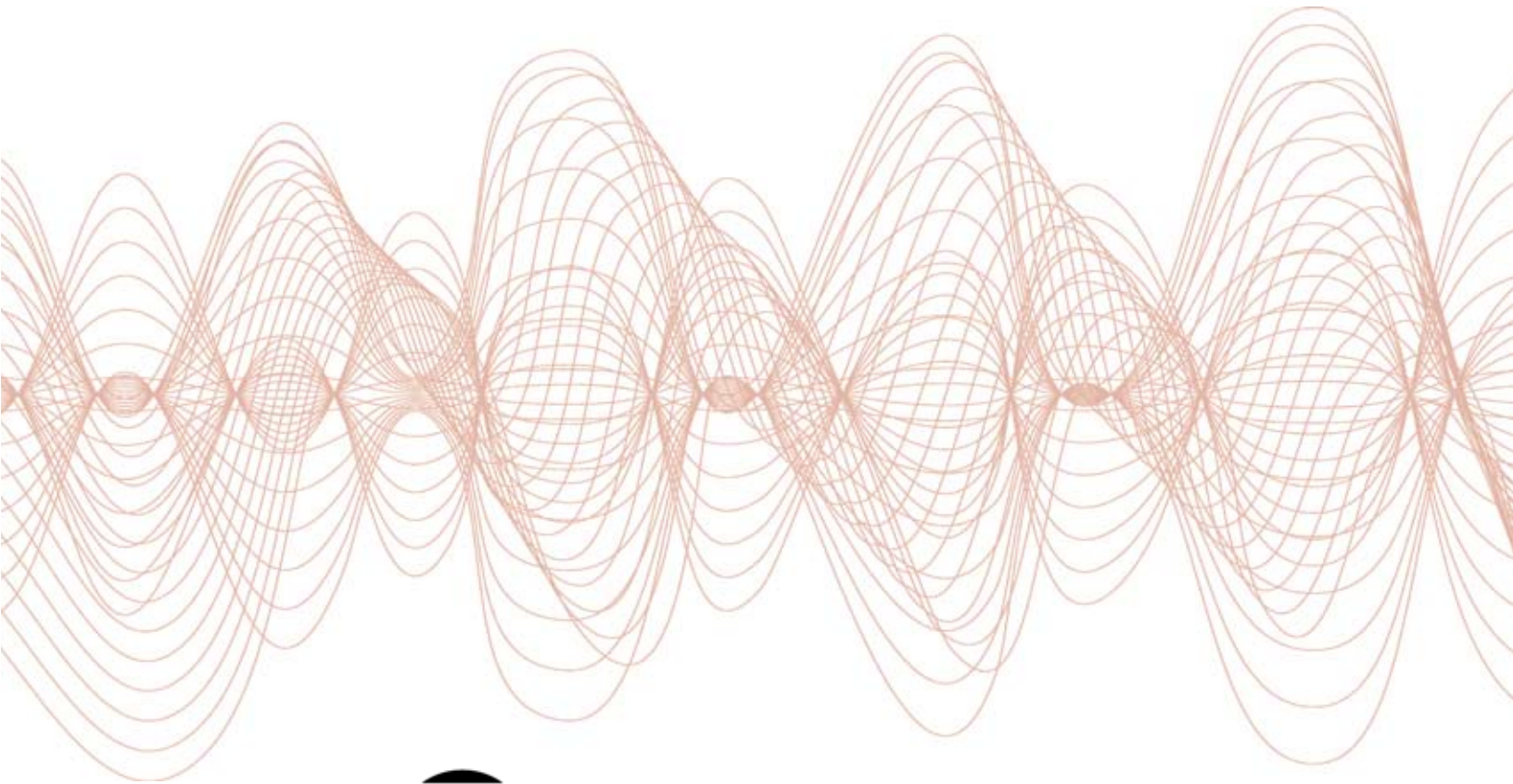


# INTEGRATED SWITCH SYSTEM CAPABILITIES



**DowKey<sup>®</sup> Microwave**  
CORPORATION

A **DOVER** COMPANY



5096

## Features

<b>Input/Output ports</b>	16x32 expandable to 32x64 unidirectional
<b>Configuration</b>	Non-blocking Full Fan-Out
<b>Operating Frequency</b>	3.4-4.2 GHz (C-band)
<b>Manual Control</b>	LCD Touch Screen
<b>Remote Control</b>	RS-422
<b>Impedance</b>	50-Ohm

## Part Numbers

5096 (32x64)	5263 (16x64)
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## Application

The C-band non-blocking fan-out solid state switch model is ideal for SATCOM applications with a narrow band operating frequency of 3.4-4.2 GHz. It can be configured to maximum 16 inputs and 64 outputs and is a fully integrated 19" rack 34U modular system using (8) sub-modules (32x64):

1x Controller module	(3U)
2x 16x64 Input modules	(3U ea.)
4x 32x16 Output modules	(6U ea.)
1x Fan Control module	(1U)

The system is fully controlled through the Controller module, which is equipped with a MS Windows based PC, removable SATA hard drive and multiple power supplies. Locally it can be controlled via an LCD touch screen and remotely with RS-422.

On the rear panel, the Input and the Output Modules are interconnected using 9-pin CAN bus D-sub connectors to create a full 16x64 or 32x64 matrix.

## RF Characteristics (5096 & 5263)

<b>VSWR (max)</b>	1.3:1 input & output
<b>Isolation (min)</b>	60 dB input/input
	60 dB input/output
	60 dB output/output (different input)
	20 dB output/output (common input)
<b>Gain, any path</b>	-14 dB $\pm$ 2 dB @ 3.8 GHz, 20°C
<b>Gain, bal. btw. ch. (max)</b>	$\pm$ 1.5 dB @ 3.8 GHz, 20°C
<b>Gain Stability</b>	$\pm$ 0.2 dB over $\pm$ 5°C
<b>Gain, variation vs. freq.</b>	$\pm$ 0.5 dB over any 40 MHz segment
	$\pm$ 0.5 dB over any 80 MHz segment
	$\pm$ 1.5 dB over 3.4-4.2 GHz segment
<b>1dB Compression (min)</b>	-5 dBm output
<b>3rd Order Intercept (min)</b>	+4 dBm output
<b>Noise Figure (max)</b>	17 dB
<b>Spurious Outputs (max)</b>	-100 dBm signal dependent
	-70 dBc signal related

## Specifications

<b>Relay Type</b>	Solid State
<b>Other Components</b>	Amplifiers, Power Dividers
<b>I/O Connector Type</b>	SMA female
<b>Dimensions (max)</b>	19" wide full rack
	21" Depth
	34U Height (59.5")
<b>Operating Temperature</b>	0 °C to +50 °C
<b>Storage Temperature</b>	-40 °C to +50 °C
<b>Operating Humidity</b>	10-80% non-condensing
<b>Weight (typ)</b>	295 lbs (32x64)

<b>Local Control</b>	6.5" LCD Touch Screen
	USB port for keyboard or mouse
<b>Remote Control</b>	RS-422 with DB9 male
<b>Commands/Syntax</b>	Dow-Key SCPI commands
<b>Operating System</b>	Microsoft Windows
<b>Hard drive</b>	160 GB (min) SATA HD / removable
<b>CPU/ Memory</b>	Embedded Intel processor / 2G RAM (min)
<b>Power Supply</b>	120-240 VAC, 50-60 Hz, 1200 W (max)
	(multiple power supplies are included)
<b>Fuse</b>	Accessible/replaceable on the rear
<b>Cooling / Venting</b>	1x 1U Fan Module



5190

5191

## Features

<b>Input/Output ports</b>	12x48 Transmitter & 48x12 Receiver
<b>Configuration</b>	12x48 Non-blocking Full Fan-Out 48x12 Non-blocking Full Fan-In
<b>Operating Frequency</b>	950-2050 MHz (L-band)
<b>Manual Control</b>	LCD Touch Screen
<b>Remote Control</b>	RS-422
<b>Impedance</b>	50-Ohm

## Part Numbers

5190 (Receiver)	5191 (Transmitter)
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## Application

The L-band non-blocking fan-out transmitter and fan-in receiver model is ideal for Teleport SATCOM applications with a narrow band operating frequency of 950-2050 MHz. The transmitter 19" rack is configured with 12 inputs and 48 outputs and the second 19" rack is the receiver tower with 48 inputs and 12 outputs.

Each rack is integrated using modular approach consisting for the following sub-modules:

### 5190/5191: Both Receiver and Transmitter

Power supply module, Signal monitor panel and Fiber optic receiver

### 5190: Receiver Only (48x12)

4x 12x12 fan-in module, Main controller and L-Band amplifiers

### 5191: Transmitter Only (12x48)

4x 12x12 fan-out module and Slave controller

## RF Characteristics (5190 & 5191)

<b>VSWR (max)</b>	1.8:1 input & output
<b>Isolation (min)</b>	55 dB input/input
	60 dB input/output
	55 dB output/output (different input)
	40 dB output/output (common input)
<b>Gain, any path</b>	0 dB ± 2.5 dB
<b>Power, Operating (max)</b>	+12 dBm routed to 1 output (fan-in)
<b>Power, no damage (max)</b>	+15 dBm routed to 1 output (fan-in)
<b>1dB Compression (min)</b>	+10 dBm output
<b>3rd Order Intercept (min)</b>	+21 dBm output
<b>Noise Figure (max)</b>	17 dB (12x48)
	21 dB (48x12)

## Specifications

<b>Relay Type</b>	Solid State
<b>Other Components</b>	Amplifiers, Power Dividers & Power Combiners
<b>I/O Connector Type</b>	SMA female
<b>Dimensions (max)</b>	19" wide full rack 21" Depth Height: 16U fan-in /16U fan-out segments plus more modules
<b>Operating Temperature</b>	0 °C to +50 °C
<b>Storage Temperature</b>	-40 °C to +50 °C
<b>Operating Humidity</b>	10-80% non-condensing

<b>Local Control</b>	6.5" LCD Touch Screen USB port for keyboard or mouse
<b>Remote Control</b>	RS-422 with DB9 male
<b>Commands/Syntax</b>	Dow-Key SCPI commands
<b>Operating System</b>	Microsoft Windows
<b>Hard drive</b>	160 GB (min) SATA HD / removable
<b>CPU/ Memory</b>	Embedded Intel processor / 2G RAM (min)
<b>Power Supply</b>	120-240 VAC, 50-60 Hz, 3-6 A, 350 W / 12V & 50 W / 5 V, redundant power supplies
<b>Fuse</b>	Accessible/replaceable on the rear
<b>Cooling / Venting</b>	As needed within each module



5230

## Features

<b>Input/Output Configuration</b>	4x48 Non-Blocking Full Fan-Out 48x4 Non-Blocking Full Fan-In 8x2 Electromechanical Matrix <sup>(1)</sup>
<b>Operating Frequency</b>	950-2050 MHz (L-band)
<b>Manual Control</b>	LCD Touch Screen
<b>Remote Control</b>	2x Ethernet ports, SNMP
<b>Impedance</b>	50-Ohm

## Part Number

5230

<sup>(1)</sup> not discussed on this data sheet

## Application

The L-band non-blocking fan-out/fan-in solid state switch model is a compact 4x48 and 48x4 switch matrix solution integrated with a modular approach using (7) sub-modules:

3x 16x4 Fan-in modules	(1U ea.)
1x Controller module	(3U)
3x 4x16 Fan-out modules	(1U ea.)

The system is fully controlled through the Controller module, which is equipped with a MS Windows based PC and two removable and replaceable power supplies cartridges. Locally it can be controlled from an LCD touch screen and remotely via Ethernet with SNMP v1 protocol.

On the rear panel, the fan-in and the fan-out modules are interconnected using RJ11 CAN bus connectors to create a full 4x48 and 48x4 matrix. (The 8x2 switch resides inside the control module)

## RF Characteristics (4x48 & 48x4)

<b>VSWR (max)</b>	1.8:1 input & output
<b>Isolation (min)</b>	60 dB input/input
	60 dB input/output
	60 dB output/output (different input)
<b>fan-in only</b>	60 dB output/output (common input)
<b>fan-out only</b>	40 dB output/output (common input)
<b>Gain</b>	+2 dB ± 2 dB
<b>Power, Operating (max)</b>	+3 dBm routed to 1 output (fan-in)
	+14 dBm routed to 1 output (fan-out)
<b>1dB Compression (min)</b>	1 dBm (fan-in)
	8 dBm (fan-out)
<b>3rd Order Intercept (min)</b>	+17 dBm (fan-in), -9 dBm input power
	+24 dBm (fan-out), +6 dBm input power
<b>Noise Figure (max)</b>	20 dB (fan-in)
	18 dB (fan-out)

## Specifications

<b>Relay Type</b>	Solid State
<b>Other Components</b>	Amplifiers, Power Dividers & Power Combiners
<b>I/O Connector Type</b>	SMA female
<b>Dimensions (max)</b>	19" Wide 21" Depth 9U Height (15.75")
<b>Operating Temperature</b>	0 °C to +40 °C
<b>Storage Temperature</b>	-40 °C to +40 °C
<b>Operating Humidity</b>	10-80% non-condensing

<b>Local Control</b>	6.5" LCD Touch Screen GUI USB port for keyboard or mouse
<b>Remote Control</b>	Ethernet with SNMP v1 protocol 2x RJ-45 connectors available
<b>Operating System</b>	Microsoft Windows
<b>Hard drive</b>	160 GB (min) SATA HD / removable
<b>CPU/ Memory</b>	Embedded Intel processor / 2G RAM (min)
<b>Power Supply</b>	120-240 VAC, 50-60 Hz, 2x 300 W (max) 2x power module cartridges, Power ON/OFF switch with guard on the front panel
<b>Fuse</b>	Accessible/replaceable on the rear

## MICROWAVE PRODUCTS GROUP

A **DOVER** COMPANY



Microwave Products Group (MPG) designs, manufactures and sells special electronic components and systems, including high-performance filters, switches, diplexers, duplexers, Integrated Cosite Equipments (ICE), EMI filters and Low PIM solutions. Our products are used in military, space, telecom infrastructure, medical and industrial applications where function and reliability are crucial.

### **Dow-Key Microwave**

4822 McGrath Street, Ventura, CA 93003 USA

Tel +1.805.650.0260

Fax +1.805.650.1734

Email [askdk@dowkey.com](mailto:askdk@dowkey.com)

### **BSC Filters Ltd.**

Jorvik House , Outgang Lane, York, YO19 5UP, England

Tel +44.1904.438438

Fax +44.1904.438123

Email [sales@bscfilters.com](mailto:sales@bscfilters.com)

### **K&L Microwave**

2250 Northwood Drive, Salisbury, MD 21801 USA

Tel +1.410.749.2424

Fax +1.443.260.2268

Email [sales@klmicrowave.com](mailto:sales@klmicrowave.com)

### **Pole/Zero Corporation**

5558 Union Centre Drive, West Chester, OH 45069 USA

Tel +1.513.870.9060

Fax +1.513.870.9064

Email [support@polezero.com](mailto:support@polezero.com)