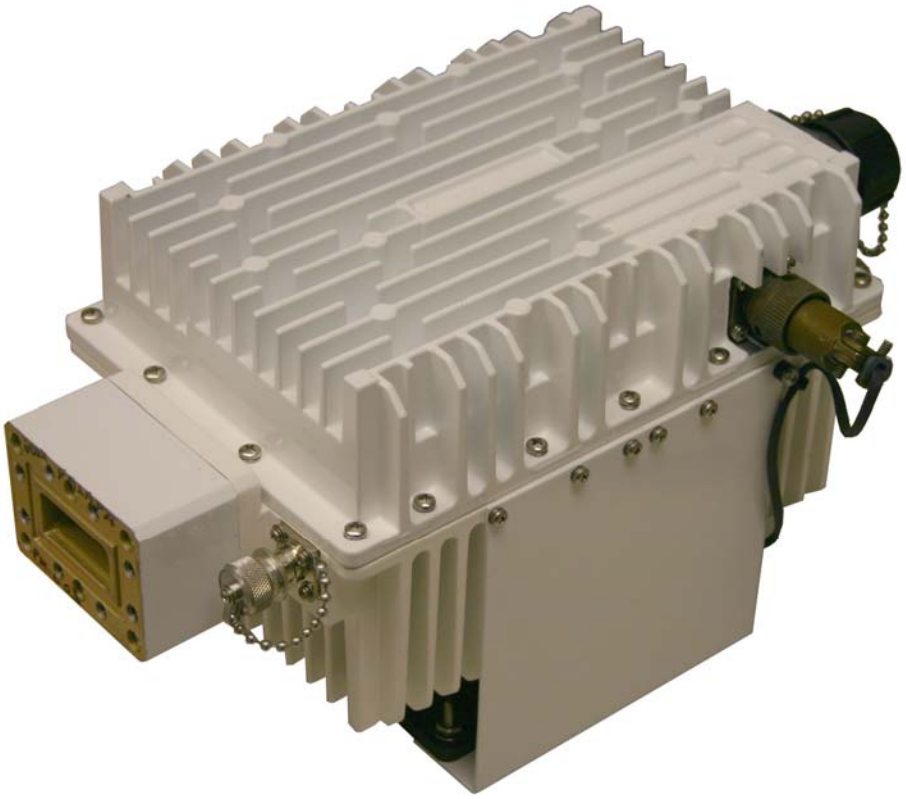
C-Band VSAT
Block Up Converters

PARADISE DATACOM
AN INTELEK PLC COMPANY



20W L-Band to C Band Block Up Converter Module

DESCRIPTION

The Paradise Datacom 31C Series of L Band to C Band Block Up Converters offer a wide array of choices to configure VSAT uplink terminals. Output power levels include 10 and 20W.

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

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

The coaxial IFL input can carry the L Band block (950-1525 MHz), 10 MHz reference, 48 VDC, and an optional 650 KHz FSK monitor and control signal.

FEATURES

- Single box BUC output power levels to 20W
- 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 and RCPD-1100 Controller
- 24 VDC operation
- AC/DC remote power supply
- Bias Tees on BUC IFL Input

SPECIFICATIONS

- **10W BUCs**
  11 lbs. (5.0 kg)
  12.00 x 5.68 x 5.00 in
  305 x 144 x 127 mm

- **20W BUCs**
  11 lbs (5.0 kg)
  12.00 x 5.68 x 6.57 in
  305 x 144 x 167 mm

- Operating Temperature: -40 to +55 ^{o}C
- Survival Temperature: -50 to +70 ^{o}C
- Humidity: 100% condensing

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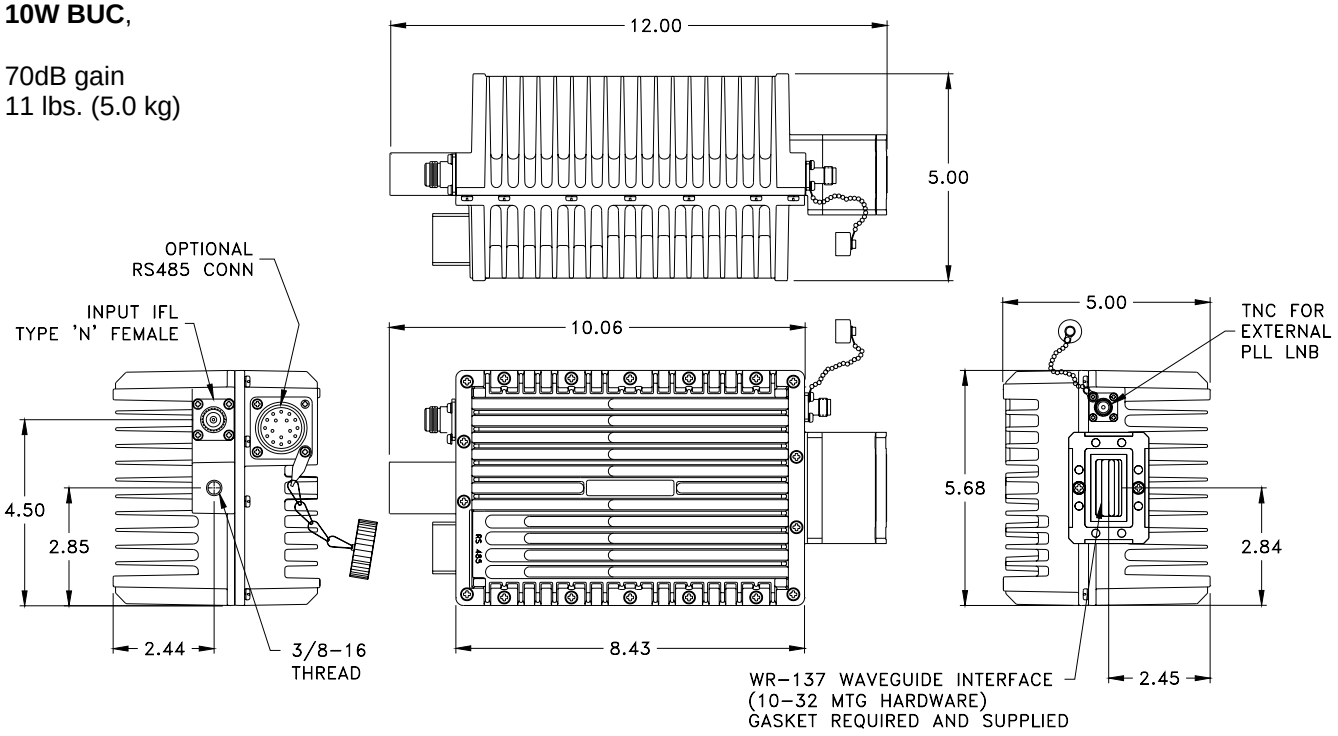
201811 Rev P ECO 3555

Configurations

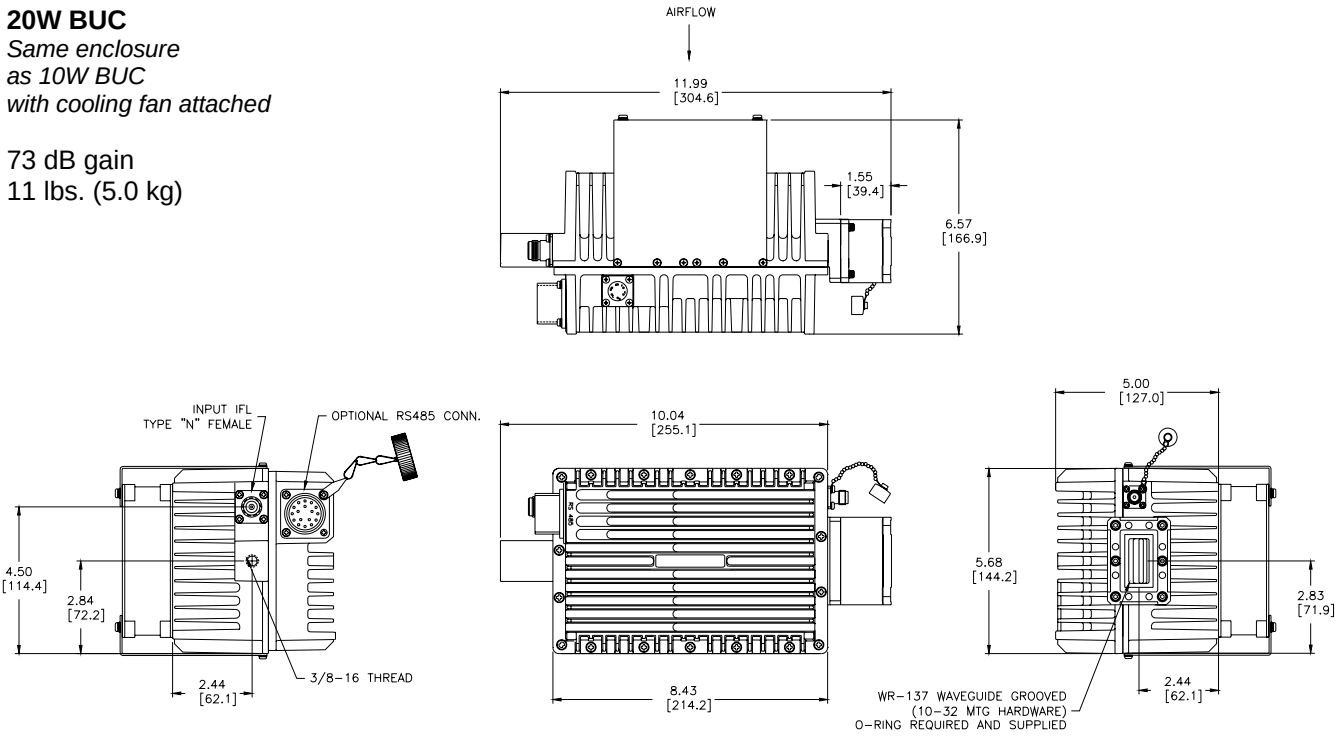
10W BUC,

70dB gain
11 lbs. (5.0 kg)

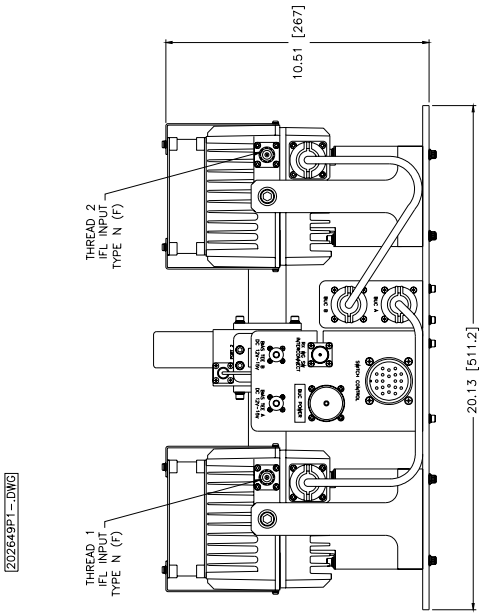


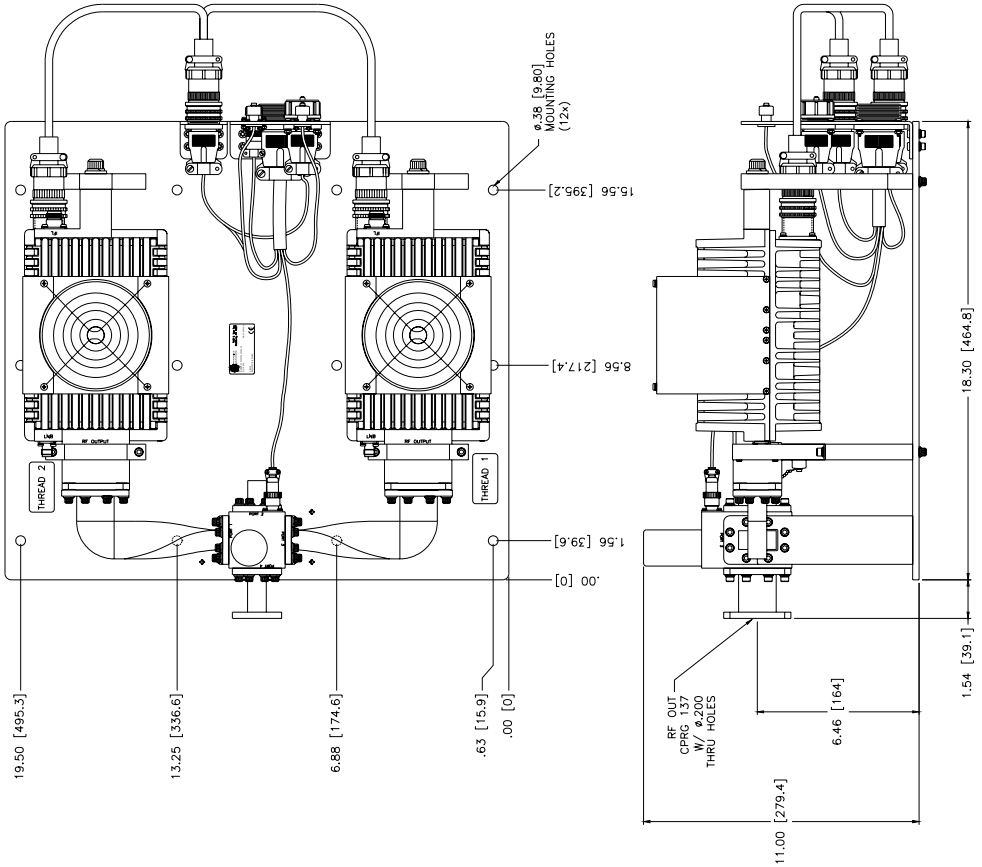
20W BUC
Same enclosure
as 10W BUC
with cooling fan attached

73 dB gain
11 lbs. (5.0 kg)



Outline Drawing,
C-Band Redundant
Plate Assembly





Electrical Parameters

PARAMETER	NOTES	LIMITS	UNITS
Output Frequency Range	4.90 GHz Local Oscillator	5.850 to 6.425	GHz
Input Frequency Range		950 to 1525	MHz
Input level range,without damage	-30 dBm for P1dB	-55 to 0	dBm
Reference signal frequency	External to BUC	10	MHz
Reference signal level		-3 to +10	dBm
Output Power (Guaranteed minimum P_{1dB})	 10W 20W	P1dB, minimum 40 43	 dBm dBm
Overall Gain (-0, +4dB) (inclusive of temperature range)	10W 20W	70 73	dB dB
Gain Stability	at constant temperature	$\pm$ 0.5	dB
Gain flatness over 575 MHz	inclusive of temperature range	$\pm$ 4	dB
Gain flatness over any 5 MHz	inclusive of temperature range	$\pm$ 0.25	dB
Intermodulation Distortion	3dB back off relative to P_{1dB}	-26	dBc
AM/PM Conversion	(@ rated P_{1dB})	3.5	^{o}/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	fc$\pm$0.5 GHz	-
Receive band noise	In 100 KHz band	< -100	dBm
BUC Phase Noise	Double sideband Integrated	2.8	degrees rms
	10 Hz 100 Hz 1 KHz 10 KHz 100 KHz 1 MHz	-65 -73 -80 -85 -105 -120	dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz
External Reference Phase Noise	10 Hz 100 Hz 1 KHz 10 KHz	-105 -134 -144 -154	dBc/Hz dBc/Hz dBc/Hz dBc/Hz
Noise Figure		< 20	dB
Output Return Loss	In WR 137 waveguide	> 14	dB
L Band input impedance		50	ohms
Input Return Loss		> 12	dB

Environmental

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

Interfaces

RF Output Connector	Waveguide Output	WR 137	CPR-137 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.

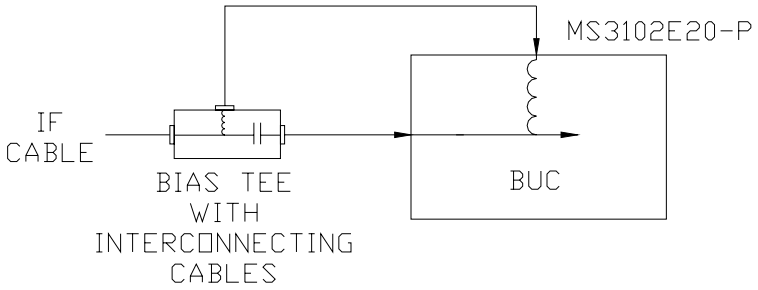
The RS-485 communication operates at a fixed Baud rate of 9600. The FSK signal operates with a deviation of $\pm$ 60 KHz. For a complete description of the communication protocol, request Paradise Datacom document 201410.

DC Power Options for Block Up Converters

The following table shows the DC bias current and BUC configuration for the various power levels.

Block Up Converter	Available DC Power Options			DC Current		Notes
	T	F (24 V) (22 - 32)	P (48 V) (36 - 60)	@ 24 V (22 - 32)	@ 48 V (36 - 60)	
10W C-Band		●	●	5.0A	2.5A	Figure 1 or 2
20W C-Band		●	●	6.0A	3.0A	Figure 1 or 2

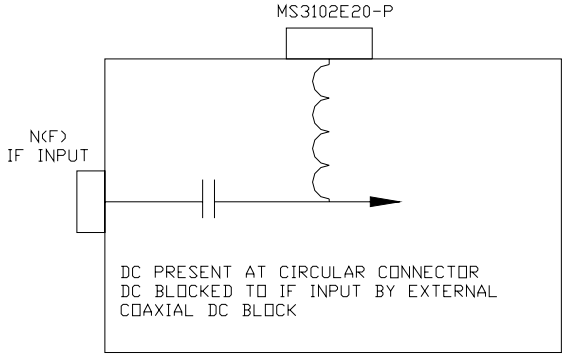
Figure 1: IF powered through external Bias Tee



3	1	C	-	1	0	A	X	X	3	P	X	X
3	1	C	-	2	0	A	X	X	3	P	X	X

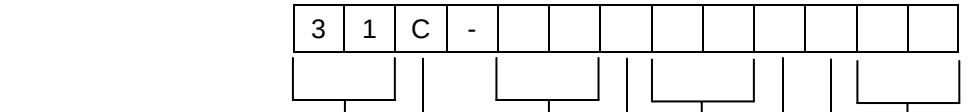
External Bias Tee and cables will be added to sales order.

Figure 2: DC blocked to IF port (Options “F” and “P”)



3	1	C	-	1	0	A	X	X	3	F	X	X
3	1	C	-	1	0	A	X	X	3	P	X	X
3	1	C	-	2	0	A	X	X	3	F	X	X
3	1	C	-	2	0	A	X	X	3	P	X	X

Configurator: Block Up Converters



3100 Series

Frequency Band
C - C-Band

Power Level
10, or 20 Watts

Gain
Dependent on Power Level

	High	Low
10W:	70	60
20W:	73	63

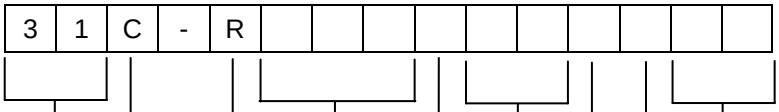
Frequency Sub-Band
A: 5.850 - 6.425 GHz

Power Mode
2 - Power Off (on startup, unit is muted)
3 - Power On (on startup, unit is transmitting)

Style
T - 5W 24/48 VDC powered through Circular Connector of IF Port
P* - 10W/20W 48 VDC powered through Circular Connector
F* - 10W-20W 24 VDC powered through Circular Connector
* Requires the purchase of an additional Bias Tee (P/N L202895) in order to be powered through IFL cable.

Options
XX - Standard
XA - Form A Summary Alarm
XB - No DC Voltage on if Input Connector (Applies to BUC Style “T” only)
XC - Form A Summary Alarm and No DC Voltage on IF Input Connector (Applies to BUC Style “T” only)

Configurator: Redundant BUC Assemblies



3100 Series

Frequency Band
C - C-Band

Configuration
R - Redundant Plate

Power (in Watts)
010, 020

Frequency Sub-Band
A: 5.850 - 6.425 GHz

Gain
Dependent on Power Level

	High	Low
10W:	70	60
20W:	73	63

Power Mode
2 - Power Off (on startup, unit is muted)
3 - Power On (on startup, unit is transmitting)

Options
XA - Form A Summary Alarm
XB - No DC Voltage on if Input Connector (Applies to BUC Style “T” only)
XC - Form A Summary Alarm and no DC Voltage on if Input Connector
XD - External DC Block on BUC Input
XE - Form A Summary Alarm and External DC Block on BUC Input
TX - Bias Tee on BUC IFL Input

Style
P* - 10W/20W 48 VDC powered through Circular Connector
F* - 10W-20W 24 VDC powered through Circular Connector
* Requires the purchase of an additional Bias Tee (P/N L202895, option TX) in order to be powered through IFL cable.