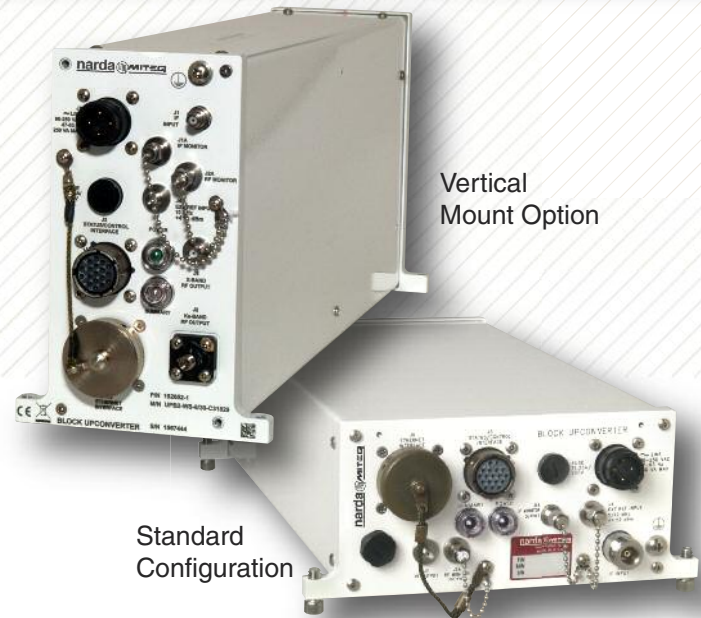


Multiple Band Outdoor Block Up- and Downconverters



Band	RF Frequency (GHz)	IF Frequency (MHz)	LO Frequency (GHz)	Model Number
Block Upconverters				
1	12.75–13.25	0.95–1.45	11.8	UPB2-WS-13.625
2	13.75–14.5	0.95–1.7	12.8	
1	29.5–30.0	1.50–2.0	28.0	UPB2-WS-30.25
2	30.0–31.0	1.00–2.0	29.0	
1	27.5–28.7	0.95–2.15	26.55	UPB2-WS-28.7-1.2
2	28.7–29.9	0.95–2.15	27.75	
1	28.0–29.0	0.95–1.95	27.05	UPB2-WS-29-1
2	29.0–30.0	0.95–1.95	28.05	
1	28.0–28.8	0.95–1.7	27.05	UPB2-WS-28.75
2	28.7–29.5	0.95–1.75	27.75	

Block Downconverters				
1	10.7–11.45	0.95–1.7	9.75	DNB3-WS-11.725
2	11.45–12.2	0.95–1.7	10.5	
3	12.2–12.75	0.95–1.5	11.25	
1	10.95–11.7	0.95–1.7	10.0	DNB3-WS-11.85
2	11.7–12.2	0.95–1.45	10.75	
3	12.2–12.75	0.95–1.5	11.25	
1	10.7–11.75	0.95–2.0	9.75	DNB2-WS-11.725
2	11.7–12.75	0.95–2.0	10.75	
1	17.7–18.7	0.95–1.95	16.75	DNB3-WS-18.95-1
2	18.3–19.3	0.95–1.95	17.35	
3	19.2–20.2	0.95–1.95	18.25	
1	18.3–18.8	0.95–1.45	17.35	DNB3-WS-19.75
2	19.7–20.2	0.95–1.45	18.75	
3	20.2–21.2	0.95–1.95	19.25	
1	19.7–20.2	1.5–2.0	18.2	DNB2-WS-20.45
2	20.2–21.2	1.0–2.0	19.2	
1	17.0–18.8	0.80–2.60	16.2	DNB3-WS-19.5-1.8
2	18.6–20.4	0.80–2.60	17.8	
3	20.2–22.0	0.80–2.60	19.6	
1	27.5–28.5	0.95–1.95	26.55	DNB3-WS-28.75-1
2	28.3–29.3	0.95–1.95	27.35	
3	29.0–30.0	0.95–1.95	28.05	
1	27.0–28.5	0.95–2.45	26.05	DNB3-WS-2.9-1.5
2	28.3–29.8	0.95–2.45	27.35	
3	29.5–31.0	0.95–2.45	28.55	

This series of outdoor block upconverters and downconverters are designed for antenna mounting.

A strong set of monitor and control functions support powerful remote control. A contact closure summary alarm is provided for fault monitoring. A continuously updated log of time-stamped records of activity is also provided.

Features

- Antenna mount, weatherproof to IP65
- Automatic 5/10 MHz internal/external reference selection
- RS485/RS422 and 10/100Base-T Ethernet remote control
- Superior phase noise below IESS308/309 and MIL-STD-188-164B specification
- 30 dB gain control
- 32 memory locations
- High frequency stability
- Summary alarm
- AC power supply (CE mark)

Options

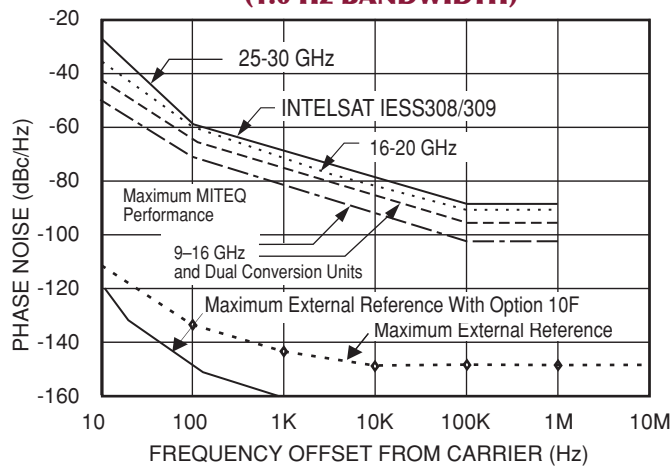
- Higher frequency stability
- Lower phase noise
- Fiber optic L-band interface
- Fiber optic RF-band interface
- LO level monitor
- Lower gain
- DC power

Specifications	Upconverter	Downconverter
Input characteristics		
Return loss (50 ohms)		18 dB minimum
LO leakage	N/A	-80 dBm maximum
Signal monitor		-20 dBc nominal
Output characteristics		
Return loss		18 dB minimum
Signal monitor		-20 dBc nominal
Power output (P1dB)	+13 dB minimum	+18 dB minimum
Transfer characteristics		
Gain	33 dB, ± 3 dB at 23°C	38 dB, ± 3 dB at 23°C
Gain adjustment	30 dB in 0.2 dB steps	
Gain stability	± 0.25 dB/day maximum at constant temperature, ± 2 dB -40 to +60°C	
Amplitude response	± 0.25 dB/40 MHz maximum, ± 1 dB over RF frequency band	
Image rejection	80 dB minimum	
Noise figure at min. atten.	15 dB maximum, 18 dB with 1 to 1.5 GHz IF bandwidth	15 dB maximum
Intermodulation distortion (third order)	With two inband signals at 0 dBm output, third order intermodulation products are less than 50 dBc minimum	
Spurious outputs (inband)	65 dBc minimum up to 0 dBm output (65 dBc minimum up to -10 dBm output including 2x1 spurious on 1 to 1.5 GHz IF bandwidth upconverters)	
Signal related		-55 dBm 2 nd harmonic
Signal independent	-75 dBm maximum	
Phase noise	See graph	
Frequency stability	$\pm 5 \times 10^{-8}$, -40 to +60°C (higher stability options available), 5×10^{-9} /day typical (fixed temperature after 24 hour on time)	
Automatic reference configuration	5 or 10 MHz at +4 ± 3 dBm on J4 (0 ± 5 dBm on L-Band connector, available as option). If external reference is above +1 dBm, the internal reference oscillator will lock to the external reference input. Reference oscillator acts as an analog phase lock with a 0.1 Hz nominal loop bandwidth. Typical loop suppression of the external reference is as follows: 28 dB at 1 Hz offset; 65 dB at 10 Hz offset; 100 dB at 100 Hz offset (improved external reference tracking and no reference suppression with Option 10F)	
Upconverter mute	60 dB minimum on summary alarm or mute command (100 ms maximum)	
Remote interface	10/100Base-T Ethernet interface providing Web-browser based configuration, SNMP 1.0 configuration, alarm reporting via SNMP trap, telnet access, password protection and selectable RS485/RS422. Refer to MITEQ's Technical Note 25T060 for details.	
Indicator and Summary alarms (front panel)	Red LED (for active alarm), Amber LED (for logged alarms), Summary alarm indicates: LO out-of-lock or DC voltage alarm or LNA current on block downconverters	
Power ON indicator	Green LED (front panel)	
Summary alarm	Contact closure status for DC voltage and local oscillator, external mute input on J3 connector (Programmable LNA current alarm for downconverters +12 VDC up to 500 mA maximum)	

Note: All specifications at maximum gain unless otherwise noted.

Phase Noise Specifications

PHASE NOISE CHARACTERISTICS (1.0 Hz BANDWIDTH)



General Specifications

Primary Power Requirements

Voltage	100-240 VAC (-10%, +6%)
Frequency	47-63 Hz
Consumption	25 W typical

Physical

Weight	20 pounds nominal (9.07 kg)
Connectors	
Front panel connectors	
RF band**	
Below 22 GHz	SMA female compatible
25 – 27 GHz	WR-34 grooved, 2 psi 10 cm ³ /min leakage rate (see Option 27 for alternatives)
Above 27 GHz	WR-28 grooved, 2 psi 10 cm ³ /min leakage rate (see Option 27 for alternatives)
L-band	N female
RF band monitor	SMA female compatible 2.92mm
L-band monitor	SMA female with termination
External reference input	SMA female with termination
Status/Control interface*	MS3116F14-18S for summary alarm, RS422/485, and LNA power
Remote interface*	RJ-45 female for Ethernet, RS422/485 available on status connector
Primary power input*	FCI clipper series CL1M1102

Notes: * Unit supplied with mating connector.

** Option 14 RF input on rear (see outline drawing on page 7).

Environmental

Enclosure rating	IP-65
Operating	
Ambient temperature	-40 to +60°C
Atmospheric pressure	Up to 10,000 feet
Humidity	Up to 100% condensing
Nonoperating	
Ambient temperature	-50 to +70°C
Atmospheric pressure	Up to 40,000 feet
Shock and vibration	Normal handling by commercial carriers

Options (Cont.)

- 14.** Low noise option (downconverters only). See outline drawing on Page 7.

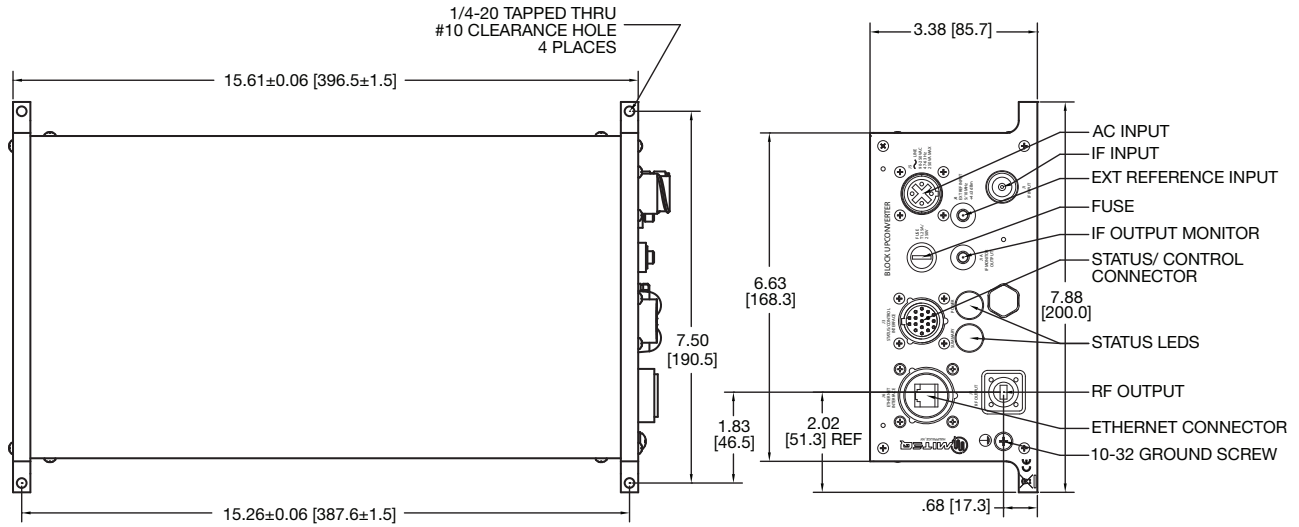
Frequency (GHz)	Available Noise Temperature At +25°C (Maximum)	Interface Input (located on rear panel)
3.40 - 4.20	35	CPR-229GN
3.70 - 4.20	35	CPR-229GN
7.25 - 7.75	50	CPR-112G
10.70 - 11.70	80	WR-75 Grooved Flange
10.95 - 11.70	70	WR-75 Grooved Flange
11.45 - 12.25	70	WR-75 Grooved Flange
11.70 - 12.50	70	WR-75 Grooved Flange
12.20 - 12.75	70	WR-75 Grooved Flange
18.30 - 18.80	120	WR-42 Grooved Flange
19.70 - 20.20	120	WR-42 Grooved Flange
20.20 - 21.20	120	WR-42 Grooved Flange

NOTE: Gain increase of 25 dB to system gain. This option is not available with Options 2 and 3.

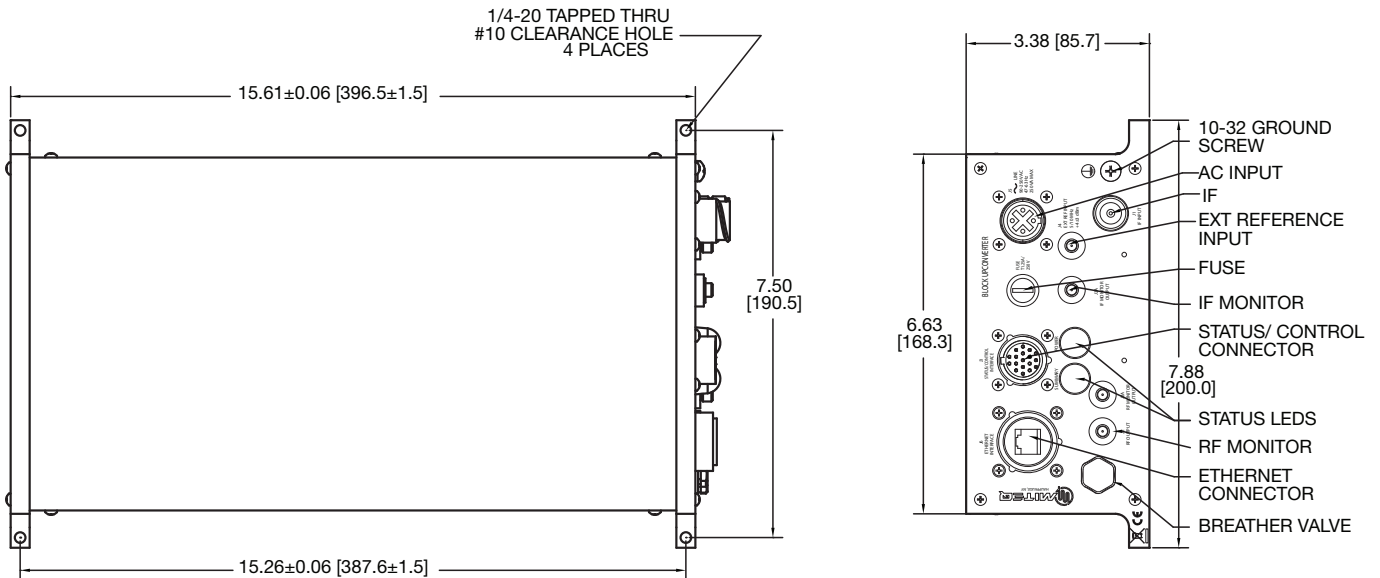
- 25.** Front panel connector option.
- 1.** WR-42 per low noise Ka-band outline.
 - 2.** WR-34 input per Ka-band up outline.
 - 3.** 2.92 mm female per standard outline.
- 27.** Rear panel RF waveguide connector option. RF output on rear panel as per outlines on pages 6 and 7.
- 1.** WR-34 input per low noise outline.
 - 2.** WR-42 input per Ka-band up outline.
 - 3.** 2.92 mm female per standard outline.
- 28.** L-band fiber optic interface (available 0.95-2.15 GHz).
- A.** Downconverter output transmitter.
Fiber: 9/125 (single mode fiber), Wavelength: 1540-1560 nm, Optical power in fiber: 4 mW typical, Connector: FC/APC
 - B.** Upconverter input receiver.
Fiber: 9/125 (single mode fiber), Wavelength: 1300-1560 nm, Connector: FC/APC
- 29.** RF-band fiber optic interface (available 0.95-18 GHz).
- A.** Upconverter output transmitter.
Fiber: 9/125 (single mode fiber), Wavelength: 1540-1560 nm, Optical power in fiber: 4 mW typical, Connector: FC/APC
 - B.** Downconverter input receiver.
Fiber: 9/125 (single mode fiber), Wavelength: 1300-1560 nm, Connector: FC/APC
- 34.** External reference input on IF connector.
- VM.** Vertical Mount (see outline on Page 7).

Outline Drawings

Ka-Band Upconverter Package



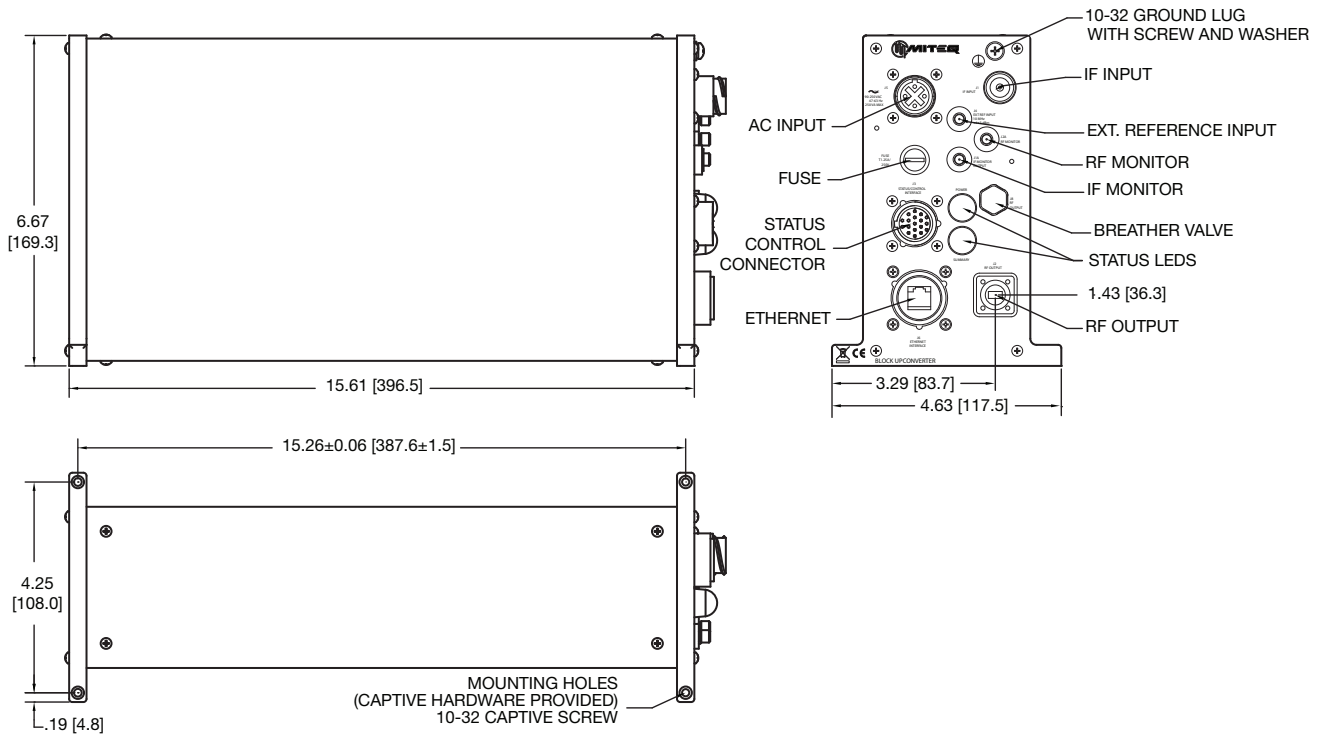
Standard Package For All Bands Except Ka-Band Upconverter



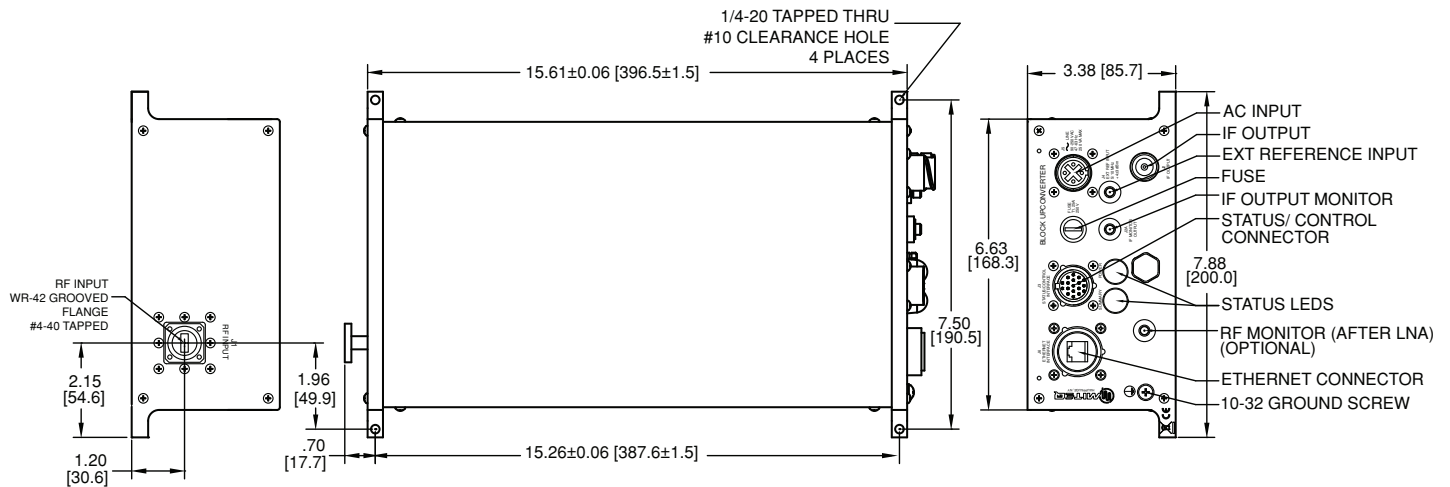
NOTE: Dimensions shown in brackets [] are in millimeters.

Outline Drawings (Cont.)

Vertical Mount Ka-Band



Low Noise Option 14 (Downconverter Package)



NOTE: Dimensions shown in brackets [] are in millimeters.

**MITEQ Also Offers a Full Line of
1:1 and 1:2 Redundant WS Block Converter Systems
as well as LNA versions**



1:1 redundant block converter and plate assembly shown

Completely integrated 1:1 or 1:2 redundant block converter assemblies, using either up- or downconverters from the high performance WS series block converters, provide continuous RF operation without loss of signal on a completely automated basis.

Redundant LNAs or LNB assemblies are also available.

Features

- Automated backup and monitoring of block converters
- High performance WS series converter plate assembly
- Antenna mount, weatherproof, integrated assembly
- Coverage for all SATCOM bands
- Fault tolerant design
- Redundant hot-swappable power supplies on controller
- Remote control and status via -
 - 10/100Base-T Ethernet and RS485/RS422 for controller
 - 10/100Base-T Ethernet for block converter remote and status

For additional information, request datasheet D-379