

Breakout Board for CRO-SM3

EXP-BOB1

Simple breakout board and expansion module for CRO-SM3 interfacing



The EXP-BOB1 is a simple breakout board for the CRO-SM3 induction heater controller. It allows for easy connection when prototyping and developing systems to interface with the SM3 controller.

Two 10-way push-clamp terminal blocks expand the 15-way JST connector for easy wiring plus additional through-hole solder pads for fixed components or an Arduino Nano (not included).

Using the same form factor as other SM3 modules, this breakout board can be mounted as part of a stack, or separately, linked by a JST cable.

The EXP-BOB1 is compatible with both the CRO-SM3-ST and the CRO-SM3-PRO. Note that some features discussed (such as serial connection) are only available on the PRO versions. Check the CRO-SM3 datasheet for the full feature differences.

Terminal Block Pinout

The terminal block connections link to the SM3 JST connector directly for easy interfacing with external control panels and systems. Terminal block connections R17 to R20 link to the nearby through-hole solder pads, which connect to Arduino pins A5, A4, A3 and A2 respectively if an Arduino is installed. These four terminals have no direct connection to an SM3 signal.

The terminal blocks accept wires with a bare conductor diameter of approximately 0.4–1.0 mm (26–18 AWG).

Terminal references are shown viewed from the component side with the JST connector at the top. L1–L10 run down the left terminal block and R11–R20 run down the right terminal block, both from top to bottom. These references are used in this datasheet; the PCB is labelled by function.

Terminal Block Pin	Connection
L1	Rx
L2	Tx
L3	GND
L4	BUTTON-ENTER
L5	BUTTON-OPTION
L6	LED-MSG*
L7	LED-RUN*
L8	SDA
L9	SCL
L10	5 V
R11	GND
R12	5 V
R13	AUX
R14	POT B
R15	POT A
R16	THERMOCOUPLE
R17	A5 (Arduino Pin Only)
R18	A4 (Arduino Pin Only)
R19	A3 (Arduino Pin Only)
R20	A2 (Arduino Pin Only)

Table 1: Terminal block pinout

* Also connected to onboard LED

THERMOCOUPLE (R16) receives the conditioned output of a thermocouple amplifier. A thermocouple must not be connected directly to this terminal. See the CRO-SM3 datasheet for amplifier requirements.

Solder pads & Arduino connection

Between the terminal blocks is a 7 x 15 array of through-hole solder connections for interfacing with an Arduino or other components. Each of the left and right columns has a direct connection to its neighbouring pad with the remaining central three columns unconnected.

The Arduino mounting pads for 5 V and GND are already connected to the corresponding CRO-SM3 connections. The Arduino RX and TX pads are connected to the SM3 serial interface through the removable RXD and TXD jumper links. Removing these jumpers disconnects the serial signals only; power and ground remain connected. All other SM3 control signals require additional wire links between the terminal blocks or pads and the chosen Arduino pins.

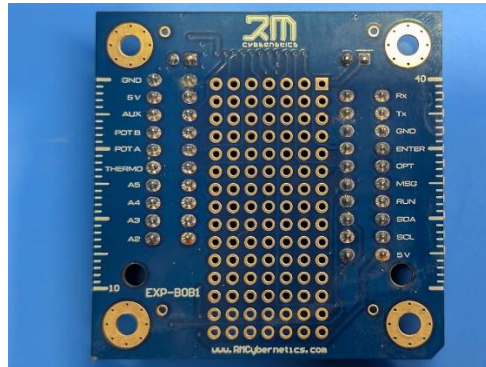


Figure 1: Underside of PCB

The through-hole solder pads can also be used to mount an optional Arduino Nano or Arduino Nano Every for adding custom control, sensors and automated operating sequences. Both Arduinos use the same header layout and 5 V logic. An Arduino Nano should be mounted with the USB port at the edge of the PCB, as shown below.



Figure 2: Example of mounted Arduino Nano clone

The Nano Every is recommended for new applications as it provides more program memory and RAM, allowing larger control programs and additional features. Its USB communication is separate from the serial port on the RX/TX pins, allowing a computer connection for monitoring and debugging while communicating with the CRO-SM3.

The classic Nano (ATmega328P) is suitable for simpler applications or projects using existing Nano code and libraries. Its USB interface shares the RX/TX pins with the CRO-SM3 connection, so these signals may need to be disconnected using the EXP-BOB1 jumpers when uploading a program.

LED indicators & I/O

Two onboard LED indicators are connected to the JST connector to be controlled by a connected CRO-SM3. Details of the LED functions and optionally connected I/O can be found in the CRO-SM3 datasheet.

I²C Pullups

The unpopulated 0805 pads are for optional 4.7 k Ω I²C pullup resistors. Fitting these will cause the SM3 to detect that an expansion module is connected (auto detect is enabled by default but can be turned off). When detected it will default to use of control signals and I²C display in the same way as the EXP-THERM1 does (see datasheet).

Mechanical information

The product is supplied as an assembled EXP-BOB1 board only. Arduino boards, Arduino headers, cables and mounting hardware are not included.

The PCB measures 50 × 50 mm and has four corner mounting holes suitable for M3 screws, on a 40 × 40 mm centre-spacing pattern.

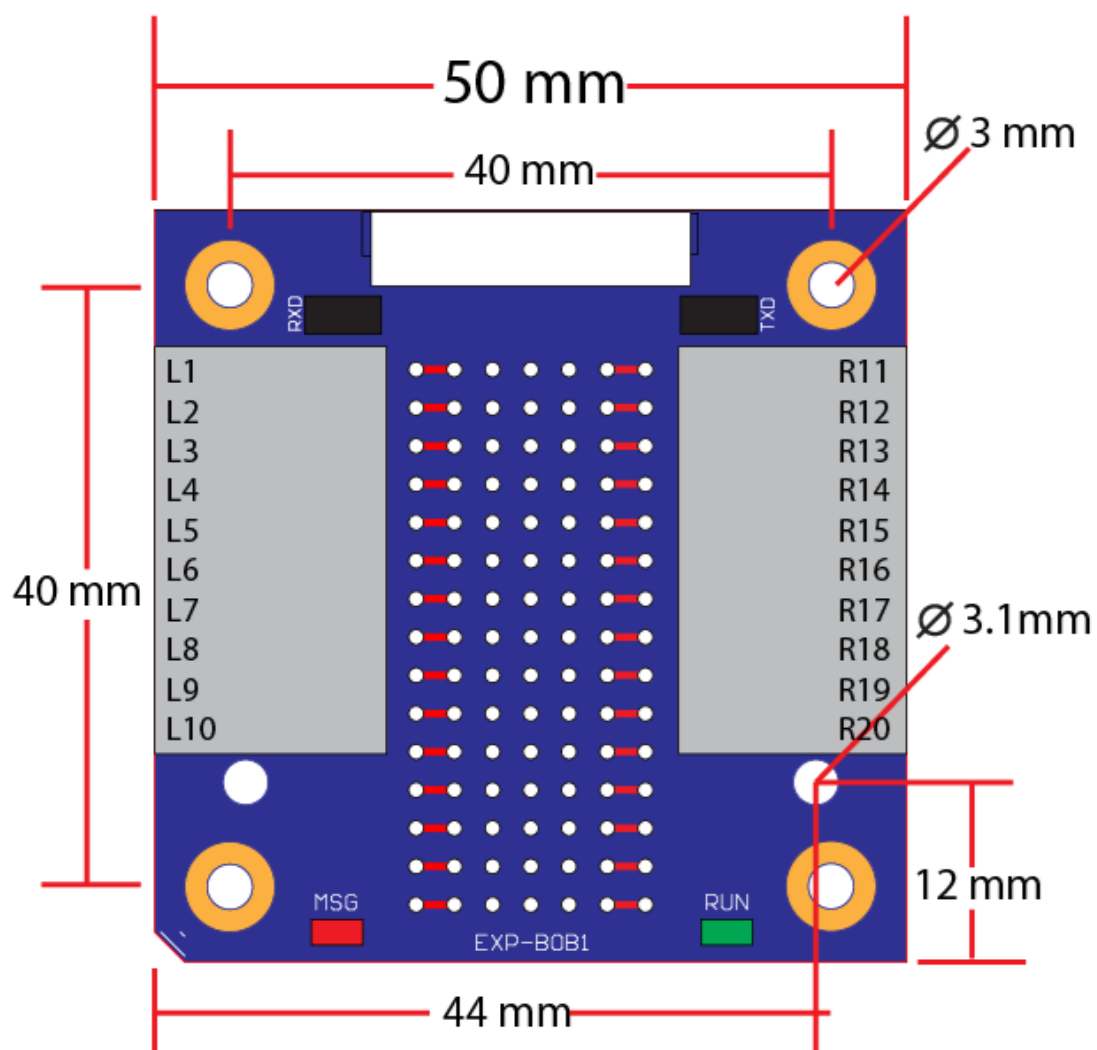


Figure 3: Mechanical Information

Document revision history

Revision	Date	Changes
1.0.0	18/09/2026	Initial Release

Table 2: Document revision history

Disclaimer

The information in this document is provided as-is and is not guaranteed to be free of errors.

The EXP-BOB1 is supplied as a component for incorporation into a complete system. RMCybernetics Ltd accepts no liability for damage, injury or loss arising from the design, construction, installation or use of any system built around it. Suitability for a particular application must be verified by the system designer.

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The EXP-BOB1 is manufactured to RoHS requirements. As a component intended for incorporation, it does not carry independent CE or UKCA marking. Conformity assessment of the finished machine or apparatus, including EMC and electrical safety, remains the responsibility of the integrator.

Warranty, returns and contact

Warranty and returns are covered by the terms of sale published on our website. Damage caused by operation outside the specified electrical or thermal limits is not covered.

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