



# 1:1 AND 1:2 REDUNDANT LOW- NOISE Ka-BAND BLOCK CONVERTER SYSTEMS



1:1  
CONTROLLER



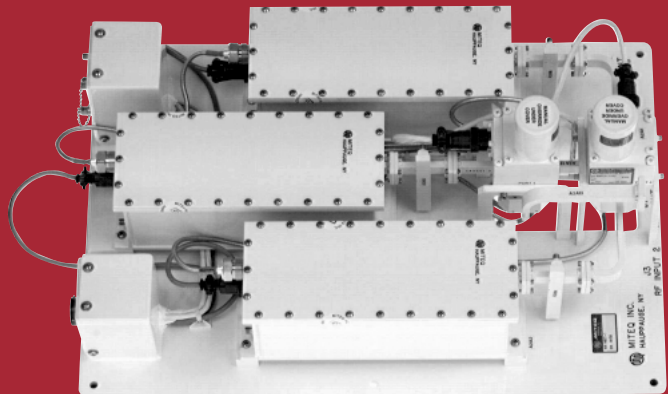
1:2  
CONTROLLER

## FEATURES

- Low noise temperature downconverters
- Fault tolerant design
- Redundant hot-swappable power supplies
- Remote control and status via RS422 or RS485 user selectable
- Automatic/manual control
- Off-line input/output access
- Time stamped event history
- Continuous operation during fault repair or maintenance

## OPTIONS

- Remote RS232 or contact closure
- Ethernet interface
- High stability reference
- Input/output signal monitors
- Remote control unit



The 1:1 and 1:2 redundant low-noise block (LNB) converter systems are designed to ensure continuous operation without disruption of signal transmission.

A fault condition in the on-line LNB, or an operator generated command, will switch the standby LNB to the on-line position and remove the on-line LNB from the signal path.

The redundant LNB system consists of an outdoor LNB/switch assembly, rack mounted local control unit and interconnect cable.

## SPECIFICATIONS

Model Number	Model Number	Input Frequency (GHz)	Output Frequency (GHz)
RB1-183188	RB2-183188	18.3 – 18.8	0.95 – 1.45
RB1-197202	RB2-197202	19.7 – 20.2	0.95 – 1.45
RB1-202212	RB2-202212	20.2 – 21.2	0.95 – 1.95
RB1-202212-1	RB2-202212-1	20.2 – 21.2	1 – 2

### RF specifications

Type..... Single conversion

Frequency sense ..... No inversion

### Input characteristics

Impedance ..... 50 ohms

Return loss..... 18 dB minimum

### Output characteristics

Impedance ..... 50 ohms

Return loss..... 15 dB minimum

Power output (1 dB compression) ..... +10 dBm minimum

### Transfer characteristics

Gain ..... 50 dB minimum

Image rejection ..... 80 dB minimum

### Level stability

Constant temperature .....  $\pm 0.25$  dB/day maximum

Over operating temperature ..... 2 dB maximum

Noise temperature ..... 150°K maximum at 23°C (excludes input switch and Option1)

Amplitude response .....  $\pm 0.5$  dB/ $\pm 40$  MHz,  $\pm 2.0$  dB over RF-band

Group delay ..... 1 ns peak-to-peak maximum

Intermodulation distortion (third order)..... With two 0 dBm output signals, 20 dBc minimum

Signal related spurious ..... 65 dBc minimum up to 0 dBm output level

Signal independent spurious ..... -70 dBm maximum

LO leakage at RF..... -70 dBm maximum

Frequency stability .....  $\pm 5 \times 10^{-8}$ , -40 to +60°C (higher stability options available),  
 $\pm 5 \times 10^{-9}$ /day typical (fixed temperature after 24 hour on time)

Automatic reference configuration ..... External 5 or 10 MHz at +4  $\pm 3$  dBm

If external reference is below +1 dBm nominal,  
the converter will automatically lock to the internal reference

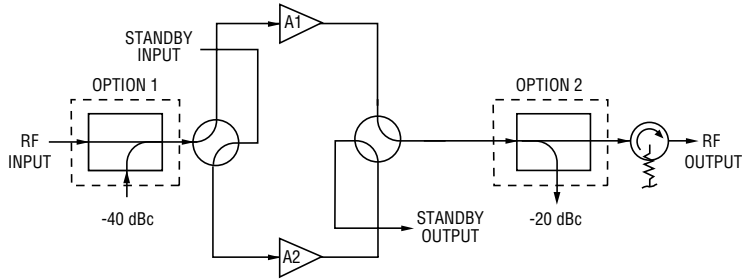
Isolation between any path ..... 50 dB minimum

## OPTIONS

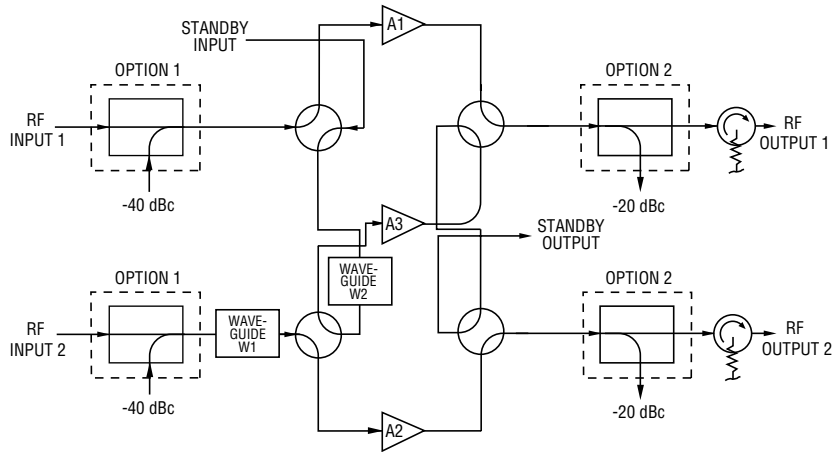
1. Test input inject crossguide coupler, 40 dB nominal coupling level.
2. Output test coupler, 20 dB nominal coupling level.
- 6-(x). Local control unit to LNB/switch assembly cable length. (x) is the length of the cable in feet. Available from 10 to 400 feet in 10 foot increments. 100 foot cable supplied as standard.
10. Higher frequency stability reference.  
 $\pm 5 \times 10^{-9}$ , -40 to +60°C  
 $1 \times 10^{-9}$ /day typical (fixed temperature after 24 hour on time).
17. Remote control.
  - C. RS232.
  - D. Contact closure.
  - H. 10/100 Base-T Ethernet interface providing:  
Web-browser-based configuration, SNMP 1.0 configuration, alarm reporting via SNMP trap, telnet access, password protection.

Note: Missing option numbers are not applicable to this product.

## 1:1 REDUNDANT LNB SYSTEM BLOCK DIAGRAM



## 1:2 REDUNDANT LNB SYSTEM BLOCK DIAGRAM



Typical system noise temperature calculation:

1:1 Redundant LNB System:

$$T_{\text{system}} = T_{\text{LNB}} + T_{\text{SWITCH}} + T_{\text{OPTION 1}}$$

1:2 Redundant LNB System:

RF input 1: LNB 1 on-line signal path

$$T_{\text{system}} = T_{\text{LNB}} + T_{\text{SWITCH}} + T_{\text{OPTION 1}}$$

RF input 1: LNB 3 on-line signal path (LNB 1 standby)

$$T_{\text{system}} = T_{\text{LNB}} + 2 * T_{\text{SWITCH}} + T_{\text{W2}} + T_{\text{OPTION 1}}$$

RF input 2: LNB 2 on-line signal path

$$T_{\text{system}} = T_{\text{LNB}} + T_{\text{W1}} + T_{\text{SWITCH}} + T_{\text{OPTION 1}}$$

RF input 1: LNB 3 on-line signal path (LNB 2 standby)

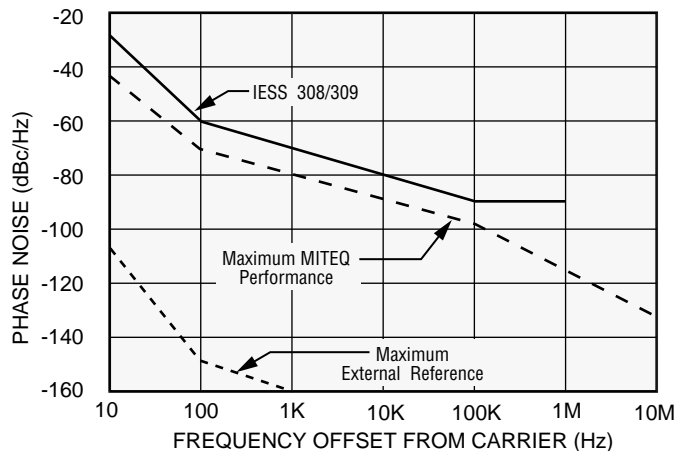
$$T_{\text{system}} = T_{\text{LNB}} + 2 * T_{\text{SWITCH}} + T_{\text{W1}} + T_{\text{W2}} + T_{\text{OPTION 1}}$$

### Typical Noise Temperature in Kelvin at 23°C

Band (GHz) 17.7-22.0

Band (GHz)	17.7-22.0
WR-42	
$T_{\text{SWITCH}}$	19°
$T_{\text{W1}}$	7°
$T_{\text{W2}}$	11°
$T_{\text{OPTION 1}}$	12°

### PHASE NOISE CHARACTERISTICS (1.0 Hz BANDWIDTH)



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## CONTROLLER PRIMARY POWER REQUIREMENTS

Voltage .....	90–250 VAC
Frequency .....	47–63 Hz
Power .....	50 W typical

## SUMMARY ALARM

Contact closure, open for DC voltage and/or summary alarm  
Status alarm readout on remote bus

## PHYSICAL

Controller AC input connector .....	IEC-320
RF input connector .....	WR42 grooved
RF output connectors .....	Type “N” female
Summary alarm interface mating connector .....	DEM-9P
Remote interface .....	DEM-9S for RS422/RS485, DB-25P for RS232, DB-37 for contact closure, RJ-45 female for Ethernet
Weight (LNB plate) .....	30 pounds typical
Overall dimensions (Controller) .....	19” x 1.75” panel x 22” maximum
Overall dimensions (LNB plate) .....	12.50” x 18.00” x 10.50” height maximum

## ENVIRONMENTAL

### Operating

Ambient temperature (Controller) .....	0 to 50°C
Ambient temperature (LNB plate) .....	-40 to +60°C
Relative humidity .....	Up to 95% at 30°C
Atmospheric pressure .....	Up to 10,000 feet

### Nonoperating

Ambient temperature .....	-50 to +70°C
Relative humidity .....	Up to 95% at 40°C
Atmospheric pressure .....	Up to 40,000 feet
Shock and vibration .....	Normal handling by commercial carriers



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