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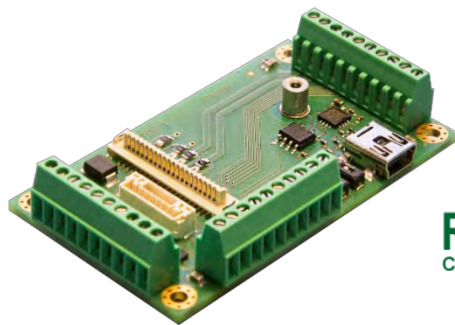
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Evaluation Board for TEC Controller



Features

Input Characteristics:

- DC Input Voltage: 5 to 12 V

Main Features:

- USB connector to interface the TEC-1092
- RS232 and RS485 (Half-Duplex) connectors
- 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 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)	14 V
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Operating Characteristics for Firmware >= v4.00

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

Electrical Characteristics

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

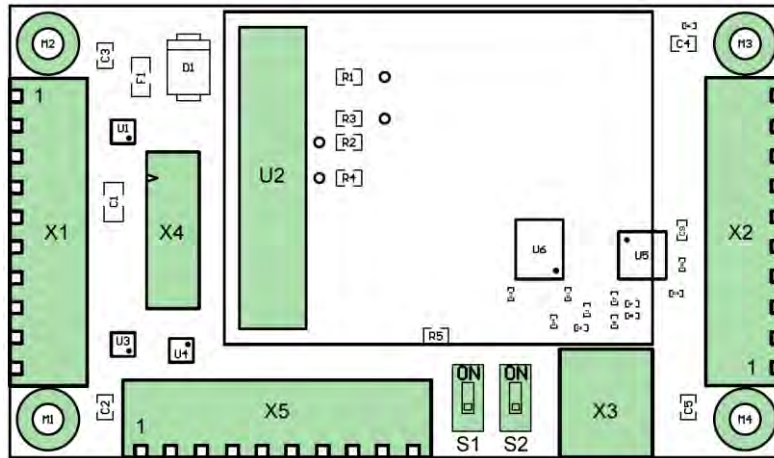
Symbol	Parameter	Test Conditions / Hints	Min	Typ	Max	Units
DC Power Supply Input:						
V_{IN}	Supply voltage		4.9		12	V
USB:						
V_{PP}	Electrical isolation				1	kV

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

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

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

Pin Configuration and Mechanical Data



Top view

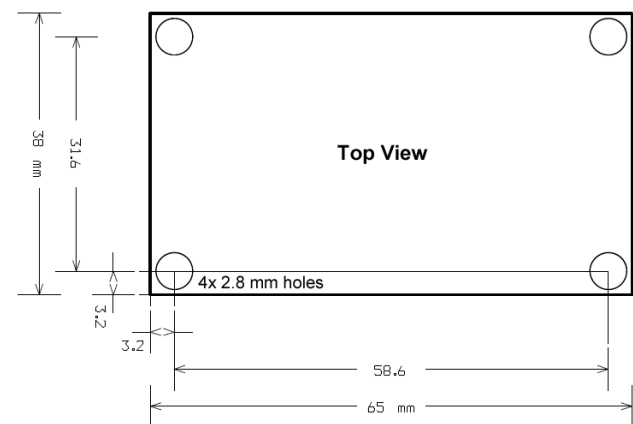
Pin Description:

X1	1	Power VIN
	2	Power GND
	3	GPIO1
	4	GPIO2
	5	GPIO3
	6	GPIO4
	7	RS232 TTL TX
	8	RS232 TTL RX
	9	RS485 A2 (D+)
	10	RS485 B2 (D-)
X2	1	HR temperature sensor IA
	2	HR temperature sensor IB
	3	HR temperature sensor UA
	4	HR temperature sensor UB
	5	Shield
	6	LR temperature sensor A
	7	LR 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-111x 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

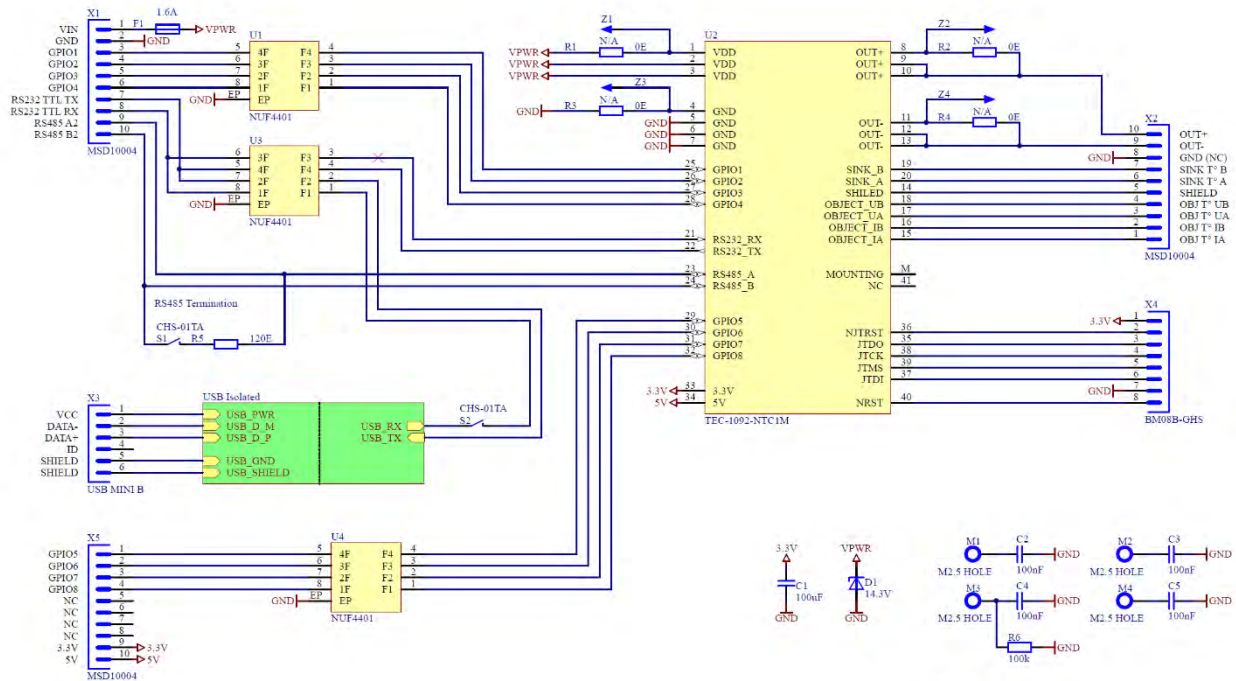


Operation Modes / Theory of Operation

The EVL-1093 allows the evaluation and simple connection of a TEC-1092 to a host system using USB. Further, a DPY-111x TEC Status Display Kit can be connected.



Schematic

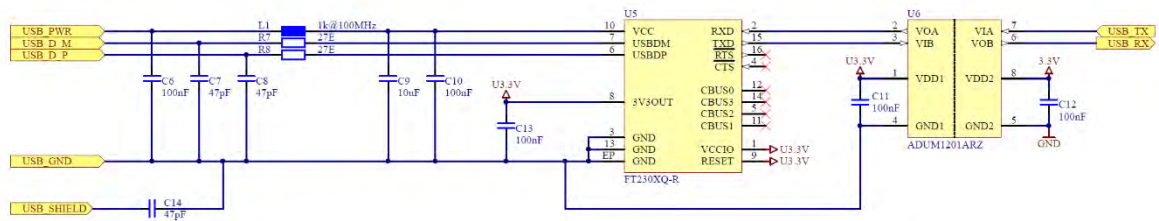


REF1 REF2 REF3

Confidential

EVL-1093
TOP.SchDoc

Meerstetter Engineering GmbH Schulhausgasse 12 CH-3113 Rüschegg Phone: +41 31 712 01 01	Revision: Unknown revision Layout: 71458 Designed: 16.09.16 ML Modified: 09.10.17 ML	4147B 1 / 2
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Confidential

EVL-1093
USB.SchDoc

Meerstetter Engineering GmbH Schulhausgasse 12 CH-3113 Rüschegg Phone: +41 31 712 01 01	Revision: Unknown revision Layout: 71458 Designed: 16.09.16 ML Modified: 09.10.17 ML	4147B 2 / 2
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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**

EVL Model:
- EVL-1093

Terminal Configuration:
- SCREW

Display Unit:

It is possible to connect a small or big OLED 2x16 / 4x20 character display directly to the X4 connector of the device. Please visit the DPY-111x product pages on our website for further information.

Customization:

Many hardware and software features of the TEC-1092 are customizable upon request. Please contact Meerstetter Engineering with your enquiry.

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Change History

Date of change	Version	Changed/ Approved	HW- Version	Change / Reason
14 October 2024	F	XF / ML	v1.01	• Add: Change History • Mod: Specified that the RS485 Data Interface only supports Half-Duplex communication • Mod: Change naming of "Object" to "HR" (High Resolution) and "Sink" to "LR" (Low Resolution) • Fix: RS232 RX and TX pins were inversed • Fix: The absolute maximum supply voltage (DC) is rated at 14 V instead of 20 V