

# HIGH-PERFORMANCE OUTDOOR BLOCK UPCONVERTERS AND DOWNCONVERTERS

narda  MITEQ

## FOR Q-BAND APPLICATIONS



### FEATURES

- Small weather resistant enclosure
- Automatic 5/10 MHz internal/external reference selection
- RS-485/RS-422 and 10/100 Base-T Ethernet remote control
- RF input signal monitor ports
- 30 dB gain control
- 32 memory locations
- High-frequency stability
- Summary alarm
- AC power supply (CE mark)

### OPTIONS

- High-performance package
- Higher frequency stability
- Lower gain
- DC power
- LO level monitoring
- Low-noise amplifier (downconverters only)
- Custom higher IF frequency bands (ie: X-Band) are available as a special order option

This series of Narda-MITEQ outdoor block upconverters and downconverters is 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.



# HIGH-PERFORMANCE OUTDOOR BLOCK UPCONVERTERS AND DOWNCONVERTERS

## BLOCK UPCONVERTERS

SPECIFICATIONS	UPCONVERTER	DOWNCONVERTER
Input characteristics		
Return loss (50 ohms)	18 dB minimum	18 dB minimum
LO leakage	N/A	-80 dB maximum
Signal monitor	-20 dBc nominal	N/A
Output characteristics		
Return loss	18 dB minimum	18 dB minimum
Signal monitor	N/A	-20 dBc nominal
Power output (1 dB compression)	+10 dBm minimum	+18 dBm minimum
Transfer characteristics		
Gain	33 dB $\pm$ 3 dB at 23 °C	38 dB $\pm$ 3 dB at 23 °C
Gain control	30 dB in 0.2 dB steps	30 dB in 0.2 dB steps
Gain stability	$\pm$ 0.25 dB/day maximum at constant temperature $\pm$ 2 dB, -40 °C to +60 °C	
Amplitude response	$\pm$ 0.25 dB/40 MHz maximum, $\pm$ 1 dB maximum over RF frequency band	
Image rejection	80 dB minimum	80 dB minimum
Noise figure at min attenuation	20 dB maximum	20 dB maximum
Intermodulation distortion (third order)	With two inband signals at 0 dBm output, third-order intermodulation products are less than: 40 dBc minimum   60 dBc minimum	
Spurious outputs (inband)		
Signal-related	65 dBc minimum up to 0 dBm output at maximum gain	
IF Harmonic related (IF bandwidth > 1 GHz)	(2 x 1) 65 dBc minimum up to -10 dBm output at maximum gain	
Signal-independent	-65 dBm maximum	-65 dBm maximum
Phase noise	See graph	See graph
Frequency stability	$\pm$ 5 x 10 <sup>-8</sup> , -40 °C to +60 °C (higher stability options available), 5 x 10 <sup>-9</sup> /day typical (fixed temperature after 24 hours on time)	
Automatic reference configuration	External 5 MHz or 10 MHz at +4 $\pm$ 3 dBm. Unit will automatically switch to internal reference if external reference level falls below +1 dBm nominal.	
Upconverter mute	60 dB minimum on summary alarm or mute command	
Remote interface	10/100 Base-T Ethernet interface providing web-browser based configuration, SNMP 1.0 configuration, alarm reporting via SNMP trap, telnet access, password protection and selectable RS-485/RS-422. Refer to Narda-MITEQ Technical Note 25T066 for details.	
Indicator and Alarms		
LO out-of-lock	Red LED (front panel)	Red LED (front panel)
Power ON indicator	Green LED (front panel)	Green LED (front panel)
Summary alarm	Contact closure status for DC voltage and local oscillator (Programmable LNA current alarm for downconverters +12 VDC up to 500 mA maximum)	

Note: All specifications guaranteed at maximum gain unless otherwise noted.

### BLOCK UP CONVERTERS

INPUT FREQUENCY (GHz)	OUTPUT FREQUENCY (GHz)	TRANSLATION FREQUENCY (GHz)	MODEL NUMBER
0.95 to 1.45	43.5 to 44.0	42.55	UPB-WS-43.75
0.95 to 1.45	44.0 to 44.5	43.05	UPB-WS-44.25
0.95 to 1.45	44.5 to 45.0	43.55	UPB-WS-44.75
0.95 to 1.45	45.0 to 45.5	44.05	UPB-WS-45.25
0.95 to 1.95	43.5 to 44.5	42.55	UPB-WS-44
0.95 to 1.95	44.5 to 45.5	43.55	UPB-WS-45
0.95 to 1.95	43.5 to 45.5	42.55/43.55	UPB2-WS-44.5
1 to 2	43.5 to 45.5	42.50/43.50	UPB2-WS-44.5.1

### BLOCK DOWN CONVERTERS

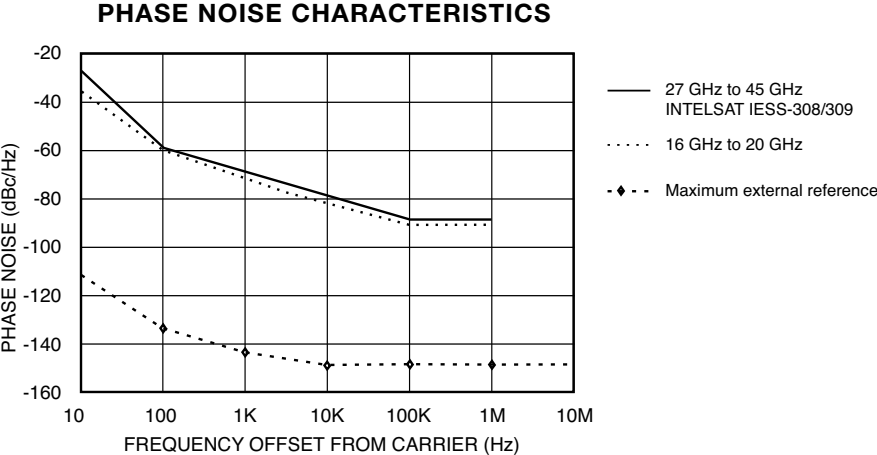
INPUT FREQUENCY (GHz)	OUTPUT FREQUENCY (GHz)	TRANSLATION FREQUENCY (GHz)	MODEL NUMBER
18.3 to 18.8	0.95 to 1.45	17.35	DNB-WS-18.55
19.7 to 20.2	0.95 to 1.45	18.75	DNB-WS-19.95
20.2 to 21.2	0.95 to 1.95	19.25	DNB-WS-20.7
20.2 to 21.2	1 to 2	19.2	DNB-WS-20.7-1

### TEST DOWN CONVERTERS

INPUT FREQUENCY (GHz)	OUTPUT FREQUENCY (GHz)	TRANSLATION FREQUENCY (GHz)	MODEL NUMBER
43.5 to 44.0	0.95 to 1.45	42.55	DNB-WS-43.75
44.0 to 44.5	0.95 to 1.45	43.05	DNB-WS-44.25
44.5 to 45.0	0.95 to 1.45	43.55	DNB-WS-44.75
45.0 to 45.5	0.95 to 1.45	44.05	DNB-WS-45.25
43.5 to 44.5	0.95 to 1.95	42.55	DNB-WS-44
44.5 to 45.5	0.95 to 1.95	43.55	DNB-WS-45
43.5 to 45.5	0.95 to 1.95	42.55/43.55	DNB2-WS-44.5

# HIGH-PERFORMANCE OUTDOOR BLOCK UP CONVERTERS AND DOWN CONVERTERS

## PHASE NOISE SPECIFICATIONS



## OPTIONS

Missing option numbers are not applicable for this product.

1. High-performance package
  - Power output (1 dB compression).....15 dBm minimum (upconverters),  
20 dBm minimum (downconverters)
  - Gain slope .....0.03 dB/MHz maximum
  - Gain stability .....±0.25 dB/day maximum at constant temperature,  
±1.0 dB peak-to-peak maximum/-40 °C to +60 °C
  - Group delay .....1 ns peak-to-peak maximum
  - Spurious outputs (inband)
    - Signal-related .....65 dBc minimum up to 0 dBm output
    - Signal-independent .....-80 dBm maximum
  - Intermodulation distortion (third order).....With two inband signals at 0 dBm output, third-order  
intermodulation products are less than 50 dBc minimum  
(upconverters), 60 dBc minimum (downconverters)
  - Noise spectral density .....-78 dBm/4 kHz maximum (downconverters),  
-83 dBm/4 kHz maximum (upconverters)
  - AM/PM conversion (at 0 dBm output).....0.1°/dB maximum
  - Upconverter mute.....80 dB minimum on summary alarm, external mute  
input command or remote control.
2. Lower gain
  - Gain .....20 ±3 dB at 23 °C, 22 dB noise figure,  
signal related spurious -65 dBc at -10 dBm output.
8. LO level alarm
  - Summary alarm is generated for loss of power in any of the required local oscillators
10. Higher frequency stability reference
  - C. ±5 x 10<sup>-9</sup>, -40 °C to +60 °C,  
1 x 10<sup>-9</sup>/day typical (fixed temperature after 24 hours on time).
  - F. 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.
14. Low Noise Option (Downconverters only).

FREQUENCY (GHz)	AVAILABLE NOISE TEMPERATURE	
	AT +25 °C (MAXIMUM)	INTERFACE INPUT
18.30 to 18.80	120°	WR-42 Grooved Flange
19.70 to 20.20	120°	WR-42 Grooved Flange
20.20 to 21.20	120°	WR-42 Grooved Flange

Note: Gain increase to 62 ±3 dBm.

19. DC power input
  - A. +24 VDC to +32 VDC input
  - B. +42 VDC to +60 VDC input
  - C. -42 VDC to -60 VDC input
27. RF connector option .....RF connector on rear panel as per outline drawing  
waveguide location. Please consult factory.
- VM. Vertical mounting option for integration on RB plates

# HIGH-PERFORMANCE OUTDOOR BLOCK UP CONVERTERS AND DOWN CONVERTERS

## GENERAL SPECIFICATIONS

### PRIMARY POWER REQUIREMENTS

Voltage ..... 90 VAC to 250 VAC  
 Frequency ..... 47 Hz to 63 Hz  
 Consumption ..... 40 W typical

### PHYSICAL

Weight ..... 15 lb. [6.80 kg] nominal  
 Front panel connectors

#### RF-Band

Below 22 GHz ..... SMA female compatible  
 Above 40 GHz ..... WR-22 grooved, UG-383/U flange

L-Band ..... N female

L-Band monitor ..... SMA female

External reference input ..... SMA female

Status monitor ..... MS3116E14-18S for summary alarm and RS-422/RS-485\*

Remote interface ..... RJ-45 female for Ethernet, RS-422/RS-485 available on status connector

Primary power input ..... FCI Clipper Series

\*Note: Unit supplied with mating connector.

### ENVIRONMENTAL

#### Operating

Temperature ..... -40 °C to +60 °C

Atmospheric pressure ..... Up to 10,000 feet

#### Nonoperating

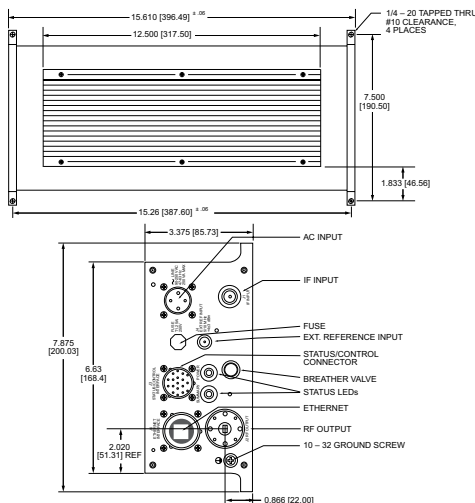
Temperature ..... -50 °C to +70 °C

Atmospheric pressure ..... Up to 40,000 feet

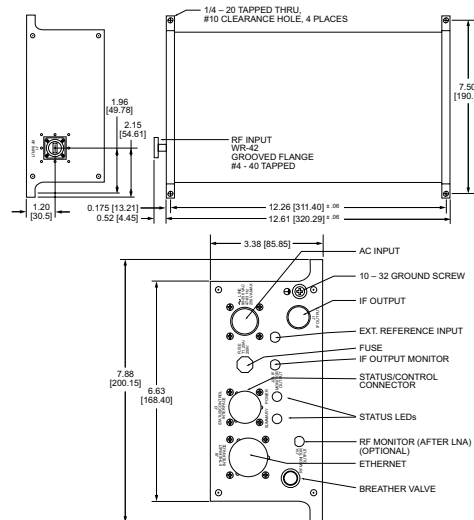
Shock and vibration ..... Normal handling by commercial carriers

## OUTLINE DRAWINGS

### Q-BAND UP CONVERTER PACKAGE



### Q-BAND DOWN CONVERTER WITH LOW NOISE OPTION



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