RTX-11X1/1801 Series

DAKT-0200-04

Display Manual

DD3084433 *Rev 0—05 January 2016*

Customer:_____
Contract:_____
Model Number: _____
Serial Number:_____
Activation Date: _____

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DAKTRONICS

DD3084433
Product 1755
Rev 0—05 January 2016

DAKTRONICS

Table of Contents

Section 1: 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 **Section 5.2**. This manual is not specific to a particular installation. Contract-specific information takes precedence over any general information found in this manual.

1.1 Resources

Figure 1 illustrates a Daktronics drawing label. This manual refers to drawings by listing the last set of digits and the letter preceding them. In the example, the drawing would be referred to as **Drawing B-3046757**.

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

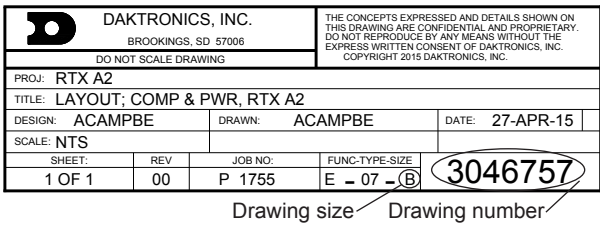

***Figure 1:** Drawing Label*

Refer to **Drawing B-3046757** in **Appendix A** for the locations of internal display components.

Daktronics identifies manuals by the DD number located on the cover page of each manual. For example, this manual would be referred to as **DD3084433**. Please list the model number, display serial number, and the date this display became operational in the blanks provided on the front page of this manual. When calling Customer Service, have this information available to ensure the request is serviced as quickly as possible.

1.2 Numbering Conventions

Part Number

Most display components within this video display carry a label that lists the part number of the unit. The component part number uses the following format: 0A-XXXX-XXXX (multi-component assembly) or 0P-XXXX-XXXX (interface board). **Section 5.2** contains the Daktronics Exchange Policy as well as details on the Repair & Return Program. Refer to these instructions if any display components need replacing or repairing. If an interface board or assembly is not found in the replacement parts list in **Section 5.1**, use the label to order a replacement. **Figure 2** illustrates a typical label. The part number is in bold.

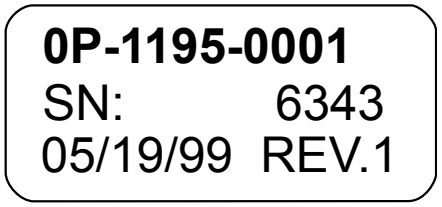

***Figure 2:** Typical Label*

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

Module Number

Figure 3 illustrates how Daktronics numbers modules on a ribbon display.

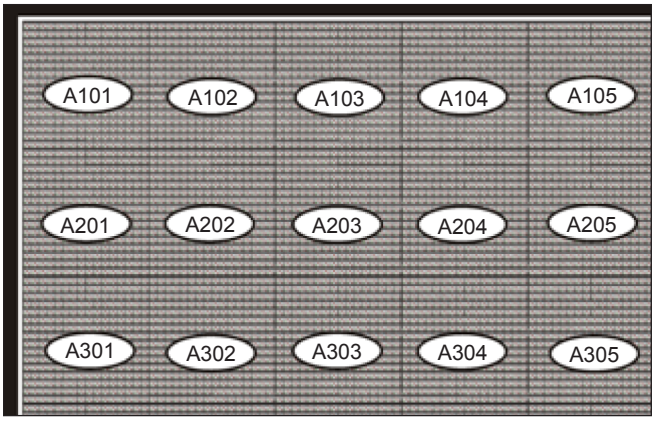

Figure 3: *Module Number (Front View/Display Face)*

Section Number

Figure 4 illustrates how Daktronics numbers sections on a ribbon display.

101	102	103	104

Figure 4: *Section Number (Front View/Display Face)*

Model Number

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

RTX-1101/1161/1801-20MT-HHHxWWW		
RTX	=	Product series
1101/1161/1801	=	Product generation
20MT	=	Pixel pitch/layout
HHH	=	Matrix height
WWW	=	Matrix width

1.3 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 physical injury if touched while powered.

Section 2: Mechanical Installation

All decisions regarding display mounting must conform to the specifications and guidelines in this section. Read both the mechanical and electrical installation sections before beginning any installation procedures.

2.1 Site Overview

During the site overview, the contractor/installer surveys for as-built conditions of the structure or mounting location through the following procedures: measuring for elevation differences, measuring the structural dimensions, and checking for variation in the face location.

After completing the initial site survey, the contractor/installer compares the results to the contract-specific Shop Drawing. If there are variations or discrepancies between the plan dimensions and the site survey, contact the project manager and the general contractor for the best course of action.

The contractor/installer is responsible for ensuring the mounting structure and hardware are built per the stamped engineering drawings and are capable of supporting the display. Daktronics is not responsible for display mounting decisions made by others.

Refer to the contract-specific Shop Drawing to determine the clip elevation and mark the clip angle placement locations with a chalk line or laser level. The clip elevation must remain level and constant and may be independent of the support structure.

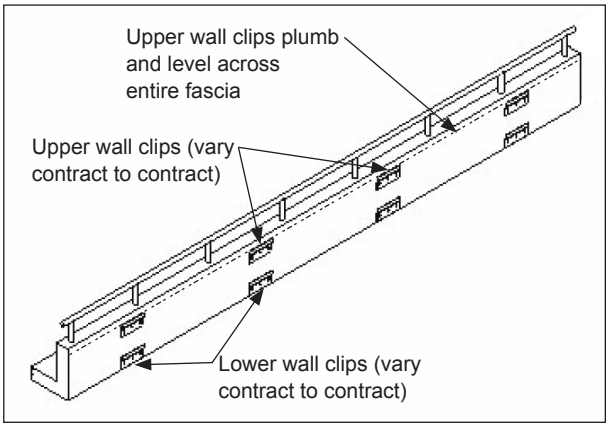

Figure 5: *Placing Clips*

Place the upper wall clips per the contract-specific Shop Drawing. Refer to **Figure 5**. Use appropriate shims to ensure all clips are both plumb and level across the entire fascia before hanging any sections. The height variation in any 4' section may not exceed $^{1}/_{4}$". If a variation of more than $^{1}/_{4}$" is encountered, contact the mechanical systems engineer.

Place the lower wall clips per the contract-specific Shop Drawing. Refer to **Figure 5**.

Verify all power drop locations per the contract-specific Shop Drawing and System Riser Diagram.

2.2 Display Receiving

The toolkit and the border box are attached to the first shipping frame of each task/display face. The toolkit is attached to the top of the frame, and the border box is attached to the front. Refer to **Figure 6**.

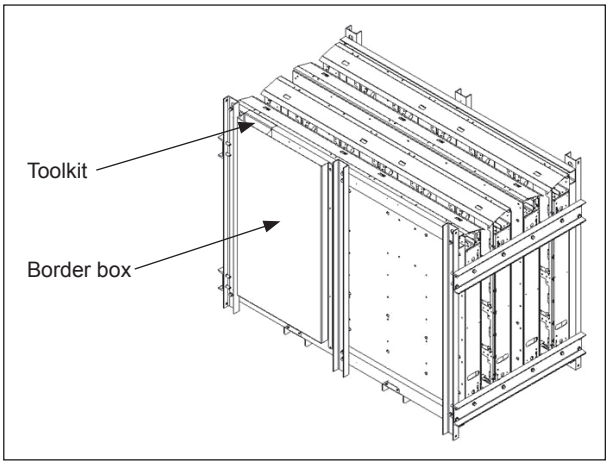

Figure 6: *Toolkit & Border Box*

1. Lift the display from transport on-site per the instructions in the **DD1402020** Ribbon Board Cabinet Lifting Instructions Quick Guide in **Appendix B**.

2. Examine all display packaging during receiving to determine if the display sections were damaged during shipping. If any of the packaging appears damaged, open the affected sections and examine for damage. Contact the project manager immediately for replacement or repair instructions.

3. Stage the sections sequentially based on the pre-determined starting location.

4. Ensure all sections are secured to prevent tipping.

5. Locate the toolkits, borders, and any additional parts shipped separately.

2.3 Display Preparation

Display preparation may occur immediately prior to display installation.

- Ensure all unpackaged sections remain secured when removing transportation packaging to prevent damage to the display.

- Remove the right column of modules before latching the sections together. Removing just the modules is recommended when installing from the front of the display, and removing the entire module pan is recommended when installing from the top of the display. Removal may be easier before flying the section into place. Refer to **Figure 7**.

Figure 7: *Right Column of Modules Removed*

- Verify the cabinet borders (flanges, caps, and transition caps) as shown on the contract-specific Shop Drawing.

- Refer to **Section 2.6** for details on installing sections on either side of a corner or gap.

2.4 Display or Display Section Lifting

Single Section

Daktronics equips each section with two lift lugs for lifting the sections into position. To expose these lift lugs, use the $^{5}/_{16}$" hex security bit (Daktronics part number TH-1170) supplied in the toolkit to release all beverage shroud latches and open the beverage shroud. Refer to **Figure 8** and **Figure 9**.

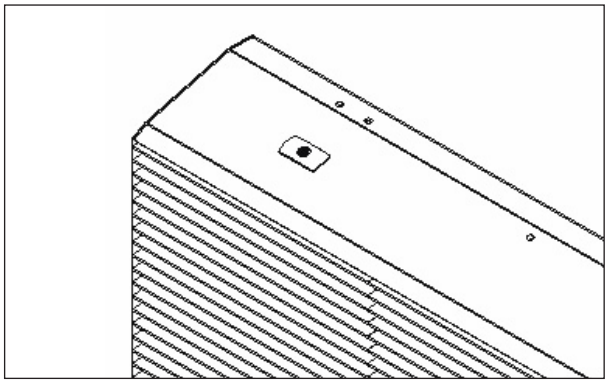

Figure 8: *Closed Beverage Shroud*

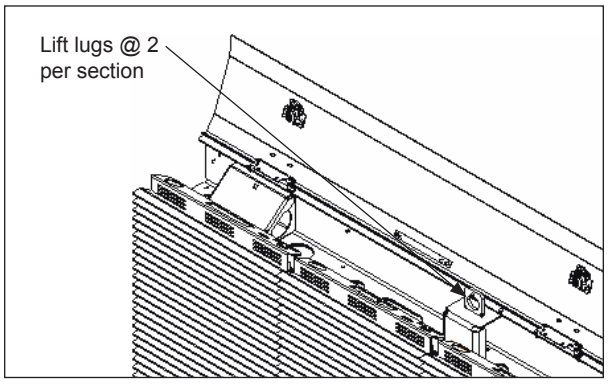

Figure 9: *Open Beverage Shroud*

Open the beverage shroud to access the lift lugs. The beverage shroud may be removed for lifting if necessary. The lift lugs are located one to two module widths inward, depending on the section size, from each end of the section. They are recessed into the section and need to be lifted up prior to lifting the displays into place.

Figure 10 illustrates two correct methods for lifting a display or display section. Always use every lifting point provided.

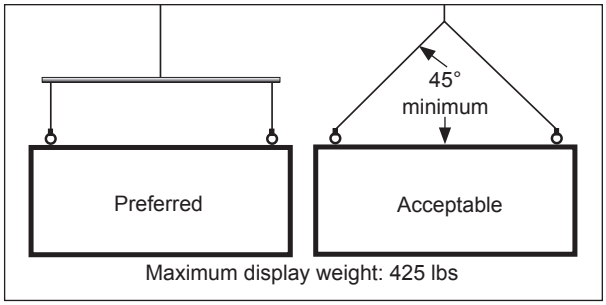

Figure 10: *Lifting Display*

Weight Approximations

This table lists the weight approximations for the section sizes.

Shell Size	RTX-11X1 Weight (lbs)	RTX-1801 Weight (lbs)
2x3	155	148
2x4	194	185
2x5	228	217
2x5 Wing	227	216
2x6	258	245
2x7	289	273
2x8	319	301
3x3	191	181
3x4	247	233
3x5	293	276
3x5 Wing	292	275
3x6	336	316
3x7	379	355
3x8	422	395
4x3	231	217
4x4	299	281
4x5	358	336
4x5 Wing	357	335
4x6	414	387

2.5 Display Mounting

This manual covers only general mounting topics. Refer to the contract-specific Shop Drawing for specific mounting instructions.

It is the installer's responsibility to ensure the installation meets local codes and standards. All hardware installation processes must meet the approved, stamped drawings from a professional engineer.

Carefully read all bullet points below before proceeding with the installation steps.

While installing, keep in mind these critical points:

- Ensure the display attachments will support the entire weight of the display and any additional weight.
- Do not set the unpackaged sections directly on the ground. Place them on spacers at least 2" high to prevent display damage and place supports every 4 to 6'.
- Wipe any dust or debris off the top of the sections before lifting the display.
- Use a clean rag to carefully brush any debris from the module faces and quickly inspect the display to ensure all modules are securely latched before lifting the display.

The following information and illustrations provide general guidance in mounting the individual sections to a support structure as shown in **Figure 11**.

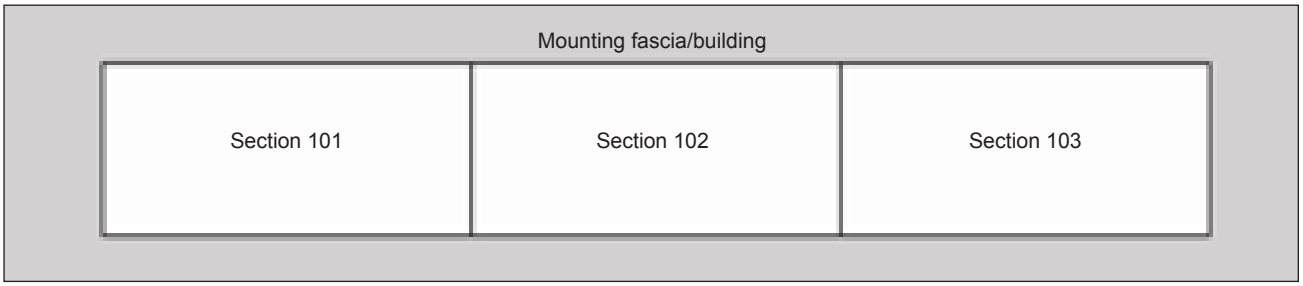

Figure 11: *Mounted Sections*

To mount a ribbon display, follow the steps below:

1. Verify all rear section clips are securely attached from the factory before lifting each section. In most cases, each section should have two rear section clip locations. These clips should align with the pre-installed wall clips on the structure. Refer to **Figure 12** and **Figure 13**.

   Note: Some rear section clip adjustment may be necessary.

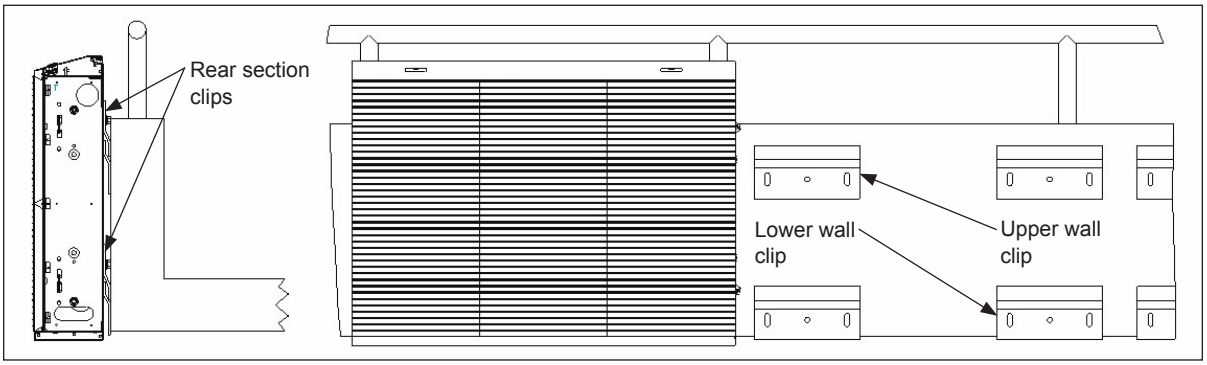

Figure 12: *Mounting Display to Wall*

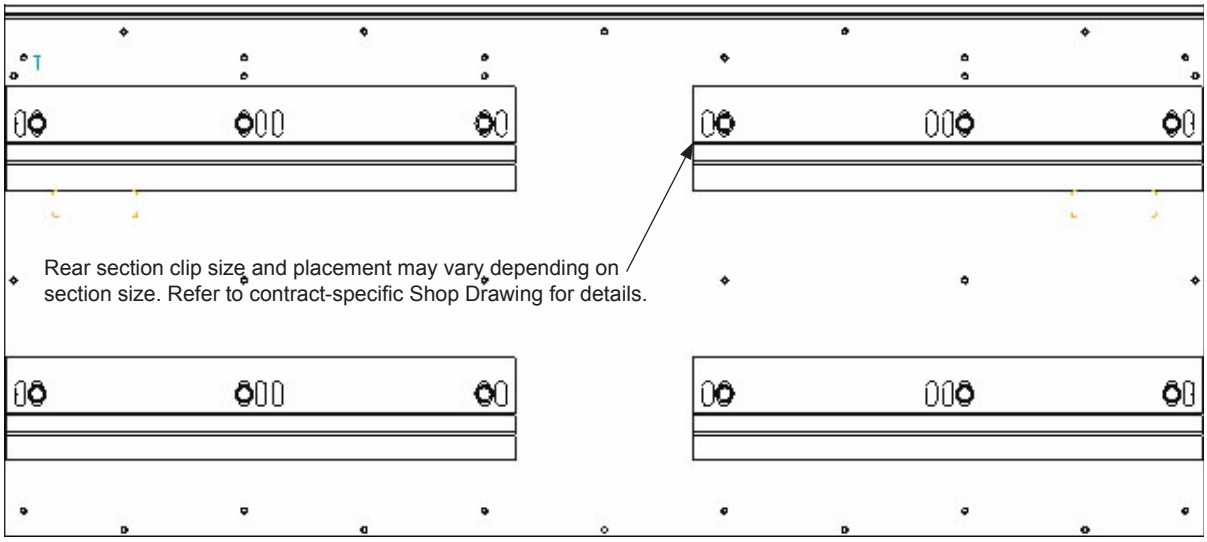

Figure 13: *Rear Section Clips*

2. Bring the first display section into position. Ensure it is both vertically plumb and horizontally level, as all other sections rely on this section's position.

Note: This may require lowering the section and adjusting the upper wall clips or the rear section clips. Ensure the section sits completely in the upper wall clips without the upper and lower wall clips extending horizontally past the rear section clips. If the rear section clips need to be moved horizontally, contact Structural Engineering. Refer to the contract-specific Shop Drawing for all attachment details. A typical installed section should look like **Figure 14**.

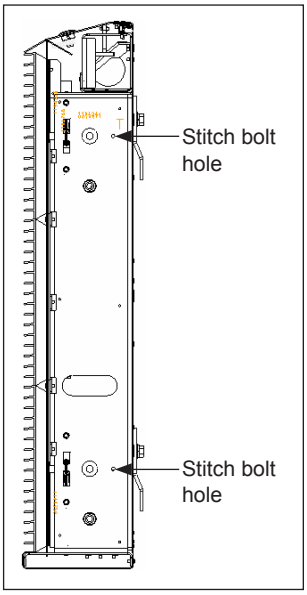

Figure 14: *Display Attached to Wall*

3. Lift the next section and position it beside the previous section. Refer to **Section 2.6** for corner or gap installation details.

4. Remove the modules or module pan entirely to access the interconnect latches. Activate the latches behind the right module column of each section until the seam is tight. Use a $^{5}/_{16}$" hex T-handle (Daktronics part number TH-1088) to rotate the upper latch clockwise and the lower latch counterclockwise. Refer to **Figure 15** and **Figure 16** for latch details and to the Alignment; Install Manual Drawings in **Appendix A** for alignment details. Partially engage both latches before fully engaging either latch (rotate the top latch a $^{1}/_{4}$ turn clockwise, fully engage the bottom latch, and then fully engage the top latch).

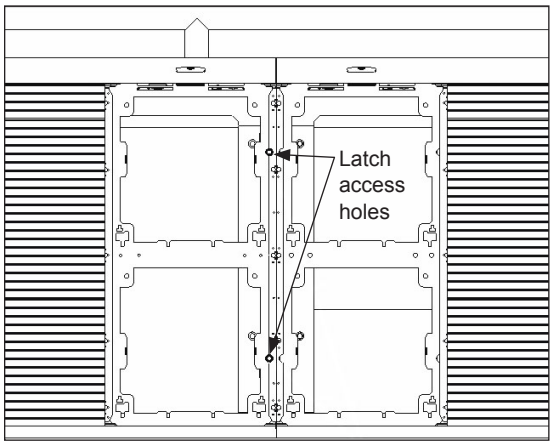

Figure 15: *Latch Access Holes*

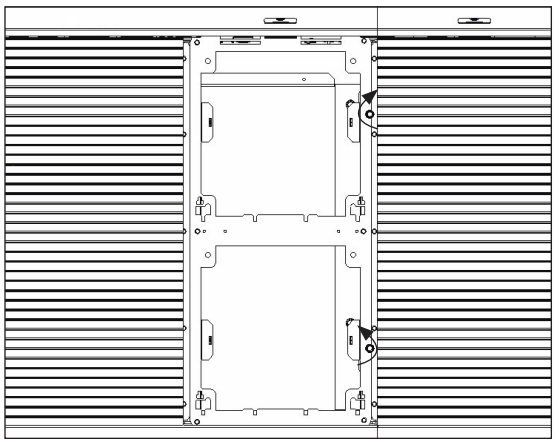

Figure 16: *Rotating Latches*

Note: Activate all latches immediately after positioning the section to ensure the display sections fit snugly together. If necessary, adjust the display mounting so the second section is plumb and level. Ensure the modules at the vertical section splice are the same distance apart as the modules on the interior of the display. There should be no distinguishable seams between the modules at any section splices. This may require unlatching, repositioning the sections, and reengaging the latches. After latching the two horizontal display sections together, do not lift or move these sections.

5. Repeat Step 3 and Step 4 to install the entire display.

6. Inspect the display carefully for any penetration points that may allow liquid to seep into the display. Release the lift lugs to drop them down into the top perimeter before reattaching and closing the beverage shroud.

2.6 Corner or Gap Mounting

Assembled Corner or Gap

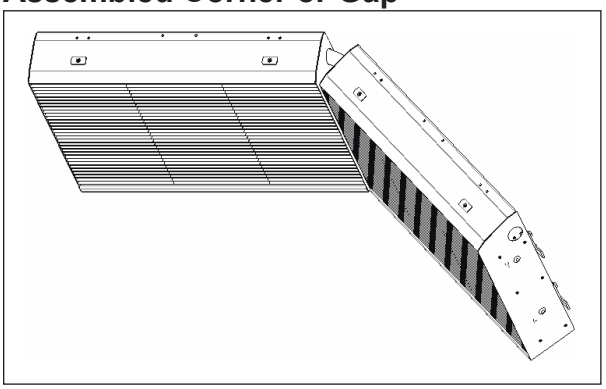

Figure 17: *Assembled Corner*

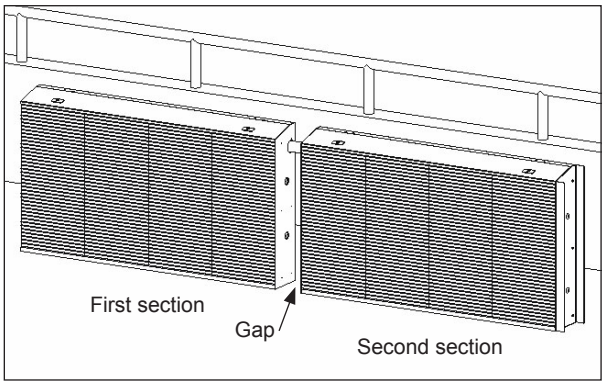

Figure 18: *First & Second Section*

Mounting

To mount a corner or gap, follow the steps below while referring to **Figure 19**:

1. Use the supplied #10 self-tapping screws (Daktronics part number HC-1554) to attach the transition caps with pass-through holes (located in the border box attached to the front of the first shipping frame of each task/display face) to the sections on either side of the gap.

2. Remove the 2" flexible conduit pieces (EC-1246) and plastic conduit clips (EC-1247) included in the far right bay of the section to the left of the gap.

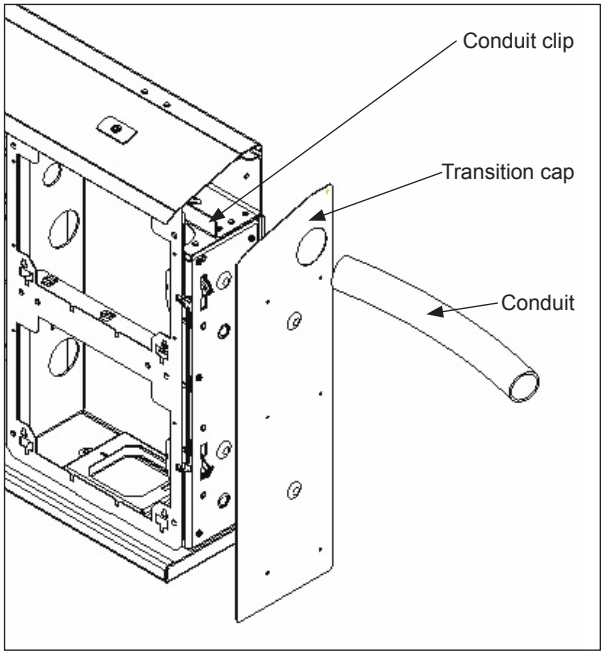

Figure 19: *Mounting Corner*

3. Attach one plastic conduit clip at least 2" from one end of the conduit. Refer to **Figure 20**.

4. Insert the 2" flexible conduit pieces into the pass-through hole in the border, leaving at least 6" sticking out of the section.

5. Lift the second section close enough to the first section to begin pressing the flexible conduit through the second section's pass-through hole located in the border.

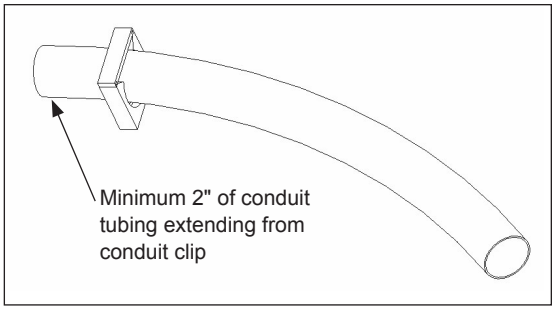

Figure 20: *Conduit & Clip*

6. Ensure the second section is vertically plumb and horizontally aligned with the previous section before attaching to the wall.

7. Begin pressing the flexible conduit through the second section's pass-through hole when the second section is close enough.

8. Ensure at least 2" of conduit extends into both sections. Trim any excess conduit from the inside of the section. Refer to **Figure 20**.

2.7 Wing Section Installation

To install a wing section, follow the steps below:

1. Open or remove the wing beverage shroud. Refer to **Figure 21**.

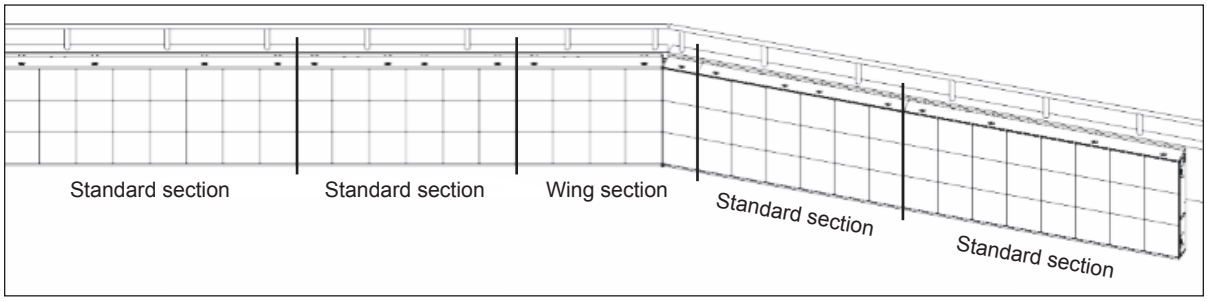

Figure 21: *Opening Wing Beverage Shroud*

2. Loosen the retainer nuts and screws from the upper and lower support brackets and release the latches holding the wing to the shell. Refer to **Figure 22** and **Figure 23**. The wing section is now free to rotate.

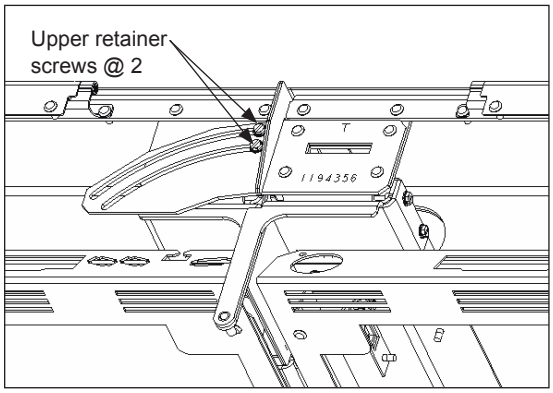

Figure 22: *Loosening Upper Retainer Hardware*

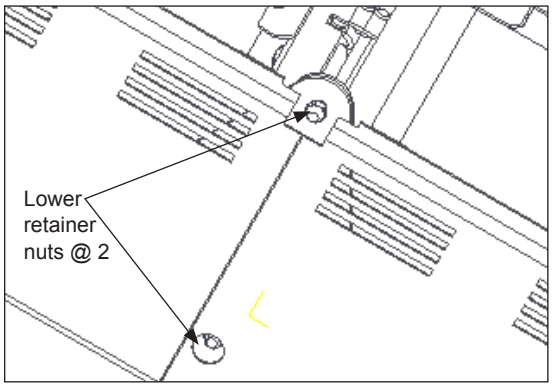

Figure 23: *Loosening Lower Retainer Hardware*

3. Set the wing at the necessary angle to engage the left and right sections. The hinge adds a gap (seam) between the module columns, which is necessary for top-access module removal via the module pan sliders. Refer to **Figure 24**.

4. Secure the retainer nuts and screws in the upper and lower support brackets into the left vertical of the wing to keep the wing from rotating. The required torque is 20 ft-lbs. Refer to **Figure 25** and **Figure 26**.

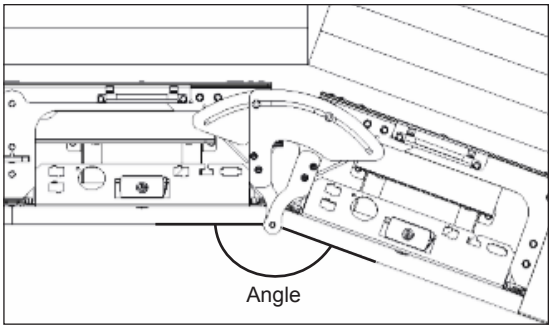

Figure 24: *Setting Wing at Appropriate Angle*

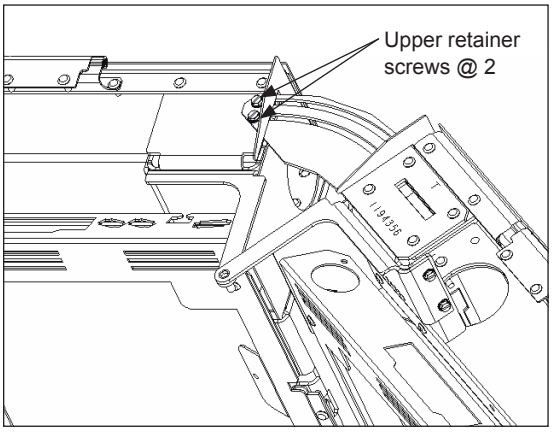

Figure 25: *Securing Upper Retainer Hardware*

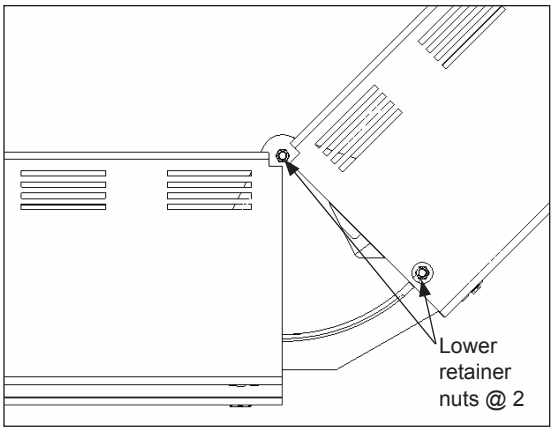

Figure 26: *Securing Lower Retainer Hardware*

5. Remove the TEK screws securing the top hinge into place and remove the top hinge. This needs to be removed to allow the beverage shrouds to close completely and the module pans to slide out. Refer to **Figure 27** and **Figure 28**.

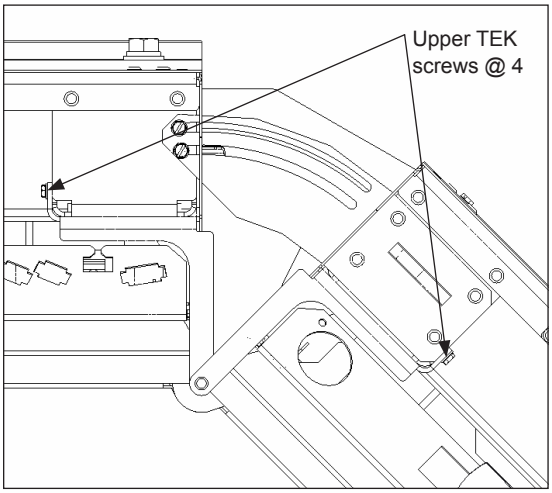

Figure 27: *Removing Top Hinge*

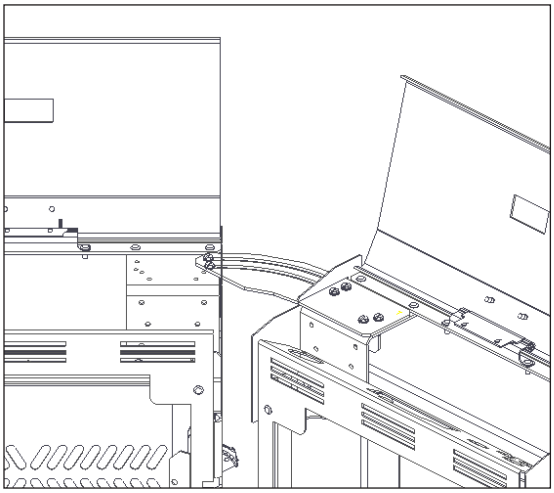

Figure 28: *Top Hinge Removed*

2.8 Border Attachment

To attach a border, follow the steps below:

1. Attach the borders (located in the border box attached to the front of the first shipping frame of each task/display face) as necessary. Refer to the contract-specific Shop Drawing for proper placement.

   End/transition cap: Use a $^{5}/_{16}$" nutdriver (Daktronics part number TH-1156) to secure the #10 self-tapping screws (HC-1554) at a quantity of six and attach the caps. Refer to **Figure 29** and **Figure 30**.

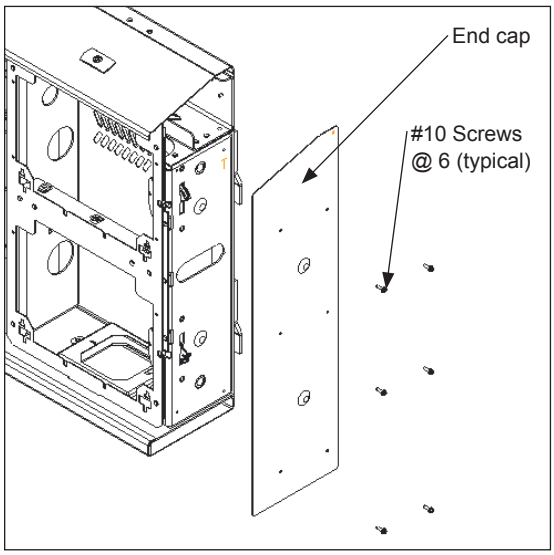

Figure 29: *Attaching End Cap*

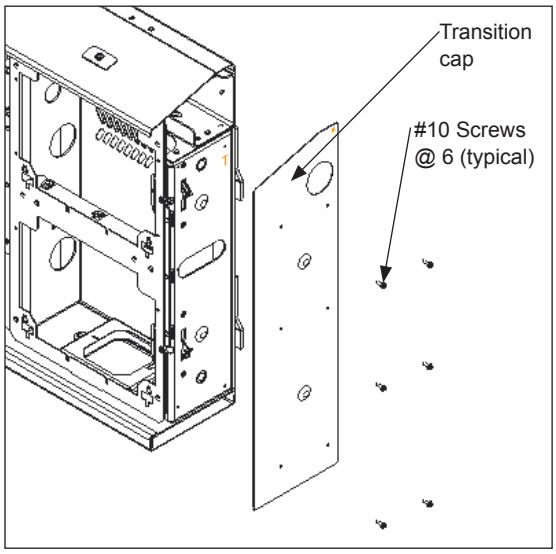

Figure 30: *Attaching Transition Cap*

   Flange border: Use a $^{5}/_{16}$" nutdriver (TH-1156) to secure the #10 self-tapping screws (HC-1554) at a quantity of six and attach the borders. Refer to **Figure 31**.

2. Refer to the contract-specific Shop Drawing if extra shrouding is necessary.

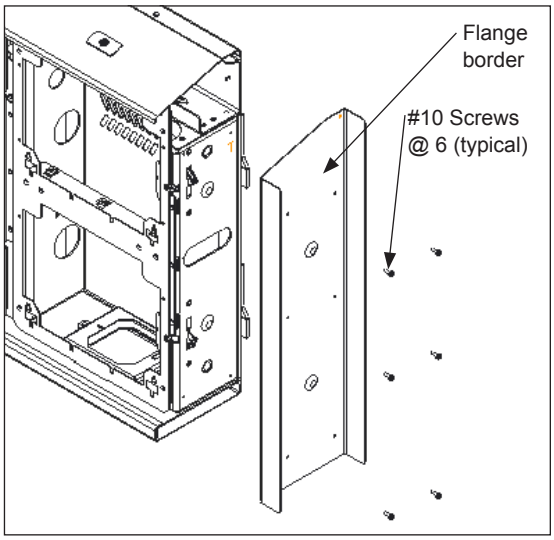

Figure 31: *Attaching Flange Border*

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Section 3: Electrical Installation

This 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.

This display is suitable for wet locations. Daktronics engineering staff must approve any changes that may affect the weathertightness of the display. If *any* modifications are made to the weathertightness of the display, detailed drawings of the changes *must* be submitted to Daktronics engineering staff for evaluation and approval, or the warranty will be null and void.

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

3.1 Power Summary

Power from the termination panel breaker routes to the Power In jack on the power supplies. From there, power routes to the individual modules. ProLink Routers (PLRs) are powered off the closest available module. Refer to the contract-specific System Riser Diagram for detailed power information.

Refer to the **DD3246225** RTX-11X1/1801 Series Power Numbers in **Appendix B** for power specifications.

3.2 Signal Summary

Depending on display application and control room design, display data may route from the control room to the display by a number of different pieces of equipment. The most common are the ProLink6 control system, the A/B transmitter interface, and the Video Image Processor (VIP) interface itself.

The Block Diagrams and Layout; Comp & Pwr Drawing in **Appendix A** illustrate the signal layout of each display section. The contract-specific Config Drawing and System Riser Diagram illustrate the signal connections from the control room to the ProLink Routers (PLRs) in the display or from section to section. This is done to some extent in all RTX displays.

Data from the control system routes via fiber-optic cable to the J5 (Data In) connector on the VIP. Refer to the **DD2773152** VIP-5X6X Operator's Manual. The VIP may be located in the control room or in a remote location. The data then routes via fiber-optic cable to the appropriate PLRs. Refer to the appropriate contract-specific Config Drawing and System Riser Diagram for more routing information. Refer to the Fiber Routing Drawing and Power Entrance Drawings in **Appendix A** for fiber termination information.

The Fiber Routing Drawing in **Appendix A** and the contract-specific Config Drawing illustrate the fiber layout from section to section of the display.

The Block Diagrams and Layout; Comp & Pwr Drawing in **Appendix A** also illustrate how data passes from one PLR to the modules and depict power harnessing and component placement.

Each PLR sends data to the modules within the display; refer to the Block Diagrams and Layout; Comp & Pwr Drawing in **Appendix A** for routing information. Signal exits via fiber-optic cable from Fiber Port B on the PLR and routes to Fiber Port A on the next PLR. Refer to **Figure 32**, as it illustrates a typical signal routing layout. Refer to the contract-specific Config Drawing for further information.

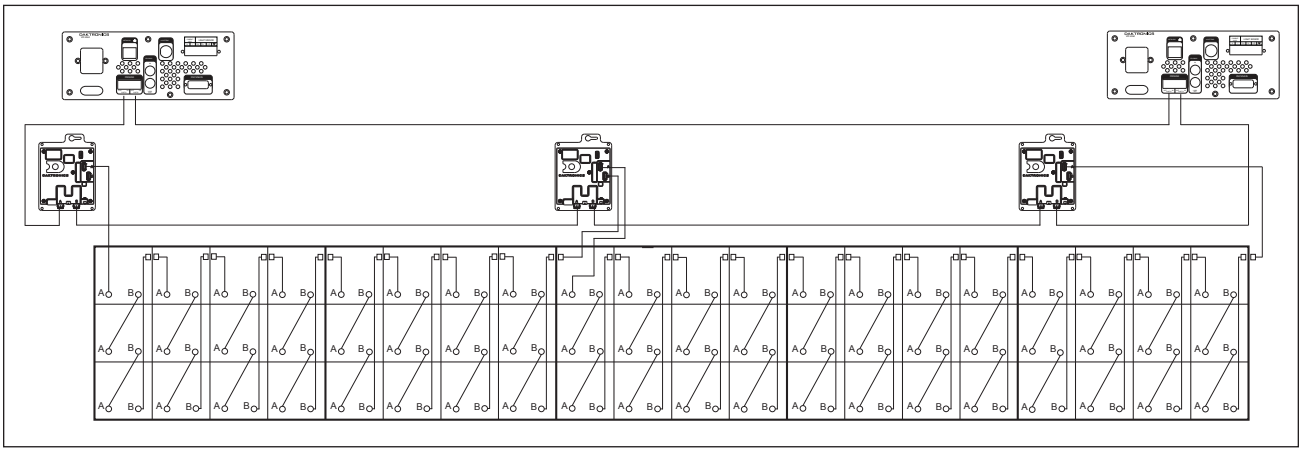

Figure 32: *Signal Routing (Full-Data Redundancy)*

3.3 Common Connectors

When pulling a connector plug from a jack, do not pull the wire or cable; detach the jack itself. Pulling the wires may damage the connector. These connectors are not found in every display.

Water-Tight SATA Cable Connector

Daktronics uses a wide variety of SATA cables and SATA cable connectors. **Figure 33** illustrates one of the most commonly used SATA cable connectors. To disconnect the SATA cable connector, squeeze the locking clips inward and pull the plug out of the jack.

Figure 33: *SATA Cable Connector*

Fiber-Optic Connector

LC connectors are square. To remove an LC connector, depress the small clip on the jack and gently remove. Refer to **Figure 34**.

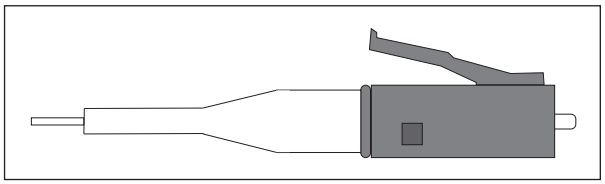

Figure 34: *LC Fiber-Optic Connector*

3.4 Control Cable

Refer to the contract-specific System Riser Diagram for specifications on signal and power cable runs. Refer to the **DD2773152** VIP-5X6X Operator's Manual for information on the Video Image Processor (VIP).

The minimum bend radius for this fiber-optic cable is 15 times the outside diameter of the cable or 7". Refer to the contract-specific System Riser Diagram for the outside diameter of the cable in this system. All fiber-optic runs must be continuous, except where noted on the System Riser Diagram.

3.5 Display Power

All display grounding, power routing, and termination must meet or exceed local codes and standards.

Correct power installation is imperative for display operation. These subsections give details on display power installation. Only qualified individuals should attempt the electrical installation; untrained personnel should not attempt to install displays or any of the electrical components. Improper installation could result in serious equipment damage and could be hazardous to personnel.

Ensure all external overcurrent protection meets all local and national electrical codes and is sized appropriately to the load of the sections it is terminating.

Refer to contract-specific documentation to determine who is responsible for providing conduit and pulling cable through the conduit.

Grounding

The display must be properly grounded according to the National Electrical Code and any other local or national codes, or the warranty will be null and void.

The display system must have proper earth-ground connection. Proper grounding is necessary for reliable equipment operation, as it protects the equipment from destructive electrical disturbances and lightning.

The material of an earth-ground electrode differs from region to region and varies with conditions present at the site. Consult local grounding codes. Daktronics does not recommend using the support structure as an earth-ground electrode; concrete, primer, corrosion, and other factors make the support structure a poor ground.

Note: The support structure may be used as an earth-ground electrode if designed to do so. A qualified inspector must approve the support structure and grounding methods.

Power Installation

This display uses a three-phase (three conductors, neutral and ground) installation.

Three-Phase Installation

To install a three phase, follow the steps below:

1. Connect the grounding electrode cable at the local disconnect, never at the termination panel.
2. Use a disconnect that opens all ungrounded phase conductors.

This display uses one power termination method. Refer to the Power Entrance Drawings in **Appendix A** and **Figure 35** for installation details. It is the electrical installation contractor's responsibility to ensure all electrical work performed on-site meets or exceeds all local and national electric codes for wiring and specifications. Refer to the contract-specific System Riser Diagram.

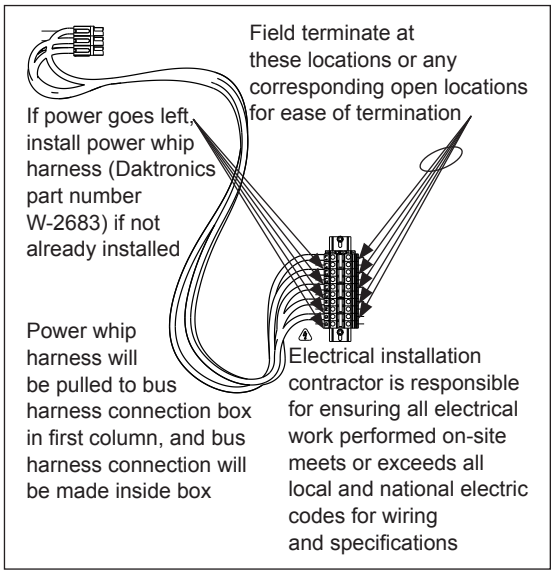

***Figure 35:** Power Installation*

Main Disconnect

Refer to the contract-specific System Riser Diagram to determine who must supply a fused main distribution/disconnect, surge suppressor, and the necessary wiring for power distribution to multiple display termination panels.

The disconnect mechanism must be located in direct line of sight from the display it controls. This allows workers to keep the disconnect mechanism in view while performing display maintenance.

Power disconnects capable of locking in the open position may be located in an out-of-sight location.

The customer or contractor is responsible for conduit and wire unless stated otherwise on the contract-specific documentation.

Power Termination at the Termination Panel(s)

All power routing and termination must comply with local and national codes and standards. Display grounding must comply with local and national codes and standards.

Route power from the main disconnect to the termination panel in conduit supplied and sized by the customer or contractor unless otherwise stated on the contract-specific documentation. Refer to the contract-specific System Riser Diagram for specific termination points.

When terminating power at the termination panel, the individual power phases must balance as evenly as possible. Current draw per line, as noted on the contract-specific System Riser Diagram, is stated as the high leg current draw.

Refer to the Power Entrance Drawings in **Appendix A** for power termination information.

3.6 Display Wiring

Power

Route the interconnect power wire as needed through the interconnect holes based on the contract-specific Config Drawing and System Riser Diagram.

When making the bus harness interconnects, it is imperative that the labels and colors of each connector match to ensure proper phase balancing of the overall power system.

Signal

Route the fiber and SATA cables based on the contract-specific Config Drawing and System Riser Diagram. Refer to the Routing Drawings in **Appendix A** for fiber and SATA routing information.

3.7 Display Continuity Check

Before turning on power to the display, perform a continuity check to ensure no short circuits occurred due to shipping vibration.

Caution: Before performing these steps, ensure all breakers are off.

To perform a display continuity check, follow the steps below:

1. Remove the cover from the termination panel.

2. Use an ohmmeter and place one probe on the neutral terminal and another probe to each of the taps on the breaker wire terminal. Repeat the same test for each breaker.

3. Place one probe to the earth ground and one to each of the breaker wire terminals and repeat for each breaker.

All tests should result in a reading of infinity or indicate an open circuit.

3.8 Display Power Up

To power up a display, follow the steps below:

1. Turn on the main disconnect to power up the display.

2. Power up the control system to ensure it is fully operational before proceeding.

3. Run an initialization/power up script or animation/logo on the display.

3.9 Signal Redundancy

Full-Data Redundancy

Full-data redundancy provides primary and redundant Video Image Processors (VIPs), ProLink Routers (PLRs), and SATA connections throughout the entire display to protect the system from signal failure. If any signal component, cabling, or connection fails, its counterpart takes over and limits the signal failure to as little of the display as possible. Refer to **Figure 32** for layout details.

Full-Data Redundancy Testing

To test the full-data redundancy wiring, use the contract-specific Config Drawing to verify where the PLRs are located. Disconnect the SATA cable from SATA Port A on each PLR individually and verify all modules still display content correctly; reconnect the SATA cable. Disconnect the SATA cable from the redundant PLR and verify all modules still display content correctly; reconnect the SATA cable. Refer to **Figure 36** for details on the PLR ports.

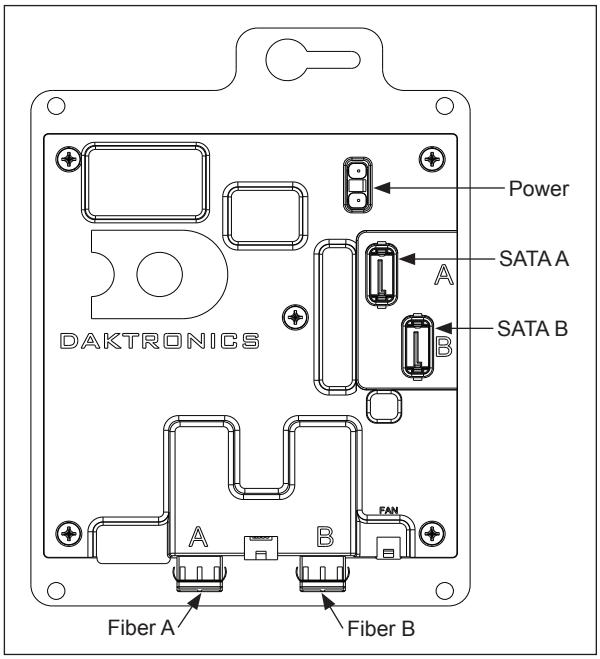

Figure 36: *PLR Connectors*

PLR Redundancy Testing

To test the PLR redundancy, use the contract-specific Config Drawing to verify where the PLRs are located. Disconnect the fiber cable from Fiber Port A on the first PLR and verify all modules still display content correctly; reconnect the fiber cable. Disconnect the fiber cable from Fiber Port B on the last PLR in the chain and verify all modules still display content correctly; reconnect the fiber cable. Refer to **Figure 36** for details on the PLR ports. Another method is to unplug the fiber cable from Fiber Port A on the primary VIP or the fiber cable from Fiber Port B on the backup VIP and verify all modules still display content correctly. Refer to **Figure 37** for details on the VIP ports.

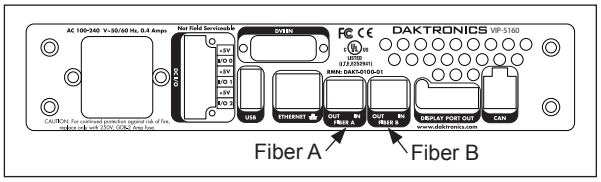

Figure 37: *VIP Connectors*

VIP Redundancy Testing

To test the VIP redundancy, log into the primary and redundant VIPs, make the primary inactive and the redundant active, and verify all modules still display content correctly. For normal operation, the redundant VIP is set to inactive and only passes redundant signal from the primary VIP to the last PLR. Refer to the **DD2773152** VIP-5X6X Operator's Manual. Return the redundant VIP to inactive and the primary VIP to active. If available, Intelligent Device Management (IDM) can also verify the system is working as intended. Refer to the **DD2097912** IDM User Manual.

Section 4: Maintenance & Troubleshooting

Turn off display power before performing any repair or maintenance work. Only qualified service personnel may access internal electronics.

Daktronics product management staff must approve any changes that may affect the display's structural integrity. This includes, but is not limited to, border shrouding, back sheets, and filler panels. If any changes are made to the display, submit detailed drawings to Daktronics product management staff for evaluation and approval, or the warranty will be null and void.

4.1 Recommended Tools

When performing maintenance work on the display, Daktronics recommends using these tools and placing them in a convenient, easily accessible location:

Tool	Part Number	Use
Module safety lanyard	0A-1175-9000	Prevents modules from falling and breaking
Module pan safety lanyard	HS-2057	Prevents module pans from falling and breaking
$^1/_4$" Nutdriver	TH-1042	Opens beverage shrouds
$^5/_{16}$" T-handle hex wrench	TH-1088	Activates latches between sections
$^5/_{16}$" Hollow shaft nutdriver	TH-1156	Attaches borders and removes components
$^5/_{16}$" Hex security bit	TH-1170	Works with $^1/_4$" nutdriver to open beverage shrouds
$^1/_8$" T-handle hex wrench	TH-1172	Removes modules
$^7/_{16}$" Hollow shaft nutdriver	TH-1202	Interconnects sections

These tools are found in the toolkit (Daktronics part number 0A-1755-0001) attached to the top of the first shipping frame of each task/display face. Toolkits include other items not on this list, and additional replacement tools may be ordered directly from Daktronics. Refer to **Section 5.2**.

4.2 Display Access

RTX displays are designed for either front or top access, depending on site requirements and customer preference.

The displays require removing modules from the front or top of the display to gain access to components. Refer to **Section 4.4**.

Top-access displays allow a technician to access internal components from a platform on the rear of the section at the top of the display. The module pans slide vertically out of position, allowing access into the sections. Refer to **Figure 38** and **Figure 39**.

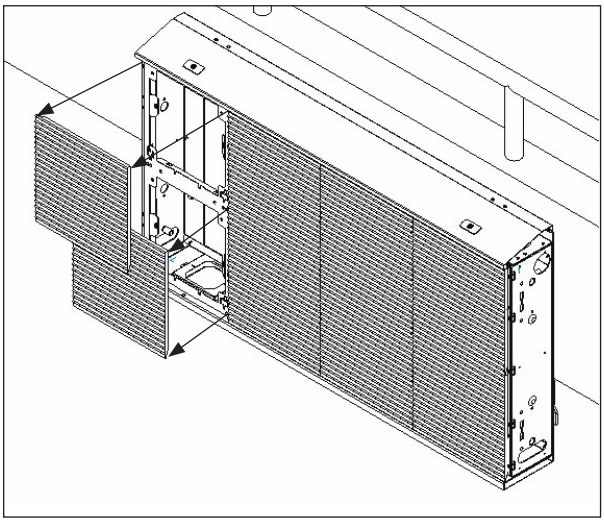

Figure 38: *Removing Front Modules*

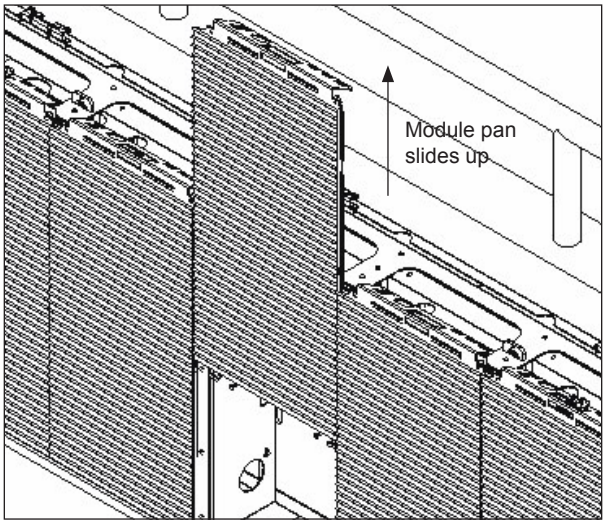

Figure 39: *Removing Module Pan*

4.3 Components

Power Supply

Figure 40 illustrates a typical power supply, also referred to as a power module. The power supply is mounted directly to the module as shown in **Figure 54** and **Figure 58**. The power harnesses connected to the unit vary depending on type and overall display application. The power LED (DS1) illuminates when the unit is receiving power.

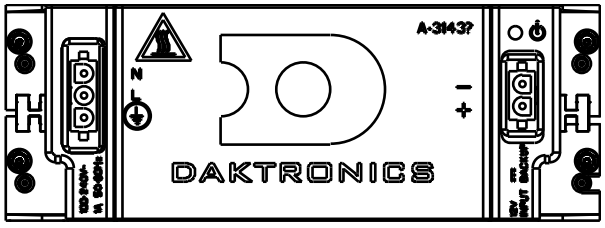

Figure 40: *Power Supply*

Caution: Disconnect display power before servicing the power supplies to avoid electrical shock. The power supplies run on high voltage and may cause physical injury if touched.

ProLink Router

Figure 41 illustrates a ProLink Router (PLR). A PLR is a display interface board that passes display data from the ProLink6 control system modules and other PLRs.

Refer to the **DD1735784** ProLink Router 6X5X Installation & Maintenance Manual for further information.

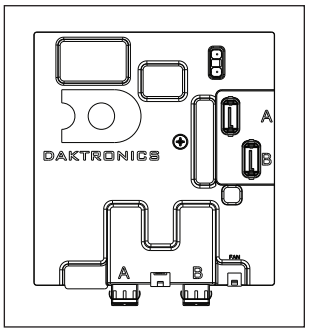

Figure 41: *PLR*

Video Image Processor

Figure 42 illustrates a Video Image Processor (VIP). A VIP is an interface that drives video to the display while also dimming, providing gamma and color controls, and displaying test patterns.

Figure 42: *VIP*

Refer to the **DD2773152** VIP-5X6X Operator's Manual for further information.

Line Filter

Figure 43 illustrates a line filter. Line filters remove electromagnetic noise that might otherwise interfere with local communication channels from the power system. The line filter is mounted to the sectional termination panel.

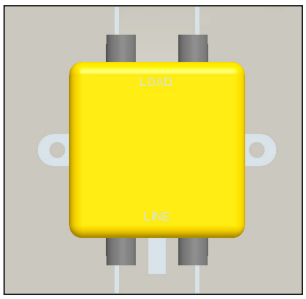

Figure 43: *Line Filter*

4.4 Service & Diagnostics

This section addresses the display components that may be encountered during routine servicing. The Layout; Comp & Pwr Drawing in **Appendix A** and **Figure 44** show the locations of most internal components.

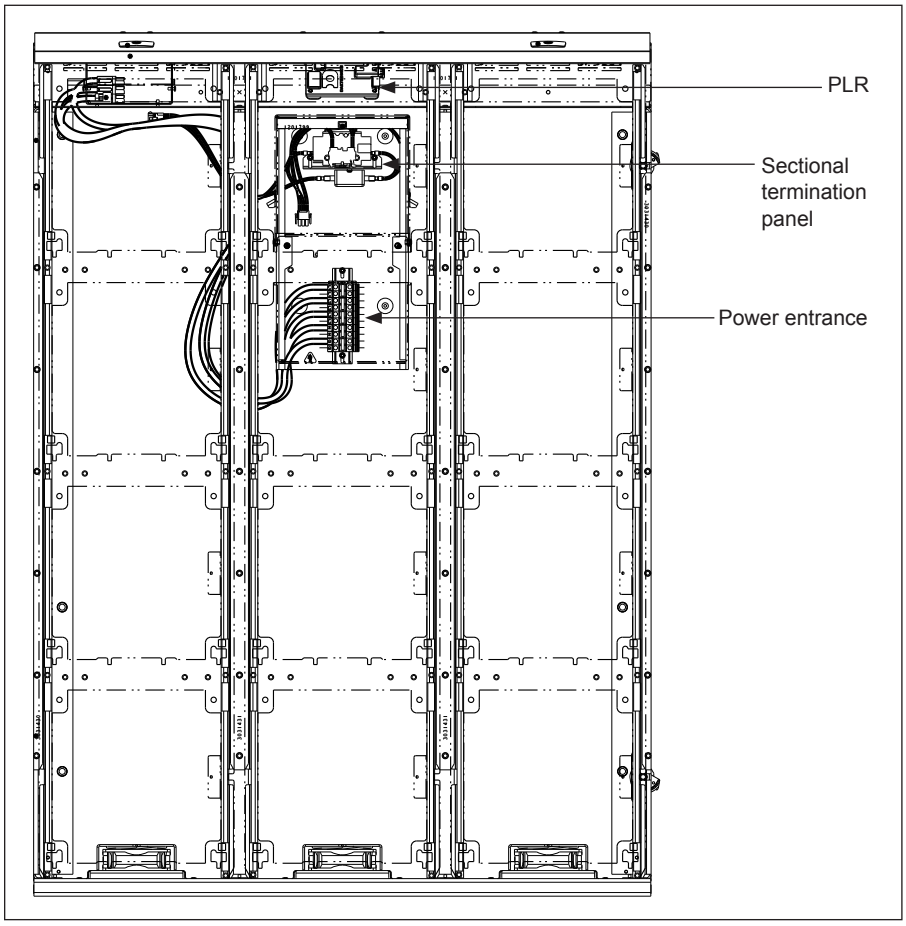

Figure 44: *Typical Component Layout (Front View)*

Module Pan

RTX displays have a unique module pan, also referred to as a pan or a mod pan, that allows for removal of the modules as well as some internal components from both the front and top of the display. If unobstructed, each module pan is fully removable from the top of the sections. Each pan contains modules and power supplies.

Figure 45 and **Figure 46** illustrate front and rear views of a module pan.

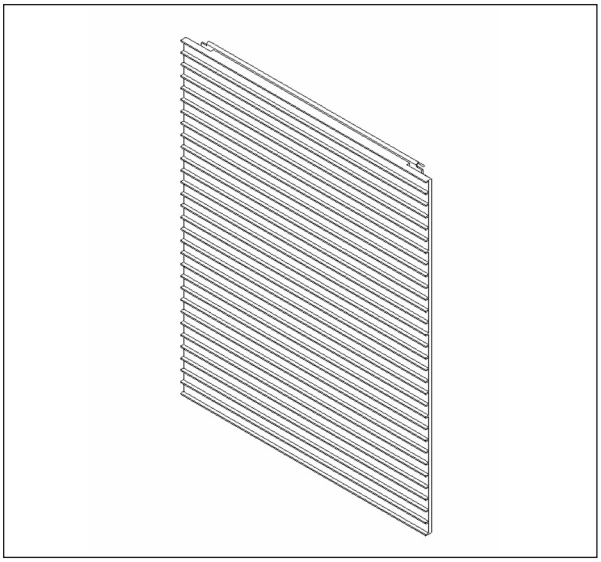

Figure 45: *Module Pan Front*

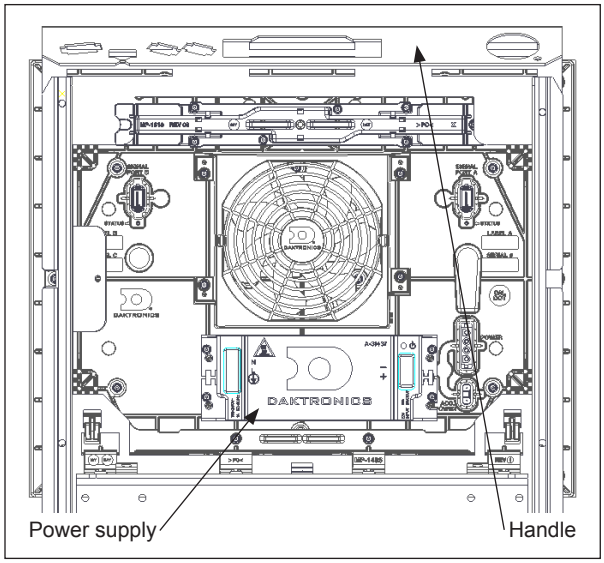

Figure 46: *Module Pan Rear*

Top-access displays require removing the module pans from a position behind the top of the display. Pay special attention to the following instructions to avoid damaging any connectors or other components.

To remove a module pan from a display, follow the steps below:

1. Disconnect power to the display.

2. Use a $^{5}/_{16}$" hex security bit (Daktronics part number TH-1170) to release the beverage shroud security latches. The beverage shroud may be left on in a flipped-up position or removed by rotating it up and unhooking the spring-loaded hinge pins. Refer to **Figure 47** and **Figure 48**.

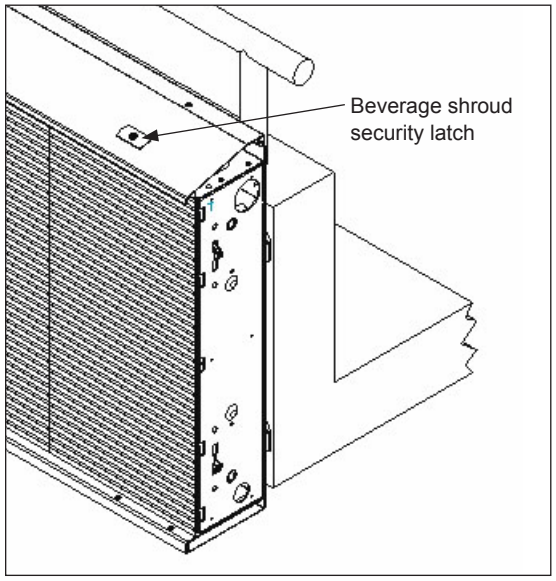

Figure 47: *Removing Beverage Shroud*

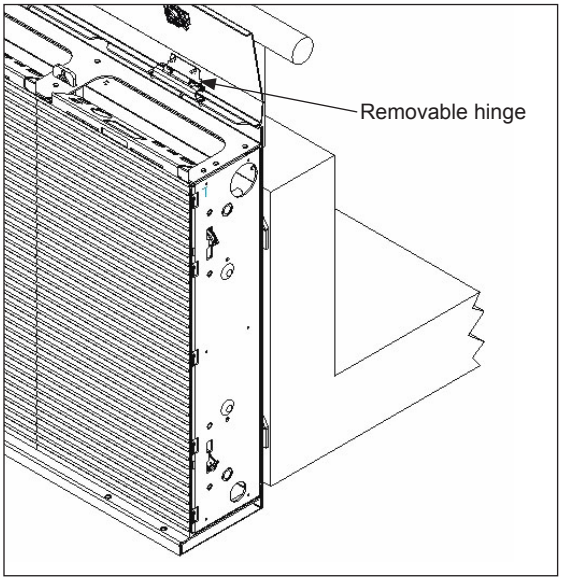

Figure 48: *Accessing Beverage Shroud*

3. Clip one end of the module pan safety lanyard to the closest lift lug in the top perimeter and the other end into the handle of the module pan in need of service. Refer to **Figure 49** and **Figure 50**.

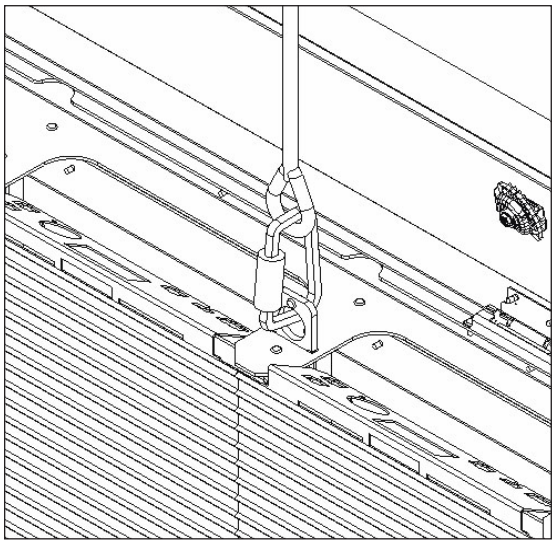

Figure 49: *Lift Lug*

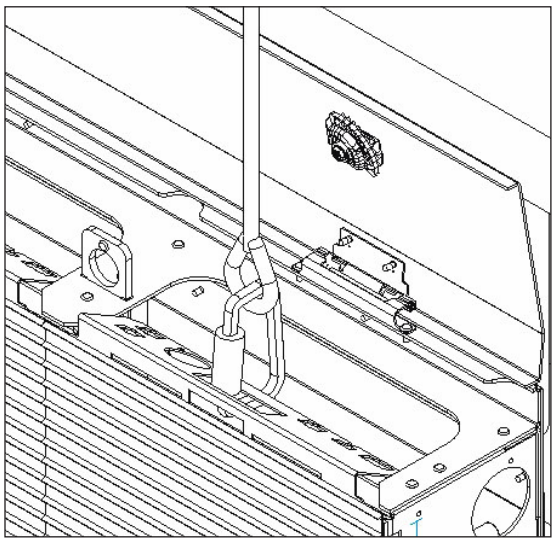

Figure 50: *Module Pan Handle*

4. Disconnect all SATA and power cables from the top of the module pan handle after the lanyard is properly attached. If there is a ProLink Router (PLR) in the column, remove the power cable from the module pan handle. Refer to **Figure 51** and **Figure 52**.

Figure 51: *Disconnected Cables*

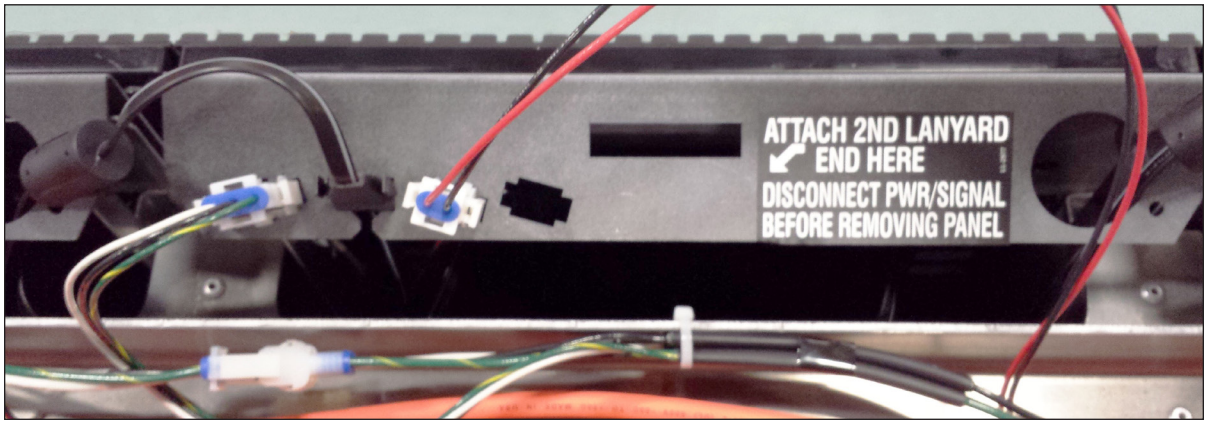

Figure 52: *Connected Cables*

5. Ensure all cables are unplugged and then raise the module pan carefully until free of the track and over the rail into a safe position. The module pan should now be ready for servicing, and the lanyard may now be unhooked. Refer to **Figure 39**.

Reverse these steps to install a module pan in a display.

RTX-11X1

Figure 53 and **Figure 54** show front and rear views of an RTX-11X1 module.

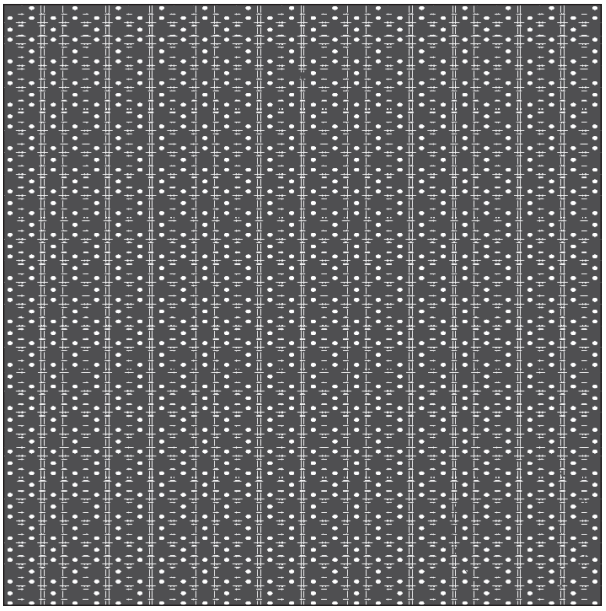

Figure 53: *RTX-11X1 Module Front*

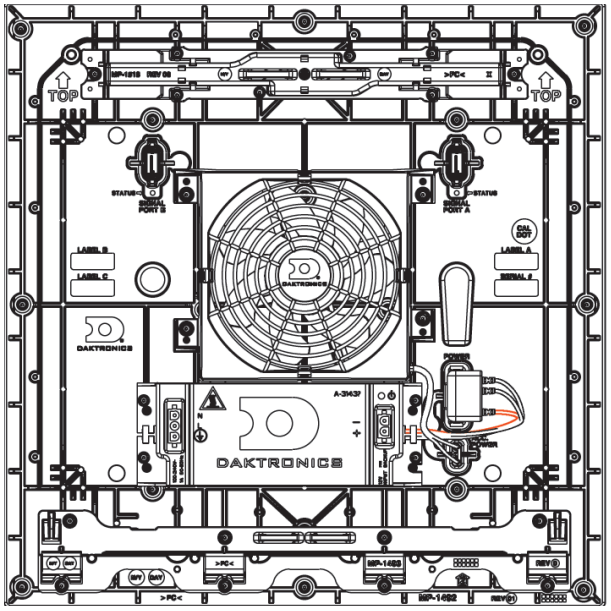

Figure 54: *RTX-11X1 Module Rear*

To remove an RTX-11X1 module from a display, refer to **Figure 55** while following the steps below:

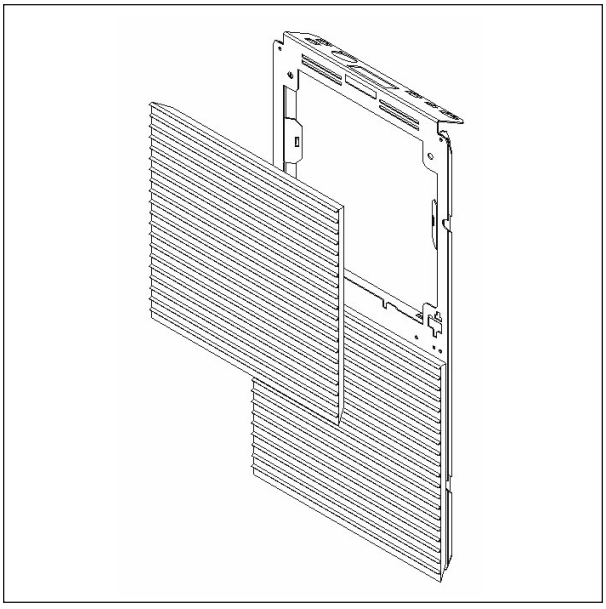

Figure 55: *Removing RTX-11X1 Module*

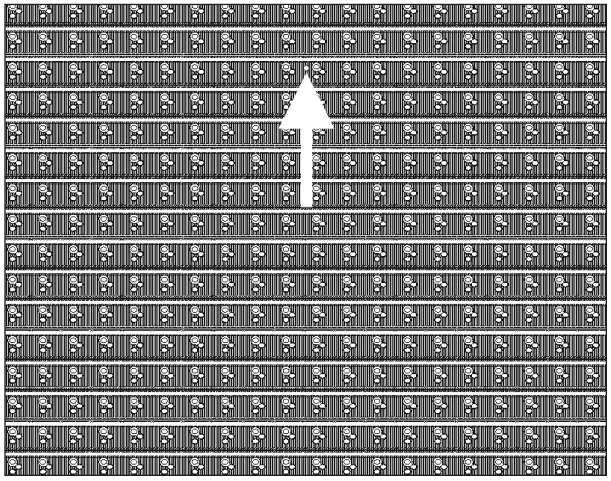

Figure 56: *Accessing Module Latch*

1. Disconnect power to the display.
2. Access the module.

   Front access: Use a $^{1}/_{8}$" Allen wrench to turn the top latch release a $^{1}/_{4}$ turn counterclockwise. Refer to **Figure 56**.

   Top access: Remove the module pan. Refer to **Module Pan** for instructions.

3. Pull the module from the display just far enough to reach around to the back of the unit.

4. Attach one end of a safety lanyard to the rings on either the top or bottom of the module and the other end to a secure location within the display to prevent the module from falling if dropped.

5. Disconnect the power and signal cables from the rear of the module.

Reverse these steps to install an RTX-11X1 module in a display.

RTX-1801

Figure 57 and **Figure 58** show front and rear views of an RTX-1801 module.

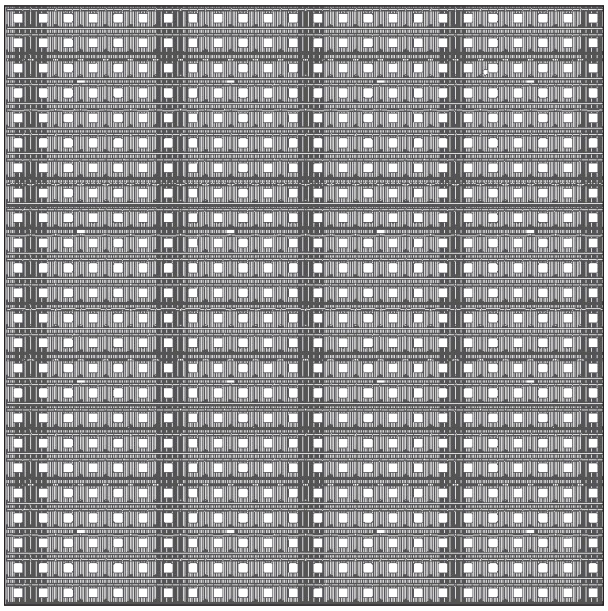

Figure 57: *RTX-1801 Module Front*

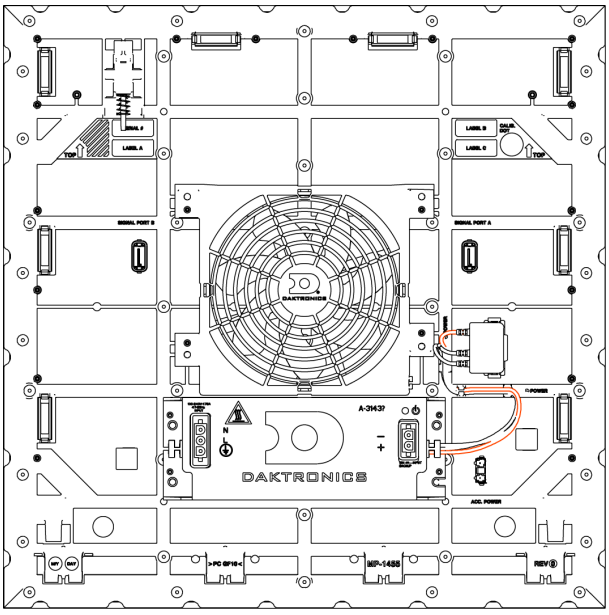

Figure 58: *RTX-1801 Module Rear*

To remove an RTX-1801 module from a display, refer to **Figure 59** while following the steps on the following page:

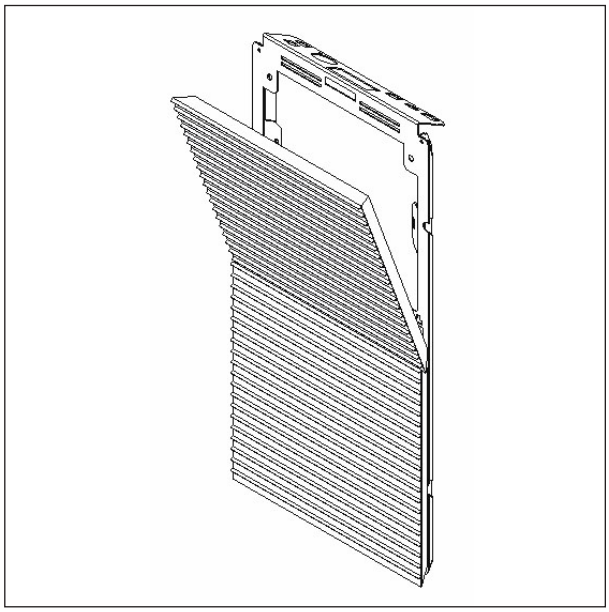

Figure 59: *Removing Module*

1. Disconnect power to the display.

2. Access the module.

   Front access: Position the module access tool (Daktronics part number TH-1212) so the arrows on the handle point up. Use slight thumb pressure to insert the tool into the module until it clicks. Refer to **Figure 60** and **Figure 61**.

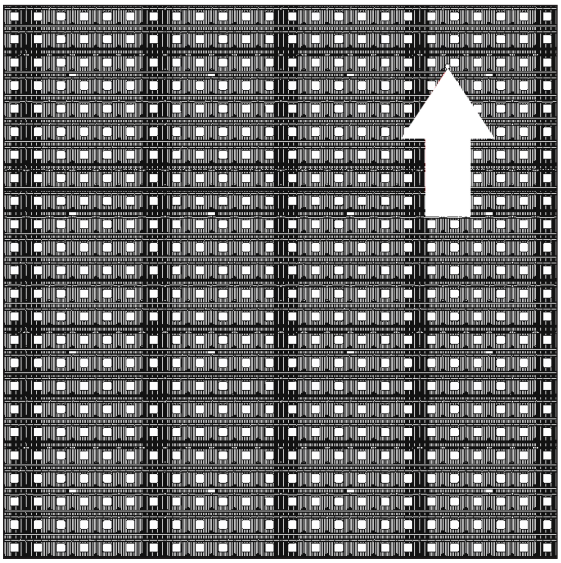

Figure 60: *Module Latch*

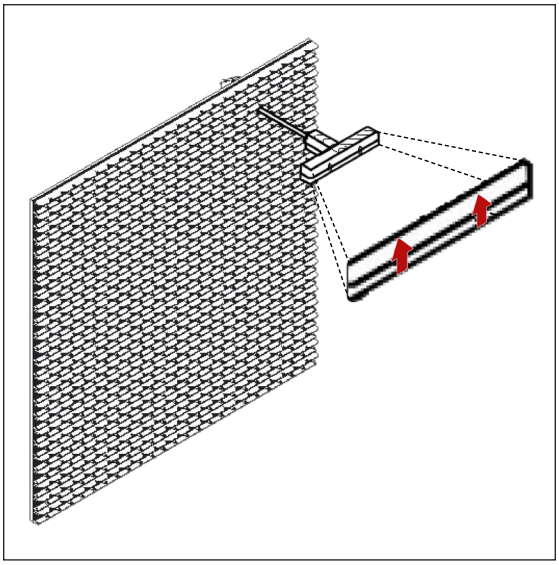

Figure 61: *Using Module Access Tool*

   Top access: Remove the module pan. Refer to **Module Pan** for instructions.

3. Pull on the handle to remove the module from the display just far enough to reach around to the back of the unit. Turn the access tool so the arrows on the handle point up and remove it from the module.

   Note: When performing this step, take care not to damage the louvers by tilting the module at too much of an angle. Refer to **Figure 62**.

4. Attach one end of a safety lanyard to the rings on the top of the module and the other end to a secure location within the display to prevent the module from falling if dropped.

5. Disconnect the power and signal cables from the rear of the module.

Reverse these steps to install an RTX-1801 module in a display.

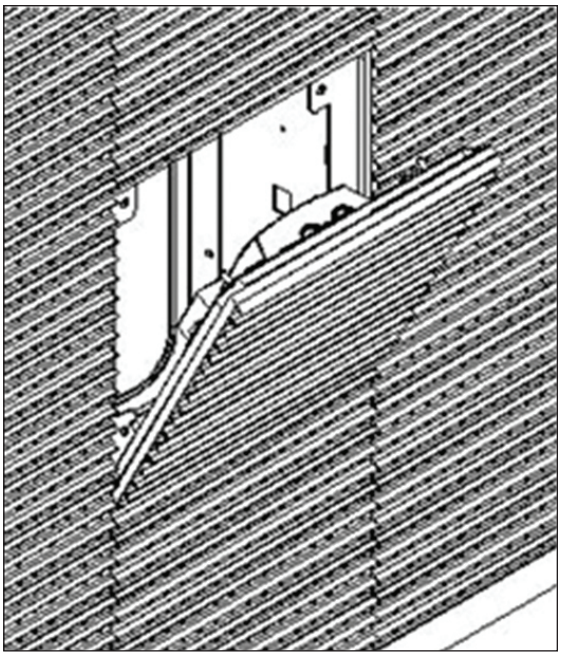

Figure 62: *Front-Access Angle*

ProLink Router

To remove a PLR from a display, follow the steps below:

1. Disconnect power to the display.

2. Use a $^{5}/_{16}$" hex security bit (Daktronics part number TH-1170) to release the beverage shroud security latches. The beverage shroud may be left on in a flipped-up position or removed by rotating it up and unhooking the spring-loaded hinge pins.

3. Unplug SATA Port A and SATA Port B, the fiber transmit and receive dual LC connections, and the two-pin power jack from the PLR.

4. Use a Phillips screwdriver to remove the three screws holding the PLR to the plate or remove the hinge, plate, and PLR together by rotating the hinge up and unhooking the spring-loaded hinge pins. Refer to **Figure 63**.

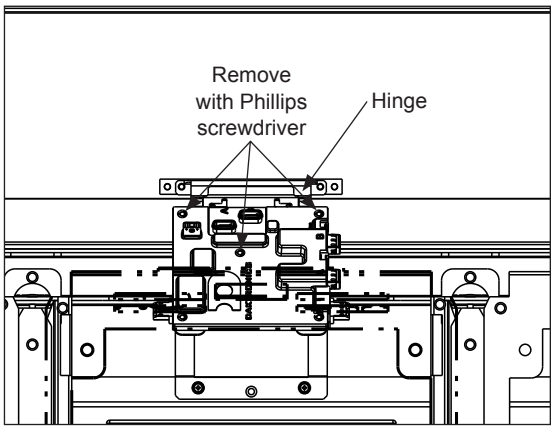

Figure 63: *Removing PLR*

Reverse these steps to install a PLR in a display.

4.5 Troubleshooting

This table lists problems that may be encountered while operating the display. Next to each problem are troubleshooting steps that may help to resolve it.

Display Problem	Troubleshooting Steps
Module is blank or garbled.	• Check the power status LEDs on all power supplies and modules connected to the module. • Check the SATA cable input into the module and the output from the previous module or PLR. • Perform a module self-test.
Section of display is blank.	• Ensure the section is receiving power and all breakers are turned on. • Ensure the power status LEDs on the modules, power supplies, and ProLink Routers (PLRs) in the blank section are on. • Ensure the connections to the PLR are secure. Change the connections with one another to test. • Ensure the fiber-optic signal is connected to the PLR or patch panel. • Perform a PLR loopback test to test the PLRs in the section. Refer to the **DD1735784** PLR 6X5X Installation & Maintenance Manual for instructions.
Entire display is blank.	• Ensure the display is receiving power and all breakers are turned on. When power is applied to the display, power supply LEDs should turn on. • Ensure the Video Image Processor (VIP) is not blank. • Ensure the fiber-optic signal cable is connected to the VIP. The input signal should be locked. If the input signal is not locked, check the fiber connections.
Entire display is garbled or uncontrollable.	• Use the test patterns to check the VIP status LEDs and ensure the board is receiving power. Refer to the **DD2773152** VIP-5X6X Operator's Manual for instructions. • Verify the controller/content player configuration and restart the display service. • Ensure the fiber-optic signal cable is connected to the VIP. The input signal should be locked. If the input signal is not locked, check the fiber connections.

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Section 5: Replacement Parts

5.1 Replacement Parts List

Part Description	Part Number
Toolkit	0A-1755-0001
ProLink Router (PLR)	0P-1525-0004
Power supply	A-3143
Cabinet fan	B-1109
Module	Contract-specific

5.2 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 (Mile Marker Number): _____
Daktronics Customer ID Number: _____

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/retail establishments	866-343-3122
Department of Transportation, mass transits, airports, and parking facilities	800-833-3157

2. **After receiving the new exchange part, mail the old part to Daktronics.**
   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.

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

4. **If the replacement part does not solve the problem, return the part within 30 working days, or Daktronics will charge the full purchase price.**
   If, after the exchange is made, the equipment is still defective, please contact Customer Service immediately. Daktronics expects immediate return of an exchange part if it does not solve the problem. The company 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 or fax Daktronics Customer Service.**
   Refer to the appropriate market number in the chart listed on the previous page.
   Fax: 605-697-4444

2. **Receive a Return Materials Authorization (RMA) number before shipping.**
   This expedites repair of the part.

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:**

   - Contact name
   - Address
   - Phone number
   - RMA number
   - Clear description of symptoms
   - Case number

Shipping Address

Daktronics Customer Service
P.O. Box 5128
201 Daktronics Dr.
Brookings, SD 57006

5.3 Daktronics Warranty & Limitation of Liability

The Daktronics Warranty & Limitation of Liability is located in **Appendix C**. The warranty is independent of extended service agreements and is the authority in matters of service, repair, and display operation.

Glossary

Lanyard Attachment Ring: a ring found on the back of each module. The lanyard attaches to the ring to keep the module from falling to the ground.

Latch Release: a device that holds the module firmly to the display frame. There are two per module, one on the top and one on the bottom.

Light Emitting Diode (LED): a low energy, high intensity lighting unit.

Line Filter: a device that removes electromagnetic noise from the power system to avoid interference with local communications channels. Line filters sometimes mount on brackets with power supplies. Other times they may mount alone on a bracket.

Louver: a plastic shade positioned horizontally above each pixel row. Louvers increase the contrast level on the display face and direct LED light for easier viewing.

Module: a display board with LEDs, a driver board or logic card, a black plastic housing, and a module latch assembly. Each module is individually removable from either the front or the rear of the display.

Module Latch: an orange latch located in the upper-left corner from the rear of the module.

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 device 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): a display interface board that passes display data from the ProLink6 control system modules and other PLRs. The ratio of PLRs to modules varies with display application.

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.

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

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Appendix A: Drawings

Refer to **Section 1.1** for information regarding how to read the drawing number.

These drawings offer general information pertaining to most RTX displays and are listed in alphanumeric order. Any contract-specific drawings take precedence over the general drawings.

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REV	DATE:	BY:

DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

PROJ: RTX A2/B1

TITLE: POWER ENTRANCE; FIELD TERMINATION DETAIL

DESIGN:	DRAWN:	DATE:
ACAMPBE	ACAMPBE	26-JUN-15

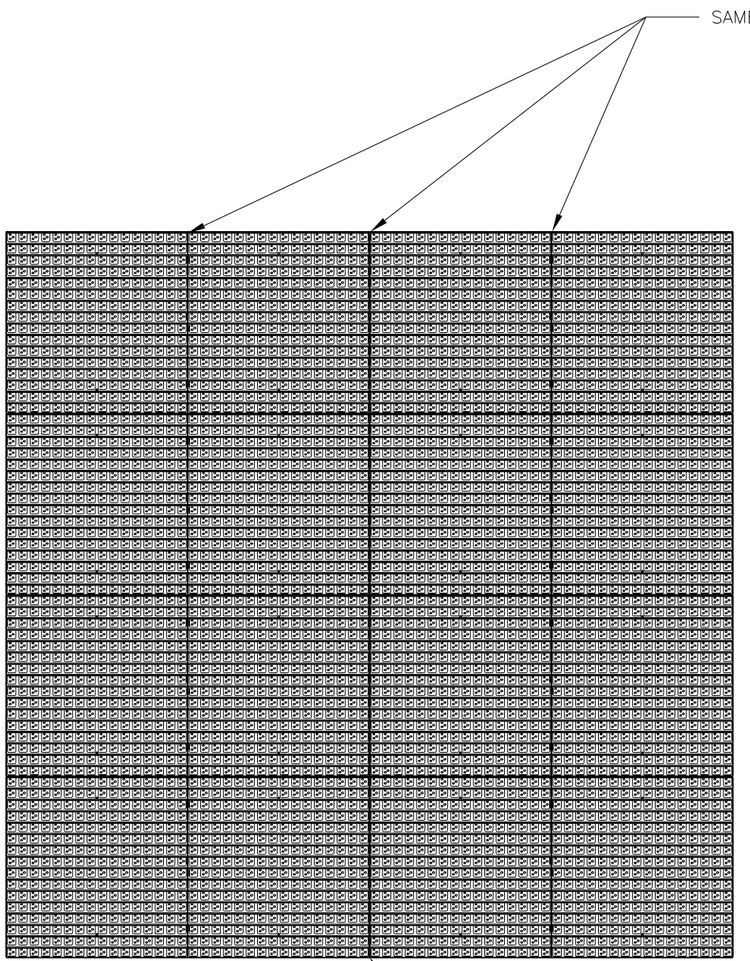
SCALE: NTS

SHEET:	REV	JOB NO:	FUNC-TYPE-SIZE
1 OF 1	00	P 1755	F - 01 - A

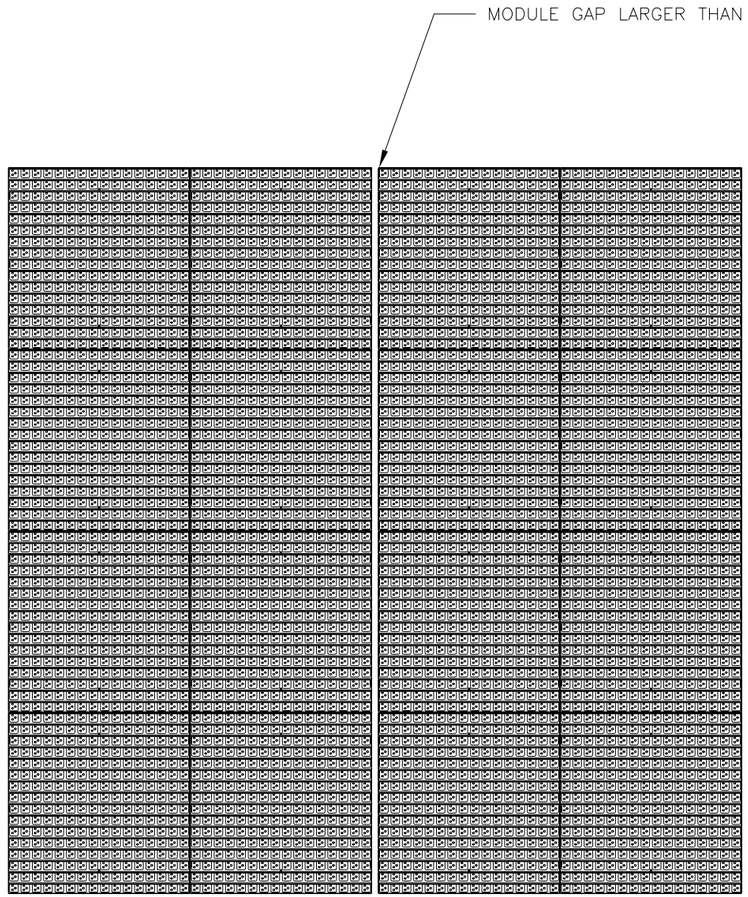
3086200

NOTES:

CHECK TO ENSURE THAT THE DISTANCE BETWEEN MODULES AT THE SPLICE IS IDENTICAL TO THE DISTANCE BETWEEN MODULES ON THE INTERIOR OF THE DISPLAY.



PROPER ALIGNMENT



IMPROPER ALIGNMENT

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: INSTALL MANUAL

TITLE: MODULE ALIGNMENT; INSTALL MANUAL

DES. BY: ASTOEBNER DRAWN BY: ASTOEBNER DATE: 12 FEB 03

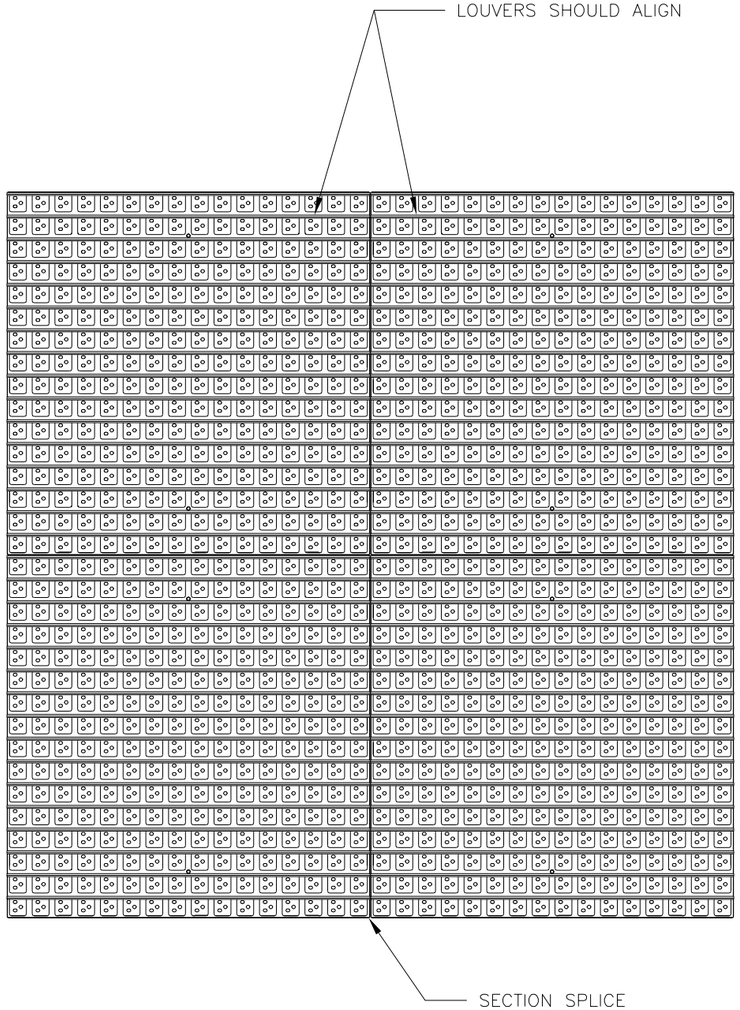
REVISION APPR. BY:

SCALE: 1"=1'

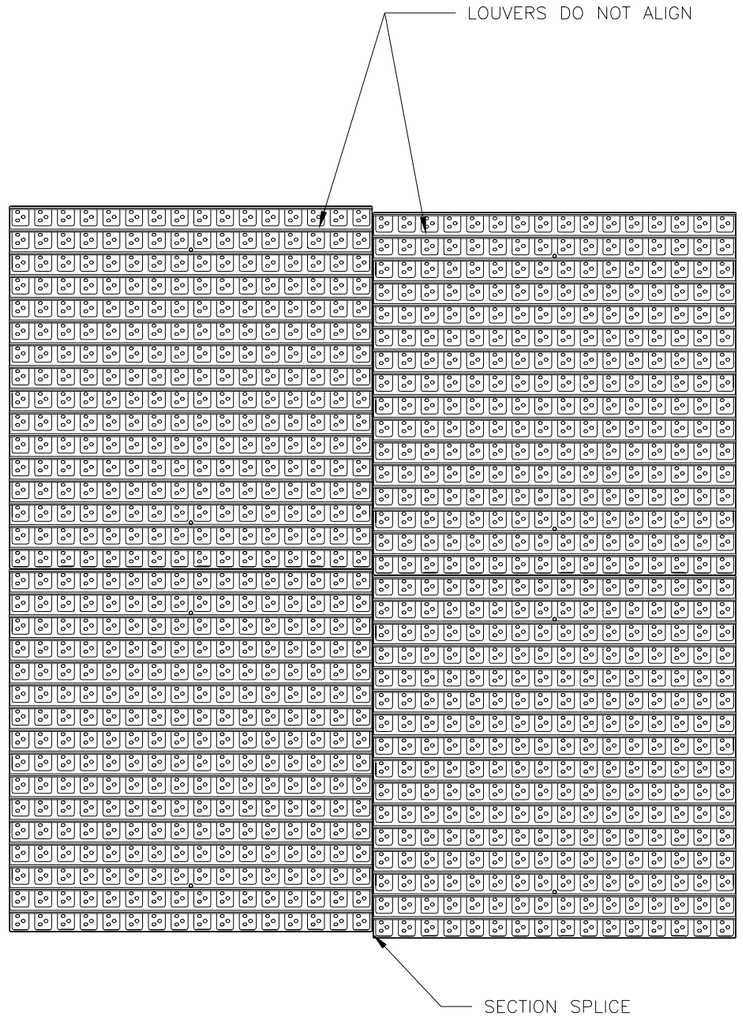
1199-E10B-183181

NOTES:

CHECK TO ENSURE THAT THE LOUVERS ARE PROPERLY ALIGNED WITH EACH OTHER AT THE SECTION SPLICE.



PROPER ALIGNMENT



IMPROPER ALIGNMENT

DAKTRONICS, INC. BROOKINGS, SD 57006

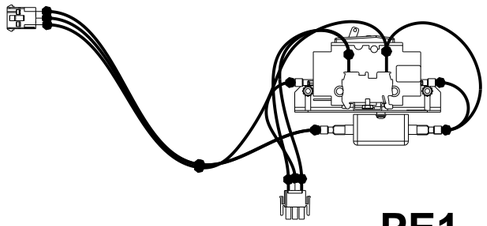
PROJ: INSTALL MANUAL

TITLE: LOUVER ALIGNMENT; INSTALL MANUAL

DES. BY: ASTOEBNER DRAWN BY: ASTOEBNER DATE: 12 FEB 03

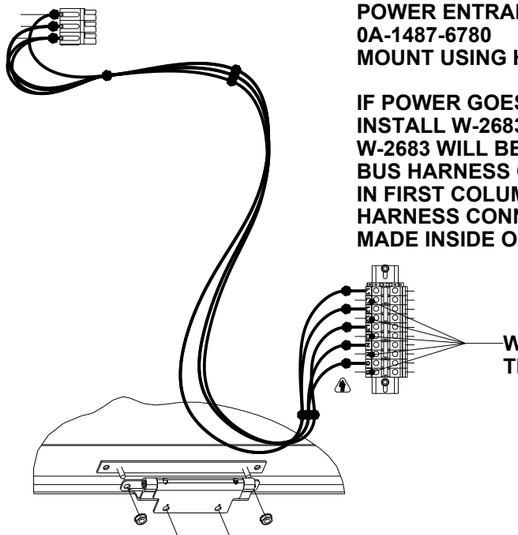
REVISION	APPR. BY:	1199-E10B-183182
	SCALE: 2"=1'	

REV.	DATE	DESCRIPTION	BY	APPR.



TB1

SECTIONAL TERM PANEL
0A-1487-6778 (DOMESTIC)
0A-1487-6779 (INTERNATIONAL)
MOUNT USING HC-1354 @ 2 (25 IN-LBS)

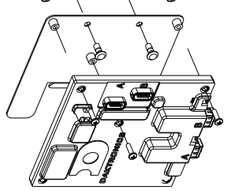


PE1

POWER ENTRANCE
0A-1487-6780
MOUNT USING HC-1354 @ 2 (25 IN-LBS)

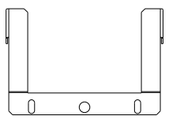
IF POWER GOES LEFT,
INSTALL W-2683 (39 IN-LBS)
W-2683 WILL BE PULLED TO THE
BUS HARNESS CONNECTION BOX
IN FIRST COLUMN AND THE BUS
HARNESS CONNECTION WILL BE
MADE INSIDE OF THAT BOX

W-2683 (39 IN-LBS)
TERMINATION LOCATION

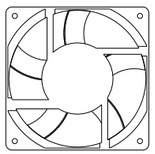


PLR1

ATTACH HS-1816 @ 1 TO BEVERAGE SHROUD
USING HC-1354 @ 2 (25 IN-LBS)
ATTACH 0M-1170866 @ 1 TO HS-1816
USING HC-1435 @ 2
ATTACH 0P-1525-0004 @ 1 TO 0M-1170866
USING HC-1014 @ 3 (5 IN-LBS)
ORIENT PLR SO SATA PORTS ARE TOWARDS TOP



FIBER PLATE / PLR SLIDER
0M-1170867 @ 1
ATTACH USING HC-1763 @ 2 (25 IN-LBS)
REFER TO DWG-03076504 FOR
J-1435 PLACEMENT & FIBER ROUTING OPTIONS



FANS

B-1109 @ 1 PER COLUMN
REMOVE ATTACHED FAN GUARD AND DISPOSE
ATTACH FANS TO BOTTOM PLATE OF CABINET
USING HS-2068 @ 1 PER FAN
FAN ORIENTED SO AIRFLOW IS UP (IN TO THE CABINET)
HARNESS TO EXIT TO THE LEFT AND REAR

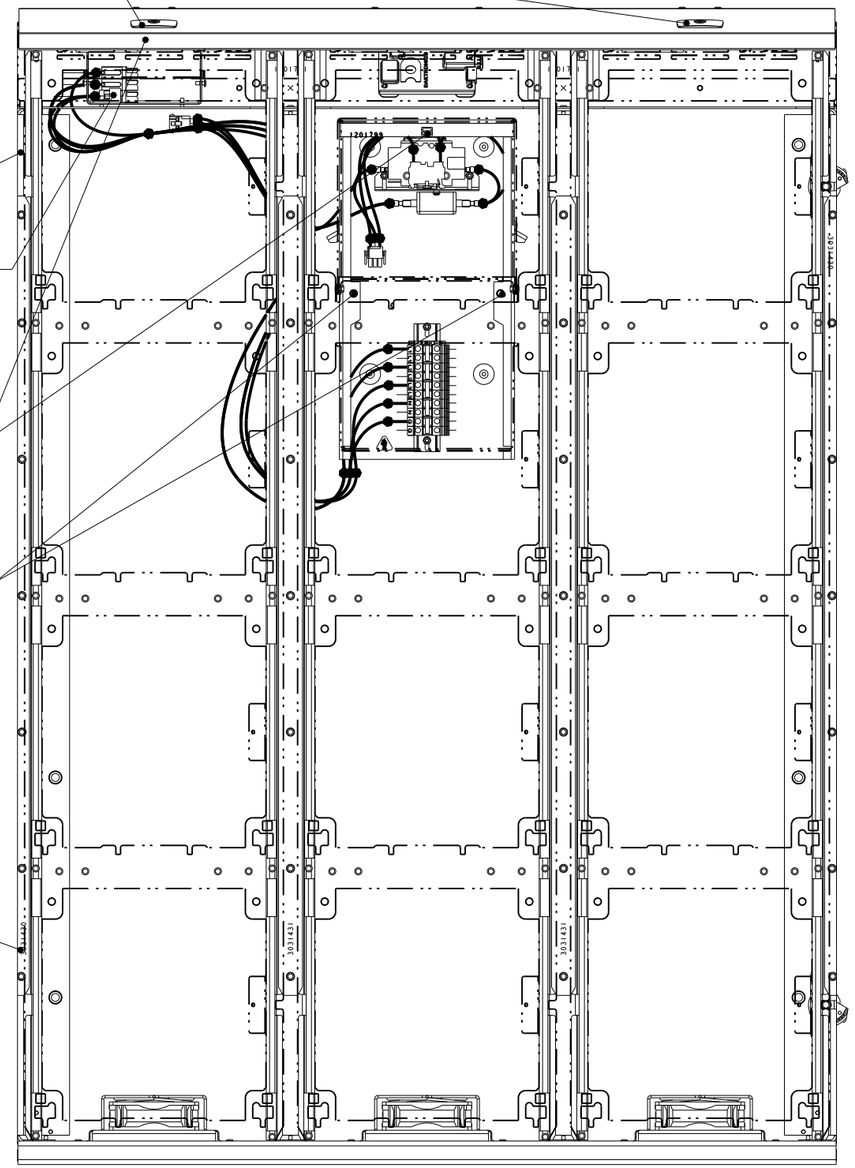
3, 4 WIDE CABINET - HS-2310 @ 2
5 WIDE CABINET - HS-2310 @ 3
6, 7, 8 WIDE CABINET - HS-2310 @ 4

ATTACH HE-1176 @ 1 HERE

ATTACH BUS HARNESS
GROUND LUG TO STUD
INSIDE BUS HARNESS
CONNECTION BOX
W/ HC-1112 (72 IN-LBS)

1/4 TURN LATCH FOR
BUS HARNESS BOX &
TERM PANEL BOX
HS-1612 @ 2

HC-1554 @ 2 (25 IN-LBS)



ATTACH HE-1176 @ 1 HERE

COMPONENT LAYOUT
WILL BE EXACTLY THE
SAME FOR
2, 3, & 4 HIGH CABINETS

COMPONENT LAYOUT WILL BE EXACTLY THE
SAME FOR 3, 4, 5, 6, 7, & 8 WIDE CABINETS

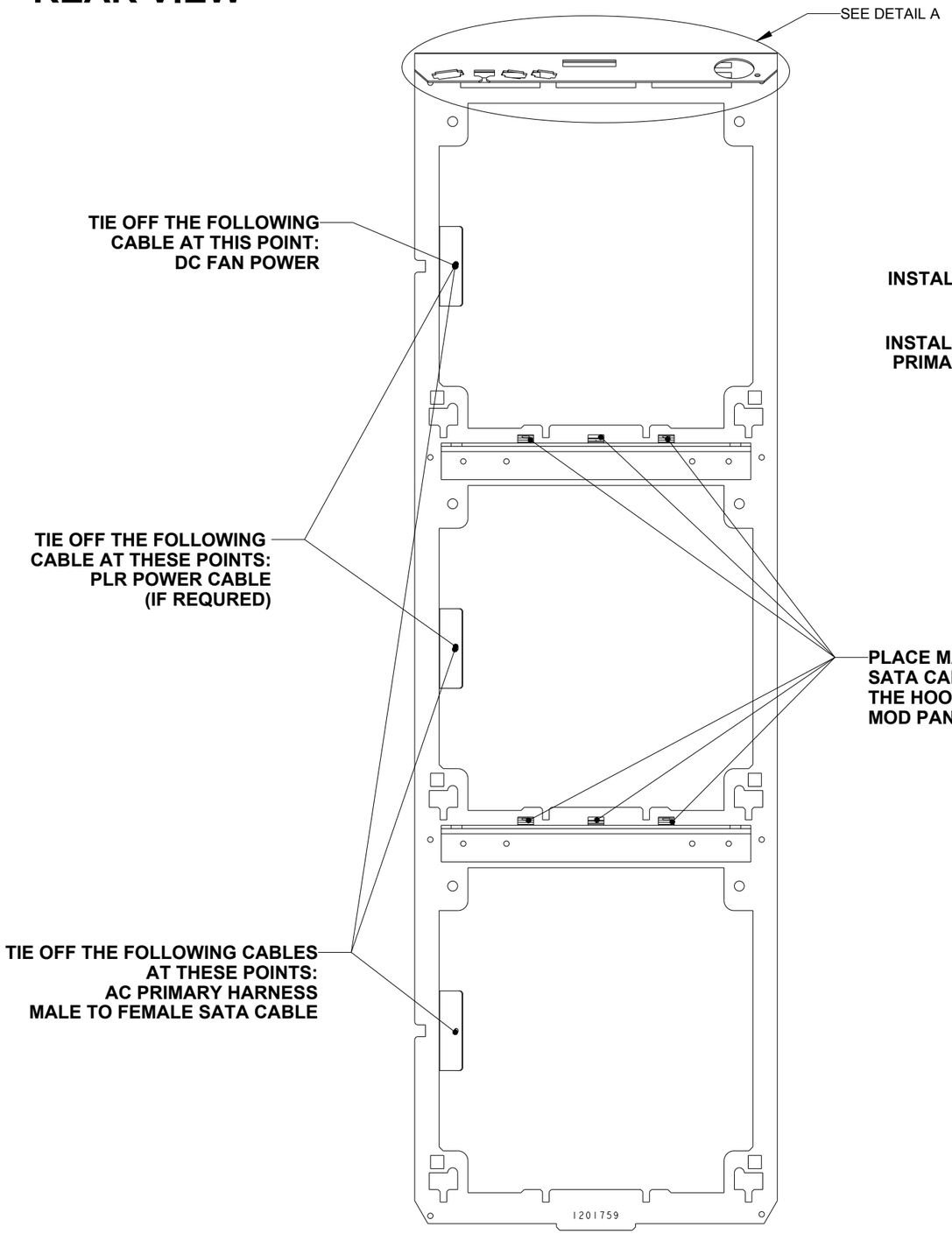
COIL BUS HARNESS & FIBER
IN RIGHT MOST BAY FOR ALL
CABINET WIDTHS

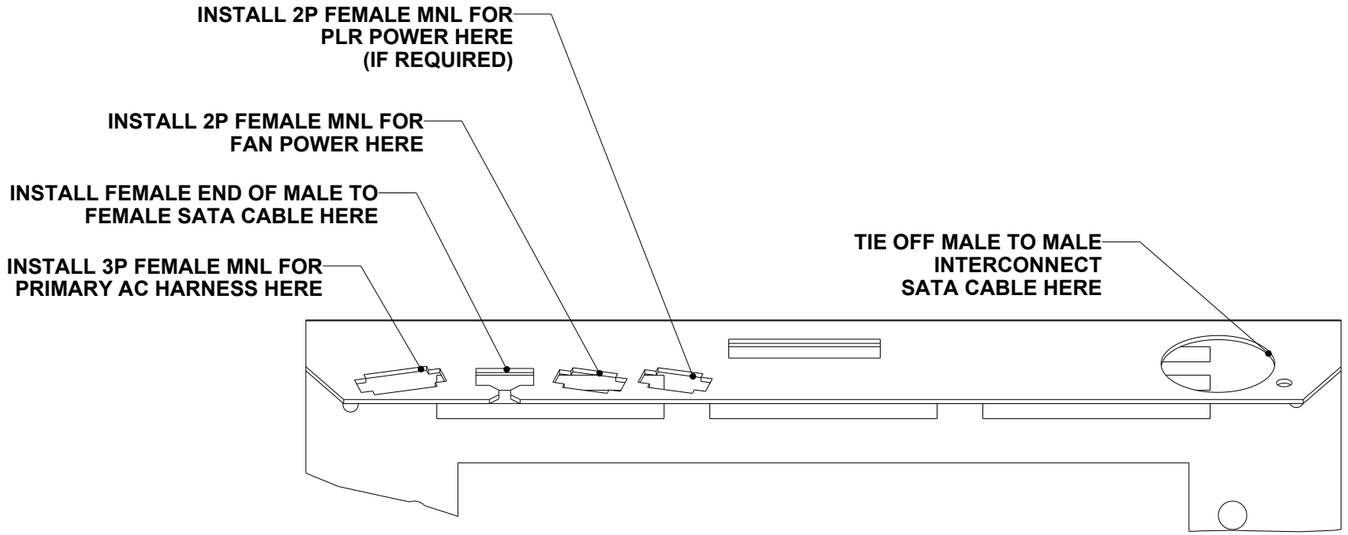
REV	DATE:		BY:

DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

PROJ: RTX A2					
TITLE: LAYOUT; COMP & PWR, RTX A2					
DESIGN: ACAMPBE		DRAWN: ACAMPBE		DATE: 27-APR-15	
SCALE: NTS					
SHEET:	REV	JOB NO:	FUNC-TYPE-SIZE	3046757	
1 OF 1	00	P 1755	E – 07 – B		

REAR VIEW





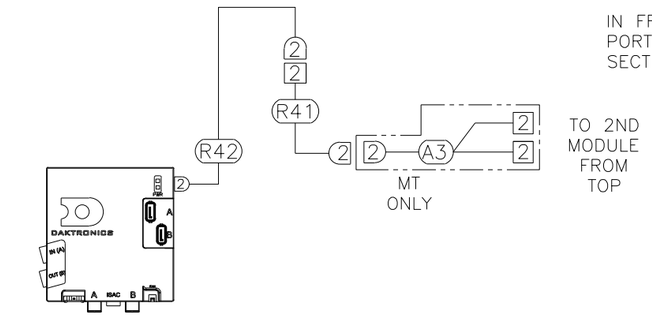
DETAIL A
SCALE 1/2

REV	DATE:		BY:

DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

PROJ: RTX A2					
TITLE: LAYOUT; MOD PAN WIRING, RTX A2					
DESIGN: ACAMPBE		DRAWN: ACAMPBE		DATE: 27-APR-15	
SCALE: NTS					
SHEET:	REV	JOB NO:	FUNC-TYPE-SIZE	3046759	
1 OF 1	00	P 1755	E _ 07 _ B		

SIGNAL



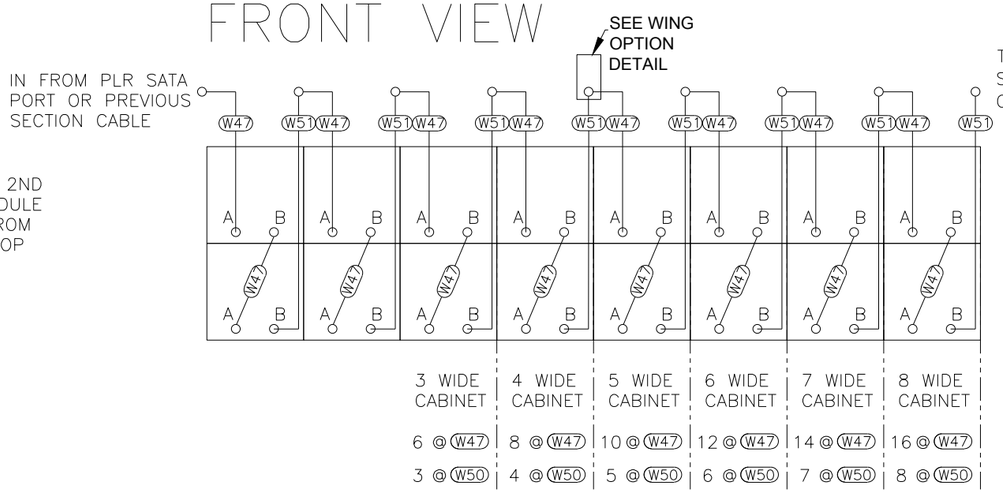
1 @ (R41) W-2673
HARNESS, MALE SLC TO 2P F MNL, SEALED

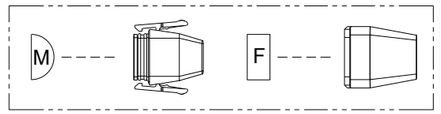
1 @ (R42) W-2674
HARNESS, MALE SLC TO 2P M MNL, SEALED

MT ONLY

1 @ (A3) W-2154
CABLE; SLC PLUG Y SLC JACKS, 6", 18AWGPLTFRM

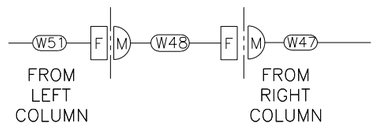
FRONT VIEW





WING OPTION DETAIL

FRONT VIEW



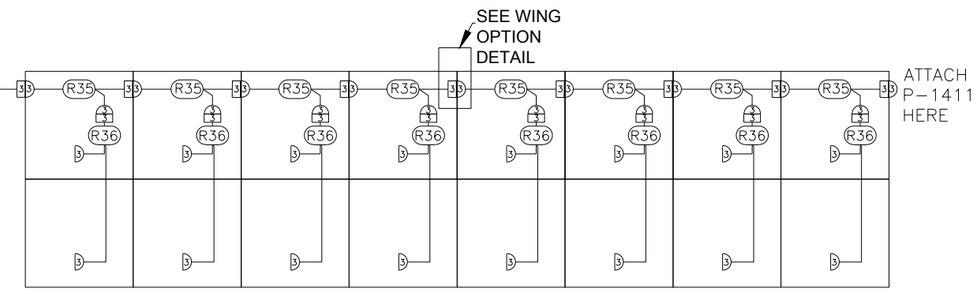
(W48) W-2893
CABLE, DAK SATA, M TO F, 48IN, BLK, STR8, DRAINS C

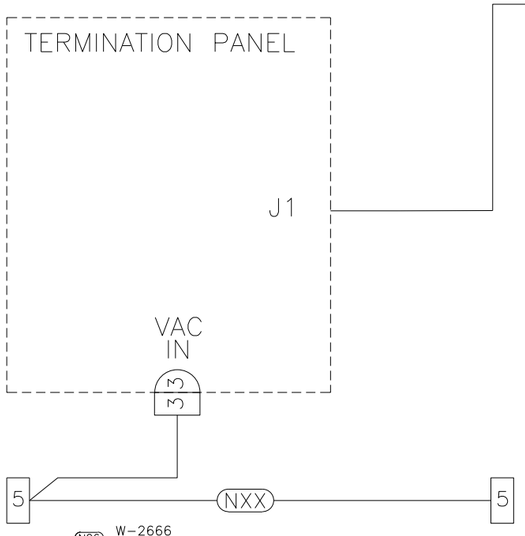
(W47) W-2892
CABLE; DAK SATA, M TO M, 33IN, BLK, XOVER, DRAINS

(W51) W-3312491
CABLE,DAK SATA,M TO F, 36IN, BLK,STR8,DRAINS CNCTD

POWER

FRONT VIEW





(N26) W-2666
HARNESS; 158" 3PH BUS W/ GND LUG, 6AWG

(N25) W-2266
HARNESS; 143" 3PH BUS W/ GND LUG, 6AWG

(N20) W-2186
HARNESS; 128" 3PH BUS W/ GND LUG, 6AWG

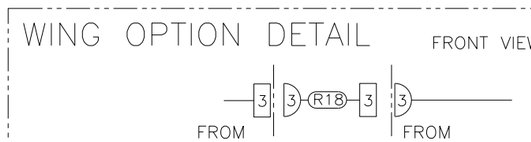
(N21) W-2187
HARNESS; 113" 3PH BUS W/ GND LUG, 6AWG

(N22) W-2188
HARNESS; 98" 3PH BUS W/ GND LUG, 6AWG

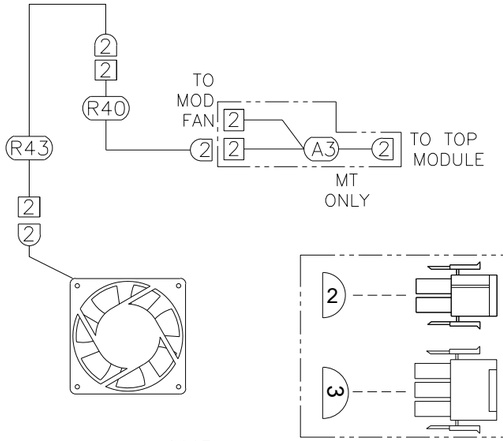
(N23) W-2189
HARNESS; 83" 3PH BUS W/ GND LUG, 6AWG

WING OPTION DETAIL

FRONT VIEW



(R18) W-2565
HARN; 15" 3 PIN M MNL TO 3 PIN F MNL
RVS GENDER, SEALED



(R35) W-2667
HARNESS; PWR, AC, TOP RUN, 3P MNL, 1 WHIP, SEALED

(R36) W-2668
HARNESS, PWR, AC, VERT DROP, 3P MNL, 2 MOD, SEALED

(R43) W-2747
HARNESS, FEMALE SLC TO 2P M MNL, SEALED, 18 AWG, 25"

(R40) W-2672
HARNESS, MALE SLC TO 2P F MNL, SEALED

MT ONLY

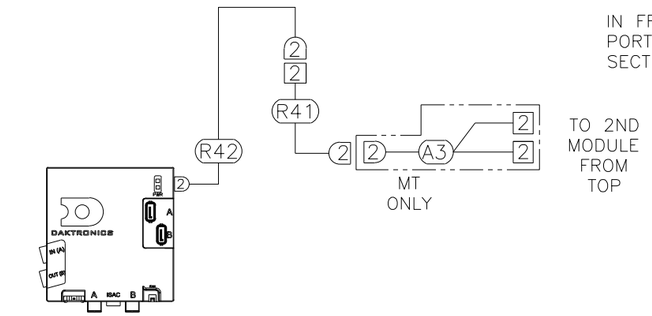
1 @ (A3) W-2154
CABLE; SLC PLUG Y SLC JACKS, 6", 18AWGPLTFRM

REV	DATE:		BY:
01	07 APR 16	UPDATED M-F SATA CABLE TO W-3312491 PER EC-20738	ADC

PROJ: RTX A2			
TITLE: BLOCK DIAGRAM; RTX A2, 2-HIGH			
DESIGN: ACAMPBE	DRAWN: ACAMPBE	DATE: 27 APR 15	
SCALE: NTS			

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	01	P1755	F - 01 - B	3046798

SIGNAL



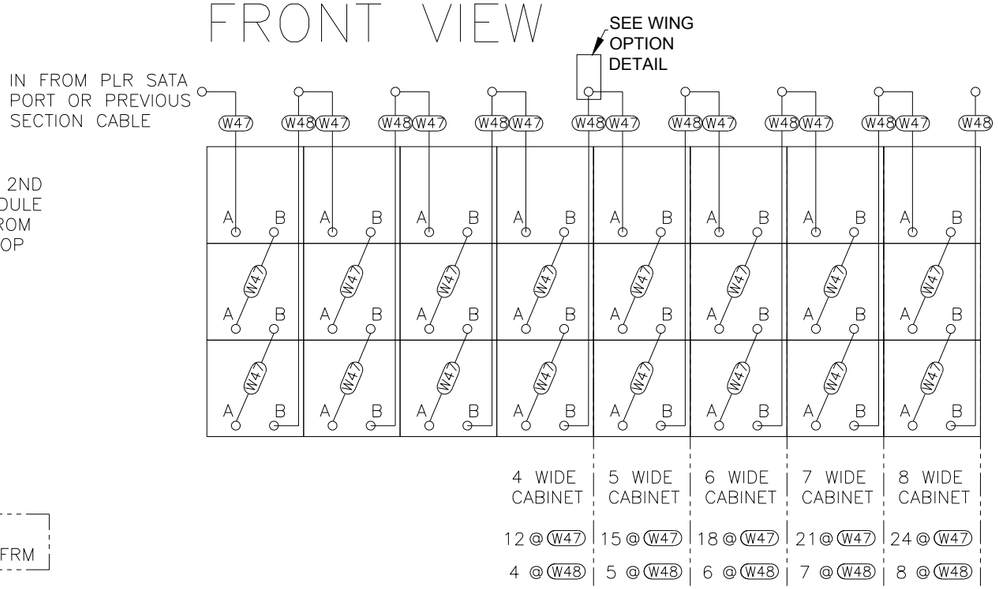
1 @ (R41) W-2673
HARNESS, MALE SLC TO 2P F MNL, SEALED

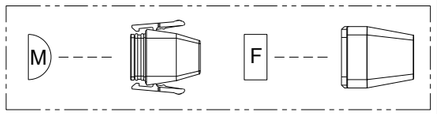
1 @ (R42) W-2674
HARNESS, MALE SLC TO 2P M MNL, SEALED

MT ONLY

1 @ (A3) W-2154
CABLE; SLC PLUG Y SLC JACKS, 6", 18AWGPLTFRM

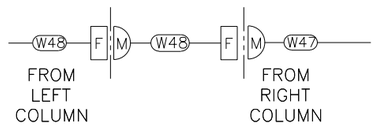
FRONT VIEW





WING OPTION DETAIL

FRONT VIEW



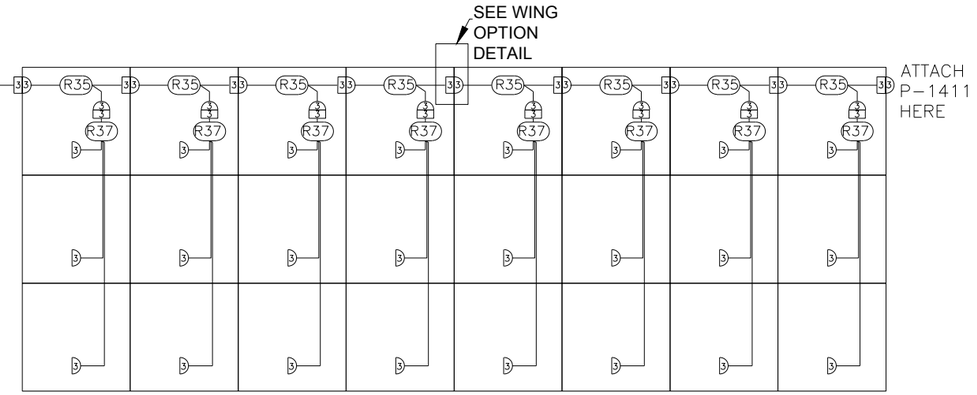
(W48) W-2893
CABLE, DAK SATA, M TO F, 48IN, BLK, STR8, DRAINS C

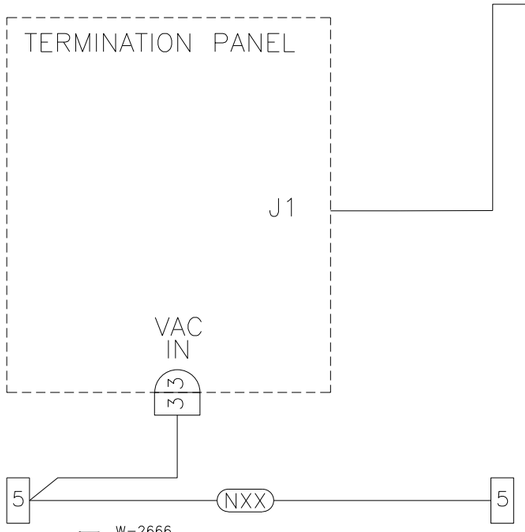
(W47) W-2892
CABLE; DAK SATA, M TO M, 33IN, BLK, XOVER, DRAINS

(W48) W-2893
CABLE, DAK SATA, M TO F, 48IN, BLK, STR8, DRAINS C

POWER

FRONT VIEW





(N26) W-2666
HARNESS; 158" 3PH BUS W/ GND LUG, 6AWG

(N25) W-2266
HARNESS; 143" 3PH BUS W/ GND LUG, 6AWG

(N20) W-2186
HARNESS; 128" 3PH BUS W/ GND LUG, 6AWG

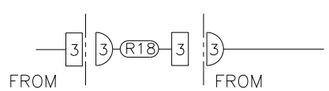
(N21) W-2187
HARNESS; 113" 3PH BUS W/ GND LUG, 6AWG

(N22) W-2188
HARNESS; 98" 3PH BUS W/ GND LUG, 6AWG

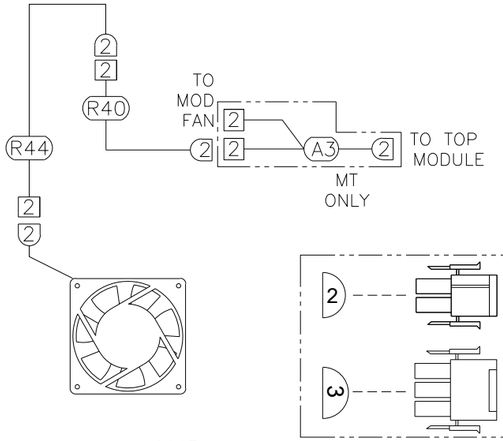
(N23) W-2189
HARNESS; 83" 3PH BUS W/ GND LUG, 6AWG

WING OPTION DETAIL

FRONT VIEW



(R18) W-2565
HARN; 15" 3 PIN M MNL TO 3 PIN F MNL
RVS GENDER, SEALED



(R35) W-2667
HARNESS; PWR, AC, TOP RUN, 3P MNL, 1 WHIP, SEALED

(R37) W-2669
HARNESS, PWR, AC, VERT DROP, 3P MNL, 3 MOD, SEALED

(R44) W-2748
HARNESS, FEMALE SLC TO 2P M MNL, SEALED, 18 AWG, 39.5"

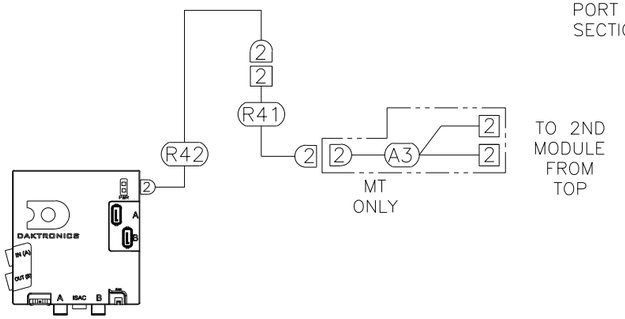
(R40) W-2672
HARNESS, MALE SLC TO 2P F MNL, SEALED

MT ONLY

1 @ (A3) W-2154
CABLE; SLC PLUG Y SLC JACKS, 6", 18AWGPLTFRM

PROJ: RTX A2				
TITLE: BLOCK DIAGRAM; RTX A2, 3-HIGH				
DESIGN: ACAMPBE		DRAWN: ACAMPBE		DATE: 27 APR 15
SCALE: NTS				
SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	3046799
	00	P1755	F - 01 - B	

SIGNAL



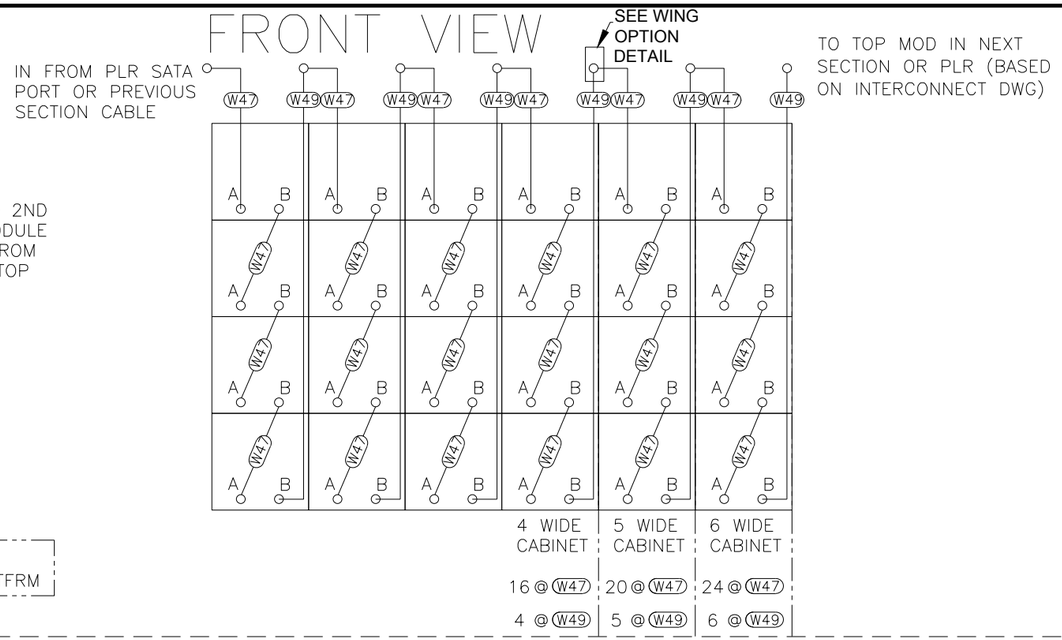
1 @ (R41) W-2673
HARNESS, MALE SLC TO 2P F MNL, SEALED

1 @ (R42) W-2674
HARNESS, MALE SLC TO 2P M MNL, SEALED

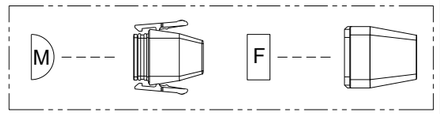
MT ONLY

1 @ (A3) W-2154
CABLE; SLC PLUG Y SLC JACKS, 6", 18AWGPLTFRM

FRONT VIEW

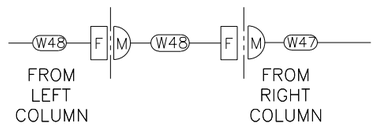


16 @ (W47) 20 @ (W47) 24 @ (W47)
4 @ (W49) 5 @ (W49) 6 @ (W49)



WING OPTION DETAIL

FRONT VIEW



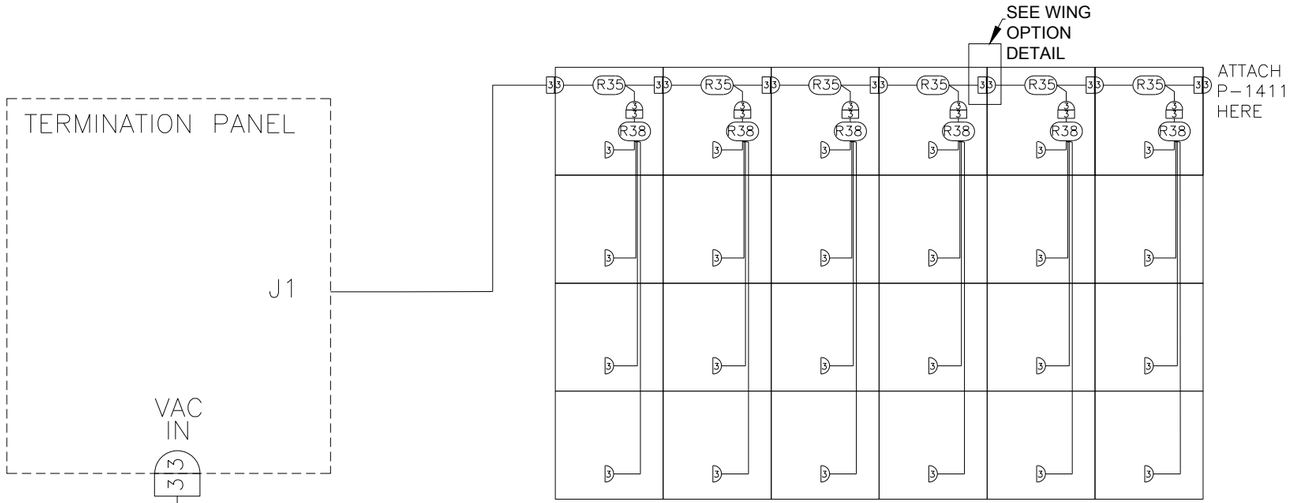
(W48) W-2893
CABLE, DAK SATA, M TO F, 48IN, BLK, STR8, DRAINS C

(W47) W-2892
CABLE; DAK SATA, M TO M, 33IN, BLK, XOVER, DRAINS

(W49) W-2894
CABLE, DAK SATA, M TO F, 62IN, BLK, STR8, DRAINS C

POWER

FRONT VIEW



(N26) W-2666
HARNESS; 158" 3PH BUS W/ GND LUG, 6AWG

(N25) W-2266
HARNESS; 143" 3PH BUS W/ GND LUG, 6AWG

(N20) W-2186
HARNESS; 128" 3PH BUS W/ GND LUG, 6AWG

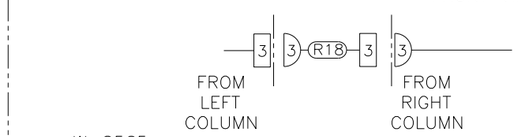
(N21) W-2187
HARNESS; 113" 3PH BUS W/ GND LUG, 6AWG

(N22) W-2188
HARNESS; 98" 3PH BUS W/ GND LUG, 6AWG

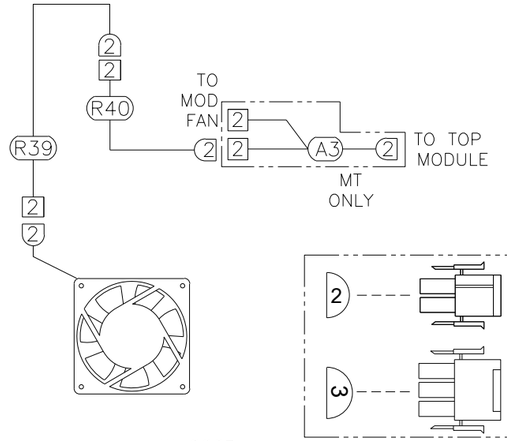
(N23) W-2189
HARNESS; 83" 3PH BUS W/ GND LUG, 6AWG

WING OPTION DETAIL

FRONT VIEW



(R18) W-2565
HARN; 15" 3 PIN M MNL TO 3 PIN F MNL
RVS GENDER, SEALED



(R35) W-2667
HARNESS; PWR, AC, TOP RUN, 3P MNL, 1 WHIP, SEALED

(R38) W-2670
HARNESS, PWR, AC, VERT DROP, 3P MNL, 4 MOD, SEALED

(R39) W-2671
HARNESS, FEMALE SLC TO 2P M MNL, SEALED, 18 AWG

(R40) W-2672
HARNESS, MALE SLC TO 2P F MNL, SEALED

MT ONLY

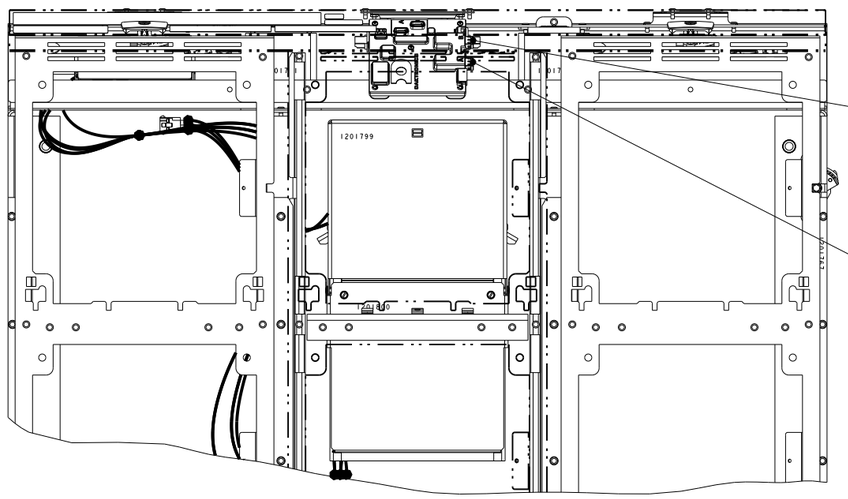
1 @ (A3) W-2154
CABLE; SLC PLUG Y SLC JACKS, 6", 18AWGPLTFRM

PROJ: RTX A2				
TITLE: BLOCK DIAGRAM; RTX A2, 4-HIGH				
DESIGN: ACAMPBE		DRAWN: ACAMPBE		DATE: 27 APR 15
SCALE: NTS				
SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	3046800
	00	P1755	F - 01 - B	

FIBER INTERCONNECT

CONNECT FIBER FROM
PREVIOUS SECTION HERE
(LEFT JACK (J-1435))
WHEN PLR IS NOT INSTALLED

FIBER INTERCONNECT
(NO PLR)
W-2123 @ 1
RIGHT JACK (J-1435) TO
COILED AT END OF CABINET

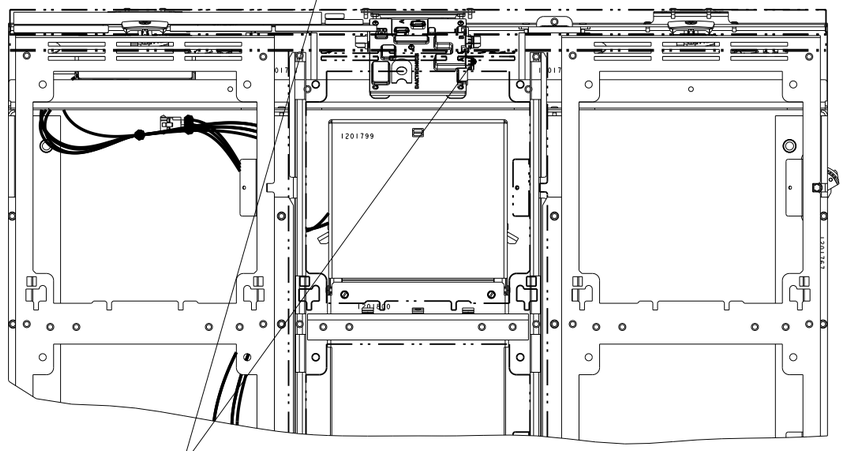


FIBER INTERCONNECT
(PLR)
W-2123 @ 1
PLR FIBER PORT B TO
COILED AT END OF CABINET

CONNECT FIBER FROM
PREVIOUS SECTION HERE
(PLR FIBER PORT A)
WHEN PLR IS INSTALLED

FIBER ENTRANCE
ENT

FIELD TERMINATE FIBER
FOR FIBER ENTRANCE OR
FIBER ENTRANCE (EXIT) HERE
(RIGHT JACK (J-1435))

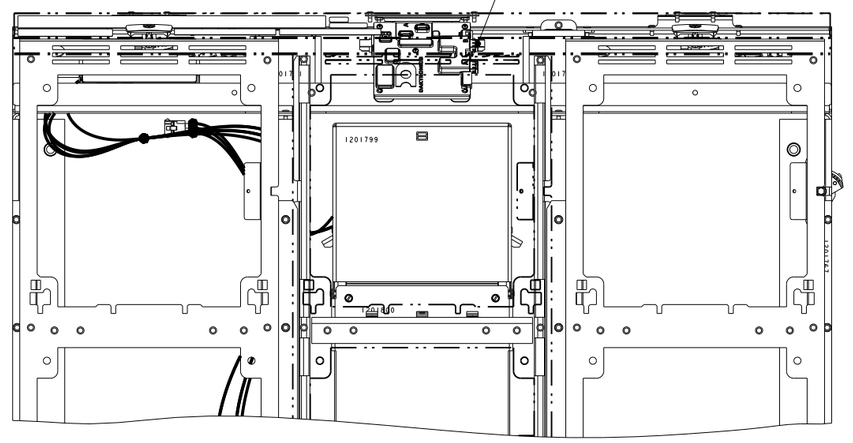


FIBER ENTRANCE
W-1659 @ 1
RIGHT JACK (J-1435) TO
PLR FIBER PORT A

FIBER ENTRANCE
EXIT

FIELD TERMINATE FIBER
FOR FIBER ENTRANCE OR
FIBER ENTRANCE (EXIT) HERE
(RIGHT JACK (J-1435)

FIBER ENTRANCE (EXIT)
W-1659 @ 1
RIGHT JACK (J-1435) TO
PLR FIBER PORT B



REV	DATE:		BY:

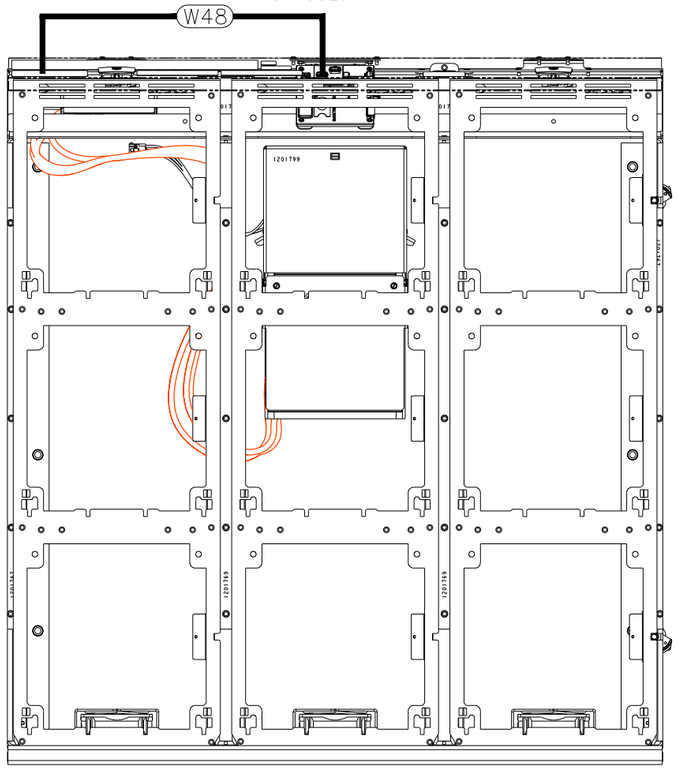
DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

PROJ: RTX A2/B1			
TITLE: RTX-1xy1 FIBER ROUTING			
DESIGN: ACAMPBE	DRAWN: ACAMPBE	DATE: 12-JUN-15	
SCALE: NTS			

SHEET:	REV	JOB NO:	FUNC-TYPE-SIZE	
1 OF 1	00	P 1755	F _ 01 _ B	3076504

START

PLR PORT A WILL
CONNECT W-2893 M-F SATA
CABLE TO W-2892 SATA CABLE
CONNECTED TO TOP MOD IN
1ST COLUMN

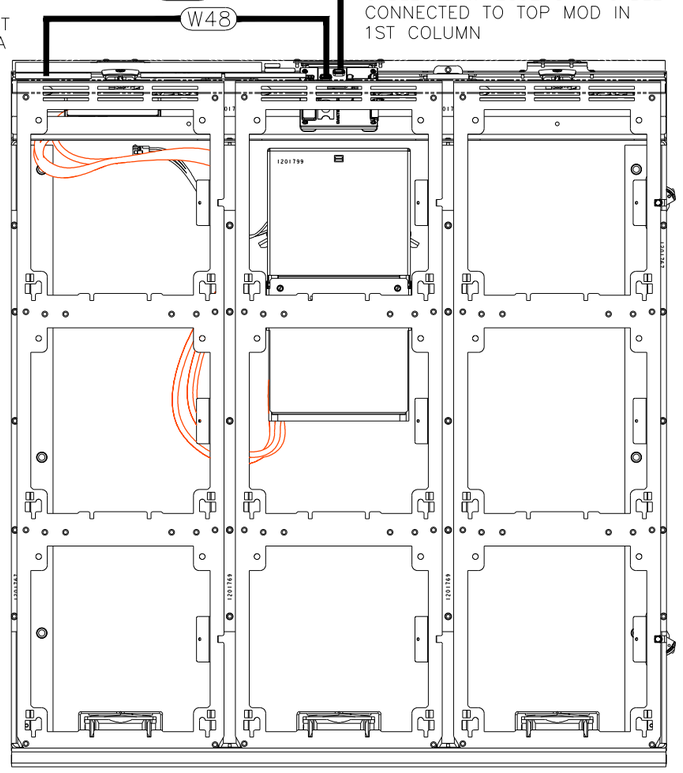


FRONT
VIEW

LEFT

PLR PORT B
WILL CONNECT
W-2889 SATA
CABLE TO
M-F SATA
CABLE IN
PREVIOUS
SECTION

PLR PORT A WILL
CONNECT W-2893 M-F SATA
CABLE TO W-2892 SATA CABLE
CONNECTED TO TOP MOD IN
1ST COLUMN

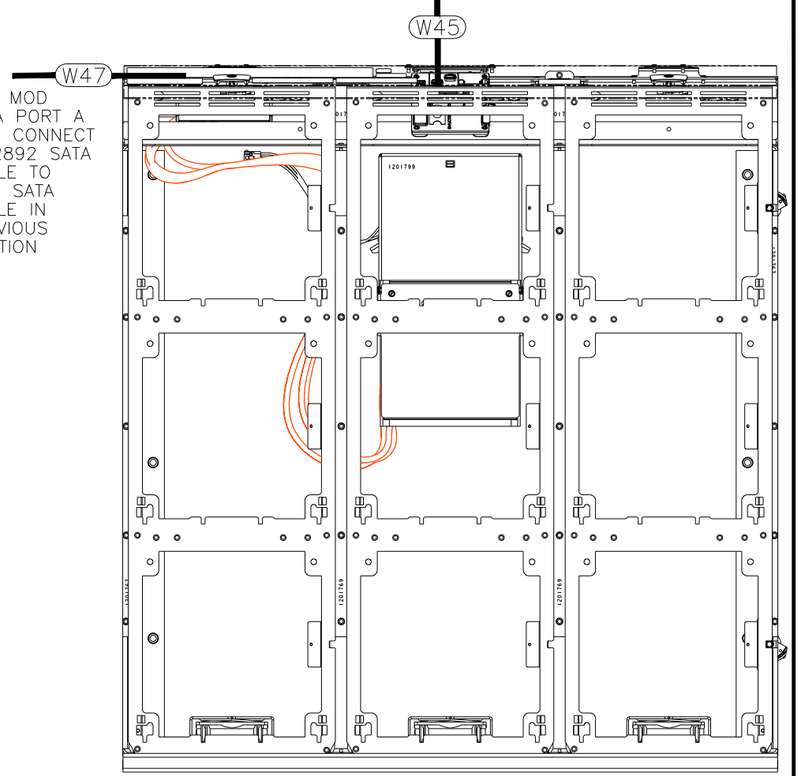


FRONT
VIEW

END

PLR PORT A WILL
CONNECT W-2890 SATA CABLE
TO M-F SATA CABLE
CONNECTED TO BOTTOM MOD IN
LAST COLUMN

TOP MOD
SATA PORT A
WILL CONNECT
W-2892 SATA
CABLE TO
M-F SATA
CABLE IN
PREVIOUS
SECTION



FRONT
VIEW

SIGNAL LEGEND

SATA CABLES

W44 W-2889
CABLE,DAK SATA,M TO M,72IN,BLK,XOVER,DRAINS CNCTD

W45 W-2890
CABLE,DAK SATA,M TO M,12FT,BLK,XOVER,DRAINS CNCTD

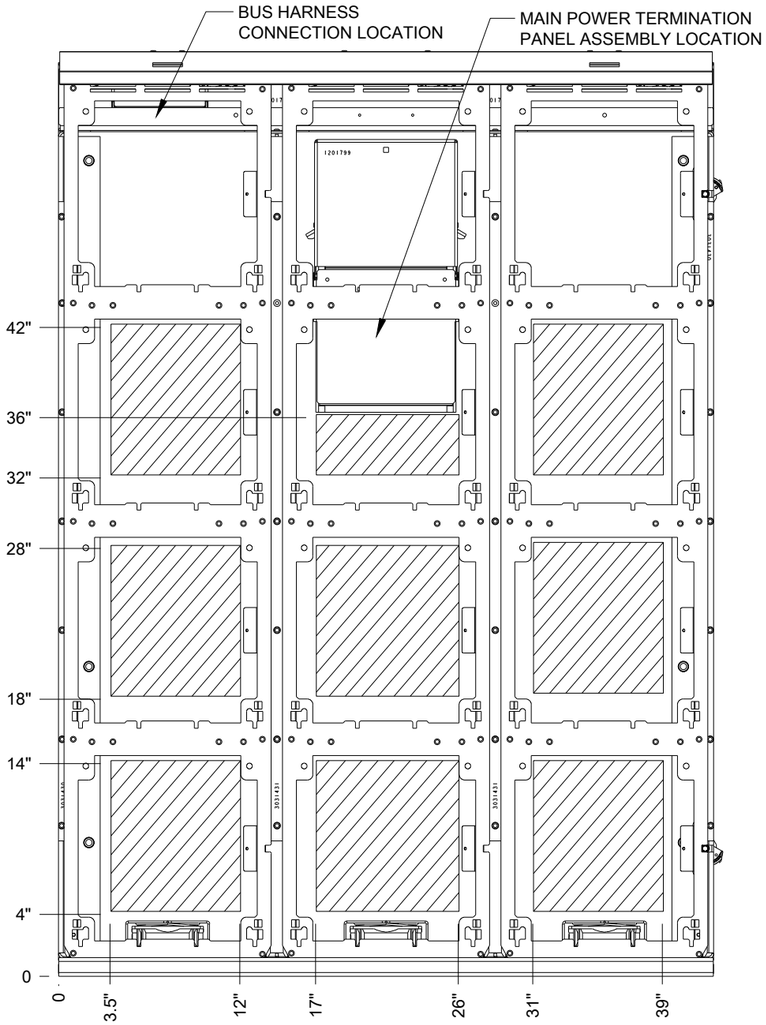
W47 W-2892
CABLE; DAK SATA, M TO M, 33IN, BLK, XOVER, DRAINS

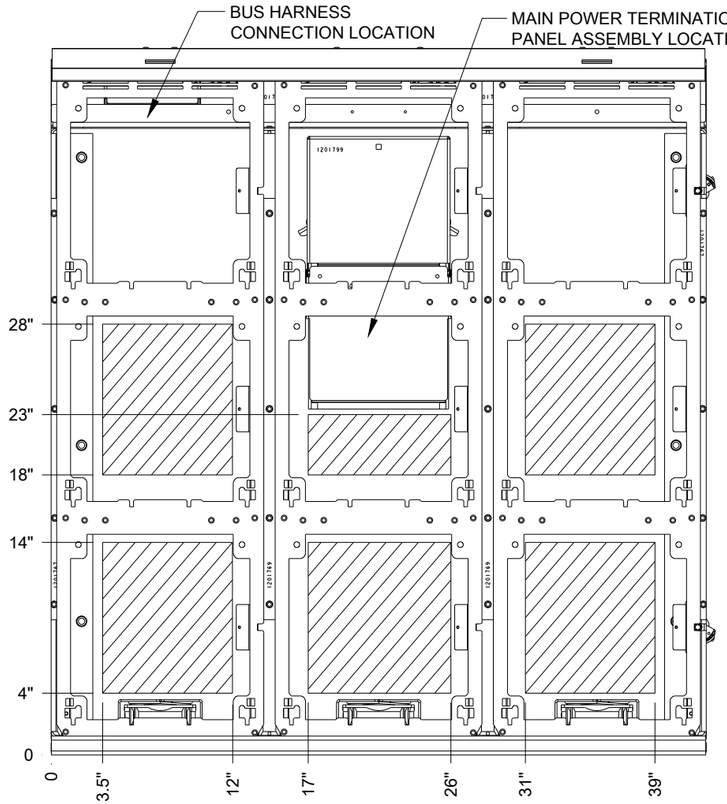
W48 W-2893
CABLE, DAK SATA, M TO F, 48IN, BLK, STR8, DRAINS C

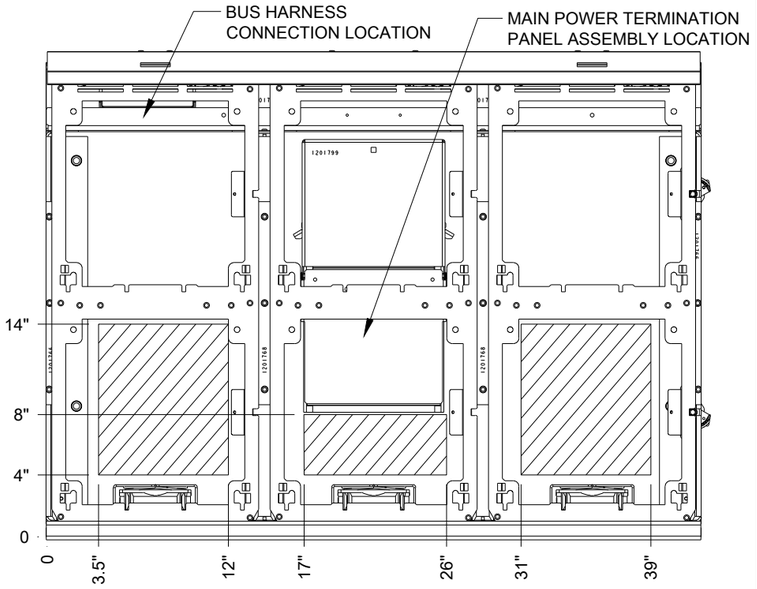
DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

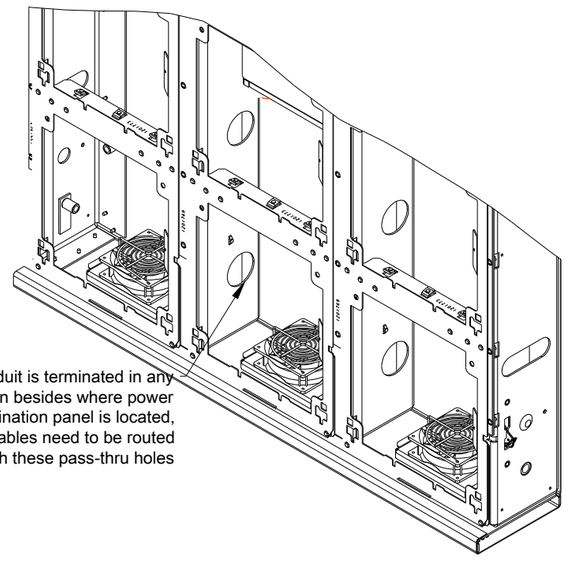
PROJ: RTX A2/B1				
TITLE: RTX-1XY1 SATA ROUTING OPTIONS				
DESIGN: ACAMPBE		DRAWN: ACAMPBE		DATE: 18 JUN 15
SCALE: NTS				
SHEET	REV	JOB NO:	FUNC - TYPE - SIZE	3080013
	00	P1755	F - 01 - B	

FRONT VIEW









If conduit is terminated in any column besides where power termination panel is located, cables need to be routed through these pass-thru holes

PREFERRED POWER & FIBER CONDUIT LANDING LOCATION

It is the responsibility of the electrical installation contractor to ensure conduit used and electrical work performed on-site meets or exceeds all local and national electric codes for wiring and specifcations.

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PROJ: RTX A2				
TITLE: RTX-1xy1 POWER ENTRANCE; FIELD CONDUIT LOCATION				
DESIGN: ACAMPBE		DRAWN: ACAMPBE		DATE: 07 JUL 15
SCALE: 1=10				
SHEET	REV	JOB NO:	FUNC - TYPE - SIZE	3092171
	00	P1755	F - 01 - B	

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Appendix B: Supplementary Documents

This section includes the following:

- **DD1402020** Ribbon Board Cabinet Lifting Instructions Quick Guide
- **DD3246225** RTX-11X1/1801 Series Power Numbers
- **DD3246273** RTX-11X1/1801 Series Sectional Installation & Service Quick Guide
- **ED-14158** Face Cleaning Procedures for Daktronics LED Matrix Displays

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Wooden-Crate Displays

Unloading with Crane

Use a spreader beam (if available) and place the lifting straps under the double-bottomed kickboard. Refer to **Figure 1**.

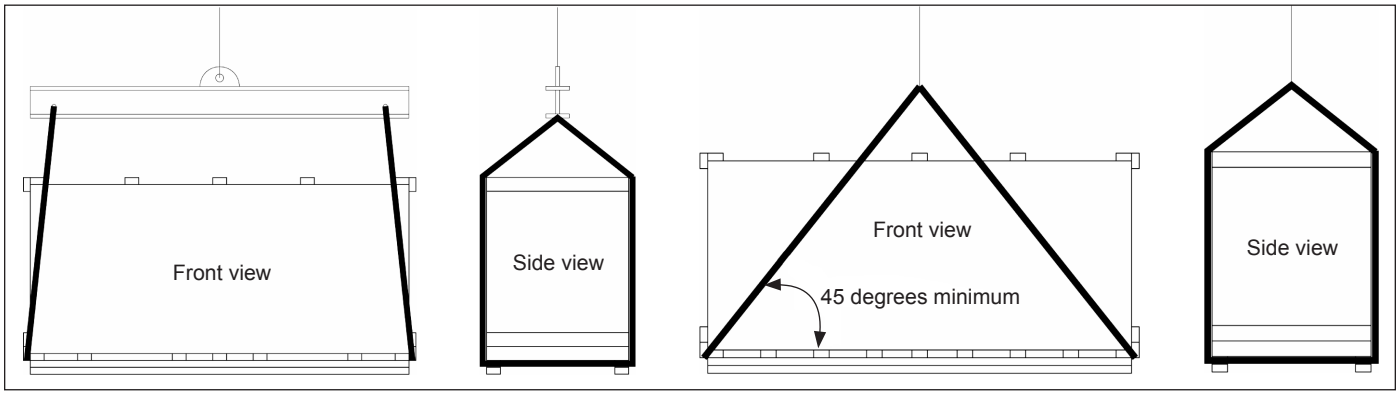

Figure 1: *Crane-Unloading Configurations*

Lifting straps may also be used without a spreader beam if a spreader beam is unavailable. Maintain a minimum angle of 45 degrees between the strap and the horizon and place the lifting straps under the double-bottomed kickboard. Refer to **Figure 1**.

Unloading with Forklift

A forklift may only be used for display crates no more than 14 feet in length and designed with forklift pockets. Align the forklift pockets with the mid-line of the crate at the forklift pocket locations. Refer to **Figure 2**.

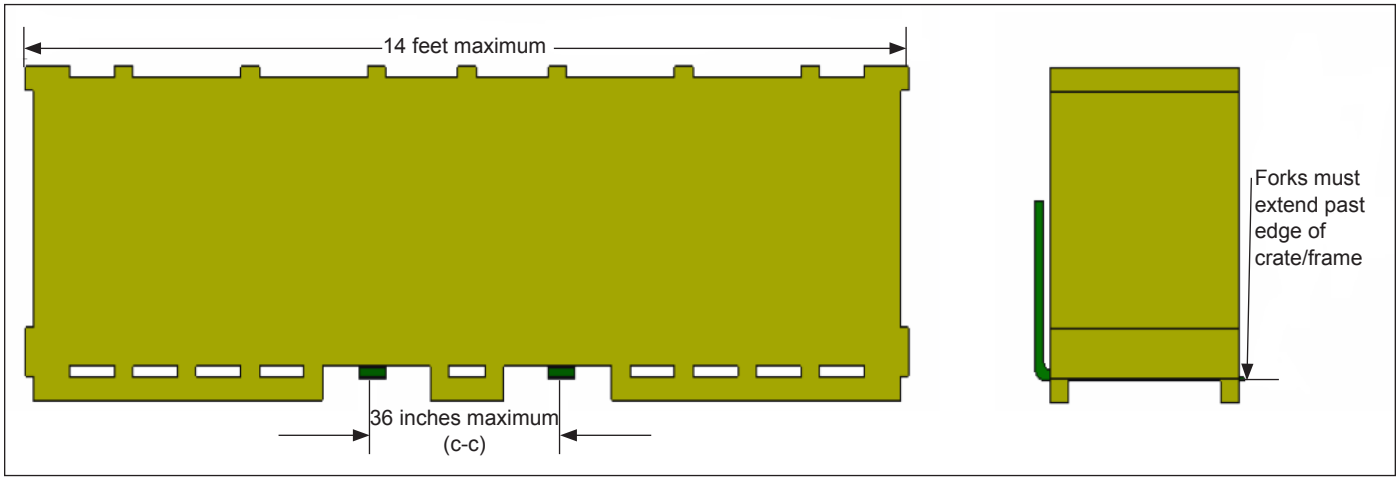

Figure 2: *Forklift-Unloading Configurations*

Note: Maximum fork center-to-center (c-c) spacing must not exceed 36 inches.

Using a forklift for overhead lifting is acceptable only in crane-unloading configurations. Refer to **Figure 1**.

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Aluma-Crate Displays

Unloading with Crane

Use a spreader beam (if available) and attach the beam to all four points provided at the top corner of the aluma-crate posts. Refer to **Figure 3**.

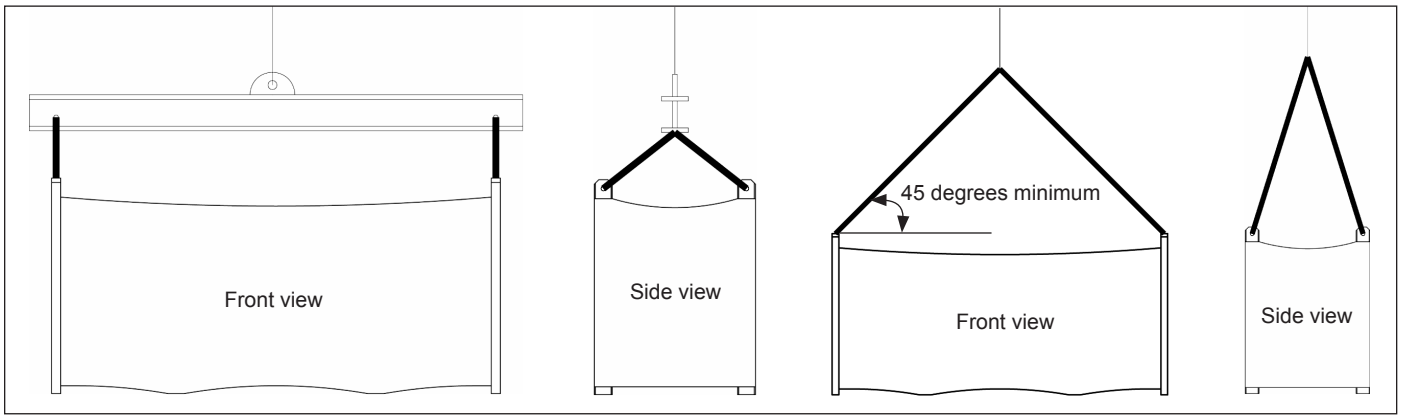

Figure 3: *Crane-Unloading Configurations*

Lifting straps or chains may be used without a spreader beam if a spreader beam is unavailable. Maintain a minimum angle of 45 degrees between the strap or chain and the horizon and attach the lifting straps or chains to all four points provided at the top corners of the aluma-crate posts. Refer to **Figure 3**.

Unloading with Forklift

Bottom lifting is allowed at forklift pocket sleeve assembly locations.

Note: Maximum fork center-to-center (c-c) spacing must not exceed 36 inches.

Using a forklift for overhead lifting is acceptable only in crane-unloading configurations. Refer to **Figure 3**.

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RTX-11X1/1801 Series Power Numbers

These tables list the power numbers for the standard section sizes.

RTX-11X1-13HD	Bus 120V~ -1P 60Hz 2W + GND		Bus 240V~ -1P 50Hz 2W + GND	
Section	**Watts**	**Amps**	**Watts**	**Amps**
2x3 – 56x84	264	2.2	250	1.0
2x4 – 56x112	348	2.9	342	1.4
2x5 – 56x140	432	3.6	410	1.7
2x6 – 56x168	516	4.3	501	2.1
2x7 – 56x196	600	5.0	592	2.5
2x8 – 56x224	684	5.7	660	2.8
3x3 – 84x84	384	3.2	364	1.5
3x4 – 84x112	504	4.2	478	2.0
3x5 – 84x140	624	5.2	615	2.6
3x6 – 84x168	756	6.3	729	3.0
3x7 – 84x196	876	7.3	843	3.5
3x8 – 84x224	996	8.3	979	4.1
4x3 – 112x84	504	4.2	499	2.1
4x4 – 112x112	660	5.5	665	2.8
4x5 – 112x140	828	6.9	832	3.5
4x6 – 112x168	984	8.2	998	4.2

RTX-11X1-15HD	Bus 120V~ -1P 60Hz 2W + GND		Bus 240V~ -1P 50Hz 2W + GND	
Section	**Watts**	**Amps**	**Watts**	**Amps**
2x3 – 48x72	264	2.2	250	1.0
2x4 – 48x96	348	2.9	342	1.4
2x5 – 48x120	432	3.6	410	1.7
2x6 – 48x144	516	4.3	501	2.1
2x7 – 48x168	600	5.0	592	2.5
2x8 – 48x192	684	5.7	660	2.8
3x3 – 72x72	384	3.2	364	1.5
3x4 – 72x96	504	4.2	478	2.0
3x5 – 72x120	624	5.2	615	2.6
3x6 – 72x144	756	6.3	729	3.0
3x7 – 72x168	876	7.3	843	3.5
3x8 – 72x192	996	8.3	979	4.1
4x3 – 96x72	504	4.2	499	2.1
4x4 – 96x96	660	5.5	665	2.8
4x5 – 96x120	828	6.9	832	3.5
4x6 – 96x144	984	8.2	998	4.2

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DAKTRONICS

RTX-11X1/1801 Series Power Numbers

RTX-11X1-16MT	Bus 120V~ -1P 60Hz 2W + GND		Bus 240V~ -1P 50Hz 2W + GND	
Section	**Watts**	**Amps**	**Watts**	**Amps**
2x3 – 44x66	264	2.2	250	1.0
2x4 – 44x88	348	2.9	342	1.4
2x5 – 44x110	432	3.6	410	1.7
2x6 – 44x132	516	4.3	501	2.1
2x7 – 44x154	600	5.0	592	2.5
2x8 – 44x176	684	5.7	660	2.8
3x3 – 66x66	384	3.2	364	1.5
3x4 – 66x88	504	4.2	478	2.0
3x5 – 66x110	624	5.2	615	2.6
3x6 – 66x132	756	6.3	729	3.0
3x7 – 66x154	876	7.3	843	3.5
3x8 – 66x176	996	8.3	979	4.1
4x3 – 88x66	504	4.2	499	2.1
4x4 – 88x88	660	5.5	665	2.8
4x5 – 88x110	828	6.9	832	3.5
4x6 – 88x132	984	8.2	998	4.2

RTX-11X1-20MT	Bus 120V~ -1P 60Hz 2W + GND		Bus 240V~ -1P 50Hz 2W + GND	
Section	**Watts**	**Amps**	**Watts**	**Amps**
2x3 – 36x54	264	2.2	250	1.0
2x4 – 36x72	348	2.9	342	1.4
2x5 – 36x90	432	3.6	410	1.7
2x6 – 36x108	516	4.3	501	2.1
2x7 – 36x126	600	5.0	592	2.5
2x8 – 36x144	684	5.7	660	2.8
3x3 – 54x54	384	3.2	364	1.5
3x4 – 54x72	504	4.2	478	2.0
3x5 – 54x90	624	5.2	615	2.6
3x6 – 54x108	756	6.3	729	3.0
3x7 – 54x126	876	7.3	843	3.5
3x8 – 54x144	996	8.3	979	4.1
4x3 – 72x54	504	4.2	499	2.1
4x4 – 72x72	660	5.5	665	2.8
4x5 – 72x90	828	6.9	832	3.5
4x6 – 72x108	984	8.2	998	4.2

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RTX-11X1/1801 Series Power Numbers

RTX-1801-8MN	Bus 120V~ -1P 60Hz 2W + GND		Bus 240V~ -1P 50Hz 2W + GND	
Section	**Watts**	**Amps**	**Watts**	**Amps**
2x3 – 90x135	480	4.0	455	1.9
2x4 – 90x180	636	5.3	615	2.6
2x5 – 90x225	792	6.6	751	3.1
2x6 – 90x270	948	7.9	911	3.8
2x7 – 90x315	1104	9.2	1048	4.4
2x8 – 90x360	1260	10.5	1207	5.0
3x3 – 135x135	708	5.9	683	2.8
3x4 – 135x180	936	7.8	888	3.7
3x5 – 135x225	1164	9.7	1116	4.6
3x6 – 135x270	1392	11.6	1344	5.6
3x7 – 135x315	1632	13.6	1549	6.5
3x8 – 135x360	1860	15.5	1776	7.4
4x3 – 180x135	924	7.7	927	3.9
4x4 – 180x180	1236	10.3	1236	5.1
4x5 – 180x225	1548	12.9	1545	6.4
4x6 – 180x270	1848	15.4	1853	7.7

RTX-1801-10MN	Bus 120V~ -1P 60Hz 2W + GND		Bus 240V~ -1P 50Hz 2W + GND	
Section	**Watts**	**Amps**	**Watts**	**Amps**
2x3 – 72x108	480	4.0	455	1.9
2x4 – 72x144	636	5.3	615	2.6
2x5 – 72x180	792	6.6	751	3.1
2x6 – 72x216	948	7.9	911	3.8
2x7 – 72x252	1104	9.2	1048	4.4
2x8 –72x288	1260	10.5	1207	5.0
3x3 – 108x108	708	5.9	683	2.8
3x4 – 108x144	936	7.8	888	3.7
3x5 – 108x180	1164	9.7	1116	4.6
3x6 – 108x216	1392	11.6	1344	5.6
3x7 – 108x252	1632	13.6	1549	6.5
3x8 – 108x288	1860	15.5	1776	7.4
4x3 – 144x108	924	7.7	927	3.9
4x4 – 144x144	1236	10.3	1236	5.1
4x5 – 144x180	1548	12.9	1545	6.4
4x6 – 144x216	1848	15.4	1853	7.7

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RTX-11X1/1801 Series Power Numbers

RTX-1801-15MN	Bus 120V~ -1P 60Hz 2W + GND		Bus 240V~ -1P 50Hz 2W + GND	
Section	**Watts**	**Amps**	**Watts**	**Amps**
2x3 – 48x72	480	4.0	455	1.9
2x4 – 48x96	636	5.3	615	2.6
2x5 – 48x120	792	6.6	751	3.1
2x6 – 48x144	948	7.9	911	3.8
2x7 – 48x168	1104	9.2	1048	4.4
2x8 –48x192	1260	10.5	1207	5.0
3x3 – 72x72	708	5.9	683	2.8
3x4 – 72x96	936	7.8	888	3.7
3x5 – 72x120	1164	9.7	1116	4.6
3x6 – 72x144	1392	11.6	1344	5.6
3x7 – 72x168	1632	13.6	1549	6.5
3x8 – 72x192	1860	15.5	1776	7.4
4x3 – 96x72	924	7.7	927	3.9
4x4 – 96x96	1236	10.3	1236	5.1
4x5 – 96x120	1548	12.9	1545	6.4
4x6 – 96x144	1848	15.4	1853	7.7

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Mechanical

Site Preparation

1. Level the upper wall clips. Refer to **Figure 1** and the contract-specific Shop Drawing for details. All upper wall clips must be plumb and level before hanging any sections.

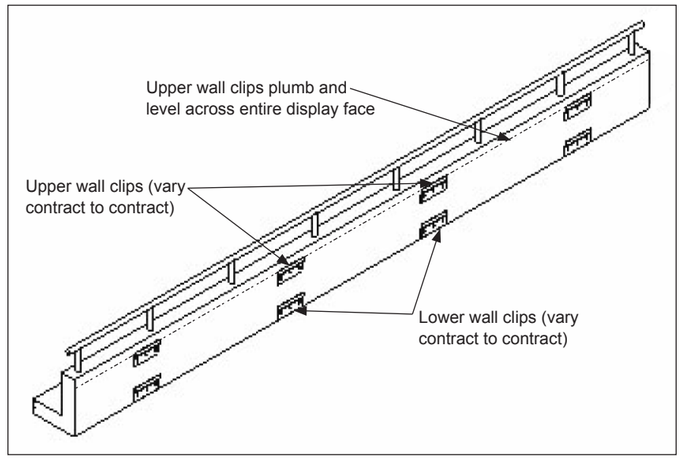

Figure 1: *Leveling Upper Wall Clips*

2. Verify the lower wall clips are installed per the contract-specific Shop Drawing if applicable. Refer to **Figure 1**.

Standard Section Installation

1. Use the included $^{5}/_{16}$" hex security bit (Daktronics part number TH-1170) to release the beverage shroud latches by rotating them counterclockwise.

2. Open the beverage shroud by rotating upward. Refer to **Figure 3**.

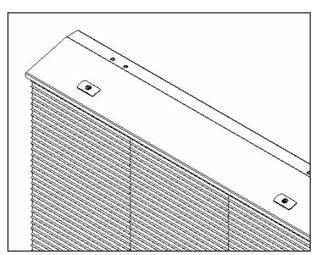

Figure 2: *Closed Beverage Shroud*

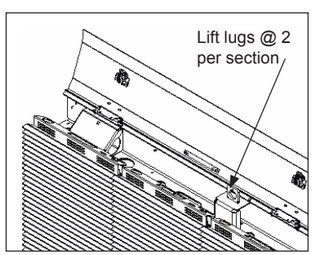

Figure 3: *Open Beverage Shroud*

3. Lift the display sections from the shipping crate using every lifting point provided. Refer to **Figure 4** and the **DD1944253** RTX Shipping Frame Instructions for details. The sections may tip forward when lifting. *Do not set the sections on the ground.*

Note: The lift lugs will be retracted into the sign and need to be lifted up before attaching a hook. Refer to **Figure 5**.

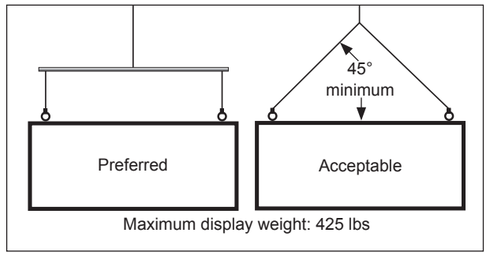

Figure 4: *Lifting Display*

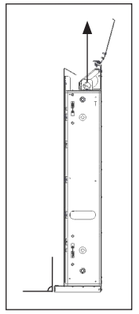

Figure 5: *Lift Angle*

4. Use the rear section clips to mount the display section to the wall. Refer to **Figure 6** and **Figure 7**. Ensure the section sits completely in the upper wall clips without the upper and lower wall clips extending past the end or edges of the rear section clips. If the rear section clips need to be moved (other than being adjusted up or down), contact Structural Engineering.

Note: The display must mount directly to a non-combustible surface.

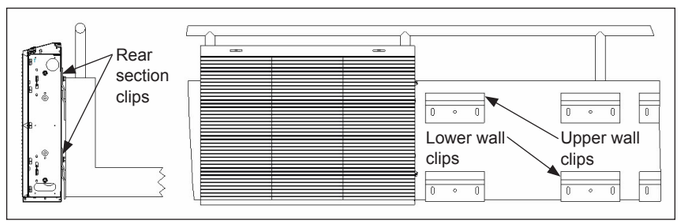

Figure 6: *Mounting Display to Wall*

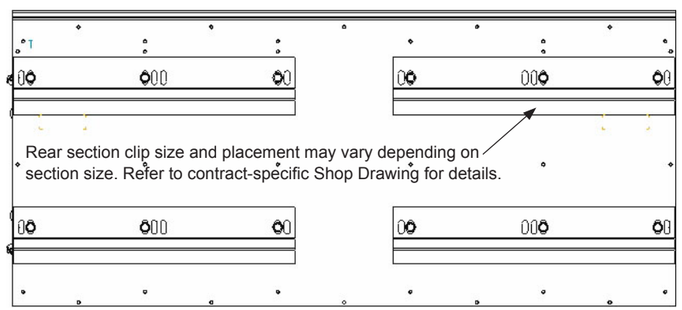

Figure 7: *Rear Section Clips*

5. Ensure the section is plumb, level, and parallel to the wall. The alignment of the first section is crucial, as it determines the alignment of the entire display. Refer to **Figure 8**.

Note: Release the lift lugs so they retract into the display before closing the beverage shroud.

6. Repeat Steps 1-5 to hang the next section. Ensure the sections are flush in all planes to the adjoining section.

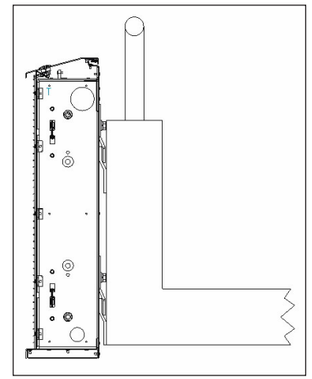

Figure 8: *Display Attached to Wall*

7. Remove the outermost modules or module pans of each section to access the interconnect latches. Refer to **Module** or **Module Pan** in **Service & Maintenance**. After aligning the sections, tighten the upper latch halfway by turning it clockwise. Refer to **Figure 9**. Align the bottom of the sections in the X and Z directions and fully tighten the lower latch by turning it counterclockwise. Fully tighten the top latch and ensure the seam is tight and the sections are vertically aligned; readjust as necessary. Refer to **Figure 10**.

Note: Section-to-section seam tolerance should be +/- 5% of the pixel pitch (e.g. pixel pitch = 20 mm, seam tolerance = +/- 1 mm or 0.040"). If the seam is out of tolerance, use the interconnect latches to tighten or loosen the seam within tolerance before attaching the next section.

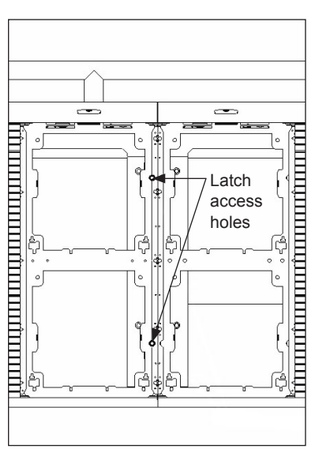

Figure 9: *Interconnecting Sections*

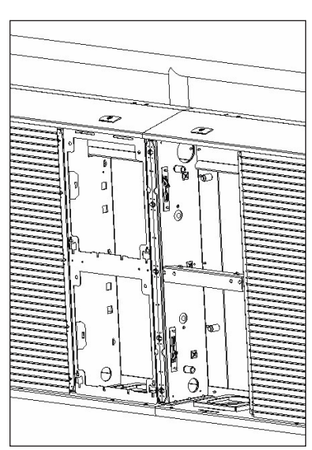

Figure 10: *Interconnecting Sections*

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8. Attach the borders as necessary. Refer to the contract-specific Shop Drawing for proper placement.

   Cap: Use a $^{5}/_{16}$" nutdriver (TH-1156) to secure the #10 self-tapping screws (HC-1554) at a quantity of six and attach the caps. Refer to **Figure 11** and **Figure 12**.

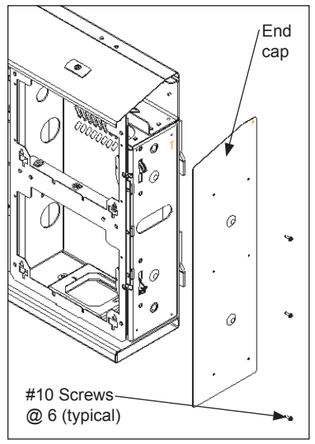

Figure 11: *Attaching End Cap*

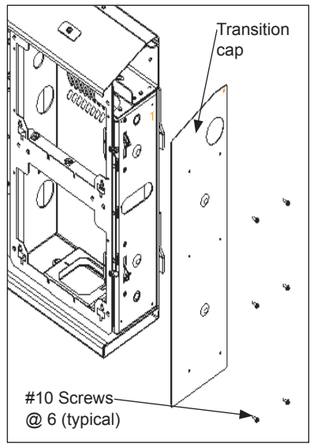

Figure 12: *Attaching Transition Cap*

   Flange border: Use a $^{5}/_{16}$" nutdriver (TH-1156) to secure the #10 self-tapping screws (HC-1554) at a quantity of six and attach the borders. Refer to **Figure 13**.

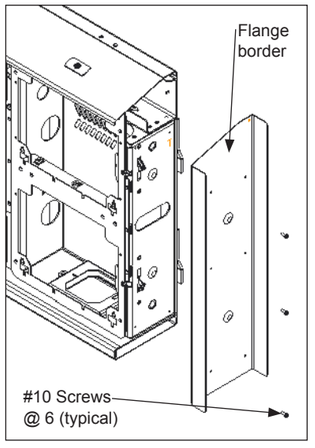

Figure 13: *Attaching Flange Border*

9. Attach the display to the lower wall clips with two TEK screws per section for uplift protection; module removal is necessary for attachment. Refer to the contract-specific Shop Drawing for the specific method of uplift protection.

10. Close the beverage shroud and secure with the beverage shroud latches using the included $^{5}/_{16}$" hex security bit (TH-1170).

Assembled Corner

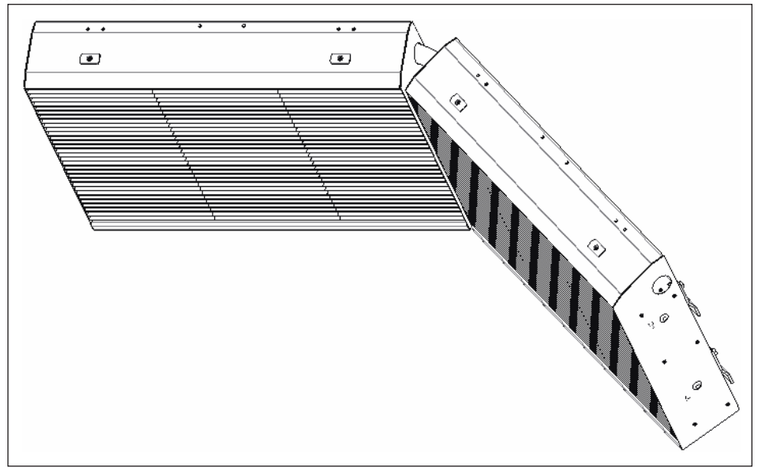

Figure 14: *Assembled Corner*

Corner or Gap Mounting

Corner and gap locations and details are noted on the contract-specific Shop Drawing.

Complete Steps 1-8 while referring to **Figure 15**.

1. Locate the transition caps with pass-through holes and use the supplied #10 self-tapping screws (Daktronics part number HC-1554) to attach them to the sections on either side of the gap.

2. Remove the 2" flexible conduit pieces (EC-1246) and plastic conduit clips (EC-1247) included in the far right bay of the section to the left of the gap.

3. Attach one plastic conduit clip at least 2" from one end of the conduit. Refer to **Figure 16**.

4. Insert the 2" flexible conduit pieces into the pass-through hole in the border, leaving at least 6" sticking out of the section.

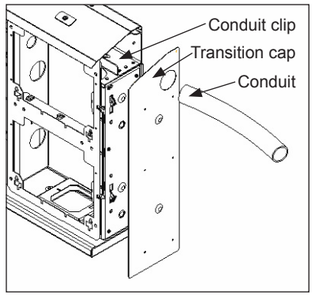

Figure 15: *Mounting Corner or Gap*

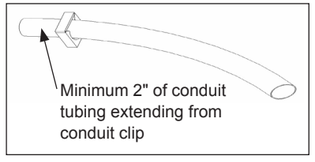

Figure 16: *Conduit & Clip*

5. Lift the second section close enough to the first section to begin pressing the flexible conduit through the second section's pass-through hole located in the border.

6. Repeat Steps 1-5 in **Standard Section Installation** to continue mounting the section.

7. Begin pressing the flexible conduit through the second section's pass-through hole when the second section is close enough.

8. Ensure at least 2" of conduit extends into both sections. Trim any excess conduit from the inside of the section. Refer to **Figure 16**.

Wing Section Installation

1. Open or remove the wing beverage shroud. Refer to **Figure 17**.

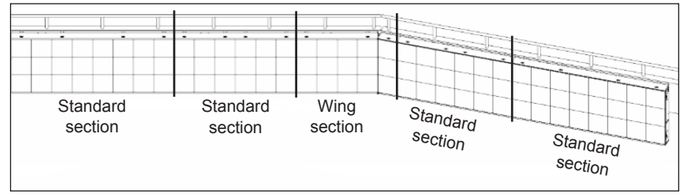

Figure 17: *Opening Wing Beverage Shroud*

2. Loosen the retainer nuts and screws from the upper and lower support brackets and release the latches holding the wing to the shell. Refer to **Figure 18** and **Figure 19**. The wing section is now free to rotate.

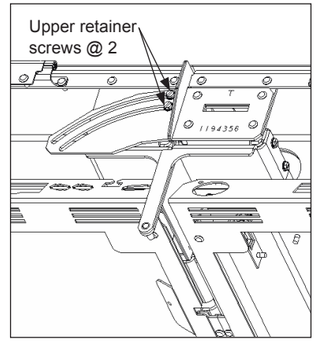

Figure 18: *Loosening Upper Retainer Hardware*

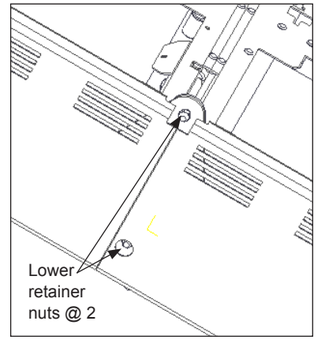

Figure 19: *Loosening Lower Retainer Hardware*

3. Set the wing at the necessary angle to engage the left and right sections. The hinge adds a gap (seim) between the module columns, which is necessary for top-access module removal via the module pan sliders. Refer to **Figure 20**.

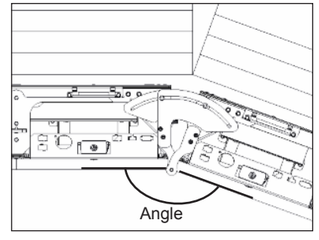

Figure 20: *Setting Wing at Appropriate Angle*

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4. Secure the retainer nuts and screws in the upper and lower support brackets into the left vertical of the wing to keep the wing from rotating. The torque required is 20 ft-lbs. Refer to **Figure 21** and **Figure 22**.

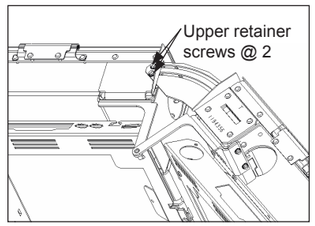


Figure 21: *Securing Upper Retainer Hardware*

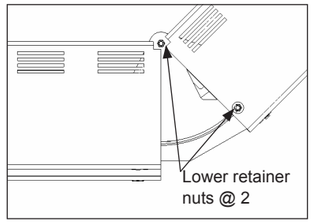


Figure 22: *Securing Lower Retainer Hardware*

5. Remove the TEK screws securing the top hinge into place and remove the top hinge. This needs to be removed to allow the beverage shrouds to close completely and the module pans to slide out. Refer to **Figure 23** and **Figure 24**.

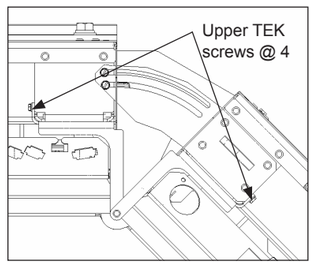


Figure 23: *Removing Top Hinge*

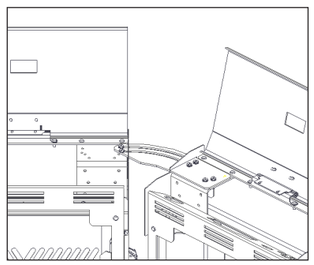


Figure 24: *Top Hinge Removed*

Electrical

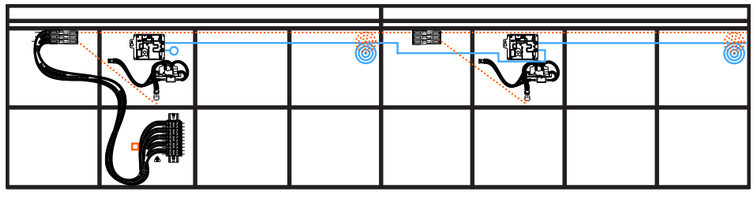
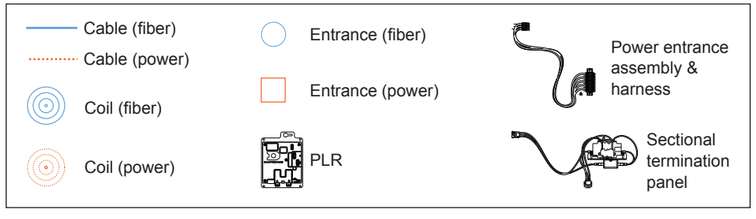


Figure 25: *Signal Routing (Front View)*



The fiber, SATA, and power connections shown in this guide serve as an example only. Refer to the contract-specific Config Drawing and System Riser Diagram for specific routing information.

To bring power to the display, follow the steps below:

1. Ensure power to the display is off.

2. Route the power cable through conduit to the termination panels inside the display at the sections specified on the contract-specific System Riser Diagram. Refer to **Drawing B-3086200**, **Drawing B-3092171**, and **Figure 26**.

Figure 26: *Bus Harness Connection*

3. Route the coiled power cables from section to section, connecting to the bus harness in the next section. Refer to **Figure 27**.

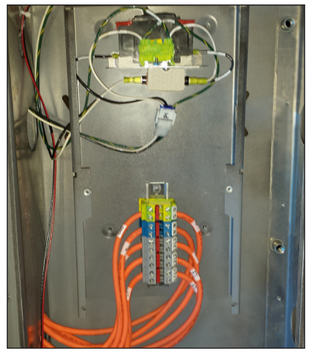


Figure 27: *Termination Panel*

To bring signal to the display, follow the steps below:

1. Route the SATA cables from section to section and connect to the module input. Refer to **Drawing B-3080013**, **Figure 28**, and **Figure 29**.

Figure 28: *SATA Cable*

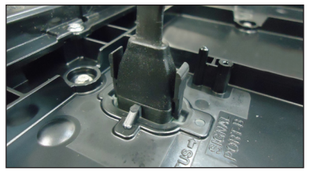


Figure 29: *SATA Connection*

2. Route the fiber cable through conduit to the fiber patch panel inside the display at the sections specified on the contract-specific System Riser Diagram. Refer to **Drawing B-3076504**, **Drawing B-3092171**, **Figure 30**, and **Figure 31**.

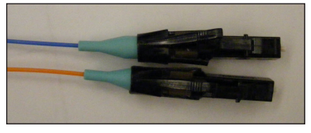


Figure 30: *Fiber Cable*

Figure 31: *Fiber Patch Panel*

3. Route the coiled fiber cables to the next section, connecting at the fiber patch panel or PLR. Refer to **Drawing B-3076504**, **Figure 31**, and **Figure 32**.

Figure 32: *PLR Connections*

Service & Maintenance

Module

RTX-11X1

To remove an RTX-11X1 module from a display, follow the steps below:

1. Disconnect power to the display.

2. Access the module.

   Front access: Use a $^{1}/_{8}$" Allen wrench (Daktronics part number TH-1172) to turn the top and bottom latch release a $^{1}/_{4}$ turn counterclockwise (front access). Refer to **Figure 33**.

   Top access: Remove the module pan. Refer to **Module Pan**.

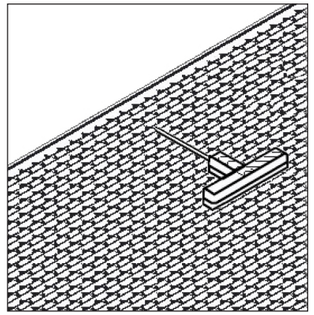


Figure 33: *Latch Release*

   Pull the module from the display just far enough to reach around to the back of the unit. Refer to **Figure 34**. Attach one end of a safety lanyard to the rings on either the top or bottom of the module and the other end to a secure location within the display to prevent the module from falling if dropped.

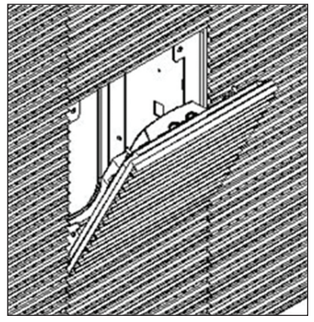


Figure 34: *Front-Access Angle*

3. Disconnect the power and signal cables from the rear of the module.

Reverse these steps to install an RTX-11X1 module in a display.

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RTX-1801

To remove an RTX-1801 module from a display, follow the steps below:

1. Disconnect power to the display.

2. Access the module.

   Front access: Position the module access tool (Daktronics part number TH-1212) so the arrows on the handle point up. Use slight thumb pressure to insert the tool into the module until it clicks. Refer to **Figure 35** and **Figure 36**.

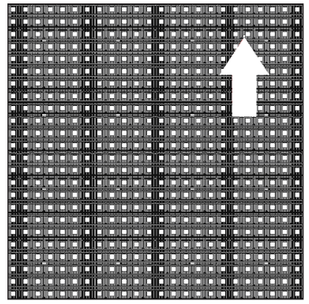

Figure 35: *Module Latch*

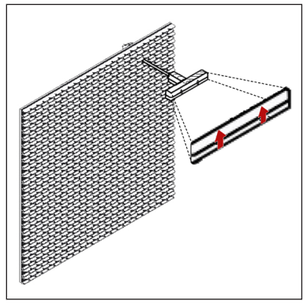

Figure 36: *Using Module Tool*

   Top access: Remove the module pan. Refer to **Module Pan** for instructions.

3. Pull on the handle to remove the module from the display just far enough to reach around to the back of the unit. Turn the access tool so the arrows on the handle point up and remove it from the module.

   Note: When performing this step, take care not to damage the louvers by tilting the module at too much of an angle. Refer to **Figure 37**.

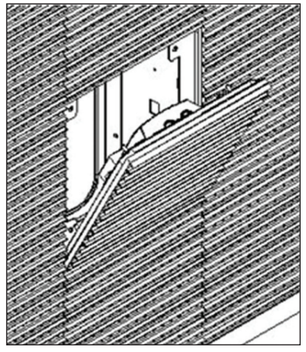

Figure 37: *Front-Access Angle*

4. Attach one end of a safety lanyard to the rings on the top of the module and the other end to a secure location within the display to prevent the module from falling if dropped.

5. Disconnect the power and signal cables from the rear of the module.

Reverse these steps to install an RTX-1801 module in a display.

Module Pan

Pay special attention to the following instructions to avoid damaging any connectors or components.

To remove a module pan from a top-access display, follow the steps below:

1. Disconnect power to the display.

2. Use a $^{5}/_{16}$" hex security bit (Daktronics part number TH-1170) to release the beverage shroud security latches. The beverage shroud may be left on in a flipped-up position or removed by rotating it up and unhooking the spring-loaded hinge pins. Refer to **Figure 38** and **Figure 39**.

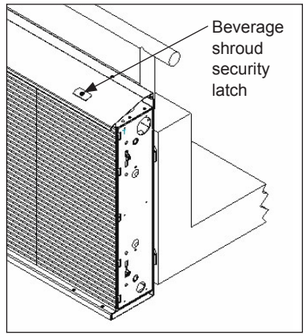

Figure 38: *Accessing Beverage Shroud*

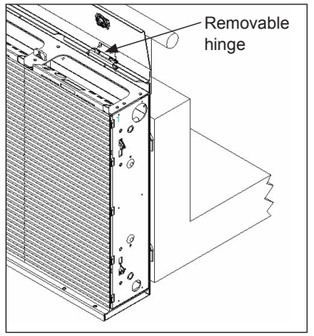

Figure 39: *Accessing Beverage Shroud*

3. Clip one end of the module pan safety lanyard to the closest lift lug in the top perimeter and the other end into the handle of the module pan in need of service. Refer to **Figure 40** and **Figure 41**.

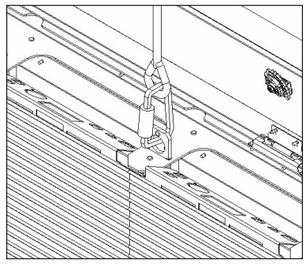

Figure 40: *Lift Lug*

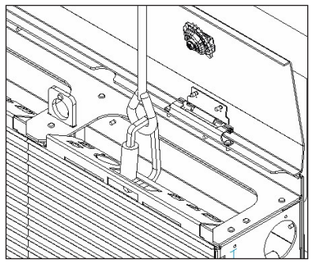

Figure 41: *Module Pan Handle*

4. Unplug the cables from the top of the module pan after the lanyard is properly attached.

   Disconnect all SATA and power cables from the top of the module pan handle. If there is a PLR in the column, remove the power cable from the module pan handle. Refer to **Figure 42** and **Figure 43**.

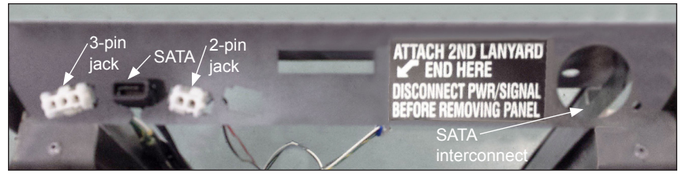

Figure 42: *Disconnected Cables*

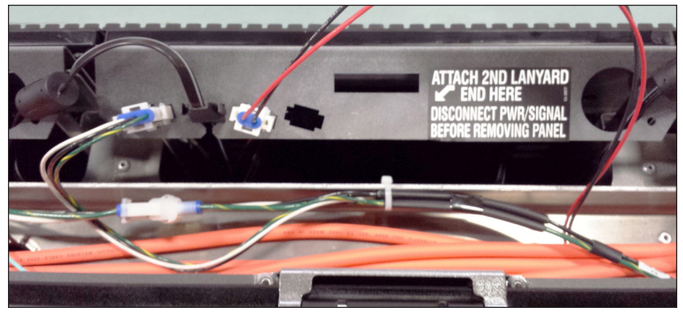

Figure 43: *Connected Cables*

5. Ensure all cables are unplugged and then raise the module pan carefully until free of the track and over the rail into a safe position. The module pan should now be ready for servicing, and the lanyard may be unhooked. Refer to **Figure 44**.

   Note: Cables may get snagged on internal components when the module pan is removed or inserted. If this occurs, be sure to free the cables of all obstructions before continuing to remove or insert the module pan.

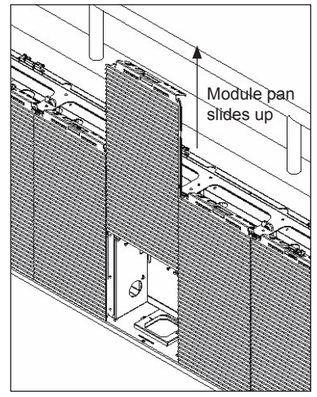

Figure 44: *Removing Module Pan*

Component Locations

- **Fiber patch panel:** second column from left (front view)
- **Module:** face of display
- **PLR:** under beverage shroud
- **Power entrance:** second column from left (front view)
- **Power supply:** on module
- **Termination panel:** second column from left (front view)

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This document outlines materials and methods used in cleaning Daktronics LED matrix displays. The procedures apply to all LED matrix screens, including Galaxy®, HD-X, ProAd®, ProStar®, DVX, RTX, DBN, DVN, RTN, DB-4xxx, and GalaxyPro® displays.

Wet Outdoor Cleaning Method

Do not use on indoor displays.

Cleaning Supplies

- Five-gallon bucket
- Car wash concentrate

  Do not use a wash and wax. The following are acceptable choices:

  - Armor All® Natural Car Wash
  - Rain-X® High Foaming Car Wash Concentrate
- Soft automotive washing bristle brush: a telescoping handle four-feet to eight-feet long with a soft-to-medium brush head 10-inches wide. A brush with four-inch-thick bristles that are light to medium in rigidity is a must.

  Do not use deck brushes. They are too abrasive and will damage the LEDs and louvers. The following are acceptable choices:

  - Wal-Mart® brush (Detailer's Choice® Flow-Thru Brush)
  - Do-It Best Center brush (60-inch Tele Flow-Thru Brush)
  - Unger® brush (Flow-Thru Washer #91030)
  - Rubbermaid® vehicle-washing brush (X718-18)
- Several soft terry cloth towels
- Cold water (municipal, potable tap water)

  Do not use the following:

  - Car wash and wax concentrate (wax leaves residue on LEDs)
  - Stiff deck brush (bristles damage LEDs and louvers)
  - Spotting agent rinse (chemicals leave residue on LEDs)
  - Power washer (high pressure damages LEDs and louvers)

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Cleaning Process

1. Turn off the power to the LED matrix display.

2. Mix the mild detergent and cold water in the five-gallon bucket, one ounce of detergent to one gallon of cold water.

3. Dip the brush in the bucket of soapy water.

   Work from top to bottom safely within reach from a lift or a stage. Take care not to damage LEDs or the plastic louvers by catching the cloth on them.

4. Use horizontal brush strokes to loosen and remove dirt and grime, washing the display from top to bottom in vertical columns. Use light pressure so as not to damage the LEDs. Clean only an area that is safely within reach from a lift or stage, and then move on to the next section of modules.

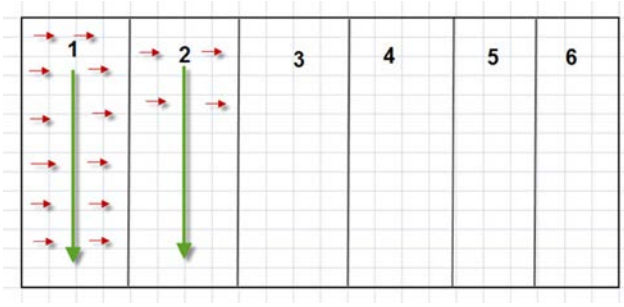

Figure 1: *Display Washing Direction for Modules*

5. Rinse the display face with generous amounts of cold water under low pressure before the soapy water dries. Soap may dry on the display faster or slower depending on weather conditions.

   It is important to flush the excess soap residue off of the display face using low water pressure.

6. Use a soft, dry terry cloth to dry and remove any excess water. Take care not to damage LEDs by catching the cloth on them. Allow the display to completely air-dry for 12 hours before applying power to the display.

7. Dispose of any leftover soapy water in a manner that is environmentally safe.

Dry Outdoor Cleaning Method

Cleaning Supplies

Several soft terry cloth towels

Cleaning Process

1. Rub a dry, soft, terry cloth towel horizontally across each row of LEDs.

2. Make four passes per row of LEDs before moving to the next row of LEDs.

   Work from top to bottom safely within reach from a lift or a stage. Take care not to damage LEDs or the plastic louvers by catching the cloth on them.

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Indoor Cleaning Method (Dry Cleaning)

Cleaning Supplies

Do not use chemicals or solvents.

Automotive dusting brush or other dusting type cloth/mop.

If a rag is used, it must be ESD compliant. The following are examples of dusting type brushes, cloths or mops:

- California Car Duster® dust mop
- Swiffer® cloth
- Pledge Grab-It® dry cloths
- Multi-surface duster

Cleaning Process

1. Wipe LED matrix display face horizontally with duster using light pressure to prevent LED damage. Several passes may be needed to remove all dust and grime.
2. Shake out or replace the duster as needed to maintain effectiveness. Horizontal strokes remove the dirt best by following the path of the LEDs.

4i Cleaning Procedure after Installation

This procedure ONLY applies to 4i Module.

Module masks can accumulate grime and grease during installation, which can greatly reduce image quality. To ensure premium performance, follow the steps under **Cleaning Process** in this section.

Cleaning Supplies

- 70% alcohol isopropyl rubbing alcohol (**Figure 2**)
- High-performance microfiber cloth (**Figure 3**)

Figure 2: *Alcohol*

Figure 3: *Microfiber Cloth*

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Cleaning Process

1. Turn off the power to the LED matrix display.

2. Pour isopropyl rubbing alcohol into a squirt bottle.

3. Squirt microfiber cloth twice to moisten. Refer to **Figure 4**.

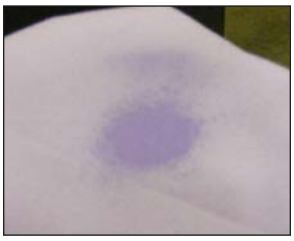

Figure 4: *Moistened Cloth*

4. Apply even pressure with two or three fingers on module and wipe module in an up and down motion covering about one-inch of width with each wipe. Refer to **Figure 5**.

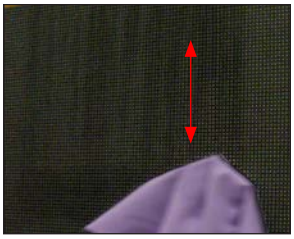

Figure 5: *Up & Down*

5. Repeat **Steps 2** & **3** but wipe in a left and right motion. Refer to **Figure 6**.

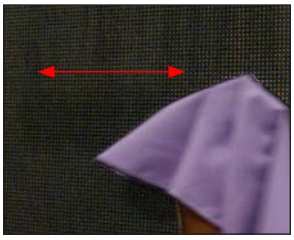

Figure 6: *Left & Right*

6. Examine display and touch up areas as needed. Refer to **Figure 7**.

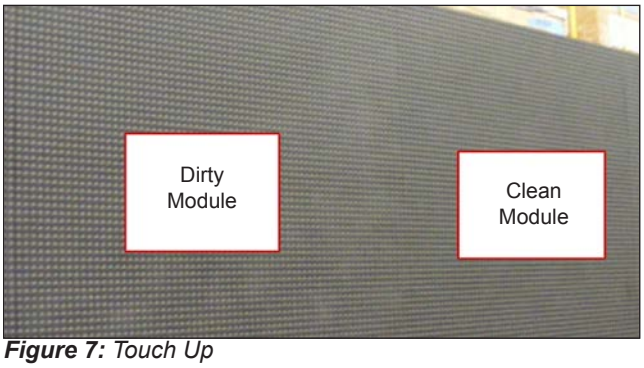

Figure 7: *Touch Up*

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Appendix 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") 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. 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; 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. 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; 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;

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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 Equipement 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

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.

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.

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

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

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.

6. Availability of Extended Service Agreement

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).

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