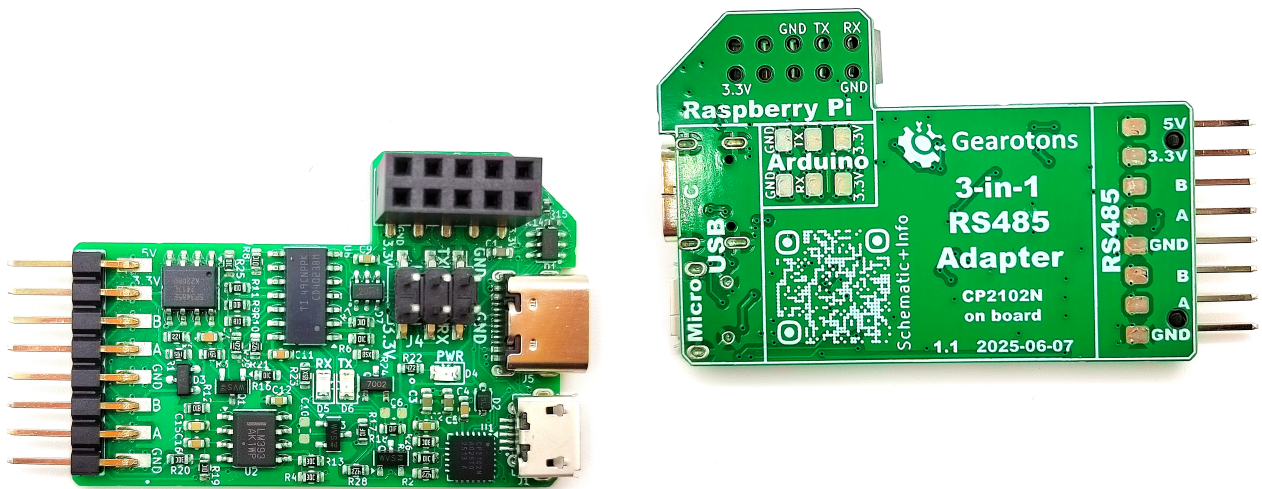


RS485 Adapter – DATASHEET



**Affordable and Simple All-in-One Motion Control
From Education to Innovation**



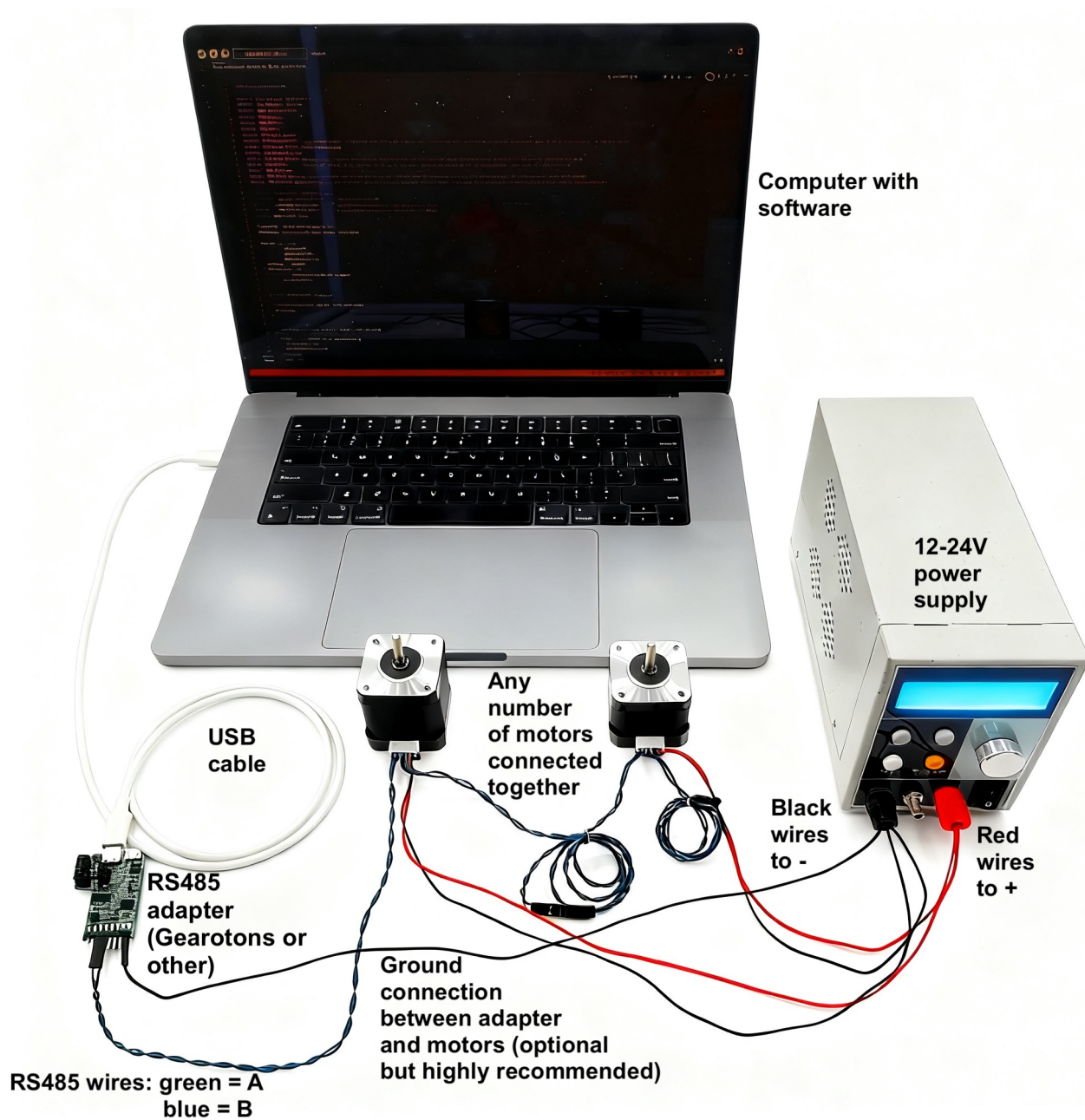
RS485 Adapter Overview

The RS485 Adapter is a friendly bridge between your controller and one or more servomotors. Plug the RS485 adapter to a Raspberry Pi (Zero, 3, or 4), an Arduino, ESP32 board, Mac, PC, or any serial device, and instantly speak to every motor on the line—no extra hubs required. The board automatically switches between transmit and receive so your code only has to send the command and listen for a response. It supports data rates up to 1 Mbps (typically the servomotors run at 230400 baud) and uses RS485 differential signaling to stay reliable across long cables and noisy environments. One master controller can address many devices on the same bus, which keeps builds tidy and demo setups compact. Both USB-C and Micro-USB ports are available for flexible cabling, and the board can also sit on a Raspberry Pi like a low-profile hat for wire-free stacking. The RS485 adapter is fully open source, so students and educators can study it or modify it as needed.

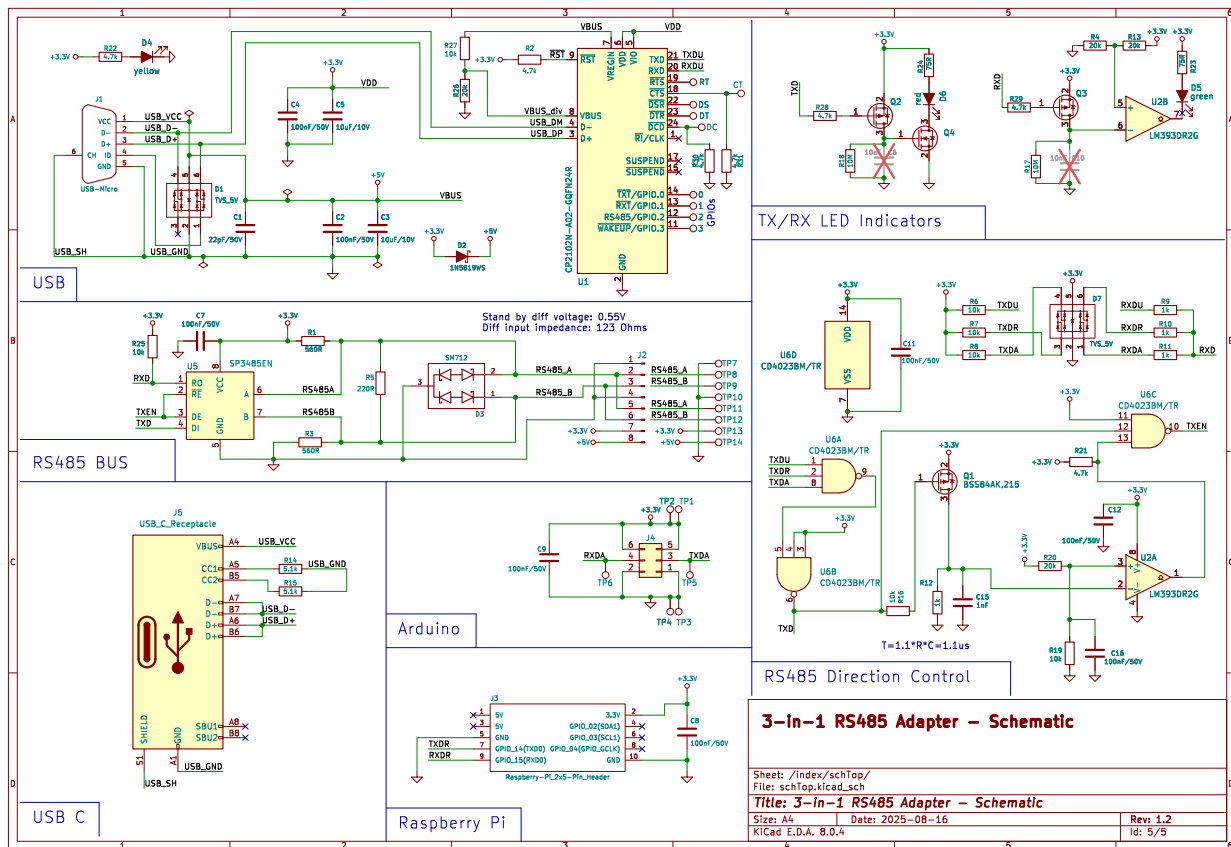
Key Features

- Single adapter links a Raspberry Pi (Zero, 3, 4), Arduino, ESP32, Mac, PC, or any serial host to a daisy chain of smart servomotors.
- Automatically switches between transmit and receive, so code only sends a command and listens for the reply.
- Bright LEDs to indicate board power, transmit, and receive.
- Supports bit rates up to 1 Mbps (servomotors typically run at 230400 baud) for high performant demos and projects.
- RS485 differential signaling keeps communication reliable in electrically noisy labs, maker spaces, classrooms, or industrial settings.
- One master controller can address multiple servos on the shared bus, reducing wiring clutter on projects.
- Keeps cost of projects low. Only one adapter is needed for controlling multiple servomotors.
- Includes both USB-C and Micro-USB connectors to match the cables students already have on hand.
- Can plug directly onto a Raspberry Pi as a low-profile hat for wire-free stacking.
- Fully open source design so educators and students can review the schematic and adapt it for their builds.

Connection Diagram



Schematic Diagram



Getting Started

Follow our online quickstart to wire the adapter and use it with Gearotons servomotors.



tutorial.gearotons.com

Feedback and Support

Spotted an error or need help? Send feedback through our portal so we can keep the datasheet accurate for every class.



tutorial.gearotons.com/feedback

Electrical Specifications

Parameter	Specification
Supply Voltage	5V nominal when powered via USB (up to 6V max) or can be powered with 3.3V or 5V from your project's power supply rail.
Typical Current Draw	To be determined
Supported Baud Rates	Up to 1 Mbps is tested and supported
ESD Protection	±8 kV (air or contact) on USB and headers. Components on the PCB are not protected, so use ESD straps or place the board into an enclosure.

Interface & Connectivity

Connector	Details
Bus Terminals	Two sets of A, B, GND on a 2.54 mm header for field wiring
Host Interface	USB, Raspberry Pi header stacking, and jumper wire area (GND/TX/RX) for boards like Arduino or ESP32
Status Indicators	Power LED (yellow), transmit LED (red) and receive LED (green)

Mechanical Details

Parameter	Value
Physical Dimensions	46.2 mm x 30.9 mm. Thickness at thickest point is 11 mm.
PCB Thickness	1.6 mm.
Weight	To be determined
Environmental Rating	0 °C to 60 °C, non-condensing

Our Mission

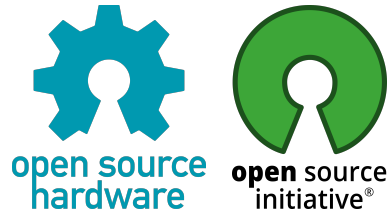
At Gearotons, we believe that the future belongs to those who understand and can work alongside artificial intelligence and automation systems. Our mission is to empower the next generation of innovators by making advanced motion control technology accessible, understandable, and affordable for makers, educators, and engineers worldwide. We are committed to breaking down the barriers that have traditionally separated students and hobbyists from professional-grade automation tools. By providing integrated solutions that eliminate complexity without sacrificing capability, we enable hands-on learning experiences that prepare young minds for a world where human creativity and machine precision work in harmony. Our core belief is that every student should have the opportunity to experiment with the building blocks of modern automation—from robotics and CNC systems to scientific instruments. Through our educational partnerships and open-source approach, we're fostering a generation that doesn't just use technology, but truly understands and shapes it. Together, we're building the foundation for innovators who will define the future.

Open Source

We share the firmware and KiCAD files so you can modify, remix, or study every part of the RS485 adapter.



github.com/tomroding/Raspberry_Pi_HAT_RS485



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