
I2C-IN1630S**16 Channels 3-30V Optocouplers Input via I2C bus****1 Features**

- Operating voltage: 3.0 – 5.5V
- I2C bus frequency: up to 400kHz
- I2C controller: PCF8575
- Input voltage: 3 – 30V
- Higher input voltages supported with external resistors
- 16 optocoupler-isolated inputs
- Input isolation voltage: 3.75kV
- Onboard pull-up resistors for I2C bus (jumper selectable)
- Configurable I2C address: up to 8 addresses via 3 jumpers
- Connector footprint for INT (interrupt) signal
- Polarity protection circuitry
- PCB dimensions: 160.50 x 28.00 mm

This is an I2C bus input expander board based on the PCF8575. It is designed to expand the input ports of microcontrollers and can interface with most platforms such as Arduino, ESP32, and Raspberry Pi.

The board supports 16 optocoupler-isolated inputs. Each input accepts 3–30 V, and higher voltages can be used by adding external resistors. The board operates with a 3.0–5.5 V power supply and supports I2C bus frequencies up to 400 kHz.

It provides a PCB footprint for a connector to the INT (interrupt) signal and includes built-in pull-up resistors for the I2C bus, which can be enabled via jumpers. The board address can be configured for up to eight different addresses using three jumpers.

To prevent accidental damage, the board includes polarity-protection circuitry. The PCB dimensions are compact, making it suitable for space-constrained applications.

2 Diagram

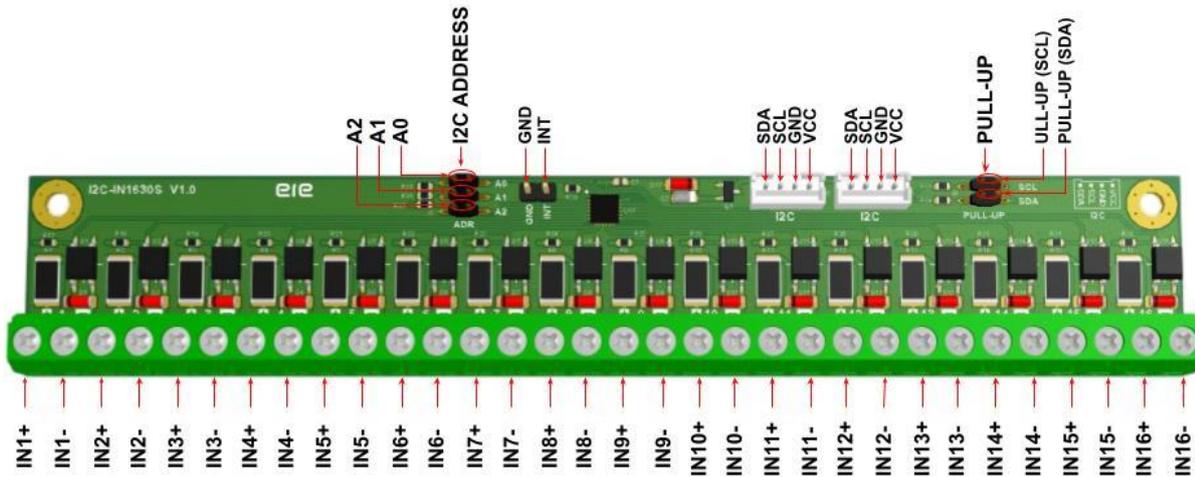


Figure 1: Board Diagram

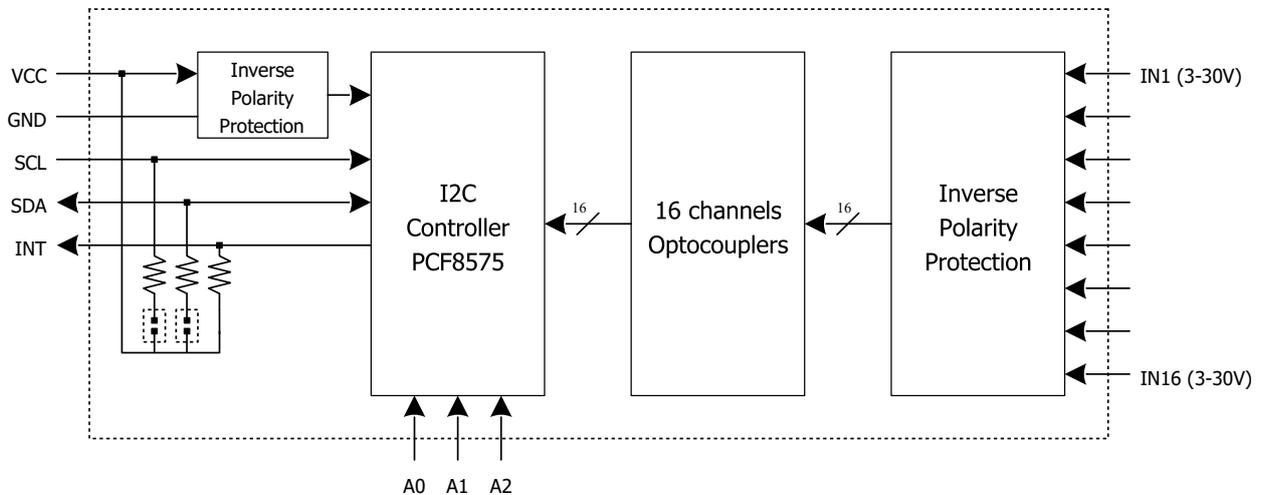


Figure 2: Block Diagram

3 Pin description

Symbol	Description
VCC	Operating input power supply
GND	Ground
SCL	I2C bus serial clock
SDA	I2C bus serial data
INT	Interrupt output signal with internal pull-up resistor
A0	A jumper for A0 address of I2C bus
A1	A jumper for A1 address of I2C bus
A2	A jumper for A3 address of I2C bus
PULL-UP (SCL)	A jumper for SCL pull-up resistor
PULL-UP (SDA)	A jumper for SDA pull-up resistor
IN1+ ... IN16+	Positive signals for IN1 to IN16
IN1- ... IN16-	Negative signals for IN1 to IN16

4 I2C Address

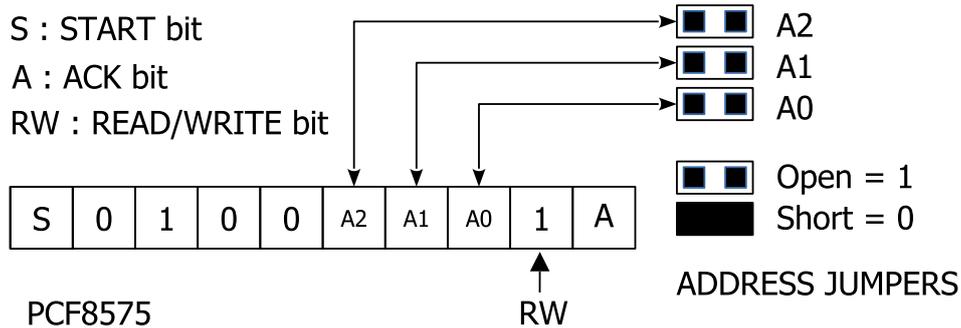


Figure 3: I2C Address

5 Data Frame

When a microcontroller reads data from the PCF8575, the first byte corresponds to inputs **IN1–IN8**, and the second byte corresponds to inputs **IN9–IN16**. In software, the first byte is treated as the **low byte**, and the second byte as the **high byte** of the 16-bit data, as shown in the picture.

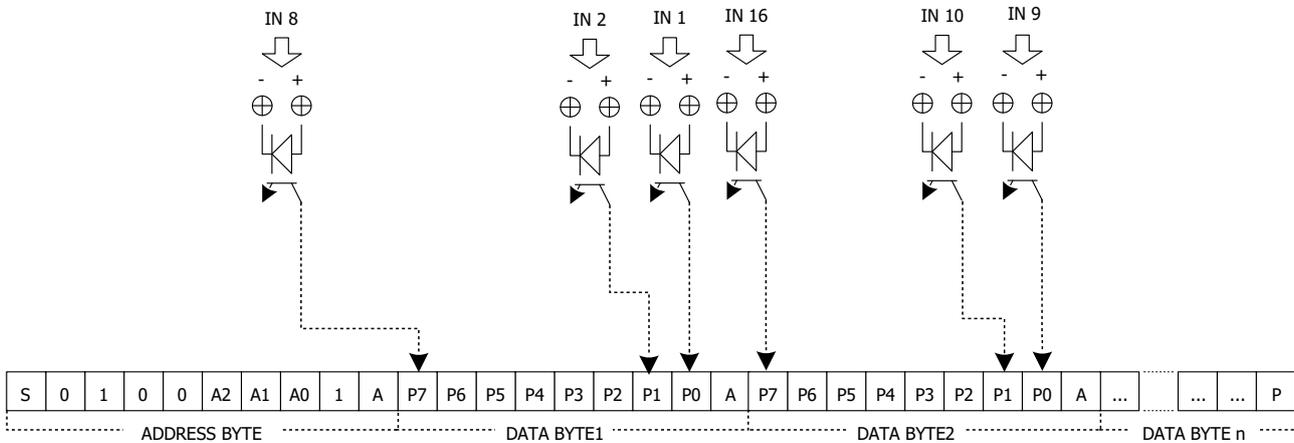


Figure 4: Data Frame

6 High Input Voltage

The board includes a 1 k Ω resistor on each input channel, which limits the maximum input current to 30 mA at 30 V. If the input voltage exceeds 30 V, an additional external resistor is required for each input channel.

Example. If 48 V is applied to the board inputs, an additional 600 Ω external resistor is required for each input channel. The total resistance per channel becomes 1.6 k Ω (1 k Ω onboard + 600 Ω external), resulting in a current of about:

$$I = 48V / 1.6k\Omega \approx 30mA$$

The power dissipation of the external resistor is:

$$P = I \times I \times R = 30mA \times 30mA \times 600\Omega \approx 540mW$$

Therefore, a 600 Ω, 1 W resistor is recommended for each external input resistor.

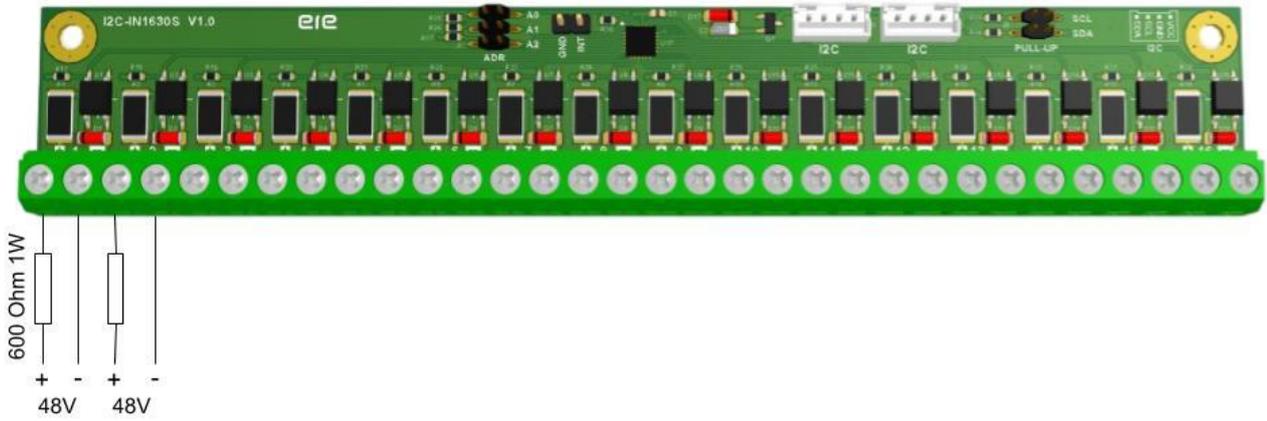


Figure 5: External Resistors

7 Specifications

	Conditions	Values	Units
I2C bus operating voltage		3.0 - 5.5	V
I2C bus frequency (SCL)		400	kHz
Input voltage range		3.0 - 30	V
Input isolated voltage		3.75	kV
Input currents	Input voltage = 3.0V	~1.8	mA
	Input voltage = 5.0V	~3.8	mA
	Input voltage = 12.0V	~10.8	mA
	Input voltage = 30V	~28.8	mA
I2C bus pull-up resistor value		10	kOhm
Interrupt pull-up resistor value		10	kOhm

Table 1: Specifications

8 Dimensions

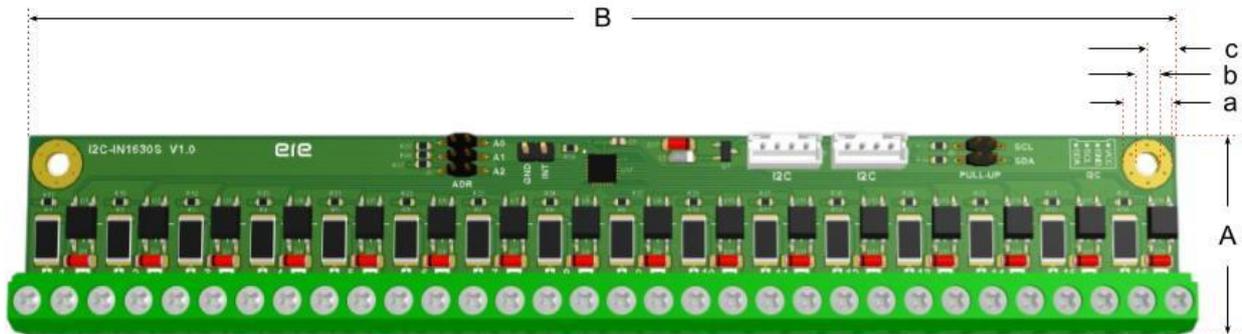


Figure 6: Dimensions



	mm	Inch
A	28.00	1.102
B	160.50	6.319
a	7.10	0.280
b	3.60	0.142
c	4.00	1.358

Table 2: Dimensions

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