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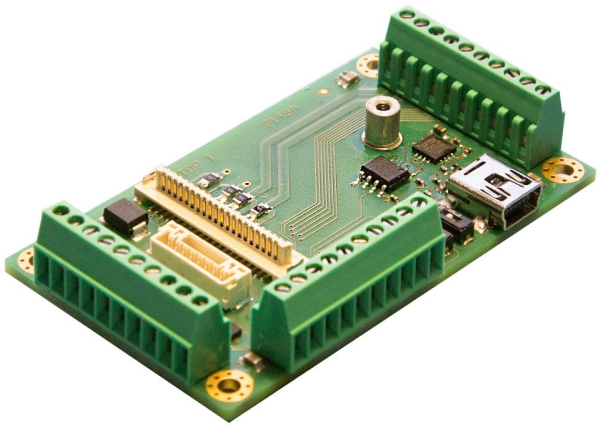
EVL-1093

Evaluation Board for the TEC-1092 Controller

The EVL-1093 is an evaluation board for the TEC-1092 Controller and provides easy connectivity for it. Its size is the same as the TEC-1091's, and it has an additional connector.
The TEC-1092 is not included with the EVL-1093.

HIGHLIGHTS

- **Input Voltage:** 5 – 12 VDC
- Dimensions: 65 × 38 × 14 mm
- USB connector to interface the TEC-1092
- RS232 and RS485 connectors
- ESD protection
- Screw headers
- Please refer to the datasheet of the TEC-1092 or contact us for additional information or customization.



Trial Device & Technical Support

Trial devices and technical support are available for evaluation projects.
Please contact support@meerstetter.ch or visit our support center.

RELATED PRODUCTS

Model	Type	Output Range	Description
TEC-1092	TEC	±1.2 A / ±9.6 V	matching TEC Controller
TCI-1181	Adapter	3.3 V or 5 V / 0.025 – 0.1 V	thermocouple adapter
DPY-1113	Display	–	2 × 16 Char OLED Display
DPY-1114	Display	–	4 × 20 Char OLED Display

See the full product overview in the Meerstetter Engineering's Product Compatibility section.

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1 SPECIFICATIONS

1.1 Absolute Maximum Ratings [1]

		Min	Max	Unit
Voltage	$U_{IN, DC}$		14	V

1 Operation at or beyond the absolute maximum ratings may result in permanent device damage. These limits are stress ratings only and functional operation of the device at these conditions is not guaranteed. Prolonged exposure to absolute maximum conditions can adversely affect long-term reliability and should be avoided during normal operation.

1.2 Operating Characteristics

		Min	Max	Unit
Temperature	T_{OP}	-40	90	°C
Humidity	RH_{OP}, non-condensing	5	95	%

1.3 Electrical Characteristics

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

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

2 INTERFACE AND CONNECTORS

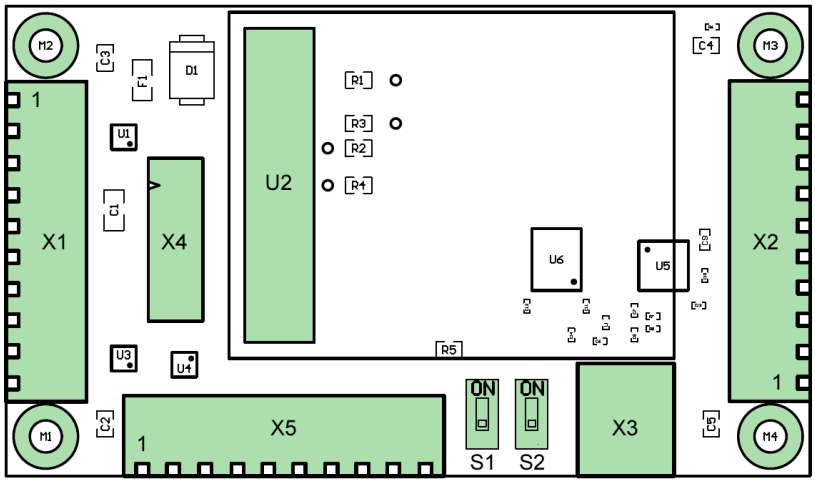
2.1 RS232 TTL and General Purpose Digital I/O Characteristics (GPIO1 ... GPIO8, RX, TX)

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

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

2.2 Pin Configuration and Mechanical Data

Top view.



2.3 Pin and Switch Description

Pinout X1				
PIN 1	Power VIN	PIN 6	GPIO4	
PIN 2	Power GND	PIN 7	RS232 TTL TX	Not the same as on the TEC-1091!
PIN 3	GPIO1	PIN 8	RS232 TTL RX	
PIN 4	GPIO2	PIN 9	RS485 A2 (D+)	
PIN 5	GPIO3	PIN 10	RS485 B2 (D-)	

Pinout X2			
PIN 1	HR temperature sensor IA	PIN 6	LR temperature sensor A
PIN 2	HR temperature sensor IB	PIN 7	LR temperature sensor B
PIN 3	HR temperature sensor UA	PIN 8	GND
PIN 4	HR temperature sensor UB	PIN 9	Out– (Peltier element minus)
PIN 5	Shield	PIN 10	Out+ (Peltier element plus)

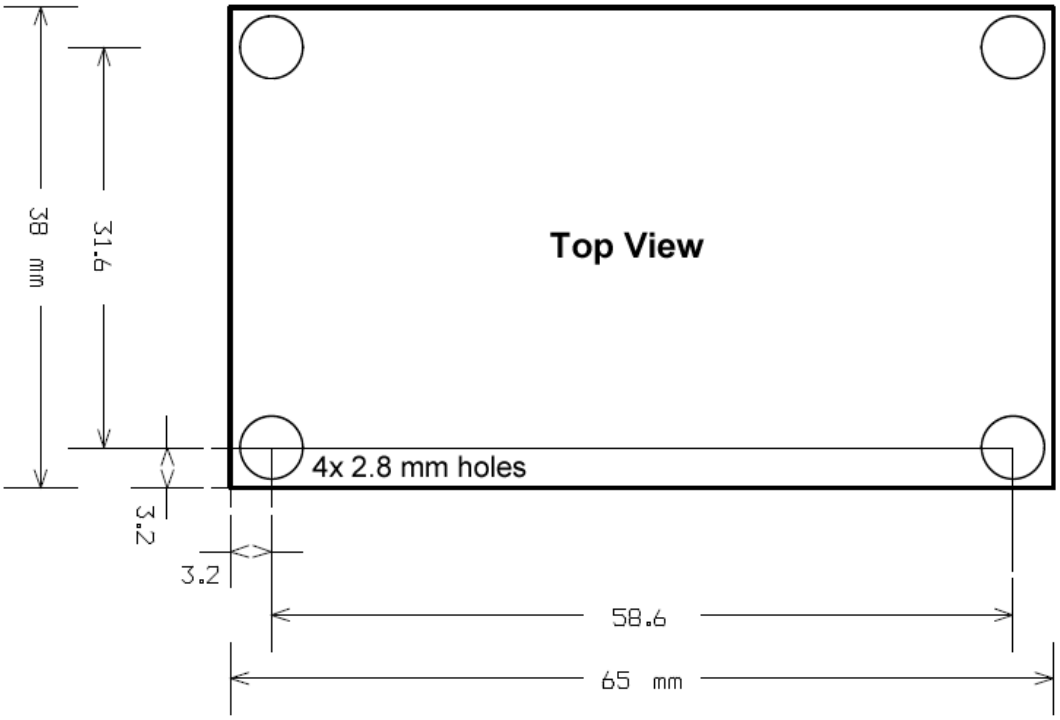
Pinout X5			
PIN 1	GPIO5	PIN 6	NC
PIN 2	GPIO6	PIN 7	NC
PIN 3	GPIO7	PIN 8	NC
PIN 4	GPIO8	PIN 9	3.3 V
PIN 5	NC	PIN 10	5 V

Designator	Description
X3	USB Mini Type B
X4	Status Display Kit DPY-111x connector
U2	TEC-1092 connector
S1	On: 120 Ω RS485 termination enabled Off: 120 Ω RS485 termination disabled
S2	On: USB connectivity enabled Off: RS232 TTL connectivity enabled

3 MECHANICAL DATA

3.1 Dimensions

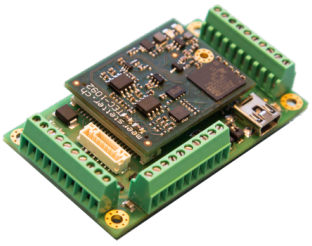
65 mm × 38 mm × 14 mm



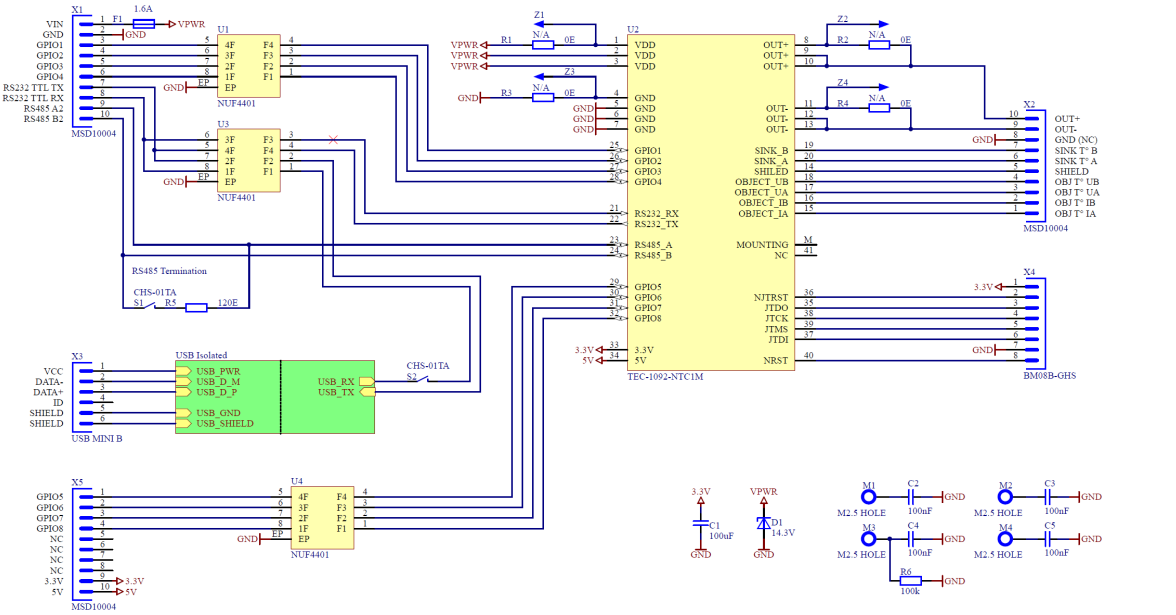
4 FUNCTIONAL DESCRIPTION

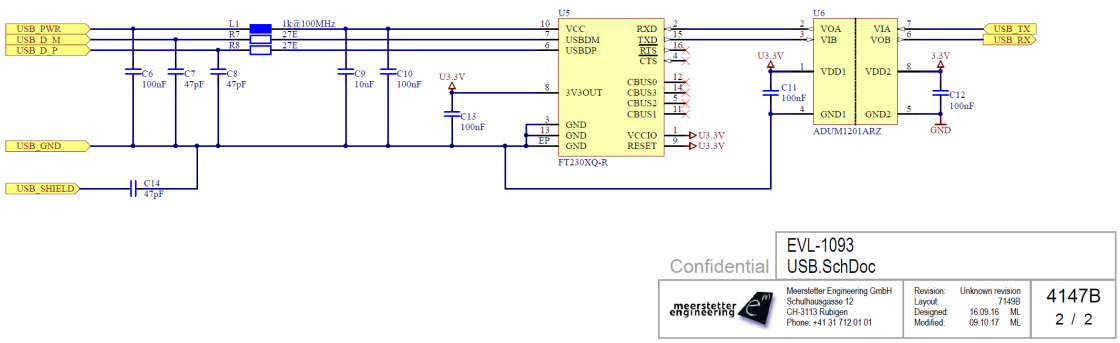
4.1 Operation-Modes / Theory of Operation

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.



4.2 Schematic





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

4.3 Parts List

Q	Reference	Component	Value	Manufacturer	Manufacturer Part No.
1	PCB	PCB 7149B	EVL-1093	MEERSTETTER ENGINEERING	ME7149B
3	C7, C8, C14	CAPACITOR CERAMIC	47 pF/50V	TDK	C1005C0G1H470J
5	C6, C10, C11, C12, C13	CAPACITOR CERAMIC	100 nF/25V	TDK	C1005X7R1E104K050BB
4	C2, C3, C4, C5	CAPACITOR CERAMIC X7R	100 nF/50V DC	AVX	08055C104KAT2A
1	C9	CAPACITOR CERAMIC	10 uF/10V	MURATA	GRM188R61A106KE69D
1	C1	CAPACITOR CERAMIC X5R	100 uF/10V	TDK	C3216X5R1A107M160AC
4	R1, R2, R3, R4	RESISTOR-0.1W-1% SMD	0E	MULTICOMP	MC 0.1W 0805 OR
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	CRCW0402100KFKEAHP
1	L1	FERRITE BEAD	1k@100MHz	TAIYO YUDEN	BK1005HS102-T
1	F1	FUSE SMD FAST	1.6A/63V DC	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
1	U6	DIGITAL ISOLATOR 2CH 1MB	ADUM1201ARZ	ANALOG DEVICE	ADUM1201ARZ
1	U5	USB TO SERIAL CONVERTER	FT230XQ-R	FTDI CHIPS	FT230XQ-R
1	X3	CONNECTOR USB SMD	UST TYP B MINI HORIZONTAL	WÜRTH ELECTRONICS	65100516121
1	X4	CONNECTOR 8PT OL SMD	BM08B-GHS	JST	BM08B-GHS-TBT
3	X1, X2, X5	SCHRAUBKLE MME 10POL	MSD10004	SAURO	MSD10004
1	U2	CONNECTOR 41POL SMD	91911-31341LF	AMP HENOL FCI	91911-31341LF
1	U2	EINL¬OT DISTANZBOLZEN	M2X5	WÜRTH ELEKTRONIK	9774050243

5 ORDERING AND CONFIGURATION

5.1 TEC-1092 Ordering Information & Configuration

Example Configuration:
EVL-1093

Variant Name	Requirement	Description	Options / Single choice
Hardware Version	-	For reference, specifies the hardware version (latest by default, subject to future change).	Example: HW1.01

5.2 Ordering Confirmation Example

EVL-1093 (HW1.01)

6 ALL MEERSTETTER ENGINEERING PRODUCTS

6.1 Meerstetter Engineering's Product Compatibility

The Laser Diode Drivers and TEC Controllers from Meerstetter have been developed to work along with each other. They share the same platform bus, communication protocol and hardware architecture. See the following table for an overview of the Laser Diode Drivers and TEC Controllers from Meerstetter Engineering:

Model		Output	Description
Laser Diode Drivers			
LDD-1321		0–1.5 A / 0–14 V	CW, Add-on TEC Controller available
LDD-1301		0–20 A / 0.5–45 V	1 ms – CW
LDD-1303		0–20 A / 1–120 V	1 ms – CW
LDD-1137		0–75 A / 0–70 V	1 ms – CW
LDD-1124		0–1.5 A / 0–15 V	CW, modulated modes
LDD-1121		0–15 A / 0–15 V	1 µs – CW, modulated, QCW and pulsed modes
LDD-1125		0–30 A / 0–27 V	1 µs – CW, modulated, QCW and pulsed modes
TEC Controllers			
Single-Channel Models	TEC-1092	±1.2 A / ±9.6 V	Micro
	TEC-1091	±4 A / ±21 V	Small
	TEC-1089	±10 A / ±21 V	Medium
	TEC-1162	±5 A / ±56 V	Medium-high
	TEC-1090	±16 A / ±30 V	Large
	TEC-1163	±25 A / ±56 V	Extra-large
Dual-Channel Models	TEC-1161-4A	2 x (±4 A / ±21 V)	Small
	TEC-1161-10A	2 x (±10 A / ±21 V)	Medium
	TEC-1122	2 x (±10 A / ±21 V)	Medium
	TEC-1166	2 x (±5 A / ±56 V)	Medium-high
	TEC-1123	2 x (±16 A / ±30 V)	Large
	TEC-1167	2 x (±25 A / ±56 V)	Extra-large

7 CHANGE HISTORY

Date of change	Version	Changed / Approved	HW Version
14 October 2024	F	XF / ML	v1.01
Change / Reason • 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			
April 17, 2026	G	NJ / SR	v1.01
Change / Reason • Mod: Datasheet design • Del: Old Ordering codes • Add: Standardized product designations and ordering codes tables			

MEERSTETTER ENGINEERING GMBH
Schulhausgasse 12
3113 Rubigen, Switzerland

+41 31 529 21 00
contact@meerstetter.ch
https://www.meerstetter.ch/

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