

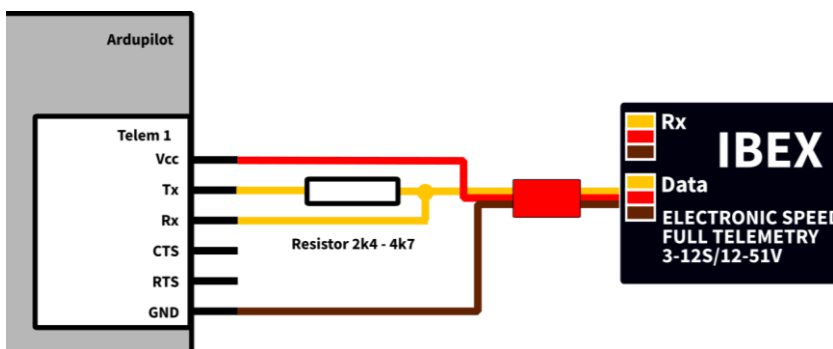
IBEX ELECTRONIC SPEED CONTROLLER ARDUPILOT TELEMETRY

Telemetry is an essential feature for monitoring the performance of your speed controller(s) in an ArduPilot-based system. This guide walks you through the steps required to set up, manage, and utilize telemetry data effectively. Follow the steps carefully to ensure proper communication between your speed controller and autopilot. The IBEX speed controllers, version 2.06 and above, support ArduPilot telemetry through the provided Lua program.

HARDWARE CONNECTION

1. Choose a suitable UART port on your autopilot, such as "Telem1" (SERIAL 1/ UART2).
2. Connect the **Vcc**, **GND**, and **Rx/Tx** wires according to the wiring diagram below. Ensure compatibility with your specific controller model:
 - Some models have a regulated output supply.
 - Some models are galvanically isolated.
3. Join the **Tx** and **Rx** lines using a 2.4kΩ or 4.7kΩ resistor.
4. Avoid using the **Vcc** and **GND** wires if the ArduPilot is powered by an external regulated supply from the same battery as the speed controller.
5. Connect your autopilot to your PC and launch Mission Planner.

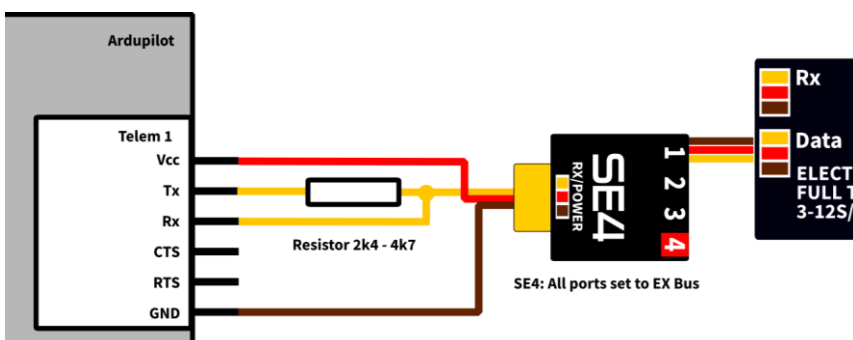
Single controller connection



Connect the ESC telemetry cable to your autopilot using this adapter. You will be able to observe the telemetry of a single controller.

Note: Remove the Vcc and GND wires from the controller if the ArduPilot is powered by an external regulated supply from the same battery as the speed controller.

Multiple controllers connection

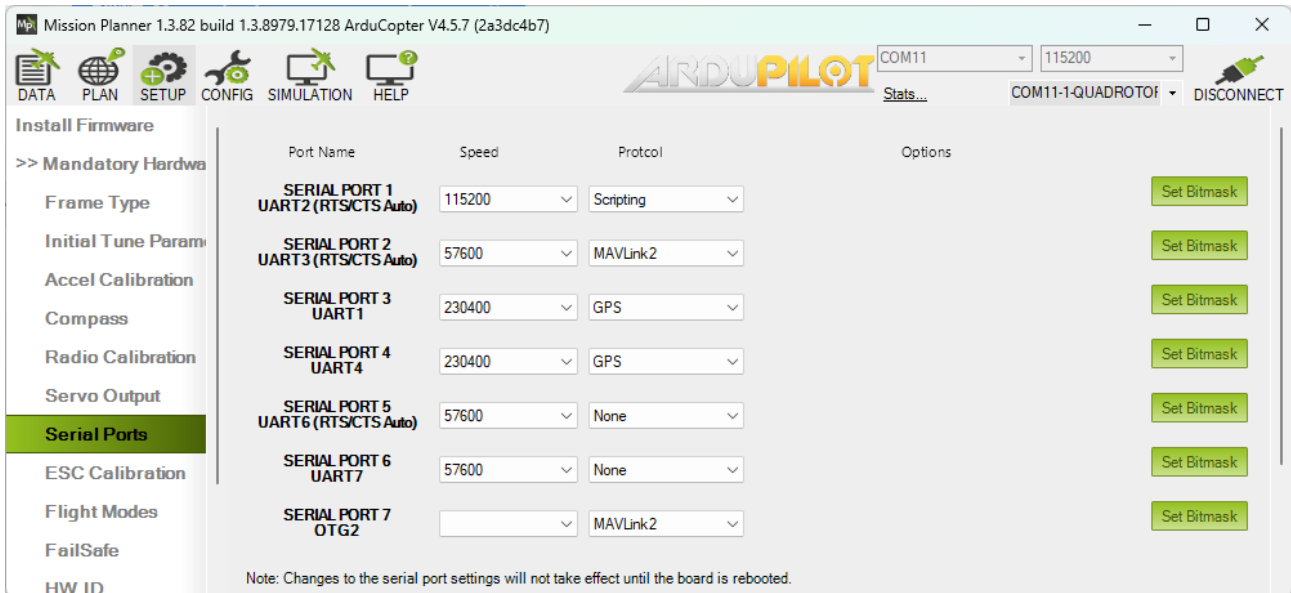


It is possible to observe the telemetry from up to 4 controllers. For this purpose, use the Telemetry expander, SE4, from our production. Install the latest firmware available for SE4, configure the device using MAV Manager to the device mode: **Ports 1-4: EX Bus**.

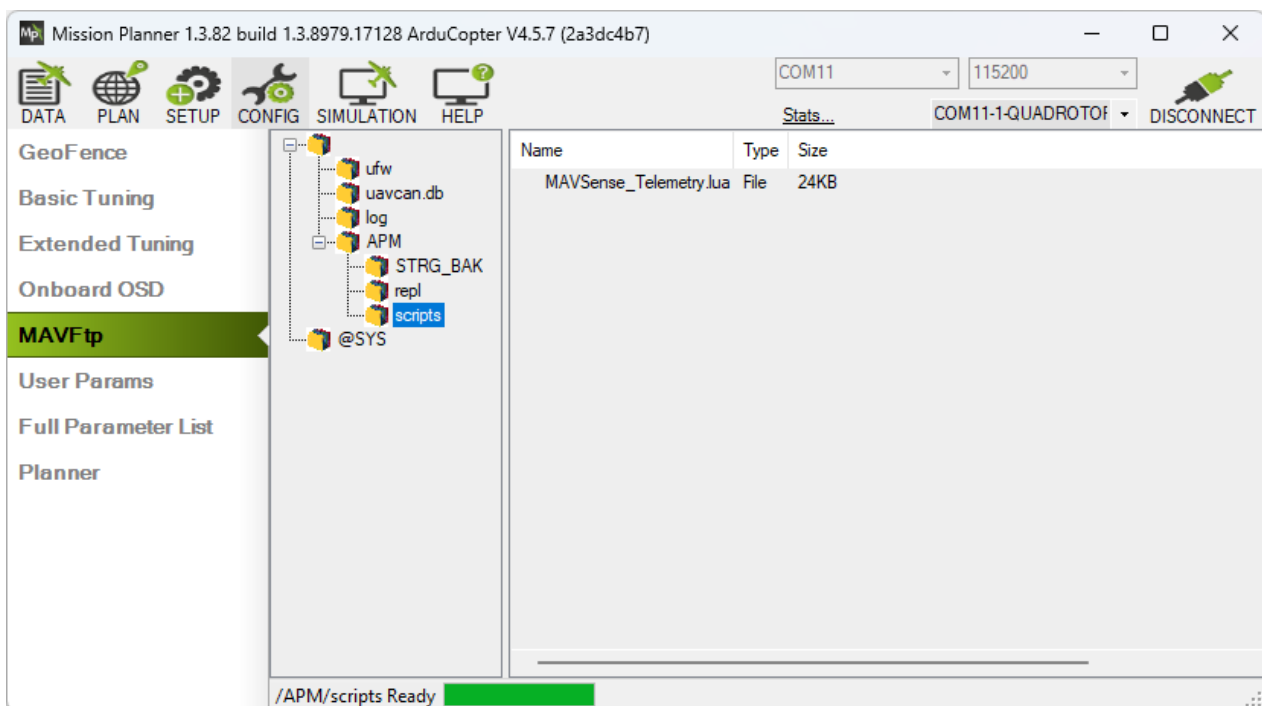
Note: Remove the Vcc and GND wires from the controller if the ArduPilot is powered by an external regulated supply from the same battery as the speed controller.

Software Connection

1. In Mission Planner, navigate to **Setup > Mandatory Hardware > Serial Ports** and set the port (e.g., SERIAL 1/ UART2) to use the **Scripting protocol (28)**.
 - Note: Do not activate half-duplex mode in the port options, even though the telemetry uses a half-duplex UART. Half-duplex processing introduces unacceptable latency.



2. Go to the **Config** menu and enable scripting:
 - Set **SCR_ENABLE** to 1.
 - Set **SCR_THD_PRIORITY** to 3 (UART priority).
3. Using MAVFtp, copy the script file `MAVSense_Telemetry.lua` to the **APM/scripts** folder. If the folder does not exist, create it.



4. Reboot the autopilot to apply the changes.
5. In the **Configuration** menu, enable the ESC MAVSense driver:
 - Set **ESC_MAVS_ENABLE** to **1** and reboot again.
6. Verify the setup:
 - Check the **Messages** window in Mission Planner for the message "ESC_MAVS: Driver loaded".
 - Confirm the speed controllers have been successfully detected.
 - In the **Status** window, telemetry values such as voltage, current, temperature, and RPM for ESC1 to ESC4 should be visible.

By following these steps, you can effectively manage the telemetry of IBEX speed controllers in ArduPilot. Proper telemetry integration provides real-time monitoring, which helps optimize performance and ensures system reliability.