

Electrical

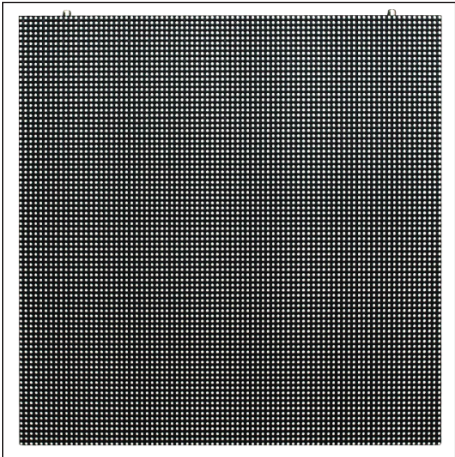


Figure 1: Standard Panel Front

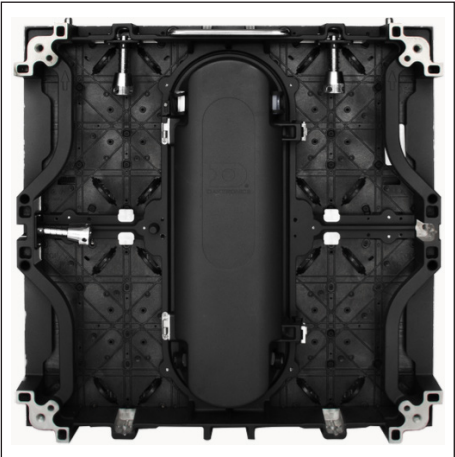


Figure 2: Standard Panel Rear

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 3** and **Figure 4**.



Figure 3: Sending Box Front



Figure 4: Sending Box Rear

2. Connect a Cat 5e/Cat 6 cable from the sending box RJ45 output jack to the RJ45 receptacle input in the first panel. Refer to **Figure 5** and the contract-specific Riser Diagram.



Figure 5: Cat 5e/Cat 6 Cable

**Note:** The maximum cable distance from the sending box to the first receiver card is 328' [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' [300 m] with multi-mode fiber or up to 9.3 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 6** and **Figure 7**.

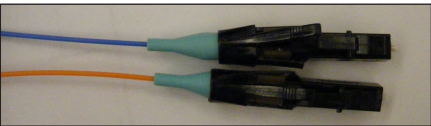


Figure 6: Fiber Cable



Figure 7: Fiber Converter

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 8** and the Riser Diagram.

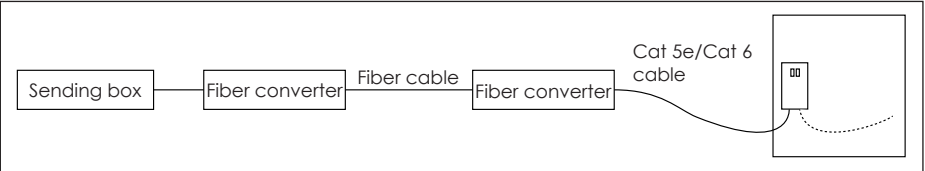


Figure 8: Route Cable

**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 9** for an example of four panels connected together.

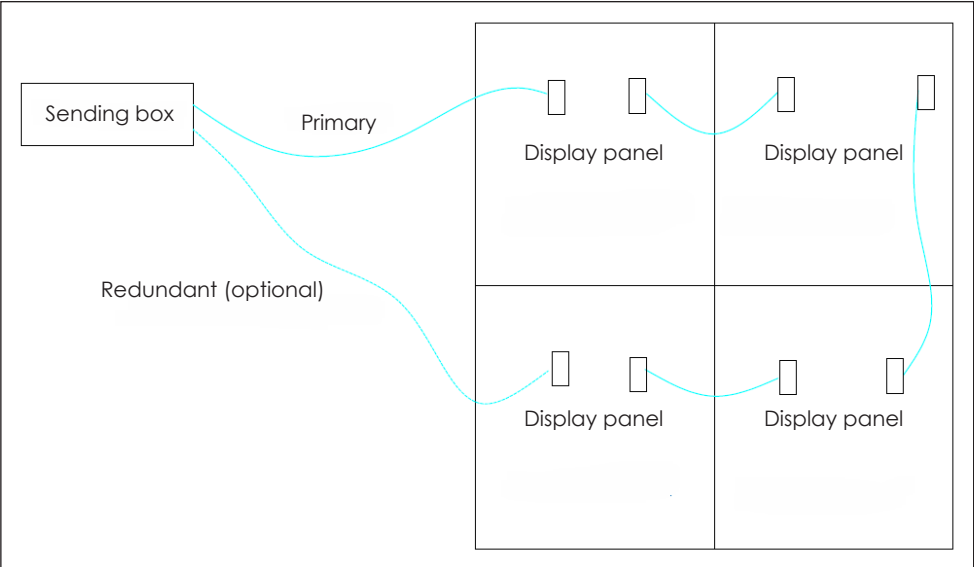


Figure 9: Connect Signal

Power Connection

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

Power interconnect cables are shipped with the displays. 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 10**.

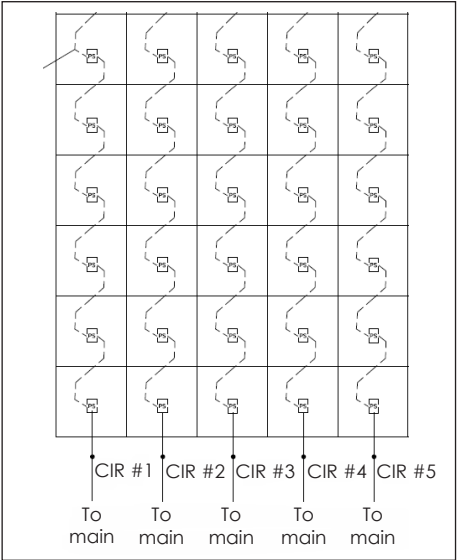


Figure 10: Interconnect Sections



Service

Module Removal

Front-Access Module Removal

**Note:** Refrain from attaching the module removal tool to any highly magnetic objects, as it is difficult to disengage the tool from these objects.

- 1. Disconnect power to the display.
- 2. Turn the knob on the module removal tool clockwise to disengage the tool.
- 3. Center the tool on the face of the module to be removed and turn the knob on the tool counterclockwise to engage the magnets. Refer to **Figure 11**.

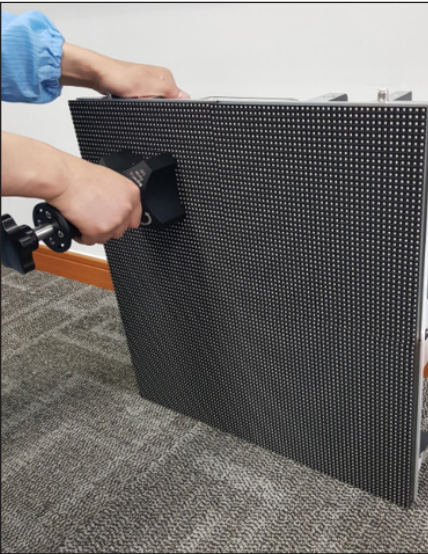


Figure 11: Center Magnetic Tool on Module

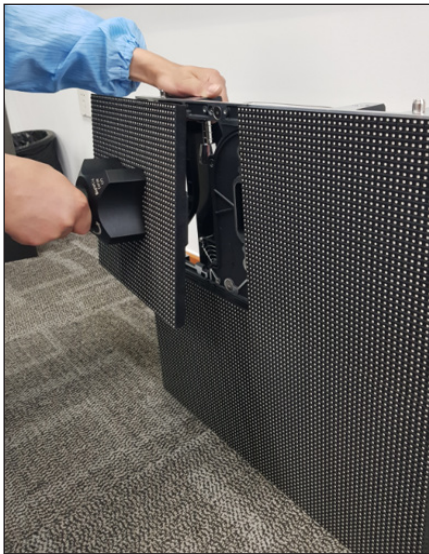


Figure 12: Remove Module from Panel

- 4. Pull the module straight out until it disengages from the display face. Refer to **Figure 12**. When the module is off the panel, hold onto the module and retract the magnet latch.
- 5. Repeat **Steps 2-4** for any modules being removed.

Reverse these steps to install a replacement module, ensuring the module lines up with the hub board sockets on the panel.

Rear-Access Module Removal

- 1. Disconnect power to the display.
- 2. Hold the handle on the rear of the module, push away from the display, and rotate the module to pull it through the opening in the panel. Refer to **Figure 13**.

For rear-access displays with optional magnetic latches, follow these steps:

- 1. Disconnect power to the display.
- 2. Retract the magnetic latches while holding the flip finger handle to unlock the module. Refer to **Figure 14**.
- 3. Push the module outward and rotate to bring it through the opening in the panel. Refer to **Figure 15**.

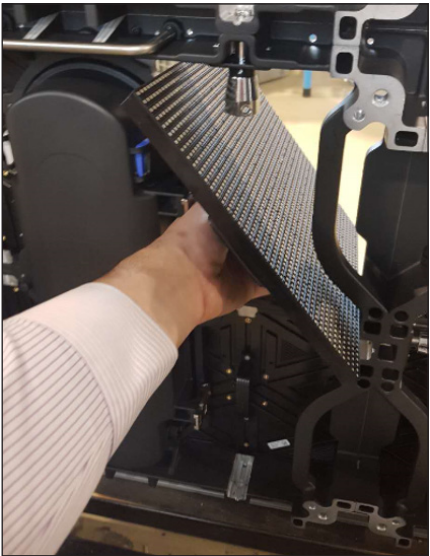


Figure 13: Rotate Module & Remove from Panel



Figure 14: Retract Magnetic Latches & Hold Flip Finger Handle



Figure 15: Rotate Module & Remove from Panel

Hub Board/Receiver Card & Power Supply Removal

Front-Access Hub Board/Receiver Card Removal

- 1. Disconnect power to the panel and remove the modules. Refer to **Module Removal (p.2)**.
- 2. Use a Phillips screwdriver to remove the eight backing plate screws and open the plate. Refer to **Figure 16** and **Figure 17**.

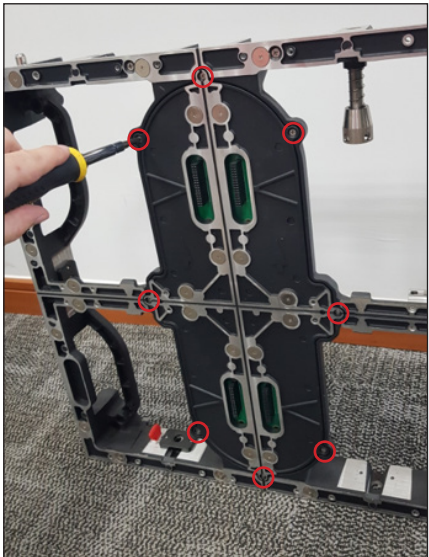


Figure 16: Remove Backing Plate Screws



Figure 17: Open Backing Plate

Rear-Access Hub Board/Receiver Card Removal

- 1. Unlatch and open the rear-access door. Refer to **Figure 18**.



Figure 18: Open Rear-Access Door

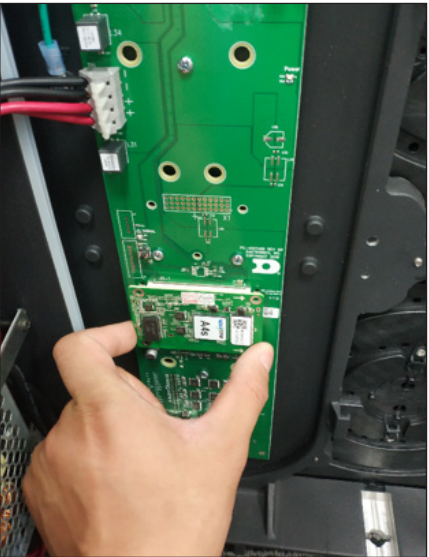


Figure 19: Remove Receiver Card

- 2. Remove the receiver card. Refer to **Figure 19**.



3. Disconnect the Cat 5 cables. Refer to **Figure 20**.



Figure 20: Disconnect Cat 5 Cables

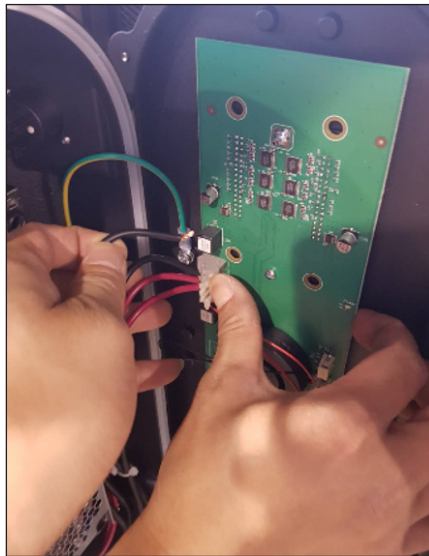


Figure 21: Disconnect Power Cables

4. Disconnect the power cables from the harness. Refer to **Figure 21**.
5. Use a Phillips screwdriver to remove the four mounting screws. Refer to **Figure 22**.

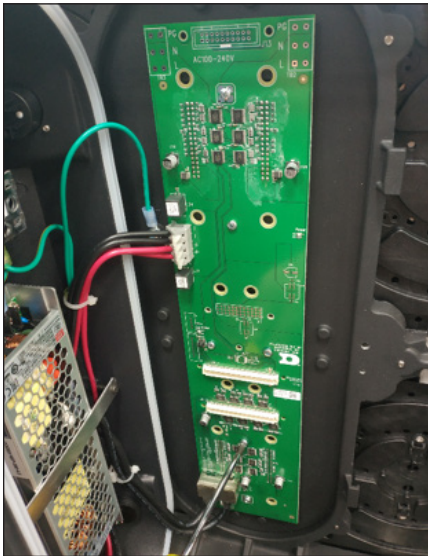


Figure 22: Remove Mounting Screws

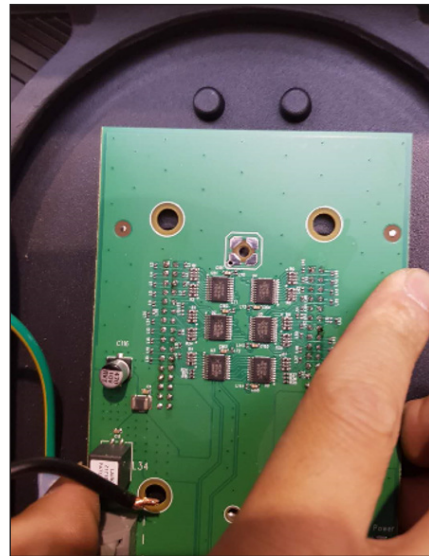


Figure 23: Line Up Pins on Hub Board

6. Line up the screw holes with the existing bosses so the pins on the hub board are correctly lined up before securing. Refer to **Figure 23**.

Rear-Access Power Supply Removal

1. Unlatch and open the rear-access door. Refer to **Figure 18**.
2. Disconnect the power harness. Refer to **Figure 24**.



Figure 24: Disconnect Power Harness



Figure 25: Remove Mounting Screws from Bottom Terminals

3. Use a Phillips screwdriver to remove the four mounting screws from the bottom terminals. Refer to **Figure 25**.
4. Use a Phillips screwdriver to remove the safety bar. Refer to **Figure 26**.

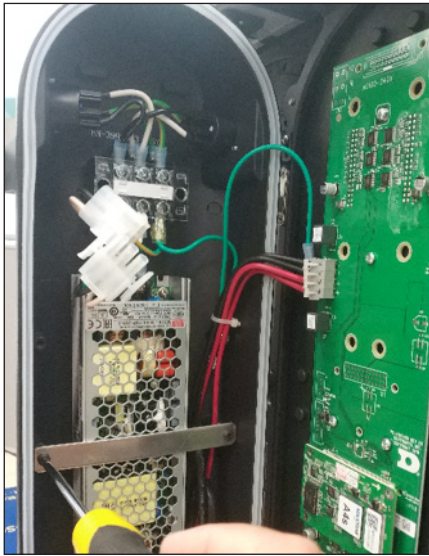


Figure 26: Remove Safety Bar

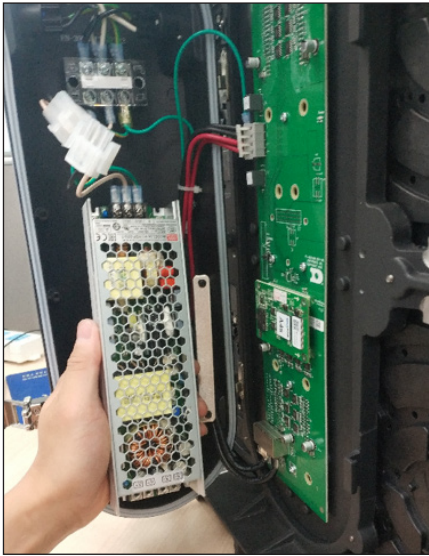


Figure 27: Remove Power Supply

5. Remove the power supply. Refer to **Figure 27**.

6. Remove the thermal pad from the old power supply and replace on the new power supply. Refer to **Figure 28**.

Reverse these steps to install a replacement power supply.

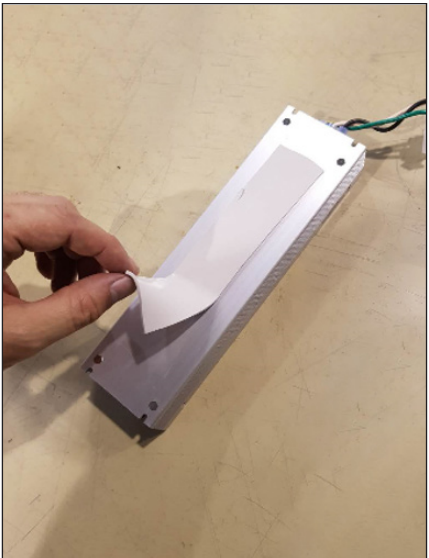


Figure 28: Remove Thermal Pad



Mechanical

Mounting Structure

Ensure the supporting structure for the display is plumb, horizontally level, and square before installing the display panels. Refer to **Structure Alignment Check (p.4)** for more information.

Structure Alignment Check

Drawings in this section are for illustrative purposes only. Content may be enlarged for better comprehension.

- 1. Inspect the level of the vertical sections by taking measurements of the horizontal intervals between vertical columns. Use at least three equally spaced horizontal measurements. Refer to **Figure 29**.

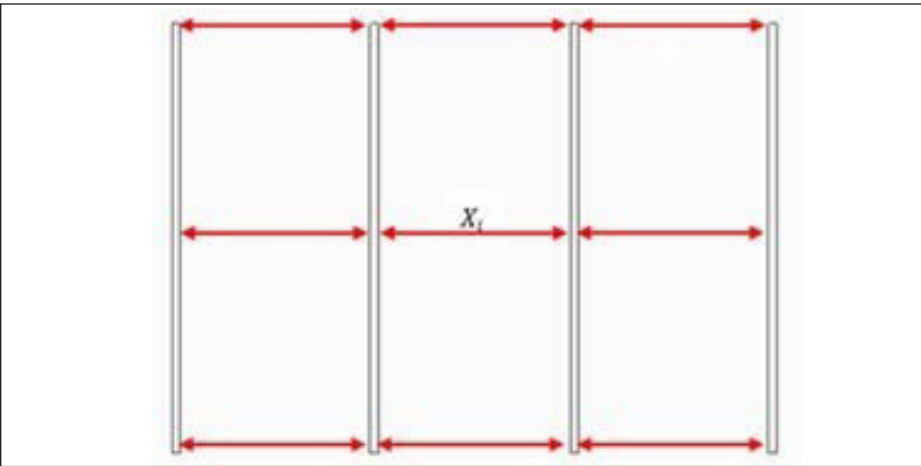


Figure 29: Vertical Level Verification (Front View)

If possible, adjust the structure or plan ahead for section adjustments while installing display panels if the difference between any two  $X_i$  measurements exceeds 5 mm.

- 2. Ensure the structure is plumb by placing a sufficiently long level attached to the top panel of the frame. Refer to **Figure 30**. If possible, adjust the structure or plan ahead for panel adjustments while installing the display sections if the value of  $\delta$  at the bottom of the structure exceeds 1 mm for each 1 m of the frame's height. For example, a 10 m high structure would have a  $\delta$  of 10 mm.
- 3. Verify if the structure is curved by placing a horizontal reference in the vertical bar with the furthest Z displacement when compared to the other bars. Refer to **Figure 31**. If possible, adjust the display sections if the difference between any two  $Z_i$  measurements exceeds 3 mm.

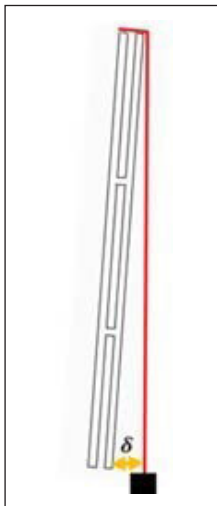


Figure 30: Plumb Verification (Side View)

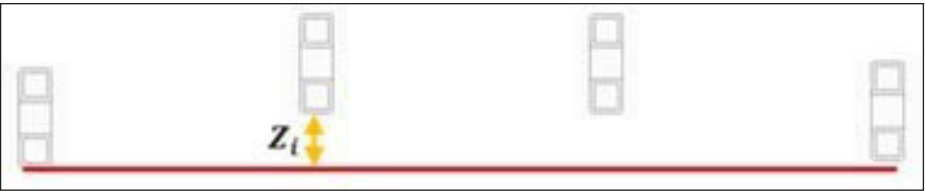


Figure 31: Flatness Verification (Top View)

Display Panels

- 1. Uncase the display panels and check the integrity of the panels. Check for any obvious deformation from transport.
- 2. Attach an angled metal section with a total length of two panels or more to the bottom of the metal structure with a C-clamp to support the first row. Ensure the metal support piece is horizontally level and plumb. Refer to **Figure 32** and **Figure 33**.

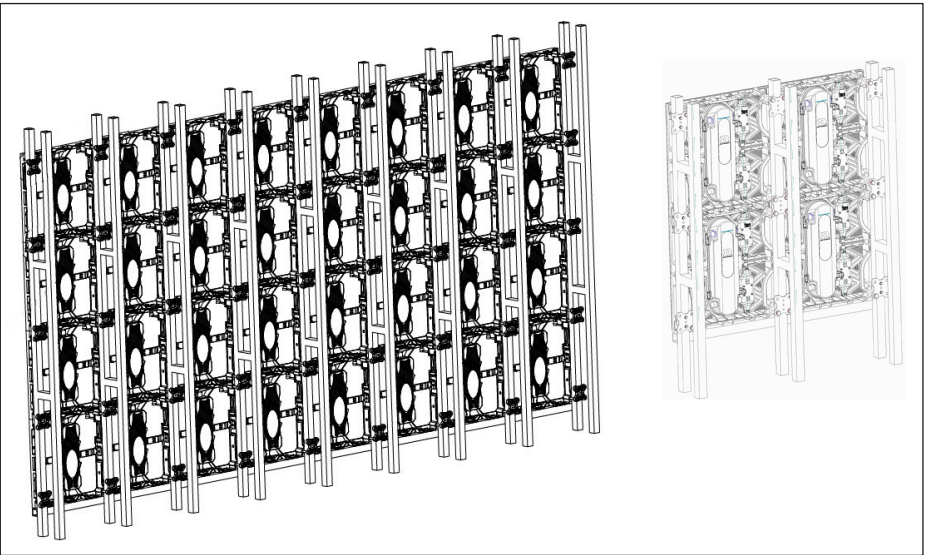


Figure 32: Angle Installed for First Row Alignment

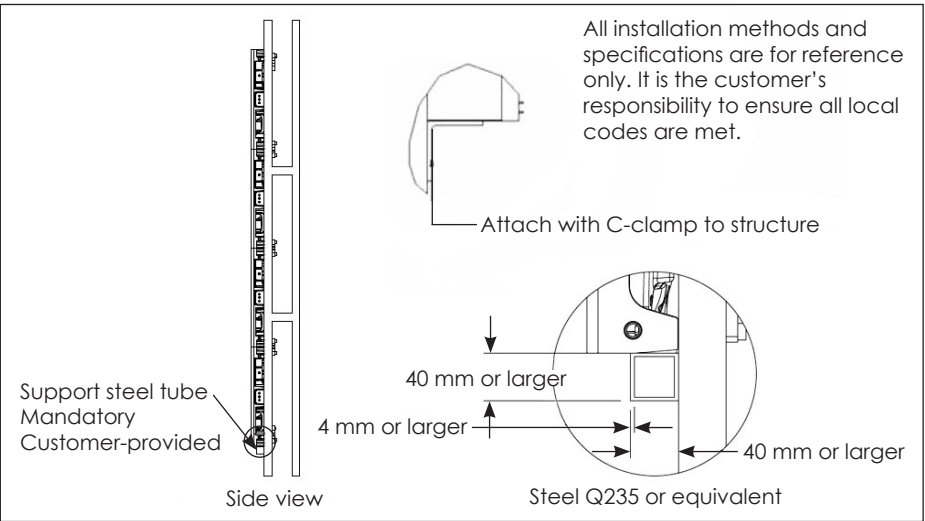


Figure 33: Angle Attachment to Structure

Panel Installation

- 1. Install the first two display panels on the horizontal structure.
- 2. Ensure the panels are level and plumb. Refer to **Figure 34**.



Figure 34: Ensure Panels Are Level & Plumb

Horizontal Connection

- 1. Lock panels together with a single quick lock on the left side of each panel. Refer to **Figure 35**.
- 2. Use a screwdriver to firmly tighten the lock.



Figure 35: Connect Panels Horizontally



Vertical Connection

- 1. Lock panels together with two quick locks on the top of each panel. Refer to **Figure 36**.
- 2. Use a screwdriver to firmly tighten the locks.

Panel Mounting

Front Installation

- 1. Install the supplied self-tapping screws in the corner of each panel into the vertical structure. Refer to **Figure 37**.  
  
Jacking bolts in each corner can be used to adjust the display face until it is flush. Refer to the contract-specific Shop Drawing for more details.



Figure 36: Connect Panels Vertically

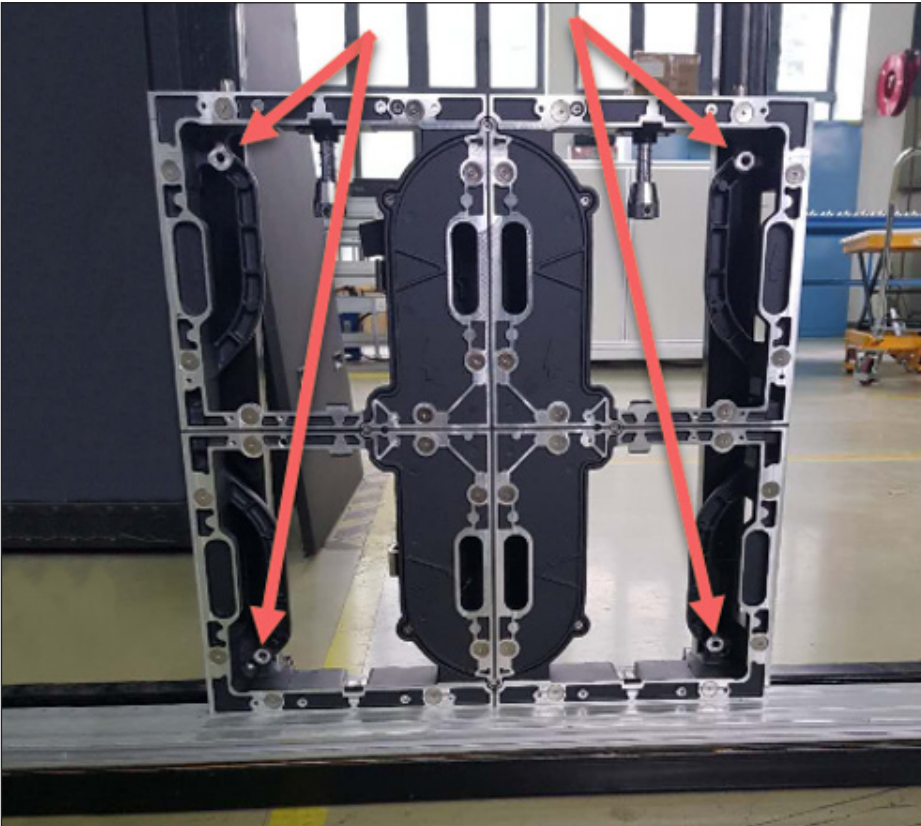


Figure 37: Panel Mounting from Front

Rear Installation

- 1. Install mounting plates on the rear of the panels after the panels are locked together and the face is flush. Refer to **Figure 38**. Panels should have a bolt attached in each corner.
  - a. Thread all bolts on each mounting plate with washers and lock washers.
  - b. Hand-tighten the bolts until they cannot be tightened any further, ensuring the mounting plate remains parallel with the display face.
  - c. Use a 17 mm wrench to tighten each bolt until the locker washer is compressed flat. Tighten all bolts evenly.
  - d. Use a 17 mm wrench to turn each bolt an additional quarter turn after all bolts are tightened and lock washers are flat.
- 2. Install two self-drilling screws into each bracket. Refer to the contract-specific Shop Drawing for more details.



Figure 38: Panel Mounting from Rear

**Note:** Shims can be placed between the vertical tube and the panels to ensure the panels are vertically plumb.