

NPN-X200/X400 SERIES

DAKT-0203-19 (NPN-X200)

DAKT-0203-21 (NPN-X400)

DISPLAY MANUAL

P2292

DD4787065
Rev 05
24 August 2023

FCC Statement

Supplier Declaration of Conformity (SDoC)

This product complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

Warning: The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

Industry Canada Regulatory Information

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Inquiries

Contact Daktronics with any questions regarding our product compliance.

Mail:

Daktronics
201 Daktronics Dr.
Brookings, SD 57006 USA

Phone:

800-325-8766

Website:

www.daktronics.com



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1 Introduction

How to Use This Manual

This manual explains the installation, maintenance, and troubleshooting of this video display system. For additional information regarding the safety, installation, operation, or service of this system, refer to the telephone numbers listed in **Daktronics Exchange and Repair & Return Programs (p.7)**. This manual contains only generic installation topics and is not specific to a particular installation. Contract-specific information takes precedence over any general information found in this manual.



Daktronics identifies manuals by the DD number located on the cover page of each manual. For example, this manual would be referred to as **DD4787065**.

Numbering Conventions

Drawing Numbers

Figure 1 illustrates a Daktronics drawing label. This manual refers to drawings by listing the last set of digits. In the example, the drawing would be referred to as **DWG-4756039**.

All references to drawing numbers, appendices, figures, or other manuals are presented in bold typeface, as shown in the example below:

REV:	DATE:	DESCRIPTION:	BY:
 <small>THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS WITHOUT THE EXPRESS WRITTEN CONSENT OF DAKTRONICS, INC. OR ITS FULLY OWNED SUBSIDIARIES. COPYRIGHT 2009 DAKTRONICS, INC. (USA)</small>			
PROJECT: NPN D1			
TITLE: RECOMMENDED TOOLS AND HARDWARE: NPN D1			
DATE: 07-JAN-21	DIM UNITS: INCHES (MILLIMETERS)		SHEET
SCALE: 1/8	DO NOT SCALE DRAWING		REV
DESIGN: KHEMILL	JOB NO.:	FUND - TYPE - SIZE:	4756039
DRAWN: KHEMILL	P2238	E - 07 - B	00

Drawing number

Figure 1: Drawing Label

Refer to **DWG-4756039** in **Appendix B: Reference Drawings (p.11)** for recommended tools and hardware.

Part Numbers

Most display components within a display carry a white label that lists the part number. The component part number uses the following format: 0A-XXXX-XXXX (multi-component assembly) or 0P-XXXX-XXXX (display interface board). **Daktronics Exchange and Repair & Return Programs (p.7)** contains the Daktronics Exchange Policy as well as the Repair & Return Program.

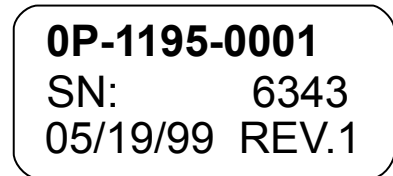


Figure 2: Typical Label

Refer to these instructions if any display components need replacing or repairing. **Figure 2** illustrates a typical label. The part number is in bold.

Part Type	Part Example	Part Number
Assembly	Display interface board and its mounting plate or bracket	0A-XXXX-XXXX
Individual display interface board	ProLink Router (PLR)	0P-XXXX-XXXX
Wire or cable	SATA cable	W-XXXX

Module Numbers

Figure 3 explains the module labeling method in more detail, and **Figure 4** illustrates how Daktronics numbers modules on a video display.

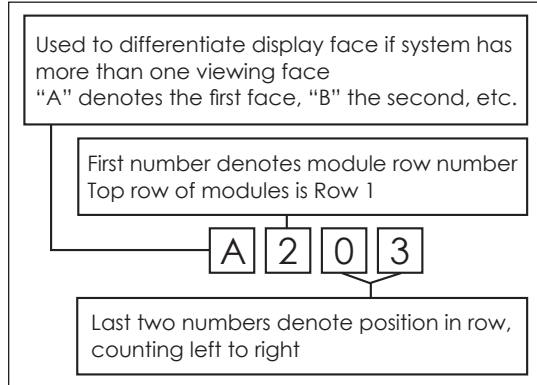


Figure 3: Module Numbering Breakdown



Figure 4: Module Numbering

Model Numbers

Each video display system has a model number that explains the display specifications.

NPN-X200-1.2/1.3/1.5/1.6/1.9/2.0/2.5-HHHxWWW NPN-X400-0.7/0.9/1.2/1.5-HHHxWWW		
NPN	=	Product series
X200 X400	=	Product generation
1.2/1.3/1.5/1.6/1.9/2.0/2.5 0.7/0.9/1.2/1.5	=	Pixel pitch/layout
HHH	=	Matrix height
WWW	=	Matrix width

Important Safeguards

- Read and understand the installation instructions before beginning the installation process.
- Do not drop the control equipment or allow it to get wet.
- Do not disassemble the control equipment or electronic controls of the display; failure to follow this safeguard will make the warranty null and void.
- Disconnect the display power when not in use or when servicing.
- Disconnect the display power before servicing the power supplies to avoid electrical shock. The power supplies run on high voltage and may cause injury if touched while powered.

2 Warnings/Disclaimers

Review the reference documents and drawings in **Appendix A: Reference Documents (p.9)** and **Appendix B: Reference Drawings (p.11)** prior to installation as well as during the installation process.

Display

Daktronics engineering staff must approve any changes that may affect the strength or protective integrity of the display frame or enclosures. If any modifications of this nature are made, detailed drawings of the change(s) must be submitted to Daktronics engineering staff for evaluation and approval, or the warranty will be null and void.

Displays must be lifted appropriately to ensure the display sections will not be damaged. It is the installer's responsibility to ensure the installation meets all local codes and standards. All hardware processes used during display installation must meet the approved, stamped drawings from a professional engineer.

The display is intended to be installed in accordance with the requirements of Article 600 of the National Electrical Code and/or other applicable local codes. This includes proper grounding and bonding of the sign.

Only qualified individuals should access the electrical components of this display and its associated equipment.

- Ensure that all electrical work meets or exceeds all local or national electrical codes.
- Provide the required power to the display as listed on the product labels, specifications, or site-specific riser drawings. The conductor size may vary based on the length of the power run.
- Consider implementing a separate circuit for the display using an isolation transformer or dedicated transformer.
- Daktronics assumes no liability for any issues caused by line voltage fluctuations or other improper power conditions.

Structure

It is the installer's responsibility to ensure the mounting structure and hardware are built per the stamped engineering drawings and are capable of supporting the display prior to beginning the installation.

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3 Glossary

Display interface (DI): an interface that drives video to the display while also dimming, providing gamma and color controls, and displaying test patterns.

Hub board: a display interface that distributes power and signal to modules in a panel.

Light emitting diode (LED): a low energy, high intensity lighting unit.

Module removal tool: a device that aids in removing a module from a panel by engaging the magnets.

Panel: the base building block for a display system. Each panel is comprised of two, four, or eight small modules with supporting electronics and power.

Pixel: the smallest single point of light on a display that can be turned on and off. For LED displays, a pixel is the smallest block of light emitting devices that can generate all available colors.

Power supply: a display component that converts AC line voltage from the termination panel to low DC voltage for one or more module driver boards. One power supply may power multiple modules.

ProLink Router (PLR) 6280: a data interface component that receives a signal from the display control system and converts and distributes the signal to individual panels. The ratio of PLRs to panels varies with display application.

ProLink Router (PLR) enclosure: an assembly of machined parts that houses a PLR.

Receiver card: a data distribution component that receives information from a PLR or sender box and distributes the information through a hub board to modules in a panel. The receiver card mounts to the hub board.

Termination block: an electrical point usually used to connect internal power and signal wires to wires of the same type coming into the display from an external source.

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4 Replacement Parts

Replacement Parts List

Most display components have a white label that lists the part number in bold. Refer to **Part Numbers (p.1)** for information on how to read the part number. Part numbers may also appear on illustrations and reference drawings as well as in the Bill of Materials (BOM) for the project. If a replacement part cannot be identified, contact Daktronics Customer Service. The following is a list of components that are commonly replaced: PLR (ProLink Router), receiver card, power supply, and hub board.

Daktronics Exchange and Repair & Return Programs

To serve customers' repair and maintenance needs, Daktronics offers both an Exchange Program and a Repair & Return Program.

Exchange Program

Daktronics unique Exchange Program is a quick service for replacing key parts in need of repair. If a part requires repair or replacement, Daktronics sends the customer a replacement, and the customer sends the defective part to Daktronics. This decreases display downtime.

Before contacting Daktronics, identify these important part numbers:

Display Serial Number: _____

Display Model Number: _____

Contract Number: _____

Installation Date: _____

Sign Location: _____

Daktronics Customer ID Number: _____

To participate in the Exchange Program, follow these steps:

1. Call Daktronics Customer Service.

Market Description	Customer Service Number
Schools (primary through community/junior colleges), religious organizations, municipal clubs, and community centers	877-605-1115
Universities and professional sporting events, live events for auditoriums, and arenas	866-343-6018
Financial institutions, petroleum, sign companies, gaming, and wholesale/retails establishments	866-343-3122
Department of Transportation, mass transits, airports, and parking facilities	800-833-3157

2. Mail the old part to Daktronics when the new exchange part is received.

If the replacement part fixes the problem, send in the problem part which is being replaced.

- a. Package the old part in the same shipping materials in which the replacement part arrived.
- b. Fill out and attach the enclosed UPS shipping document.
- c. Ship the part to Daktronics.

Daktronics will charge for the replacement part immediately, unless a qualifying service agreement is in place. In most cases, the replacement part will be invoiced at the time it is shipped.

3. Return the part within 30 working days if the replacement part does not solve the problem, or Daktronics will charge the full purchase price.

If the part is still defective after the exchange is made, please contact Daktronics Customer Service immediately. Daktronics expects immediate return of an exchange part if it does not solve the problem. Daktronics also reserves the right to refuse parts that have been damaged due to acts of nature or causes other than normal wear and tear.

Repair & Return Program

For items not subject to exchange, Daktronics offers a Repair & Return Program. To send a part for repair, follow these steps:

1. Call Daktronics Customer Service.

Refer to the telephone number listed on the previous page.

2. Receive a Return Materials Authorization (RMA) number before shipping.

Refer to the telephone number listed on the previous page.

3. Package and pad the item carefully to prevent damage during shipping.

Electronic components, such as printed circuit boards, should be placed in an antistatic bag before boxing. Daktronics does not recommend packing peanuts when shipping.

4. Enclose the following information:

- Name
- Address
- Phone number
- RMA number
- Clear description of symptoms

Shipping Address

Daktronics Customer Service
600 E 54th St N
Sioux Falls, SD 57104
Case #

A Reference Documents

These documents detail structure installation options:

- **NPN-X200/X400 Series Speed Frame Substructure and Panel Quick Guide (DD5075265)**
- **NPN-X200/X400 Series 1x4 Vertical Tube Substructure and Panel Quick Guide (DD4824308)**

This document details custom panel positioning:

- **NPN-X250/X450 Panel Positioning Jigs Quick Guide (DD5081046)**

Use the following documents in the order listed:

- **NPN-X200/X400 Series Panel Basics Quick Guide (DD4824317)**
- **NPN-X200/X400 Series Electrical Install and Service Quick Guide (DD4823877)**
- **NPN-X200/X400 Series Border Installation Quick Guide (DD4825251)**

This document details 3R Remote Power installation:

- **NPN-6X00 3R Remote Power Quick Guide (DD5132012)**

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Custom-Request Plywood Substrate Option

If a custom request was made for plywood wall substrate, then the hollow bolts in the speed frames must be replaced to accommodate the larger $\frac{5}{16}$ " lag bolts (Daktronics part number HC-5100786) needed for attachment to plywood.

Remove the standard hollow bolts (HC-5098752) and replace with the hollow bolts needed for the plywood fasteners (HC-5098762). Refer to **Figure 1**.

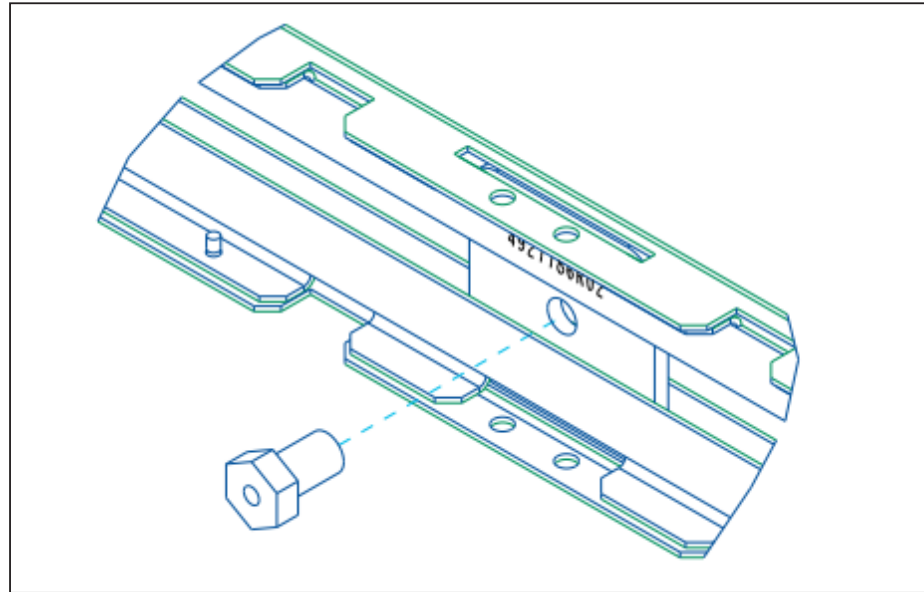


Figure 1: Remove Standard Bolts and Install Custom Bolts

The difference between the hollow bolts are the through-hole diameters. Refer to **Figure 2**.

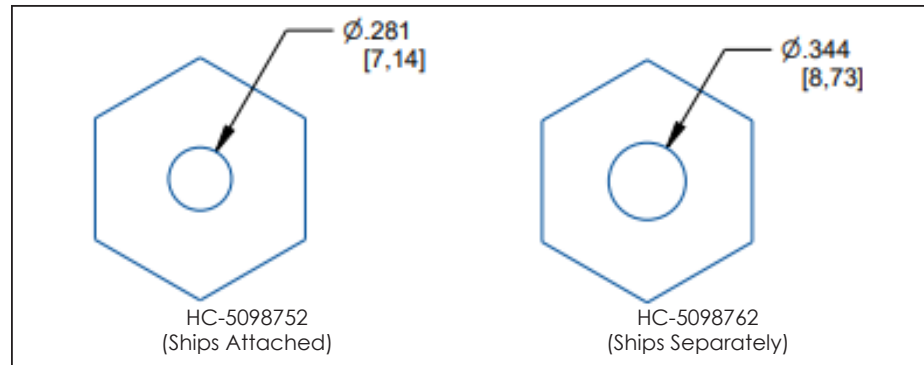


Figure 2: Comparison of Standard and Custom Hollow Bolts

Frame Installation

Install First Frame

Note: These steps are easiest with two to three people.

1. Identify the stud locations on the wall and mark the top, middle, and bottom of the studs. Use a level to draw lines the height of the display and mark the studs.
2. Identify the position of the bottom-center frame.

3. Cut the zip ties from the first frame. Test each bolt assembly to verify that it slides freely.

Note: If the assembly binds, tap a hammer on the side of the steel plate to break it loose.

4. Mark the location for the perimeter of the frame on the wall. Use this mark to position the first frame. Hold the frame in place on the wall and use a 4' digital level on the top and sides of the frame while positioning it. Refer to **Figure 3**.

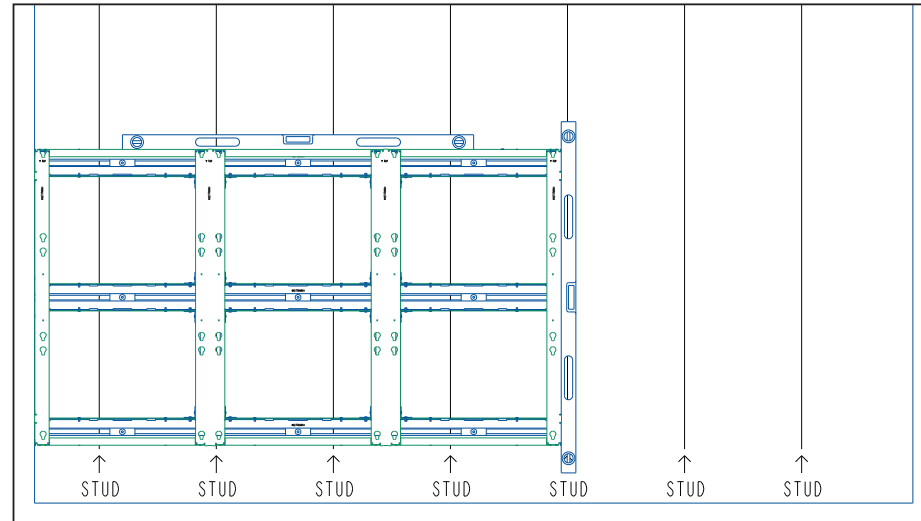


Figure 3: Position Frame on Wall

5. Slide the bolt assemblies to the nearest stud lines.
6. Depending on site-specific conditions, attach the frame to the substrate using TEK screws (HC-3979953), Spax screws, or lag screws. Install the screws through the hollow bolts into the respective studs. Start with the frame corners first, and fill in remaining available screws. Refer to **Figure 4**.

Note: Do not tighten the screws.

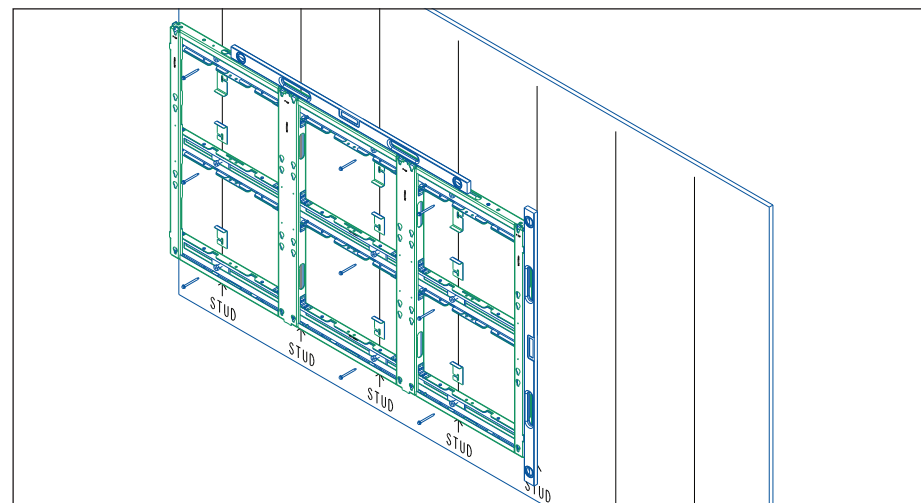


Figure 4: Install TEK Screws in Remaining Bolt Assemblies

7. Install the brace plate (0M-4951150) after starting a screw in the stud.

Note: Ensure that the brace plate is positioned on the screw and lands between the wall and the tip of the hollow bolt. The brace plate provides a strong surface to adjust the Z-axis position of the frame. If the brace plate is not placed properly, the tip of the hollow bolt will cut and sink into the wall material.

8. Tighten the screws until the frame is fixed in place.
9. Use a level on the top and side of the frame and repeat **Steps 6** and **7** for the remaining bolt assemblies.
10. Place a level on the face of the vertical members in the frame to ensure the frame is plumb and level. Adjust the Z-position of the frame as needed. Refer to **Adjust Frame Z-Position (p.1)**.

Note: Ensure the frame position aligns to the marked location on the wall.

Adjust Frame Z-Position

1. Identify the bolt assembly locations to adjust away from the wall. Refer to **Figure 5**.

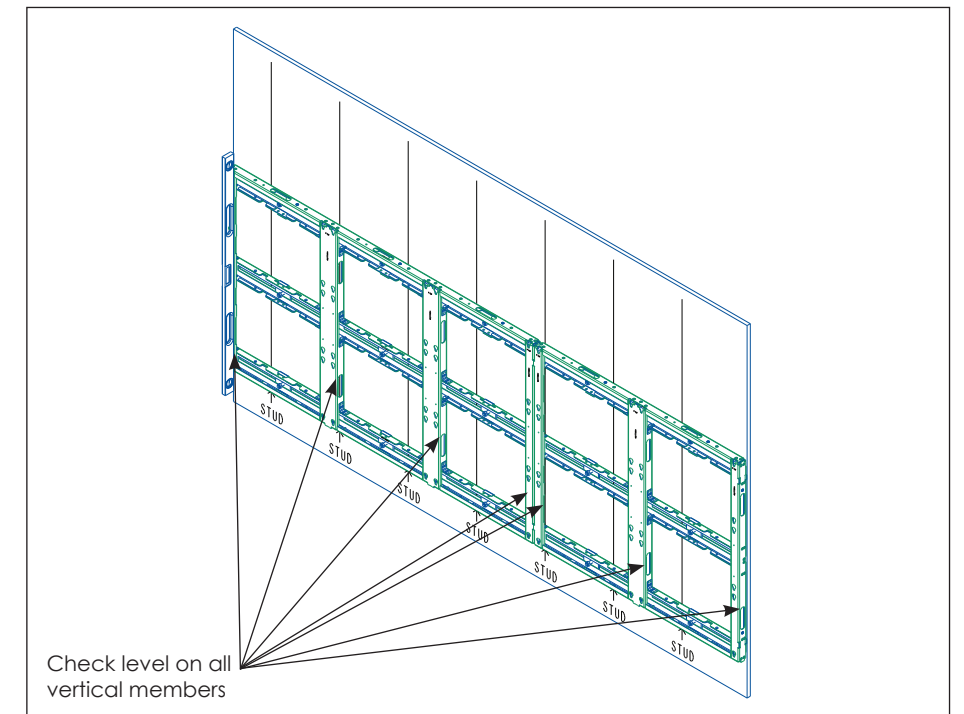
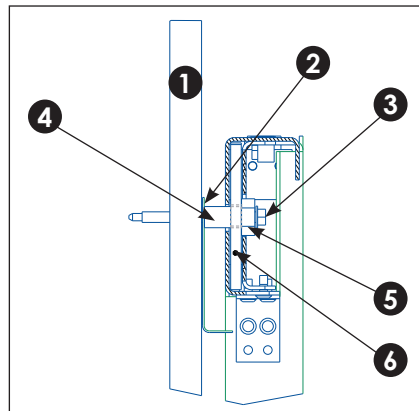


Figure 5: Identify Bolt Assemblies to Z-Adjust

2. Adjust one bolt assembly at a time. Refer to **Figure 6**.

- Loosen the TEK screw.
- Tighten the hollow bolt into the threaded plate until the end of the bolt braces against the brace plate. Continue until the face of the frame is level.
- Tighten the TEK screw to lock the Z-position in place.



- 1: Sheetrock
- 2: Backer plate
- 3: TEK screw
- 4: Fully adjusted bolt
- 5: Hollow bolt
- 6: Threaded plate

Figure 6: Adjust Z-Position of Bolt Assembly

Install Next Adjacent Frame in First Row

- Position the adjacent frame in the row next to the installed frame.
- Install the supplied stitch bolts (HC-1842). Refer to **Figure 7**.

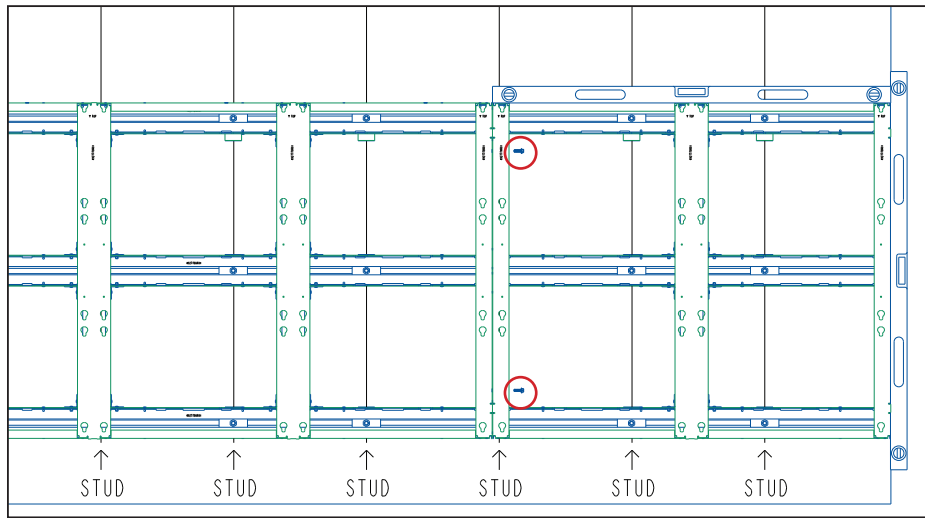


Figure 7: Install Stitch Bolts

- Ensure the alignment tabs are flush and even with each other. Refer to **Figure 8**. Tighten the stitch bolts to lock the tabs into place.

Note: Tighten the bolts to just snug, being sure to not deform the frames.

- Cut the zip ties and verify that the bolt assemblies slide freely.
- Slide the bolt assemblies to the nearest stud lines.
- Use a 4' level on top of the frame to level the frame while positioning it.

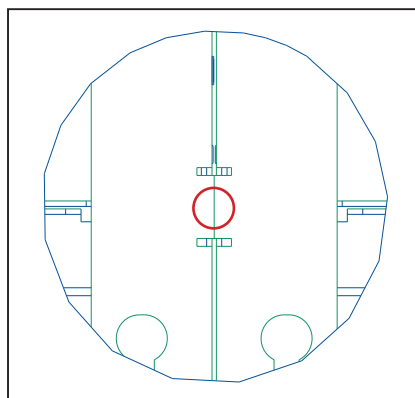


Figure 8: Ensure Alignment Tabs Are Flush & Even

- Repeat **Steps 5–7** in **Install First Frame (p.1)**.
- Repeat **Steps 1–7** in **Install Next Adjacent Frame in First Row (p.2)** until the first row is fully installed.
- Use a string line across the installed bottom row and adjust the Z-position of the frames so the frame faces are all aligned to the string. Verify the frame faces are level vertically as they are adjusted for the string line.

Install Remaining Frames

- Position the left frame in the next row on top of the first installed frame. Ensure the alignment tabs are flush and properly aligned. The mid verticals set the X- and Y-axis positions of the frame.
- Install the supplied stitch bolts across the horizontal seam and tighten to lock the frame into place. Refer to **Figure 9**, **Figure 10**, and **Figure 11**.

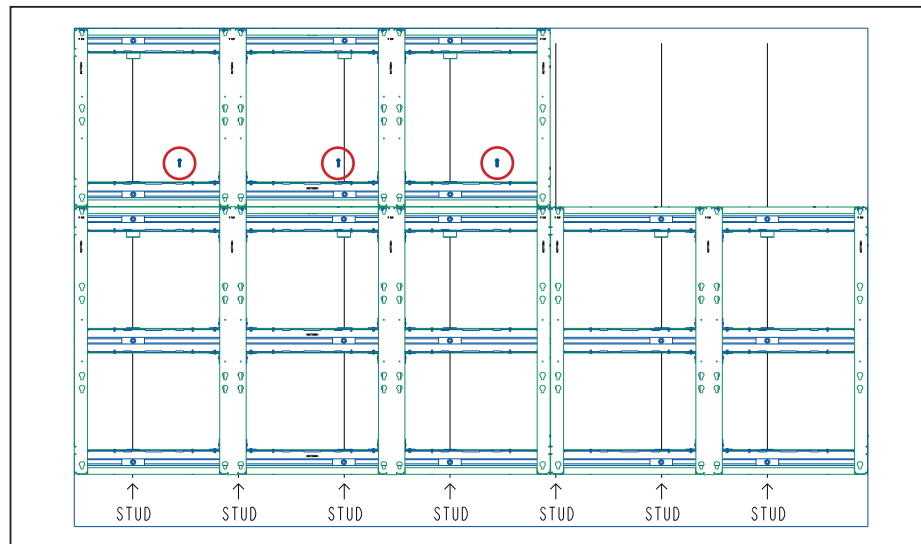


Figure 9: Install Stitch Bolts across Horizontal Seam

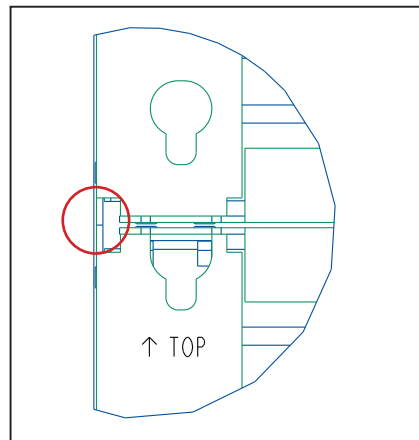


Figure 10: Ensure Alignment Tabs Are Flush & Even

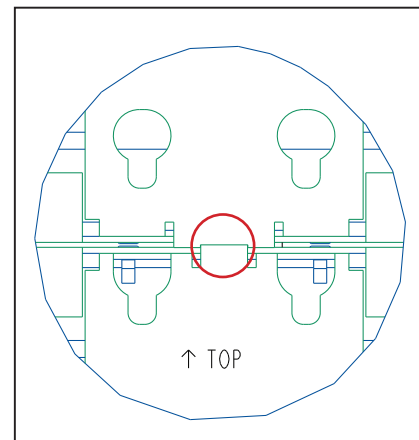


Figure 11: Lock X & Y Position

- Cut the zip ties, allowing the bolt assemblies to slide along the track.
- Slide the bolt assemblies to the nearest stud locations.

- Install TEK screws and brace plates, but do not tighten all the way. Leave the TEK screws approximately 1/4" from tightened down, to allow room for Z-axis adjustment.
- Install the remaining frames while leaving the frames slightly loose from the wall. Refer to **Figure 12**.

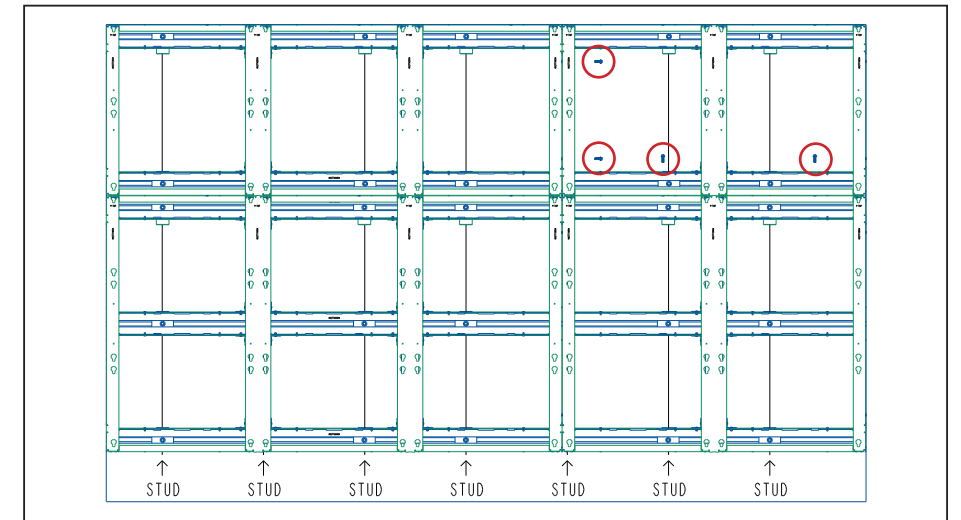


Figure 12: Install Remaining Frames

Plumb/Level Entire Display

- Identify the wall high spot. Use a level on the face of the frame column while adjusting the Z-position of the frame column. If a high spot cannot be identified, start with the center-most frame column in the display.
- Use the frame alignment tabs closest to the display corners and secure a string line in an X pattern. Refer to **Figure 13**.

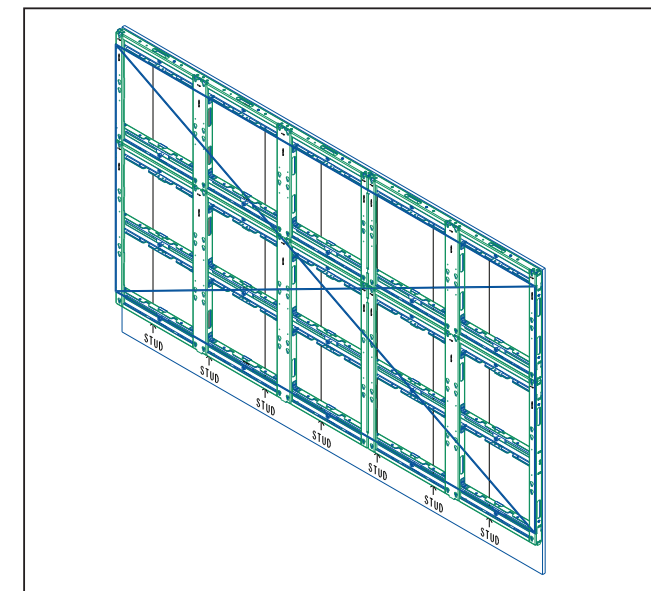


Figure 13: Secure String Line

- Identify frame high points along the string line. Adjust the Z-position toward the wall at the high points if the frames were not previously Z-adjusted. If the high-point frame was previously Z-adjusted, adjust the surrounding frames away from the wall to make the display face level and plumb.
- Tighten down the TEK screws to lock the frame Z-positions into place.
- Adjust the frame Z-positions until the faces are aligned to the string and the frame faces are plumb and level to each other.

Install Seismic Clips

- Place a seismic clip (0M-4983082) up to the secured mounting points in the frame. Refer to **Figure 14**.

Note: Ensure that the flange of the clip falls in the track opening and is pressed against the side of the threaded clip.

- Mark the location of one of the two holes in the clip to match the drill with the screw hole. Remove the clip.
- Drill a $\frac{5}{32}$ " diameter hole at the marked location.
- Replace the clip and secure with a #10-12 x $\frac{3}{8}$ " sheet metal screw (HC-1186) using the pre-drilled hole. Refer to **Figure 15**.
- Repeat clip installation steps for all frame mounting locations in the display.

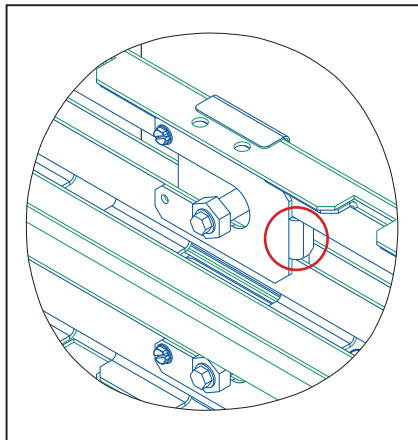


Figure 14: Position Seismic Clip

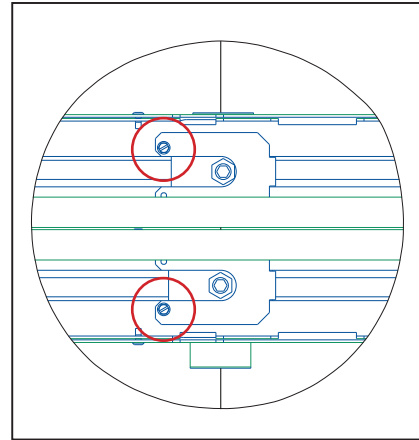


Figure 15: Secure Clip Screws

Panel Installation

Route Power & Signal

- Identify which panels will require power and/or signal inputs. Refer to the contract-specific Shop and Riser Drawings for details.
- Use the pass-through holes and notches in the frame to route the power and signal input cables from the input to the required input panel location prior to panel installation.

Note: Incoming power and signal cables external to the display cannot be routed after panels are installed.

Install First Panel

Note: If the display uses panel-embedded PLRs, identify the PLR panels using the two "PLR" labels. Refer to **Figure 16**. Refer to the contract-specific Signal Interconnect Drawing to position the PLR panels appropriately within the display.

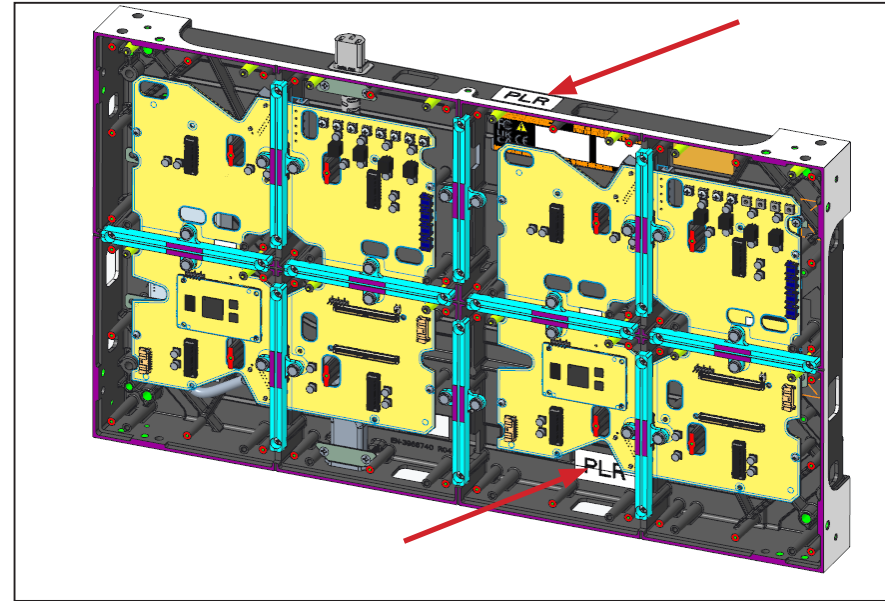


Figure 16: Identify PLR Panels Via Labels

- Remove the first panel from its packaging and install the hardware.
 - Install four M6 bolts (HC-1795) through the front of the panel. Refer to **Figure 17** and **Figure 18**.

Note: If necessary for Z-axis adjustment, ensure the bolt threads are engaged but not protruding out the rear of the panel.

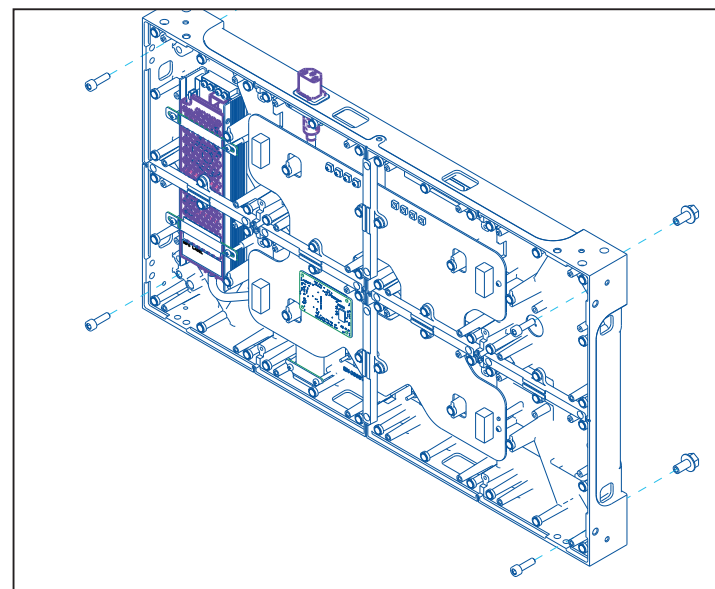


Figure 17: Install Hardware in First Panel

- Install four M8 bolts (HC-4884317) through the rear of the panel so the threads are engaged but not tightened all the way. Leave $\sim\frac{1}{4}$ " between the bolt flange and the rear of the panel. Refer to **Figure 17** and **Figure 18**.

- If installing a panel where power/signal needs to land, route the Cat 6 or Fiber incoming signal cable and/or the male end of the AC power input cable through the rectangular cutout in the panel prior to panel installation.

Note: Depending on the structure and access to the rear of the display, it may be very difficult or impossible to route power cables into the panel after the panel is secured to the tube.

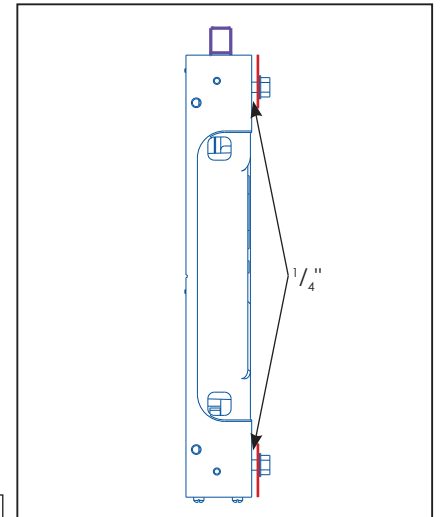


Figure 18: Leave $\frac{1}{4}$ " between Bolt Flange & Panel Rear

- Remove the two nuts (circled in red in **Figure 19**) securing the appropriate cover on the inside of the cabinet.
- Use a Phillips screwdriver to remove the two screws securing the power cable and the mounting bracket at the bottom of the panel. Refer to **Figure 20**.
- Install the power input cable through the rear of the panel and plug in the cable. Refer to **Figure 21**.

- Hang the M8 bolt heads through the keyholes in the frames to place the panel in the bottom center-most display position.

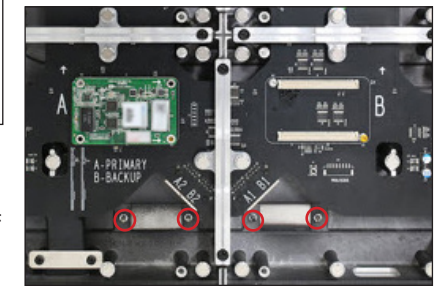


Figure 19: Remove Nuts from Cover

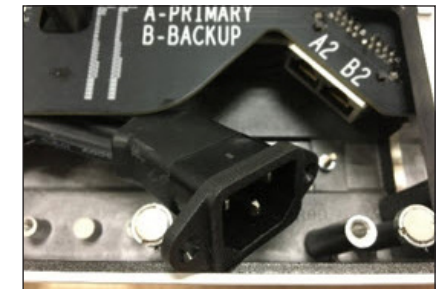


Figure 20: Remove Screws from Mounting Bracket



Figure 21: Install Power Input Cable

4. Repeat **Steps 1–3** for the remainder of the first row. Refer to **Figure 22**.

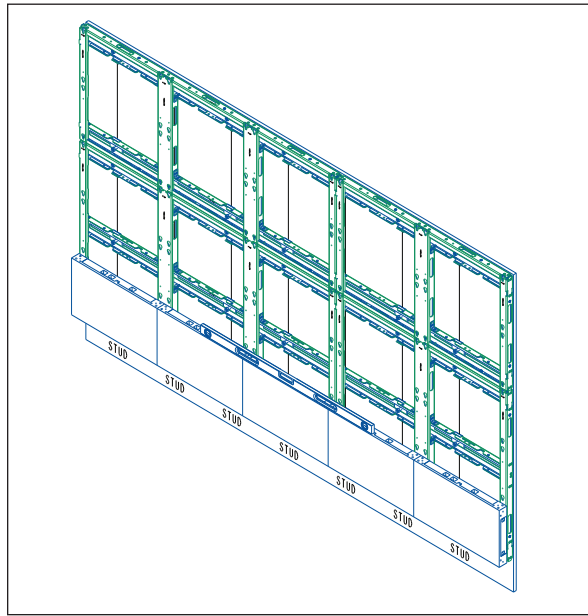


Figure 22: Install Remaining Panels in Bottom Row

5. Push the panels together and verify the far-left and far-right frame alignment tabs are not protruding beyond the display limits. Refer to **Figure 23**. Shift the panels left or right as needed.

6. Start at the center of the display and use a 5 mm hex key in the end of the M8 bolt to tighten the panel hardware. Level the top of the panel while tightening.

7. Install the panel side stitch bolts across the bottom row of panels while ensuring the machined tops, bottoms, and faces are all flush to each other. Use a 5 mm key to tighten the stitch bolts.

8. Tighten the M8 bolts in the first row of panels until the bolts are snug to the frame.

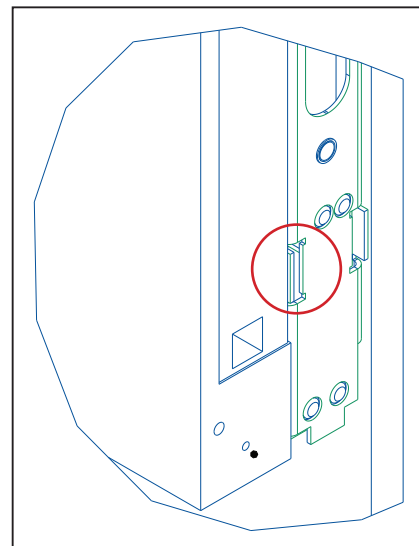


Figure 23: Ensure Alignment Tabs Do Not Protrude Past Display Edge

9. Repeat **Steps 1-3** for the remaining panels in the display. Start at the center of the next row up, install the columns, and then fill in from the bottom out from there. Refer to **Figure 24**.

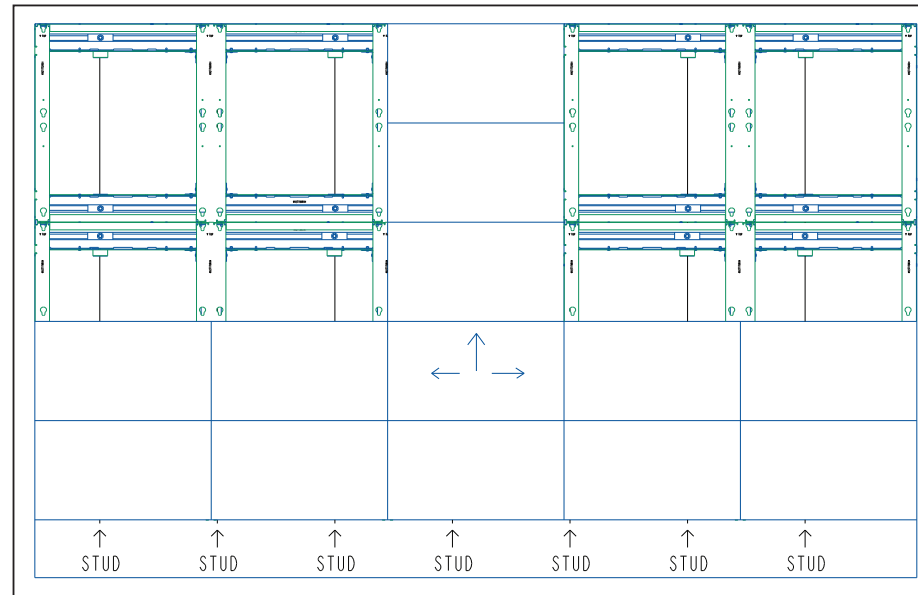


Figure 24: Install Remaining Panels in Display

10. Start securing panels together and to the frames at the top-center of the display after all panels are hanging on the frames.

11. Stitch the top row of panels together, ensuring the top and machined surfaces are flush to each other.

12. Tighten the M8 bolts so the panels are snug to the frame.

Note: Turn the M8 bolts counterclockwise to tighten and clockwise to loosen.

13. Continue to stitch panels together with stitch bolts center, down, and out. Tighten the M8 bolts to lock the panels in place. Refer to **Figure 25**.

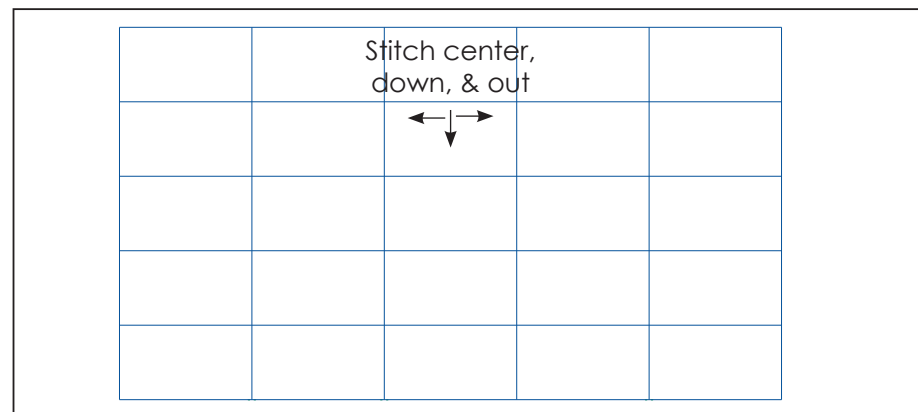


Figure 25: Stitch Panels Together

Adjust Corner Z-Position

Use M6 bolts to adjust the panel corner if a corner needs to be adjusted in the Z-position. Use a 5 mm hex key for either bolt type.

Push Panel Corner from Structure

1. Loosen the M8 bolt in the low panel corner.
2. Tighten the M6 bolt in the low panel corner until the face is flush with the adjacent panel.
3. Tighten the M8 bolt to lock the position into place.

Pull Panel Corner to Structure

1. Loosen the M6 bolt in the high panel corner until the face is flush with the adjacent panel.
2. Tighten the M8 bolt to lock the position into place.

When all panels are installed, go back across the faces of the corners of the panels to ensure the surfaces are flush. Fine-tune the Z-position as needed. Refer to **Figure 26**.

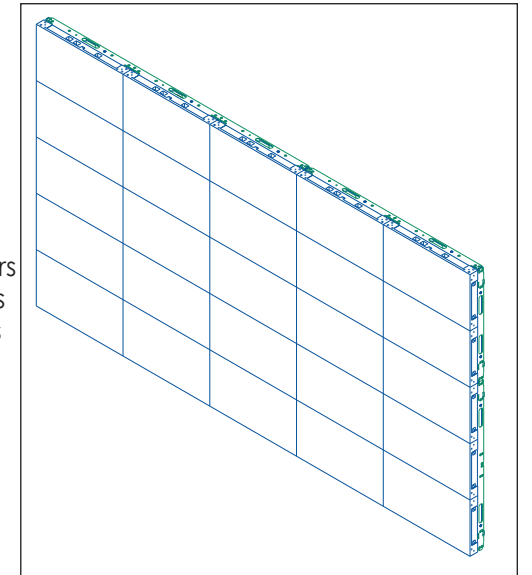


Figure 26: Ensure Panel Corner Faces Are Flush

The standard NPN-X200/X400 display substructure is vertical aluminum tubing with mounting pass-through holes and shims for attachment to a wall or equivalent structure. The panels are self-drilled into the vertical tubes at four points per panel. The tubes must be vertically level, or plumb, on the face and sides, horizontally level on the top/bottom across multiple tubes, vertically flat along each tube, and horizontally flat across multiple tubes.

Steel tubes are not recommended for the substructure, as metal filings can accumulate on the magnets and cause module flatness issues.

Substructure Installation

Tubes come in eight different sizes ranging from one panel high to a maximum of eight panels high. Refer to **Figure 1**. Each panel height has two mounting pass-through holes.

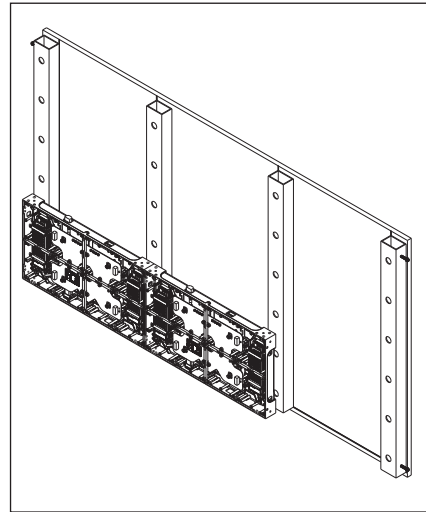


Figure 1: Tube Type

1. Attach $\frac{3}{4}$ " [19 mm] plywood to the wall before substructure attachment if the holes in the tubes do not line up with studs on the wall. Other wall materials such as concrete should not require $\frac{3}{4}$ " [19 mm] plywood, but refer to the contract-specific Shop Drawing for verification.

2. Mark wall for tube positions:

- a. Measure and mark where the bottom of the center tube will land on the wall based on the contract-specific Shop Drawing.
- b. Use a digital level to draw a horizontal straight line from that point. Refer to **Figure 2**. Draw the line to the edges of the display.

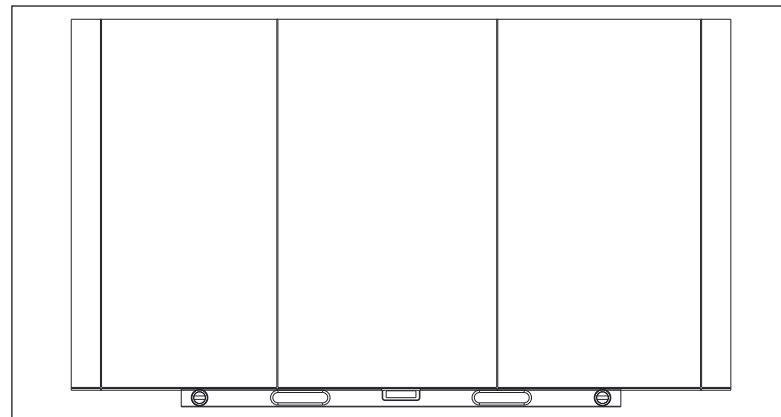


Figure 2: Use Digital Level to Draw Horizontal Line

- c. Measure and mark where the sides of the tubes will land along the horizontal line on the wall based on the contract-specific Shop Drawing. Measure each tube location from the same center reference.

- d. Use a digital level to draw a vertical straight line from that point. Refer to **Figure 3**. The line does not need to be longer than 3' [.9 m].

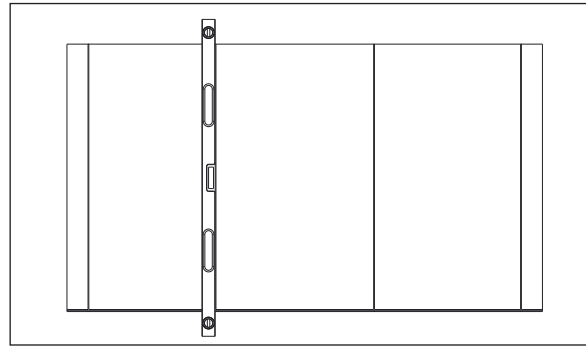


Figure 3: Use Digital Level to Draw Vertical Line

3. Install tubes:

- a. Use the horizontal line and corresponding vertical line to position each tube (center tube first). While holding the tube, hold the digital level up to the side of the tube for fine adjustment. Tubes will recess $\frac{3}{4}$ " [19 mm] from both the top and bottom of the display.
- b. Use only the top and bottom screw locations in each tube. Refer to **Figure 4**. Drill a pilot hole as needed if a tube screw lands on a stud.

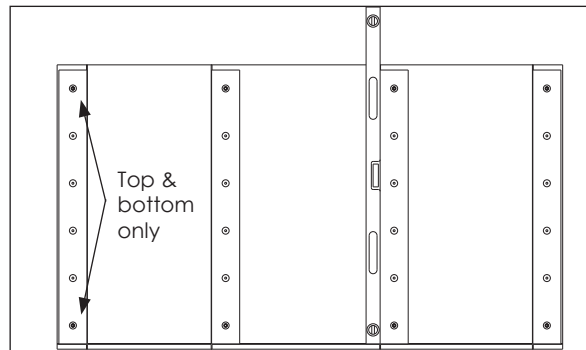


Figure 4: Use Only Top & Bottom Screw Locations

For stacked rows of tubes, space the tubes $1\frac{1}{2}$ " [38 mm] apart from each other and use a digital level to align and level the stack of tubes. Refer to **Figure 5**.

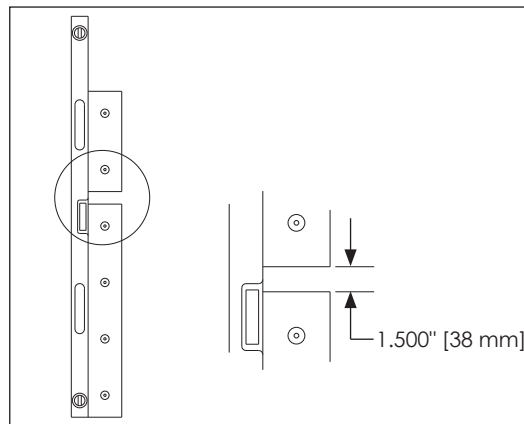


Figure 5: Space Tubes in Stacked Rows

- c. Continue until all tubes are installed with two screws per tube.

4. Level tubes:

- a. Use a digital level on the face of each tube to ensure the tubes are plumb.
- b. Place the supplied shims to shim between the tube and wall until the tube is plumb. Two thin shims equal one thick shim. Use one thick shim in place of two thin shims to prevent running out of thin shims before the tubes are level. Refer to **Figure 6**.

Note: Orient the shims on the end tubes so the tail/tag sticks out behind the display and out of sight when the display is fully installed. Refer to **Figure 7**.

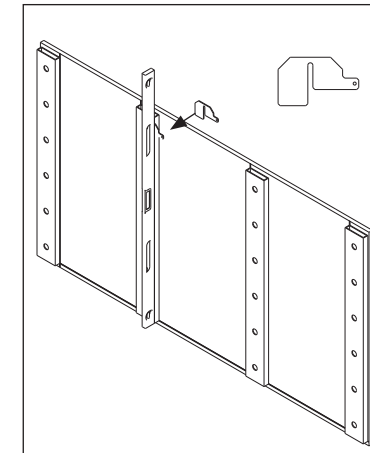


Figure 6: Use Shims between Tube & Wall until Tube Is Plumb

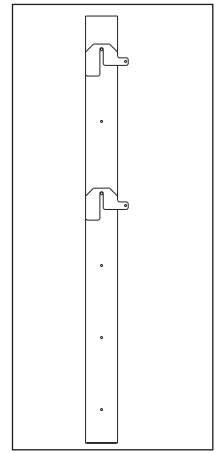


Figure 7: Shim Orientation

- c. Tie a string line across the top and bottom of the tubes. Use the supplied $\frac{1}{4}$ " TEK screws on the sides of the tubes for temporary string anchors.

- d. Use the supplied shims to ensure all tubes are in line and level to each other. Refer to **Figure 8**. Double-check the tube plumbness as tubes are adjusted using the string line. Each individual tube should be level within $\frac{1}{4}$ " [6 mm]

1. Finish tube installation:

- a. Start the remainder of the screws in the empty screw holes, but do not tighten down.
- b. Install shims on loose screw hardware so the tube does not flex when screws are tightened down.

- c. Tighten the screws.

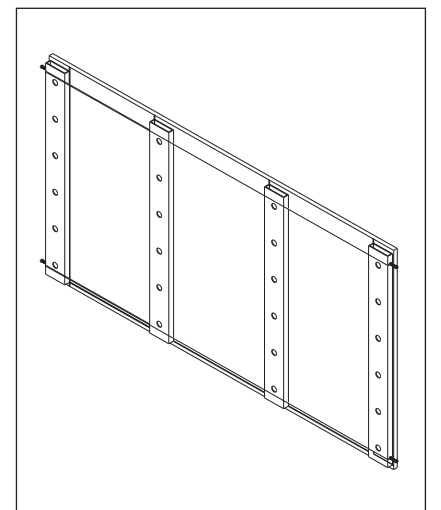


Figure 8: Use Shims between Tube and Wall until All Tubes are in Line and Level

Panel Installation

Power/Signal Identification and Routing

1. Identify which panels will require power and/or signal inputs. Refer to the contract-specific Shop and Riser Drawings for details.
2. Route power/signal inputs around the structure prior to panel installation. Use the designed gaps between the vertical tubes and at the top and bottom of the display to run the cables horizontally across the display. Refer to **Figure 9** and **Figure 10**.

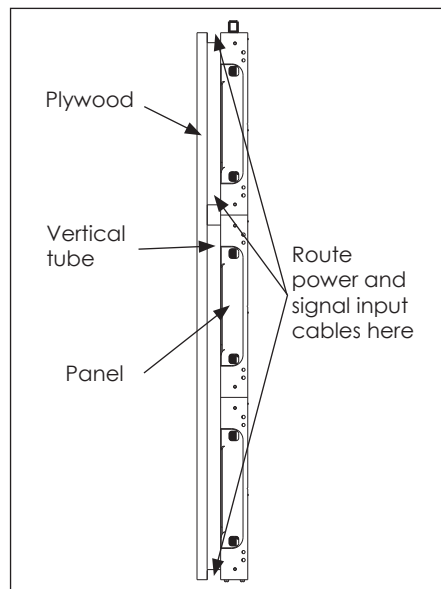


Figure 9: Power & Signal Routing (Left View with Panels)

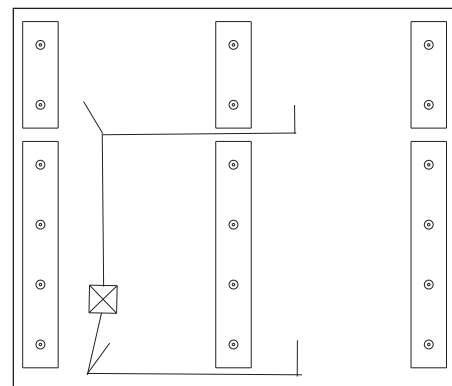


Figure 10: Power & Signal Routing (Front View without Panels)

First Panel Installation

The bottom-center panel is typically the first panel installed.

Note: If the display uses panel-embedded PLRs, identify the PLR panels using the two "PLR" labels. Refer to **Figure 11**. Refer to the contract-specific Signal Interconnect Drawing to position the PLR panels appropriately within the display.

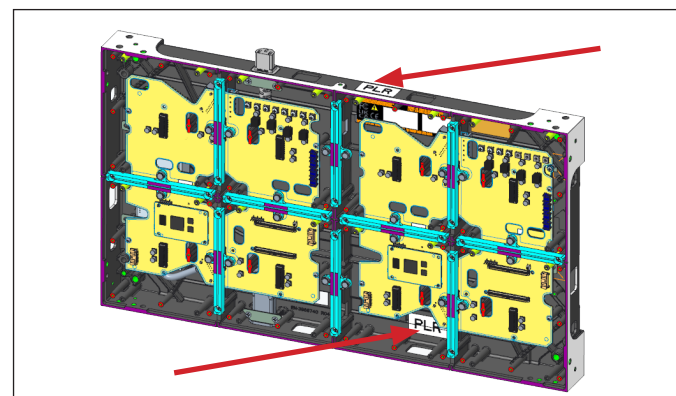


Figure 11: Panel Identified With PLR Labels

1. Measure and mark the correct panel location. Refer to **Figure 12**.
2. Remove the panel from its packaging
3. Mark the mounting holes in the panel for pre-drilling. Refer to **Figure 13**.

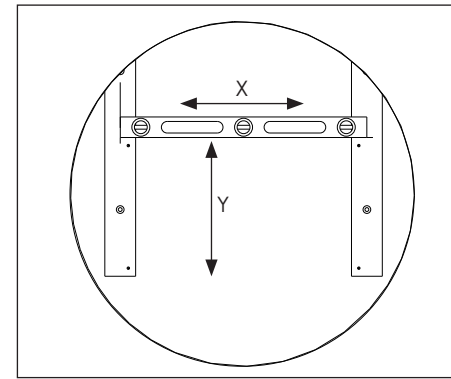


Figure 12: Measure and Mark First Panel Location

- a. Slide the panel positioning jigs into the bottom of the mounting tubes with the jigs on the inside edge of the tube. Refer to **Figure 14**. The panel will sit on the punched edge of the positioning jig, using the bottom of the tube to set the location. Refer to **Figure 15**.
- b. Use C-clamps to secure the bottom of the installation jigs to the bottom of the mounting tubes. Refer to **Figure 16**.

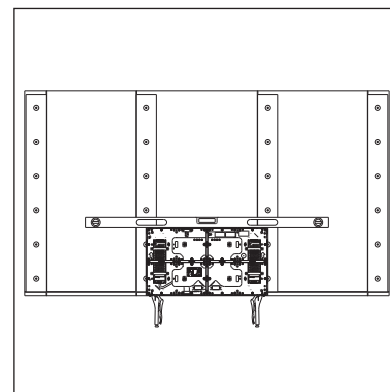


Figure 13: Mark Mounting Holes in First Panel

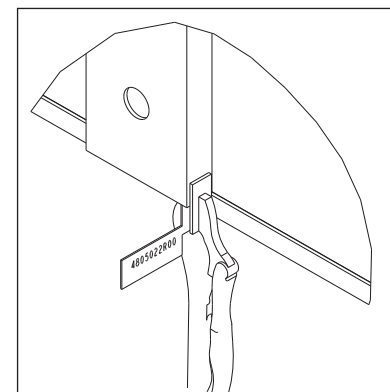


Figure 14: Slide Jigs into Bottom of Mounting Tubes

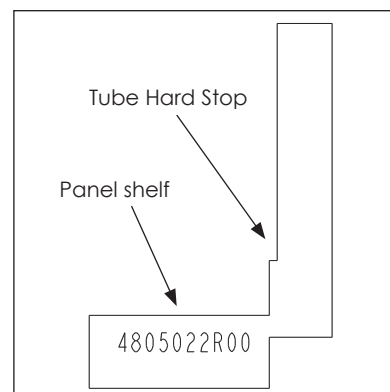


Figure 15: Set Panel Location

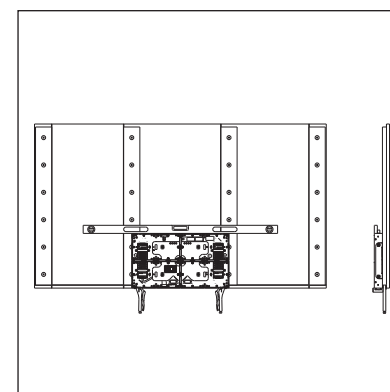


Figure 16: Secure Installation Jigs to Mounting Tube

- c. Level the jigs and adjust as needed.
- d. Lift the panel into place.

- e. Align the panel to the marked location and verify the location is level.
 - f. Hold the panel in place and mark the screw locations through the mounting screw holes with a punch.
 - g. Remove the panel and set it aside to keep it clear of metal filings.
4. Pre-drill $\frac{13}{64}$ " [5 mm] holes into the tube at the marked mounting locations. Refer to **Figure 17**.
 5. Identify where power will enter the display prior to panel installation.
 6. If installing a panel where power/signal needs to land, route the Cat 6 or Fiber incoming signal cable and/or the male end of the AC power input cable through the rectangular cutout in the panel prior to panel installation.

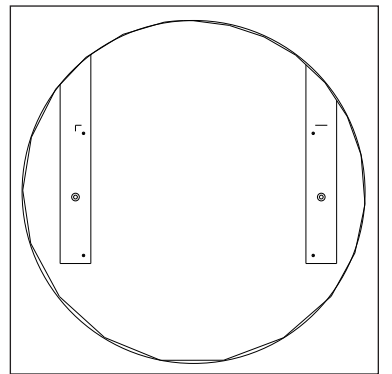


Figure 17: Pre-Drill Holes into Tube

Note: Depending on the structure and access to the rear of the display, it may be very difficult or impossible to route power cables into the panel after the panel is secured to the tube.

- a. Remove the two nuts (circled in red in **Figure 18**) securing the appropriate cover on the inside of the cabinet.
 - b. Use a Phillips screwdriver to remove the two screws securing the power cable and the mounting bracket at the bottom of the panel. Refer to **Figure 19**.
 - c. Install the power input cable through the rear of the panel and plug in the cable. Refer to **Figure 20**.
7. Secure the panel to the tubes with a $\frac{1}{4}$ " TEK screw through all four corner mounting locations. Refer to **Figure 21**.

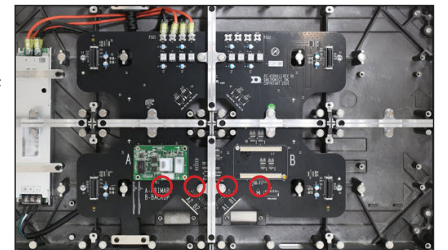


Figure 18: Remove Nuts From Cover



Figure 19: Remove Screws from Mounting Bracket



Figure 20: Install Power Input Cable



Figure 21: Secure Panel to Tube

- Use a 5 mm Allen wrench to adjust the jacking hardware (circled in red in **Figure 23**) and correct any plumbness issues. Refer to **Figure 22** and **Figure 23**.



Figure 22: Ensure Panel is Level and Vertically Plumb



Figure 23: Adjust Jacking Hardware

Panel Hardware Adjustment

Only make small adjustments to the jacking and securing hardware.

Pull Panel Corner to Structure

- Loosen the jacking hardware. This may pull the panel closer to the structure.
- Tighten the securing hardware. This pulls the panel closer to the structure until it contacts the panel adjustment screws on the rear of the panel.

Push Panel Corner from Structure

- Loosen the securing hardware. This may push the panel away from the structure.
- Tighten the jacking hardware. This pushes the panel away from the structure until it touches the head of the securing hardware.

Secure Panel Corner Spacing

- Secure the corner in place to prevent movement after the desired depth is achieved.
- Tighten both bolts until they touch the panel or tube.

Panel Connection

Connect Panels Side-to-Side

- Remove the panel from its packaging.
- Place the panel beside the existing panel.
- Remove the panel positioning jig from the right side of the first panel to use on the left side of the new panel.
- Install the panel positioning jigs adjacent to the first panel and use a level across the jigs.
- Place a panel on top of each of the two existing panels.

- Use a 5 mm Allen wrench and socket-head stitch screws to attach the panels together, but do not tighten the screws. Refer to **Figure 24**.

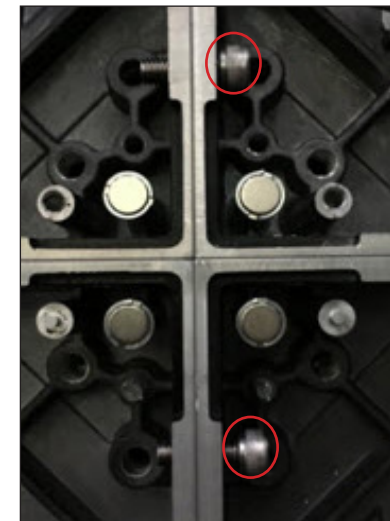


Figure 24: Assemble Panels with Screws

- Use a 6 mm Allen wrench to attach the flattening jig to the front of the panels, and ensure the panel faces are completely flush. Refer to **Figure 25** and **Flatten Panels (p.4)**.

- Install the top and side interconnect hardware.

- Use a 5 mm Allen wrench to tighten the jacking hardware next to the existing panel until the panel is firmly seated against the tube. Refer to **Figure 23**. Tighten the remaining adjustment hardware until it touches the tube.

- Mark the screw locations through the mounting screw holes with a punch.

- Pre-drill $\frac{13}{64}$ " [5 mm] holes into the tube at the marked mounting locations. Refer to **Figure 17**.

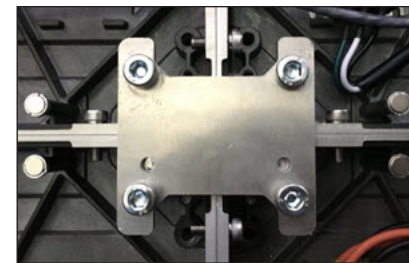


Figure 25: Align Panel Faces

- Secure the panel to the tubes with a $\frac{1}{4}$ " TEK screw through all four corner mounting locations. Refer to **Figure 21**.

- Ensure the panel is flush and flat to the lower panels:

- Check seams to verify flushness.
- Verify flatness by laying a 4' level across the face to ensure the combined face of both panels is straight and flat. Check both ends of the panel. Refer to **Figure 26**.
- Use a 5 mm Allen wrench to adjust the jacking hardware as needed to modify the four corners of panel depth.

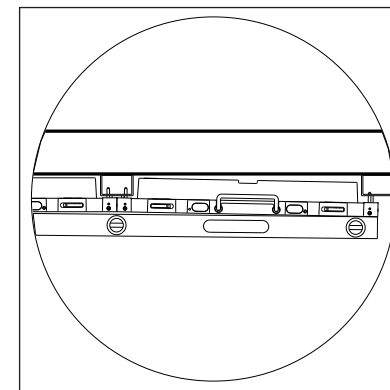


Figure 26: Verify Flatness

Connect Panels Top-to-Bottom

- Remove the panel from its packaging.
- Place the panel on top of the existing panel, fitting the alignment pins into the recesses.

- Use a 5 mm Allen wrench and socket-head stitch screws to attach the panels together, but do not tighten the screws. Refer to **Figure 27**.

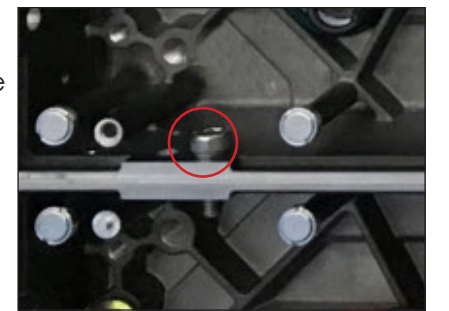


Figure 27: Assemble Panels with Socket-Head Screws

- Use a 6 mm Allen wrench to attach the flattening jig to the front of the panels, and ensure the panel faces are completely flush. Refer to **Figure 28** and **Flatten Panels (p.4)**.

- Use a 5 mm Allen wrench to tighten the socket-head screws, but do not remove the flattening jig. Refer to **Figure 28**.

- Use a 5 mm Allen wrench to tighten the jacking hardware next to the existing panel until the panel is firmly seated against the tube. Refer to **Figure 23**. Tighten the remaining adjustment hardware until it touches the tube.

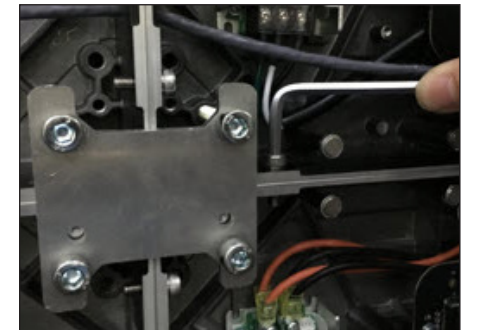


Figure 28: Align Panel Faces

- Secure the panel to the tubes through all four corner mounting locations. Refer to **Figure 21** and **Figure 29**.

- Use a 6 mm Allen wrench to remove the flattening jig.

- Ensure the panel is flush and flat to all adjacent panels.

- Check seams to verify flushness.
- Verify flatness by laying a 4' level across the face to ensure the combined face of both panels is straight and flat. Check both ends of the panel. Refer to **Figure 30**.



Figure 29: Secure Panel to Tube in Corners

- Use a 5 mm Allen wrench to adjust the jacking hardware as needed to modify the depth on the four corners of the panel.



Figure 30: Verify Flatness

Flatten Panels

Complete these steps if additional panel flattening is needed.

1. Identify the center of the display and choose a vertical panel seam at or near that location.
2. Install the first two flattening jigs in the START locations in **Figure 31**.

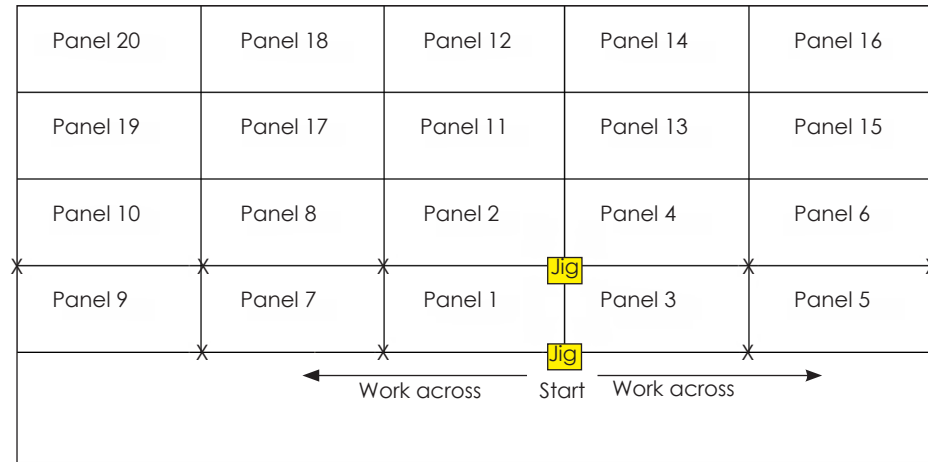


Figure 31: Install Flattening Jigs

3. Install the next two flattening jigs on an adjacent vertical panel seam.
4. Work horizontally across the display in one direction, adjusting the Z-axis panels at the X locations in **Figure 31**. Bring the center-most jig in front of the other two jigs while working across the display. Refer to **Figure 32**.

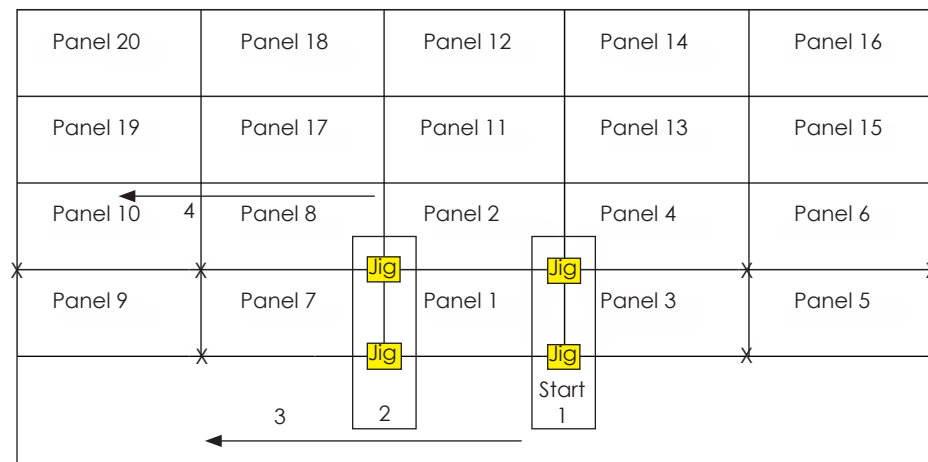


Figure 32: Adjust Z-Axis Panels

5. Go back to the center and work across the display in the other direction, adjusting the Z-axis panels in the X locations in **Figure 31**. Bring the center-most jig in front of the other two jigs while working across the display. Refer to **Figure 32**.
6. Move the flattening jigs up to the next two horizontal seams and repeat **Step 3**.
7. Continue up the display until all panels are adjusted and flat.

Daktronics-supplied jigs (top and bottom) are custom-designed per contract based on curve type, size, and facet width (2' facets for a full panel or 1' facets for a half panel) with the jigs positioning two full panels or four half panels at a time. Top jigs (dashed red) have a clearance cutout for the power connector, and bottom jigs (dotted blue) do not. Refer to **Figure 1** and **Figure 2**.

Note: Refer to **DWG-05095300** for interconnect bracket installation details for full panel facet curve displays or **DWG-04988412** for interconnect bracket installation details for half panel facet curve displays.

1. Loosely install the interconnect brackets and hardware prior to jig use.
2. Tighten the hardware when the jigs are in place.

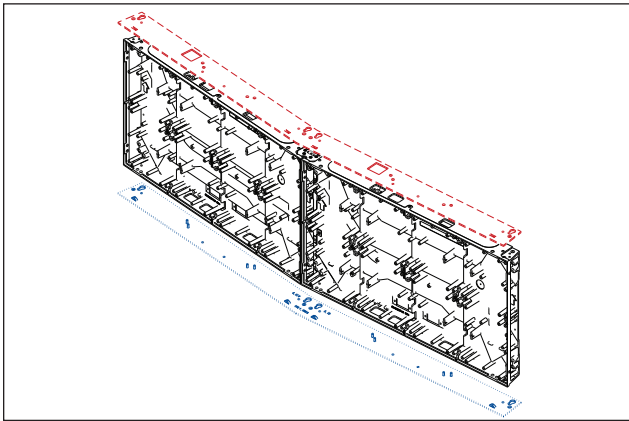


Figure 1: Full-Panel Jig

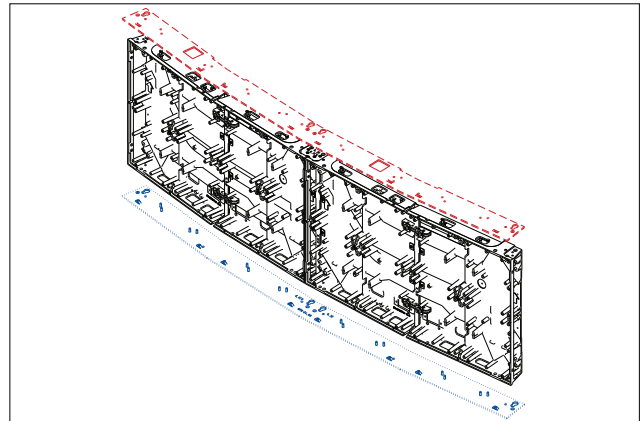


Figure 2: Half-Panel Jig

3. Prior to panel installation:
 - a. Assemble the left and right halves of the panels together.
 - b. Use the jigs on the tops and bottoms of the panels to set the angle position before tightening the interconnect bracket hardware. Refer to **Figure 3**.

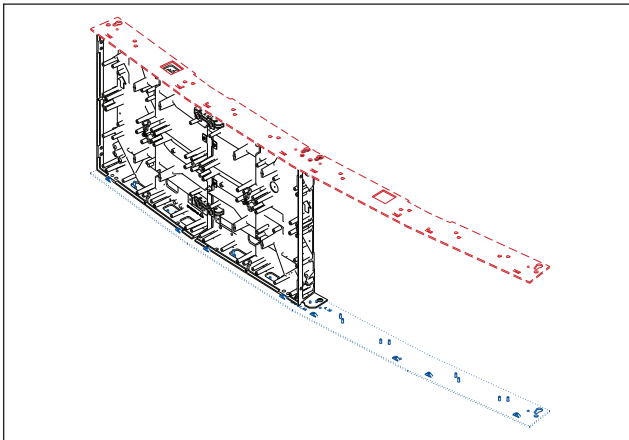


Figure 3: Set Angle Position

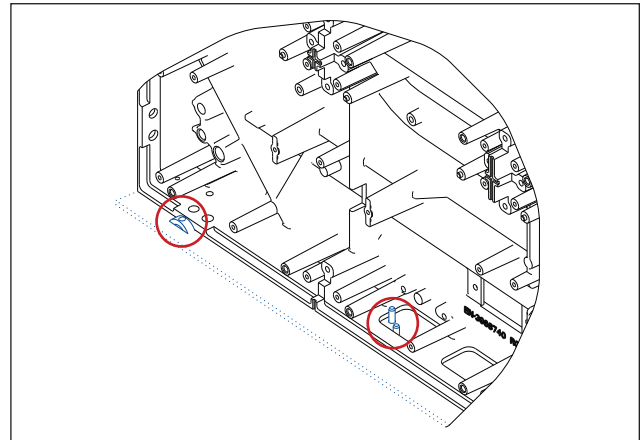


Figure 4: Align Panel Faces

4. Use the jigs while installing panels to the structure to position the panel angles appropriately.

Note: Jigs align the formed bridge punches and alignment pins in panel faces with the machined cutouts in the panel for high precision placement. Refer to **Figure 4**.

5. When installing panels to the structure, use the top jigs on the tops of all panels and the bottom jigs on the bottoms of only the first row of panels.

Optional screw holes (circled **blue** in **Figure 5**) in the jigs align with the M4 border screw holes in the panels to secure jigs to panels as needed. For example, attach a jig to the bottom of the panels and tighten the interconnect plate hardware (boxed **yellow** in **Figure 5**) to lock the angle in place if the bottom jig cannot be held up to the bottom row of panels while the plate hardware is tightened.

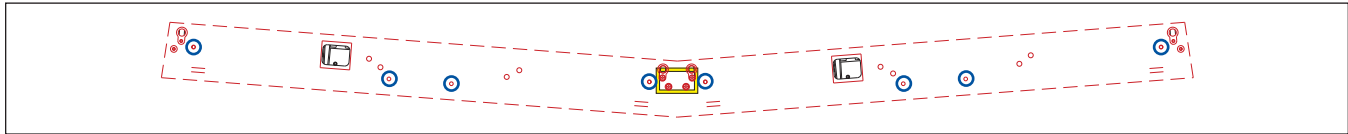
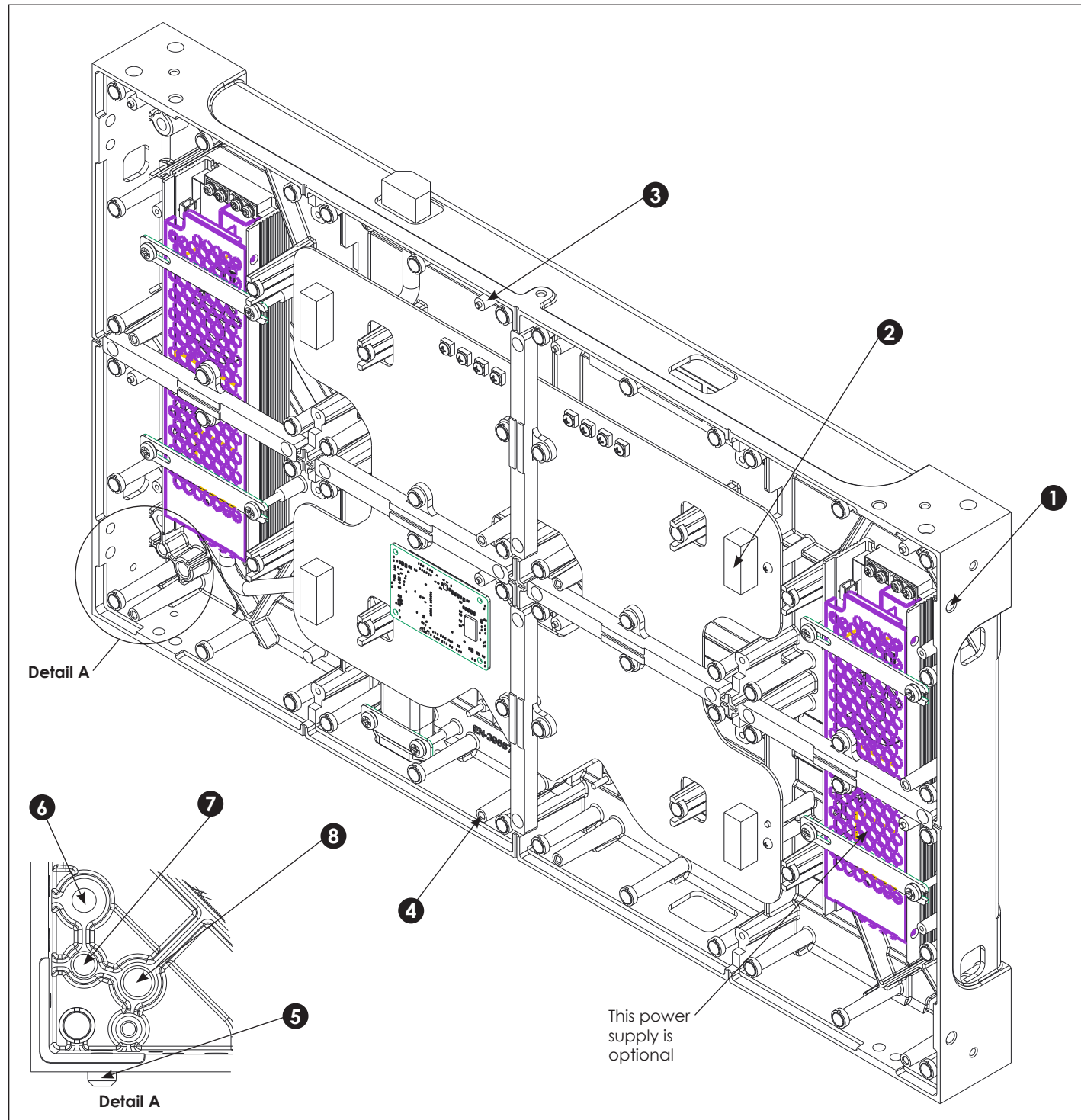


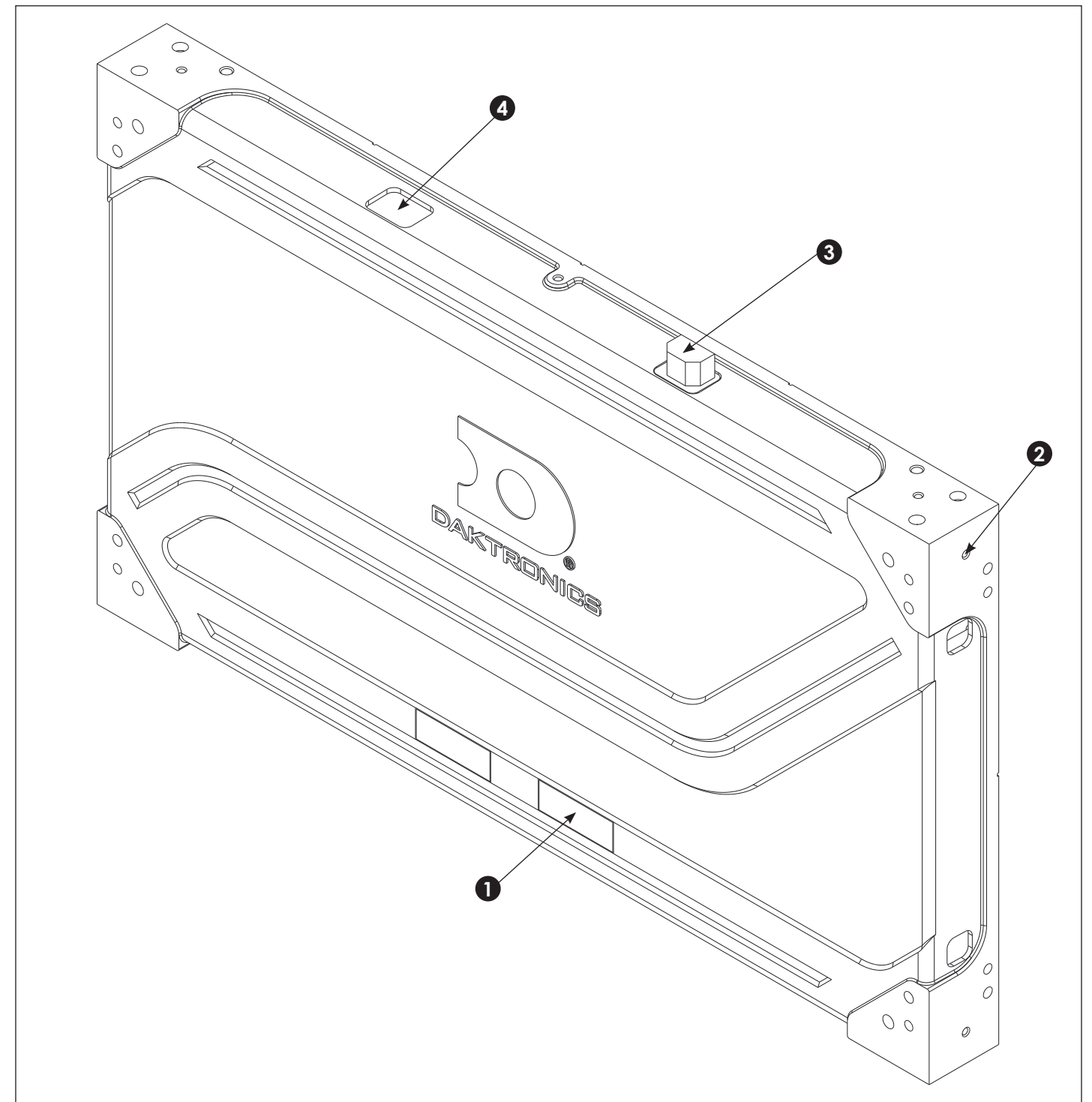
Figure 5: Lock Angle in Place

Figure 1 (rotated front view) and Figure 2 (rotated rear view) show the basic features of a typical NPN-X200/X400 series display panel.



- 1: Interconnect bolt hole @ 8 per panel (2 per side)
- 2: Module power/signal jack location @ 4 per panel
- 3: Module alignment peg @ 16 per panel
- 4: Module alignment hole @ 16 per panel
- 5: Panel alignment pin @ 4 per panel
- 6: 0.266" [6.75 mm] thru-hole for self-drilling screw @ 4 per panel
- 7: M6x1.0 threaded thru-hole @ 4 per panel
- 8: M8x1.25 threaded-thru-hole @ 4 per panel

Figure 1: Display Panel (Rotated Front View)



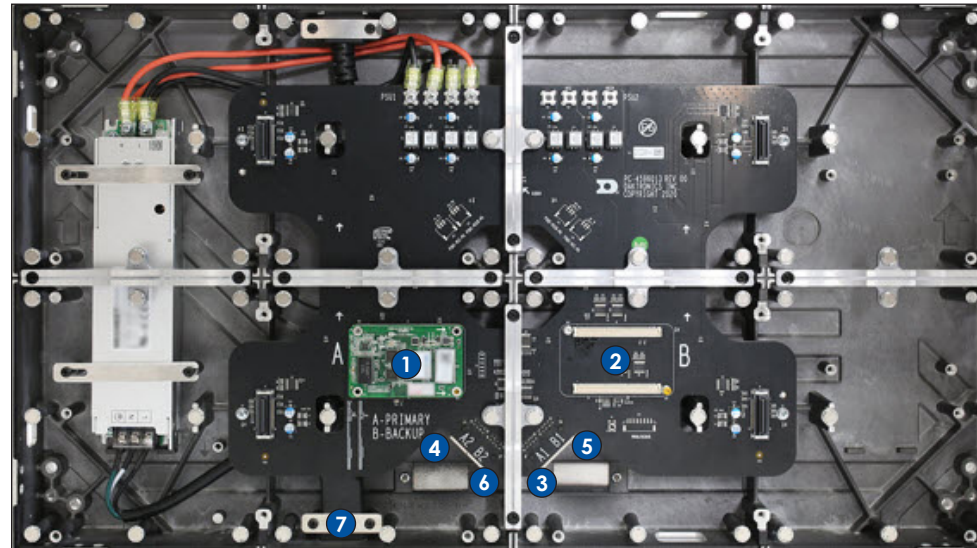
- 1: Power/signal entrance cutout @ 2 per panel
- 2: M4x0.7 threaded border hole @ 10 per panel
- 3: Vertical power interconnect plug @ 1 per panel
- 4: Signal interconnect pass-thru cutout @ 6 per panel

Figure 2: Display Panel (Rotated Rear View)

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Refer to the **NPN-X200/X400 Series 1x4 Vertical Tube Substructure and Panel Quick Guide (DD4824308)** and **NPN-X200/X400 Series Speed Frame Substructure and Panel Quick Guide (DD5075265)** for details on how to install the substructure and panels.

Electrical Install



- 1: Primary card
- 2: Secondary card
- 3: Primary Port A1
- 4: Primary Port A2
- 5: Backup Port B1
- 6: Backup Port B2
- 7: Power connector

Figure 1: Panel

Power and Signal Input

The power input is located on the bottom of each panel. The supplied power cable can be plugged directly into this input as shown in **Figure 2**. Refer to the contract-specific Riser Diagram for part numbers.



Figure 2: Power Input

The signal input is located on the bottom of the hub board as shown in **Figure 3**. Refer to the contract-specific Riser Diagram for part numbers.

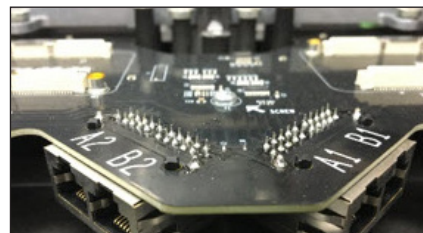


Figure 3: Signal Input

Power Connection

NPN-X200/X400 panels are designed for vertical power interconnection only. Plug the power from the lower panel into the panel above it as shown in **Figure 4**. Refer to the contract-specific Riser Diagram for specific routing details.

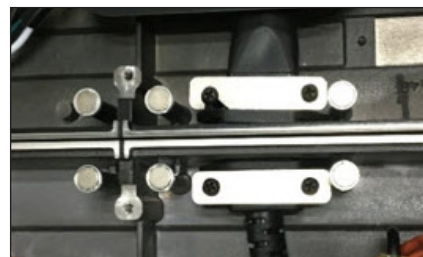


Figure 4: Power Connection

Signal Connection

If the display uses panel-embedded PLRs, identify the PLR panels using the two "PLR" labels. Refer to **Figure 5**.

Use the three cable ends to connect the fiber and Cat 6 cables. Refer to **Figure 6**. The two fiber cables will be labeled 'A' and 'B'. The third cable connects a Cat 6 cable to **Port B** of the PLR. Use the contract-specific Signal Interconnect Drawing for cable routing instructions.

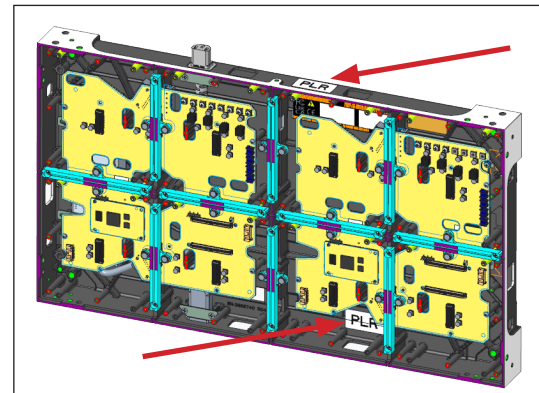


Figure 5: Panel Identified With PLR Labels

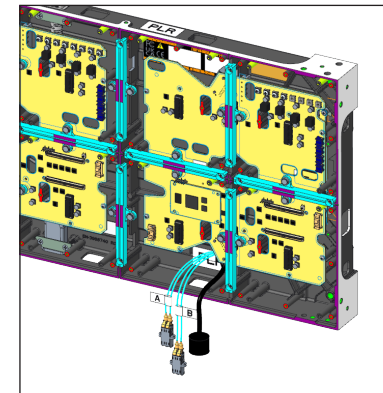
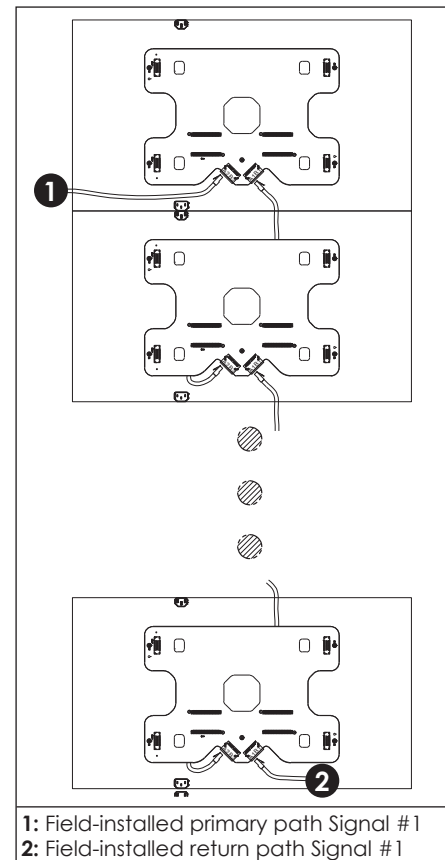


Figure 6: PLR Cables

Signal can be routed horizontally or vertically with the supplied Cat 6 cables. Refer to the contract-specific Riser Diagram for specific routing details.

Primary signal is connected to **Port A2 (In)** from the control room/rack and **Port A1 (Out)** back to the control room/rack. Refer to **Figure 7** for an example of vertical signal routing.

Note: NPN-6X00 panels have a pre-installed Cat 6 cable in the cabinet for easy connection in the field. The cable for the first panel in the signal path may be pre-installed from the factory in Port A2. It can be removed to allow for the primary incoming signal from the control room/rack. This cable can be set aside and used as a spare. Cables in subsequent panels can be plugged in as normal.



- 1: Field-installed primary path Signal #1
- 2: Field-installed return path Signal #1

Figure 7: Primary Vertical Signal Connection

Note: When routing Cat 6 cable, ensure that loops are not bent too tightly. Refer to **Figure 8**.

Redundant signal is connected to Port B1 and Port B2 and is only used in fully redundant systems. Refer to **Figure 9** and **Figure 10**.

Refer to **Module Installation (p.2)** to install the modules.

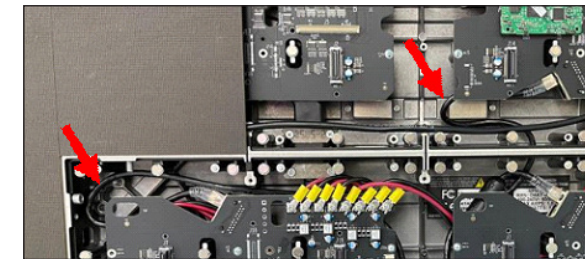


Figure 8: Cat 6 Cable Routing



Figure 9: Redundant Horizontal Signal Connection

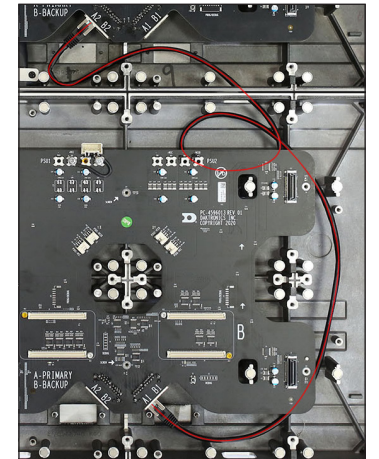


Figure 10: Redundant Vertical Signal Connection

3R Remote Power (Optional)

For installations using 3R remote power, install the power entrance (**Figure 11**) at the power entrance location (**Figure 12**). Refer to the **NPN-6X00 3R Remote Power Quick Guide (DD5132012)** and contract-specific Riser Diagram for details on how to install 3R remote power.

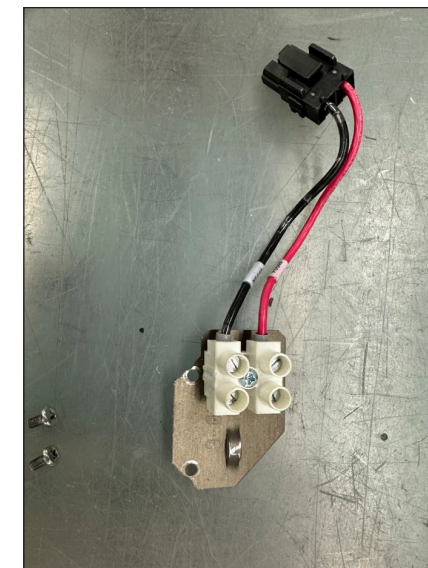


Figure 11: Power Entrance

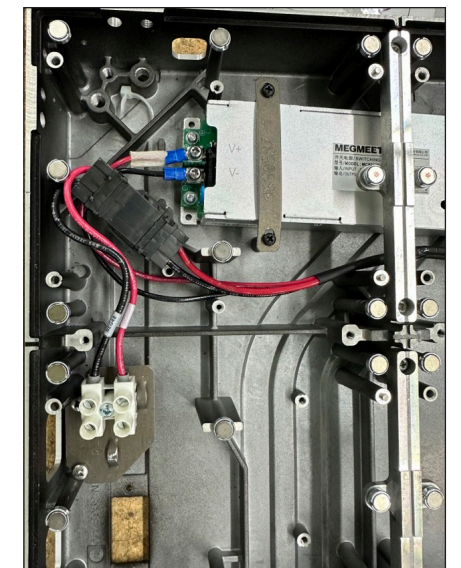


Figure 12: Power Entrance Location

Tether Installation (Optional)

In some instances, a module tether (Daktronics part number HS-5253269) is required to secure the module to the display. If a tether is required, attach the tether to the module prior to installing the module:

1. Place the module face down on a soft surface, taking care not to damage the LEDs, and place a tether next to the module. Refer to **Figure 13**.
2. Note the four 0.203" x 0.750" slots in the magnet plate, as these will be used to secure the tether to the module. There are two different magnet plate shapes depending on the size of the module. Refer to **Figure 14**.
3. Slide the narrow end of the tether through one of the slots. Refer to **Figure 15**.
4. Fold the tether over itself. Refer to **Figure 16**.
5. Push the narrow end of the tether through the slit in the wide end of the tether until small bulges catch in the slit. Refer to **Figure 17**.

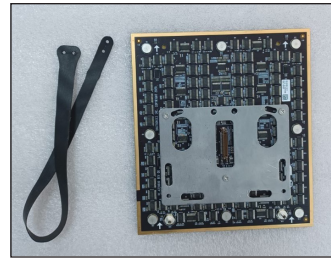


Figure 13: Tether and Module

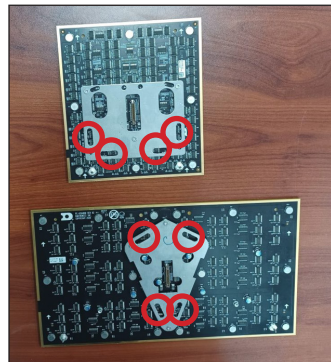


Figure 14: Tethering Slots

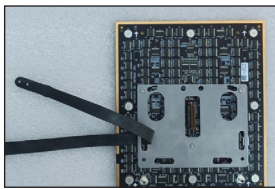


Figure 15: Slide Tether Through Slot

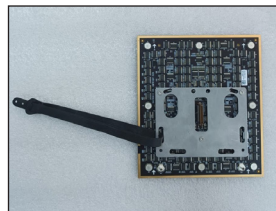


Figure 16: Fold Tether



Figure 17: Tether Slit

6. Lay the tether flat across the back of the module, in the opposite direction from the edge of the magnet plate on which the slot is located.
7. Position the module close to its location on the display and slip the narrow end of the tether over one of the magnet posts in the display to secure the module to the panel. Refer to **Figure 18** and **Figure 19**.
8. Place the module onto the panel, ensuring the tether lays flat behind the module and does not interfere with any components or prevent the module from fully seating on the panel. Some adjustments may be required to ensure proper alignment/seating. Refer to **Figure 20**.

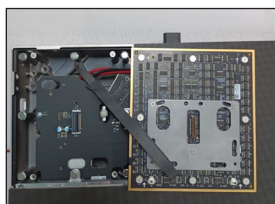


Figure 18: Module Tethered to Chassis



Figure 19: Magnet Post

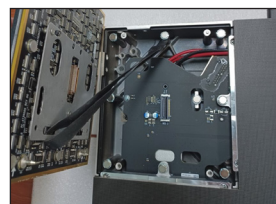


Figure 20: Keep Tether Clear of Components

Module Installation

1. Ensure power and signal connections are completed prior to module installation.
2. Power on the display and verify LEDs light up on the receiver cards throughout entire display. Refer to **Callout 1** in **Figure 1**.

Note: If any receiver cards do not have LEDs lit, verify power connections and troubleshoot prior to installing modules.

3. Disconnect power to the display.
4. Install modules using the module removal tool, picking up a module with the tool from the box. Refer to **Figure 21** and **Figure 22**. Consider magnet alignment and carefully place the modules into the display. Refer to **Module Removal (p.2)** for detailed instructions.



Figure 21: Magnetic Removal Tool



Figure 22: Removing Module from Box

Z-Axis Seam Adjustment

If a module is lower than adjacent modules, remove the module and turn the magnet out for adjustment. Use a notched sheet metal tool (0M-5018247) or notched screwdriver (TH-4176465) to loosen the magnet, then turn the magnet by hand. Refer to **Figure 23**.

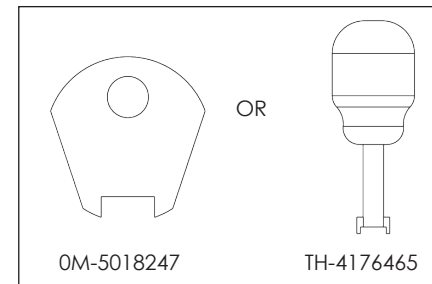


Figure 23: Turn Magnet Options for Z-axis Adjustment

If a module is higher than adjacent modules, remove the adjacent modules and adjust the appropriate magnets until the modules are flush. This may take several attempts.

X/Y-Axis Seam Adjustment

When modules are installed on a display, all modules should be pushed toward the center of the display until all PCBs touch or nearly touch each other. When the display is turned on, there should be many bright seams but no dark seams. If dark seams are present, adjust the seams to be bright. Software will be used later to remove bright seams.

Service

Module Removal

1. Disconnect power to the display.
2. Ensure the face of the supplied magnetic removal tool is free of dust and metal filings that can damage the modules and LEDs. Refer to **Figure 21**.
3. Tilt and place the magnetic removal tool at an angle on the center of the module to be removed. Refer to **Figure 24**.
4. Hold the magnetic removal tool with two hands and pull the module directly out. Do not tilt the module as this can result in broken LEDs.



Figure 24: Using Magnetic Removal Tool

Note: Avoid setting down modules with LEDs facing down.

Refer to **Module Installation (p.2)** to install a module. Complete all power and signal connections prior to module installation.

Receiver Card Removal

1. Disconnect power to the display.
2. Remove the lower-left module. Refer to **Module Removal (p.2)**.
3. Pull the receiver card from the hub board. Refer to **Figure 25**.



Figure 25: Remove Receiver Card

Reverse these steps to install a receiver card. Ensure the receiver card is firmly pressed into the hub board and the jacks are fully seated. Reinstall the module after the receiver card is replaced. Refer to **Module Installation (p.2)**.

Refer to the contract-specific Riser Diagram for specific routing details.

Hub Board Removal

1. Disconnect power to the display.
2. Remove the four modules from the panel being serviced. Refer to **Module Removal (p.2)**.
3. Disconnect the DC power harness from the top of the hub board.
4. Remove the receiver card. Refer to **Receiver Card Removal (p.2)**.
5. Remove the eight screws (circled in yellow in **Figure 26**) on the support bars.

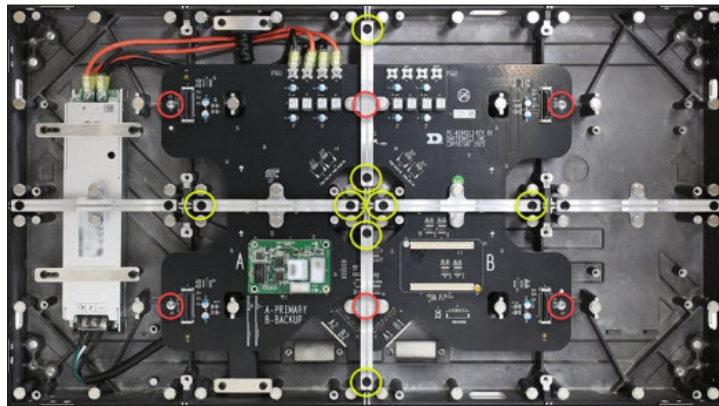


Figure 26: Remove Hub Board

6. Remove the six screws (circled in red in **Figure 26**) securing the hub board, and then remove the hub board.

Power Supply Removal

1. Disconnect power to the display.
2. Remove the three screws (circled in orange in **Figure 27**) for the AC harness.

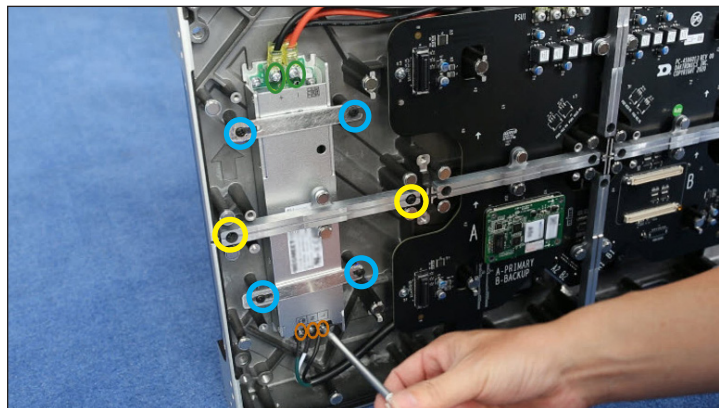


Figure 27: Remove Power Supply

3. Remove the two screws (circled in green in **Figure 27**) for the DC harness.

Note: The UHP power supply option will have four screws to remove.

4. Remove the two screws (circled in yellow in **Figure 27**) securing the support bar.
5. Remove the four screws (circled in blue in **Figure 27**) securing the power supply strips and bridge bracket, and then remove the power supply.

Reverse these steps to install a power supply.

Panel-Embedded PLR Removal

1. Disconnect power to the display.
 2. Remove the support bar(s) from the right half of the panel.
- Note:** Only one support bar needs to be removed if using a full 4-module hub board.
3. If using a half hub board, remove the 6 screws from the right half of the hub board.
 4. Disconnect the cables from the PLR and remove the 4 screws that attach the PLR to the plate (circled in red in **Figure 28**).

Reverse these steps to install a new PLR.

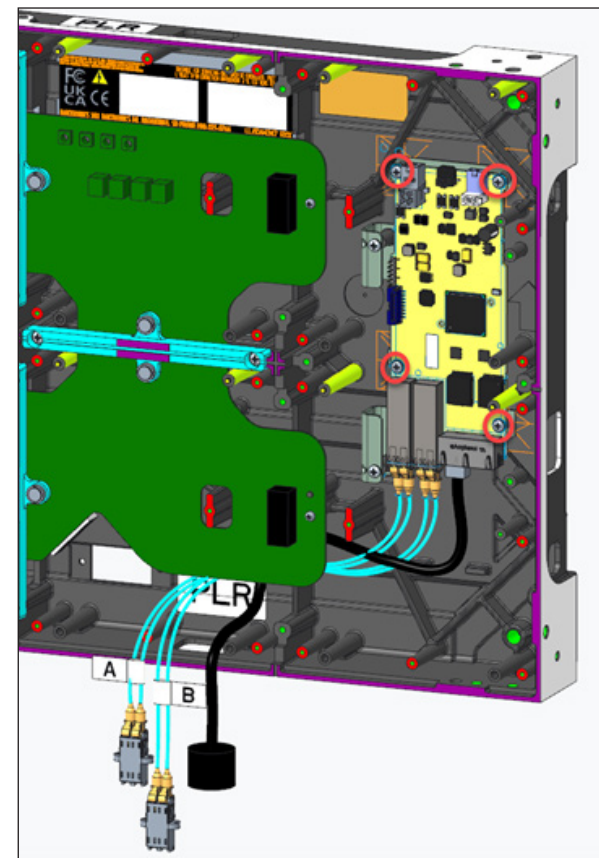


Figure 28: Embedded PLR Removal

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Flat Border

Tools

Part	Part Description
Flat-head bit or screwdriver	Removes bottom alignment pins
2.5 mm hex key (Daktronics part number TH-4747832)	Attaches borders

Part Identification

There are six different border sizes for the NPN-X200/X400 display series:

one-, two-, three-, and four-panel-high borders and one- and two-panel-wide borders. The part numbers are etched into the metal on each border for identification purposes. Refer to the table below for part numbers and to **Figure 1** for a visual.



Figure 1: Flat Border

Part Number	Part Description
0M-4804541	Flat border, side, 1-panel high, NPN D1, 1x4 tube
0M-4804543	Flat border, side, 2-panel high, NPN D1, 1x4 tube
0M-4804545	Flat border, side, 3-panel high, NPN D1, 1x4 tube
0M-4804547	Flat border, side, 4-panel high, NPN D1, 1x4 tube
0M-4804549	Flat border, top/bottom, 1-panel wide, NPN D1, 1x4 tube
0M-4804551	Flat border, top/bottom, 2-panel wide, NPN D1, 1x4 tube

Border Installation

Borders are attached either before the display is mounted to the structure or after if site conditions allow for tool clearance around the mounted display. If the borders must be installed before the sections, only one-panel-high (Daktronics part number 0M-4804541) and two-panel-wide (0M-4804551) borders are available. Borders longer than one panel high must be installed after the display sections are mounted to the structure.

1. Remove the bottom alignment pins from the bottom row of panels. Refer to **Figure 2**.

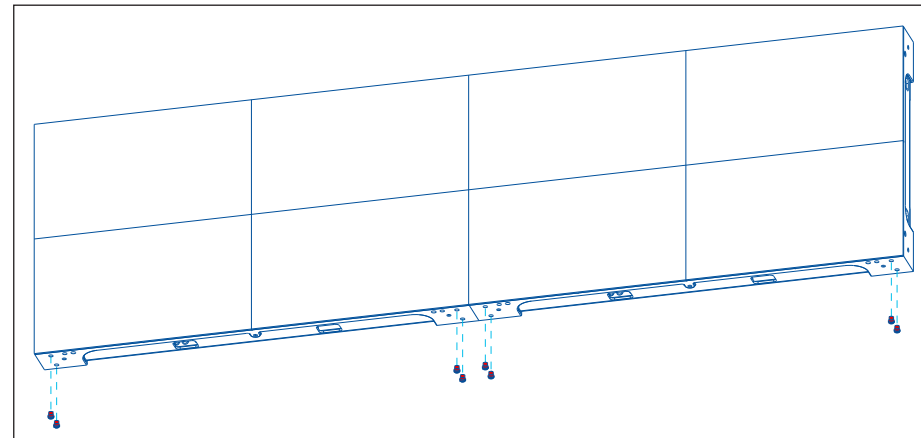


Figure 2: Prepare Bottom Row of Panels

2. Select the correct border size according to the Shop Drawing.
3. Use a clean rag to wipe off the perimeter of the panel receiving the border.
4. Bring the border into position. The holes should be oriented toward the front of the display to align with the threaded holes in the panels. Refer to **Figure 3**.

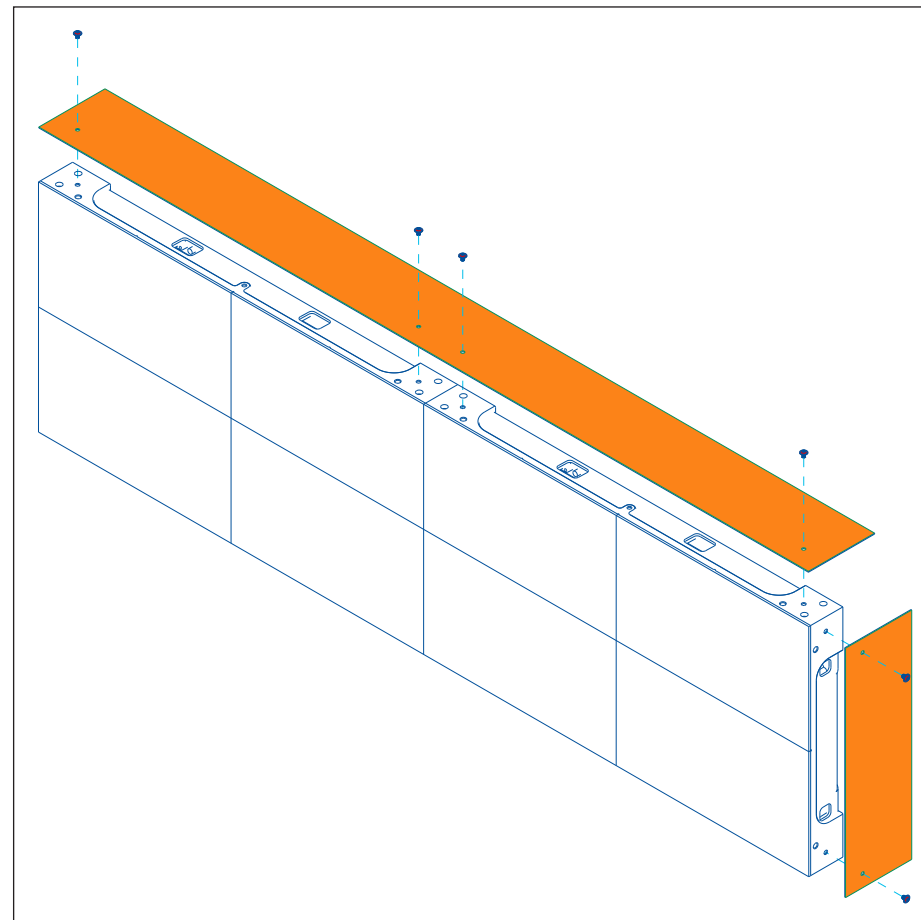


Figure 3: Install Flat Border

5. Use a 2.5 mm hex key (TH-4747832) to attach the M4-0.7 x 6 mm machine screws (HC-4729087), fastening the border to the panel perimeter in all pre-punched hole locations on the border. Each panel has threaded holes for borders on all four sides. Refer to **Figure 4** for the finished appearance.

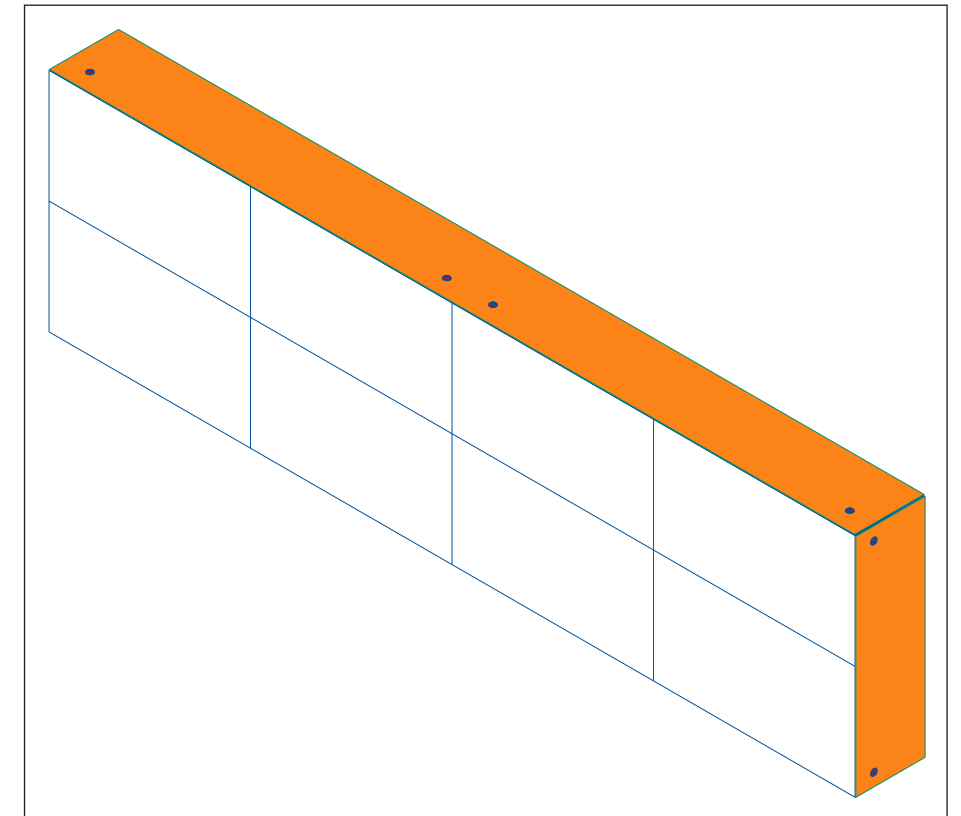


Figure 4: Attached Flat Border

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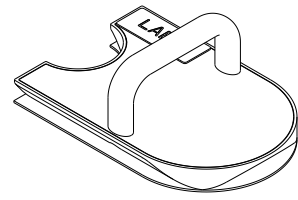
B Reference Drawings

Refer to **Numbering Conventions (p.1)** for information regarding how to read the drawing number.

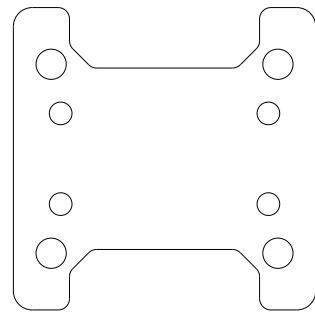
These drawings offer general information pertaining to most NPN-X200/X400 series displays and are listed in numeric order. Any contract-specific drawings take precedence over the general drawings.

Recommended Tools and Hardware; NPN D1	DWG-4756039
Field Bracket Install Guide; NPN-D1 Curve	DWG-4988412
Required Tools and Hardware, Speed Frame; NPN D1	DWG-5015596
Field Bracket Install Guide Full Panel; NPN-D1 Curve	DWG-5095300

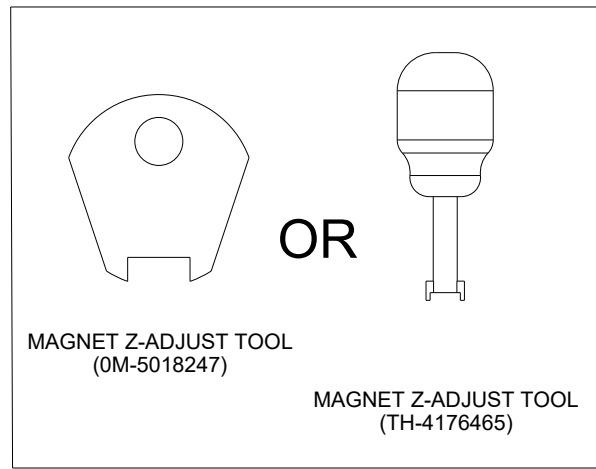
REQUIRED TOOLS AND JIGS (PROVIDED)



MODULE REMOVAL TOOL
(0A-2238-9999)



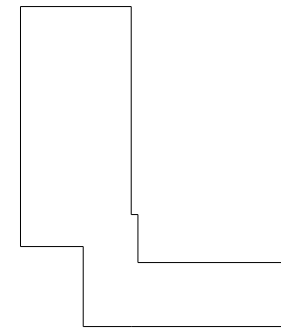
PANEL FLATTENING JIG
(0M-4671476)



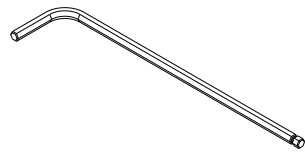
MAGNET Z-ADJUST TOOL
(0M-5018247)

OR

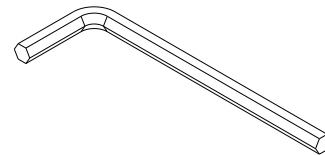
MAGNET Z-ADJUST TOOL
(TH-4176465)



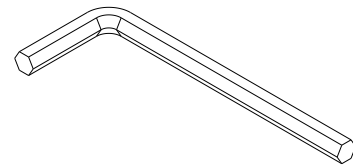
PANEL POSITIONING JIG
(0M-4748002)



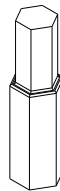
2.5MM HEX KEY
(TH-4747832)



5MM HEX KEY
(TH-4747831)



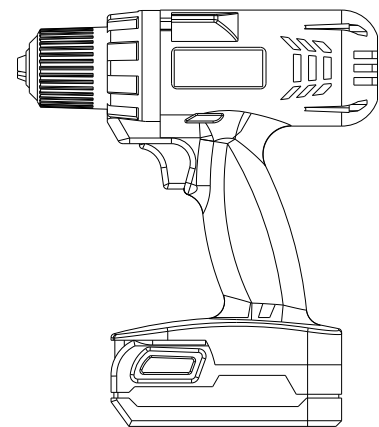
6MM HEX KEY
(TH-4747831)



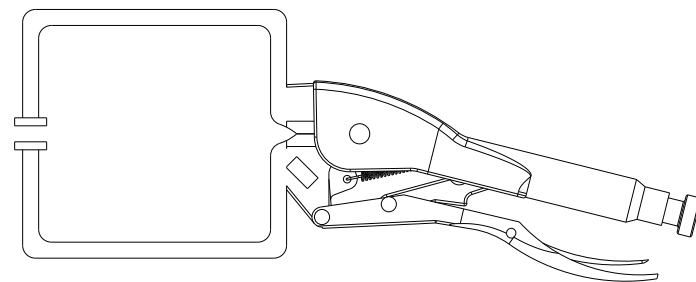
5MM HEX BIT
1/4" DRIVE
(TH-4747830)



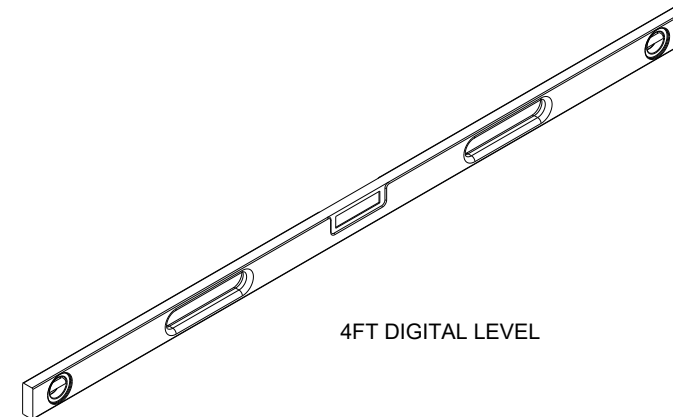
FLATTENING JIG BOLTS
M8-1.25X50
(HC-4084277)



CORDLESS DRILL



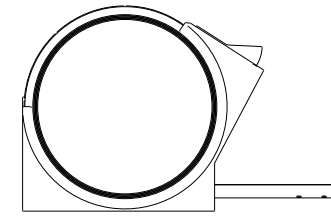
C-CLAMPS



4FT DIGITAL LEVEL

REQUIRED TOOLS (NOT PROVIDED)

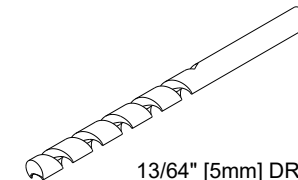
TOOL
SURGICAL (NITRILE) GLOVES: FOR MODULE HANDLING
STRING LINE
MARKER
1/4" [6MM] CENTER-LOCATING PUNCH
NUTDRIVER- 1/4"
SOCKET ADAPTER/EXTENSION- 1/4"
VACUUM



TAPE MEASURER



3/8" SOCKET

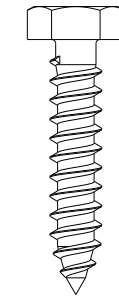


13/64" [5mm] DRILL BIT

REQUIRED HARDWARE (PROVIDED)

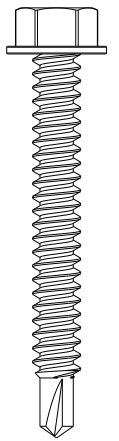


M4-0.7X6 BTN HEAD HEX DRIVE SCREW
PN# HC-4729087
(BORDER HARDWARE)

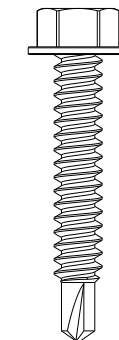


1/4"-10X1-1/2" LAG BOLT
PN# HC-4284469
(TUBE TO PLYWOOD MOUNTING)

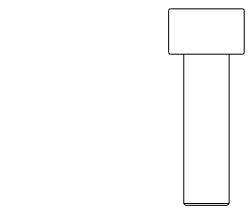
OR



1/4"-14X2" HEX WASHER HEAD
PN# HC-4044048
(ALT. TUBE MOUNTING)



1/4"-14X1-1/2" HEX WASHER HEAD
PN# HC-3880111
(PANEL MOUNTING)

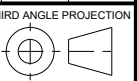


M6-1.0X20 CAP SCREW HEX DRIVE
PN# HC-1795
(Z-ADJUST AND STITCH HARDWARE)

02	11 APR 22	CN-138248- UPDATED MAG ADJUST TOOL	KRH 15657
REV: 01	DATE: 18 OCT 21	PER CN-129273: UPDATED RECOMMENDED TOOLS AND HDWE PER INSTALLATION REQUEST	BY: LJH 07198
PROJECT: NPN D1		TITLE: RECOMMENDED TOOLS AND HARDWARE; NPN D1	
DATE: 11-APR-22	DIM UNITS: INCHES [MILLIMETERS]	SHEET	REV 02
SCALE: 1/1	DO NOT SCALE DRAWING		
DESIGN: KHEMILL	JOB NO. P2238	FUNC - TYPE - SIZE E - 07 - B	4756039
DRAWN: KHEMILL			



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NPN D1 CURVE HALF-PANEL FACET BRACKET DETAILS

INDEX	NAME	QTY	DESCRIPTION
1	0M-4913246	8	HALF PANEL SPANNER BRKT, MID; NPN-D1 CRV
2	BOTTOM PAD BRACKET	1	PAD INTERCONNECT BRKT, BTM, 00000CV; NPN-D1 CRV
3	EMI SHIELD BRACKET	3	EMI SHIELD, 00000CV; NPN-D1 CRV
4	HC-1089	8	WASHER, #10 FLAT, ZN PLTD, SAE
5	HC-3898468	8	SCREW; M3X6 COUNTER SUNK, SS304, GB/T 822
6	HC-4090072	12	SCREW, M3-0.5 X 6, SOCKET HEAD, SS
7	HC-5054609	8	MACH SCR, M4-0.7 X 30MM, PHIL PAN HEAD, ZN PLTD
8	MID HALF PANEL BRACKET	8	HALF PANEL INT BRKT, MID, 00000CV; NPN-D1 CRV
9	TOP PAD BRACKET	1	PAD INTERCONNECT BRKT, TOP, 00000CV; NPN-D1 CRV

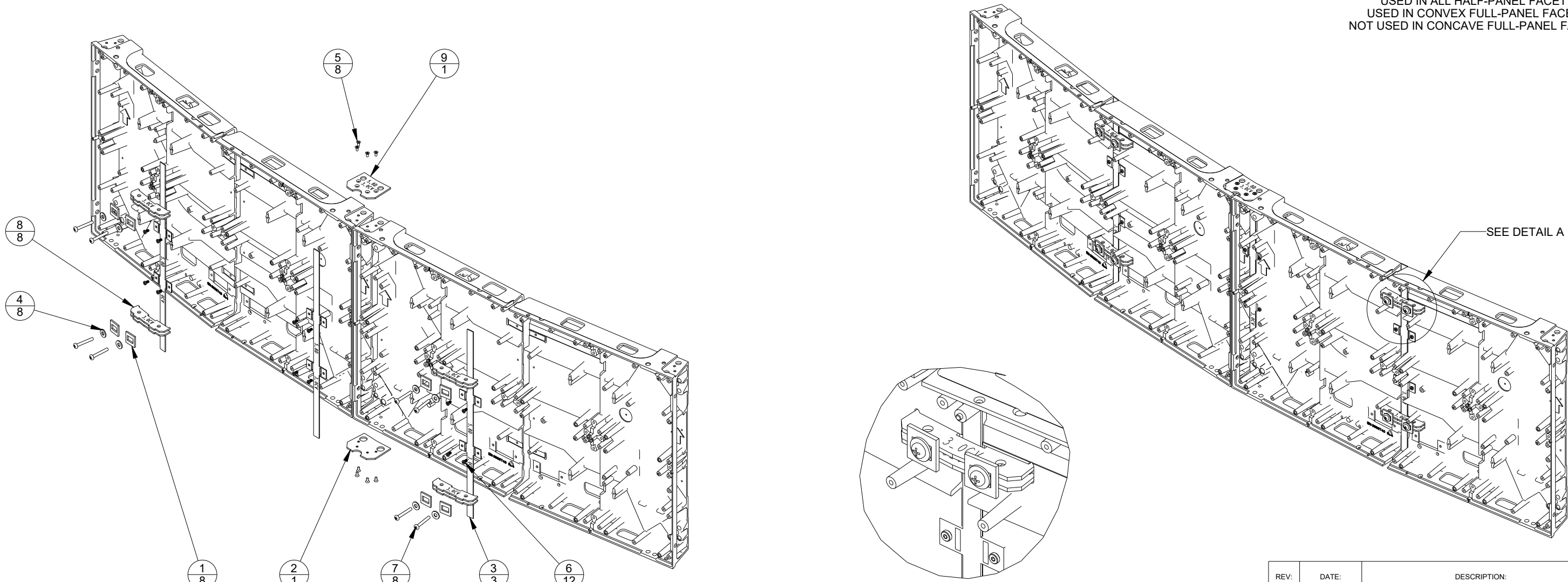
0M-4913246 (MID PANEL SPANNING BRACKET):
USED IN ALL HALF-PANEL FACET DISPLAYS
NOT USED IN FULL-PANEL FACET DISPLAYS

TOP PAD INTERCONNECT BRACKET:
USED IN ALL CURVED DISPLAYS

BOTTOM PAD INTERCONNECT BRACKET:
USED IN ALL CURVED DISPLAYS

MID PANEL INTERCONNECT BRACKET:
USED IN ALL HALF-PANEL FACET DISPLAYS
NOT USED IN FULL-PANEL FACET DISPLAYS

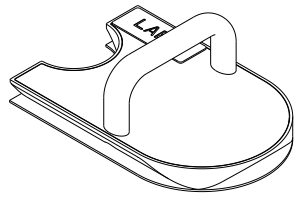
EMI SHIELD BRACKET:
USED IN ALL HALF-PANEL FACET DISPLAYS
USED IN CONVEX FULL-PANEL FACET DISPLAYS
NOT USED IN CONCAVE FULL-PANEL FACET DISPLAYS



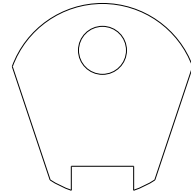
DETAIL A
SCALE 1/2

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<p>PROJECT: NPN-D1 CURVE</p>			
<p>TITLE: FIELD BRACKET INSTALL GUIDE; NPN-D1 CRV</p>			
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DESIGN: KHEMILL	JOB NO. P2292	FUNC - TYPE - SIZE	F - 07 - B
DRAWN: KHEMILL	4988412		

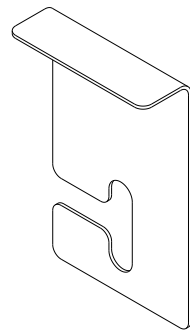
REQUIRED TOOLS, JIGS, & PLATES (PROVIDED)



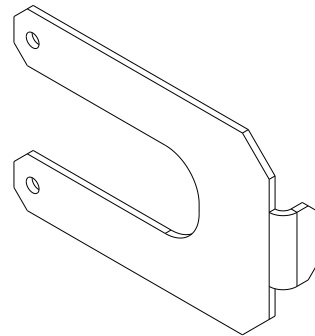
MODULE REMOVAL TOOL
(0A-2238-9999)



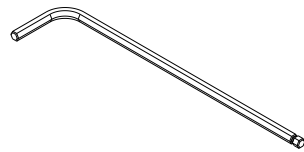
MAGNET Z-ADJUST TOOL
(0M-5018247)



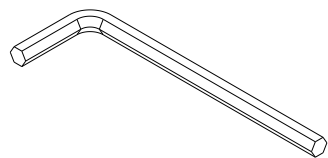
SPEEDFRAME BRACE PLATE
(0M-4951150)



SPEEDFRAME SEISMIC PLATE
(0M-4983082)



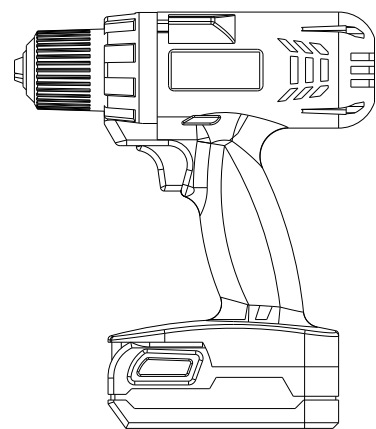
2.5MM HEX KEY
(TH-4747832)



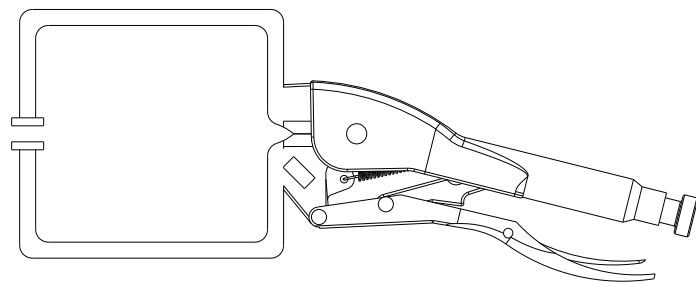
5MM HEX KEY
(TH-4747831)



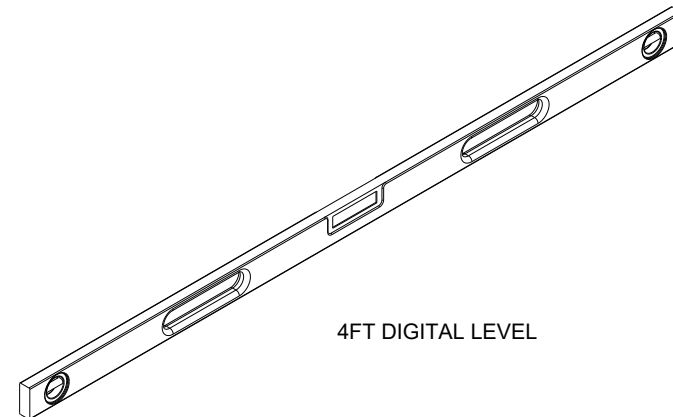
5MM HEX BIT
1/4" DRIVE
(TH-4747830)



CORDLESS DRILL



C-CLAMPS



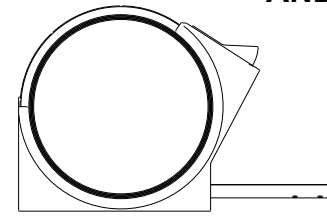
4FT DIGITAL LEVEL

REQUIRED TOOLS (NOT PROVIDED)

TOOLS NOT PICTURED

- SURGICAL (NITRILE) GLOVES: FOR MODULE HANDLING
- CUT RESISTANT GLOVES: FOR SPEEDFRAME INSTALLATION
- STRING LINE
- STUD FINDER
- SCISSORS/SIDE-CUTTING PLIERS
- MARKER/PENCIL
- RATCHET
- NUTDRIVER- 1/4"
- SOCKET ADAPTER/EXTENSION- 1/4"
- VACUUM

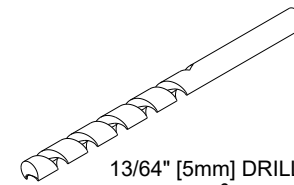
- AND -



TAPE MEASURER



3/8" SOCKET &
5/16" SOCKET



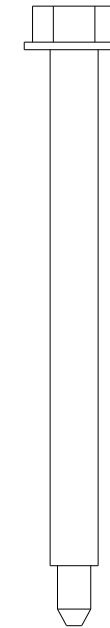
13/64" [5mm] DRILL BIT &
5/32" [4mm] DRILL BIT



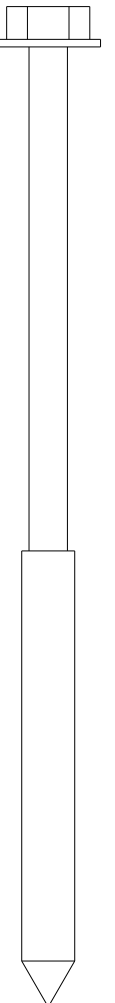
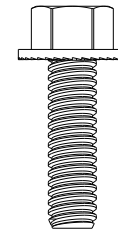
15/16" DEEP WELL SOCKET

REQUIRED HARDWARE (PROVIDED)

1/4"X5" HEX WASHER HEAD SPAX POWERLAG SCREW
PN# HC-5100765
(FRAME TO WOOD STUD MOUNTING)



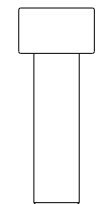
1/4-20 X 0.875" HEX SERRATED FLANGE HEAD
PN# HC-1842
(FRAME STITCH HARDWARE)



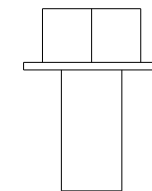
1/4"-14X3" HEX WASHER HEAD
PN# HC-3979953
(FRAME TO STEEL STUD MOUNTING)



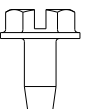
M4-0.7X6 BTN HEAD HEX DRIVE SCREW
PN# HC-4729087
(BORDER HARDWARE)



M6-1.0X20 CAP SCREW HEX DRIVE
PN# HC-1795
(Z-ADJUST AND PANEL STITCH HARDWARE)



M8-1.25 X 16MM HEX SERRATED FLANGE HEAD
5MM HEX BROACH
PN# HC-4884317
(PANEL MOUNT HARDWARE)



#10-16 X 0.375" TAP SCREW HEX DRIVE
PN# HC-1186
(SEISMIC PLATE HARDWARE)

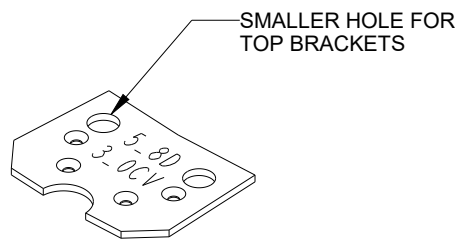
02	15 AUG 22	CN-145138: ADDED SPAX SCREW FOR WOOD STUD CAPABILITIES	KRH 15657
REV: 01	DATE: 11 APR 22	DESCRIPTION: CN-138248- UPDATED MAG ADJUST TOOL, ADDED PROVIDED OM PLATES, MISSING SOCKET & DRILL BIT, AND HC-1186	BY: KRH 15657

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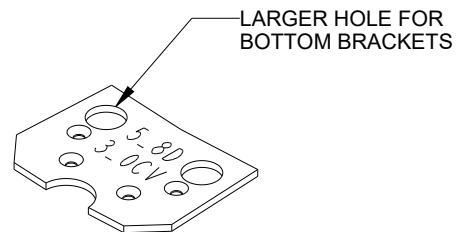
PROJECT: NPN D1		TITLE: REQUIRED TOOLS AND HARDWARE, SPEED FRAME; NPN D1	
DATE: 15-AUG-22	DIM UNITS: INCHES [MILLIMETERS]	SHEET	REV 02
SCALE: 1/1	DO NOT SCALE DRAWING		
DESIGN: KHEMILL	JOB NO. P2238	FUNC - TYPE - SIZE E - 07 - B	5015596
DRAWN: KHEMILL			

NPN D1 CURVE FULL-PANEL FACET BRACKET DETAILS

INDEX	NAME	QTY	DESCRIPTION
1	BOTTOM PAD BRACKET	1	PAD INTERCONNECT BRKT, BTM, 00000CV; NPN-D1 CRV
2	EMI SHIELD BRACKET	1	EMI SHIELD, 00000CV; NPN-D1 CRV
3	HC-3898468	8	SCREW; M3X6 COUNTER SUNK, SS304, GB/T 822
4	HC-4090072	4	SCREW, M3-0.5 X 6, SOCKET HEAD, SS
5	TOP PAD BRACKET	1	PAD INTERCONNECT BRKT, TOP, 00000CV; NPN-D1 CRV



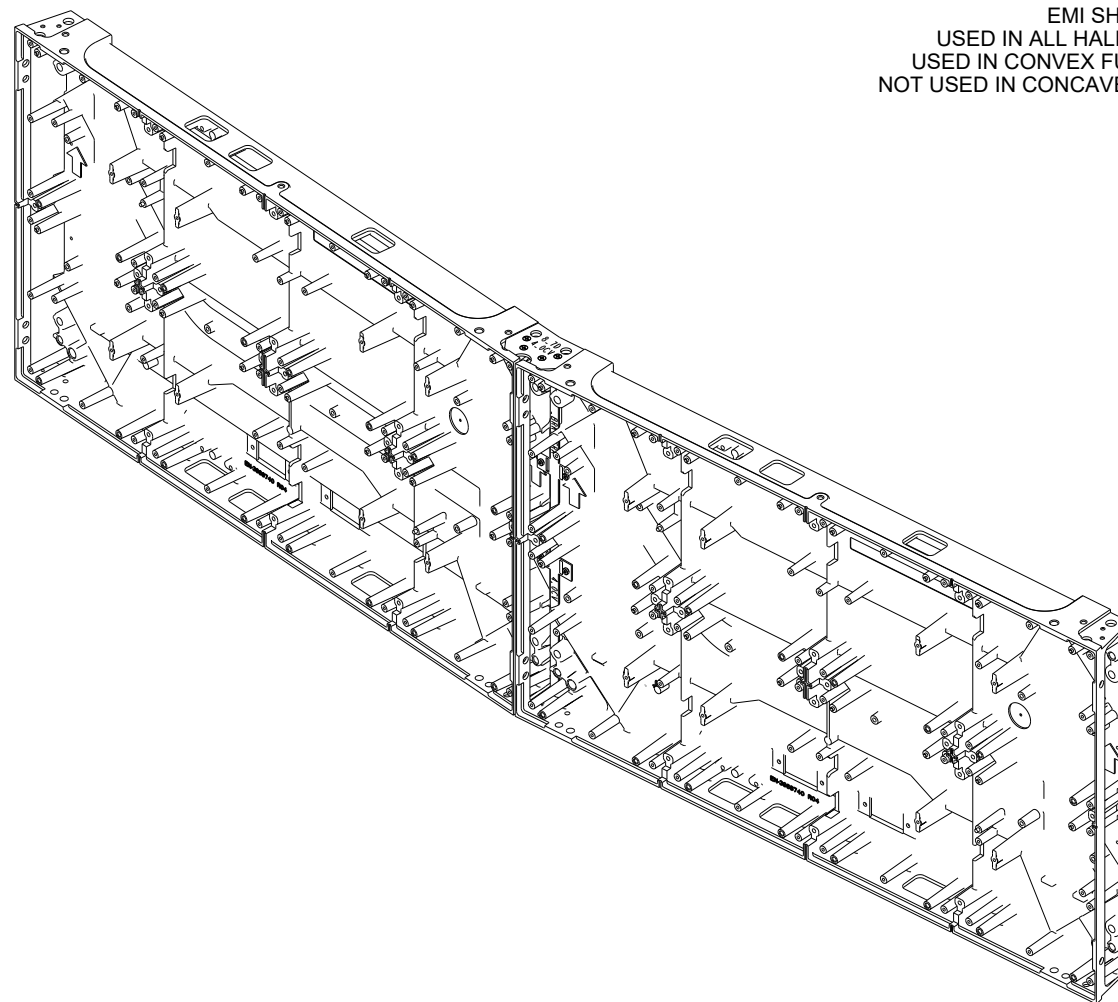
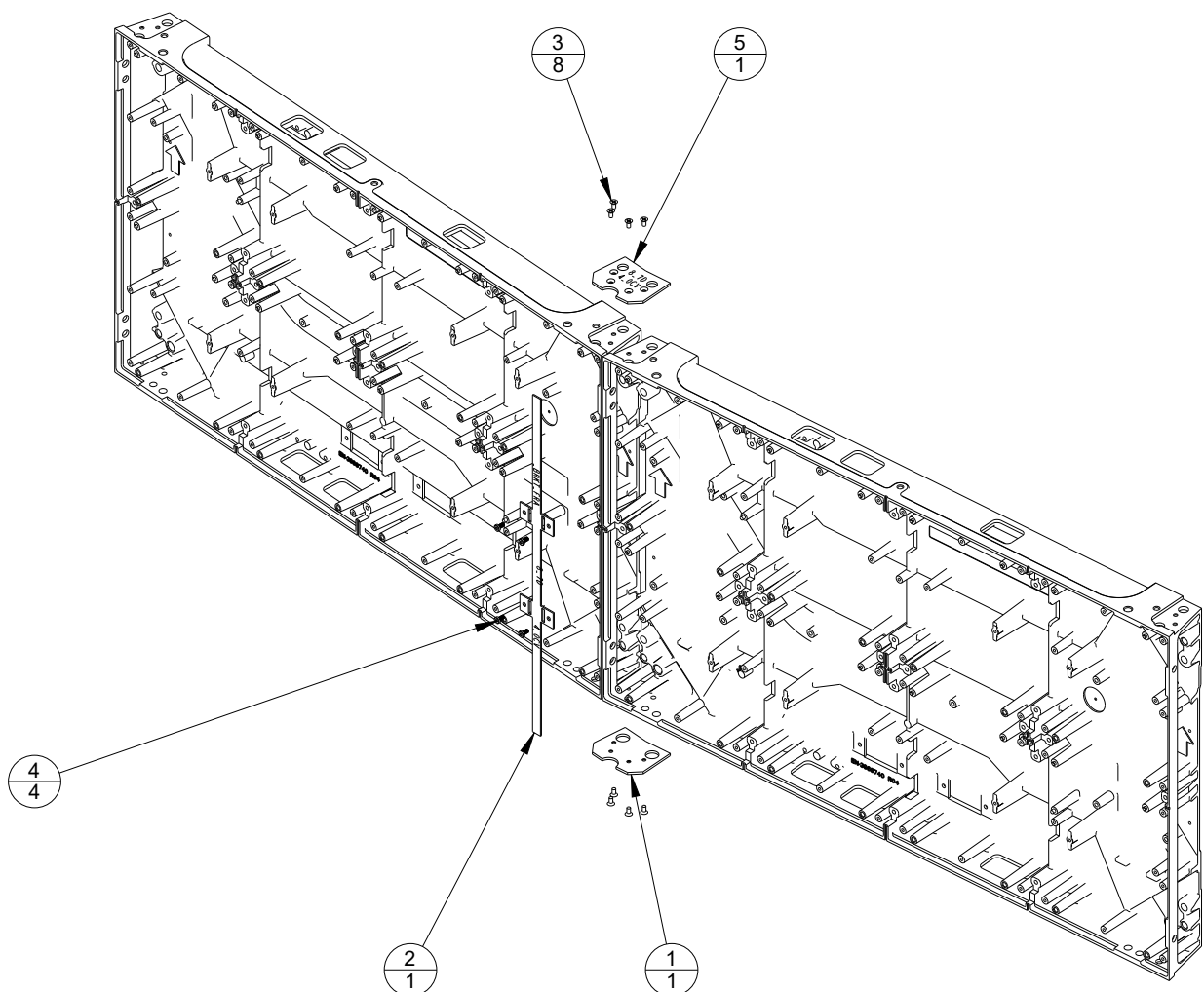
TOP PAD INTERCONNECT BRACKET:
USED IN ALL CURVED DISPLAYS



BOTTOM PAD INTERCONNECT BRACKET:
USED IN ALL CURVED DISPLAYS



EMI SHIELD BRACKET:
USED IN ALL HALF-PANEL FACET DISPLAYS
USED IN CONVEX FULL-PANEL FACET DISPLAYS
NOT USED IN CONCAVE FULL-PANEL FACET DISPLAYS



REV:	DATE:	DESCRIPTION:	BY:
<p>THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS WITHOUT THE EXPRESS WRITTEN CONSENT OF DAKTRONICS, INC. OR ITS WHOLLY OWNED SUBSIDIARIES. COPYRIGHT 2021 DAKTRONICS, INC. (USA)</p>			
<p>PROJECT: NPN-D1 CURVE</p>			
<p>TITLE: FIELD BRACKET INSTALL GUIDE FP; NPN-D1 CRV</p>			
DATE: 22-JUN-22	DIM UNITS: INCHES [MILLIMETERS]	SHEET	REV 00
SCALE: 1/6	DO NOT SCALE DRAWING		
DESIGN: KHEMILL	JOB NO. P2292	FUNC - TYPE - SIZE F - 07 - B	5095300
DRAWN: KHEMILL			

External Power Connection

Connect to the wall box according to local code. Route power within 6' of the power supply chassis. Refer to the contract-specific Riser Diagram.

Internal Power Connection

Power routes internally to the display after field power is landed. Incoming power is terminated at a Daktronics-provided MNL connector. Each connector includes 110" of 12 AWG bare wire for connection to incoming power.

Each power supply chassis will require two (2) 20A circuits or one (1) 30A circuit.

There are four options for AC input. Incoming power is terminated at the appropriate Daktronics-supplied harness. Refer to **Figure 1**.

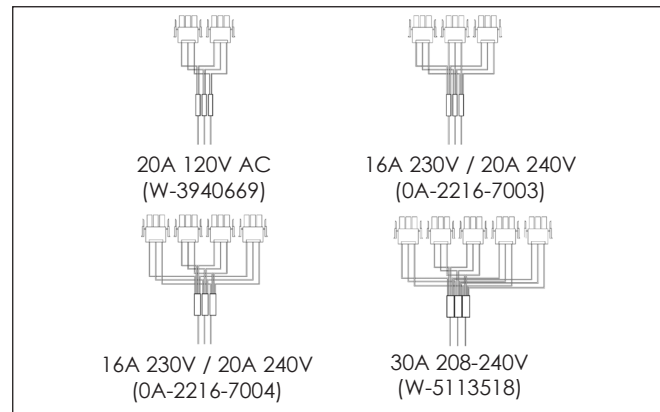


Figure 1: AC Connector Harness Options

The power entrance is shown in **Figure 2**. Use two screws to mount the power entrance to the power entrance location on the bottom of the panel. Refer to **Figure 3**.



Figure 2: Power Entrance

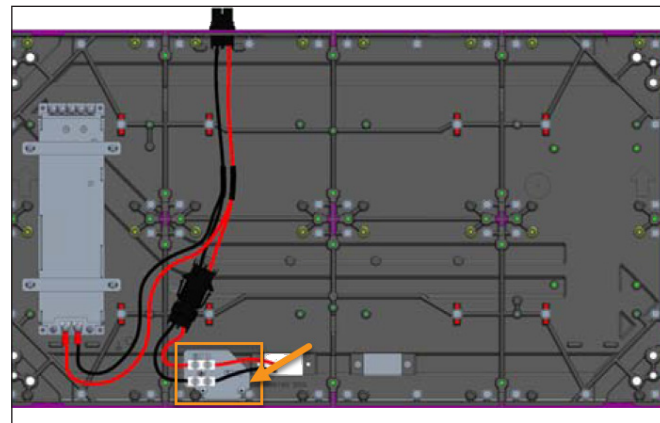


Figure 3: Power Entrance Location

Rectifier Connection

AC input through MNL connectors powers individual rectifiers. In a 4-rectifier harness, 3 rectifiers are used and 1 is redundant. The number of rectifiers needed for each incoming current is detailed in the table below.

Voltage	Rectifiers
20A 120V	2
20A 208V	3
20A 230V	3
30A 208V	5

There is a maximum of 5 rectifiers per power shelf. Rectifiers each share the load to output terminals. Refer to **Figure 4** for the locations of rectifiers and output terminals.

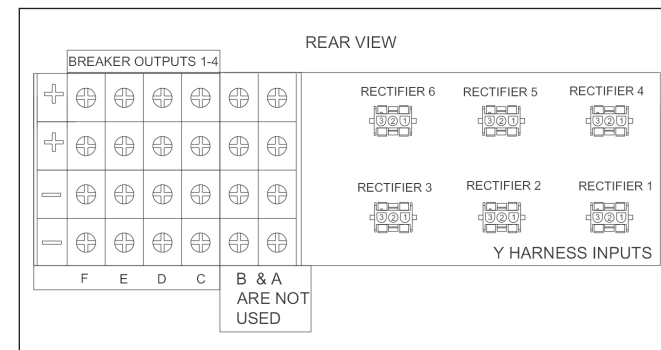


Figure 4: Remote Power Chassis (rear view)

Output Connection

Wire each output terminal using 10 AWG paired wire and either a 1/4" ring terminal or two-hole lug with 1/4" stud hole at 5/8" spacing. Refer to **Figure 5**.

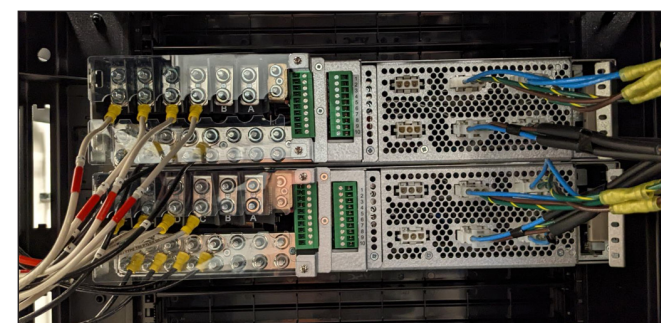


Figure 5: Wired Power Chassis

Route the 10 AWG wire a maximum of 200' to the display. Refer to **Figure 6**.

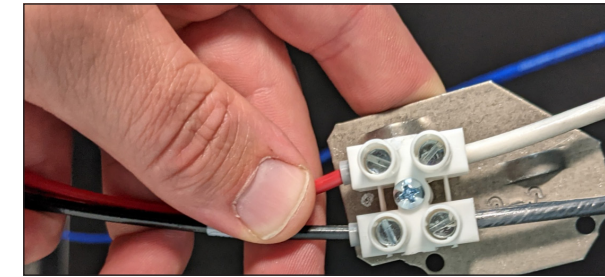


Figure 6: Wired Power Connection at Display

There is a maximum of 6 panels that may be powered by each output terminal. The number of panels that may be powered by each power shelf is determined by the number of rectifiers, as detailed in the table below.

# of Rectifiers	# of Panels
2	6
3	12
4	18
5	24

C Daktronics Warranty & Limitation of Liability

This section includes the Daktronics Warranty & Limitation of Liability statement.

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DAKTRONICS WARRANTY & LIMITATION OF LIABILITY

This Warranty and Limitation of Liability (the “Warranty”) sets forth the warranty provided by Daktronics with respect to the Equipment. By accepting delivery of the Equipment, Purchaser and End User agree to be bound by and accept these terms and conditions. Unless otherwise defined herein, all terms within the Warranty shall have the same meaning and definition as provided elsewhere in the Agreement.

DAKTRONICS WILL ONLY BE OBLIGATED TO HONOR THE WARRANTY SET FORTH IN THESE TERMS AND CONDITIONS UPON RECEIPT OF FULL PAYMENT FOR THE EQUIPMENT

1. Warranty Coverage.

- A. Daktronics warrants to the original end user (the “End User”, which may also be the Purchaser) that the Equipment will be free from Defects (as defined below) in materials and workmanship for a period of one (1) year (the “Warranty Period”). The Warranty Period shall commence on the earlier of: (i) four weeks from the date that the Equipment leaves Daktronics’ facility; or (ii) Substantial Completion as defined herein. The Warranty Period shall expire on the first anniversary of the commencement date.

“Substantial Completion” means the operational availability of the Equipment to the End User in accordance with the Equipment’s specifications, without regard to punch-list items, or other non-substantial items which do not affect the operation of the Equipment

- B. Daktronics’ obligation under this Warranty is limited to, at Daktronics’ option, replacing or repairing, any Equipment or part thereof that is found by Daktronics not to conform to the Equipment’s specifications. Unless otherwise directed by Daktronics, any defective part or component shall be returned to Daktronics for repair or replacement. This Warranty does not include on-site labor charges to remove or install these components. Daktronics may, at its option, provide on-site warranty service. Daktronics shall have a reasonable period of time to make such replacements or repairs and all labor associated therewith shall be performed during regular working hours. Regular working hours are Monday through Friday between 8:00 a.m. and 5:00 p.m. at the location where labor is performed, excluding any holidays observed by Daktronics.
- C. Daktronics shall pay ground transportation charges for the return of any defective component of the Equipment. All such items shall be shipped by End User DDP Daktronics designated facility per Incoterms® 2020. If returned Equipment is repaired or replaced under the terms of this Warranty, Daktronics will prepay ground transportation charges back to End User and shall ship such items DDP End User’s designated facility per Incoterms® 2020; otherwise, End User shall pay transportation charges to return the Equipment back to the End User and such Equipment shall be shipped Ex Works Daktronics designated facility per Incoterms® 2020. All returns must be pre-approved by Daktronics before shipment. Daktronics shall not be obligated to pay freight for any unapproved return. End User shall pay any upgraded or expedited transportation charges
- D. Any replacement parts or Equipment will be new or serviceably used, comparable in function and performance to the original part or Equipment and warranted for the remainder of the Warranty Period. Purchasing additional parts or Equipment from the Seller does not extend the Warranty Period.
- E. Defects shall be defined as follows. With regard to the Equipment (excepting LEDs), a “Defect” shall refer to a material variance from the design specifications that prohibit the Equipment from operating for its intended use. With respect to LEDs, “Defects” are defined as LED pixels that cease to emit light. Unless otherwise expressly provided, this Warranty does not impose any duty or liability upon Daktronics for partial LED pixel degradation. Notwithstanding the foregoing, in no event does this Warranty include LED pixel degradation caused by UV light. This Warranty does not provide for the replacement or installation of communication methods including but not limited to, wire, fiber optic cable, conduit, trenching, or for the purpose of overcoming local site interference radio equipment substitutions.

EXCEPT AS OTHERWISE EXPRESSLY SET FORTH IN THIS WARRANTY, TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, DAKTRONICS DISCLAIMS ANY AND ALL OTHER PROMISES, REPRESENTATIONS AND WARRANTIES APPLICABLE TO THE EQUIPMENT AND REPLACES ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ACCURACY OR QUALITY OF DATA. OTHER ORAL OR WRITTEN INFORMATION OR ADVICE GIVEN BY DAKTRONICS, ITS AGENTS OR EMPLOYEES, SHALL NOT CREATE A WARRANTY OR IN ANY WAY INCREASE THE SCOPE OF THIS LIMITED WARRANTY.

THIS LIMITED WARRANTY IS NOT TRANSFERABLE.

2. Exclusion from Warranty Coverage

This Warranty does not impose any duty or liability upon Daktronics for any:

- A. damage occurring at any time, during shipment of Equipment unless otherwise provided for in the Agreement. When returning Equipment to Daktronics for repair or replacement, End User assumes all risk of loss or damage, agrees to use any shipping containers that might be provided by Daktronics, and to ship the Equipment in the manner prescribed by Daktronics;
- B. damage caused by: (i) the improper handling, installation, adjustment, use, repair, or service of the Equipment, or (ii) any physical damage which includes, but is not limited to, missing, broken, or cracked components resulting from non-electrical causes;

DAKTRONICS WARRANTY & LIMITATION OF LIABILITY

altered, scratched, or fractured electronic traces; missing or gauged solder pads; cuts or clipped wires; crushed, cracked, punctured, or bent circuit boards; or tampering with any electronic connections, provided that such damage is not caused by personnel of Daktronics or its authorized repair agents;

- C. damage caused by the failure to provide a continuously suitable environment, including, but not limited to: (i) neglect or misuse; (ii) improper power including, without limitation, a failure or sudden surge of electrical power; (iii) improper air conditioning, humidity control, or other environmental conditions outside of the Equipment's technical specifications such as extreme temperatures, corrosives and metallic pollutants; or (iv) any other cause other than ordinary use;
- D. damage caused by fire, flood, earthquake, water, wind, lightning or other natural disaster, strike, inability to obtain materials or utilities, war, terrorism, civil disturbance, or any other cause beyond Daktronics' reasonable control;
- E. failure to adjust, repair or replace any item of Equipment if it would be impractical for Daktronics personnel to do so because of connection of the Equipment by mechanical or electrical means to another device not supplied by Daktronics, or the existence of general environmental conditions at the site that pose a danger to Daktronics personnel;
- F. statements made about the product by any salesperson, dealer, distributor or agent, unless such statements are in a written document signed by an officer of Daktronics. Such statements as are not included in a signed writing do not constitute warranties, shall not be relied upon by End User and are not part of the contract of sale;
- G. damage arising from the use of Daktronics products in any application other than the commercial and industrial applications for which they are intended, unless, upon request, such use is specifically approved in writing by Daktronics;
- H. replenishment of spare parts. In the event the Equipment was purchased with a spare parts package, the parties acknowledge and agree that the spare parts package is designed to exhaust over the life of the Equipment, and as such, the replenishment of the spare parts package is not included in the scope of this Warranty;
- I. security or functionality of the End User's network or systems, or anti-virus software updates;
- J. performance of preventive maintenance;
- K. third-party systems and other ancillary equipment, including without limitation front-end video control systems, audio systems, video processors and players, HVAC equipment, batteries and LCD screens;
- L. incorporation of accessories, attachments, software or other devices not furnished by Daktronics; or
- M. paint or refinishing the Equipment or furnishing material for this purpose.

3. Limitation of Liability

- A. Daktronics shall be under no obligation to furnish continued service under this Warranty if alterations are made to the Equipment without the prior written approval of Daktronics.
- B. It is specifically agreed that the price of the Equipment is based upon the following limitation of liability. In no event shall Daktronics (including its subsidiaries, affiliates, officers, directors, employees, or agents) be liable for any claims asserting or based on (a) loss of use of the facility or equipment; lost business, revenues, or profits; loss of goodwill; failure or increased cost of operations; loss, damage or corruption of data; loss resulting from system or service failure, malfunction, incompatibility, or breaches in system security; or (b) any special, consequential, incidental or exemplary damages arising out of or in any way connected with the Equipment or otherwise, including but not limited to damages for lost profits, cost of substitute or replacement equipment, down time, injury to property or any damages or sums paid to third parties, even if Daktronics has been advised of the possibility of such damages. The foregoing limitation of liability shall apply whether any claim is based upon principles of contract, tort or statutory duty, principles of indemnity or contribution, or otherwise
- C. In no event shall Daktronics be liable for loss, damage, or injury of any kind or nature arising out of or in connection with this Warranty in excess of the Purchase Price of the Equipment. The End User's remedy in any dispute under this Warranty shall be ultimately limited to the Purchase Price of the Equipment to the extent the Purchase Price has been paid.

4. Assignment of Rights

- A. The Warranty contained herein extends only to the End User (which may be the Purchaser) of the Equipment and no attempt to extend the Warranty to any subsequent user-transferee of the Equipment shall be valid or enforceable without the express written consent of Daktronics.

5. Governing Law; Election of Remedies

- A. The rights and obligations of the parties under this Warranty shall not be governed by the provisions of the United Nations Convention on Contracts for the International Sales of Goods of 1980. The parties consent to the application of the laws of the State of South Dakota to govern, interpret, and enforce each of the parties' rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Warranty, without regard to conflict of law principles.
- B. Any dispute, controversy or claim arising from or related to this Warranty, the parties shall first attempt to settle through negotiations. In the event that no resolution is reached, then such dispute, controversy, or claim shall be resolved by final and binding arbitration under the Rules of Arbitration of the International Chamber of Commerce. The language of the arbitration



DAKTRONICS WARRANTY & LIMITATION OF LIABILITY

shall be English. The place of the arbitration shall be Sioux Falls, SD. A single arbitrator selected by the parties shall preside over the proceeding. If a single arbitrator cannot be agreed upon by the parties, each party shall select an arbitrator, and those arbitrators shall confer and agree on the appointed arbitrator to adjudicate the arbitration. The arbitrator shall have the power to grant any provisional or final remedy or relief that it deems appropriate, including conservatory measures and an award of attorneys' fees. The arbitrator shall make its decisions in accordance with applicable law. By agreeing to arbitration, the Parties do not intend to deprive any court of its jurisdiction to issue a pre-arbitral injunction, pre-arbitral attachment, or other order in aid of arbitration proceedings and the enforcement of any award. Without prejudice to such provisional remedies as may be available under the jurisdiction of a court, the arbitrator shall have full authority to grant provisional remedies and to direct the Parties to request that any court modify or vacate any temporary or preliminary relief issued by such court, and to award damages for the failure of any Party to respect the arbitrator's orders to that effect.

6. Availability of Extended Service Agreement

- A. For End User's protection, in addition to that afforded by the warranties set forth herein, End User may purchase extended warranty services to cover the Equipment. The Extended Service Agreement, available from Daktronics, provides for electronic parts repair and/or on-site labor for an extended period from the date of expiration of this warranty. Alternatively, an Extended Service Agreement may be purchased in conjunction with this Warranty for extended additional services. For further information, contact Daktronics Customer Service at 1-800-DAKTRONics (1-800-325-8766).

Additional Terms applicable to sales outside of the United States

The following additional terms apply **only** where the installation site of the Equipment is located outside of the United States of America.

1. In the event that the installation site of the Equipment is in a country other than the U.S.A., then, notwithstanding Section 5 of the Warranty, where the selling entity is the entity listed in Column 1, then the governing law of this Warranty is the law of the jurisdiction listed in the corresponding row in Column 2 without regard to its conflict of law principles. Furthermore, if the selling entity is an entity listed in Column 1, then the place of arbitration is listed in the corresponding row in Column 3.

Column 1 (Selling Entity)	Column 2 (Governing Law)	Column 3 (Location of Arbitration)
Daktronics, Inc.	The state of Illinois	Chicago, IL, U.S.A.
Daktronics Canada, Inc.	The Province of Ontario, Canada	Toronto, Ontario, Canada
Daktronics UK Ltd.	England and Wales	Bristol, UK
Daktronics GmbH	The Federal Republic of Germany	Wiesbaden, Germany
Daktronics Hong Kong Limited	Hong Kong, Special Administrative Region of the P.R.C.	Hong Kong SAR
Daktronics Shanghai Co., Ltd.	The Peoples Republic of China	Shanghai, P.R.C.
Daktronics France, SARL	France	Paris, France
Daktronics Japan, Inc.	Japan	Tokyo, Japan
Daktronics International Limited	Macau, Special Administrative Region of the P.R.C.	Macau SAR
Daktronics Australia Pad Ltd	Australia	Sydney, Australia
Daktronics Singapore Pte. Ltd	Singapore	Singapore
Daktronics Brazil LTDA	Brazil	São Paulo, Brazil
Daktronics Spain S.L.U.	Spain	Madrid, Spain
Daktronics Belgium N. V	Belgium	Kruikeke, Belgium
Daktronics Ireland Co. Ltd.	Ireland	Dublin, Ireland