



## Components for Signal Processing

### Power Dividers and Combiners, Resistive

This product line covers DC to 6 GHz in a single unit and is available in 3 port to 1 x 16 port devices. SMA and type "N" packages are the most common and are well suited to applications that require flat response and good VSWR.



### Power Dividers and Combiners, Coaxial

This particular Power Divider incorporates a coaxial transformer approach. This design has a very broadband response, in excess of two decades. I.F.E. offers this type of design from 1 x 2 up to 1 x 32 Divider/Combiner.



### Power Dividers and Combiners, Lumped Constant

These types of Power Dividers and Combiners have been in production for many years. Recently the engineers at I.F.E. have made major advances in extending the bandwidth and the upper limits of operation. We are now delivering broadband units that operate from 20 MHz to 3000 MHz. They are available in 2 way, 4 way, 8 way and 16 way Power Dividers and Combiners. They are offered in SMA and surface mount packages. Other options are available.



### Directional Couplers

I.F.E. offers three port, four port, and Dual Directional Couplers. Our couplers offer typical coupling tolerances of <0.5 dB, directivity >20 dB, with VSWR <1.2:1. Standard coupling values are 6, 10, 14, 15, 16, 20, and 30 dB. The couplers are available in several connectorized packages as well as surface mount, and operate from 0.1 MHz to 3 GHz.



### Signal Control and Conversion

I.F.E. has a very comprehensive line of signal control and conversion devices. These include but are not limited to Up/Down Converters with internal phase locked LO, Digital Attenuators, Digital Phase Shifters, Vector Modulators, Single Side-Band Modulators, Image Reject Mixers, and I&Q Demodulators/Phase Comparators.



I.F.E. offers an extensive array of broadband components for both 50 and 75 ohm systems. These components are available in a variety of packages that include connectorized housings, T08, Plug-In, Flat Pack and surface mount. Our designs incorporate coaxial, lump constant, resistive, micro-strip and stripline algorithms.

Power Divider/Combiner Frequency Table

Model	Frequency Range (MHz)	50 Ohm Packages	75 Ohm Packages
PD-X001	0.5-32	B, T,S,N, SM	B,T,F,N, SM
PD-X002	2-100	B, T,S,N, SM	B,T,F,N, SM
PD-X003	5-500	B, T,S,N, SM	B,T,F,N, SM
PD-X004	10-1000	B, T,S,N, SM	B,T,F,N, SM
PD-X005	20-1200	B, T,S,N, SM	B,T,F,N, SM
PD-X006	20-1600	B, T,S,N, SM	B,T,F,N, SM
PD-X007	20-2000	S, N, SM	B,T,F,N, SM
PD-X008	20-3000	S, N, SM	—

B= BNC, T=TNC, S=SMA, N=Type "N", F=Type "F", SM=Surface Mount  
For hermetically sealed and alternate packaging, contact the factory.

## TO MEET YOUR NEEDS

CrossPoint Technologies designs and manufactures router switches and matrix switching systems. Our products are commonly found in satellite ground stations, commercial TV and video processing facilities and government installations. Many types of analog and digital signals can be switched, having bandwidth to 18 GHz. The information below summarizes our most popular configurations. If you don't see what you need, CrossPoint Technologies will be pleased to work with you to define a custom switching system that meets your requirements.

### Redundancy Switching Systems

CrossPoint Technologies RS series switches provide a 1 for N shared redundant path for protecting multiple fiber optic or coaxial transmission links. The switch system accepts alarm signals from your equipment or if a transmission link fails, the redundant link is automatically engaged to carry that particular signal. No manual patching is required, and by sharing a single redundant path, total cost of the system is reduced compared to providing individual spares for each active link. These systems are available with either Solid-State or electro-mechanical switches.



### Redundant Switching Systems

Other configurations available, consult factory

Model (1)	Channels Protected	Frequency (MHz)	Switch Type	Insertion Loss (2) (dB)	Isolation (3) (dB)	VSWR
RS-1000-4-IF	4	10-200	Solid-State	2.0	80	1.5:1
RS-1000-8-IF	8	10-200	Solid-State	2.0	80	1.5:1
RS-1000-4-LB	4	950-2150	Solid-State	5.0	70	1.5:1
RS-1000-8-LB	8	950-2150	Solid-State	5.0	70	1.5:1
RS-1001-4-MW	4	0.5-18 GHz	Relay	2.0	80	1.5:1
RS-1001-8-MW	8	0.5-18 GHz	Relay	2.0	80	1.5:1

Notes:  
(1) The RS-100x consists of two modules: one transmit and one receive  
(2) Insertions Loss is specified end-to-end. (back-to-back with loss less link between)  
(3) Isolation is specified end-to-end (back-to-back with loss less link between)  
(4) Standard Control is RS-232 & RS-422. Optional Ethernet available.

### 5000 Series – High Performance Isolation 70 dB typical

Models:	MS-5000-8x8	MS-5000-16x16	MS-5000-32x32	MS-5000-8x16	MS-5000-16x32
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### Remote Control Selector Switch

CrossPoint Technologies Routing Switches provide signal switching in a rack mounted package. The switched paths are bi-directional. Multiple N-way switches can be included in a single enclosure. Switches from 2 way through 64 way are available.

### Remote Control Selector Switch

Other configurations available, consult factory

Model	Configuration	Frequency (GHz)	Insertion Loss (dB)	Isolation (dB)	VSWR
SS-2001-4(1x4)-MW	Quad (1x4)	0.5-18	0.8	80	1.5:1
SS-2001-1x32-MW	1x32	0.5-18	2.0	80	1.5:1

Typical Configurations: Single 8 way switch / Single 16 way switch / Dual 8 way switch / Quad 4 way switch

**I.F. Engineering** is a leading designer and manufacturer of components and sub-systems, which extend from 100 kHz through 7 GHz, with an emphasis on L-Band Distribution Systems. Founded in 1994, I.F.E. has made significant strides in becoming a major supplier to the RF industry.

Our products are incorporated into numerous military and commercial applications such as Radar Systems, Cellular and PCS Base Stations, Earth Stations/Teleports and Communications systems.

We are a supplier of:

- Power Dividers/Combiners
- Directional Couplers
- Quadrature Hybrids
- Phase Shifters
- Phase Modulators
- Attenuators
- Multi-Couplers
- Distribution Amplifiers
- Mixers
- Up/Down Converters
- Power Insertion (Bias-T) Systems
- Switching devices

## L-Band Multi-Couplers/Patch Panels (50/75 ohm)

These Multi-Couplers are available in a variety of configurations and frequency ranges. The mechanical configurations vary from 1RU high to 6RU high chassis. The 1RU configuration has a maximum of sixteen (16) outputs and four (4) input channels. The 2RU versions are available with thirty-two (32) outputs and from one (1) to eight (8) input channels. Present designs in 6RU chassis's have one hundred twenty-eight (128) outputs and from one (1) to sixteen (16) input channels.

Connector Selections	Options
B = BNC	1. Passive Power Dividers, LNB Power Insertion, Redundant Power Supplies.
F = Type "F"	2. Unity Gain 0 dB, Redundant Power Supplies.
<b>Frequency Selections</b>	3. Unity Gain 0 dB, LNB Power Insertion, Redundant Power Supplies.
LB1 950-1450 MHz	4. Unity Gain 0 dB, LNB Power Insertion, Redundant Power Supplies RF Monitors (-10 dB) for each input Channel.
LB2 950-1750 MHz	
LB3 950-2150 MHz	5. Unity Gain 0 dB, LNB Power Insertion, Redundant Universal Power Supplies, RF Monitors (-10 dB) for each input Channel.

## C-Band Power Dividers/Combiners

I.F.E. manufactures a complete line of C-Band Power Dividers and Combiners for Down/Uplink facilities and Switch Matrix applications. They are available in several packages, which include type "N", SMA, and OSP connectorized versions as well as surface mount devices. The standard configurations are: 2 way, 4 way, 8 way, 16 way and 32 way. The available frequency ranges are: CB1 3.7 to 4.2 GHz (receive), CB2 5.8 to 6.5 GHz (transmit), CB3 3.6 to 6.6 GHz (dual range).

## Switching Products

I.F.E. manufactures several types of switch products covering 0.1 MHz to 2.5 GHz. Our designs incorporate P.I.N. diode, electro-mechanical, and GaAs devices. The designs include 1 x 2 through 1 x 16, and transfer switching.

## Switch Matrix Systems

CrossPoint Technologies IF/RF Switch Matrices provide signal switching and distribution in a rack mounted package. Any input can be routed to one or all outputs simultaneously. The Switch Matrix is available with either Solid-State or electro-mechanical switch technologies. Systems can be tailored for antenna receiving and applications, where low noise is most crucial, or for IF switching applications where power handling capability is most important. LNB power insertion is available on inputs. For test and simulation systems, full fan-in (summing) switches can be provided.

The modular packaging permits larger Switch Matrices to be built using 32 x 32 configurations. The larger Switch Matrices retain their full fan-out, non-blocking characteristics. A centralized controller and power supply system reduces cost of larger Switch Matrices.



The standard remote control interface is RS-232 and RS-422. Ethernet control is available.

## Matrix Switching Systems

Other configurations available, consult factory

Model	Inputs/Outputs	Switch Type	Frequency (MHz)	Gain (dB)	Isolation (dB)	VSWR
MS-4000-8X8-IF	8/8	Solid-State	10-200	0 ±2	55	1.5:1
MS-4000-16X16-IF	16/16	Solid-State	10-200	0 ±2	55	1.5:1
MS-4000-32X32-IF	32/32	Solid-State	10-200	0 ±2	55	1.5:1
MS-4000-8X8-LB	8/8	Solid-State	950-2150	0 ±2	50	1.8:1
MS-4000-16X16-LB	16/16	Solid-State	950-2150	0 ±2	50	1.8:1
MS-4000-32X32-LB	32/32	Solid-State	950-2150	0 ±2	50	1.8:1
MS-4001-8X8-MW	8/8	Relay	0.5-18 GHz	0 ±2	50	2.0:1
MS-4001-16x16-MW	16/16	Relay	0.5-18 GHz	0 ±2	50	2.0:1
MS-4001-32X32-MW	32/32	Relay	0.5-18 GHz	0 ±2	50	2.0:1

## Optional Features for All Switch Matrix Products

### Redundant Power Supplies

Typical configurations are dual redundant supplies. Hot swappable power supply drawers have fully independent AC paths. N+ 1 configurations are available for larger Switch Matrices.

### Ethernet Remote Control

10 BASE-T RJ-45 interface is available. Communication is via Telnet session (currently). HTTP (Browser) support is planned.

### No Local Front Panel Control

The standard front panel control can be deleted. The Switch Matrix will be remotely controlled.

### 75 Ohms

50 ohms is standard. Consult factory for other impedances.

### Manual Attenuator

An attenuator is available on the input of the Switch Matrix to accommodate excess LNA/LNB gain.

### Signal Presence Detectors

Fixed threshold detectors are available at the inputs and/or outputs. These detectors provide remote and local status indications for signal power levels.

# YOUR CHALLENGE IS OUR PROGRESS



**CrossPoint**  
Technologies

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