 ,160 MHz
Bandwidth (3 dB):	40 MHz, 80 MHz typical
Gain Flatness over 80% of IF BW:	± 0.6 dB (Typ.), ± 0.8 dB (Max.)
RF to IF Gain	30 dB max
Manual Gain Control (MGC):	Programmed 50 dB, 1 dB Resolution
IF Output Impedance:	50 ohm
Group Delay Variation:	6 nsec over 80% of BW
VSWR:	2.0:1 Max
IF Signal Monitor Output Level:	-20 dBc



LOG VIDEO OUTPUT

Dynamic Range: 70 dB
Output Level: 3.0 VDC Full Scale
Linearity: ± 1.5 dB
Impedance: 50 ohms

FM VIDEO DEMODULATOR

Output Level: 1 Vp-p for 2/3 of selectable IF Bandwidth
Coupling: DC
Video Response (3 dB): 50% of IF Bandwidth
FM Gain: 0.1 to 1 Vpp
Connector Type: BNC-F
Impedance: 50 ohms

AM VIDEO DEMODULATOR

Output Level: 1 Vp-p $\pm 10\%$ for -10 dBm IF Output
Coupling: DC
Video Response(3 dB): 50% of Reconstructed IF Bandwidth
Video Gain: 0.1 to 1 Vp-p adjustable
Connector Type: BNC-F
Impedance: 50 ohms

AM AUDIO OUTPUT

Level: 1 Vrms for -10 dBm IF Output
Response: 300 Hz to 10 KHz, -3 dB
Attenuation Range: 30 dB, 1 dB Step
Connector Type: BNC-F
Impedance: 600 ohms
Phone Output: 1/8" Phone Jack, Front Panel

FM AUDIO OUTPUT

Level: 1 Vp-p
Response: 300 Hz to 10 KHz, -3 dB
Attenuation Range: 0.1 to 1 Vp-p
Connector Type: BNC-F
Impedance: 600 ohms

PHONE OUTPUT:

1/8" Phone Jack, Front Panel

DIGITAL AUDIO:

Voice over IP (VoIP) (OPT-124)
RTP (Per RFC 1889/1890)
CODEC: A-law G.711 (20ms)
User selectable destination: IP Address, Port #, mask, GW, Up to four (4) destinations simultaneous



ENVIRONMENTAL

Operating :

Temp Range:	0° C to +60° C (tested at +50° C)
Relative Humidity:	Up to 95% at +30° C
Altitude:	10,000 Feet

Non Operating:

Relative Humidity:	Up to 95% at +40° C
Altitude:	Up to 40,000 Feet
EMI:	Designed to Meet MIL-STD-461C, CE03 and RE02
Shock:	MIL-STD-810E, Method 516.4, Procedure VI
Vibration:	MIL-STD-810E, Method 514.4 Procedure I, Category 9, Fig. 514.4-15
AC Power:	95 to 265 VAC, 47-63 Hz, 150 Watts

MECHANICAL

Required Package:	19" 1U (1.75" H X 22" D X 17" W)
Weight:	20 Pounds

REAR PANEL CONNECTORS

0.5 to 26.5 GHz RF Input:	SMA F
Switchable AM Video, FM Video Output:	BNC F
Switchable AM, FM Audio Output:	BNC F
Log Video Output:	BNC F
IF Output:	BNC F
IF Monitor Output:	BNC F
L Band IF Output:	SMA F
L Band IF Monitor Output:	SMA F
External REF Input:	BNC F
REF Output:	BNC F
Ethernet	RJ 45
Remote Interface	DEM – 9S
Summary Alarm	DE – 9D

OPTIONS

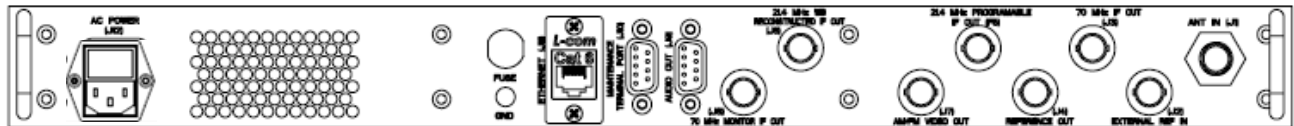
OPT-109	1 GHz L-band Output
OPT-112	Operating Temp Range (-20° to 60° C)
OPT-124	VOIP
OPT 126	Aircraft Power Supply: 115 VAC, 400 Hz, 100 Watts
OPT 128	Stretched Audio Output up to 50 microseconds
OPT 137	Airborne (RTCA/DO-160E). Contact Factory for Details.

* For other form factors contact factory

Specifications are subject to change without notice.



FRONT PANEL



REAR PANEL

ABOUT FEI-ELCOM TECH, Inc

FEI-Elcom designs and manufactures instruments and modules in the RF and Microwave frequency spectrum for broadband and narrow band applications in ATE, Aerospace/ Defense, SIGINT and commercial communications. Proprietary technologies include low phase noise fast switching direct analog synthesis, low noise indirect PLL designs, and RF DSP up to 40GHz.

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