

# Ku-Band Redundant Block Downconverter Systems

## BRKD1 Series

### Introduction

BRKD1 Series Ku-Band Redundant Block Downconverter (BDC) systems contain either three converters in a 1:2 redundant configuration or two converters in a 1:1 redundant configuration. The systems include automatic switchover logic, redundant power supplies, and redundant ac line inputs. The systems are designed for installation at satellite earth stations in standard 19-inch EIA equipment racks. The systems are designed to house BD-Series Ku-Band Block Downconverters.

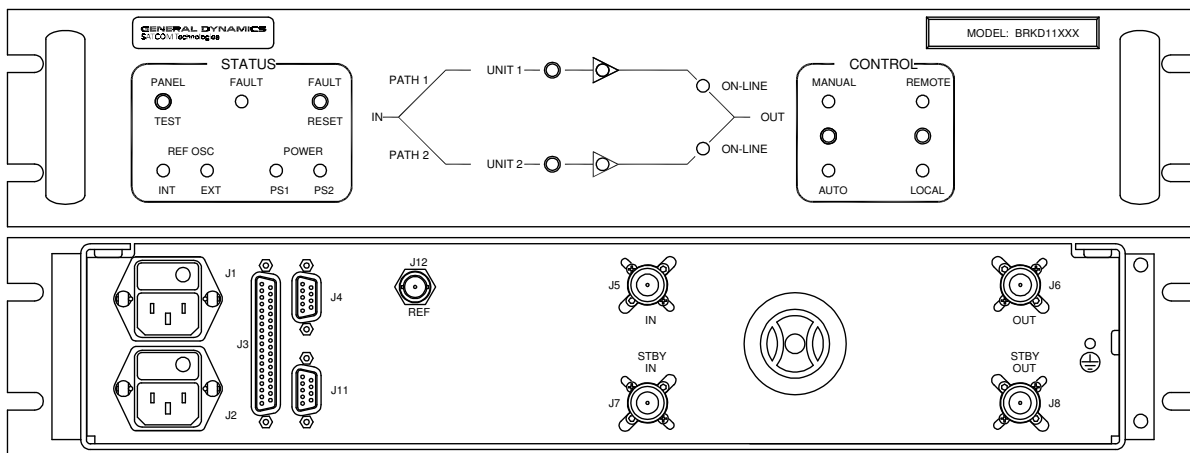
### Options

- 10 dB gain
- 20 dB gain

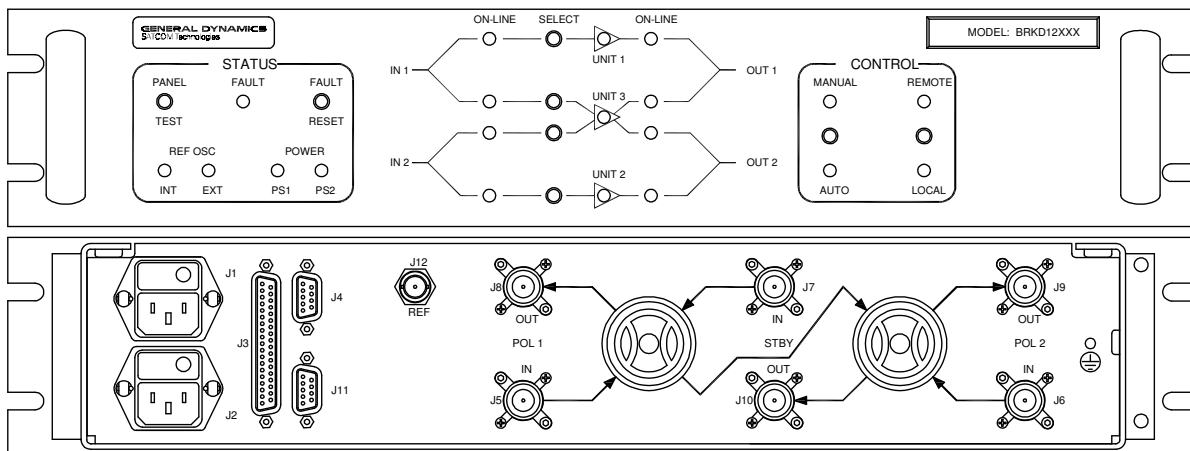
### Features

- Standard 19" rack panel, 3.5" high
- Dual redundant power supplies
- Worldwide AC input capability
- Monitors converter bias currents and phase lock to external reference
- Manual or automatic operation
- Manual override switch control knobs on rear panel
- Serial I/O
- Offline I/O
- Frequency reference that is stable to  $\pm 20$  ppb in stand-alone operation
- 10.0 MHz external reference

1:1 FRONT AND REAR PANELS:



1:2 FRONT AND REAR PANELS:



## Operating Modes

- *Automatic Mode*

In Automatic mode, if a failure is detected in an on-line converter, the standby converter is switched on line. Typical switchover time is 100 milliseconds. For 1:2 systems, in the case that both on-line converters fail, priority is selectable to either Pol 1 or Pol 2. For either 1:1 or 1:2 systems, the unit will not automatically switch to a defective converter.

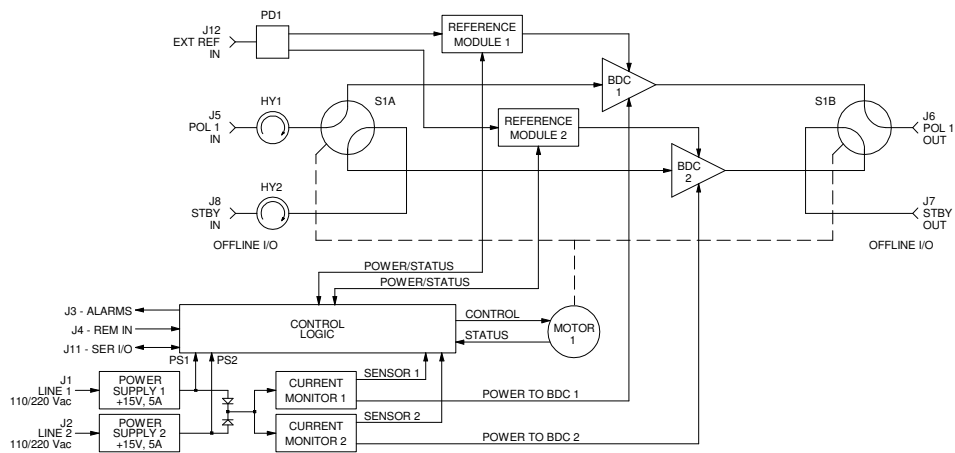
- *Manual Mode*

The converters can also be manually switched from the front panel or remotely. In Manual mode, automatic switching will not occur upon fault detection, although the monitor and alarm circuits still function.

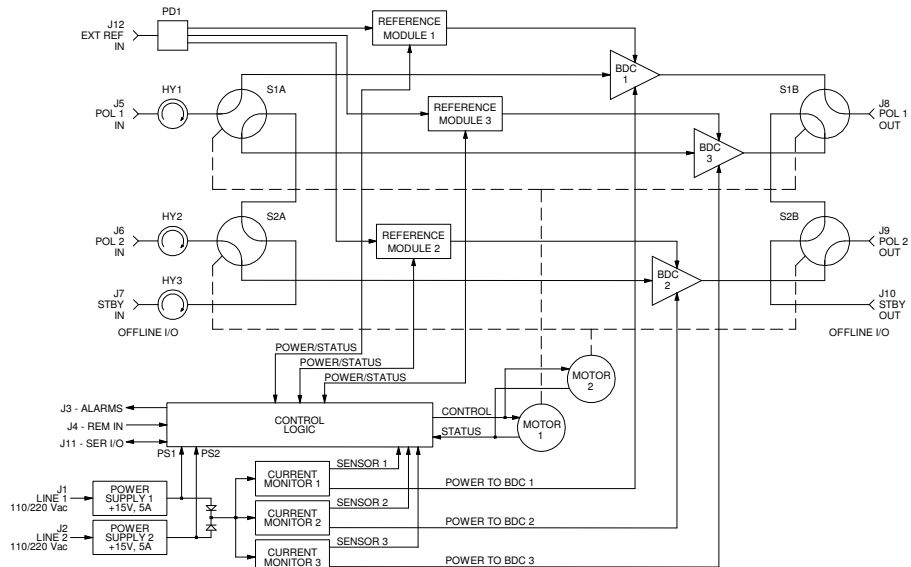
## Local or Remote Control

The systems include provision for remote status monitoring and operation. Typical uses are for sending status information to a centralized monitor and control system or for remotely controlling the system from a nearby building. All Local front panel features can be remotely controlled and monitored, except for the Remote/Local switch. In Remote mode, the front panel controls are inoperative, but the indicators continue to reflect the current operating state of the system. Remote status outputs are Form 'C' dry relay contacts capable of switching up to 100 Vdc at 100 mA. Remote control inputs are opto-isolator coupled for noise and common mode ground loop rejection.

### 1:1 System Block Diagram



### 1:2 System Block Diagram



Parameter	Notes	Min.	Nom./Typ.†	Max.	Units
Configuration	BRKD11___ systems BRKD12___ systems				
			1:1, One standby BDC for one main BDC 1:2, One standby BDC for two main BDCs		
Input Frequency Range	BRKD1_F___ systems BRKD1_B___ systems BRKD1_J___ systems	10.70 10.95 11.70		11.75 11.70 12.75	GHz GHz GHz
Output Frequency Range	BRKD1_C___ systems BRKD1_F___ systems BRKD1_B___ systems BRKD1_J___ systems BRKD1_C___ systems	12.20 950 950 950 950		13.00 2000 1700 2000 1750	GHz MHz MHz MHz MHz
System Gain	BRKD1___ 10 systems BRKD1___ 20 systems	10 20			dB dB
Gain Flatness	Full band		±1.0	±1.5	dB
Gain Match	Between BDCs			±1.0	dB
Noise Figure	At +23 °C		16	20	dB
Power Output	At 1 dB compression (P <sub>1 dB</sub> )	+7	+10		dBm
Third Order Intercept	Output, OIP <sub>3</sub>	+17	+20		dBm
Phase Noise	@ 100 Hz offset @ 1 kHz offset @10 kHz offset @100 kHz offset @ 1 MHz offset			-60 -70 -80 -90 -100	dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz
Group Delay	Linear Parabolic Ripple		0.03 0.003		ns/MHz ns/MHz <sup>2</sup> ns p-p
VSWR	Input (50 ohms) Output (50 ohms)		1.20 1.50	1.25 2.00	:1 :1
Connectors	RF input and output External reference Remote input Alarm output Serial I/O (RS-232/-422/-485)		Type N Female (50 ohms) Type BNC Female (50 ohms) 9-pin D Male 37-pin D Male 9-pin D Female		
Operating Modes			Manual or Automatic		
Alarm Method	BDC phase lock/bias current		Alarm is generated if phase lock is lost or current draw is outside tolerance window		
Alarm Output	Form 'C' contacts		100 Vdc / 100 mA		
Remote Inputs	Control inputs		Contact closure to ground; withstand 5 V, sink 5 mA		
External Reference (10.0 MHz)	Level Impedance Phase Noise @ 10 Hz offset @ 100 Hz offset @ 1 kHz offset @ 10 kHz offset	0	50	+15 -105 -135 -145 -150	dBm ohms dBc/Hz dBc/Hz dBc/Hz dBc/Hz
Power Requirements	Voltage (autoranging) Frequency Power	47	90–135 or 175–264 30	63	Vac Hz W
Size			19 x 3.47 x 24 483 x 88.1 x 610		inches mm
Temperature Range	Operating	0		+50	°C

\* Specifications shown are for BD-Series BDCs. See product data sheet 16970 for spurious levels.

† When there is only one value on a line, the Nom./Typ. column is a nominal value; otherwise it is a typical value. Typical values are intended to illustrate typical performance, but are not guaranteed.

**Part Number/Ordering Information,  
Ku-Band Redundant Block Downconverter Systems**

**BRKD1**

System Type:	1:1 .....	1		
	1:2 .....	2		
Frequency Band (In / Out / LO)	10.70–11.75 GHz / 950–2000 MHz / 9.75 GHz .....	F		
	10.95–11.70 GHz / 950–1700 MHz / 10.00 GHz.....	B		
	11.70–12.75 GHz / 950–2000 MHz / 10.75 GHz.....	J		
	12.20–13.00 GHz / 950–1750 MHz / 11.25 GHz.....	C		
Gain	10 dB min. ....	1	0	
	20 dB min. ....	2	0	

**Examples:**

**Order Number**

- 1:1 system with 10.95–11.70 GHz input, 950–1700 MHz output, 20 dB gain     **BRKD11B20**
- 1:2 system with 12.20–13.00 GHz input, 950–1750 MHz output, 10 dB gain   **BRKD12C10**

**Other Products**

- Solid-State Power Amplifiers and SSPA Systems
- Solid-State Power BUCs and SSPB Systems
- Low Noise Amplifiers and LNA Systems
- Low Noise Block Converters and LNB Systems
- Block Up and Block Down Converters
- Synthesized Converters
- Line Drive Amplifiers
- Power Supply Monitors
- Redundant Control Panels for SSPAs, SSPBs, and LNAs

**GENERAL DYNAMICS**  
SATCOM Technologies

60 Decibel Road, Suite 200 • State College, PA 16801 USA • Tel. +1-814-238-2700 • FAX +1-814-238-6589  
Email: [satcom@gd-ms.com](mailto:satcom@gd-ms.com) • [www.gdsatcom.com/electronics.php](http://www.gdsatcom.com/electronics.php)

19380 Rev. A

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