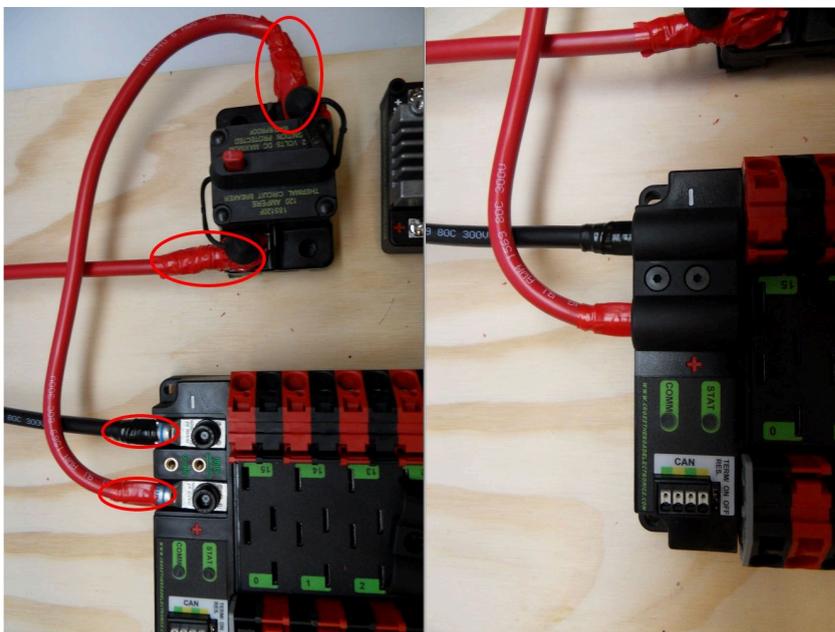


Wiring a robot is a very important process for the robot, as a small error can easily result in the robot malfunctioning. It involves connecting wires among the components of the robot.

All connections are critical and should be done carefully for the connection to be reliable and also to comply with FIRST® regulations. For example, as the game manual states, the cable that goes from the battery to the main breaker to PDH/PDP should have a specific length.

The most important connections for a robot are high-power cables, which are cables that are connected to more power-demanding components. There is a photo of the connection between the main breaker and PDH below, which is the most critical wire, since without it, there wouldn't be any power provided to PDH, therefore to any component.



This connection is **VERY CRITICAL** because it delivers power to all motors, controllers, and other devices. These cables must be of the correct gauge and length as defined by the regulations, and every connection must be tight and insulated properly. Any weak or loose connection in this circuit could cause voltage drops, overheating, or sudden power loss during operation — which can be critical in competition environments.

Alongside power, the communication network is equally important. Many modern robots use a **data bus** system to allow electronic components to share information in real time, and for FRC robots, this is mostly the CAN Bus Interface. CAN bus cables are one of the most important things in wiring, if any CAN interface component exists in the robot besides RoboRIO. CAN bus is a way of communication between components that uses CAN bus interface like CANivore, CANcoder, and Pigeon.. This network connects sensors, controllers, and feedback devices through a single line of communication, reducing wiring complexity but requiring careful attention to connection order, polarity, and termination. If these connections

are made incorrectly or left loose, the robot can lose communication between subsystems, resulting in erratic or unsafe behavior.

Good wiring is not just about making connections — it's about organization and reliability. Wires should be neatly routed, secured with cable ties, and labeled clearly for troubleshooting. Avoiding sharp bends, keeping power and data lines separated to prevent interference, and protecting cables from strain or damage are all standard practices. A clean and methodical wiring layout not only improves performance and safety but also makes maintenance and inspections far more efficient.

In conclusion, wiring a robot is the step where attention directly equals to performance. Power must be always reliable, communication must remain stable, and every connection must be deliberate and secure — because in robotics, a single wire can decide whether the system works flawlessly or fails completely.