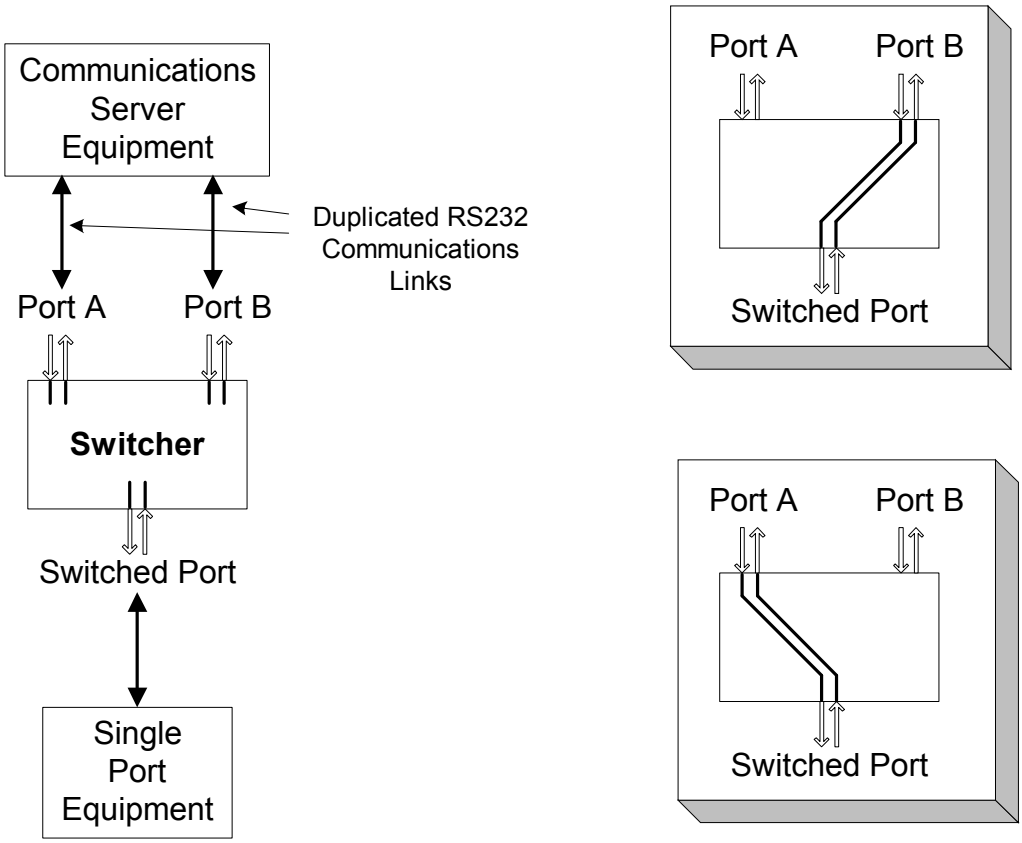
Serial Communications Switcher

Product Specification
Version 1.1
March 2005

1 Product Description

The Serial Communications Switcher provides a means of connecting two RS232 communications links, a dual redundant pair, to a device which has a single RS232 communications port.



The role of the switch is to monitor the two incoming communications links and automatically route one of these links to the switched port.

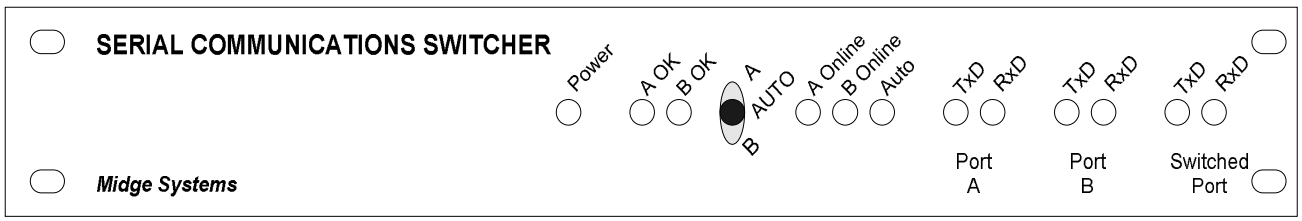
A front panel mounted toggle switch provides for selection of either automatic or manual routing of the communications links.

Front panel LEDs are used to display the status of the two incoming communications links, the current routing and the activity present on the links.

A configuration port is provided to allow configuration of switch parameters.

The three communications ports are optically isolated from each other and from the input supply voltage.

2 Front Panel



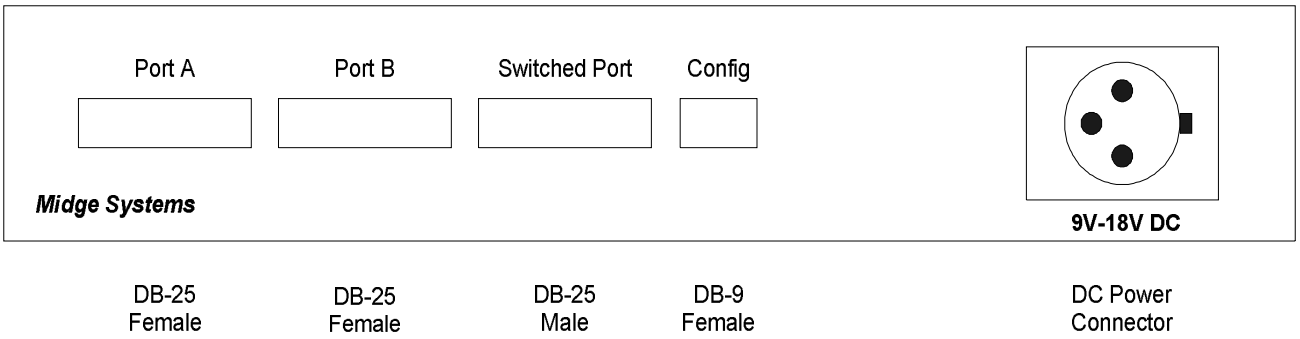
2.1 LEDs

Power	DC Power supplied to the unit.
2 to 1:	Current mode of operation, when flashing.
1 to 2:	Future mode of operation (not implemented)
A OK:	Communications is occurring on Port A.
B OK:	Communications is occurring on Port B.
A Online:	Port A is the Online port. Rxd is routed through to the switched port.
B Online:	Port B is the Online port. Rxd is routed through to the switched port.
Auto:	Automatic port switching selection.
Port A:	
Txd	Data transmitted out Port A
Rxd	Data received in Port A.
Port B:	
Txd	Data transmitted out Port B
Rxd	Data received in Port B.
Switched Port:	
Txd	Data transmitted out the switched port.
Rxd	Data received in the switched port.

2.2 Toggle Switch

Up position:	Forces Port A Online.
Centre position:	Automatic switching.
Down position:	Forces Port B Online.

3 Rear Panel



3.1 Port A & Port B

Connector: DB-25 Female

Pin	Signal	Description	Direction
1	-	Chassis Ground	-
2	TxD	Transmit Data	In
3	RxD	Receive data	Out
4	RTS	Request to Send	In
5	CTS	Clear to Send	Out
7	SG	Signal Ground	-

3.2 Switched Port

Connector: DB-25 Male

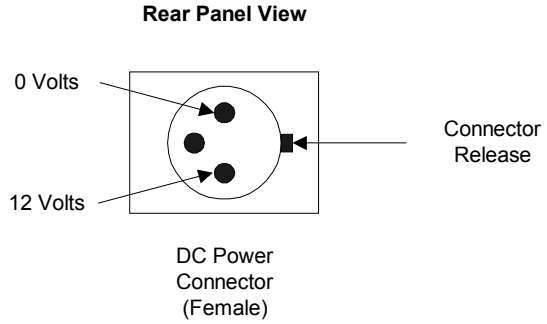
Pin	Signal	Description	Direction
1	-	Chassis Ground	-
2	TxD	Transmit Data	Out
3	RxD	Receive data	In
4	RTS	Request to Send	Out
5	CTS	Clear to Send	In
7	SG	Signal Ground	-

3.3 Configuration Port

Connector: DB-9 Female

Pin	Signal	Description	Direction
2	TxD	Transmit Data	Out
3	RxD	Receive data	In
5	SG	Signal Ground	-

3.4 DC Power Connector



4 Mode of Operation

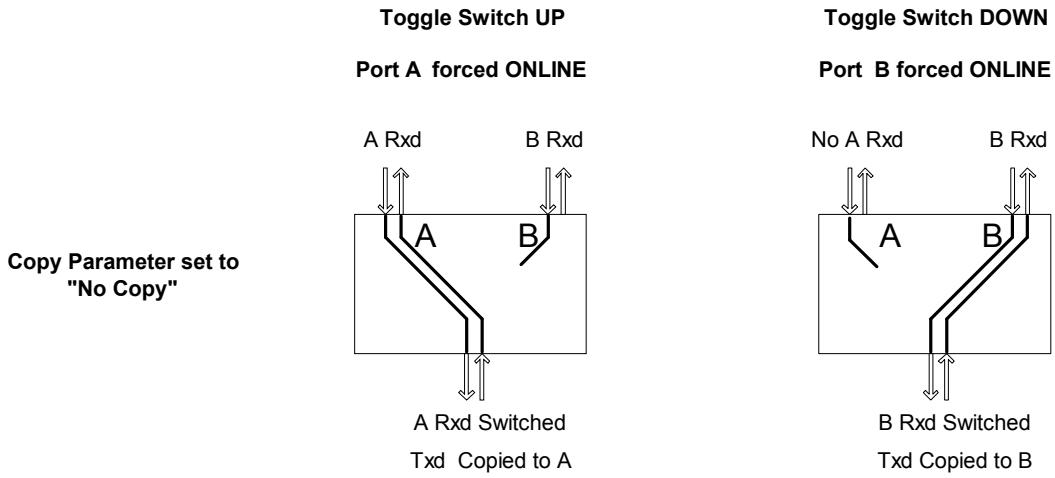
The Serial Communications Switcher provides for both manual and automatic switching of the communications streams between the duplicated links and the switched port. The following is a description of both manual and automatic modes of operation.

4.1 Manual Operation

The manual mode of operation forces communications via the link selected by the position of the front panel mounted toggle switch.

If the switch is placed in the “UP” position then communications from Port A is switched through to the switched port.

If the switch is placed in the “DOWN” position then communications from Port B is switched through to the switched port.



Note: The use of the “Copy” Parameter is described in Section 4.5.

4.2 Automatic Operation

The automatic mode of operation is selected when the front panel mounted toggle switch is placed in the “CENTRE” position. This mode allows for automatic selection of the duplicated links, depending upon activity found on the links.

Each link is monitored for activity. If the Received Data signal on a link contains traffic, the link is marked as “OK” and the links “OK” led is lit. The link is marked as failed if “No Traffic” is received for a user-defined period. When a link is failed, its “OK” led is extinguished.

The Switcher determines which link to make the “Online” link comparing the “OK” state of each link. If only one port is “OK” then this port is marked as “Online” and switched through. If both links are “OK”, then Port A is marked as Online and switched through. The Switcher considers Port A as the primary communications link.

In order to minimise switching backwards and forwards between the two links, two user configurable changeover timers are provided. These are “Startup” and “Synchronise”.

See Section 4.5 for a flow chart of the automatic switching.

4.3 “Copy Back”

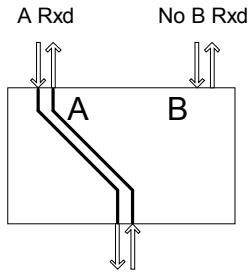
The Switcher provides a “Copy Back” mode, where by the data received by the switched port from the attached device, is copied to the “Offline” port. This mode allows the communications server equipment, connected to Port A and B, to determine the state of the Offline link.

This is achieved by “copying” the data received by the switched port to the Offline port, when the Offline port is marked as “OK”. In this way, if the communications server does not received traffic on its Offline port, the link is dead.

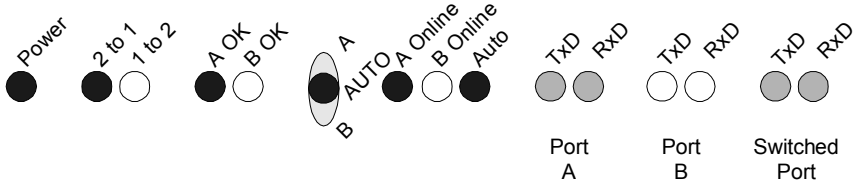
This method of Offline link health determination relies on the communications server equipment transmitting the same data on both links at the same time. If the data on each link is not “synchronised”, the returned responses may cause the communications server to become confused by receiving unexpected data.

4.4 Modes, LEDs and Traffic – (Copy Back enabled)

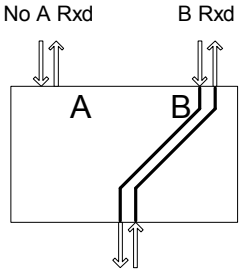
Lit LEDs
Power
2 to 1 (Flashing)
A OK
A Online
Auto



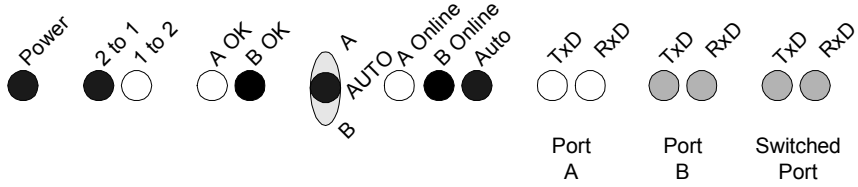
A Rxd Switched
Txd Copied to A



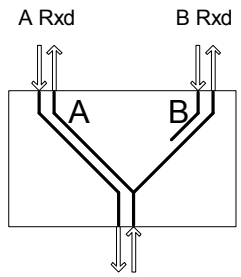
Lit LEDs
Power
2 to 1 (Flashing)
B OK
B Online
Auto



B Rxd Switched
Txd Copied to B



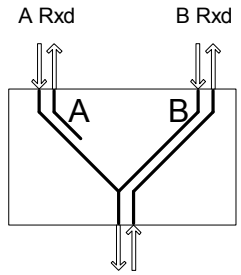
Lit LEDs
Power
2 to 1 (Flashing)
A OK
B OK
A Online
Auto



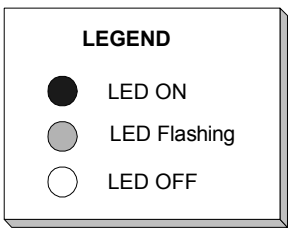
A Rxd Switched
Txd Copied to A & B

Lit LEDs
Power
2 to 1 (Flashing)
A OK
B OK
B Online
Auto

(Transitional state on recovery of A)

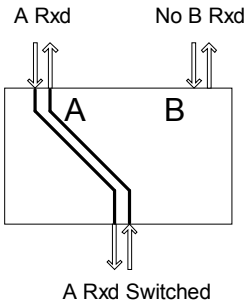


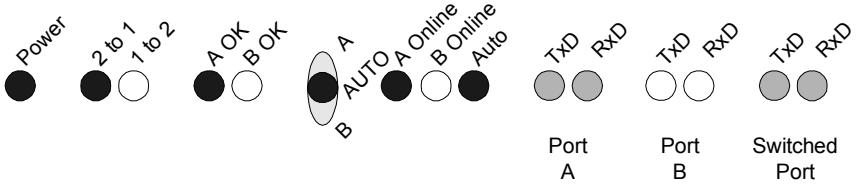
B Rxd Switched
Txd Copied to A & B



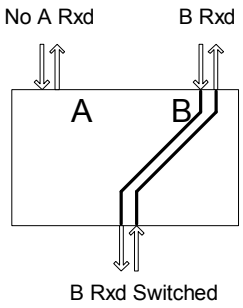
4.5 Modes, LEDs and Traffic – (Copy Back disabled)

Lit LEDs
Power
2 to 1 (Flashing)
A OK
A Online
Auto

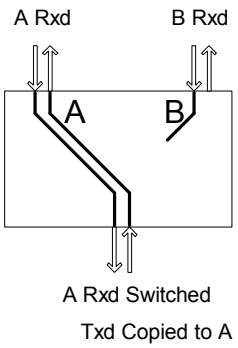


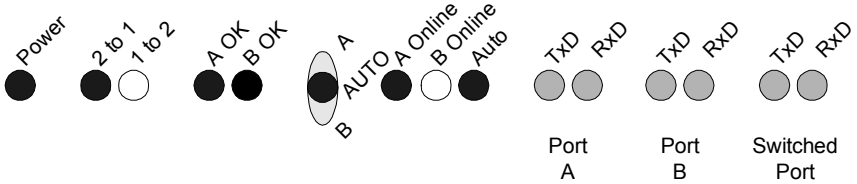


Lit LEDs
Power
2 to 1 (Flashing)
B OK
B Online
Auto



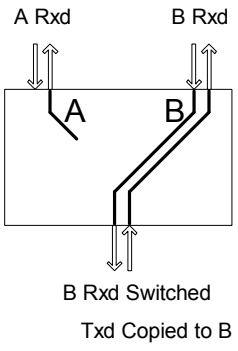
Lit LEDs
Power
2 to 1 (Flashing)
A OK
B OK
A Online
Auto

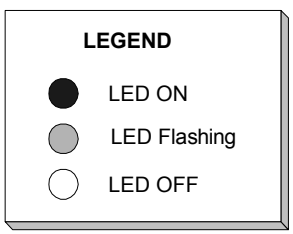




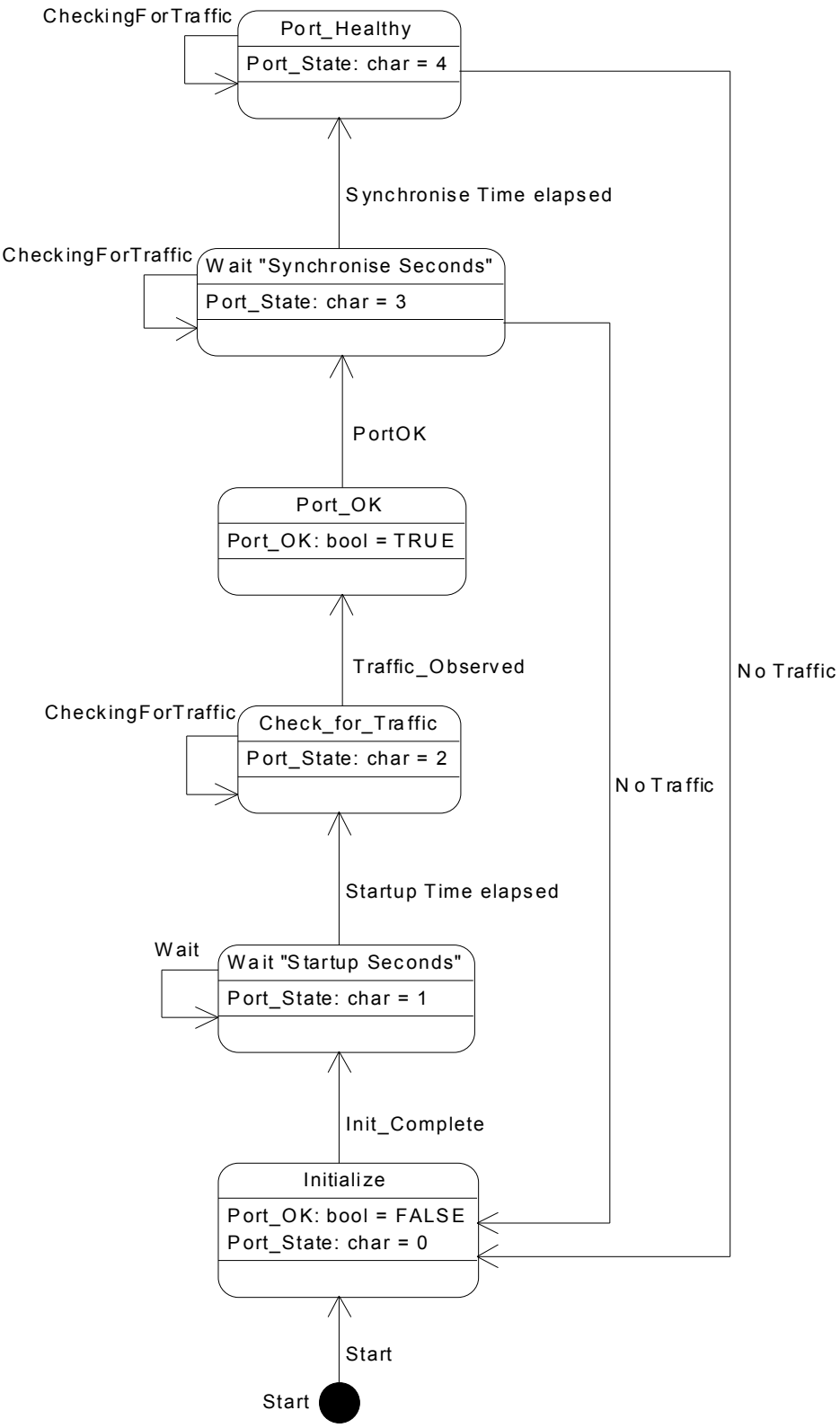
Lit LEDs
Power
2 to 1 (Flashing)
A OK
B OK
B Online
Auto

(Transitional state on recovery of A)





4.6 Automatic Switching – Flow Chart



5 Configuration Port

Configuration of Switcher parameters is via the configuration port. This port operates using DB-9 female 3-wire connection at 57600 baud.

The following parameters are configurable via the port.

- Port A - Timer X (Startup)
- Port A - Timer Y (No traffic)
- Port A - Timer Z (Synchronise)
- Port B - Timer X (Startup)
- Port B - Timer Y (No traffic)
- Port B - Timer Z (Synchronise)
- Copy Port C Rx data to Offline Port Tx data

The “Timer” parameters have a range of 1 to 999.
The “Copy” parameter is configured by [0 = No Copy] [Other = Copy].

5.1 Accessing the Configuration Port

Upon connecting to the configuration port and powering up the Switcher, the following menu will appear.

```
   Switcher Maintenance Page V1.3
M  for manual mode
P  set parameters
E  to exit
?  for this message
```

If no key is pressed, a diagnostic message is displayed every second showing the port state and the current value of the timers.

This same menu will appear if a connection is made to the Switcher, which is already powered up, and a <?> key is pressed.

When entering either the “M” or “P” modes, the “2 to 1” LED stops flashing, indicating that the Switcher is not in the normal operating mode. Exiting the “M” or “P” modes places the Switcher into normal operating mode.

5.1.1 Manual Mode

This mode allows the front panel LEDs to be tested. This following menu is displayed.

```
Manual Mode
 1  to toggle 2 to 1
 2  to toggle 1 to 2
 A  to toggle A OK
 B  to toggle B OK
 C  to toggle Side Select OK
 E  to exit
 ?  for this message
```

5.1.2 Set Parameters

This mode allows the parameters to be set. This following input lines will be displayed.

```
Port A - Timer X (Startup)     <  1> =
Port A - Timer Y (No traffic)  <  2> =
Port A - Timer Z (Synchronise) <  3> =

Port B - Timer X (Startup)     <  1> =
Port B - Timer Y (No traffic)  <  2> =
Port B - Timer Z (Synchronise) <  3> =

Copy Port C Rx data to Offline Port Tx data
  [0 = No Copy] [Other = Copy] <  0> =
```

When entering value, only numbers are accepted.

Parameter input is terminated by entering 3 numbers or pressing <CR>.

The value accepted is displayed with the words **Changed**

If <CR> is pressed with no value **NO Change** is displayed.

6 Specifications

Features:

Opto-Isolated communications ports
Microprocessor controller switching
Manual force switch
Configurable switch over times
19" Rack Mount Chassis

Environmental:

Temperature	0°C to 60°C
Humidity	0 to 95% Non-condensing
MTBF	173,834 hours (MIL-HDBK-217F – Notice 2)

Mechanical:

1RU 19" Rack mount

Width	492mm
Height	44mm
Depth	150mm
Weight	2.5Kg

Power Requirements:

Input power	12V DC @ 500mA
Input voltage range	9V DC to 18V DC

Interfaces:

Port A	V.24, DB-25F, (Txd, Rxd, CTS, RTS)
Port B	V.24, DB-25F, (Txd, Rxd, CTS, RTS)
Switched Port	V.24, DB-25M, (Txd, Rxd, CTS, RTS)
Configuration Port	V.24, DB-9F, (Txd, Rxd)
Maximum Port Speed	19200 bps

Isolation:

Port A – Port B – Switched - Chassis	1500V
DC Input – Chassis - Configuration	500V

Protection:

DC Supply	Fused (poly fuse), filtered and surge protected
Signal Lines	Filtered and surge protected.

Order information:

Part number	SWITCHER-150-12RM

7 Document Revision

Version 1	December 2000	Initial Release
Version 1.1	March 2005	Minor corrections Added copy back function (Section 4.3) Added configuration port (Section 5) Added MTBF (Section 6) Adjusted Input voltage range (Section 6) Adjusted Isolation rating (Section 6)

8 Contact Details

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