

# Ku-Band VSAT Block Up Converters



## 10W L-Band to Ku-Band Block Up Converter Module

### DESCRIPTION

The Paradise Datacom 31K Series of L-Band to Ku-Band Block Up Converters offer a wide array of choices to configure VSAT uplink terminals. Output power levels include 4, 8 and 10W.

An Internal Phase Locked Local Oscillator provides excellent phase noise when locked to an external 10 MHz reference.

The BUC can be powered by separate 48 VDC input or by the IFL via the coaxial input.

The coaxial IFL input can carry the L-Band block (950-1450 MHz), 10 MHz reference, 48 VDC, and an optional 650 KHz FSK monitor and control signal.

### FEATURES

- Single box BUC output power levels to 10W
- RS485 M&C capability
- Accurate RF Power Monitoring
- Maintenance Free Operation
- +24VDC or +48 VDC input voltage

### OPTIONS

- Antenna Mounting Kit
- Form A Summary Alarm Output
- 1:1 Redundant Systems
- Dual 1:1 Systems with LNBS
- 24 VDC operation
- Offset frequency band (13.75-14.25 GHz)
- AC/DC remote power supply

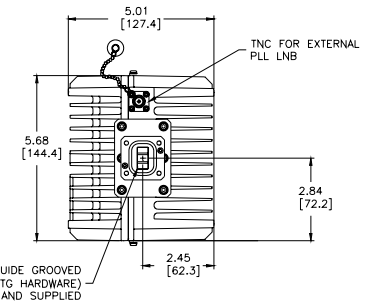
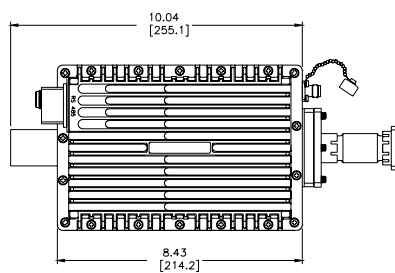
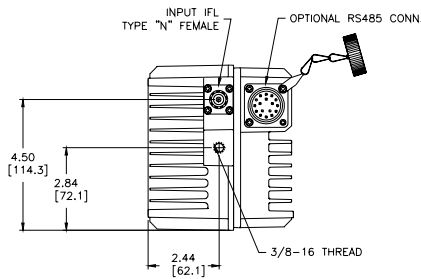
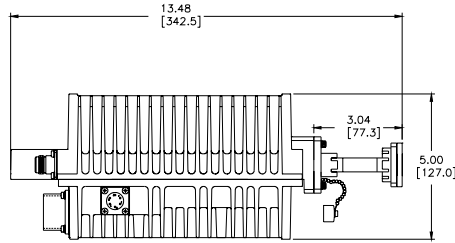
### SPECIFICATIONS

- **4W BUCs**  
10 lbs (4.5 kg)  
13.48 x 5.68 x 5.00 in  
342.5 x 144.4 x 127 mm
- **8W, 10W BUCs**  
11 lbs (5.0 kg)  
13.50 x 5.68 x 6.57 in  
342.9 x 144.4 x 166.9 mm
- Operating Temperature: -40 to +55 °C
- Survival Temperature: -50 to +70 °C
- Humidity: 100% condensing

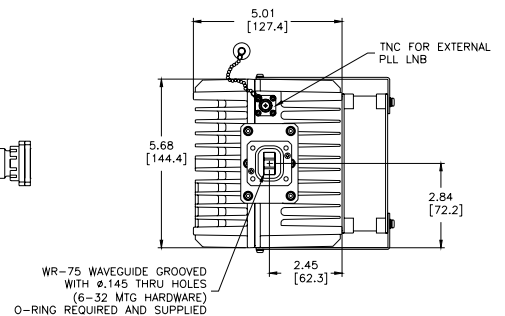
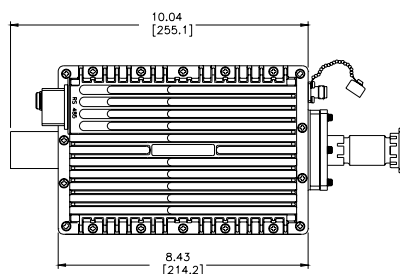
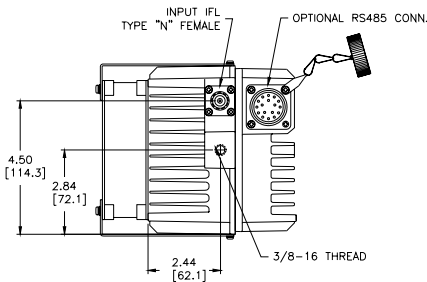
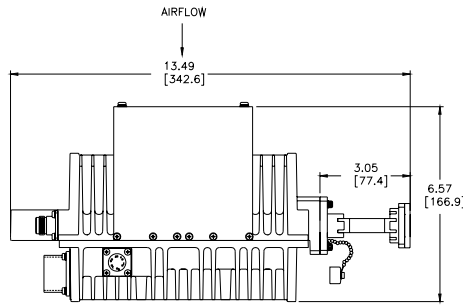
# Ku-Band VSAT Block Up Converters

## Configurations

**4W BUC, 66dB gain**  
Weight: 10 lbs.  
4.5 kg



**8W,10W BUC**  
*Same enclosure as 4W BUC  
with additional cooling fan*  
8W, 69 dB gain  
10W, 70 dB gain  
Weight: 11 lbs.  
5.0 kg





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## Electrical Parameters

PARAMETER	NOTES	LIMITS	UNITS
Output Frequency Range	13.05 GHz Local Oscillator	14.0 to 14.5	GHz
Input Frequency Range		950 to 1450	MHz
Input level range, without damage	-30 dBm for P <sub>1dB</sub>	-55 to 0	dBm
Reference signal frequency	External to BUC	10	MHz
Reference signal level		-3 to +10	dBm
Output Power (Guaranteed minimum P <sub>1dB</sub> )	4W 8W 10W	P <sub>1dB</sub> , minimum 36 39 40	dBm dBm dBm
Overall Gain (-0, +4dB) (inclusive of temperature range)	4W 8W 10W	Standard    Option 66            56 69            59 70            60	dB dB dB
Gain Stability	at constant temperature	± 0.5	dB
Gain flatness over 500 MHz	inclusive of temperature range	± 4	dB
Gain flatness over any 5 MHz	inclusive of temperature range	± 0.25	dB
Intermodulation Distortion	3dB back off relative to P <sub>1dB</sub>	-26	dBc
AM/PM Conversion	(@ rated P <sub>1dB</sub> )	3.5	°/dB
Group Delay	Over any 5 MHz	<10	ns
Transmit Interrupt Isolation	TX inhibit	>60	dB
Spurious in band		-50	dBc
Spurious out of band	As defined by ETSI mask	f <sub>c</sub> ±0.5 GHz	-
Receive band noise	In 100 KHz band	< -100	dBm
Output Return Loss	In WR 75 waveguide	> 14	dB
L Band Input Impedance		50	ohms
Input Return Loss		> 12	dB
BUC Phase Noise	Double sideband Integrated	2.8	degrees rms
	10 Hz	-50	dBc/Hz
	100 Hz	-66	dBc/Hz
	1 KHz	-70	dBc/Hz
	10 KHz	-75	dBc/Hz
	100 KHz	-100	dBc/Hz
	1 MHz	-120	dBc/Hz
External Reference Phase Noise	10 Hz	-105	dBc/Hz
	100 Hz	-134	dBc/Hz
	1 KHz	-144	dBc/Hz
	10 KHz	-154	dBc/Hz
Noise Figure		< 20	dB

## Environmental

Operating Temperature		-40 to +55	C
Survival Temperature		-50 to +70	C
Humidity	condensing	100	%
Rain, Snow, Ice		Operational	-

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## Interfaces

RF Output Connector	Waveguide Output	WR 75	WR 75 G
L Band Input Connector	IF, DC, 10 MHz, FSK Input	Type N	female
M & C Connector	Alternate DC Input, RS-485 Serial I/O	MS3102E20-29P	Plug
	Optional Form C Summary Alarm		
	and SPI link for Booster Amplifier	Pin Out	
	Serial Communication	C	RS-485 (-)
	Serial Communication	D	RS-485 (+)
	Ground	J	GND
	Alternate DC Input	K	+ Vin
	Alternate DC Input	L	+ Vin
	Ground	M	GND
	Summary Alarm Contacts	P	Form A – Open on Fault
Summary Alarm Contacts	N	Form A – Common	
Reserved for Booster Communication	B	MISO	
Reserved for Booster Communication	E	HPA PIC_SEL	
Reserved for Booster Communication	F	PIC_CLK	
Reserved for Booster Communication	G	SS	
Reserved for Booster Communication	R	MOSI	
Reserved for Booster Communication	S	PIC_SEL	

## Monitor and Control

RF Output Power	Measurement range	$P_{1dB} - 20$	dB
	accuracy	$\pm 1$	dB
Alarm	Phase Lock Oscillator	Loss of Lock	-
Gain Adjust	Available in BUC only, when used with Booster amplifier gain is fixed	15	dB
Temperature	Internal Temperature	-40 to +50	C
Transmit On/Off	Amplifier mute function	-	-
Status Request		-	-
Address Set	Used in RS-485 network	-	-

Specifications are subject to change.

## Monitor and Control

The Block Up Converter can communicate with a host computer by means of a 2-wire RS-485 interface or 650 KHz Frequency Shift Keying (FSK) interface. The 2-wire RS-485 interface is available at the circular M&C connector, MS3102E20-29P. The FSK input must be diplexed onto the coaxial L-Band input via the connector. The FSK will always take priority over the RS-485. Therefore if the BUC receives commands from both ports, only the FSK signal will reach the internal micro-controller. The 2-wire RS-485 port includes an internal 120 ohm terminating resistor.

The RS-485 communication operates at a fixed Baud rate of 9600. The FSK signal operates with a deviation of  $\pm 60$  KHz. For a complete description of the communication protocol, request Paradise Datacom document 201410.

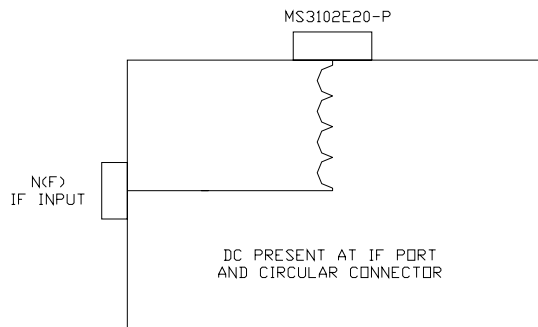
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## DC Input Power Options for Block Up Converters

The table below shows the DC bias current and BUC configuration for available power levels.

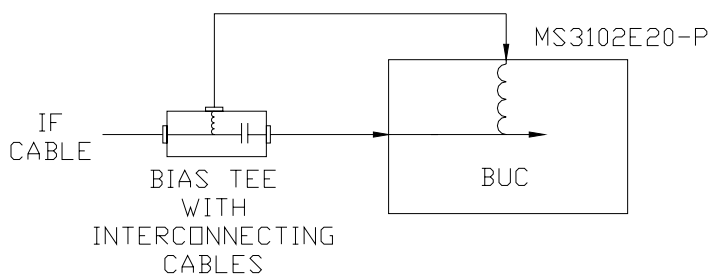
Block Up Converter	Available DC Power Options			DC Current		Notes
	T	F (24V) (22 - 32)	P (48V) (36 - 60)	@ 24 V (22 - 32)	@ 48 V (36 - 60)	
4W Ku-Band	●			4.0A	2.0A	Figure 1
8W Ku-Band		●	●	4.6A	2.3A	Figure 2 or 3
10W Ku-Band		●	●	5.0A	2.5A	Figure 2 or 3

**Figure 1: DC connected to IF port (Option “T”)**



3	1	K	-	0	2	A	X	X	3	T	X	X
3	1	K	-	0	4	A	X	X	3	T	X	X

**Figure 2: IF powered through external Bias Tee**

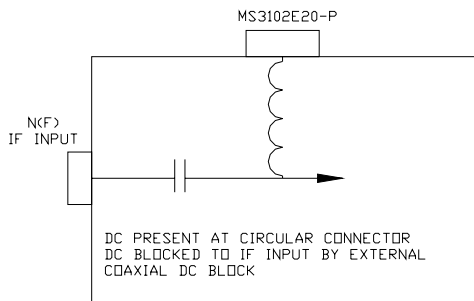


3	1	K	-	0	8	A	X	X	3	P	X	X
3	1	K	-	1	0	A	X	X	3	P	X	X

External Bias Tee and cables will be added to sales order.



**Figure 3: DC blocked to IF port (Options “F” and “P”)**

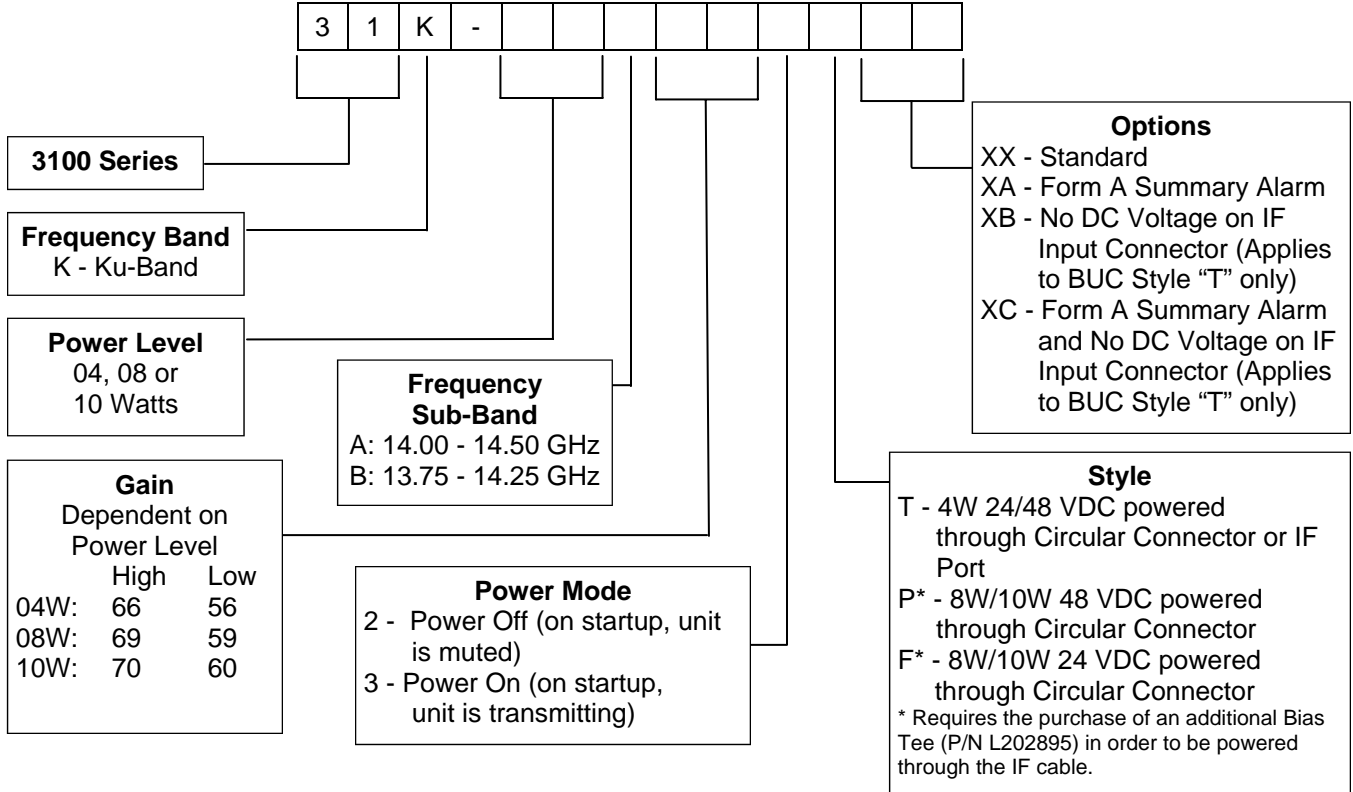


3	1	K	-	0	8	A	X	X	3	F	X	X
3	1	K	-	0	8	A	X	X	3	P	X	X
3	1	K	-	1	0	A	X	X	3	F	X	X
3	1	K	-	1	0	A	X	X	3	P	X	X

# Ku-Band VSAT Block Up Converters



## Configurator: Block Up Converters



# Ku-Band VSAT Block Up Converters



## Configurator: Redundant BUC Assemblies

