

Mechanical

Panel-to-Tube Attachment

Panels are equipped with one steel converter plate on each of the lower-rear corners. Refer to **Figure 1** and the **QVN-1000 Series Panel Basics Quick Guide (DD3962224)** for more details. The plates provide holes and threads to self-drill the panel to the tube and to jack the panel away from the tube (approximately 1/4" [6.35 mm]) with an M6 bolt if Z-axis adjustment is needed.

**Figure 2** shows standard panel-to-tube attachment. If there is bolt head interference at the standard location, use the attachment pattern shown in **Figure 3**.

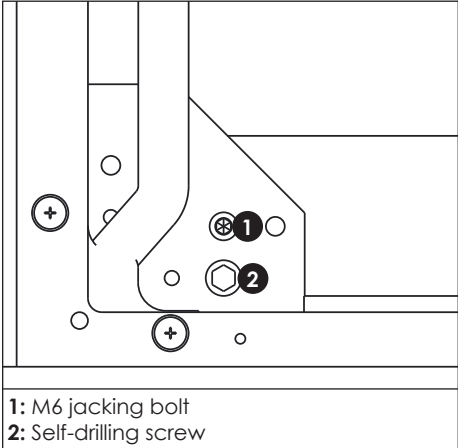


Figure 2: Standard Panel-to-Tube Attachment

These steps provide only a general overview of panel-to-tube attachment. Refer to **Panel Installation (p.1)** for more detailed instructions.

1. Insert one self-drilling screw and one M6 jacking bolt in the lower-left and lower-right corners on each panel. Refer to **Figure 2**.
2. Insert one self-drilling screw and one M6 jacking bolt in the upper-left and upper-right corners on each panel in the top row of panels only.
3. Use the alternate mounting holes as shown in **Figure 3** to secure a panel if a tube-to-wall mounting bolt head interferes with the standard mounting hardware.

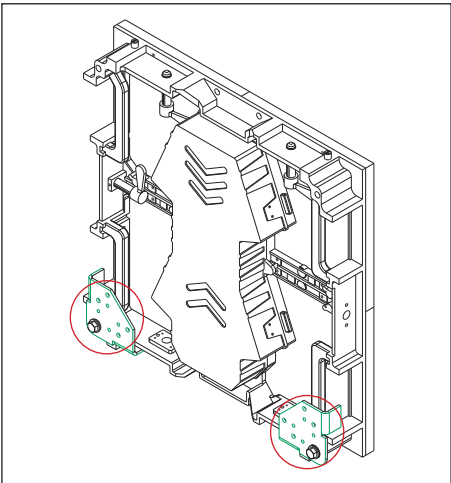


Figure 1: Panel Rear

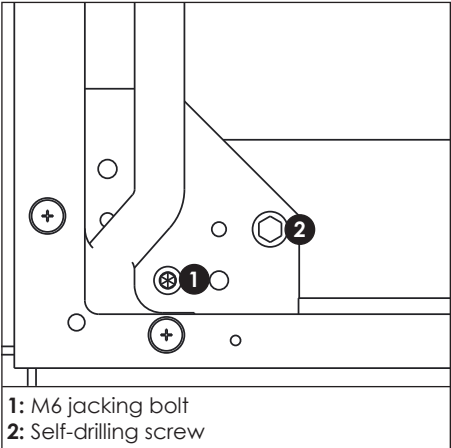


Figure 3: Alternate Panel-to-Tube Attachment

Panel Installation

**Note:** Use a level through this section to verify each panel is level in the X and Y directions.

Panels have four modules as shown in **Figure 4**.

1. Start the first panel (with the modules removed) at the middle of the bottom tube. Refer to **Figure 5**. Use a straight edge to position the panel so the bottom is flush with the bottom of the tube and does not hang below the bottom of the tube by more than 1/4" [6.35 mm]. The left and right edges of the panel should align with the dashed vertical lines created with the interference jig.

**Note:** This step is easiest with three people.

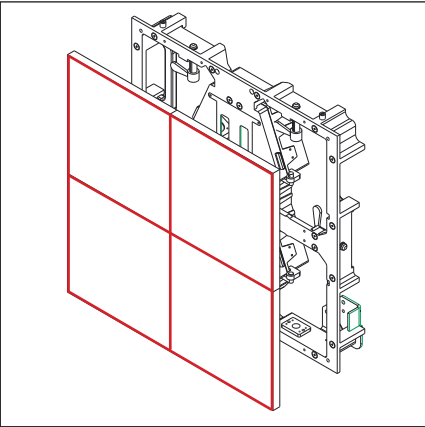


Figure 4: Modules on Panel

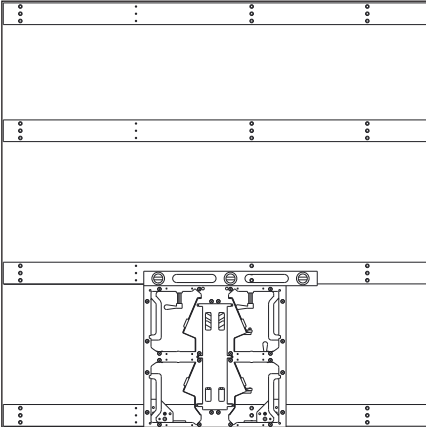


Figure 5: Install First Panel

2. Use a level to verify the panel is level in the X and Y directions.
3. Mark the location of the lower-left self-drilling screw. Drill a 13/64" [5.16 mm] pilot hole.
4. Mark the location of the lower-right self-drilling screw while the panel is level. Drill a 13/64" [5.16 mm] pilot hole.
5. Start the attachment of the self-drilling screws in both pilot holes, but do not tighten the screws down all the way.
6. Hand-bend an installation jig plate (Daktronics part number 0M-3921813) to a 90° angle. Refer to **Figure 6**. Slide the slot in the jig plate around the pin on the interconnect latch and temporarily secure the plate in place with a self-drilling screw. Refer to **Figure 7**.

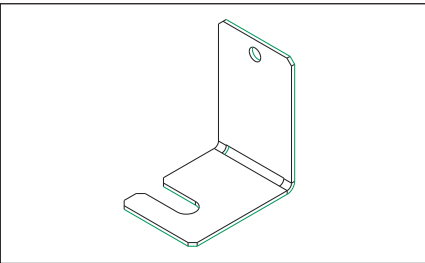


Figure 6: Hand-Bend Jig Plate

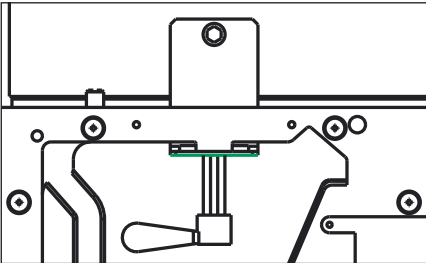


Figure 7: Secure Jig Plate

7. Place the second panel next to the existing panel.
8. Engage the interconnect hardware between the panels with the Y-axis handle turned down and the X-axis handle turned right. When the hardware is engaged to the spring mechanism, tighten the hardware a 1/4 turn to secure.
9. Check the panel alignment top-to-bottom to ensure the panels are level.
10. Clamp the panels together with two C-clamps, one at the top and one at the bottom. Refer to **Figure 8**.

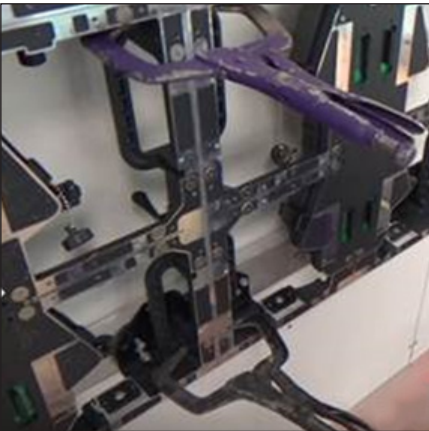


Figure 8: Clamp Panels Together

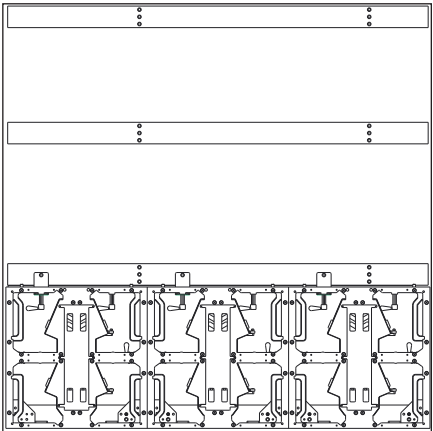


Figure 9: Install Bottom Row of Panels

11. Mark the self-drilling screw holes. Remove the panel and drill the 13/64" [5.16 mm] pilot holes.
12. Install the M6 jacking hardware until it touches the horizontal stringer.
13. Install the self-drilling screws.
14. Repeat **Steps 5-13** for each panel in the row, ensuring the machined surfaces are as flush as possible. Refer to **Figure 9**.
15. Start on the next row after the bottom row is completed, working from the center out. Remove the self-drilling screws that are temporarily securing the installation jig plates and transfer the jig plates to the next panel up when the bottom connections of the panel are started. Refer to **Figure 10**.

**Note:** The jig plate prevents the latches from engaging if it is not removed before the panel above is installed. Use jig plates for every row.

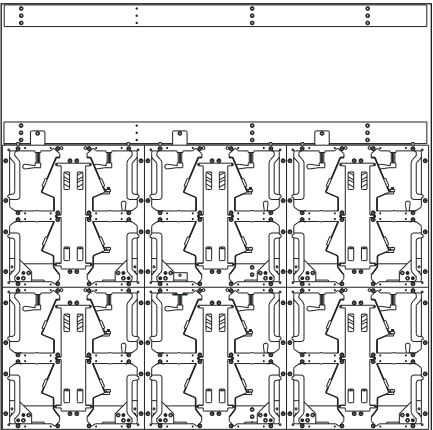


Figure 10: Install Second Row of Panels



16. Continue attaching panels up to the top row. Use M10 hardware to attach a steel converter plate on each of the upper corners in the top row before installing the panels. Refer to **Figure 11**.

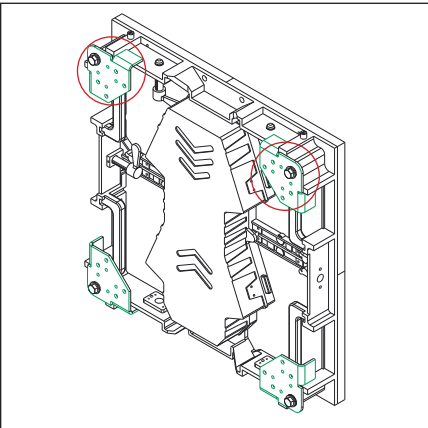


Figure 11: Install Converter Plates

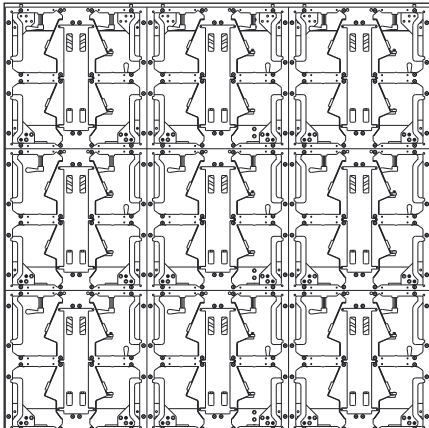


Figure 12: Install Tubes

17. Self-drill through all four corner locations to secure the top row of panels. Refer to **Figure 12**.
18. Use a level after all panels are up and the hardware is started to verify the panels are all plumb, flat, and level to each other in the X, Y, and Z directions. Use the jacking hardware in the front-installation converter plate to brace the panels away from the tubes by no more than 1/4". After verified, tighten down the hardware in all applicable corners.

Electrical

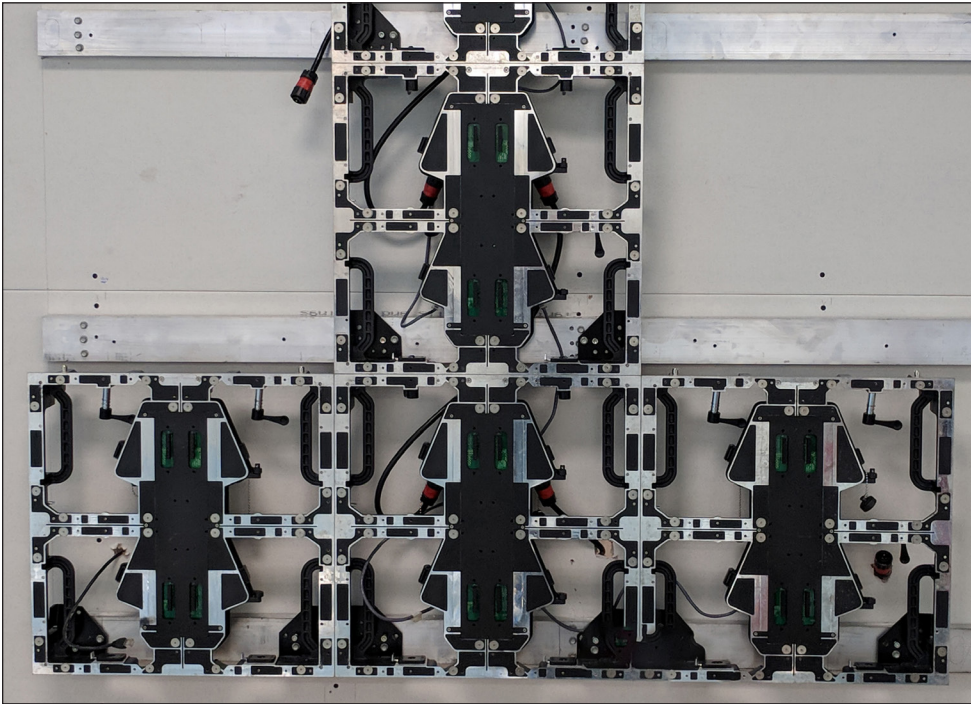


Figure 13: Standard Panel

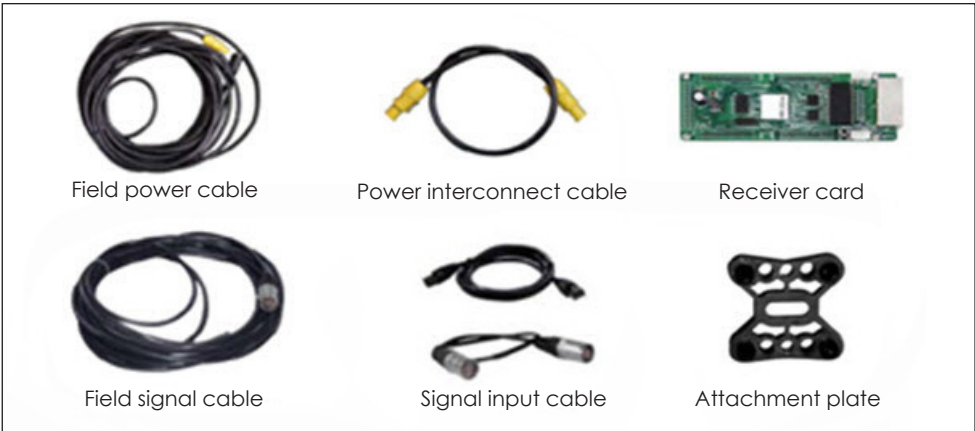


Figure 14: Accessories

Signal Connection

A DVI cable connects a computer located in the control room to a sending box. Some sending boxes may have additional signal input options, such as HDMI and SDI. The sending box passes signal via a Cat 5e/Cat 6 cable into the receiver card located inside the first panel. Each panel has a receiver card, and Cat 5e/Cat 6 cables daisy-chain the receiver cards together. The last panel can connect back to the sending box for redundant data to the receiver cards if desired.

1. Connect the sending box to the computer with a DVI cable. Refer to **Figure 15** and **Figure 16**.

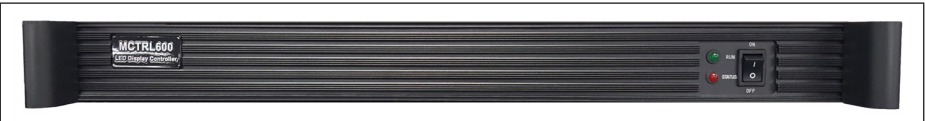


Figure 15: Sending Box Front



Figure 16: Sending Box Rear

2. Connect a Cat 5e/Cat 6 cable from the sending box RJ45 output jack to the RJ45 quick connect jacks on the receiver card in the first panel. Refer to **Figure 16**, **Figure 17**, and the contract-specific Riser Diagram.



Figure 17: Cat 5e/Cat 6 Cable

**Note:** The maximum cable distance from the sending box to the first receiver card is 328.08' [100 m]. For installations exceeding this distance, use a fiber converter to convert the Cat 5e/Cat 6 cable to a fiber cable, which offers an additional 984.25' [300 m] with multi-mode fiber or up to 9.32 mi [15 km] with single-mode fiber. Two fiber converters can be used to convert the cable to a fiber cable and then back to a Cat 5e/Cat 6 cable. The cable can connect to the first panel. Use additional cables to connect to the next panel. Refer to **Figure 18** and **Figure 19**.

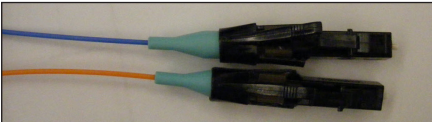


Figure 18: Fiber Cable

3. Route the Cat 5e/Cat 6 cable from the signal output jack to the signal input jack on the next panel. Refer to **Figure 20** and the Riser Diagram.



Figure 19: Fiber Converter

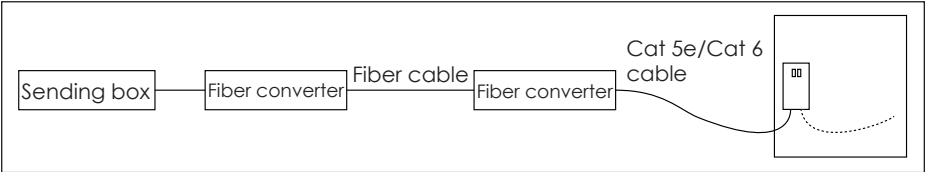


Figure 20: Route Cable

**Note:** Routing may vary based on converter type.

4. Connect the last panel back to the sending box for redundant signal connection if desired.
5. Refer to the **NovaStar® LED Display Control System M3 User's Manual** for details on how to configure the system and run the display.

Refer to **Figure 21** for an example of four panels connected together.

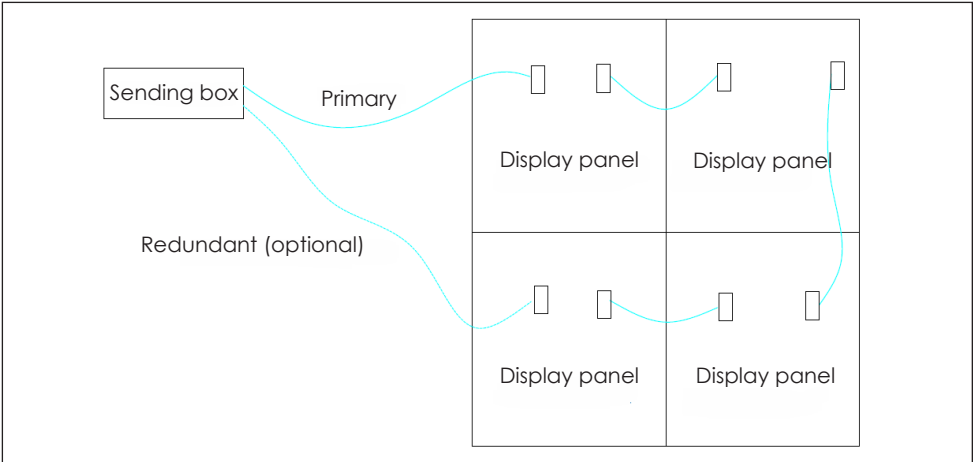


Figure 21: Connect Signal



Power Connection

Most standard panels include power quick connects with pre-terminated connectors at each end.

Power interconnect cables are shipped with the displays. Every six panels require a new field power input cable. Refer to the contract-specific Riser Diagram for more details.

The main field power input cable has a pre-terminated connector at one end and bare wires at the other end. Both vertical and horizontal interconnects are available. Refer to **Figure 22**.

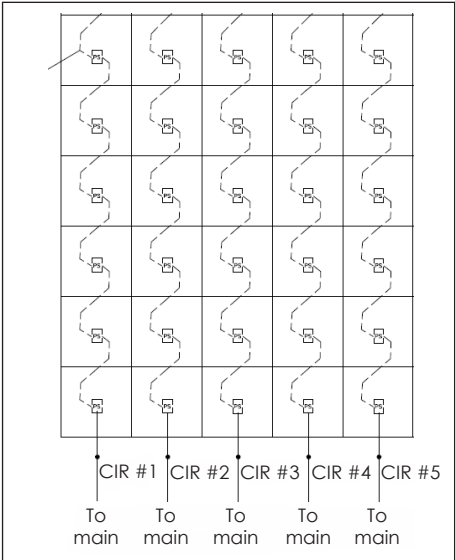


Figure 22: Interconnect Sections

Service

Remove Module

1. Disconnect power to the display.
2. Turn the knob on the module removal tool clockwise to disengage the tool. Refer to **Figure 23**.
3. Center the tool on the face of the module to be removed.
4. Turn the knob on the tool counterclockwise to engage the magnets. Refer to **Figure 23**.
5. Pull the module straight out until it disengages from the display face.

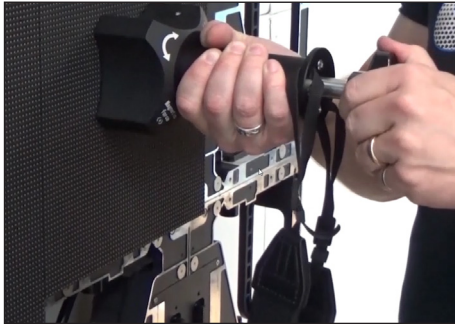


Figure 23: Remove Module

Reverse these steps to install a module.

Remove Front-Access Plate

1. Disconnect power to the display.
2. Use the module removal tool to remove the modules from the panel to be serviced. Refer to **Remove Module (p.3)**.
3. Use a Phillips screwdriver to loosen the six screws securing the front-access plate to the panel. Refer to **Figure 24**.
4. Pull the plate gently and clip any zip ties securing the cables in place to allow the plate to be fully removed.

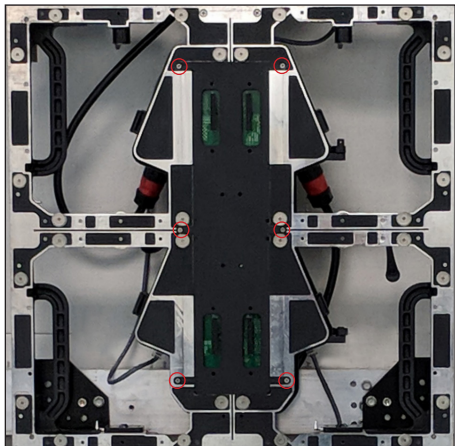


Figure 24: Loosen Six Screws

Reverse these steps to install a front-access plate.

Remove Power Supply

1. Disconnect power to the display.
2. Remove the front-access plate on the panel to be serviced. Refer to **Remove Front-Access Plate (p.3)**.
3. Use a Phillips screwdriver to loosen and remove the power cables extending from the power supply.
4. Use a Phillips screwdriver to remove the screws securing the power supply to the panel.

Reverse these steps to install a power supply.

Remove Hub Board/Receiver Card

1. Disconnect power to the display.
2. Remove the front-access plate on the panel to be serviced. Refer to **Remove Front-Access Plate (p.3)**.
3. Disconnect the Cat-5 cables from the RJ45 jacks on the hub board. Refer to **Figure 25**.
4. Disconnect the power supply from the hub board. There are two ways to do this:
  - Use a Phillips screwdriver to loosen the connections on the power supply and disconnect the cables extending from the board. Refer to **Figure 26**.

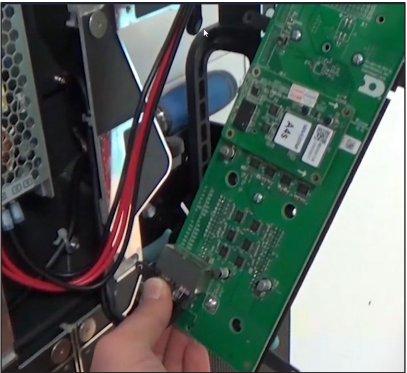


Figure 25: Disconnect Cat-5 Cables from RJ45 Jacks

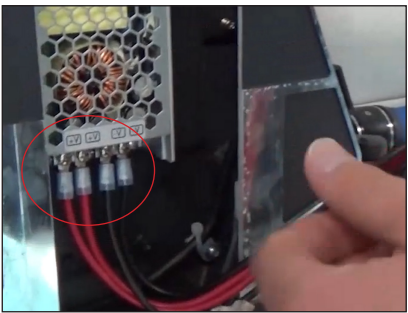


Figure 26: Disconnect Cables from Power Supply

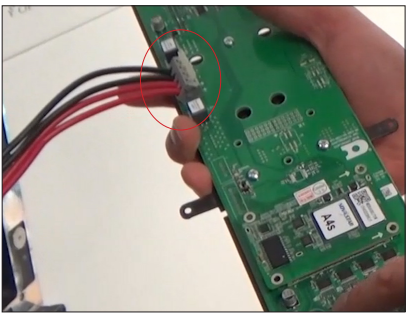


Figure 27: Disconnect Cables from Terminal Block

- Push in the positions on the spring-loaded terminal block and disconnect the cables extending from the board. Refer to **Figure 27**.
5. Use a Phillips screwdriver to remove the screws securing the hub board to the front-access plate.
  6. Use a Phillips screwdriver to remove the screws securing the receiver card to the hub board if necessary.

Reverse these steps to install a hub board.