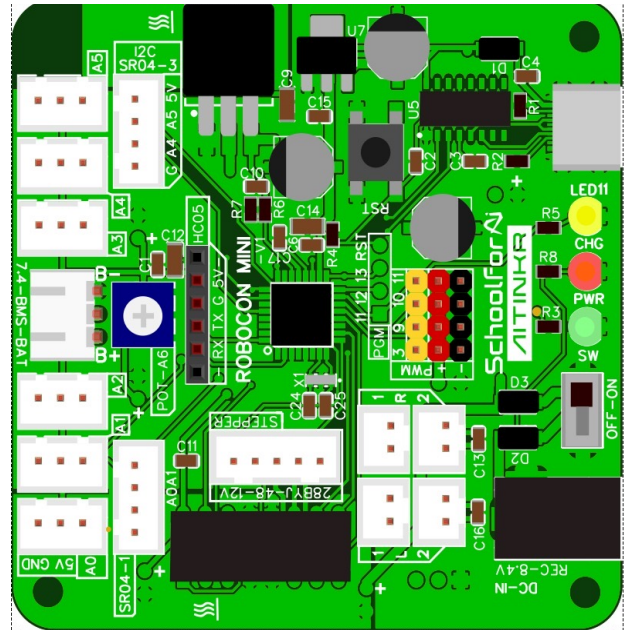


ROBOCON MINI

A General-Purpose Development Board
Product Reference Manual



SKU: AT000015

Latest Release: 12 JAN 2024

Description:

The ROBOCON MINI is a versatile microcontroller board designed for educational purposes and small-scale robotics projects. This board is powered by the ATMEGA 328, an 8-bit microcontroller widely recognised for its application in Arduino platforms.

The board features four PWM outputs that can be used to control servos or function as general-purpose GPIO (General Purpose Input/Output) pins. It supports a 12V DC stepper motor, providing robust control for various robotic applications.

Several 3-pin JST connectors are available for GPIOs, offering Ground (GND), 5V, and Signal connections. It includes an onboard potentiometer connected to A6, which can be used to generate variable signals, such as for servo control or adjusting brightness. Additionally, A7 is internally connected to function as a battery voltage reader.

An onboard LED connected to Pin 11 serves general-purpose uses and is programmable for various indications. The board also supports two SR04-US ultrasonic sensors, which utilize A0 & A1 and A4 & A5 pins in a sharing mode. It is important to note that these pins should not be used with other 3-pin JSTs while the ultrasonic sensors are in operation.

For wireless communication, the board can accommodate both HM10 or HC-05 Bluetooth modules, with the Tx connected to pin 2 and Rx to pin 4.

The ROBOCON MINI supports bootloader uploads through pins 11, 12, 13, and RST. Power options include a DC Jack accepting 7 to 12V DC with a current range of 1 to 2 A, and an external battery connection via a 3-pin JST male connector, suitable for a Li-ion 2-cell battery (7.4V). When using a 7.4V battery, an 8.4V to 9V DC adapter is recommended for charging.

The board also features a USB C-type connector for power and programming, ensuring ease of use and compatibility with modern devices. For optimal performance, it is advised to use the battery supplied by AITinkr.

1. Features

Processor

ATMEGA 328

8-Bit AVR RISC Architecture Microcontroller Operates at up to 20 MHz

Flash – 32KB

EEPROM - 1KB

SRAM - 2KB

Bluetooth Connectivity: Compatible with HM10 and HC-05 modules Tx (Transmit) to Pin 2Rx (Receive) to Pin 4

Peripheral Interfaces

Programmable GPIOs:	10
Digital Interfaces:	2 x I2C
Analog Interfaces:	4 x 12-bit ADC (or) 4 x Touch Sensing IOs (All pins support PWM)
Servos:	4 x Servo Motors
Onboard Potentiometer:	A6 - Generates a variable signal (E.g.: Servo or Brightness control)
Onboard LED:	Pin 11, Gen. Purpose & Programmable

Motor Driver

2-Channel Motor Driver

(2 x 2-pin JST for Left Channel and 2 x 2-pin JST for Right Channel)

Connectivity

USB Type-C - Power & Computer connectivity

Reset

1 x RESET Button

Power Supply

Rated: 7 to 12V DC, 1 to 2A

1 x Female DC Jack for External Power Supply

1 x 3-pin JST for Battery Connection

- use Li-ion 2 Cell, 7.4V with in-built BMS.
- while using 3rd party external battery crosscheck pinout or polarity of the battery with the Board's JST connector.
- recommended to use AITinkr supplied battery to avoid issues.

1 x Power On/Off Switch

Operating Conditions

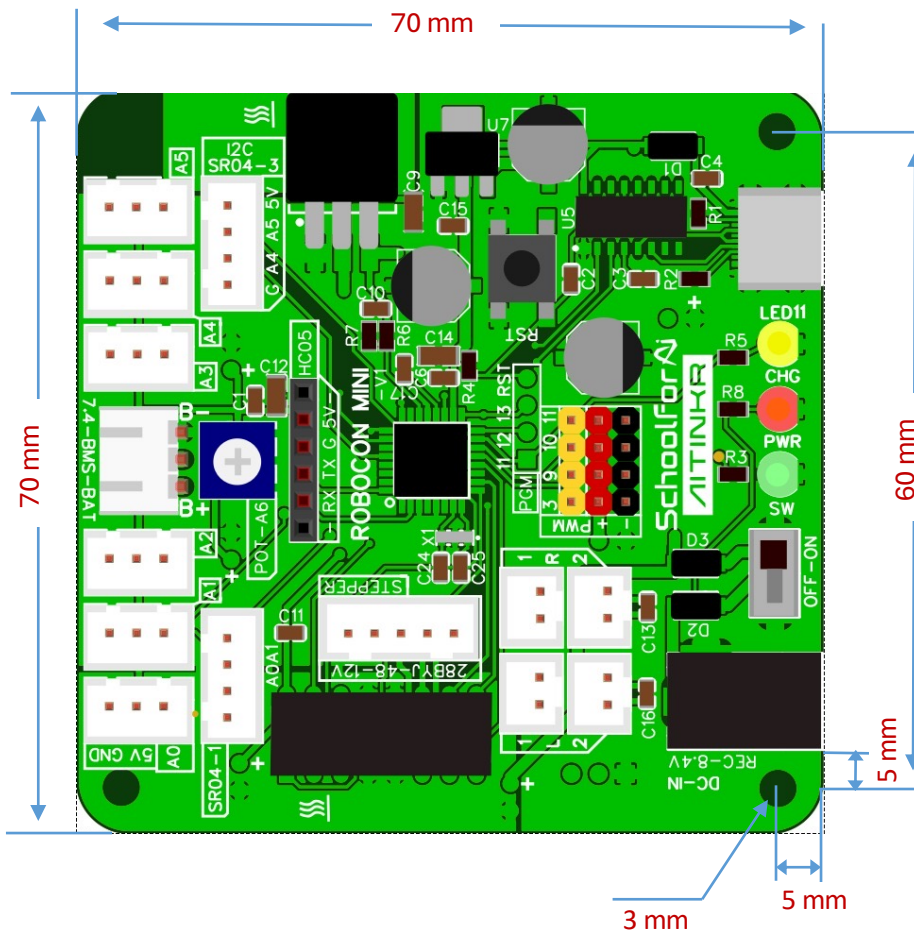
Recommended -20 Deg C to 60 Deg C

Please note:

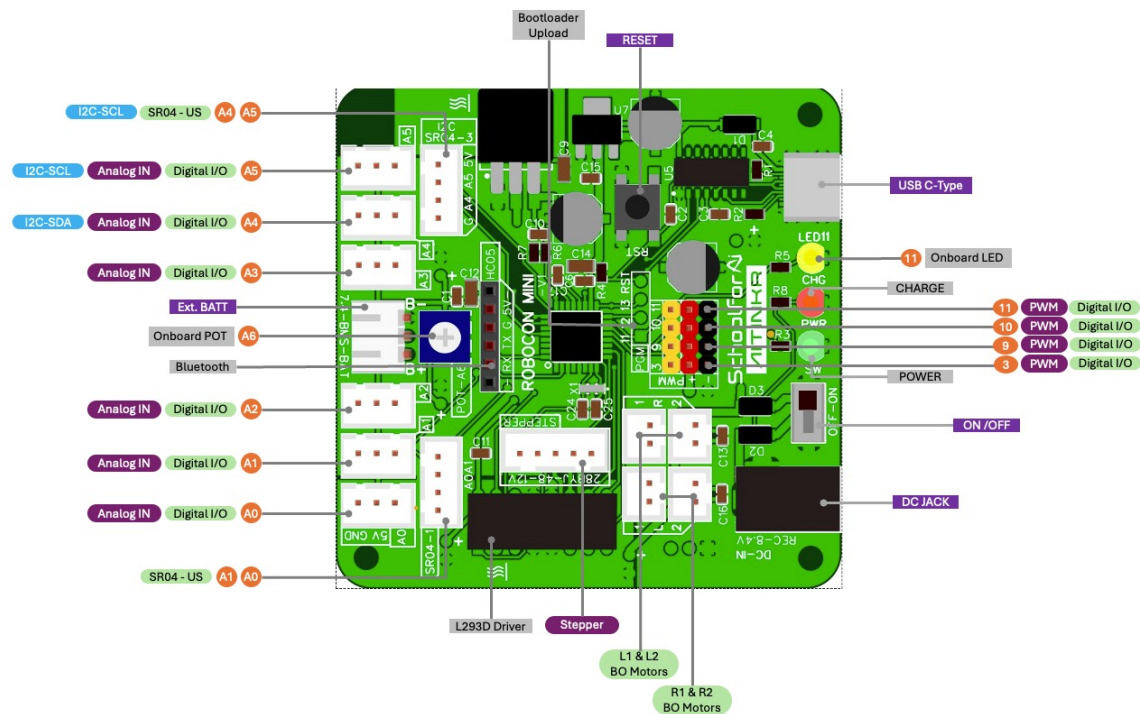
- *Use the 3-pin, 7.4V (nominal V) BMS battery supplied by AITinkr only for safety and performance. We have matched battery pins as per the board's requirement. 8.4V Charger should be used for charging AITinkr supplied battery through the DC Jack.*
- *In case you would like other external batteries please connect them to the DC Jack (always check the allowed battery rating).*
- *While using Ultrasonic Sensor ensure maintaining proper pin connection.*

1.1 Mechanical Layout

The ROBOCON MINI IS A GP Development Board, powered by an ATMEGA 328 8-bit AVR RISC microcontroller, is designed for versatile robotics and electronics projects, offering multiple PWM outputs, I2C connectors, and onboard potentiometers. It supports various peripherals, including Bluetooth modules, stepper motors, and sensors, making it ideal for educational and hobbyist applications.



2. Overview - Pinout Diagram



ATMEGA 328 - 8-Bit Microcontroller PWM (4 off) - Servos / GPIO Stepper Motor : 12 V DC 3-pin JST for GPIOs - Gnd, 5V, Signal	Onboard Potentiometer : A6 - To generate a variable signal (E.g.: Servo control or Brightness change) A7 - Battery Voltage Reader (Output). Internal connection. Onboard LED - Pin 11, Gen. Purpose & Programmable	SR04-US (2 off) : A0 & A1 pins and A4 & A5 pins are used in sharing mode. Do not use A0 & A1 or A4 & A5 3-pin JSTs while using the US Sensors Bluetooth : Could use both HM10 / HC-05 (Tx to pin 2, Rx to pin 4) Bootloader Upload : Pins 11, 12, 13, RST	DC JACK - 7 to 12V DC, 1 to 2 A Ext. BATT - 3 PIN JST MALE - Use Li-Ion 2 Cell, 7.4V, 3 pin only. While using 7.4V batter use an 8.4V to 9V DC Adapter for charging USB C-type: For Power and Programming * Please use the battery supplied by AITinkr.	SchoolForAI AITINKR ROBOCON MINI GP Development Board SKU Code: C00033 Update: 12 Jun 2024 Page: 1 of 1 Pinout Diagram Documentation: PDF Copyright CEDURA
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A0 : Digital I/O | Analog IN
A1 : Digital I/O | Analog IN
A2 : GPIO | Servo Output 2 | LOG (3-pins - Signal, 5V, Gnd)
A3 : GPIO | Servo Output 3 | SPLCLK_P (3-pins - Signal, 5V, Gnd)
A4 : GPIO | Servo Output 4 | BOOT (3-pins - Signal, 5V, Gnd)
A5 : GPIO | Servo Output 4 | BOOT (3-pins - Signal, 5V, Gnd)

A0, A1 : SRO4 - US
A4, A5 : SRO4 - US
A6 : Onboard POT

Pins 11,12,13 & RST : Bootloader Upload (updating the bootloader on a microcontroller)

Bluetooth : Bluetooth Could use both HM10 / HC-05 (Tx to pin 2, Rx to pin 4) and with GND & 5V

BO Motor L1 & L2 : 2 off Left side Motors - 1 Channel from the motor driver shared between these two.

BO Motor R1 & R2 : 2 off Left side Motors - 1 Channel from the motor driver shared between these two.

STEPPER : 12V DC Stepper Motor

Pin 3 : GPIO | PWM | DIGITAL I/O | (3-pins - Signal, 5V, Gnd)

Pin 9 : GPIO | PWM | DIGITAL I/O | (3-pins - Signal, 5V, Gnd)

Pin 10 : GPIO | PWM | DIGITAL I/O | (3-pins - Signal, 5V, Gnd)

Pin 11 : GPIO | PWM | DIGITAL I/O | (3-pins - Signal, 5V, Gnd)

Onboard LED : Onboard Programmable LED

RST: Reset the Microcontroller

USB: Type-C (Power & Upload)

PWR: Power LED

CHG: Charing LED

DC JACK: Female DC Jack for External Power Supply

Ext. BATT: 3 PIN JST MALE - Use Li-ion 2Cell, 7.4V, with in-built BMS only (check the wiring on PCB)

ON/OFF: Switch for Power ON / OFF