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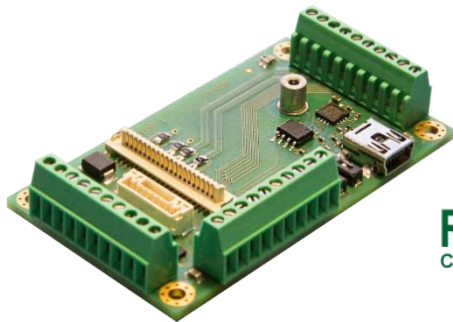


LASER LAB SOURCE
marketplace for **Scientists & Engineers**

contact@LaserLabSource.com

800.887.5065

Evaluation Board for TEC Controller



RoHS
COMPLIANT

Features

Input Characteristics:

- DC Input Voltage: 5 to 12 V

Main Features:

- USB connector to interface the TEC-1092
- Interface for TEC-1092
- ESD protection
- Screw connectors

Special Requirements / More Information:

- Please contact us for additional information or customization.

General Description:

The EVL-1093 is an evaluation board for the TEC-1092 TEC Controller and provides easy connectivity for it.

The TEC-1092 is not included with the EVL-1093.

It has exactly the same size and pinout as the TEC-1091. (Except the additional connector X5)

Please refer to the datasheet of the TEC-1092 (document 5208) for more information.

Absolute Maximum Ratings

| | |
|---------------------|------|
| Supply voltage (DC) | 20 V |
|---------------------|------|

Operating Ratings

| | |
|-------------|-------------------------|
| Temperature | -40 – 90°C |
| Humidity | 5 – 95%, non-condensing |

Electrical Characteristics

Unless otherwise noted: $T_A = 25\text{ °C}$, $V_{IN} = 12\text{ V}$

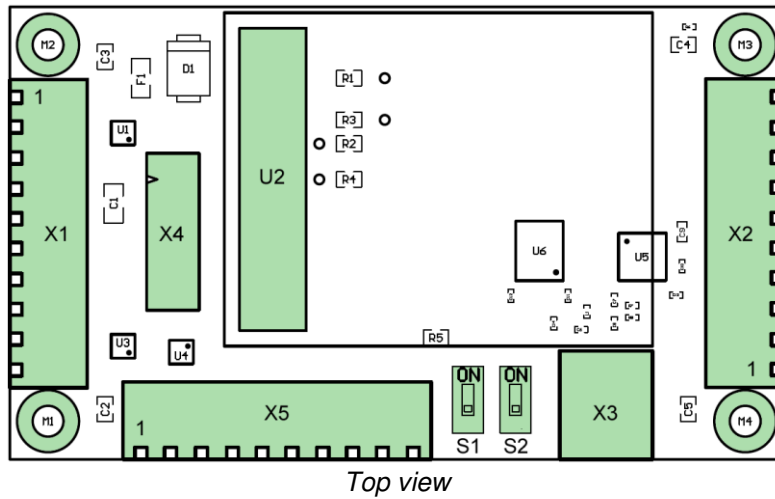
| Symbol | Parameter | Test Conditions | Min | Typ | Max | Units |
|-------------------------------|----------------------|-----------------|-----|-----|-----|-------|
| DC Power Supply Input: | | | | | | |
| V_{IN} | Supply voltage | | 4.9 | | 12 | V |
| USB: | | | | | | |
| U_{PP} | Electrical isolation | | | | 1 | kV |

RS232 TTL and General Purpose Digital I/O Characteristics (GPIO1 ... GPIO8, RX, TX)

Unless otherwise noted: $T_A = 25\text{ °C}$, $U_{IN} = 12\text{ V}$

| Symbol | Parameter | Comments | Min | Typ | Max | Units |
|--|-------------------|--------------|-----|-----|-----|----------|
| ESD Protection: (Between TEC-1092 and Connector) | | | | | | |
| U_{PP} | ESD discharge | IEC61000-4-2 | | | 100 | kV |
| R_A | Series resistance | | 170 | 200 | 230 | Ω |

Pin Configuration and Mechanical Data



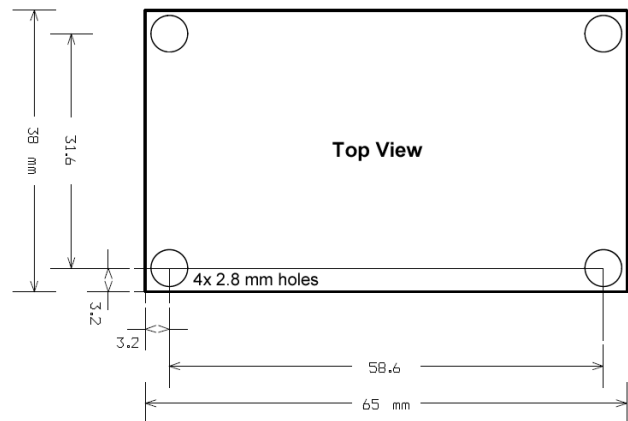
Pin Description:

| | | |
|----|---------------------------------------|------------------------------|
| X1 | 1 | Power VIN |
| | 2 | Power GND |
| | 3 | GPIO1 |
| | 4 | GPIO2 |
| | 5 | GPIO3 |
| | 6 | GPIO4 |
| | 7 | RS232 TTL RX |
| | 8 | RS232 TTL TX |
| | 9 | RS485 A2 (D+) |
| | 10 | RS485 B2 (D-) |
| X2 | 1 | Object temperature sensor IA |
| | 2 | Object temperature sensor IB |
| | 3 | Object temperature sensor UA |
| | 4 | Object temperature sensor UB |
| | 5 | Shield |
| | 6 | Sink temperature sensor A |
| | 7 | Sink temperature sensor B |
| | 8 | GND |
| | 9 | Out- (Peltier element minus) |
| | 10 | Out+ (Peltier element plus) |
| X5 | 1 | GPIO5 |
| | 2 | GPIO6 |
| | 3 | GPIO7 |
| | 4 | GPIO8 |
| | 5 | NC |
| | 6 | NC |
| | 7 | NC |
| | 8 | NC |
| | 9 | 3.3 V |
| | 10 | 5 V |
| X3 | USB mini B | |
| X4 | Status Display Kit DPY-1113 connector | |
| U2 | TEC-1092 connector | |

| | |
|----|---|
| U2 | TEC-1092 connector |
| S1 | On: 120 Ω RS485 termination enabled |
| S2 | On: USB connectivity enabled Off: RS232 TTL connectivity enabled |

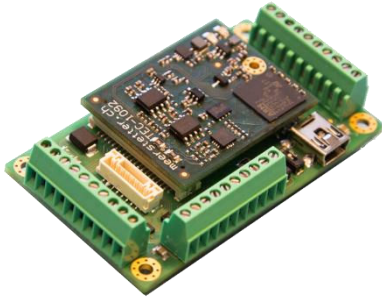
Dimensions:

65 mm × 38 mm × 14 mm

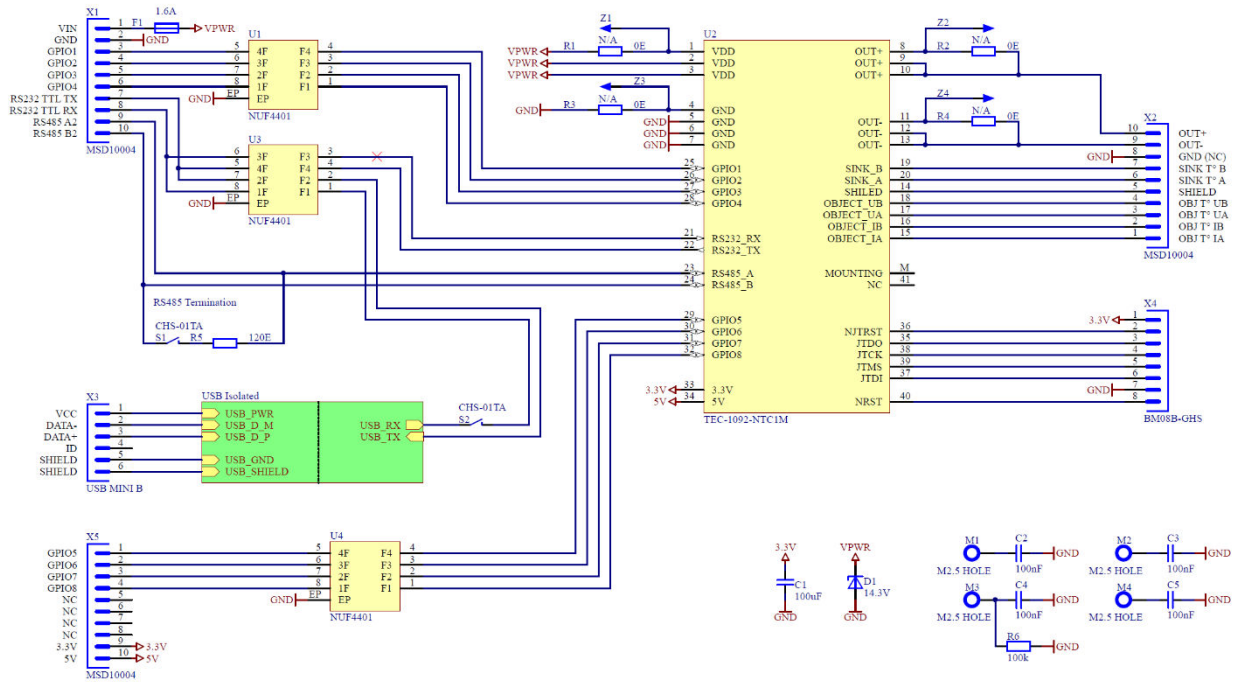



Operation-Modes / Theory of Operation

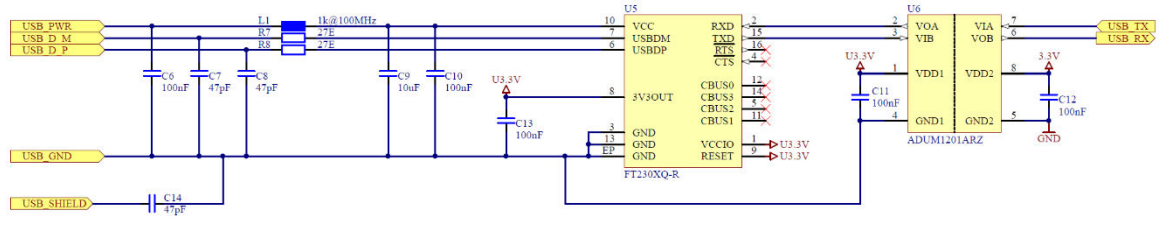
The EVL-1093 allows the evaluation and simple connection of a TEC-1092 to a host system using USB. Further, a DPY-1113 TEC Status Display Kit can be connected.




Schematic



| | | | | |
|--|-------------------|---|---|-----------------------|
| Confidential | EVL-1093 | | Revision: Unknown revision Layout: 71458 Design: 16.09.16 ML Modified: 09.10.17 ML | 4147B 1 / 2 |
| | TOP.SchDoc | | | |
|  | | Meerstetter Engineering GmbH Schulhausgasse 12 CH-3113 Rübigen Phone: +41 31 712 01 01 | | |



| | | | | |
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Please contact Meerstetter Engineering if you need the whole Altium Project inclusive layout.

Parts List

| Quantity | Referenze | Component | Value | Manufacturer | Manufacturer Part No. |
|----------|------------------------------|--------------------------------|--------------------|----------------------------|-------------------------|
| 1 | PCB | PCB 7149B | EVL-1093 | MEERSTETTER ENGINEERING | ME7149B |
| 3 | C7, C8, C14 | CAPACITOR CERAMIC | 47pF / 50V | TDK | C1005C0G1H470J |
| 5 | C6, C10, C11, C12, C13 | CAPACITOR CERAMIC | 100nF / 25V | TDK | C1005X7R1E104K050BB |
| 4 | C2, C3, C4, C5 | CAPACITOR CERAMIC X7R | 100nF / 50VDC | AVX | 08055C104KAT2A |
| 1 | C9 | CAPACITOR CERAMIC | 10uF / 10V | MURATA | GRM188R61A106KE69 D |
| 1 | C1 | CAPACITOR CERAMIC X5R | 100uF / 10V | TDK | C3216X5R1A107M160A C |
| 4 | R1, R2, R3, R4 | RESISTOR- 0.1W-1% SMD | 0E | MULTICOMP | MC 0.1W 0805 0R |
| 2 | R7, R8 | RESISTOR- 63mW-1% SMD | 27E | VISHAY DRALORIC | CRCW040227R0FKED |
| 1 | R5 | RESISTOR ANTI-PULSE SMD | 120E / 0.25W | PANASONIC | ERJT06J121V |
| 1 | R6 | RESISTOR- 125mW-1% SMD | 100k | VISHAY DRALORIC | CRCW0402100KFKEAH P |
| 1 | L1 | FERRITE BEAD | 1k@100MHz | TAIYO YUDEN | BK1005HS102-T |
| 1 | F1 | FUSE SMD FAST | 1.6A / 63VDC | SCHURTER INC | 3413.0218.22 |
| 1 | D1 | DIODE TRANSIL UNIDIR SMD | VBR MIN = 14.3V | ST MICROELECTRONICS | SM6T15A |
| 2 | S1, S2 | SWITCH DIP 1POS SMD | CHS-01TA | COPAL ELECTRONICS | CHS-01TA |
| 3 | U1, U3, U4 | FILTER EMI / ESD | NUF4401 | ON SEMICONDUCTOR | NUF4401MNT1G |

| Quantity | Referenze | Component | Value | Manufacturer | Manufacturer Part No. |
|----------|------------|--------------------------------|---------------------------------|-------------------|-----------------------|
| 1 | U6 | DIGITAL ISOLATOR 2CH 1MB | ADUM1201AR Z | ANALOG DEVICE | ADUM1201ARZ |
| 1 | U5 | USB TO SERIAL CONVERTER | FT230XQ-R | FTDI CHIPS | FT230XQ-R |
| 1 | X3 | CONNECTOR USB SMD | USB TYP B MINI HORIZONTAL | WÜRTH ELECTRONICS | 65100516121 |
| 1 | X4 | CONNECTOR 8POL SMD | BM08B-GHS | JST | BM08B-GHS-TBT |
| 3 | X1, X2, X5 | SCHRAUBKLE MME 10POL | MSD10004 | SAURO | MSD10004 |
| 1 | U2 | CONNECTOR 41POL SMD | 91911-31341LF | AMPHENOL FCI | 91911-31341LF |
| 1 | U2 | EINLÖT DISTANZBOL ZEN | M2X5 | WÜRTH ELEKTRONIK | 9774050243 |

EVL-1093 Ordering Information, Hardware Configuration

Example Configuration: **EVL-1093-SCREW**



Display Unit:

It is possible to connect an OLED 2x16 character display directly to the X4 connector.
Please visit the DPY-1113 product web page for further information.

Customization:

Many hardware and software features of the EVL-1093 are customizable upon request. Please contact Meerstetter Engineering with your enquiry.