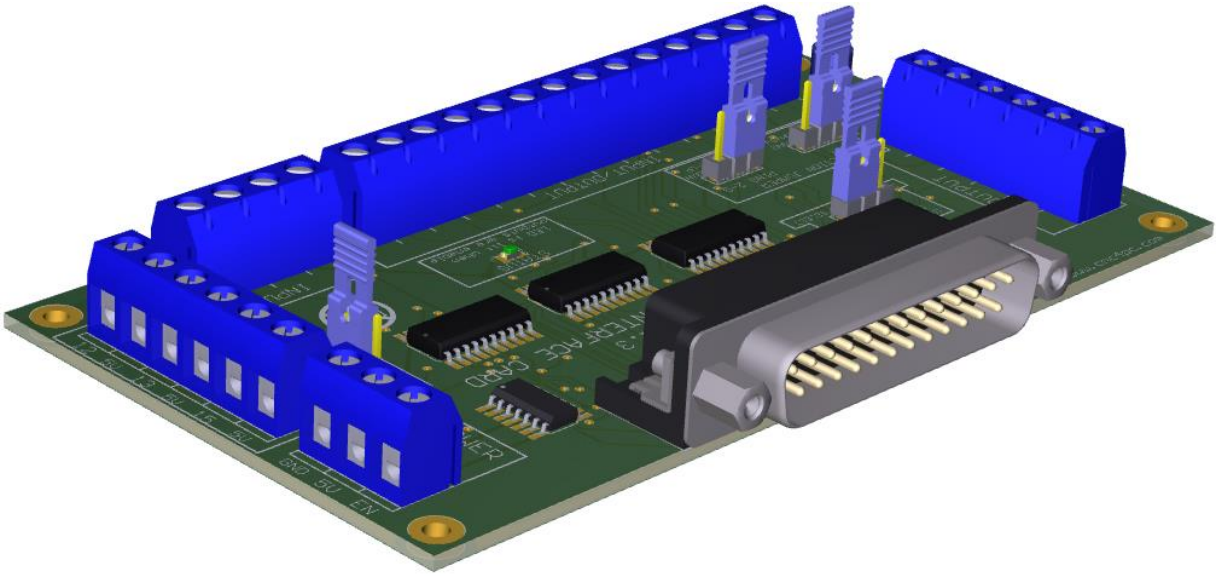
CNC4PC

Integration Solutions for CNC Projects

USER'S MANUAL VER.2

C10- PARALLEL PORT INTERFACE CARD BOARD Rev. 11.3



APRIL, 2019

USER'S MANUAL

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1.0 OVERVIEW

This card provides an easy way of interfacing your inputs and outputs from you parallel port. It provides terminals for the connections and conditions the signals for use in CNC applications.

2.0 FEATURES

- **IEEE 1284 Standard compatible.**
- **PULL-UP or PULL-DOWN selection for inputs.**
- **Buffered inputs and outputs.**
- **Bidirectional pins 2-9.**
- **Output pins 1, 2, 3, 4, 5, 6, 7, 8, 9, 14, 16, 17. Or 1, 14, 16, 17.**
- **Input pins 10, 11, 12, 13, 15. Or 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15.**
- **Input and output pins with close by ground or +5vdc connections**

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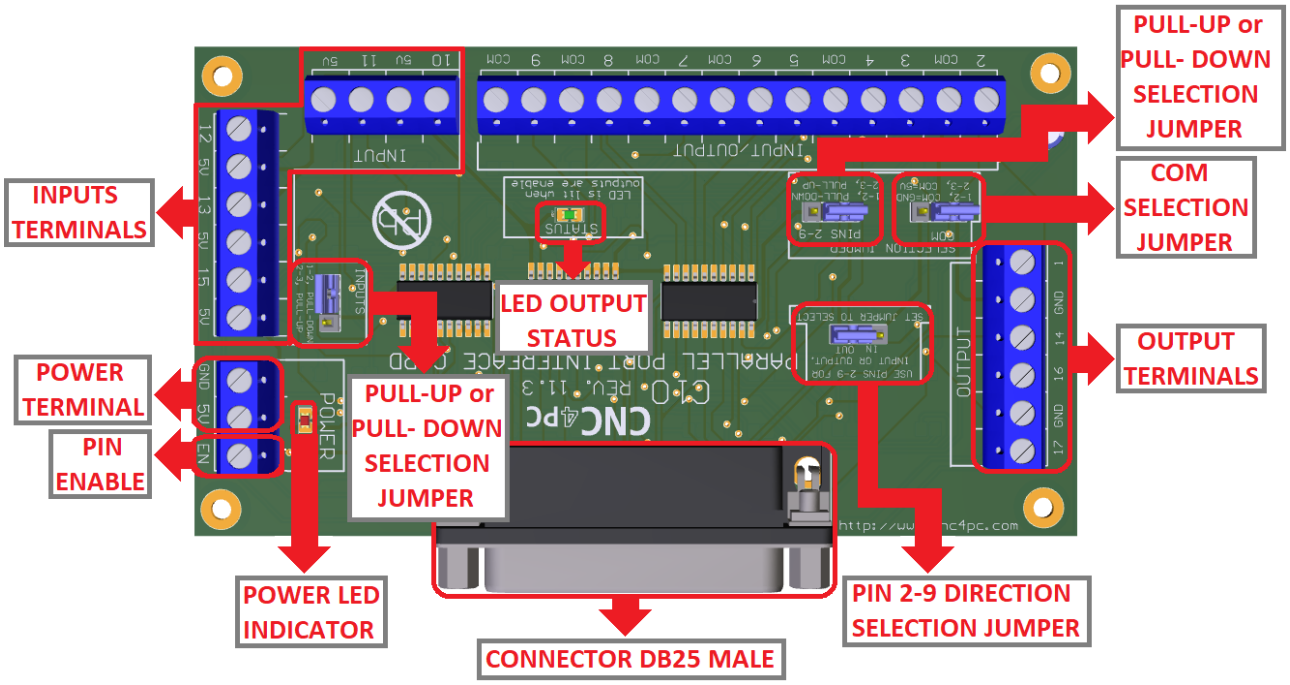
- **Input pins 10, 11, 12, 13, 15.**
- **Input and output pins with close by ground or +5vdc connections**
- **External Enable Pin (EN).**
- **Works directly with popular CNC hardware and software.**
- **All TTL 5VDC signals.**
- **Screw-On connections for all terminals.**
- **Status LEDs for enable.**

3.0 SPECIFICATIONS

DIGITAL INPUT SPECIFICATIONS	
On-state voltage range	2 to 5V DC
Maximum off-state voltage	0.8V
Maximum operation frequency	4 MHz
Typical signal delay	10nS

DIGITAL OUTPUT SPECIFICATIONS	
Maximum output voltage	(5V power supply voltage) + 0.5V
Typical output current	24mA
Maximum off-state voltage	0.44 V
Maximum operation frequency	4 MHz
Typical signal delay	10 nS
Time of transition to high impedance state	12 S*

4.0 BOARD DESCRIPTION



5.0 SPECIFICATIONS

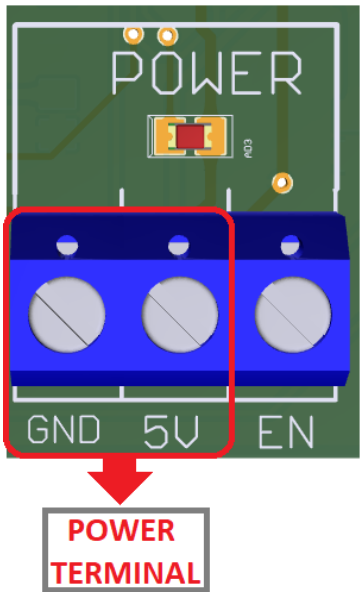
5.1 Power Requirements

Regulated +5VDC@ 500mA is required to power this board.

WARNING

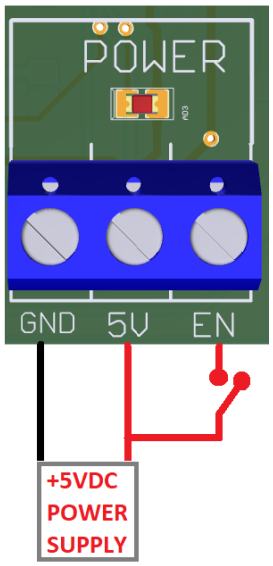
Check the polarity and voltage of the external power source and connect the 5VDC and GND. Overvoltage or reverse-polarity power applied to these terminals can cause damage to the board, and/or the power source.

6.0 POWER TERMINAL



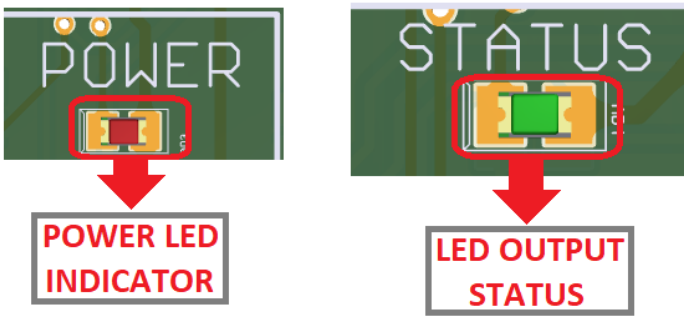
6.2 Enable pin.

The card must be provided with a 5VDC signal to enable operation. This feature has been added to externally control the status of the outputs. An external switch or a Safety Charge Pump can be added to provide the enabling signal. When the enable signal is not present, output signals sent high impedance state. If this function is not required, a jumper can be placed between +5vdc and the EN terminal. It has an internal 4.7kOhm pull-down resistor



7.0 LED INDICATOR

The **power LED** lights to indicate that the system is ready but disabled. When **Status LED,** (Green LED) lights, it indicates that the system is enabled.

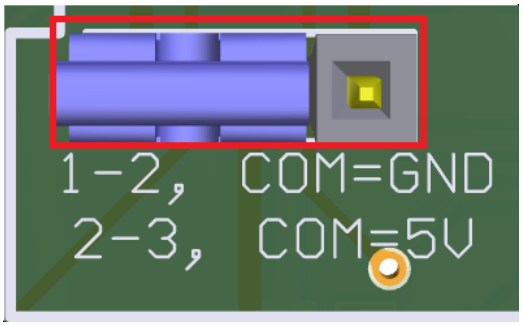


8.0 CONFIGURATION JUMPERS

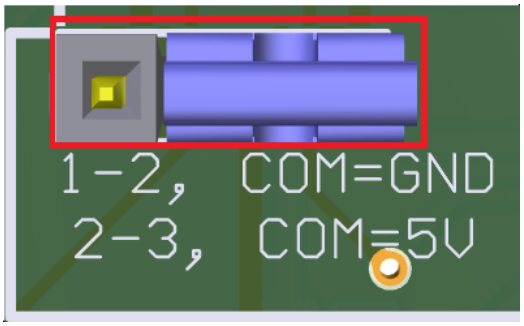
8.1 Using the COM configuration jumper

There is a jumper that allows you to select +5VDC or GND for the COM pins.

1-2: COM= GND



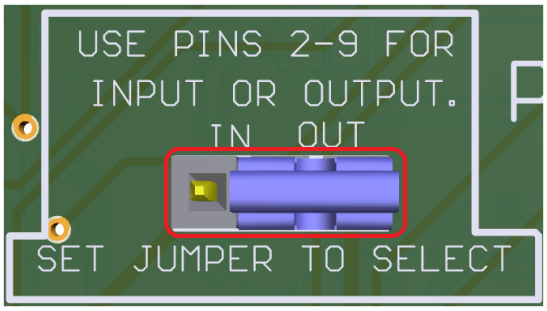
2-3: COM= +5VDC



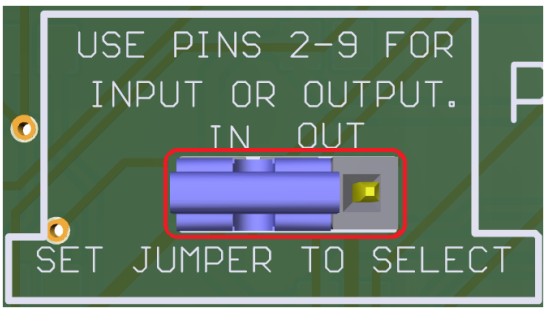
8.2 Using the Pins 2-9 direction jumper

There is a jumper to select the pins 2-9 direction.

1-2: OUTPUTS



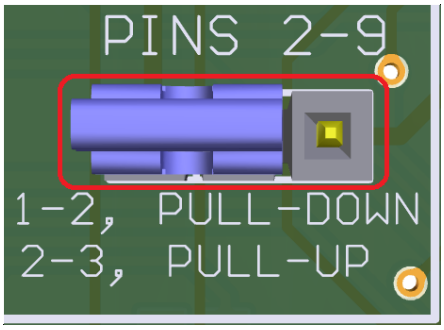
2-3: INPUTS



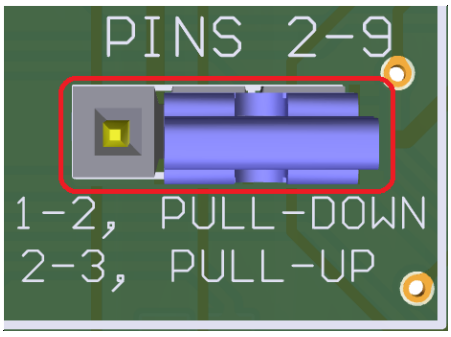
8.3 Using the Pull-up or Pull-down selection jumper for pins 2-9.

Jumper allows to change the input configuration for 2-9. Using the Pull-up or Pull-down selection jumper for pins 2-9 the input voltage is pulled through a 4.7Kohm resistor to up or down in this way:

1-2: PULL-DOWN



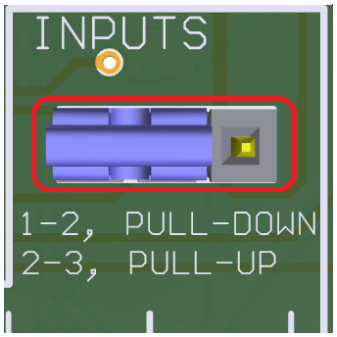
2-3: PULL-UP



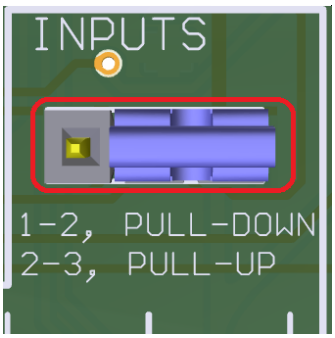
8.4 Using the Pull-up or Pull-down selection jumper for pins 10, 11, 12, 13 and 15.

Jumper allows to change the input configuration for pins 10, 11, 12, 13 and 15. Using the Pull-up or Pull-down selection jumpers for those pins will pull them up or down through a 4.7Kohm resistor:

1-2: PULL-DOWN



2-3: PULL-UP



9.0 FUNCTIONAL BLOCK DIAGRAMS

9.1 Bidirectional pins simplified block diagram

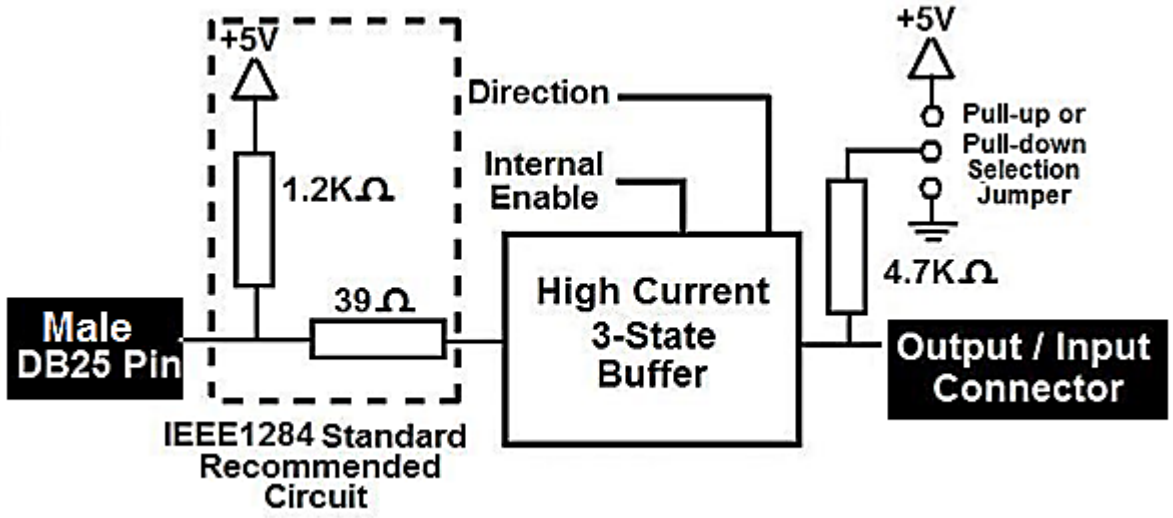


Fig. 1 Simplified functional block diagram for the 2-9 pins.

A Pull-up or Pull-down selection jumper allows selecting the configuration for the all bidirectional pins (2-9) when they are set as inputs.

9.2 Dedicated Inputs simplified block diagram

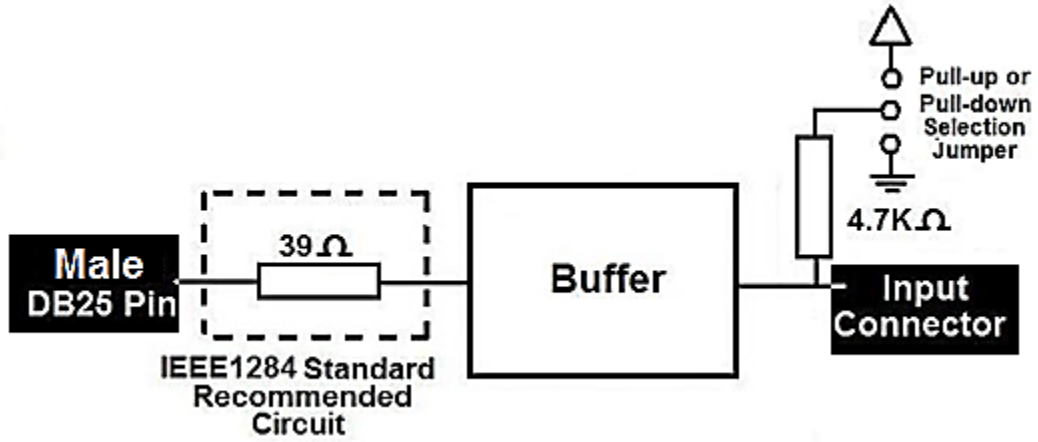


Fig. 2 Simplified functional block diagram for the inputs.

A Pull-up or Pull-down selection jumper allows selecting the configuration for the all dedicated inputs (pins 10, 11, 12, 13 and 15).

10.0 WIRING DIAGRAMS

While this board supports only TTL +5VDC signals, different kind of sensors, switches using different voltages can be connected using the diagrams that follow:

Note. This board has two possible inputs banks, (bidirectional pins: 2-9) and (dedicated inputs: pins 10, 11, 12, 13 and 15), and all the inputs of the same bank have the same configuration. The below wiring diagrams are an example, any input can be used for the connections.

Note. The bellow wiring diagrams require setting the inputs to use pull-down resistor.

10.1 Connecting Switches or push button.

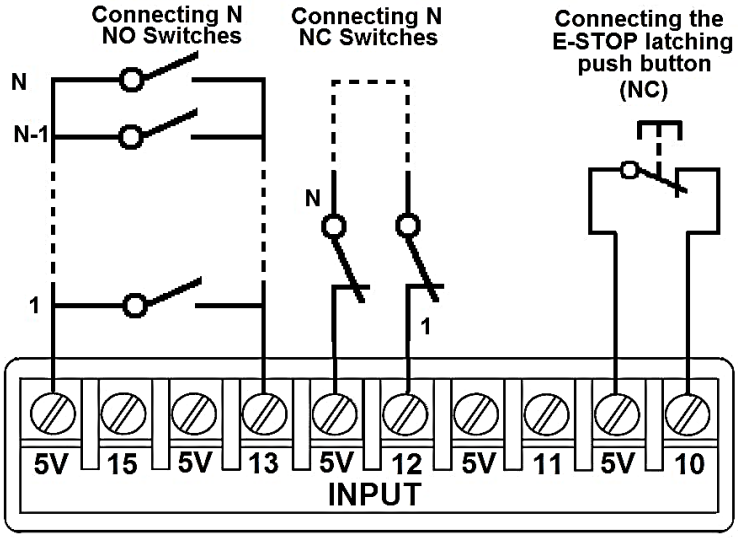


Fig. 3 Wiring diagram to connect switches.

10.2 Connecting NPN sensors.

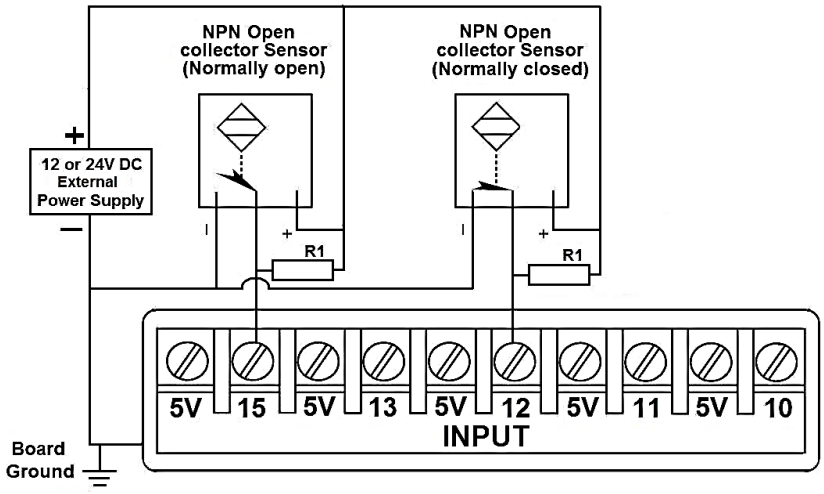


Fig. 4 Wiring diagram to connect NPN open collector proximity sensors.

10.3 Connecting in parallel NPN sensors.

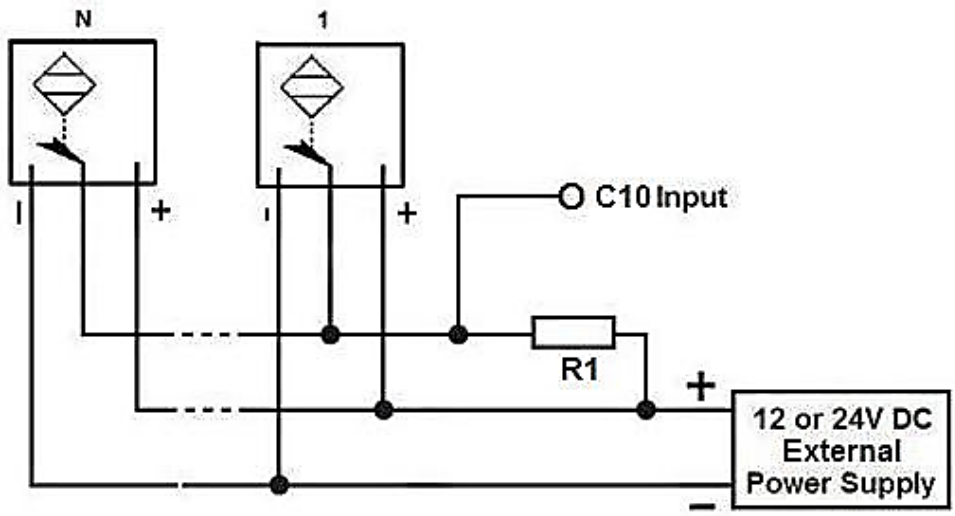


Fig. 5 Wiring diagram to connect in parallel NPN open collector proximity sensors.

Connecting NPN open collector proximity sensor with the C25	
R1 Value (12V)	**R1 Value (24V)**
Approx. 10KΩ	Approx. 25KΩ

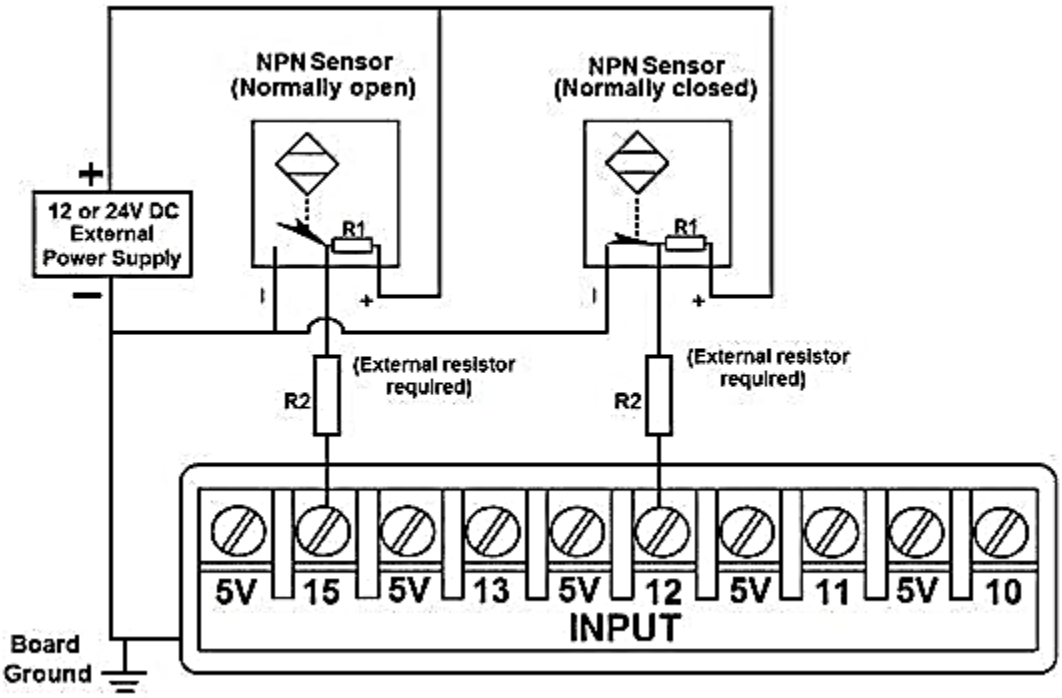


Fig. 6 Wiring diagram to connect NPN proximity sensors with internal pull up resistor.

Some NPN proximity sensors have an internal pull-up resistor (R1). It is necessary to know its value in order to safety connect the sensor with the BOB. Follow this recommendation:

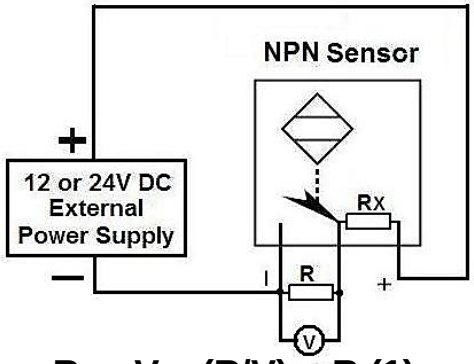
Connecting NPN open collector proximity sensor with the C25	
(R1+R2) Value (12V)	**(R1+R2) Value (24V)**
Approx. 10KΩ	Approx. 25KΩ

CALCULATING THE R1 VALUE

Note: Rx is the unknown resistor value.

Where:

V_{EX} is the external power supply voltage
V is the voltage across the R resistor



$$R_X = V_{EX}.(R/V) - R \quad (1)$$

A voltmeter is required to calculate the internal resistor value (Rx). Do the connections as are shown in the figure above and do the calculations using the equation (1).
Note. R value has to be known to do this operation. A 4.7KOhm@1/2W is recommended.

10.4 Connecting PNP sensors.

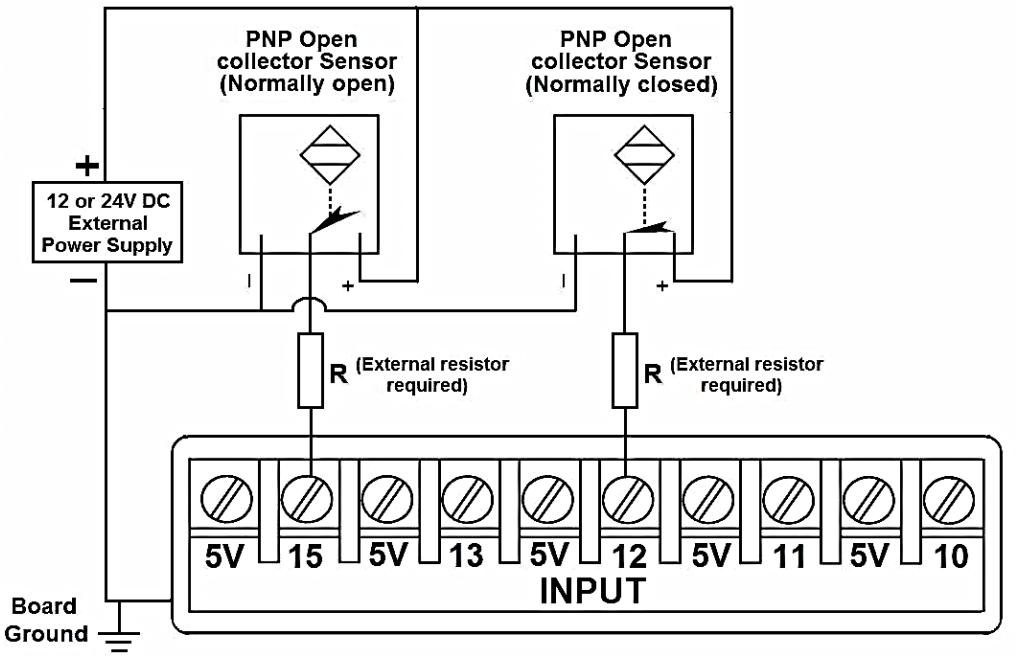
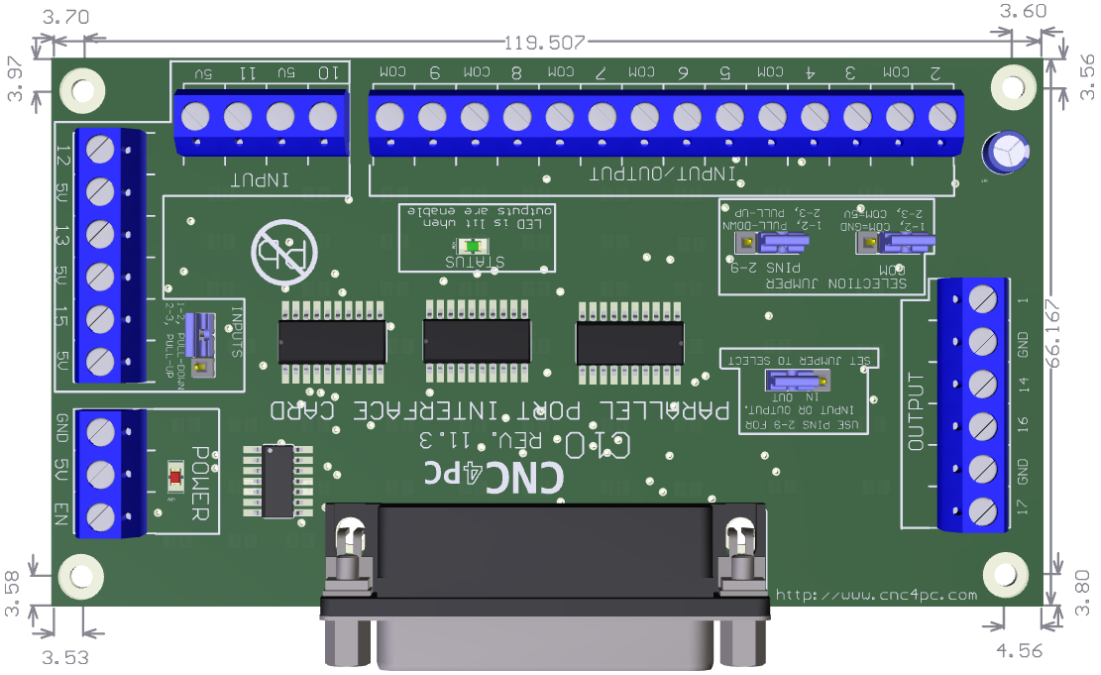


Fig. 7 Wiring diagram to connect PNP proximity sensors

Connecting PNP proximity sensor with the C25	
R Value (12V)	**R Value (24V)**
Approx. 10KΩ	Approx. 25KΩ

11.0 DIMENSIONS



All dimensions are in Millimeters.
Fixing holes (2.8mm).

DISCLAIMER

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