

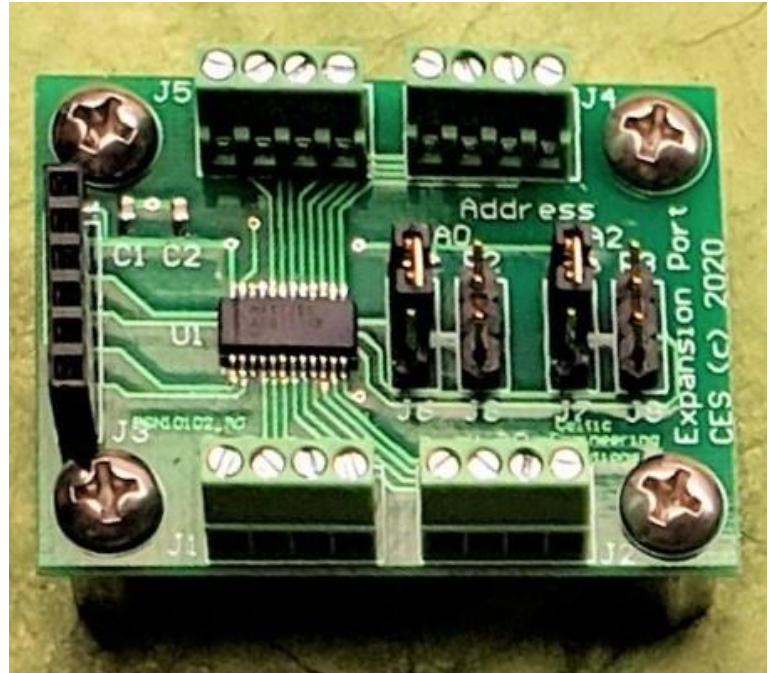
Solstice Family: Port Expander

I²C Port Expander

General Description

The SF-3 is a serial interfaced port expander board. The board is based on Maxim MAX7325. The board can be powered with between 1.71Vdc and 5.5Vdc. The communication to the board is through a two-wire interface and will require pullups on the SDA, SCL and the Reset lines; 4.99K recommended to start. Actual resistance will depend on the length of the serial cable and the number of devices on the bus.

The chip is divided into two digital ports. Port1 has Open-Drain pins. These can be pulled high internally or externally. When placed in the high state, they can be read as inputs. Reading from the port register returns 2 8-bit bytes. The first is the current state of the port, the second is a flag for each pin that is set if there was a change in state since the last port read.



The second port is a push-pull output port. Reading from this port returns one byte indicating the status of each pin.

The chip software can also be reset using the reset input pin. This pin must either have a pull up or be driven. If left floating it will cause erratic behaviour of the chip.

Using the Address selection jumpers, A0 and A2 allow one of 16 addresses to be selected for the Open-Drain Port (110xxxx) and a second address (one of 16) to be selected for the Push-Pull Output (101xxxx).

Applications

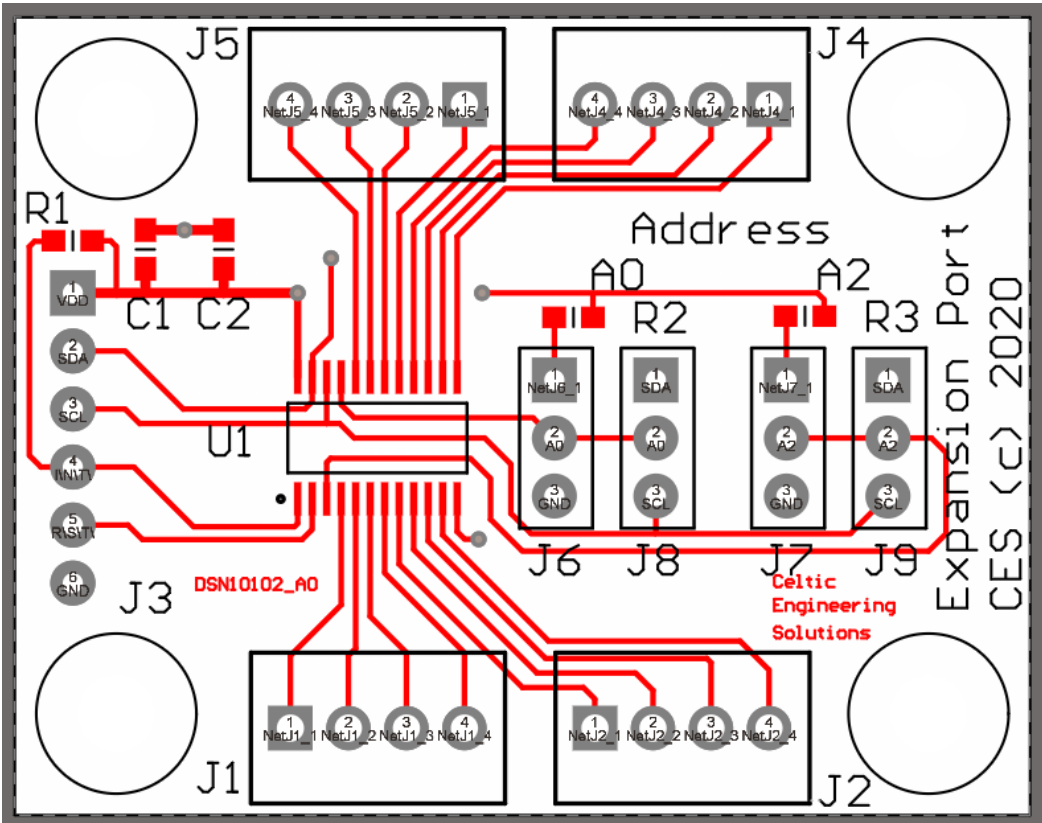
- Cell Phones
- SAN/NAS
- Servers
- Notebooks
- Satellite Radio
- Automotive

Benefits and Features

- 400kHz I2C Serial Interface
- +1.71V to +5.5V Operation
- 8 Push-Pull Outputs
- 8 Open-Drain I/O Ports, Rated to 20mA Sink Current



- I/O Ports are Overvoltage Protected to +6V
- Selectable I/O Port Power-Up Default Logic States
- Transient Changes are Latched, Allowing Detection Between Read Operations
- INT Output Alerts Change on Inputs
- AD0 and AD2 Inputs Select from 16 Slave Addresses
- Low 0.6µA (typ) Standby Current
- -40°C to +125°C Temperature Range
- Board Size: 1.750” x 1.375”



Pin Configuration (J3)

Pin	Name	Function
1	VDD	Power Supply Input
2	SDA	Bidirectional Serial Data
3	SCL	Serial Clock Input
4	INTb	Interrupt
5	RSTb	Reset
6	GND	Ground



Pin Configuration (J1)

Pin	Name	Function
1	P0	Open Drain I/O
2	P1	Open Drain I/O
3	P2	Open Drain I/O
4	P3	Open Drain I/O

Pin Configuration (J2)

Pin	Name	Function
1	P4	Open Drain I/O
2	P5	Open Drain I/O
3	P6	Open Drain I/O
4	P7	Open Drain I/O

Pin Configuration (J4)

Pin	Name	Function
1	O8	Outputs
2	O9	Outputs
3	O10	Outputs
4	O11	Outputs

Pin Configuration (J5)

Pin	Name	Function
1	O12	Outputs
2	O13	Outputs
3	O14	Outputs
4	O15	Outputs

Absolute Maximum Ratings

VDD, SDA, SCL, DRDYn, A0, A2..... -0.3 to 6.0V
 Storage temperature..... -65°C to +150°C
 Port pin sink current..... 25mA
 Total GND Current 100mA

Pin Description

Serial Data Pin (SDA)

SDA is a bidirectional input/output pin, used to serially transmit data to and from the host controller. This pin requires a pull-up resistor to output data. Requires a pull up.

Serial Clock Pin (SCL)

SCL is a clock input pin. All communications and timing are relative to the signal on this pin. The clock is generated by the host controller on the bus. Requires a pull up.



Reset Input

The active-low RST input voids any I2C transaction involving the MAX7325, forcing the MAX7325 into the I2C STOP condition. A reset does not affect the interrupt output (INT). This pin is floating on the board. In order to operate correctly the pin must be pulled high either by a resistor or driven high by an MCU output.

Power supply Input (VDD)

VDD is the power pin. The operating voltage is between 1.71Vdc and 5.5Vdc.

Ground (GND)

This is the system ground pin

Interrupt

State changes are indicated by the INTb output. This interrupt is cleared when the status register is accessed.

Address Pins

The address pins select the address of each port. There are two addresses, one for Port 1 and a second for Port 2. There are 16 possible addresses for each port. AD2 and AD0 set the addresses for the Ports. In selecting the address, you also set the power-up default and whether the pullups are enabled. There are 4 selections for AD2 using the jumper on J7 and J8. And there are 4 selections for AD0 using Jumpers J6 and J8. These are VDD, GND, SDA or SCL. It is important to only select one for each group. Placing multiple jumpers can damage the chip or the board.

The function of each pin is shown on the accompanying drawing of the board. Upper left is VDD, Lower Left is GND, Upper Right is SDA and Lower Right is SCL. Use of this diagram and the included schematic should allow you to determine how to wire up your project.

Board shipped with A0 and A2 pulled high. This gives default addresses of 0b1101101 for Port P and 0b1011101 for Port O.

Port Pins

Port 1 uses screw terminal blocks J1 and J2. Pin 1 is on the left of J1 and Pin 8 is on the right of J2.

Port 2 uses screw terminal blocks J4 and J5. Pin 1 is on the right of J4 and Pin 8 is on the left of J5.

Serial Interface

The Open-Drain Port can be read by sending the port address to the chip and reading either 1 or 2 bytes back. The first byte is always the port values. The second byte contains the interrupt flags. Repeated reads will return updated versions of the data and flag registers. Reading this register also clears the interrupt if one exists.

The Push-Pull output port can be read by send the port address and reading back one byte. Repeated reads will return the current state of the port.

Writing to either port is done by writing the port address followed by the desired pin data. Repeated writes will update the port without the need to resend the address.



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For additional information about the performance of the port expander and for the registers please see Maxim datasheet.

Revision History

NR	New Release
01	Updated pull up information. Added default addresses.