Modular System Controls
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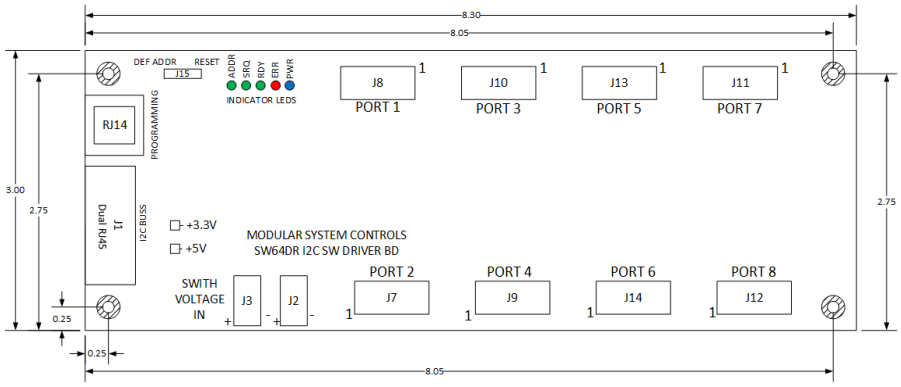
New Product Data Sheet

SW64DR

32 Pole I²C RF Switch Driver Board with Readback



1. Introduction

The SW64DR is a I²C switch driver/readback board designed to drive mechanical RF switches or relays with direct coil drive and indicator contact readback. The board is compatible with the MSC02/MSC03 System Controller Boards and contains an I²C interface and 4 ports with 8 high voltage switch coil drivers each with internal suppression diodes and 4 ports with 8 direct inputs each for indicator contact sensing or general purpose I/O. Resulting in the capability to control and sense up to 32 switch poles. Each port can drive multiple switches with up to 8 poles per switch. Switches can be latching with or without cutoff or non-latching.

The indicator sense inputs may also be configured as general purpose TTL compatible IO with any mix of inputs and outputs. The SW64DR is physically compatible with other SW64 series boards.

2. Operation

The SW64DR I/O Board is configured and controlled by the System Controller Board and is compatible with all switch functions supported by the MSCS system. The board is fully configurable in the field by the OEM for custom applications using SCPI commands. The indicator sense inputs have internal pull-up resistors eliminating the need to supply power to the switch indicator common. Each port can control a single switch or multiple switches as long as all of the switch poles are in the same port. For example, one port could control 4 SPDT (2-poles) switches, two 4-pole switches or a mix of different types of switches adding up to 8 poles. Switches can be one line per switch pole (with or without a reset line),

latching or non-latching or binary encoded (with or without an All Off line). Switches can be controlled and monitored via the controller's optional touchscreen or by SCPI commands. Please see the MSC0x data sheet for additional information.

There is an external voltage input to supply power to the switches.

3. CONFIGURATION & CONNECTIONS

This is an example of the connections for two 2-position switches and a 4-position switch to Port 1.

Port Pin #	Chan #	Device Number	Function	Comments
Port 2-10			SW Voltage	SW1 & SW2 +V connections
Port 2-9			Ground	SW1 & SW2 Ground (if needed)
Port 2-8	15	3	Coil Driver	SW3 4-Position Switch, Coil 4
Port 2-7	14	3	Coil Driver	SW3 4-Position Switch, Coil 3
Port 2-6	13	3	Coil Driver	SW3 4-Position Switch, Coil 2
Port 2-5	12	3	Coil Driver	SW3 4-Position Switch, Coil 1
Port 2-4	11	2	Coil Driver	SW2 2-Position Switch, Coil 2
Port 2-3	10	2	Coil Driver	SW2 2-Position Switch, Coil 1
Port 2-2	9	1	Coil Driver	SW1 2-Position Switch, Coil 2
Port 2-1	8	1	Coil Driver	SW1 2-Position Switch, Coil 1
Port 1-10			+3.3V	N.C.
Port 1-9			Ground	Switch Indicator Commons
Port 1-8	7	3	Indicator	SW3 4-Position Switch, Ind 4
Port 1-7	6	3	Indicator	SW3 4-Position Switch, Ind 3
Port 1-6	5	3	Indicator	SW3 4-Position Switch, Ind 2
Port 1-5	4	3	Indicator	SW3 4-Position Switch, Ind 1
Port 1-4	3	2	Indicator	SW2 2-Position Switch, Ind 2
Port 1-3	2	2	Indicator	SW2 2-Position Switch, Ind 1
Port 1-2	1	1	Indicator	SW1 2-Position Switch, Ind 2
Port 1-1	0	1	Indicator	SW1 2-Position Switch, Ind 1

These are example assignment commands that would be used to configure 3 switches with the connections shown in the table. Please refer to the system manual for more information.

```
ASSign:MODule 1, 10, 4, 2, 1000000, SW64DR      // assign the module parameters
ASSign:SWITch 1, 1, 1, 8, 2, 1, 1, 1, 2         // assign switch 1 parameters
ASSign:SWITch 2, 1, 2, 10, 2, 1, 1, 1, 2        // assign switch 2 parameters
ASSign:SWITch 3, 1, 3, 12, 4, 1, 1, 1, 2        // assign switch 2 parameters
*sav 0
```

The switches can be set using the SCPI **ROUTe:SWITch** command and the switch position can be read back with the **ROUTe:SWITch?** query command.

4. SPECIFICATIONS

1.1 I/O PORTS

Ports 2, 4, 6 & 8

Coil Drivers: 4 ports, 8 per port (32 total) with suppression diodes
Switch Voltage: Switch Voltage (35V max)

Ports 1, 3, 5 & 7

Indicator Inputs/ I/O lines: 8 per port (32 total) with programmable pull-up resistors
I/O Voltage: 3.3V (<100 mA total), can be changed to Switch Voltage via on board jumpers.

Ground: 1 per port

1.2 CONNECTORS

1.2.1 I2C Control

Connector type: 2-each RJ-45 shielded, compatible with MSC0x controller boards. Signals include SCL, SDA, SRQ, +5V power and ground.

1.2.2 IO Ports

Connector type: 8 each, standard 10 pin header, 2 rows, 0.1" pin spacing (standard IDC ribbon cable or crimp pin connector compatible)

Ports 2, 4, 6 & 8	
Pin #	**Function**
1	Coil Driver 1
2	Coil Driver 2
3	Coil Driver 3
4	Coil Driver 4
5	Coil Driver 5
6	Coil Driver 6
7	Coil Driver 7
8	Coil Driver 8
9	Ground
10	Switch Power

Ports 1, 3, 5 & 7	
Pin #	**Function**
1	Indicator 1
2	Indicator 2
3	Indicator 3
4	Indicator 4
5	Indicator 5
6	Indicator 6
7	Indicator 7
8	Indicator 8
9	Ground
10	3.3V (100 mA max)

1.2.3 Switch Power

Connector type: 2 each to allow daisy chaining, Molex 0015912025, 2-pin, 1-row, latching

Pin #	Function
1	Ground
2	Switch Power

1.3 LED INDICATORS

Switch Power – Blue
Logic Power – Blue
Ready – Green
Addressed – Green
SRQ – Green
Error – Red

1.4 PHYSICAL

Size – 8.3” x 3.0”

1.5 SUPPORTED I/O DEVICES

1.5.1 RF Switches

1.5.1.1 Mechanical Switches (direct coil drive)

- 1 to 8 poles
- 1 of N (one line per switch pole) or binary encoded
- Latching with or without cutoff (pulsed)
- Non-latching
- Selectable Indicator contact read-back
- Selectable Reset line

1.5.2 Relay control (direct coil drive)

- Latching (2 coils) or non-latching

1.5.3 General Purpose I/O (using indictor lines only)

- Configurable ports – 1 to 8 lines per port
- Each bit can be configured as input or output
- Individual I/O line control (set or reset)
- Can drive TTL level switches