

Arduino Motor Driver Shield V.1

BoticShield V1 — User Manual & Getting Started Guide

1. What's in the Box

- 1 × Arduino Uno R3 (or compatible board)
- 1 × BoticShield V1 motor driver shield (pre-fitted on the Arduino Uno)
- 1 × USB cable
- 1 × Quick-start wiring guide

2. Board Overview

BoticShield V1 stacks directly onto the Arduino Uno's header pins. All motor, sensor, and communication connections are made through keyed JST connectors on the shield — no breadboard or loose jumper wires are required. Key zones on the board:

Motor outputs (×4)	Screw/JST terminals for up to 4 independent DC motors
Ultrasonic ports (×3)	4-pin JST — VCC, GND, TRIG, ECHO
Servo ports (×5)	3-pin JST — 5V, GND, Signal
Analog ports A0–A5	3-pin JST — 5V, GND, Signal, for analog sensors
I2C port	4-pin JST — SDA, SCL, 5V, GND
UART port	4-pin JST — TX, RX, 5V, GND
DC power jack	External motor supply input (use for high-torque motors)
USB-B port	Arduino programming port (underneath the shield)

3. Safety & Handling Notes

Always power off and disconnect the battery/DC supply before changing wiring. Never force a JST connector in the wrong orientation — it is keyed and should only insert one way. Do not exceed 5V logic level on sensor signal pins. Keep the board away from moisture and conductive debris.

4. Installing the Software

Step 1 — Install the Arduino IDE

Download and install the Arduino IDE (version 1.8.19 or later, or Arduino IDE 2.x) from the official Arduino website.

Step 2 — Install the BoticShieldV1 library

- 1 Download the **BoticShieldV1.h** library file (link provided with your order / on the product page).
- 2 In the Arduino IDE, go to *Sketch → Include Library → Add .ZIP Library...*
- 3 Select the downloaded library file and click Open.

- Restart the Arduino IDE. The library will now appear under *File* → *Examples* → *BoticShieldV1*.

Step 3 — Select your board and port

Go to *Tools* → *Board* and select **Arduino Uno**. Then go to *Tools* → *Port* and select the COM port your board is connected to (Windows) or `/dev/tty.*` (Mac/Linux).

5. Wiring & First Use

5.1 — Connecting a DC motor

- Plug the motor's 2-wire connector into any MOTOR1–MOTOR4 port.
- If using high-torque motors, connect an external DC power supply to the DC power jack (do not rely on USB power alone for motors).
- Upload the example sketch below and observe the motor respond.

```
#include <BoticShieldV1.h>
BoticShieldV1 shield;

void setup() {
  shield.begin();
}

void loop() {
  shield.motorForward(1, 200); // motor 1, speed 0-255
  delay(2000);
  shield.motorStop(1);
  delay(1000);
}
```

5.2 — Connecting an ultrasonic sensor

Plug the ultrasonic sensor into any ULTRA1–ULTRA3 port (VCC, GND, TRIG, ECHO are matched automatically by the keyed connector). Example:

```
void loop() {
  float distance = shield.readUltrasonic(1); // port 1
  Serial.println(distance);
  delay(200);
}
```

5.3 — Connecting a servo motor

Plug the servo into any SERVO1–SERVO5 port. Example:

```
void loop() {
  shield.servoWrite(1, 90); // servo port 1, angle 0-180
  delay(1000);
}
```

6. Adding I2C and UART Devices

The I2C port (SDA/SCL/5V/GND) supports displays, IMUs, and EEPROMs using the standard Arduino **Wire** library alongside `BoticShieldV1.h`. The UART port (TX/RX/5V/GND) supports Bluetooth (e.g. HC-05/06), Wi-Fi (e.g. ESP-01), and GPS modules using **SoftwareSerial** or the board's hardware serial, depending on your sketch.

7. Troubleshooting

Motor doesn't spin	Check external motor power is connected; confirm correct MOTOR port in code; verify motor connector is fully seated.
Ultrasonic reads 0 or erratic values	Reconnect the JST cable firmly; keep sensor wiring away from motor wiring to reduce noise; add a short delay between readings.
Servo jitters or doesn't move	Ensure servo port is not overloaded — use external power for multiple high-torque servos; check angle values are within 0–180.
Board not detected by IDE	Try a different USB cable/port; reinstall Arduino Uno USB drivers (CH340/FTDI as applicable).
Upload fails / verify error	Confirm correct board (Arduino Uno) and port are selected under Tools; close any other program using the serial port.

8. Maintenance

- Store the shield in a dry, dust-free environment when not in use.
- Avoid flexing the board or applying pressure to the JST connectors.
- Periodically check screw terminals (if used for motors) for looseness.

9. Support

For wiring diagrams, sample code, and further help, visit www.boticsedu.com or contact your Botics EduTech reseller / robotics trainer.

© Botics EduTech Private Ltd. This manual may be updated periodically — always refer to the latest version at www.boticsedu.com.