

**1:1 Redundant
25W Ku-Band
Plate Assembly**

Description

The Paradise Datacom family of vBUCs can be configured in a variety of custom systems to meet any redundant system application.

Redundant systems are available in the following output power levels:

25W, 50W	C-Band
10W, 25W, 35W	X-Band
10W, 16W, 25W	Ku-Band

The vBUC is also available in 1:2 redundant configurations with the addition of a RCP2-1200 Redundant System Controller. Chain 1:1 redundancy is available with the use of a RCPD-1100 Dual Redundant Controller.

FEATURES

- Single box BUC output power levels to:
 - 50W C-Band
 - 35W X-Band
 - 25W Ku-Band
- Wide Range of Interface Capability including:
 - FSK Control
 - RS 485
 - Ethernet
- Output Power Detection
- Adjustable Gain
- Automatic detection of external reference power and frequency
- Multiple external reference frequency operation including:
 - 5, 10, 20, 25 & 50 MHz

OPTIONS

- 6 Amp External Bias Tee for IFL Bias feed
- High Stability internal 10 MHz reference
- AC Power Supply
- 24 VDC operation on selected models
- TX & RX Reject Filters
- Extended Bands

SPECIFICATIONS

- 1:1 Plate dimension:
 - 18 x 18.3 x 12.0 inches
 - 457 x 465 x 306 mm
 - (with AC Power Supplies)
- 1:1 Plate weight:
 - 53.5 lbs. / 24.3 kg.
 - (with AC Power Supplies)

C-Band Redundant System Output Power Levels

PARAMETER	MODEL NUMBER	NOTES	LIMITS	UNITS
Frequency Range		*	5.850 to 6.425	GHz
Output Power @: Saturation/P _{1dB} (Guaranteed minimum)	VBUC25AAXXXXX VBUC50AAXXXXX	<u>Gain</u> 69 dB 72 dB	P _{sat} / P _{1dB} 44.25/43.75 (26.6/23.7) 47.25/46.75 (53.1/47.3)	dBm (W) dBm (W)
Power Requirements 48 VDC Input @ max current draw per unit	VBUC25AAXXXXX VBUC50AAXXXXX	<u>24 VDC current</u> 6.5 11.5	<u>48 VDC current</u> 3.0 5.6	Amps Amps

X-Band Redundant System Output Power Levels

PARAMETER	MODEL NUMBER	NOTES	LIMITS	UNITS
Frequency Range			7.90 to 8.40	GHz
Output Power @: Saturation/P _{1dB} (Guaranteed minimum)	VBUX10AAXXXXX VBUX25AAXXXXX VBUX35AAXXXXX	<u>Gain</u> 65 dB 69 dB 70 dB	P _{sat} / P _{1dB} 40.25/39.75 (10.6/9.4) 44.25/43.75 (26.6/23.7) 45.25/44.75 (33.5/29.9)	dBm (W) dBm (W) dBm (W)
Power Requirements 48 VDC Input @ max current draw per unit	VBUX10AAXXXXX VBUX25AAXXXXX VBUX35AAXXXXX	<u>24 VDC current</u> 4.2 9.6 11.0	<u>48 VDC Current</u> 2.0 4.7 5.2	Amps Amps Amps

Ku-Band Redundant System Output Power Levels

PARAMETER	MODEL NUMBER	NOTES	LIMITS	UNITS
Frequency Range		*	14.0 to 14.5	GHz
Output Power @: Saturation/P _{1dB} (Guaranteed minimum)	VBUCK10AAXXXXX VBUCK16AAXXXXX VBUCK25AAXXXXX	<u>Gain</u> 65 dB 67 dB 68 dB	P _{sat} / P _{1dB} 40.25/39.75 (10.6/9.4) 42.75/41.75 (18.8/15.0) 43.75/42.75 (23.7/18.8)	dBm (W) dBm (W) dBm (W)
Power Requirements 48 VDC Input @ max current draw per unit	VBUCK10AAXXXXX VBUCK16AAXXXXX VBUCK25AAXXXXX	<u>24 VDC current</u> 6.2 9.1 10.1	<u>48 VDC Current</u> 3.0 4.5 5.0	Amps Amps Amps

* Units available with Extended band frequencies.
 For C-Band units, de-rate output power by 1 dB over 6.425 - 6.725 GHz.
 For Ku-Band units, de-rate output power by 1 dB over 13.75 - 14.0 GHz.

Redundant System Specifications

PARAMETER	NOTES	LIMITS	UNITS
Gain Flatness Gain Slope Gain variation vs. Temperature	full band per 40 MHz	± 2.0 ± 0.75 0 ± 1.0	dB dB dB
Intermodulation Distortion	3dB back off relative to P_{1dB}	-25	dBc
Spurious	In-Band Signal Related (C-/Ku-Band) (Extended C-Band) Close to Carrier Spurious (≤ 20 MHz) Local Oscillator Non-Signal Related	-50 -40 -70 -70 -50	dBc dBc dBc dBm dBm
Harmonics	2 nd harmonic measured at P_{1dB}	-40	dBc
Output Spectrum	Low side Local Oscillator	Non Inverted	
Input VSWR		1.43:1	
Output VSWR		1.67:1	
Noise Figure		15	dB
Group Delay (per 40 MHz segment)	Linear Parabolic Ripple	0.02 0.005 1.0	ns/MHz ns/MHz ² ns p-p
User Adjustable Gain	In 0.1 dB steps	+15	dB
Reference Input Frequency	Diplexed on L-Band Input Connector	5, 10, 20, 25, 50 MHz	MHz
Reference Input Power	Diplexed on L-Band Input Connector	-10 to +5	dBm
Input Voltage	+48 VDC nominal	+36 to +60	VDC
FSK Communication ¹ Diplexed on L-Band Input	Center Frequency Deviation Locking Range Input Power Range Start Tone Time	650 ± 60 ± 32.5 -15 to -5 10	KHz KHz KHz dBm msec
Alarm Output	Phase Lock Alarm Internal BUC Voltages BUC Current +48 or +24 VDC Input Voltage Case Temperature LNB Current	Form C Summary Contacts	
Internal Reference Option ²	Reference Frequency Freq. Stability over temperature range Aging per day Aging per year Frequency Accuracy Warm up time	10 $< \pm 1 \cdot 10^{-8}$ $< \pm 1 \cdot 10^{-9}$ $< \pm 5 \cdot 10^{-8}$ $\pm 1 \cdot 10^{-8}$ 20 minutes	MHz $< \pm 1 \cdot 10^{-8}$
Internal Reference Phase Noise	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz	-120 -140 -145 -152 -155	dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz

¹ FSK Communication protocol, document # 201410

² Internal reference option units will automatically detect and switch to an applied external reference.

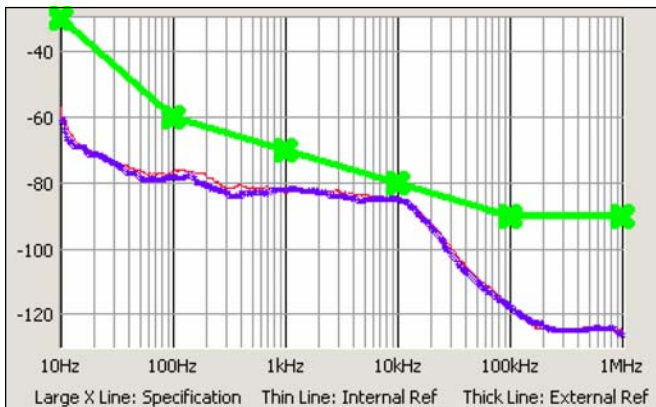
Frequency Bands

Band	Frequency Plan*	IF Input	LO Frequency	RF Output
C	Standard C-Band	950 - 1525 MHz	4.900 GHz	5.850 - 6.425 GHz
C	Extended C-Band	950 - 1825 MHz	4.900 GHz	5.850 - 6.725 GHz
C	Palapa Band	950 - 1250 MHz	5.475 GHz	6.425 - 6.725 GHz
C	Insat Band	950 - 1250 MHz	5.775 GHz	6.725 - 7.025 GHz
X	Standard X-Band	950 - 1450 MHz	6.950 GHz	7.900 - 8.400 GHz
Ku	Standard Ku-Band	950 - 1450 MHz	13.050 GHz	14.00 - 14.50 GHz
Ku	Extended Ku-Band	950 - 1700 MHz	12.800 GHz	13.75 - 14.50 GHz

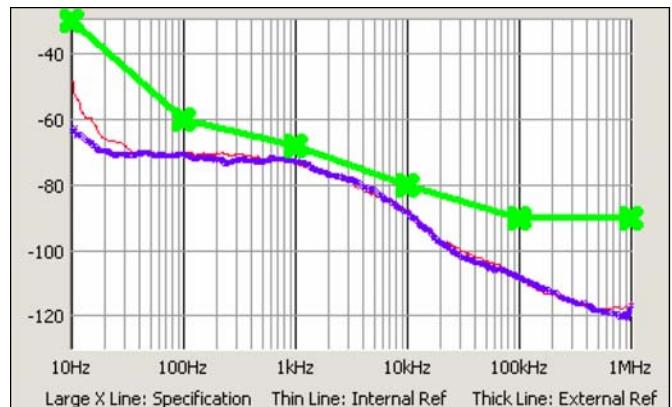
* Custom frequency plans available upon request.

Local Oscillator Phase Noise

Offset	Guaranteed Max.	C-Band <i>Typical</i>	X-Band <i>Typical</i>	Ku-Band <i>Typical</i>	Units
10 Hz	-30	-60	-60	-50	dBc/Hz
100 Hz	-60	-80	-75	-65	dBc/Hz
1 KHz	-65	-80	-75	-72	dBc/Hz
10 KHz	-75	-85	-100	-80	dBc/Hz
100 KHz	-90	-120	-110	-100	dBc/Hz
1 MHz	-90	-125	-122	-115	dBc/Hz



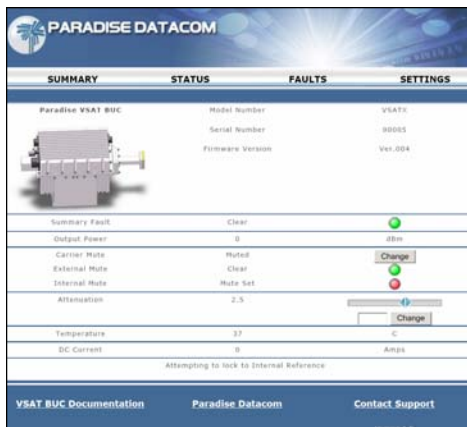
Typical C-Band Phase Noise Plot



Typical Ku-Band Phase Noise Plot

Interfaces

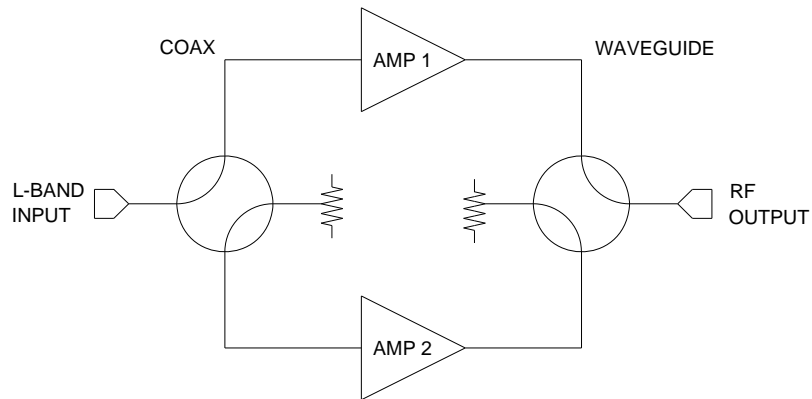
Port	Connector	Description	Details	
J1	L Band Input	IF, 10 MHz, FSK Input DC must be tapped off using external Bias Tee	Type N	female
J7	DC Input MS3102R18-4P	+48 VDC Optional +24 VDC	A B C D	+ VDC + VDC - VDC - VDC
J4	Monitor & Control MS3112E14-18S	Serial Communication Serial Communication Serial Communication Summary Alarm Contacts Summary Alarm Contacts Summary Alarm Contacts TX Inhibit Ethernet Ethernet Ethernet Ethernet Ground Ground Ground Serial Override Ethernet Override	U R L B F D J H G C A E K M S N	RS-485 (-) RS-485 (+) Isolated Ground Form C - Closed on Fault Form C - Common Form C - Open on Fault Ground Enable TX TX - TX + RX - RX + Chassis Ground Chassis Ground Chassis Ground Ground resets to Serial Comms Ground resets to Ethernet Comms
J5	Link Connector MS3112E12-10S	Fiber Optic Module Alarm Ground Ground +15 VDC for LNB +15 VDC for Fiber Optic Module Redundancy Switch Drive Link In Link Out Redundancy Switch Common	J C H A B G E F K	Closure to Ground Ground Ground Ground Current Sensed +15 VDC +15 VDC @ 1A +48 or +24 Current Sink +48 or +24 VDC (Vin+)
J8	Fan Voltage MS3112E8-3S	V+ V-	A B	+48 or +24 VDC Return



Universal M&C Software

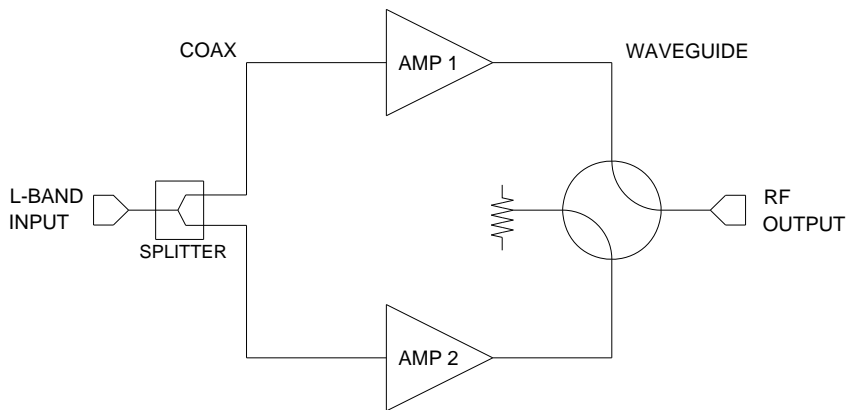
The Paradise Datacom Universal Monitor & Control software provides a remote view of the state of the vBUC via a web browser.

The user may adjust the attenuation of the vBUC and mute/unmute the unit. In addition, the web-based status screen shows the fault condition, mute state, current and temperature.



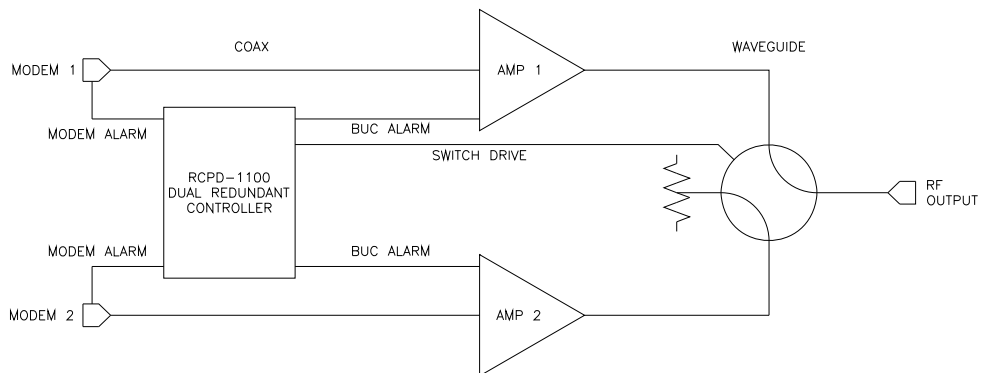
Block Diagram, 1:1 redundant system, input switching

1:1 systems with input switching require the internal reference option in each vBUC.



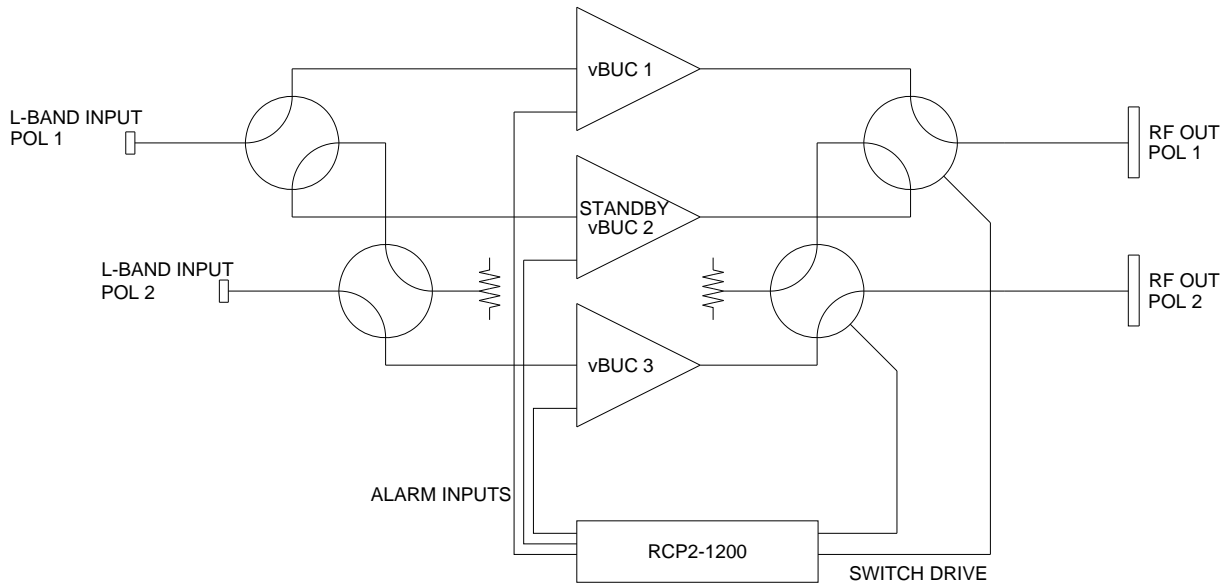
Block Diagram, 1:1 redundant system, input splitting

1:1 systems with input splitting can use an external reference. Units can be fitted with internal reference for auto-detection and switch over to an external reference at need.



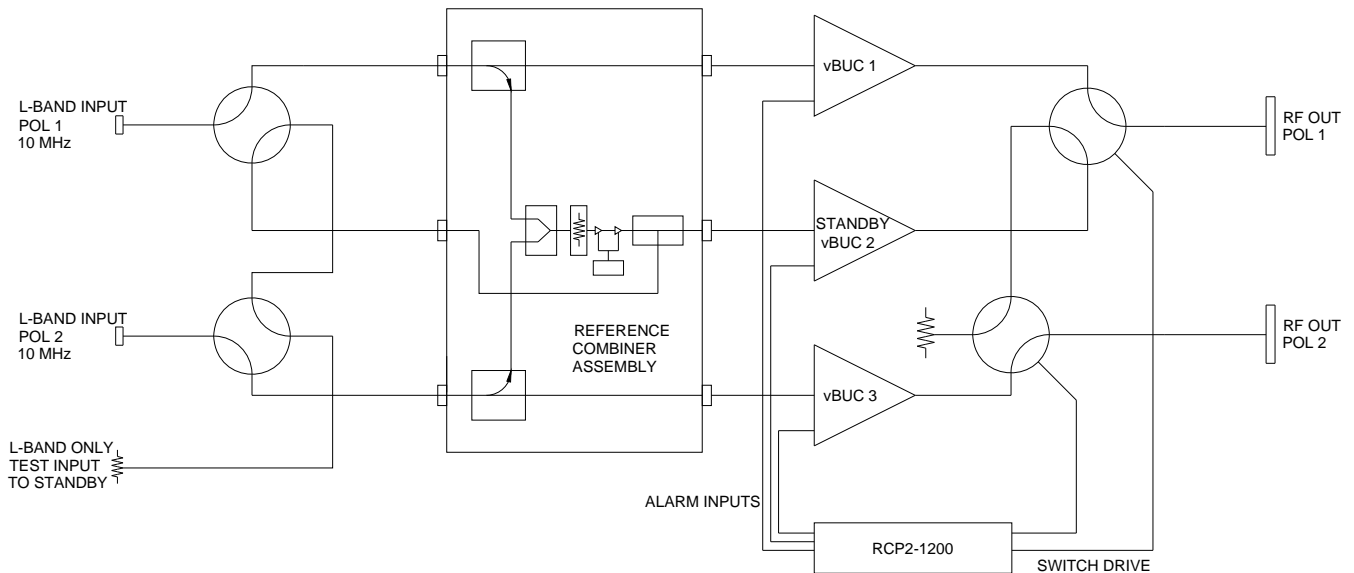
Block Diagram, 1:1 chain redundant system

1:1 Chain Redundant Systems require a RCPD-1100 Dual Redundant System Controller.



Block Diagram, 1:2 Redundant System, Internal 10 MHz Reference

1:2 Redundant Systems require the use of a RCP2-1200 Redundant System Controller.

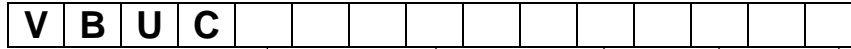


Block Diagram, 1:2 Redundant System, External Reference with Reference Combiner

1:2 Redundant Systems require the use of a RCP2-1200 Redundant System Controller.

With this configuration, vBUCs may be fitted with an internal reference for auto-detection and be able to switch over to an external reference at need.

Part Number Configuration



Band

C - C-Band
 X - X-Band
 K - Ku-Band

**Power Level
(in Watts)**

C-Band
 25, 50

X-Band
 10, 25, 35

Ku-Band
 10, 16, 25

Frequency Sub Band

C-Band
 A - 5.85 - 6.425 GHz
 B - 5.85 - 6.725 GHz
 C - 5.75 - 6.670 GHz
 E - 6.425 - 6.725 GHz (Palapa)
 F - 6.725 - 7.025 GHz (Insat)
 G - 5.750 - 6.475 GHz

X-Band
 A - 7.90 - 8.40 GHz

Ku-Band
 A - 14.00 - 14.50 GHz
 B - 13.75 - 14.50 GHz

Input Voltage

A = +48 V
 B = +24 V

Configuration Modifier

XXX = Standard

System Configuration Options

A¹ = 1:1 w/ Input Switching, Internal Control
 B = 1:1 w/ Input Splitter, Internal Control
 C² = 1:2 w/ Input Switching & RCP2-1200³
 F = 1:1 w/ Input Splitter & RCP2-1100³
 H¹ = 1:1 w/ Input Switching & RCP2-1100³
 J = 1:1 chain redundancy & RCPD-1100³

¹ Not available with units utilizing an external reference.
² 1:2 systems utilizing input switching with an external reference require the use of a reference combiner.
³ Standard Cable Length of 100 ft. (30m) with RCP

Block Up Converter

X = Standard External Reference
 R = Internal 10 MHz Reference Oscillator

Input Power Configuration

X = Input Voltage on Circular Connector (Standard)
 A* = AC Power Supply mounted to BUC
 B* = AC Power Supply with DC connectors only
 C* = AC Power Supply with custom-length DC cable
 T* = External IFL Bias Tee

* Available with +48V Input Voltage only

Specifications within this document are subject to change without notice.