

# **OPTO-8-DC**

## **Peripheral Board**

## **Technical Manual**

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OPTO-8-DC Peripheral Board Technical Manual. No part of this work may be reproduced in any manner without written permission of BiPOM Electronics.

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#### WARRANTY:

BiPOM Electronics warrants OPTO-8-DC for a period of 2 years. If the board becomes defective during this period, BiPOM will at its option, replace or repair the board. This warranty is voided if the product is subjected to physical abuse or operated outside stated electrical limits. BiPOM Electronics will not be responsible for damage to any external devices connected to OPTO-8-DC. BiPOM Electronics disclaims all warranties express or implied warranties of merchantability and fitness for a particular purpose. In no event shall BiPOM Electronics be liable for any indirect, special, incidental or consequential damages in connection with or arising from the use of this product. BiPOM Electronics' liability is limited to the purchase price of this product.

## Overview

OPTO-8-DC is an eight-channel opto-isolated input peripheral board for the MINI-MAX series of micro-controller systems. Input channels are configured as Dry Contact ( hence the –DC suffix in product name ).

OPTO-8-DC is powered from 5 Volts DC through the 20-pin expansion connector.

Software examples for OPTO-8-DC peripheral board are available from [www.bipom.com](http://www.bipom.com)

## Specifications

- 8 channels of LTV-846 Optocouplers with 10 KHz frequency response.
- Terminal blocks for Optocoupler inputs
- Maximum reverse voltage on Optocoupler inputs: 6 VDC
- 20-pin Expansion connector for a host [micro-controller board](#)
- Single operating voltage for logic: 5 VDC
- Optocoupler input side voltage jumper selectable as 5VDC or 3.3 to 30VDC external supply
- Up to 8 OPTO-8-DC boards are stackable for a total of 64 opto-isolated Dry Contact inputs.
- Dimensions are 2.35 X 2.40 inches (5.97 X 6.10 centimeters).
- Mounting holes of 0.138 inches (3.5 millimeters) are on four corners.
- -40° - +85° C operating and storage temperature range.

## Functional Blocks

Figure 1 shows the block diagram of the OPTO-8-DC system:

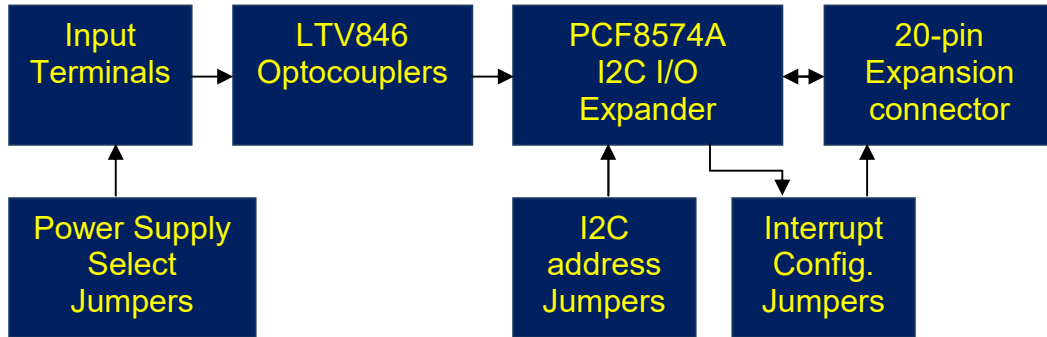


Figure 1

### Expansion connector

The interface signals and 5 Volt power supply pins are available on the 20-pin connector (X19) for interfacing to micro-controller boards. OPTO-8-DC can be connected to a micro-controller board either as a piggyback daughter-board using standoffs or can be placed away from the micro-controller board using a 20-wire ribbon cable ( Part #: [CBL-EXP-6](#) ). Table 1 shows the pin assignments for the connector J1:

**Connector J1**

Signal	Pin	Pin	Signal
P3.0	20	19	P3.1
P3.2	18	17	P3.3
P3.4	16	15	P3.5
P3.6	14	13	P3.7
P1.0	12	11	P1.1
P1.2	10	9	P1.3
P1.4	8	7	P1.5
P1.6	6	5	P1.7
NOT USED	4	3	GND
VCC (+5V)	2	1	NOT USED

Table 1

## Input Terminals

Table 2 shows the pin assignments for the input terminals:

**Input Port Terminals X11 ... X18**

Name	Signal	Pin
<b>I1</b>	Input I1 (+Vx1)	X11-1
<b>G1</b>	Input G1 (-Vx1)	X11-2
<b>I2</b>	Input I2 (+Vx2)	X12-1
<b>G2</b>	Input G2 (-Vx2)	X12-2
<b>I3</b>	Input I3 (+Vx3)	X13-1
<b>G3</b>	Input G3 (-Vx3)	X13-2
<b>I4</b>	Input I4 (+Vx4)	X14-1
<b>G4</b>	Input G4 (-Vx4)	X14-2
<b>I5</b>	Input I5 (+Vx5)	X15-1
<b>G5</b>	Input G5 (-Vx5)	X15-2
<b>I6</b>	Input I6 (+Vx6)	X16-1
<b>G6</b>	Input G6 (-Vx6)	X16-2
<b>I7</b>	Input I7 (+Vx7)	X17-1
<b>G7</b>	Input G7 (-Vx7)	X17-2
<b>I8</b>	Input I8 (+Vx8)	X18-1
<b>G8</b>	Input G8 (-Vx8)	X18-2

Table 2

## Configuration Jumpers

Table 3 shows the signal connections for the jumpers:

Jumper	If installed
<b>X1</b>	Connects Common Ground to optocouplers input Ground
<b>X2</b>	Connects common VCC to optocouplers input VCC
<b>X3, X4, X5</b>	I2C address, see Table 5.
<b>X6</b>	Interrupt configured for MINI-MAX/ARM boards
<b>X7</b>	Interrupt configured for MINI-MAX/AVR boards
<b>X8</b>	Interrupt configured for MINI-MAX/51 boards

Table 3

## Application Notes

OPTO8-DC board can either be stacked on top of a MINI-MAX board using stand-offs or connected in a chain configuration using flat ribbon cable. Figure 2 shows how OPTO8-DC can be connected to a microcontroller board in a stacked fashion. Figure 3 shows chain connection (without using cable for additional 10-pin connector J2).

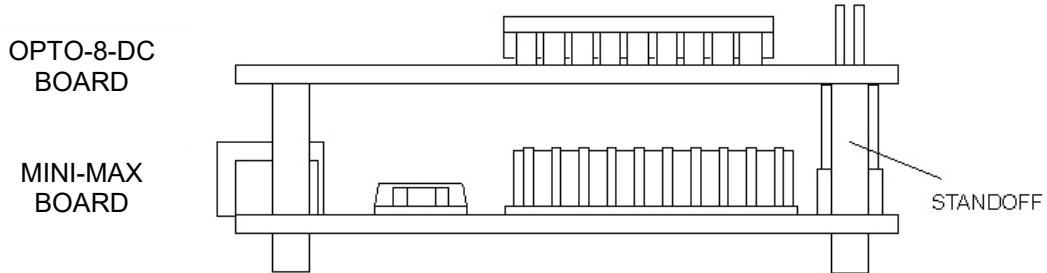


Figure 2

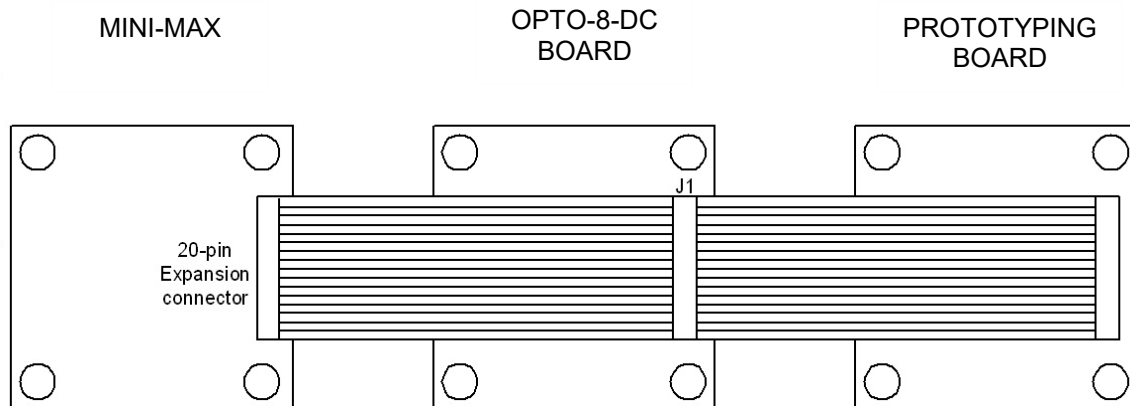


Figure 3

More details on BiPOM Peripheral boards are available from the link below:

[http://www.bipom.com/periph\\_cat/us/44/0.html](http://www.bipom.com/periph_cat/us/44/0.html)

8051/52, BASCOM51 and SDCC (Small Device C Compiler) development systems provide examples for OPTO8-DC.

Please download any of these development systems from:

<http://www.bipom.com/software.php>

## Setting I2C address

Table 4 shows how to set I2C address, using jumpers X3, X4, X5.

Board Number in stack	X3 Installed	X4 Installed	X5 Installed	I2C Address Write	I2C Address Read
1	Yes	Yes	Yes	70h	71h
2	No	Yes	Yes	72h	73h
3	Yes	No	Yes	74h	75h
4	No	No	Yes	76h	77h
5	Yes	Yes	No	78h	79h
6	No	Yes	No	7Ah	7Bh
7	Yes	No	No	7Ch	7Dh
8	No	No	No	7Eh	7Fh

Table 4

## Powering optocoupler inputs

Optocoupler inputs can be powered either from internal +5VDC (VCC), or external 3.3-30VDC power supply.

To power optocoupler inputs from internal +5VDC, install jumpers X1 and X2.

To power optocoupler inputs from external 3.3-30VDC power supply, remove jumpers X1 and X2, and connect external power supply to terminal block X9, as it shown on Figure 4.

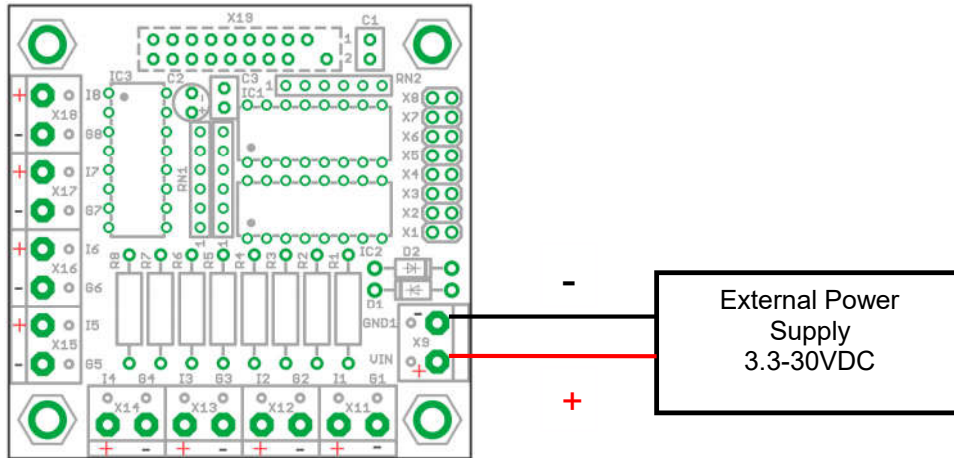


Figure 4

Figure 5 shows a typical dry contact connection. Connecting the + input to – input activates the dry contact.

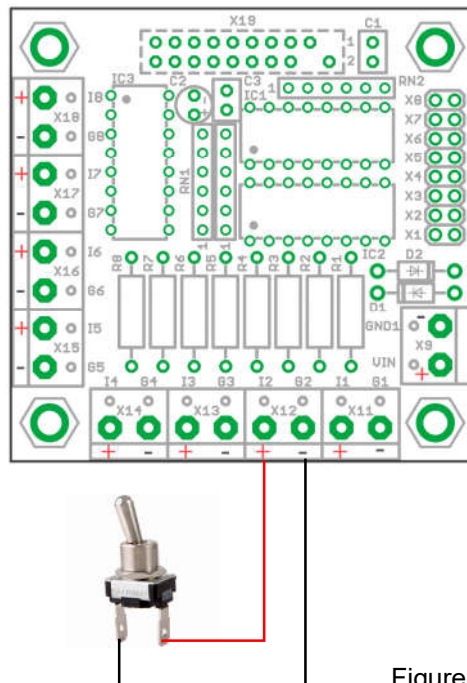
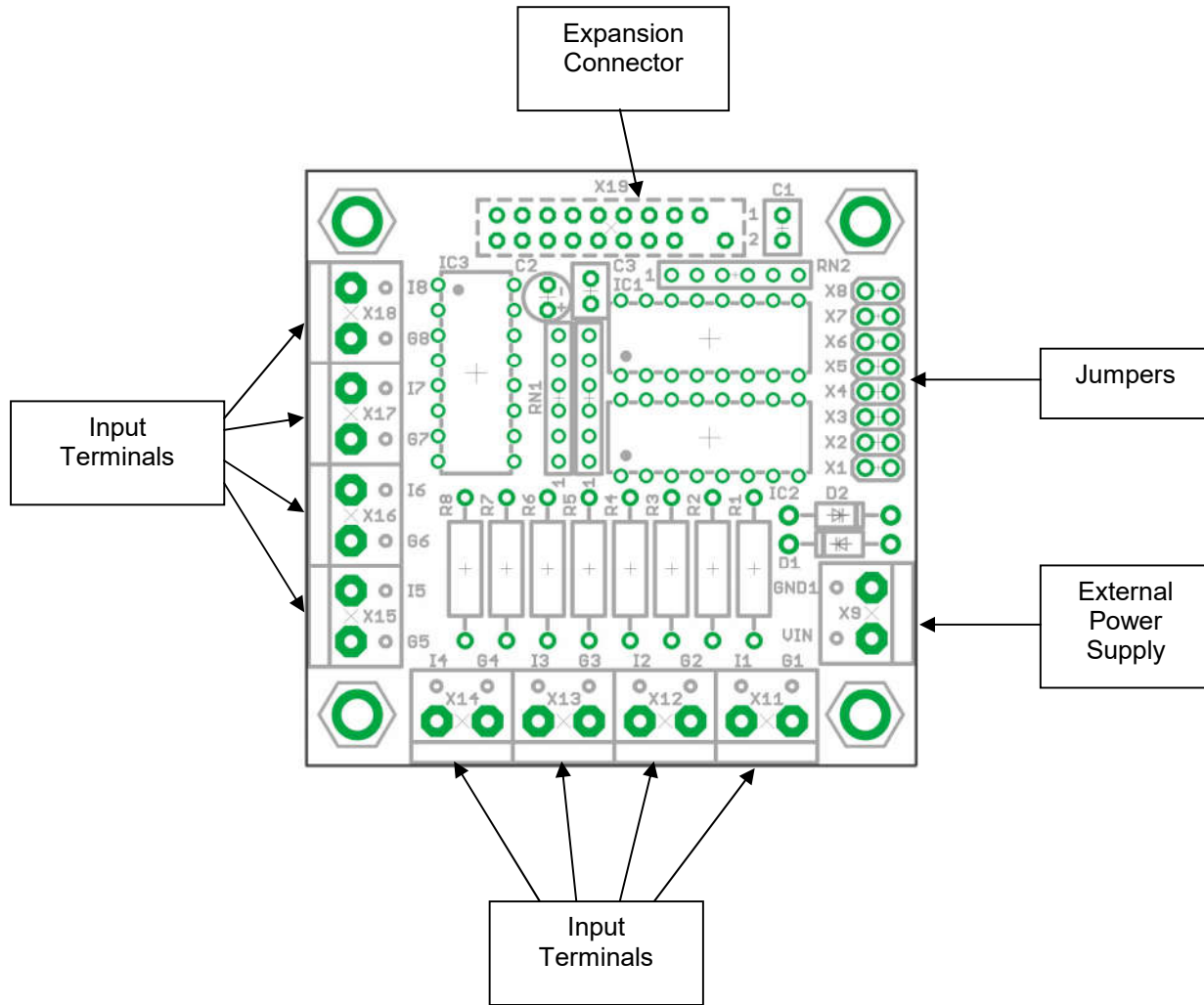


Figure 5



## 7. Board Layout

Layout of OPTO-8-DC board is shown below:



# 8. Schematics

