



## SIR-4011

### MICROWAVE WIDEBAND DSP RECEIVER



### WIDE FREQUENCY RANGE: 0.5 – 18.0 GHz

#### FEATURES

- Advanced Front Panel Graphics 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
- Optional Streaming Audio over Ethernet
- 500 MHz Bandwidth 1.0 GHz CF L Band IF Output
- 70 MHz IF Output with Selectable Bandwidth from 3.2 KHz to >25 MHz
- 160 MHz IF Output with 80 MHz BW Typical
- Manual and Automatic Gain Control with Adjustable Threshold
- Ethernet 10/100 Base T, RS232, RS 485
- 2U 19" Rack Standard\*

#### APPLICATIONS

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



## SPECIFICATIONS AT 25°C

### FREQUENCY

Frequency Range:	0.5 – 18 GHz
Impedance:	50 Ohms
Tuning Resolution:	10 Hz
Preselector:	YIG Tuned Preselector
Frequency Accuracy vs. Temp (Internal Ref):	< +/- 0.1 PPM
Long Term Aging (Internal Ref):	< +/- 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:	-95 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
List Mode:	Up to 512 Frequencies
Dwell Time:	From 5 millisecond to 60 Seconds, or Stop on Detection
Tuning Speed:	1.25 milliseconds / 100MHz

### RF SECTION

Input VSWR:	2.5 : 1
Input Level:	-35 dBm optimal
Noise Figure @ 1 GHz Output:	14 dB Typical
Noise Figure @ 70 MHz IF Output	14 dB Typical
RF Input Maximum Level:	+25 dBm with no damage
Conversion Sense:	Non Inverting
RF Gain Variation:	+/- 1.5 dB vs. RF Input Frequency Range

### DYNAMIC RANGE

Two Tone SFDR:	65 dB RF to IF, 1 MHz BW, $f_1-f_2 \leq 25\%$ of BW
Linear Dynamic Range:	$\geq 90$ dB, RF to IF, 1 MHz 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  
Output P1dB +18 dBm @ 30 dB Gain

## WIDEBAND IF OUTPUT

Center Frequency: 1.0 GHz  
Bandwidth ( 3dB): 500 MHz  
RF to IF Gain: 30 dB (0 dB Attenuation)  
Gain Flatness Over 80%IF BW:  $\pm 1.2$  dB max  
Group Delay Variation: 3 nsec max over 80% of 3 dB BW (Meet IESS 308 SATCOM Stand)  
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

## 70 MHz RECONSTRUCTED IF OUTPUT

Bandwidth ( 3 dB): 3.2 KHz, 6.4 KHz, 10 KHz, 15 KHz, 20 KHz, 30 KHz, 50 KHz, 100 KHz, 200 KHz, 300 KHz, 400 KHz, 1 MHz, 5 MHz, 10 MHz, 20 MHz, 25-30 MHz  
Group Delay: Linear phase FIR design for 3.2 KHz to 20 MHz IF BW (all of the above)  
Gain Flatness over 80% of IF BW:  $\pm 0.4$  dB (Typ.),  $\pm 0.6$  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 +7dBm to -35 dBm, 1 dB Step

## ANALOG IF OUTPUT

Frequency: 160 MHz  
Bandwidth ( 3 dB): 80 MHz Typical  
Gain Flatness over 80% of IF BW:  $\pm 0.6$  dB (Typ.),  $\pm 0.8$  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  
NB IF Signal Monitor Output Level: -20 dBc

## LOG VIDEO OUTPUT

Dynamic Range: 70 dB  
Output Level: 3.0 VDC Full Scale  
Linearity:  $\pm 1.5$  dB  
Impedance: 50 Ohms



## FM VIDEO DEMODULATOR

Output Level:	1 Vp-p for 2/3 of selectable IF Bandwidth
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 for 2/3 of selectable IF BW
Coupling:	DC
Video Response(3 dB):	50% of Reconstructed IF Bandwidth
Video Gain:	0.1 to 1 Vp-p
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

## STREAMING AUDIO:

64 KBPS

## BUILT IN TEST (BIT):

Power Supply Voltages, Three Phase Lock Alarms, Over Temp

## CONTROL

Local Manual Control:	Keyboard & Display
Remote Programming	Ethernet 10/100 Base T, RS 422/RS 485 and RS 232



## ENVIRONMENTAL

Operating Temp Range:	-10° C to +55 ° C, MIL-STD-810E Method 501.3, 502.3
Non Operating:	-30° C to +85° C, MIL-STD-810E Method 501.3, 502.3
Relative Humidity:	Up to 95%, Non Condensing, MIL-STD-810E Method 501.3, 502.3
Altitude:	13,000 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, 47-440 Hz, 150 Watts

## MECHANICAL

Required Package:	19" 2U (3.50" H X 22" D X 17" W)
Weight:	20 Pounds

## REAR PANEL CONNECTORS

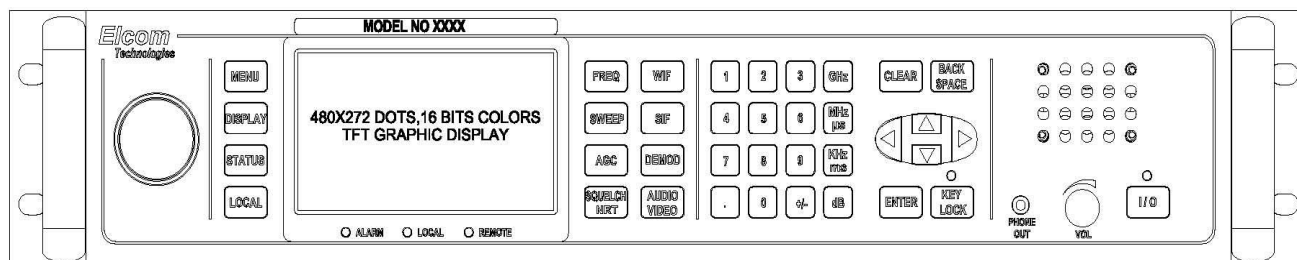
0.5 to 18 GHz RF Input:	SMA F
Switchable AM Video, FM Video Output:	BNC F
Switchable AM, FM Audio Output:	BNC F
Log Video Output:	BNC F
IF Output:	BNC F
IF Monitor Output:	BNC F
WB 1 GHz IF Output:	SMA F
WB 1 GHz IF Monitor Output:	SMA F
External REF Input:	BNC F
REF Output:	BNC F
Ethernet	RJ 45
Remote Interface	DEM-9S
Summary Alarm	DE -9D

## OPTIONS

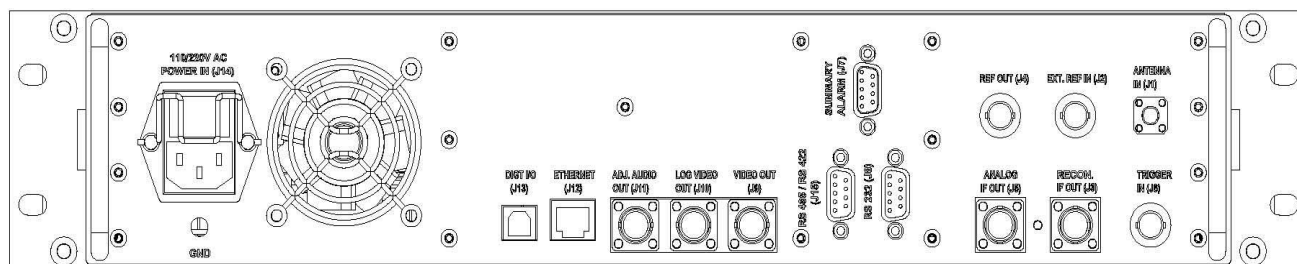
OPT-112	Operating Temp Range (-20° to 60° C)
OPT-124	Streaming Audio over Ethernet 64 KBPS
OPT 126	Aircraft Power Supply: 115 VAC, 400 Hz, 100 Watts
OPT 137	Airborne (RTCA/DO-160E). Contact Factory for Details.
OPT 140	GUI with Panoramic IF 20 MHz plus swept spectral display 0.5 to 18 GHz

\* For other form factors contact factory

Specifications are subject to change without notice.



**UNIT FRONT VIEW**



**UNIT REAR VIEW**

**CONNECTORS**

J1	SMA-F	ANTENNA INPUT
J2	BNC-F	EXTERNAL REFERENCE INPUT
J3	BNC-F	10.7/21.4/70 MHz RECONSTRUCTED IF OUTPUT
J4	BNC-F	REFERENCE OUTPUT
J5	BNC-F	140 MHz ANALOG IF OUTPUT
J6	BNC-F	TRIGGER INPUT (OPTIONAL)
J7	DB-9,M	SUMMARY ALARM
J8	DB-9,F	RS-232
J9	BNC-F	VIDEO OUTPUT
J10	BNC-F	LOG VIDEO OUTPUT
J11	BNC-F	ADJUSTABLE AUDIO OUTPUT
J12	RJ-45	ETHERNET 10/100
J13	USB, B	DIGITAL I/O
J14	POWER ENTRY MODULE	AC POWER INPUT
J15	DB-9,F	RS-485, RS-422

**REAR VIEW AND CONNECTOR TABLE  
SUBJECT TO CHANGE**

FEI-Elcom Tech, Inc.			
1.000	2/2	XXXXX-00-VCD	XX

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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