TELEDYNE COAX SWITCHES
Everywhereyoulook™

Miniature Matrix: MMB Series Controlled with USB or Ethernet

RoHS Compliant

PART NUMBER DESCRIPTION

The MMB Series is an ideal solution that consists of Transfer, electromechanical coaxial switches designed to switch a microwave signals in a DPDT configration. The characteristic impedance is 50 Ohms.
The MMB Series is designed to allow the remote operation of 1 to 4 Transfer switches. Remote operation is accomplished via TCP/IP commands to the Matrix's Ethernet interface. Switch control is also accessible via the USB virtual serial port, using the provided command set. Through these interfaces the Coax Switch can be switched to the desired position and its position can be read for verification. The default switch position at power up can be set by the user. The MMB will feature a graphical user interface (GUI), which will enable user to control switches through graphical icons and visuals.

ENVIRONMENTAL AND PHYSICAL CHARACTERISTICS

Operating Temperature	–40°C to 65°C
Standard Actuator Life	5,000,000 cycles
Connector Type	SMA, N, TNC
Weight Enclosure A - SMA Models	
1 Switch	22 oz. (624 g) (max.)
2 Switches	24 oz. (680 g) (max.)
Weight Enclosure B - SMA Models	
2 Switches (N or TNC)	72 oz. (2041 g) (max.)
4 Switches	64 oz. (1814 g) (max.)

ELECTRICAL CHARACTERISTICS (SWITCHES ONLY)

Form Factor	DPDT, break before make
Frequency Range	Up to DC-26.5GHz
Characteristic Impedance	50 Ohms
Operate Time	15 ms (max.)
Release Time	15 ms (max.)
Actuation Voltage	24Vdc
Actuation Current, max. @ ambient	Varies

ADDITIONAL INFORMATION

Interface	USB or TCP/IP
Host Operating System	Windows, MAC, Linux
Operating System	Embedded

INCLUDED ITEMS

- AC/DC Power Adapter
- Power Cord
- Ethernet Cable
- USB Cable
- Installation CD

BUILD YOUR BOX

Number of Switches *(Select One)*:

ENCLOSURE A		ENCLOSURE B	
◯	1	◯	4
◯	2	◯	2 (N or TNC)

Connector *(Select One)*:

◯	SMA (DC-18GHz)	◯	SMA (DC-26.5GHz)*
◯	TNC (DC-11GHz)	◯	N (DC-12GHz)

Actuation Type *(Select One):*

◯	Failsafe	◯	Latching

Remote Control *(Select One)*:

◯	USB Only	◯	USB & Ethernet

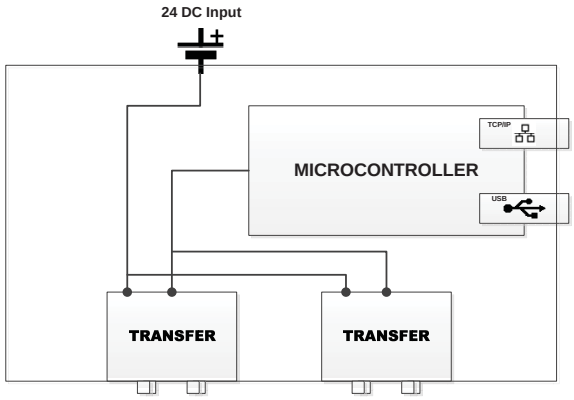
Switch Type *(Select One):*

◯	Transfer	◯	SP3T**

For additional options, please contact factory.

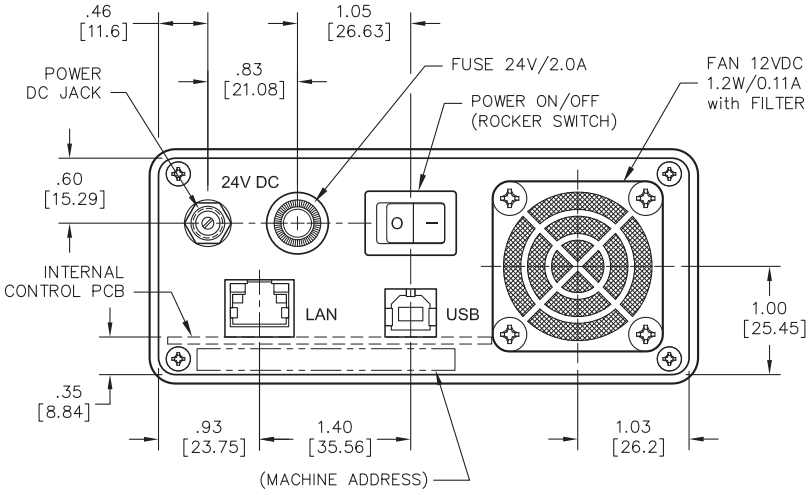
* Only available in 2P3T
** Ony available in SMA (18 and 26.5GHz)
See Page 4, for Part Number List for switches used

BLOCK DIAGRAM EXAMPLE

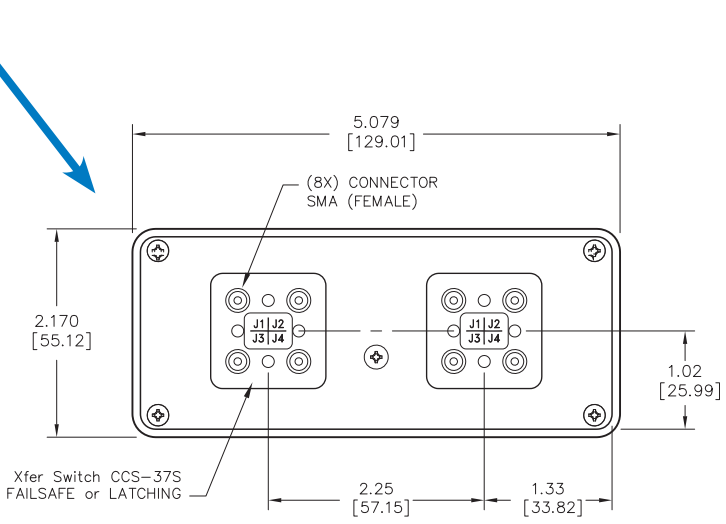


MECHANICAL OUTLINE FOR ENCLOSURE A

Max. Length with Switches= 7.75 (196.85)

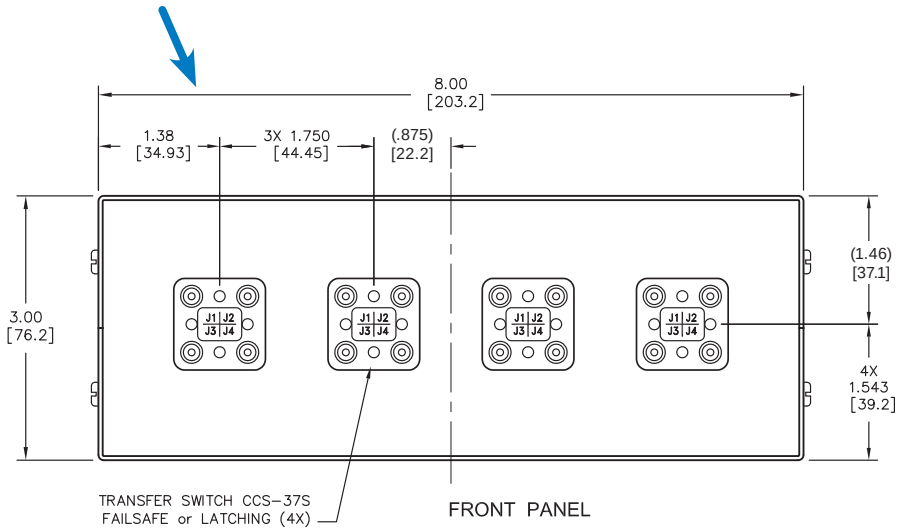


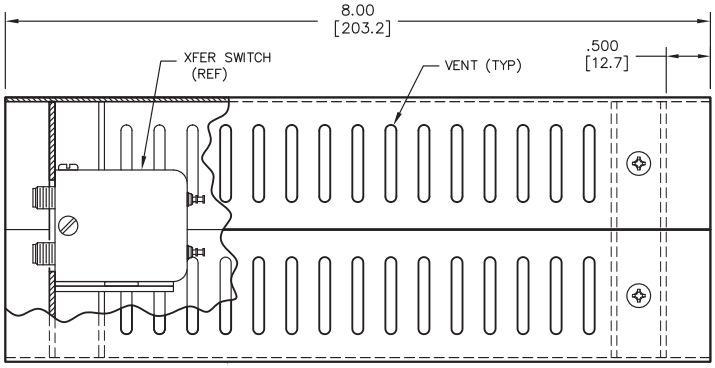
Enclosure A:
UP TO 2 TRANSFER SWITCHES



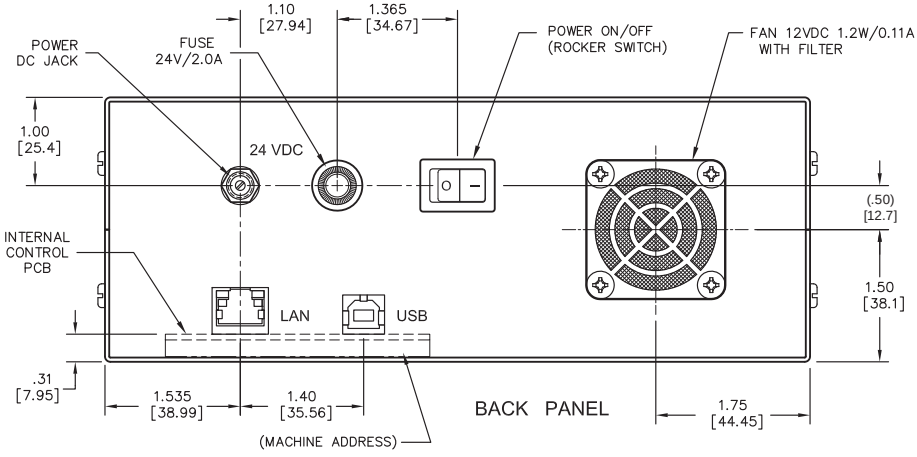
MECHANICAL OUTLINE FOR ENCLOSURE B

Enclosure B: UP TO 4 TRANSFER SWITCHES

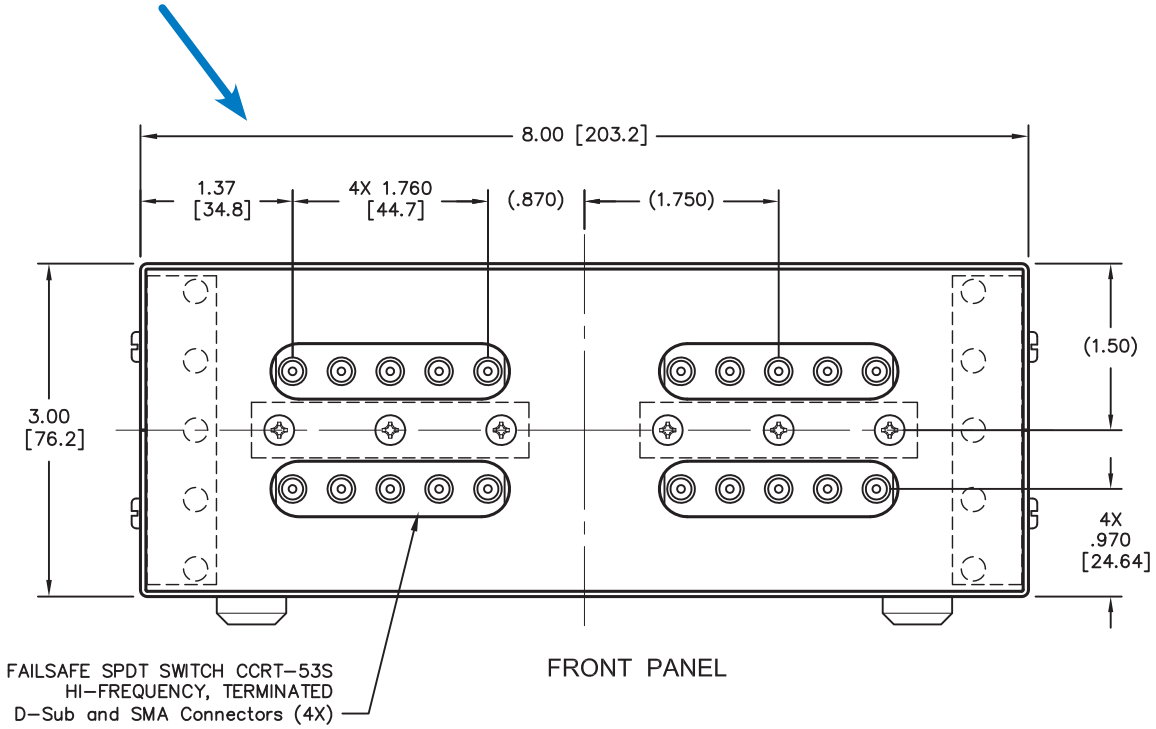




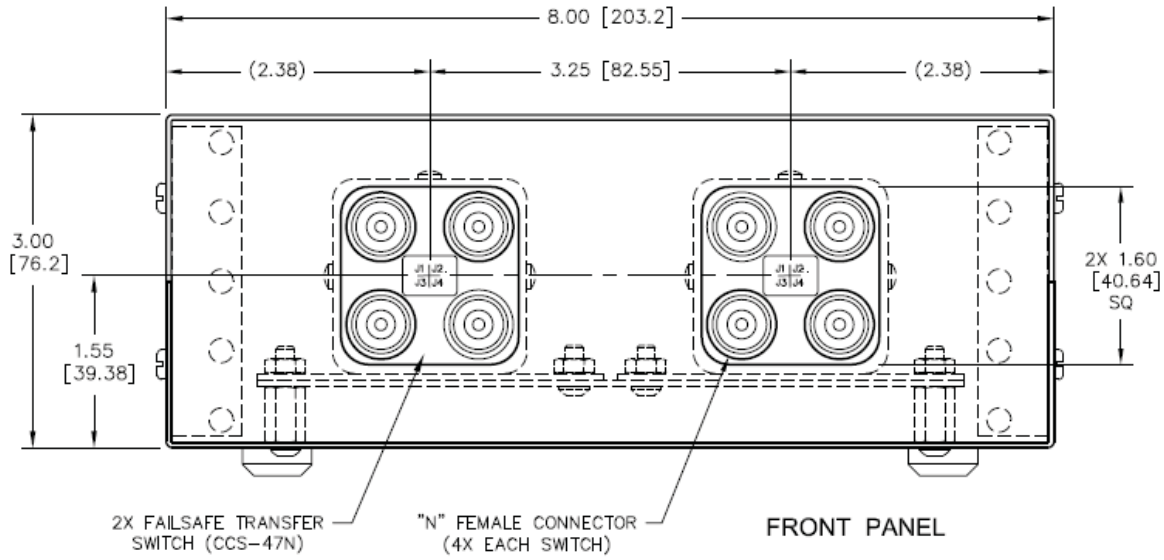
SIDE VIEW



Enclosure B:
UP TO 4 2P3T SWITCHES



Enclosure B:
UP TO 2 TYPE N CONNECTOR TRANSFER SWITCHES



GLOSSARY

Actuator
An actuator is the electromechanical mechanism that transfers the RF contacts from one position to another upon DC command.

Ethernet
A high-speed interface used in local area networks (LAN). Ethernet is also known as IEEE 802.3 standard. DHCP or Static IP can be configured through a web interface.

Isolation
Isolation is the measure of the power level at the output connector of an unconnected RF channel as referenced to the power at the input connector. It is specified in dB below the input power level.

Magnetic Sensitivity
An electro-mechanical switch can be sensitive to ferrous materials and external magnetic fields. Neighboring ferrous materials should be permitted no closer than 0.5 inches and adjacent external magnetic fields should be limited to a flux density of less than 5 Gauss.

Performance Parameters vs Frequency
Generally speaking, the RF performance of coaxial switches is frequency dependent. With increasing frequency, VSWR and insertion loss increase while isolation decreases. All data sheets specify these three parameters as “worst case” at the highest operating frequency. If the switch is to be used over a narrow frequency band, better performance can be achieved.

Switching Time
Switching time is the total interval beginning with the arrival of the leading edge of the command pulse at the switch DC input and ending with the completion of the switch transfer, including contact bounce. It consists of three parts: (1) inductive delay in the coil, (2) transfer time of the physical movement of the contacts, and (3) the bounce time of the RF contacts. **This does not include time added by the communication interface, application or operating system.**

Universal Serial Bus (USB)
An industry standard that defines the cables, connectors and communication protocols used in a bus for connection, communication and power supply between computers and electronic devices. VCP Driver available for Windows OS, Mac OS, and Linux.

TRANSFER Switch
A four-port switch consisting of two independent pairs of RF paths. These pairs are actuated simultaneously. This actuation is similar to that of a double-pole double-throw switch.

Part Number List

Frequency	Series	Link
DC-18GHz	CCS-47S	http://www.teledynecoax.com/Datasheets/CCS-47S_CS-47S%20FAILSAFE.pdf
DC-18GHz	CCS-37S	http://www.teledynecoax.com/Datasheets/CCS-37S_FAILSAFE_SHORT.pdf
DC-18GHz	CCRS-33S	http://www.teledynecoax.com/Datasheets/CCRS-33S_CRS-33%20FAILSAFE.pdf
DC-26.5GHz	CCRS-53S	http://www.teledynecoax.com/Datasheets/CCRS-53S_CRS-53%20FAILSAFE.pdf