TRI-BAND OUTDOOR COMMUNICATION CONVERTERS



FEATURES

- Compact outdoor unit
- Low phase noise
- Dual conversion
- Low intermodulation distortion
- No spectral inversion
- Simple control via RS232 remote
- Monitoring of the SSPA detected DC output level (upconverter only)
- Monitoring of the supplied LNA power (downconverter only)
- Simple installation
- Temperature compensated gain
- Separate up/downconverter summary alarm outputs
- Remote reference oscillator adjust
- Time-stamped alarm history
- System temperature monitor
- CE mark

The 100 series of synthesized frequency converters are designed for both single and redundant operation in an outdoor environment. An internal synthesizer provides frequency tuning.

In addition to an RS422/485 remote monitor and control port, each unit has an RS232 local control port. A robust feature set is provided with the local control software that communicates with the converter via a COM port on an IBM compatible PC.

SPECIFICATIONS

UPCONVERTERS

RF Frequency (GHz)	1 kHz Step Size Model Number	125 kHz Step Size Model Number
5.845 – 6.725 7.9 – 8.4 13.75 – 14.5	U-100-37991M-1K	U-100-37991M

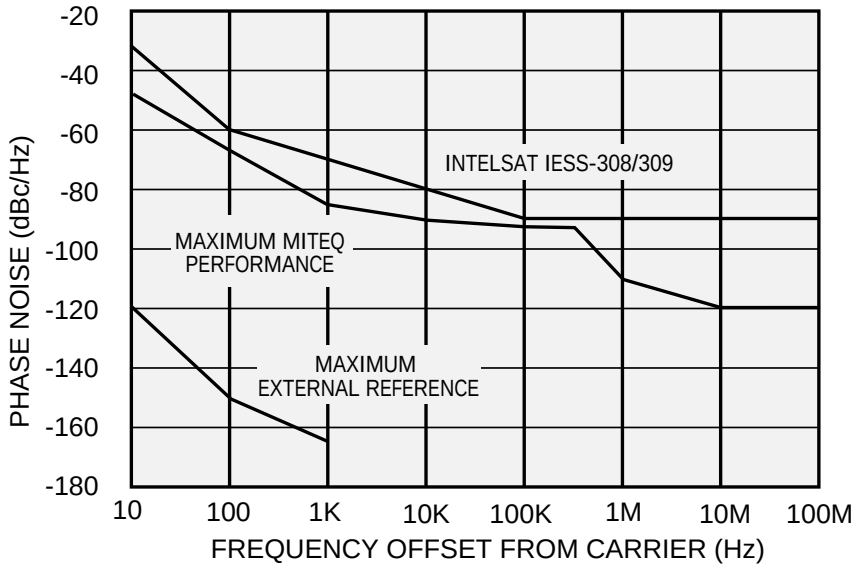
DOWNCONVERTERS

RF Frequency (GHz)	1 kHz Step Size Model Number	125 kHz Step Size Model Number
3.4 – 4.2 7.25 – 7.75 10.7 – 12.75	D-100-37991M-1K	D-100-37991M

INDEPENDENT RF FREQUENCY CONTROL UP/DOWNCONVERTERS

Upconverter RF Band (GHz)	Downconverter RF Band (GHz)	Model Number
5.845 – 6.725 7.9 – 8.4 13.75 – 14.5	3.4 – 4.2 7.25 – 7.75 10.7 – 12.75	U/D-100-37991M (125 kHz step size) U/D-100-37991M-1K (1 kHz step size)

PHASE NOISE CHARACTERISTICS (1.0 Hz BANDWIDTH)



SPECIFICATIONS

	UPCONVERTER	DOWNCONVERTER
Type	Dual conversion	
Frequency step size	See model number table	
Frequency sense	No inversion	
Input characteristics		
Frequency	70 ±20 MHz (140 ±40 MHz Option 4)	Refer to model number table
Impedance	75 ohms (50 ohms Option 15)	50 ohms
Return loss	26 dB minimum (70 ±20 MHz) 20 dB minimum (140 ±40 MHz)	17 dB minimum
Signal monitor	-20 dBc nominal	Option 2
LO leakage	N/A	-80 dBm maximum
Input level (nondamage)	+20 dBm maximum	
Output characteristics		
Frequency	Refer to model number table	70 ±20 MHz (140 ±40 MHz Option 4)
Impedance	50 ohms	75 ohms (50 ohms Option 15)
Return loss	17 dB minimum	26 dB minimum (70 ±20 MHz) 20 dB minimum (140 ±40 MHz)
Signal monitor	Option 2	-20 dBc nominal
Power output	+10 dBm minimum at 1 dB compression point	
Transfer characteristics		
Gain	+30 dB minimum	+45 dB minimum +55 dB minimum (Option 16C)
Noise figure	20 dB typical, 25 dB maximum	15 dB maximum
Image rejection	80 dB minimum	
Level stability	±0.25 dB/day maximum at constant temperature	
Amplitude response		
70 ±20 MHz	±0.25 dB/±20 MHz, ±0.20 dB/±18 MHz	
140 ±40 MHz	0.75 dB/76 MHz	
Group delay (70 ±18 MHz)		
Linear	0.03 ns/MHz maximum	
Parabolic	0.01 ns/MHz^2 maximum	
Ripple	1 ns peak-to-peak maximum	
Group delay (140 ±36 MHz)		
Linear	0.025 ns/MHz maximum	
Parabolic	0.0035 ns/MHz^2 maximum	
Ripple	1 ns peak-to-peak maximum	
Intermodulation distortion (third order)	With two -10 dBm output signals, 60 dBc minimum	
AM/PM conversion	0.1°/dB maximum to 0 dBm output	
Gain slope		
70 ±20 MHz	0.03 dB/MHz maximum (10 MHz minimum)	
140 ±40 MHz	0.05 dB/MHz maximum (10 MHz minimum)	
Spurious outputs		
Signal related	60 dBc up to 0 dBm output	
Signal independent	-70 dBm maximum	-75 dBm maximum -65 dBm maximum (Option 16C)
Gain adjustment	30 dB in 0.2 dB steps	
Frequency stability	±5 x 10^{-8}, -30 to +60°C (higher stability options available) 5 x 10^{-9}/day typical (fixed temperature after 24 hour on time)	
Frequency accuracy	22 Hz maximum with external reference	
Upconverter mute	60 dB minimum	N/A
External reference	5 or 10 MHz, +4 ±3 dBm Unit will automatically switch to internal reference if external reference level falls below +1 dBm nominal	
Phase noise	See graph	
Primary power	90–250 VAC	
Fuse	T1.25A	
Remote interface	RS485/RS422 user selectable	

GENERAL SPECIFICATIONS

PRIMARY POWER REQUIREMENTS

Voltage ..... 90–250 VAC, auto selectable
Frequency ..... 47–63 Hz
Power consumption
  Up or downconverter units ..... 80 W typical
  Combined up/downconverters ..... 120 W typical

SUMMARY ALARM

Contact closure/open for DC voltage and/or LO alarm
Status alarm readout on remote control bus

PHYSICAL

Converter enclosure ..... Refer to outline drawing
RF connectors ..... SMA female
IF connectors ..... N female
External reference connector ..... BNC female
SSPA/LNA interface mating connector MS3116F12-8P*
Redundancy interface mating connector MS3116F14-18P*
Status interface mating connector MS3116F12-10S*
Local control (RS232) interface mating connector MS3116F10-6P*
AC input connector ..... FCI Clipper series CL1M1102*
(Clipper series is interchangeable with MIL-C-5015 and AMP CPC product)

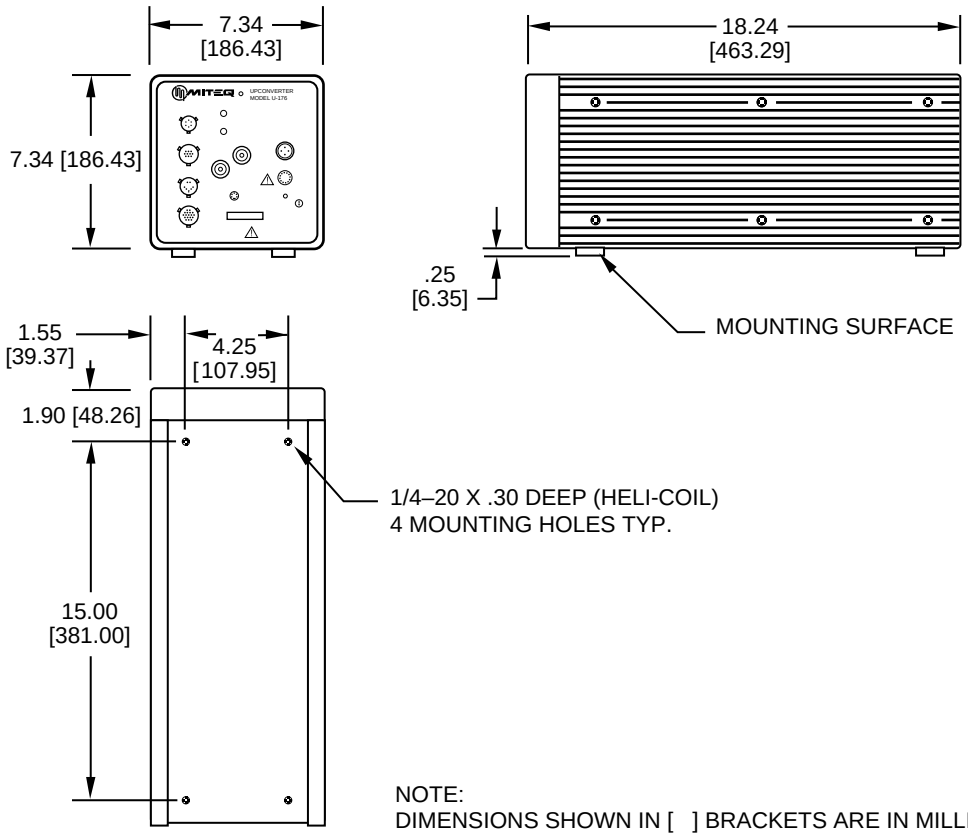
*Note: Unit supplied with mating connector

Converter enclosure weight
  Up or downconverter units ..... 40 pounds typical (Outline, Figure 1)
  Combined up/downconverters ..... 60 pounds typical (Outline, Figure 2 and 3)

ENVIRONMENTAL

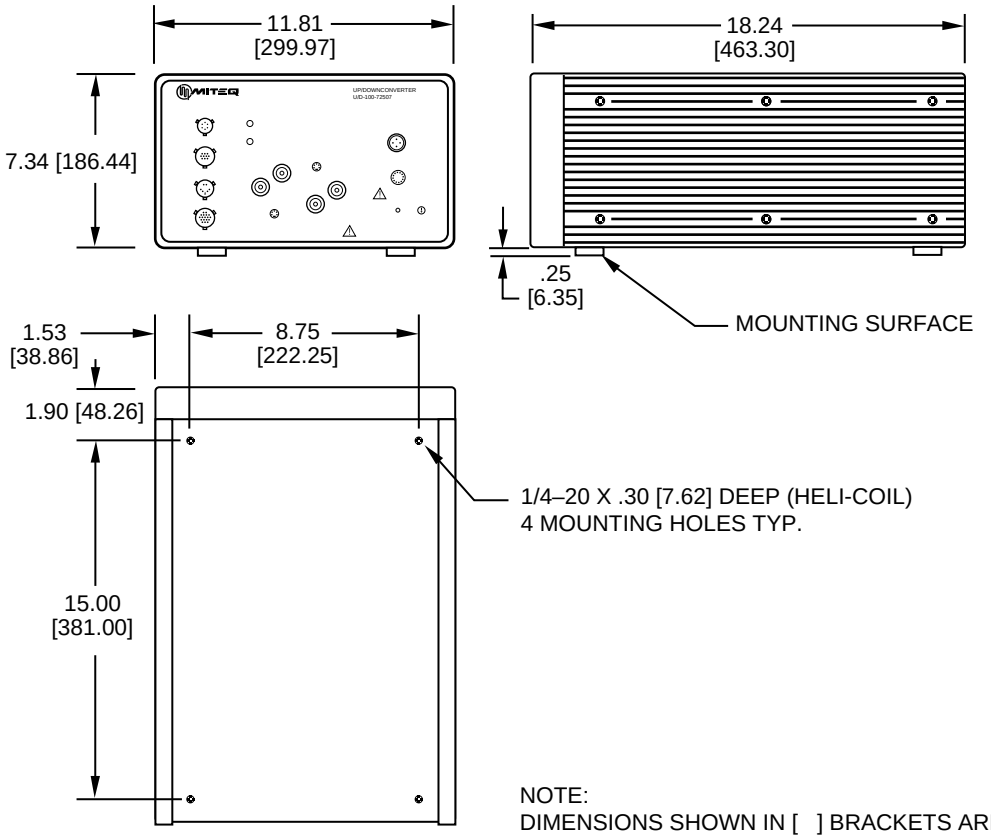
Operating
  Ambient temperature ..... -30 to +60°C
  Atmospheric pressure ..... Up to 10,000 feet
Nonoperating
  Temperature ..... -50 to +70°C
  Atmospheric pressure ..... Up to 40,000 feet
  Shock and vibration ..... Normal handling by commercial carriers

UP OR DOWNCONVERTER OUTLINE DRAWING



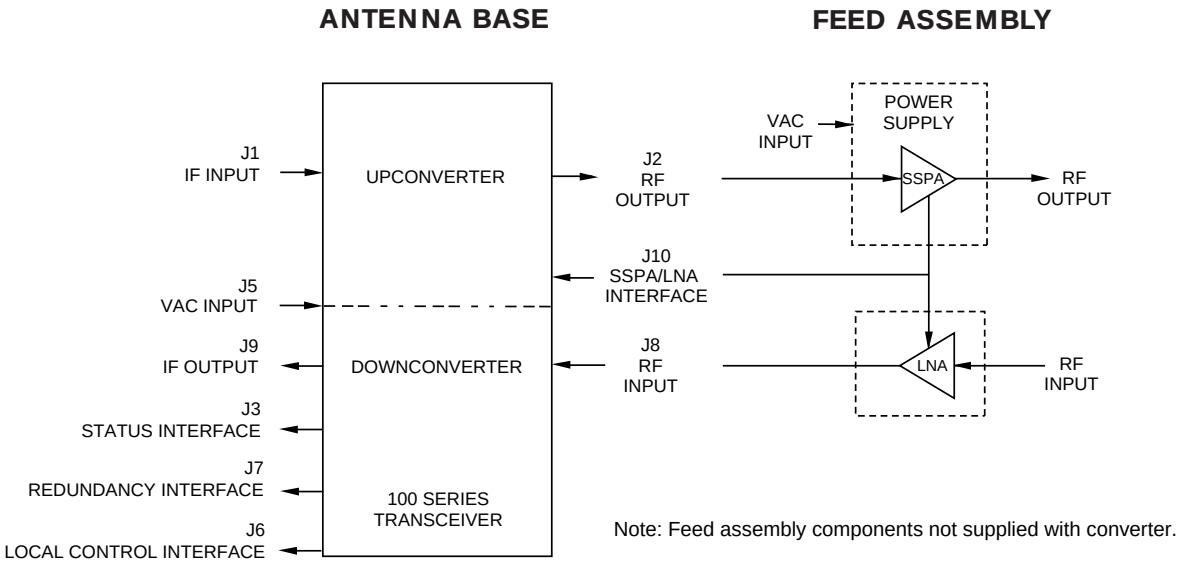
NOTE:
DIMENSIONS SHOWN IN [ ] BRACKETS ARE IN MILLIMETERS.

UP/DOWNCONVERTER OUTLINE DRAWING



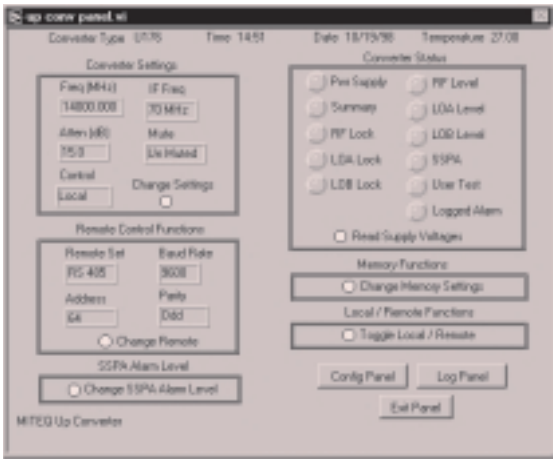
NOTE:
DIMENSIONS SHOWN IN [ ] BRACKETS ARE IN MILLIMETERS.

TYPICAL SYSTEM DIAGRAM



Note: Feed assembly components not supplied with converter.

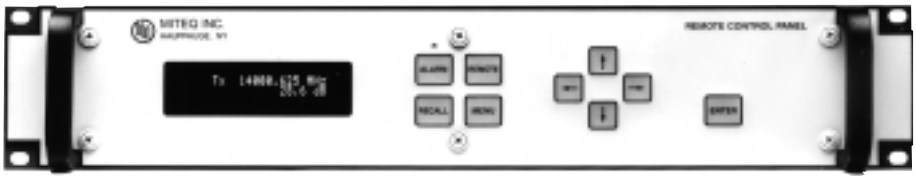
CONTROL OPTIONS



Robust software feature set
(supplied as standard)



Weather resistant
hand-held control unit
MITEQ Model Number HCT-100
(sold separately)



19" Rack-mount control unit, 2 RU
MITEQ Model Number RCT-100
(sold separately)

OPTIONS

2. RF Signal Monitor (RF connector (SMA) with -20 dBc nominal level).

4. 140 MHz IF frequency.
Bandwidth: 80 MHz minimum
Flatness: 0.75 dB/76 MHz
Group delay (±36 MHz)
Linear: 0.025 ns/MHz
Parabolic: 0.0035 ns/MHz^2
Ripple: 1 ns peak-to-peak
IF return loss (140 ±40 MHz): 20 dB minimum
Gain slope: 0.04 dB/MHz maximum (10 MHz minimum)

10. Higher frequency stability reference.
B. ±1 x 10^{-8}, -30 to +60°C,
1 x 10^{-9}/day typical (fixed temperature after 24 hour on time).
C. ±5 x 10^{-9}, -30 to +60°C,
1 x 10^{-9}/day typical (fixed temperature after 24 hour on time).

15. 50 ohm IF impedance.

16. Higher gain option (downconverters only).
C. 55 dB nominal RF/IF gain.
Specification of signal independent spurious increases with increase in IF/RF gain (e.g., if without option, specification is -75 dBm maximum, an increase of 10 dB in gain will result in signal independent spurious of -65 dBm maximum).

17. Remote control.
A. RS422.
Note: All units are supplied with an RS232 local control interface.

26. Pressurization.
Converter enclosures capable of 0.5 PSI.
Leak rate 3.0 standard cubic feet per hour maximum.

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

For literature describing local control and remote control (bus protocols), refer to MITEQ's Technical Note 25T032.

For SATCOM low-noise amplifiers, refer to MITEQ's Catalog C-23.

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