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**Model 232MSS2**  
**RS-232 Four-Port Mini**  
**Smart Switch/Port Combiner**

**Description**

The RS-232 Four Port Mini Smart Switch/Port Combiner, Model 232MSS2, allows one RS-232 host device to connect to as many as four RS-232 devices. The 232MSS2 can function as a software and/or hardware controlled switch. As a software controlled switch, referred to as smart switch mode, the device connected to the master port of the 232MSS2 has control over which one of the four ports it is connected to. As a hardware controlled switch, referred to as port combiner mode, the handshake lines of the devices connected to the four ports are used to gain access to the master port. More details of smart switch and port combiner modes are covered later in this datasheet.

There are four LED's on the 232MSS2 to indicate which port is connected to the master port. The master port has a DB-25S female connector and the slave ports have DB-9S female connectors. The master port can be configured as a DTE or DCE port by an internal switch setting (See Table 1). If the master port is configured as a DTE port, the four slave ports will become DCE ports. The 232MSS2 supports the following signals: TD, RD, RTS, and CTS. Handshake lines DSR and DTR are connected together and are not passed through to the master port. There is no delay through the device and data is not buffered. The 232MSS2 will work with baud rates from 1200 to 115,200 bps; 7 or 8 data bits; even, odd or no parity; and 1 or 2 stop bits (7,N, 1 is not allowed). The communication format is set via dipswitch 1 (SW1 -- See Table 1).

**NOTE:** The data format and rates mentioned are used to switch the 232MSS2. Communication between the devices can use any format or data rate.

**Operation**

**Smart Switch Mode**

The switch can be controlled in two different ways. The first way is referred to as smart switch mode. In this mode, the switch is controlled by sending a programmable three-character preamble code to the "Master" port of the 232MSS2. The first character of the preamble code must be the ASCII "Escape" character (decimal 27). The second character is user programmable by setting Dipswitch 2 (SW2 -- See Table 2). The third character should be the ASCII upper case letters A, B, C, or D to select the appropriate port. The third character can also be the ASCII "EOT" (decimal 4) character, which will turn off all the ports. Example: To select port "A", send the ASCII "ESC" character, the programmable character and the "A" character. When the 232MSS2 receives this code the master port will be connected directly to port "A".

**Port Combiner Mode**

The other way to control the switch is referred to as port combiner mode. In port combiner mode, a slave port can gain access to the master port by asserting a handshake line (CTS for DTE slave ports, RTS for DCE slave ports). If a slave port asserts its handshake line and no other slave ports have their handshake line asserted, the master port will then be connected directly to the slave port with the asserted handshake line. Once a slave port is connected to the master port, the connection will remain until the slave disasserts its handshake line. If multiple slave ports have their handshake lines asserted, access will be granted on a first come-first serve basis. If none of the slave ports have their handshake line asserted, the switch can be controlled using the preamble codes.

Example: (Initial conditions--no slave ports with handshake lines asserted) In chronological order, Port C asserts its handshake line, Port A asserts its handshake line, Port D asserts its handshake line and then Port C disasserts its handshake line. When Port C asserts its handshake line, a connection will be made between the master port and Port C. When Port C disasserts its handshake line, Port C will be disconnected and Port A will be connected to the master port. When Port A disasserts its handshake, Port A will be disconnected and Port D will be connected to the master port.

### Timer Features

The 232MSS2 has an enhanced mode, which offers special timer features. The timer features can be used to prevent slave devices from receiving preamble commands, inadvertent switching from binary/graphic file transfers, and inactive slave devices from holding control of the master port. The timer has two different modes: an inactivity mode and an inadvertent switch mode. When in inactivity mode, the 232MSS2 will monitor the data lines. If there is no activity for the specified time, the selected slave port will be disconnected from the master port. When in inadvertent switch mode, the 232MSS2 will ignore switching commands for the specified time. After this time has expired, the selected slave port will be disconnected from the master port.

Timer functions are enabled via a dipswitch setting and through software commands. Software commands follow the same format as preamble codes used for switching. Two commands are used to set the timer functions: Set Timer Mode and Set Timer Value. These commands require an additional byte for data. The Set Timer Value command requires the third byte to be an ASCII "T" character. The data byte (fourth byte) must be a value between ASCII "0" and ASCII "9". A value of "0" is used to disable the timer. Refer to Table 3 for timer values.

The Set Timer Mode command requires the third byte to be an ASCII "M". If the data byte (fourth byte) is an ASCII "0" (default), the timer will be setup as an inactivity timer. When the timer is configured as an inactivity timer, the 232MSS2 will monitor the data lines (TD & RD) for data. If there is no activity for the specified timer value, the slave port that is connected to the master port will be disconnected. In smart switch mode, the inactivity timer can be used to prevent the preamble codes from being received by the slave devices. In port combiner mode, the inactivity timer can be used to prevent devices from tying up the master port. For example (port combiner mode): All the slave ports have their handshake lines asserted. The device on Port C has its handshake line asserted and is currently connected to the master port, but has not been transmitting or receiving data. When the inactivity timer expires, Port C will be disconnected and the next slave port will then be connected to the master port (following the first come-first serve rule). Port C will then be placed at the "end of the line".

If the data byte of the Set Timer Mode command is an ASCII "1", the timer will be set up to ignore switching commands. When the timer is configured in this mode, the 232MSS2 will not accept any switching commands ("A", "B", "C", "D", or "EOT") for the specified timer value. After the timer has expired the slave port that is connected to the master port will be disconnected. This feature is useful to prevent inadvertent switching during binary/graphic type file transfers. For example (smart switch mode): the timer is configured to ignore switching commands for 5 seconds. The select Port D command is sent to the 232MSS2. Once Port D is connected a file of unknown data type (so file may or may not contain a switching command sequence) is to be transferred through the 232MSS2. For a period of 5 seconds after Port D is connected, no switching commands will be accepted. As long as the file transfer takes less than 5 seconds, there is no chance the 232MSS2 will inadvertently switch ports.

Table 1 - Communication & Port Setup

Dipswitch SW1								Setting
1	2	3	4	5	6	7	8	
0	0	0	X	X	X	X	X	1200 Baud
1	0	0	X	X	X	X	X	2400 Baud
0	1	0	X	X	X	X	X	4800 Baud
1	1	0	X	X	X	X	X	9600 Baud*
0	0	1	X	X	X	X	X	19.2K Baud
1	0	1	X	X	X	X	X	38.4K Baud
0	1	1	X	X	X	X	X	57.6K Baud
1	1	1	X	X	X	X	X	115.2K Baud
X	X	X	0	X	X	X	X	Enhanced Disabled *
X	X	X	1	X	X	X	X	Enhanced Enable
X	X	X	X	0	X	X	X	8 Data Bits *
X	X	X	X	1	X	X	X	7 Data Bits
X	X	X	X	X	0	X	X	Parity Disabled *
X	X	X	X	X	1	X	X	Parity Enabled
X	X	X	X	X	X	0	X	Smart Switch Mode*
X	X	X	X	X	X	1	X	Port Combiner Mode
X	X	X	X	X	X	X	0	DCE master port *
X	X	X	X	X	X	X	1	DTE master port

0 = OFF 1 = ON X = DON'T CARE

\*Factory defaults

Table 2 Programmable Character Setting	
Dipswitch SW2*	Weight
1	1
2	2
3	4
4	8
5	16
6	32
7	64
8	128
*Factory Default --ASCII "STX" character (decimal 2), SW2 position is only one ON.	

Table 3 - Timer Values	
Data Byte	Value
0	timer disabled
1	10ms
2	25ms
3	100ms
4	500ms
5	1 s
6	5 s
7	30 s
8	1 min.
9	5 min.

### Instruction Manual & Software

The 232MSS2 comes with an instruction manual and software media. An IBM PC or compatible terminal stay resident (TSR) program is supplied. The program allows the user to select the Smart Switch ports either through the command line or by pressing a sequence of keys referred to as hot keys. The TSR requires 1K of memory. Also included is a program written in Visual Basic, which allows you to switch ports in Windows 98, Windows NT 4.0 with service pack 3 installed, XP or Vista.

### Power Supply

The 232MSS2 requires 12 VDC at 10 mA which is provided through a 2.5 mm power jack. The tip of the plug is positive and the sleeve of the plug is ground. A power supply is available.

Power: 12 VDC to 16 VDC @ 10 mA  
Dimensions: 12.2 x 7.1 x 2.3 cm (4.8 x 2.8 x 0.9 in)

#### DECLARATION OF CONFORMITY

Manufacturer's Name:	B&B Electronics Manufacturing Company
Manufacturer's Address:	P.O. Box 1040 707 Dayton Road Ottawa, IL 61350 USA
Model Numbers:	232MSS2
Description:	Four-Port Mini Smart Switch/Port Combiner
Type:	Light industrial ITE equipment
Application of Council Directive:	89/336/EEC
Standards:	EN 55022 EN 61000-6-1 EN 61000 (-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11)



Michael J. Fahrion, Director of Engineering