

# VHF / UHF BAND MATRIX SWITCH

## Model: USC410-L

### GENERAL:

The USC410-L is a VHF / UHF Band (nominal between 30 and 600 MHz) Communications front end Matrix Switch, designed mainly for Military and other Professional applications.

The unit is compact, featuring fully non-blocking operation, and 4 Antenna to 10 Receiver (maximum) capacity, in a 1U nineteen inch rack mounting chassis.

The equipment can also be supplied with reduced Receiver capacity, of either 4 or 8 Receivers.

Normal System control is from a remotely located PC, via a LAN (Ethernet running TCP/IP).

PC Control Software (GUI based) is supplied with the equipment.

Optional Internet control is available (Please consult Factory).

System specifications are detailed below. Please contact the factory if you require additional information.

### ELECTRICAL SPECIFICATIONS:

Configuration:	4 Antennas to 10 Receivers (maximum).
Control:	Remote Control only (refer to 'CONTROL SYSTEM').
Operation:	Fully Non Blocking.
Expansion Capacity:	Not available.
Frequency Response:	Customer Specified (Refer to Note 1). Bandwidth Filtering to Customer Specification is available.
Gain:	Nominal 3db @ a specified Reference Frequency.
Flatness:	+2db to -1db about the above Reference Frequency.
Linearity (Third Order)	IM3 < -35dbc @ -5dbm input level. (Measured @ Ref Freq).
NF:	< 8db.
Pre Amplifiers:	Four internally mounted Pre Amplifier Modules.
Sensitivity Control (each Input):	Switch-able Attenuator, 15db (Refer to Note 2).
Max Input (linear operation):	0dbm for High Sensitivity. +15dbm for Low Sensitivity.
Max Input (no damage):	+20dbm for High Sensitivity. +35dbm for Low Sensitivity.
On / Off Isolation:	>50db @ 30 MHz.
Output to Output Isolation:	>40db worst case.
Crosstalk:	>50db worst case.
Input Impedance: (all inputs):	50 Ohms (Nominal).
Input VSWR:	< 1.4 : 1
Output Impedance (all outputs):	50 Ohms (Nominal).
Output VSWR:	< 1.2 : 1

### POWER SUPPLY

Input Voltage:	90 to 264 VAC Auto-sensing.
Input Frequency:	47 to 63 Hz.

### MECHANICAL

Width:	19 Inch Rack Mounting.
Height:	1RU (1.75 inches, 44 mm).
Depth:	260 mm overall (Includes rear connectors).
Weight:	3 KG.
RF Connectors (inputs):	N or TNC or BNC (Female). Customer option (no cost).
RF Connectors (outputs):	TNC or BNC (Female). Customer option (no cost)
Power Connector:	IEC.
Ethernet Connector (Network Control):	RJ45.
USB Auxiliary Control Connector:	USB Unpowered Type A Front Panel Mounted.

## GENERAL NOTES

**1. Frequency Response:** The frequency response can be designed to meet individual Customer specifications within the VHF / UHF bands by the inclusion of a high performance Pre Selector (Bandpass) LC filter.

The nominal bandwidth limitations for the Lowband (-L) version of the Switch is anything between 30 MHz (i.e. top of HF), to about 600 MHz recommended upper limit.

The upper limit is somewhat flexible, however if performance is required at a substantially higher top end frequency, the Wideband (-W) version of the Switch is strongly recommended.

Please consult our Sales department if assistance is required.

Bandpass characteristics can be achieved either by a true Bandpass design, or by the use of a high pass (HP) section to limit response below the lower nominated frequency limit, combined with a separate low pass (LP) section to limit response above the upper nominated frequency limit.

Separate Filter sections are usually more easily designed and realized than a true bandpass design, and consequently are more commonly used.

The Pre-Selector Filter is entirely optional, and is provided to meet Customer specification only where required, and is at an additional cost.

The use of a Pre Selector Filter in most cases for VHF / UHF is highly recommended.

Accordingly, this Filter, if required, must be fully specified prior to manufacture.

A typical response plot of a UHF Pre Selector Filter is shown below. This Filter is realized by cascading a 5<sup>th</sup> order Elliptic High Pass design, with a 7<sup>th</sup> order Low Pass Elliptic design.

In this instance, the low side rejection was not critical, hence a 5<sup>th</sup> order Filter was deemed adequate.



**2. Sensitivity Control:** The Pre Amplifier Module includes a 'Sensitivity' control. This comprises an in line 15db Attenuator that can be switched into circuit to provide a de-sensitised input, or out of circuit to provide normal sensitivity. This extends the linear operation of the system to +15 dbm at the input.

**3. Auto Recover:** During normal operation, the internal Switch control system stores all current control settings in non volatile memory, in order that, in the event of a shut down or unintentional power interruption, the system will automatically restore all last saved control settings at power up, thereby restoring the Switch to the same configuration as it was immediately prior to shut down.

**CONTROL SYSTEM:**

Matrix Switch Control, and current Status Display, is provided from a remotely located PC via a standard 10/100Base-T Ethernet link, running TCP/IP.

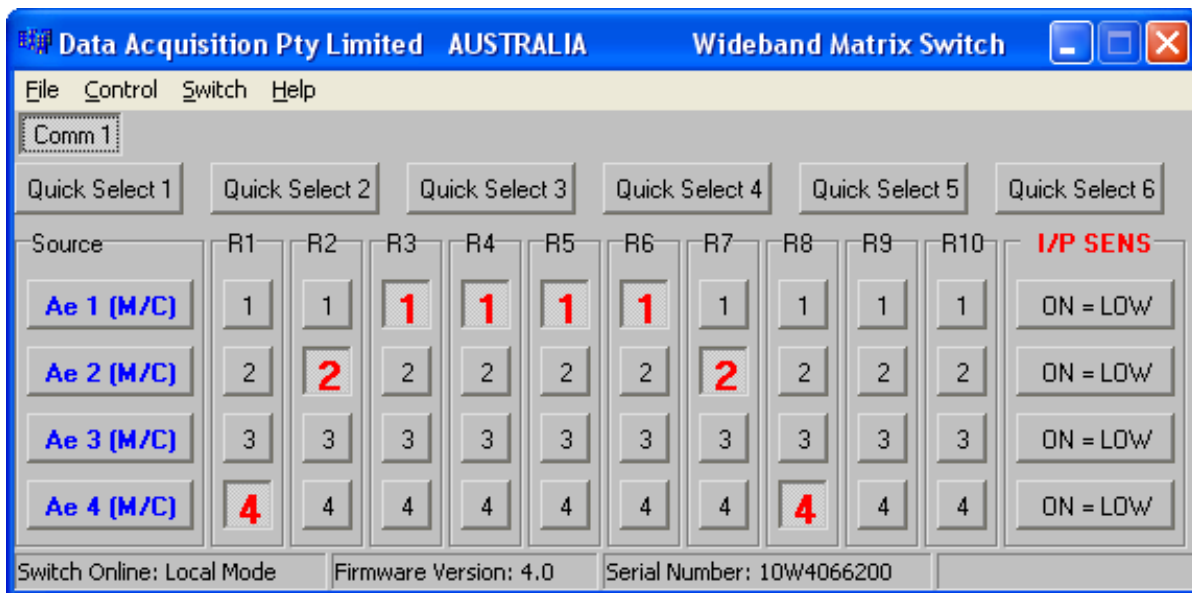
PC User Interface: The PC User Interface is a windows based point and click system, and is provided with the Switch. The PC User Interface provides a screen presentation similar to that shown below.

Basic Matrix control includes:

- \* Separate Columns and Rows of illuminated buttons for Matrix Control, Sensitivity, and Multicouple.
- \* Captions on all Pushbuttons can be user defined.
- \* ‘Quick Select’ buttons for single click recall of stored Switch configurations.

AUXILIARY CONTROL: The Unit includes a Front Panel mounted USB connector (unpowered A) to which a Laptop computer can be connected to provide control for set up and occasional use.

Control software is provided with the Unit.



**TYPICAL GUI EXAMPLE - 4 x 10 SWITCH**



**REAR PANEL VIEW - USC410 MATRIX SWITCH  
( TNC INPUT and OUTPUT CONNECTORS )**

**TOTALLY AUSTRALIAN DESIGNED AND MANUFACTURED**