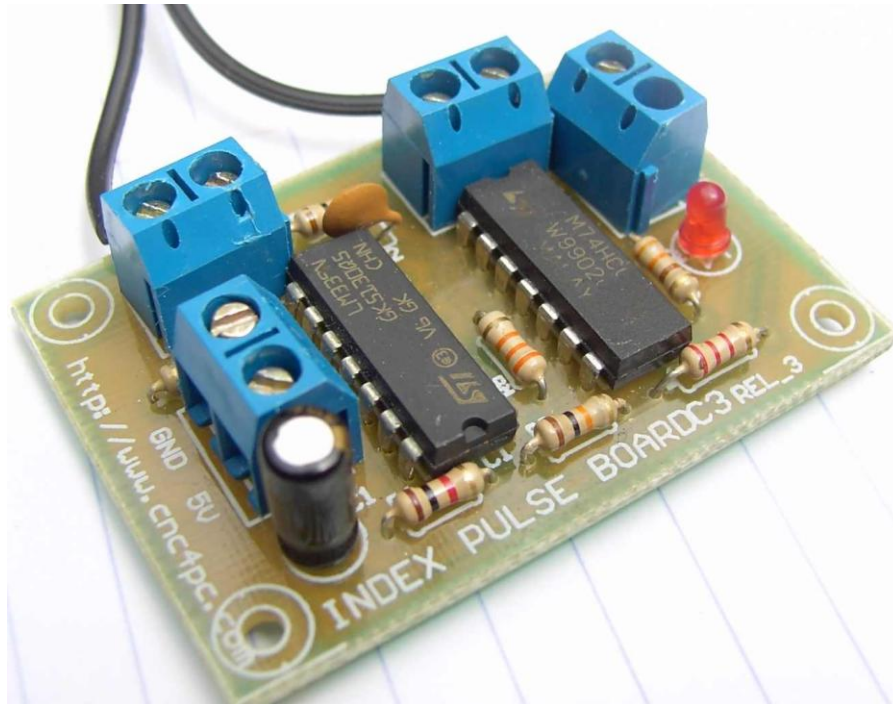


**C3 – INDEX PULSE BOARD  
Rev. 6.1**



DECEMBER 2014

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# USER'S MANUAL

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## 1.0 OVERVIEW

This card provides easy way of capturing the pulse signal from photo-transistor and transmitting it to the parallel port.

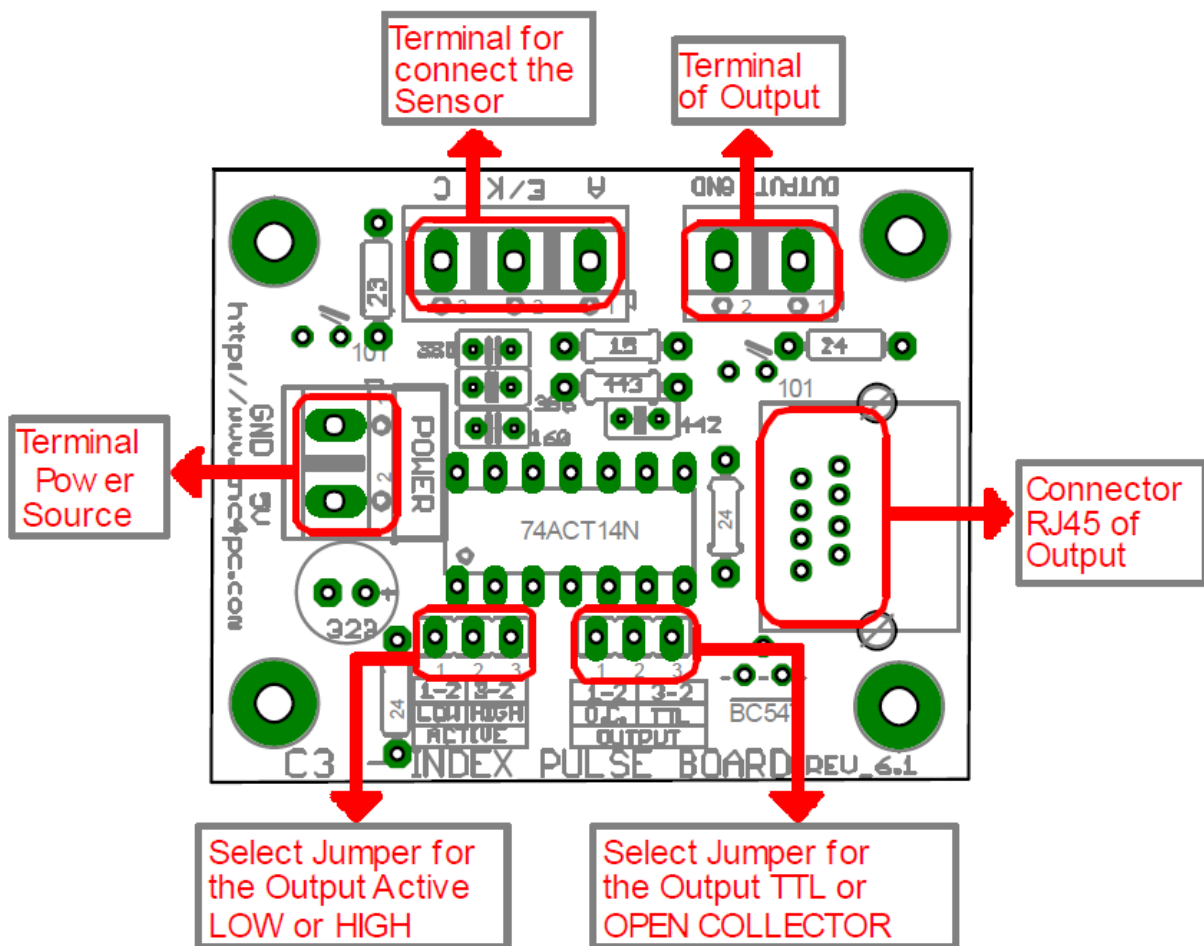
## 2.0 FEATURES

- Reads an index pulse from the spindle.
- Acts as an optical switch for accurate homing.
- TTL or Open collector output signal.
- Active low or Active high output signal.
- Comes with a Built-in LED that shows the status of the output pin at all times.
- Comes with 6' pre-wired shielded cable.
- **Easy connections.** Just put the Photo-Transistor in place, connect the board to the power supply, and attach the signal output to an input pin from the parallel port.
- **Screw-On connections for all terminals.** You only have to screw-on the wires to make all your connections.
- **Comes with an RJ45 Connector fast installation** With this connector you just have to plug in a standard RJ45 cable and will not require further wiring. For more info go to: <http://cnc4pc.com/RJ45.htm>

### 3.0 SPECIFICATIONS

Max Frequency	15Khz.
Maximum output voltage (TTL Output)	(5V power supply voltage) + 0.5V
Maximum supported output voltage (Open Collector Output)	30V
Maximum off-state voltage	0.44 V

### 4.0 BOARD DESCRIPTION



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## 5.0 USES

- Threading on a Lath.
- Configure a tachometer on your software. When it is used as a tachometer, you must provide a disk with perforations on the side to provide the reading for the phototransistor.
- Use per-rev speed feeds, instead of per-min
- Using it as an optical limit or homing switch. You can place the phototransistor at the end of travel of an axis to use it as a limit or homing switch.

## 6.0 INSTALLATION

Please read your software's manual for configuring your setup. Keep in mind that with Mach you can use more than one pulse per revolution for increased accuracy. If you are using Mach, might have to adjust your debounce settings to obtain accurate readings.

### 6.1 Requirements

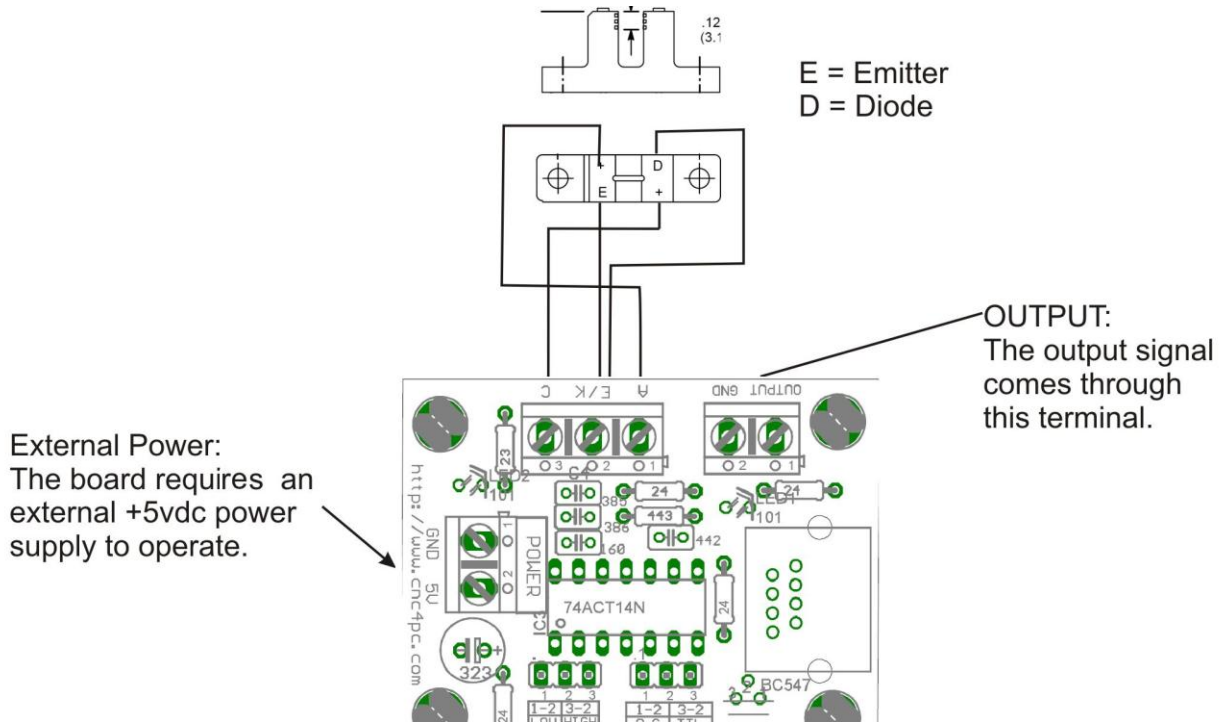
It requires a +5VDC@200mA or power supply to operate



**WARNING:** Check the polarity and voltage of the external power source and connect the 5V and GND. Overvoltage or reverse polarity power applied to the Power Terminals can cause damage to the board, and/or the power source

## 6.2 Wiring

Please note the wiring diagram bellow.



In many cases the photo-transistor provided would not be suitable for your application. In most cases it could be replaced for other photo transistors. For example, you can use a reflective photo-transistor, and placing a piece of tape on the spindle.

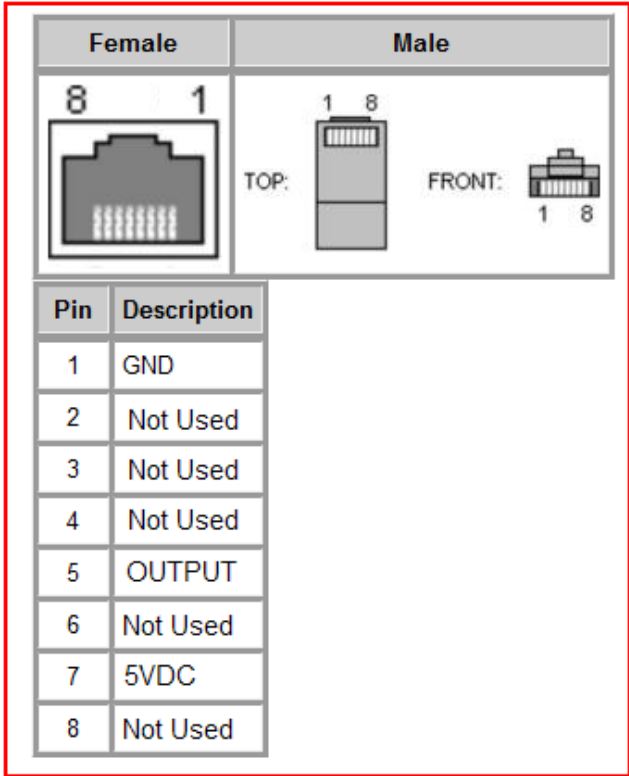
## 6.3 RJ45 Connector

The RJ45 connector is for connecting the boards directly using a RJ45 connector with standard network cable. A standard network cable has straight through wiring. That means that Pin1 = Pin1, etc...

This Connector is been provided in many of our boards and soon we will have breakout boards that will come with this connectors. This is to ease the installation process by eliminating the screw on terminals. The RJ45 connectors are used not just to carry the I/O signals, but also to power the external board. That way you will have it all in one connection.

The main I/O is carried in pin5 of the RJ45 connector.

The type of connection is +5VDC, just as the signal coming out of the terminal.



## 6.4 Tuning

Test the card by connecting the photo-transistor, the power supply, and a LED in the output pins. The LED indicates the output signal status.

**Note:** Open collector output requires an external pull-up resistor to generate a High.

## 7.0 BLOCK DIAGRAM

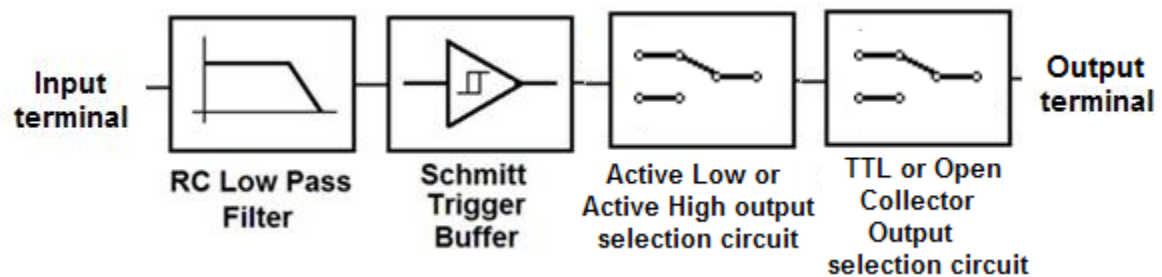
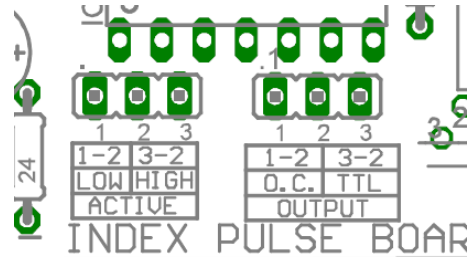


Fig. 2 C3 Block Diagram

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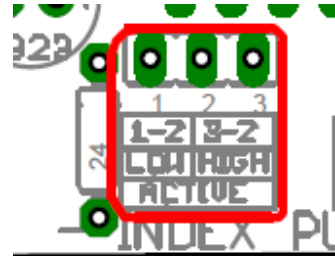
## 8.0 CONFIGURATION JUMPERS

This board includes two configuration jumpers in order to select the C3 output features.



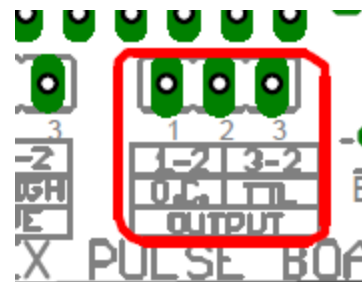
### 8.1 Active low or active high output

- 1-2: Active Low Output
- 2-3: Active High Output



### 8.2 Open Collector (OC) or TTL output

- 1-2: Open Collector Output
- 2-3: TTL Output



**Note:** Open collector output allows generate higher voltage output signal. An external pull-up resistor is required.



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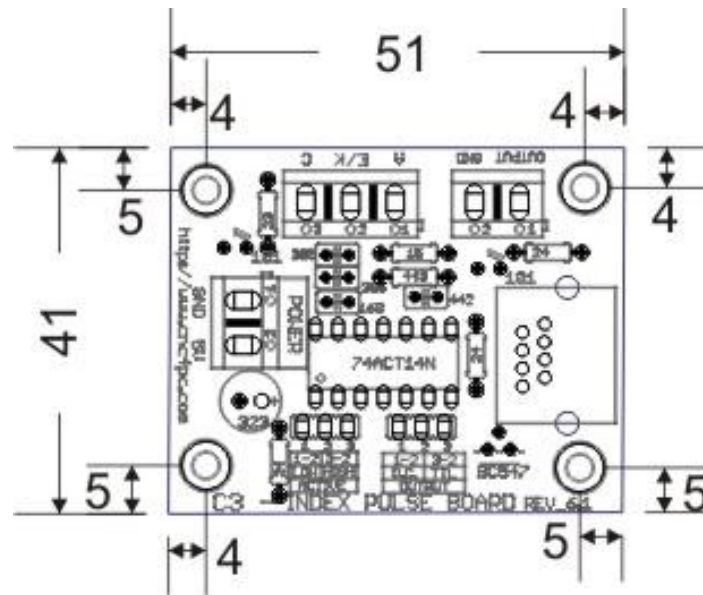
## 9.0 TROUBLESHOOTING

**SYMPTOM:** THE PC DOES NOT REACT TO THE SIGNAL.

POSSIBLE CAUSE	POSSIBLE SOLUTIONS
<ul style="list-style-type: none"><li>- <b>Pin conflict or mach3 configuration.</b> It is possible that the port address used for the pin is not right, or that there is a pin conflict with the. That is that you are using that same pin twice. (it could be assigned to a different function).</li></ul>	<ul style="list-style-type: none"><li>- Go to the device manager in windows, and check the memory address used for the parallel port you are using. Usually it will be 378 for LPT1. Check also that the port does not have a conflict. Then in mach3, go to Ports &amp; Pins / Port Setup and Axis Selection. Check the memory address is correct.</li><li>- Check that the pin you are using is not been used anywhere else in your setup. Got to motor output and output signals, and check all the entries.</li></ul>
<ul style="list-style-type: none"><li>- <b>The board does not like the waveform it is getting.</b> Some breakout boards could invert the signals or modify the pulse width. Changing the active low status of the pin used also inverts the waveform.</li></ul>	<ul style="list-style-type: none"><li>- Play with the active low status of the pin used for the frequency.</li></ul>

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## 10.0 DIMENSIONS



All dimensions are in Millimeters.

### DISCLAIMER

Use caution. CNC machines can be dangerous machines. Neither DUNCAN USA, LLC nor Arturo Duncan are liable for any accidents resulting from the improper use of these devices. This board is not a fail-safe device and it should not be used in life support systems or in other devices where its failure or possible erratic operation could cause property damage, bodily injury or loss of life.