

Tode-IOSTB.24B7

Hardware Development

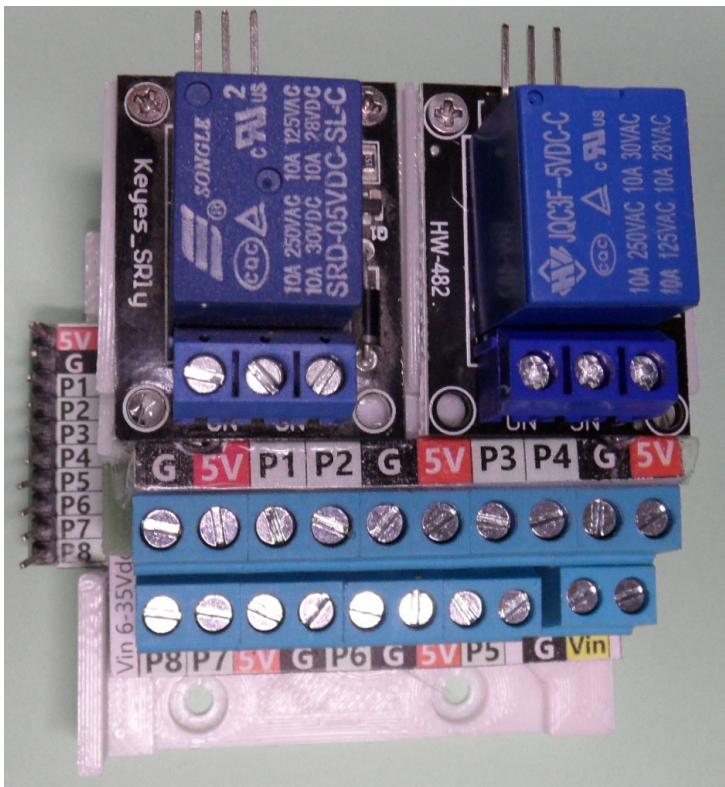
IO Screw Terminal Block

by TGit-Tech [<http://www.TGit-Tech.com>] Last Updated: 2024-11-07

Compatible with Tode-RCs - Models: BD241S

Fitted for Outdoor Box Enclosure with 5mm Mount Plate.

This guide covers everything needed to build the IO Screw Terminal Block.



1. Table of Contents

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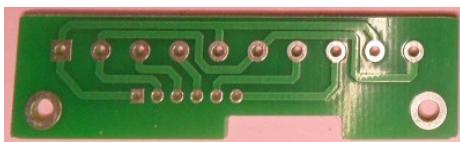
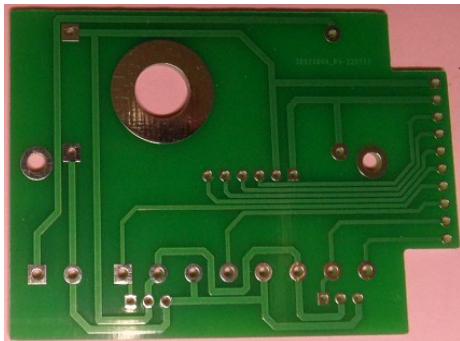
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TOTAL Screw-Terminals with Outdoor Enclosure: \$32.04

2. Screw Terminal Block

2.1 Bill of Materials (BOM) \$5.84

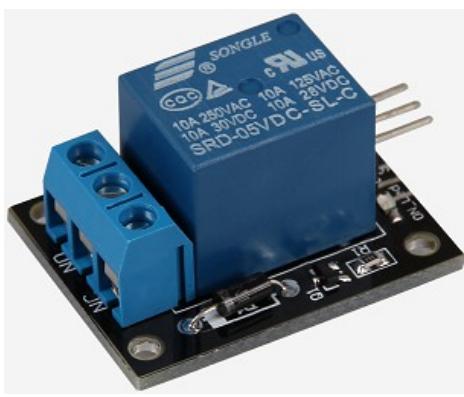
2.1.1 Parts \$1.66



- (1) Bottom PCB
 - Design Software: Kicad
 - Folder: [\Tode-IO\Side-IO 3D-Printed Box\kicad\SIOST-BOTTOM\SIOST](#)
 - Manufacturer: [jlpcb.com](#)
 - Batch Price: \$33.96 per 100
 - Pricing: \$0.34/ea

- Top PCB
 - Design Software: Kicad
 - Folder: [\Tode-IO-Options\Side-IO 3D-Printed Box\kicad\SIOST-TOP\SIOST](#)
 - Manufacturer: [jlpcb.com](#)
 - Batch Price: \$10.11 per 50
 - Pricing: \$0.20/ea

- LM2596 DC-DC Step Down Buck Power Supply Module
 - Power In: 3Vdc to 35Vdc
 - Power Out: 1.5Vdc to 35Vdc (adjustable)
 - Load Amps: 2A to 3A (10W)
 - Dimensions: 44mm x 22mm x 12mm (high)
 - Temp Range: -40C to 85C
 - Pricing: \$1.16/each
 - Listing: <https://www.aliexpress.us/item/2251832482015567.html>

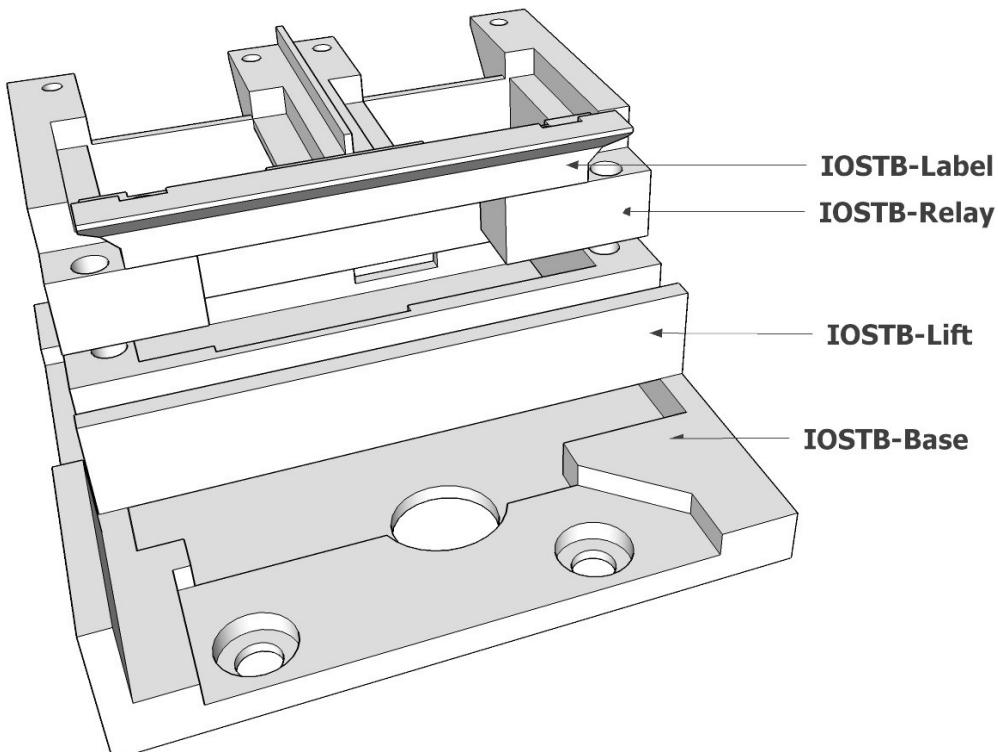


- (2) KY-019 5V 1-Channel Relay Module Board
 - Pricing:\$0.82/ea = \$1.64
 - Listing:
<https://www.aliexpress.us/item/3256807535744117.html>

2.1.2 Supplies \$3.18

	<p>(1) 1x10P Male Pin Header Dupont 2.54mm-Pitch For IOSTB to BIOBB wiring @\$0.10/ea = \$0.10</p>		<p>(1/2-Sheet) Adhesive Shipping Label @\$0.04/sheet = \$0.02</p> <p>2-Inch Clear Packing Tape Weatherproof Label</p>
	<p>(9) CUI 1x2P Screw Terminals 5.08mm Pitch @\$0.30/ea = \$2.70</p>		<p>(2) #2 x 3/8" Phillips-Flat Screw for IOSTB-BlockLabel \$0.04/ea = \$0.04</p>
	<p>(2) #4 x 1" Phillips-Pan Screws for IOSTB-Lift & Base \$0.08/ea = \$0.16</p>		<p>(4) #2 x 1/4" Phillips-Flat Screw for IOSTB Relays \$0.04/ea = \$0.16</p>

2.1.3 3D-Prints \$1.00

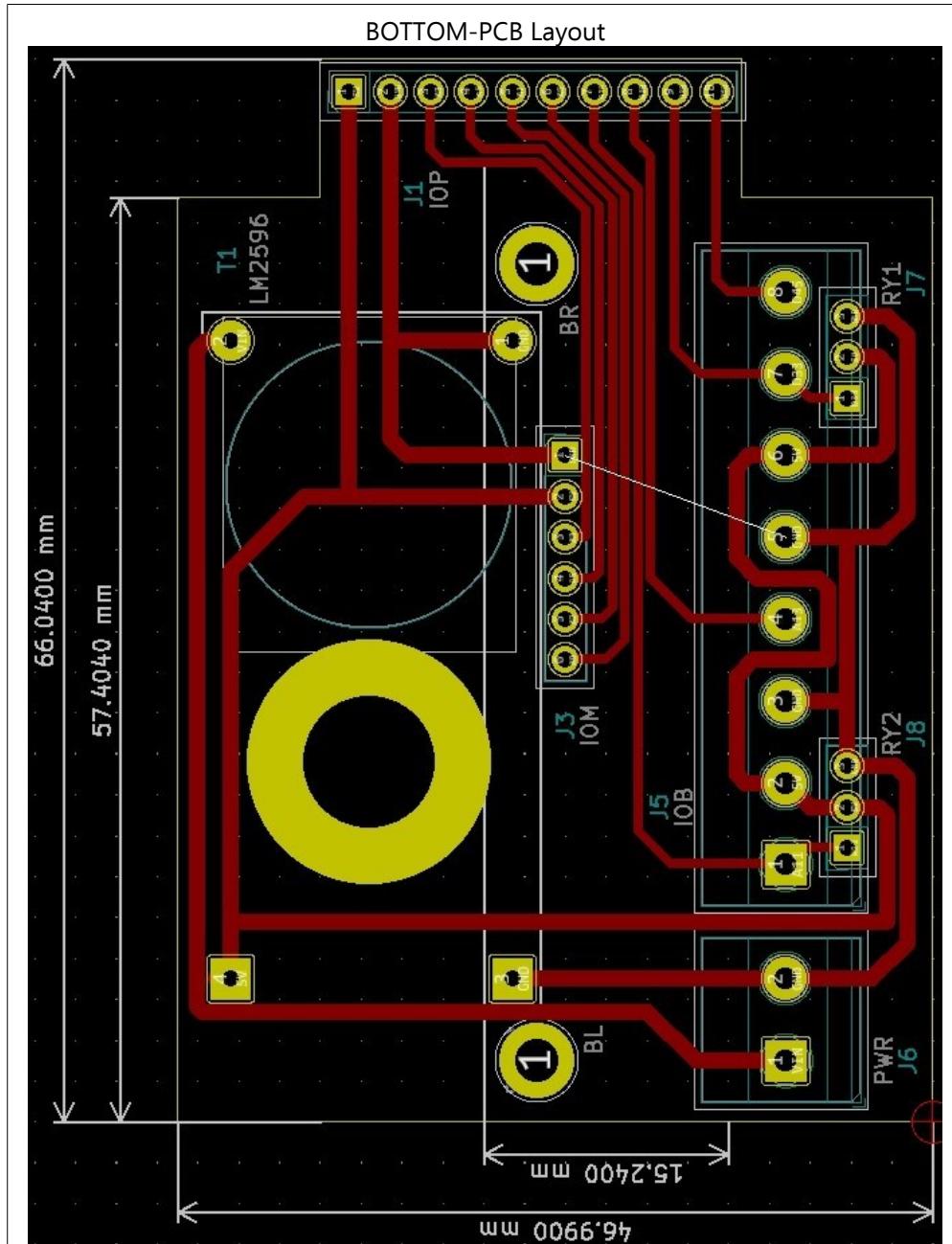


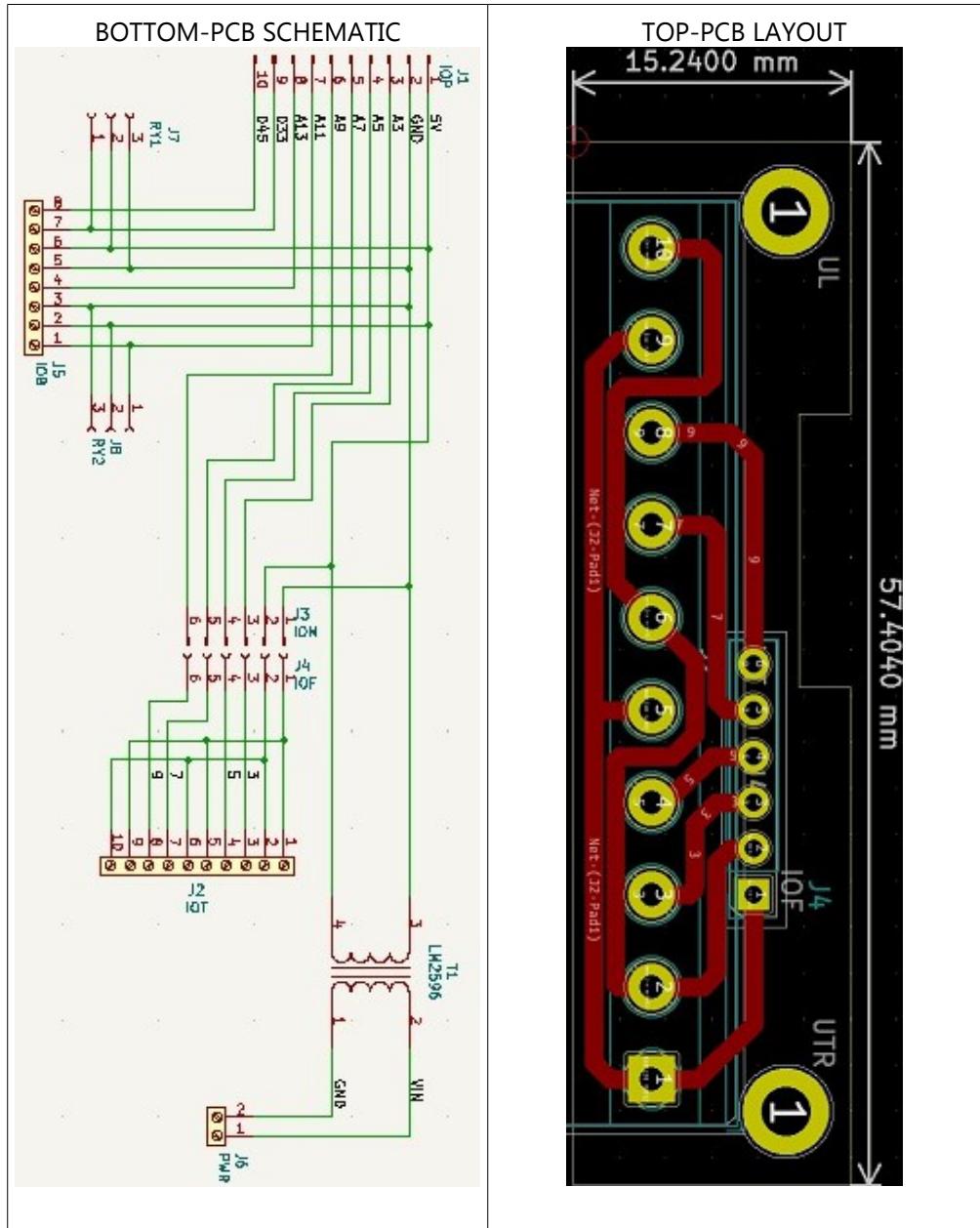
- ✓ 3D Print the Following Files in Folder /3DPrints/stl
- Priced @ \$20/per 1KG Roll

QTY	File Name	Grams	Cost \$0.02/g	Time HH:MM	Power & Use \$0.01/hr	Total Cost
1	IOSTB-Base.stl	60-grams	\$1.14	10h:59m	\$0.04	\$1.25
1	IOSTB-Lift.stl	5-grams	\$0.10	00h:54m	\$0.01	\$0.12
1	IOSTB-Relay.stl *(Supports Required)	4-grams	\$0.08	00h:40m	\$0.01	\$0.10
1	IOSTB-Label.stl	8-grams	\$0.12	01h:21m	\$0.01	\$0.14

	IOSTB-Label.stl Folder: ./Tode-IO/Tode-IOSTB/3DPrints/stl Layer Height: 0.2mm Infill Density: 100% Supports: OFF Plastic: 24-grams @ \$0.02/g = \$0.48 Printer-use: @ \$0.0015/g = \$0.036 Power: 3h 02m @ \$0.01/hr = \$0.03 TOTAL COST: \$0.546
	IOSTB-Relay.stl Folder: ./Tode-IO-Options/Side-IO Commercial Box/3DPrints/stl Layer Height: 0.2mm Infill Density: 100% Supports: OFF Plastic: 19-grams @ \$0.02/g = \$0.38 Printer-use: @ \$0.0015/g = \$0.0285 Power: 2h 52m @ \$0.01/hr = \$0.03 TOTAL COST: \$0.4385
	SIOST-Standoff-Label.stl Folder: ./Tode-IO-Options/Side-IO Commercial Box/3DPrints/stl Layer Height: 0.2mm Infill Density: 100% Supports: OFF Plastic: 1-grams @ \$0.02/g = \$0.02 Printer-use: @ \$0.0015/g = \$0.0015 Power: 0h 09m @ \$0.01/hr = \$0.00 TOTAL COST: \$0.0215

2.2 Diagram

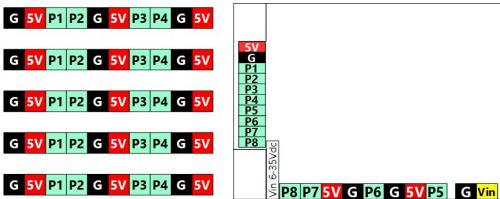




2.3 PCB Assembly

2.3.1 Print Labels

1. Use half-page shipping labels and color.
2. File: /docs/Tode-IOSTB Stickers.pdf



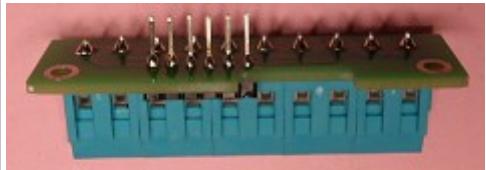
2.3.2 Bottom PCB

1. Cut & Stick boxed Label to PCB.
2. Solder on (4) CUI screw terminals
3. Solder on (10) Right Angle Pin Header
4. Solder on Power Supply



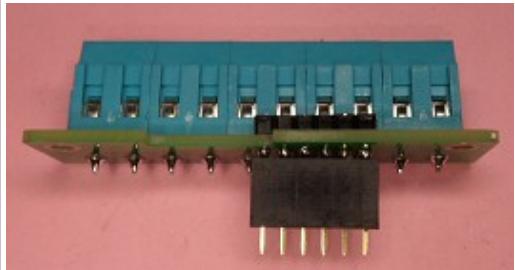
2.3.3 Top PCB

5. Install 1x6P Header; push pins down flat with top-side and solder from back-side.
6. Solder on (5) CUI Screw Terminals.



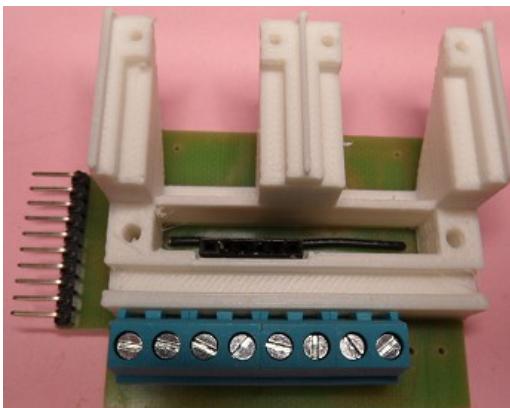
2.3.4 LED

7. Attach 1x6P Socket to Pins



2.3.5

8. Put Standoff in place
9. Put Top PCB on Standoff with 1x6P Socket aligned with Bottom-PCB holes.



2.3.6

10. Solder the 1x6P Socket to Bottom-PCB.



2.4 Casing Assembly

2.4.1 Terminal Block

11. Plug the Top PCB over the Standoff.
12. Using **(2) #4 x 3/4" Phillips-pan** screw fasten Top PCB to SIOST-1W 3DPrint.



2.4.2 Relays

13. Place (2) Relay Modules onto Standoff and fasten them using **(4) #2 x 1/4" Phillips-Flat** Screws.

2.4.3 Labels

14. Print Label
15. Stick Label to Labels 3DPrint using 2-Inch Packing
Tape wrapped all the way around.
16. Use Scissors to cut-off excess tape.
17. Screw Label above the Relays



3. Outdoor Enclosure

3.1 Bill of Materials (BOM) \$26.20

3.1.1 Parts \$26.20



- Commercial Box
- Manufacturer: Joinfworld
- Retail Dimensions: 6x6x4
- Cover: Clear
- Outside Dimensions: 5.9 x 5.9 x 3.9
- Inside Dimensions:
- Link <https://www.amazon.com/Joinfworld-Outdoor-Electrical-Box/dp/B0CHHJ49QN?th=1>
- \$19.99/ea = \$19.99



- SMA Extension Cable
 - Female SMA Right Angle
 - Male SMA Straight
 - 5-Meters Long
 - \$6.21/ea = \$6.21