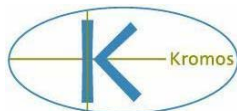


# L-Band Plug-in Modules Specifications

## L-BAND TRANSMIT CARD SPECIFICATIONS

<b>L-Band IF Transmit Card</b>	
IF Center Frequency	950-1700 MHz, Programmable in 500 Hz Steps.
Output Level Range	0 to -25 dBm into 50 ohms (0.5 dB Steps)
Output Level Stability	+/- 0.25 dB over Time (Freq. & Temp. Fixed) +/- 0.50 dB over Freq. (Time & Temp Fixed) +/- 2.00 dB over Temp. (Time & Freq. Fixed)
Phase Noise Outputs	Freq. From Center (Hz)      SSB Phase noise density (dBc/Hz)
	10                                      -35
	100                                     -65
	>100k                                 -95
Spurious Outputs	<-40 dBc
TX IF Output	TNC Female, 50 Ohm.
TX IF VSWR	1.25:1
Spectral Mask	IESS-308 Compliant
CW Mode Operation	950-1700 MHz, Frequency and Power adjustable in steps of 2.5 kHz and 0.5 dB steps respectively.
Modulation	QPSK, or none (pure carrier)
Data Rate	Variable rate: 128 kbps to 5 Mbps in 2 kbps steps.
FEC	Selectable: Viterbi R $\frac{1}{2}$ , R $\frac{3}{4}$ , R $\frac{7}{8}$ , Concatenated Reed-Solomon Outer Code compliant with IESS-308 Appendix H
Diff Encoding	Selectable: on/off
Spectral Inversion	Selectable: on/off
Scrambling	Selectable: IESS-308 or none
DC Power on Center Conductor	0 to 60v @ 3Amps (NO FUSE). User must supply DC power to connector on faceplate of PCA.
10 MHz on Center Conductor	Selectable on/off
FSK on Center Conductor	For ODU monitoring and control
Physical	Occupies 1 slot

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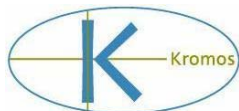
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# L-BAND RECEIVE CARD SPECIFICATIONS

	<b>L-Band IF Receive Card</b>			
IF Center Frequency	950-1750MHz			
Input Level Range	Threshold level scales linearly with log10(symbol rate). -59 dBm for 2500 kSymb/sec. -75 dBm for 64 kSymb/sec. -75 dBm + 10*log10(SymbolRate/(64kSymb/sec)) for other rates. Must also satisfy the following limitations: Total Power input +/- 50 MHz about and including desired carrier must not exceed -30 dBm Total Power input +/- 50 MHz about Desired carrier must not exceed +17 dBc			
RX IF Input	Type F, Jack, 75 Ohm.			
RX IF VSWR	1.5:1			
Spectral Mask	IESS-308 Compliant			
Modulation	QPSK			
Data Rate	Variable rate: 128 kbps to 5Mbps in 2kbps steps.			
FEC	Selectable: Viterbi R $\frac{1}{2}$ , R $\frac{3}{4}$ , R $\frac{7}{8}$ , Concatenated Reed-Solomon (RS) Outer code compliant with IESS-308 Appendix H			
Diff Encoding	Selectable: on/off			
Spectral Inversion	Selectable: on/off			
Scrambling	Selectable: IESS-308 or none			
<b>Performance with Viterbi Only</b>	<b>Eb/No Performance in dB vs BER for Various Coding Rates</b>			
	<b>BER</b>	<b>R<math>\frac{1}{2}</math></b>	<b>R<math>\frac{3}{4}</math></b>	<b>R<math>\frac{7}{8}</math></b>
	1.00E-09	7.8	9.4	10.3
	1.00E-08	7.25	8.75	9.6
	1.00E-07	6.65	8.1	9.0
<b>Performance with Viterbi and RS (219,201) Outer Coding</b>	1.00E-09	4.5	5.9	6.7
Acquisition Range	+/-50 kHz with adjustable sweep width			
Physical	Occupies 1 slot			

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# L-BAND COMBINER CARD SPECIFICATIONS

## L-Band Combiner Card

### RF

Number of Input Ports	6 (internal to PC) – Each port is software selectable (on/off). Unselected inputs are automatically terminated.
Outputs:	TNC Female, 50 Ohm
Frequency Range	950-1700 MHz,
Individual Port Input to Output Gain	0 dB nominally
Gain Flatness	+/- 1.5 dB
Port to Port Amplitude Balance	+/-0.5 dB nominally
P (1dB)	7.5 dBm
Third Order Intercept	18 dBm typ.
Power Input	0 dBm Max.

### Power Detector

Measures total RF power of combined (selected) inputs

### 10 MHz Reference

Provides a means of combining 10 MHz reference signal onto output.

#### Input

+5 to – 5 dBm sine wave, Bandpass filtered, and switched.  
(supplied from internal reference card)

#### Control

Selectable on/off.

### DC Volts

Provides externally supplied DC voltage onto the output connector.

#### Voltage/Current

0 to 60v @ 3Amps (NO FUSE). User must supply DC power to connector on faceplate of PCA.

### M&C Serial I/O

A single UART that can be software configured to supply 3 wire RS232, 3 wire RS485, (Requires additional faceplate connector) or FSK M&C on coax to ODU.

### FSK

Provides FSK data for M&C to output connector.

### Relay output

Controlled by WatchDog Timer and power.

#### Faults detected

Hung CPU and No Power.

#### Connector

3 Pin (NO, NC, COM) (AMP INCORPORATED 147278-2)

#### Contact Ratings

0.5 Amps/110 V or 1 Amp/30V

### Indicators

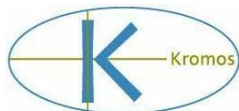
#### Green LED

When Lit Indicates no faults

### Physical

Occupies 1 slot (additional faceplate required if Serial port used).

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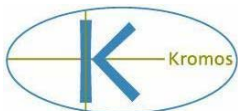
## L-BAND DIVIDER CARD SPECIFICATIONS3

<b>L-Band Divider Card</b>	
<b>RF</b>	
Number of Output Ports	10 (internal to PC) – Each port is software selectable (on/off). Unselected ports are automatically terminated.
Monitor Output	BNC-F, 50 ohms, -20 dB down from input.
Input	F-type Female, 75 Ohm
Frequency Range	950-1750 MHz,
Output Connectors	Mini-SMB-male, 75 Ohms.
Input VSWR	1.5:1 Max.
Output VSWR	1.5:1 Max.
Input to Individual Port Output Gain	0 dB nominally
Gain Flatness	+/- 1.5 dB
Port to Port Amplitude Balance	+/-0.5 dB nominally
P (1dB)	-3 dBm
IP3	12 dBm typ.
Power Input	-25 dBm Max.
<b>M&amp;C Serial I/O</b>	A single UART that can be software configured to supply 3 wire RS232, 3 wire RS485, (Requires additional faceplate connector) to ODU.
<b>Relay output</b>	Controlled by WatchDog Timer and power.
Faults detected	Hung CPU and No Power.
Connector	3 Pin (NO, NC, COM) (AMP INCORPORATED 147278-2)
Contact Ratings	0.5 Amps/110 V or 1 Amp/30V
<b>WatchDog Timer</b>	Detects Hung CPU (Selectable enabled or disabled)..
<b>Physical</b>	Occupies 1 slot (additional faceplate required if Serial port used).

## 10 MHZ CLOCK REFERENCE CARD SPECIFICATIONS

<b>10 MHz Clock Reference Card</b>	
Nominal Frequency	10.0 MHz
Frequency Stability over Temperature	+/- 10ppb (Ref. 25 deg. C).
Aging	Per day, $\pm 0.5$ ppb (After 30 days Operation) Per year, $\pm 0.1$ ppm (After 30 days Operation)
Adjustment	Software Controlled DAC.
SSB Phase Noise	< -134dBc/Hz @ 100Hz offset < -144dBc/Hz @ 1kHz offset < -152dBc/Hz @ 10kHz offset.
Spurs	Non-harmonic: -100dBc, 10Hz to 10kHz -125dBc, >10kHz Harmonic: -20 dBc.
Physical	Custom mounting, 1”H x 5.5” L x 5” W

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