

MULTIPLE OUTPUT WIDEBAND Ku AND Ka DOWNCONVERTERS



FEATURES

- Small weather resistant enclosure
- Automatic 5/10 MHz internal/external reference selection
- 10/100 Base-T Ethernet and RS-485/RS-422 remote control
- Superior phase noise below IESS-308/IESS-309 and MIL-STD-188-164B specification
- 30 dB gain control
- 32 memory locations
- High frequency stability
- Summary alarm
- AC power supply with power factor correction
- CE mark

OPTIONS

- Custom frequency ranges
- Higher frequency stability
- Lower phase noise with high performance package Option 1
- Fiber-optic L-Band interface

This Narda-MITEQ series of outdoor, antenna-mount block downconverters are designed to cover simultaneously multiple wide bandwidth satellite transponders providing two or three independent IF outputs.

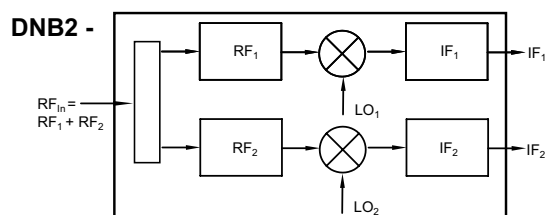
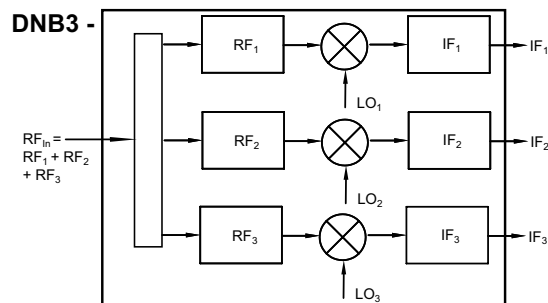
A strong set of monitor and control functions support powerful remote control. A contact closure summary alarm is provided for fault monitoring. A continuously updated log of time-stamped records of activity is also provided.

FREQUENCY CONVERTER

MULTI-OUTPUT SIMULTANEOUS DOWNCONVERTERS

RF FREQUENCY (GHz)	IF FREQUENCY (GHz)	LO FREQUENCY (GHz)	MODEL NUMBER
10.7 to 11.45 (RF ₁)	0.95 to 1.7 (IF ₁)	9.75 (LO ₁)	DNB3-W-11.725
11.45 to 12.2 (RF ₂)	0.95 to 1.7 (IF ₂)	10.5 (LO ₂)	
12.2 to 12.75 (RF ₃)	0.95 to 1.5 (IF ₃)	11.25 (LO ₃)	
10.95 to 11.7 (RF ₁)	0.95 to 1.7 (IF ₁)	10.0 (LO ₁)	DNB3-W-11.8
11.7 to 12.2 (RF ₂)	0.95 to 1.45 (IF ₂)	10.75 (LO ₂)	
12.2 to 12.75 (RF ₃)	0.95 to 1.5 (IF ₃)	11.25 (LO ₃)	
10.7 to 11.75 (RF ₁)	0.95 to 2.0 (IF ₁)	9.75 (LO ₁)	DNB2-W-11.725
11.7 to 12.75 (RF ₂)	0.95 to 2.0 (IF ₂)	10.75 (LO ₂)	
17.7 to 18.7 (RF ₁)	0.95 to 1.95 (IF ₁)	16.75 (LO ₁)	DNB3-W-18.75-1
18.3 to 19.3 (RF ₂)	0.95 to 1.95 (IF ₂)	17.35 (LO ₂)	
19.2 to 20.2 (RF ₃)	0.95 to 1.95 (IF ₃)	18.25 (LO ₃)	
18.3 to 18.8 (RF ₁)	0.95 to 1.45 (IF ₁)	17.35 (LO ₁)	DNB3-W-19.75
19.7 to 20.2 (RF ₂)	0.95 to 1.45 (IF ₂)	18.75 (LO ₂)	
20.2 to 21.2 (RF ₃)	0.95 to 1.95 (IF ₃)	19.25 (LO ₃)	
19.7 to 20.2 (RF ₁)	1.5 to 2.0 (IF ₁)	18.2 (LO ₁)	
20.2 to 21.2 (RF ₂)	1.0 to 2.0 (IF ₂)	19.2 (LO ₂)	DNB2-W-20.45
17.0 to 18.8 (RF ₁)	0.80 to 2.60 (IF ₁)	16.2 (LO ₁)	
18.6 to 20.4 (RF ₂)	0.80 to 2.60 (IF ₂)	17.8 (LO ₂)	
20.2 to 22.0 (RF ₃)	0.80 to 2.60 (IF ₃)	19.6 (LO ₃)	DNB3-W-19.5-1.8
27.5 to 28.5 (RF ₁)	0.95 to 1.95 (IF ₁)	26.55 (LO ₁)	
28.3 to 29.3 (RF ₂)	0.95 to 1.95 (IF ₂)	27.35 (LO ₂)	
29.0 to 30.0 (RF ₃)	0.95 to 1.95 (IF ₃)	28.05 (LO ₃)	
27.0 to 28.5 (RF ₁)	0.95 to 2.45 (IF ₁)	26.05 (LO ₁)	DNB3-W-28.75-1
28.3 to 29.3 (RF ₂)	0.95 to 1.95 (IF ₂)	27.35 (LO ₂)	
29.0 to 30.0 (RF ₃)	0.95 to 1.95 (IF ₃)	28.05 (LO ₃)	
27.0 to 28.5 (RF ₁)	0.95 to 2.45 (IF ₁)	26.05 (LO ₁)	DNB3-W-29.5-1.5
28.3 to 29.8 (RF ₂)	0.95 to 2.45 (IF ₂)	27.35 (LO ₂)	
29.5 to 31.0 (RF ₃)	0.95 to 2.45 (IF ₃)	28.55 (LO ₃)	

BLOCK DIAGRAMS

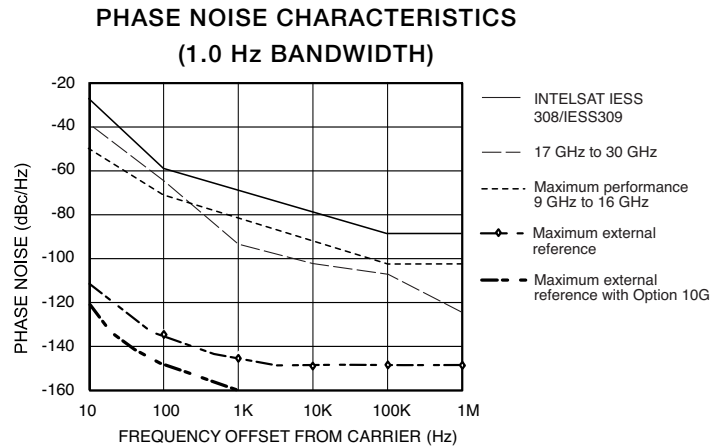


SPECIFICATIONS	DOWNCONVERTERS
Input characteristics	
Return loss (50 ohms)	18 dB minimum
LO leakage	-80 dB maximum
Signal monitor	-20 dBc nominal
Output characteristics	
Return loss	18 dB minimum
Power output (P1dB)	18 dBm minimum
Signal monitor	-20 dBc nominal (available as Option 6A)
Transfer characteristics	
Gain	30 dB, ± 3 dB at 23 °C
Gain adjustment	30 dB in 0.2 dB steps independent for each output
Gain stability	± 0.25 dB/day maximum at constant temperature, ± 2 dB -40°C to +50°C and over a 1 GHz BW
Amplitude response	± 0.5 dB/40 MHz maximum, ± 1 dB/1 GHz, ± 2 dB over each output band above 1 GHz
Image rejection	80 dB minimum
Noise figure at minimum atten.	15 dB maximum
Group delay	1 ns peak-to-peak maximum per band
Intermodulation distortion (third order)	With two inband signals at 0 dBm output, third-order intermodulation products are less than 60 dBc minimum at minimum attenuation
Spurious outputs	
Signal-related (in band)	65 dBc minimum up to 0 dBm output
Signal-independent	-75 dBm maximum
Phase noise	See graph on next page
Frequency stability	$\pm 5 \times 10^{-8}$, -40°C to +60°C (higher stability options available), 5×10^{-9} /day typical (fixed temperature after 24 hours on time)
Automatic reference configuration	External 5 MHz or 10 MHz, +4 ± 3 dBm. If external reference is below +1 dBm nominal, the converter will lock to the internal reference.
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 Multi-Channel Technical Note for details.
Indicator and Alarms	
LO out-of-lock	Red LED (front panel), 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 (programmable LNA current alarm for downconverters +12 VDC up to 500 mA maximum)

Note: All specifications at maximum gain unless otherwise noted.

FREQUENCY CONVERTER

PHASE NOISE SPECIFICATIONS



OPTIONS

Missing option numbers are not applicable for this product.

1. High-performance package

- Power output (1 dB compression)..... 20 dBm minimum
- Gain slope 0.03 dB/MHz maximum
- Gain stability ± 0.25 dB/day maximum at constant temperature,
 ± 1 dB peak-to-peak maximum/ -40°C to $+60^{\circ}\text{C}$

Spurious outputs (inband)

- Signal-related..... 65 dBm minimum up to 0 dBm output
- Signal-independent -80 dBm maximum
- Noise spectral density -90 dBm/4 kHz maximum
- AM/PM conversion (at 0 dBm output)..... 0.1 $^{\circ}$ /dB maximum

High-performance phase noise (dBc/Hz) (maximum)

MODEL	OFFSET (Hz)					
	10	100	1K	10K	100K	1M
Ku-Band	-48	-73	-103	-112	-115	-132
K-Band	-42	-67	-97	-106	-109	-126
Ka-Band	-41	-64	-94	-102	-107	-124

6A. L-Band IF monitor..... 20 dBc nominal from IF signal, SMA female with termination

10. Higher frequency stability reference

- D. $\pm 5 \times 10^{-9}$, -40°C to $+60^{\circ}\text{C}$,
 2×10^{-10} /day typical (fixed temperature after 24 hours on time).
- G. Higher frequency stability reference with an analog phase lock with 0.2 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,
and 100 dB at 100 Hz with the following frequency stability:
 $\pm 5 \times 10^{-9}$, -40°C to $+60^{\circ}\text{C}$,
 1×10^{-9} /day typical (fixed temperature after 24 hours on time).

Note: Converter may require 7 to 10 days to reach stability after long storage periods.

OPTIONS (CONTINUED)

Missing option numbers are not applicable for this product.

14. Low noise option. Gain: 60 ±2 dB at 25°C

FREQUENCY (GHz)	AVAILABLE NOISE TEMPERATURE		INTERFACE INPUT (REAR PANEL)
	AT +25 °C (Maximum)		
10.70 to 12.75	80		WR-75 Flat Flange
17.0 to 22.0	150		WR-42 Grooved Flange

25. Front panel RF connector option

- 1. WR-42 grooved flange, 2 psi 10 cm³/min leakage rate
- 2. WR-34 grooved flange, 2 psi 10 cm³/min leakage rate
- 3. 2.92 mm female per standard outline
- 4. 3.5 mm female per standard outline
- 5. WR-28 grooved flange, 2 psi 10 cm³/min leakage rate

- 28A. L-Band fiber-optic interface (bandwidth 0.95 GHz to 2.15 GHz). Downconverter fiber-optic output transmitter interface is: Fiber: 9/125 (single-mode fiber), Wavelength: 1540 nm to 1560 nm, Optical power in fiber: 4 mW typical, Connector: FC/APC
- 28C. L-Band fiber-optic interface (bandwidth 0.8 GHz to 2.6 GHz). Downconverter fiber-optic output transmitter interface is: Fiber: 9/125 (single-mode fiber), Wavelength: 1540 nm to 1560 nm, Optical power in fiber: 4 mW typical, Connector: FC/APC

GENERAL SPECIFICATIONS

PRIMARY POWER REQUIREMENTS

Voltage..... 100 VAC to 240 VAC (-10%, +6%)
 Frequency 47 Hz to 63 Hz
 Consumption 50 W typical below 15 GHz, 60 W typical above 15 GHz

PHYSICAL

Weight..... 28 lb. [12.72 kg] nominal, 30 lb. [13.64 kg] maximum

Front panel connectors

RF-Band**

Below 22 GHz..... SMA female-compatible
 Above 22 GHz..... 2.9 mm female

L-Band N female

RF-Band monitor..... SMA female-compatible (available as option for Ka-Band)

External reference input SMA female with termination

Status/Control interface*..... MS3116F14-18P for summary alarm, RS-422/RS-485, redundancy and LNA power

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

Primary power input FCI clipper series CL1M1102*

Notes: * Unit supplied with mating connector.

** Option 14 RF input on rear.

Option 27 RF input available rear panel.

ENVIRONMENTAL

Operating

Ambient temperature..... -40°C to +50°C

Atmospheric pressure Up to 10,000 feet

Nonoperating

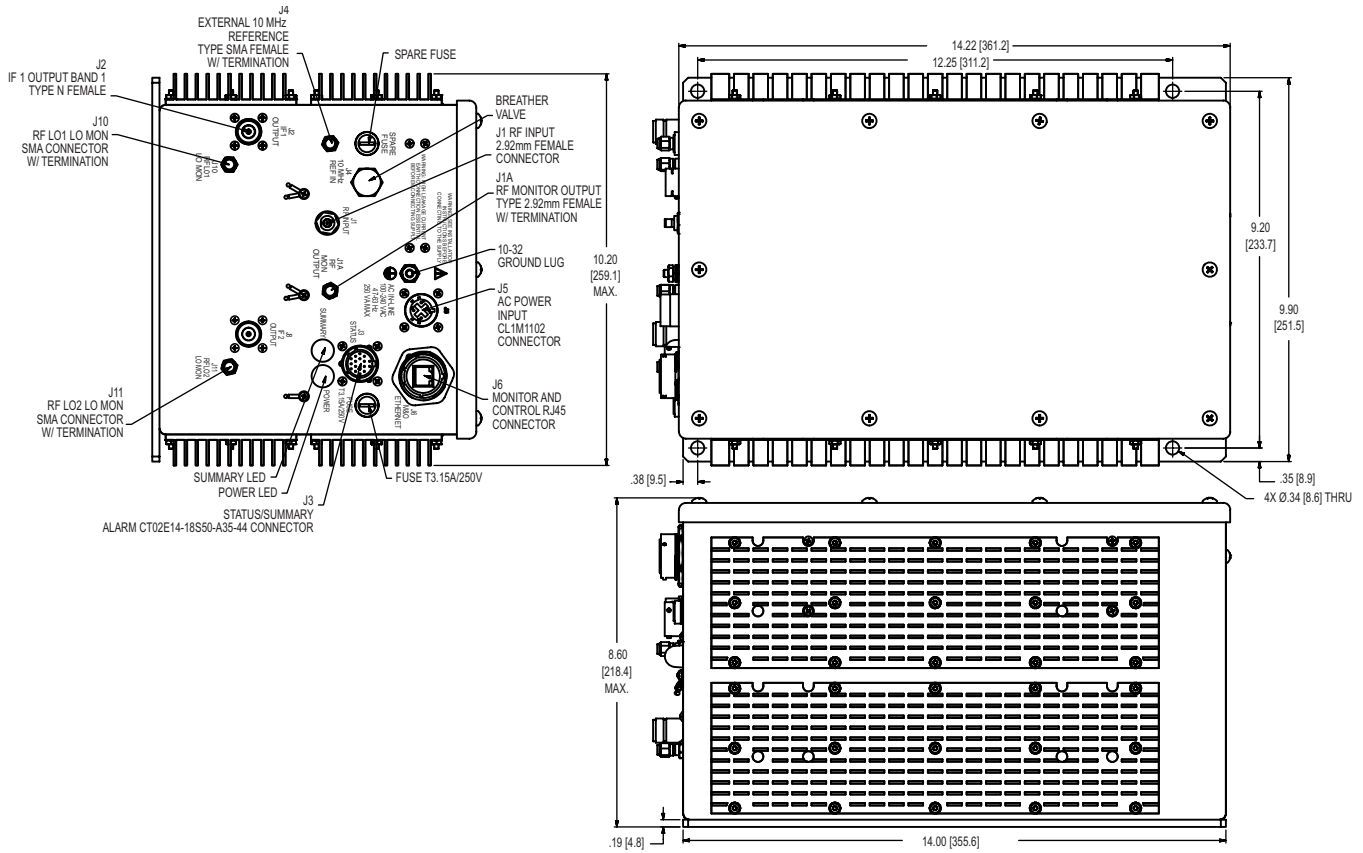
Ambient temperature..... -50°C to +70°C

Atmospheric pressure Up to 40,000 feet

Shock and vibration Normal handling by commercial carriers

FREQUENCY CONVERTER

OUTLINE DRAWING



Note: Dimensions shown are in inches and those shown in brackets [] are in millimeters.

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