

MBT-5000 & MBT-5003 t L-Band Up/Down Converter System t

converters t



Introduction s

The RF marketplace has been transitioning from traditional 70/140 MHz IF-based networks to systems using L-Band (950 to 2000 MHz) B for the modem/RF equipment link. BThe MBT-5000 Up/Down Converter System provides this frequency conversion between B L-Band IF and C-/X-/Ku-Band RF frequencies. Featuring a drop down front panel providing access to two “hot swappable” frequency B conversion modules, this unit offers either a mix of conversion functionality or 1:1 redundant system operation. B

Designed for rack mounting, the MBT-5000's 1RU 19-inch chassis front panel contains all operator controls, indicators and displays for B local and remote with RF, IF, power, and communications interfaces on the rear. BWhen configured with the redundancy option, the main B chassis contains two diode “OR-ed” internal power supplies for increased reliability along with the necessary IF/RF switches. BProviding B the level of RF frequency conversion performance that has historically been associated with 70/140 MHz rack mount converter systems, B the MBT-5000 provides a smooth IF infrastructure upgrade path. B

Key Features s

- Meets or exceeds IESS-308/309 B
- Facilitates 188-164A system compliance B
- Low phase noise B
- Powerful M&C support B
- Ethernet/Telnet/SNMP B
- EIA-232/485 B
- Flexible configuration B
- RF Band switching in minimal time without requiring tools B
- Available 1:1 redundancy in a 1RU chassis (MBT-5000) or a 3RU chassis (MBT-5003) B

MBT-5003 s

The MBT-5003 is a 3RU version of the MBT-5000, providing higher output power and a “single chassis” redundant solution. BThis B package is designed for rugged “fly-away” terminal use. B

Applications s

The flexibility of the MBT-5000 & MBT-5003 make them ideally suited for: B

- Earth stations where L-Band IF products are being integrated into a 70/140 MHz IF infrastructure B
- Reconfigurable Multi-Band requirements that are typically found in transportable / flyaway type installations B

Block Up Converter (BUC-5000) s

The BUC-5000 field interchangeable module translates an L-Band input carrier to the desired output frequency (C, X, or Ku-Band) with B an output level capable of driving an HPA. Available bands include: B

Frequency Bands By odel

	RF Output	IF Input	O
BUC-5000C I	5850 – 6425 MHz I	950 I– 1525 MHz I	4900 MHz I
Option I	6650 MHz I	1750 MHz I	
Option I	6725 MHz I	1825 MHz I	
BUC-5000C I I	5850 – 6425 MHz I	950 I– 1525 MHz I	7375 MHz I
Inverted I			
BUC-5000X I	7900 – 8400 MHz I	950 I– 1450 MHz I	6950 MHz I
Optional I	7900 – 8400 MHz I	1000 I– 1500 MHz I	6900 MHz I
BUC-5000Ku I	13.75 – 14.50 GHz I	950 I– 1700 MHz I	12.80 GHz I
BUC-5000Ku I	14.00 – 14.50 GHz I	950 I– 1450 MHz I	13.05 GHz I
MBT-5003 I	7900 I– 8400 MHz I	1000 I– 1500 MHz I	6900 MHz I



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Block Down Converter (BDC-5000)

The BDC-5000 field interchangeable module translates a band specific input frequency block (C, X, or Ku), from the LNA, down to L-Band (950 to 2000 MHz). Available bands include:

Frequency Bands By Model

	RF Input	IF Output	LO
BDC-5000C	3400 – 4200 MHz T	950 – 1750 MHz T	5150 MHz T
BDC-5000CNI T Non-inverting	3625 – 4200 MHz T	1325 – 1900 MHz T	2300 MHz T
BDC-5000X T Optional	7250 – 7750 MHz T	950 – 1450 MHz T 1000 – 1500 MHz T	6300 MHz T 6250 MHz T
BDC-5000K T Switched LO 5	10.95 – 11.70 GHz 5 11.70 – 12.20 GHz T 12.25 – 12.75 GHz T	950 – 1700 MHz T 950 – 1450 MHz T 950 – 1450 MHz T	10.00 GHz 5 10.75 GHz T 11.30 GHz T
Option 1 T	10.95 – 11.70 GHz T 11.70 – 12.75 GHz T	950 – 1700 MHz T 950 – 2000 MHz T	10.00 GHz T 10.75 GHz T
Option 5 T	10.70 – 11.70 GHz T 11.70 – 12.75 GHz T	950 – 1950 MHz T 950 – 2000 MHz T	9.75 GHz T 10.75 GHz T
MBT-5003 T	7250 – 7750 MHz T	1000 – 1500 MHz T	6250 MHz T

Specifications

BUC-5000 Block Up Converter IDU v

Input/Output Impedance 5	50 Ω
Input Return Loss 5	15 dB minimum 5
Output Return Loss 5	18 dB minimum 5
Input Connector 5	N, Female SMA for Redundancy option, TNC 5 MBT-5003)
Output Connector 5	N, Female SMA for Redundancy option 5
Gain 5	30 dB nominal (38 dB for MBT-5003) at minimum 5 attenuation 5
Full Band (Constant 5 Temp./ 0° to 50°C) 5 Per 40 MHz 5 Slope	+/-525 dB/+/-51.0 dB (to +56°C for MBT-5003) 5 +/-50.25 dB 5 .03 dB/MHz Max. 5
Mute 5	-60 dBc (-80 dBm for MBT-5003) 5
User Attenuation Range 5	0 to 20 dB (50 dB for MBT-5003), in 0.25 dB 5 steps 5
Output Power, P1dB 5	+15 dBm (+22 dBm for MBT-5003) minimum 5
Noise Figure 5	15 dB at minimum attenuation 5
Intermodulation Distortion 5	-50 dBc at 0 dBm Total Output 5 -30 dBc at 3 dB OPBO Total Output (MBT-5003) 5
Lo Leakage 5	-60 dBm (-75 dBm MBT-5003) 5
60 Hz & Harmonics 5	<-36 dBc (typically <-50 dBc) 5
Phase Non-Linearity 5	
per 20 MHz BW 5	8 degrees p-p 5
per 36 MHz BW 5	12 degrees p-p
Spurious (In-band) 5	
Carrier Related 5	-60 dBc (-75 dBc for MBT-5003) 5
Non-Carrier Related 5	-60 dBm (-70 dBm for MBT-5003) 5
Phase Noise 5	Exceeds MIL-STD-188-164A 5
100 Hz 5	-68 dBc/Hz 5
1 kHz 5	-78 dBc/Hz 5
10 kHz 5	-88 dBc/Hz 5
100 kHz 5	-98 dBc/Hz 5
1 MHz 5	-108 dBc/Hz 5

Monitor & Control v

Serial M&C Interface 5	TIA/EIA-232, TIA/EIA-485, 4-wire 5 9-pin D, Female 5
Alarm 5	Form C 5 9-pin D, Female 5
Redundant Switch Connections 5	SMA Female 5
Remote Interface 5	Ethernet, RJ-45 5

Reference v

External Input 5	50 or 100 MHz 0 ± 55 dBm 5 BNC Female
Optional output 5	10 MHz Rear Panel 5 BNC Female 5
Internal 5	
Stability over Time 5	± 1 x 10 ⁻⁸ /Day 5
Stability over Temp 5	± 1 x 10 ⁻⁸ /Day 5

BDC-5000 Block Down Converter IDU v

Input/Output Impedance 5	50 Ω
Input Return Loss 5	18 dB minimum 5
Output Return Loss 5	15 dB minimum 5
Input Connector 5	N, Female SMA for Redundancy option 5
Output Connector 5	N, Female (SMA for Redundancy option, TNC for 5 MBT-5003) 5
Gain 5	35 dB nominal (38 dB for MBT-5003) at minimum 5 attenuation 5
Full Band (Constant 5 Temp./ 0° to 50°C) 5 Per 40 MHz 5 Slope 5	+/-525 dB/+/-51.0 dB (to +56°C for MBT-5003) 5 +/-50.25 dB 5 .03 dB/MHz Max. 5
Mute 5	-60 dBc (-80 dBm for MBT-5003) 5
User Attenuation Range 5	0 to 20 dB, in 0.25 dB steps 5
Output Power, P1dB 5	+ 15 dBm (+ 20 dBm for MBT-5003) minimum 5
Noise Figure 5	15 dB at minimum attenuation 5
Intermodulation Distortion 5	-50 dBc at 0 dBm Total Output 5 -56 dBc at 3 dBm Total Output (MBT-5003) 5
Spurious (In-band) 5	
Carrier Related 5	-60 dBc (-75 dBc, MBT-5003) 5
Non-Carrier Related 5	-60 dBm (-70 dBm, MBT-5003) 5
2nd Harmonic 5	20 dBc max. (-40 dBc typical) 5
Lo Leakage 5	-60 dBm (-75 dBm, MBT-5003) 5
60 Hz & Harmonics 5	<-36 dBc (typically <-50 dBc) 5
Phase Non-Linearity 5	
per 20 MHz BW 5	3 degrees p-p 5
per 36 MHz BW 5	4 degrees p-p 5
Phase Noise 5	Exceeds MIL-STD-188-164A 5
100 Hz 5	-68 dBc/Hz 5
1 kHz 5	-78 dBc/Hz 5
10 kHz 5	-88 dBc/Hz 5
100 kHz 5	-98 dBc/Hz 5
1 MHz 5	-108 dBc/Hz 5

Physical & Environmental v

Operating Temp. 5	0° to 50°C (56°C, MBT-5003) 5
Non-Operating Temp. 5	-50° to 70°C 5
Humidity 5	5 to 95% non-condensing 5
Operational Altitude 5	10,000 ft. above sea level 5
Weight 5	15 lbs nominal 5
Dimensions 5	1.75" x 19" x 15" (MBT-5000) 5 (height x width x depth) 5
	5.22" x 19" x 14" (MBT-5003) 5

Power v

Voltage 5	90 – 260 VAC 5 -48 VDC Optional 5
Frequency 5	475 to 635 Hz 5
Dissipation 5	60 W (100 W, MBT-5003) typical 5