DVX-1100/1500/1800 Gen 1 Series

DAKT-0204-01

Display Manual

DD2513392

Rev 1—19 June 2015

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

201 Daktronics Drive PO Box 5128 Brookings, SD 57006
tel 800-325-8766 fax 605-697-4700
www.daktronics.com

DAKTRONICS

DD2513392
Products 1730 & 1760
Rev 1—19 June 2015

DAKTRONICS

Table of Contents

Section 1: How to Use This Manual 1

1.1 Resources 1
1.2 Numbering Conventions 1
Module Number 1
Part Number 2
Model Number 2
1.3 Important Safeguards 2

Section 2: Mechanical Installation 3

2.1 Support Structure Selection & Design 3
2.2 Border Type Confirmation 4
2.3 Display or Display Section Lifting 5
Display Lifting without Spreader Beam (Standard Method) 5
Display Lifting with Spreader Beam (Alternate Method: Lifting More Than 1400 Pounds) 5
Weight Approximations 5
2.4 Display Mounting 6
Display Section Basics 7
Recommended Section Installation Sequence for Matrix Displays 11
Installation 13
Preparation for Installation of First Section 13
Center Adjustment 16

Section 3: Electrical Installation 17

3.1 Power Summary 17
3.2 Signal Summary 17
3.3 Common Connectors 18
Fiber-Optic Connector 18
Water-Tight SATA Cable Connector 19
3.4 Control Cable 19
3.5 Display Power 19
Grounding 19
Power Installation 20
Main Disconnect 20
Power Termination at the Termination Panel(s) 20
3.6 Display Wiring 20
Power 20
Signal 21
3.7 Display Continuity Check 21
3.8 Display Power Up 21
3.9 DVX-1100/1800 Optional Power Redundancy 22
Testing 22
3.10 Signal Redundancy 22
Standard Module Redundancy 23
Optional Full-Data Redundancy 23
Full-Data Redundancy Testing 23
3.11 DVX-1100/1800 with Embedded Controller 24
System Startup 24
Network & Communication Installation 25

3.12 DVX-1100/1800 with Embedded Controller Light Sensor Mounting 29
3.13 Optional Temperature Sensor Mounting 29

Section 4: Maintenance & Troubleshooting 31

4.1 Recommended Tools 31
4.2 Display Access 31
4.3 Display Components 32
ProLink Router 32
Video Image Processor 32
Line Filter 33
Power Supply 33
4.4 Service & Diagnostics 33
DVX-1100/1500 34
DVX-1800 35
Rear-Access 36
4.5 Module 36
DVX-1100/1500 36
DVX-1800 37
4.6 Ventilation Systems 39
Ventilation Maintenance 39
Filter Maintenance (If Applicable) 39
4.7 Structural Inspection 40
4.8 Troubleshooting 40

Section 5: Replacement Parts 43

5.1 Replacement Parts List 43
5.2 Daktronics Exchange and Repair & Return Programs 43
Exchange Program 43
Before Contacting Daktronics 43
Repair & Return Program 44
Shipping Address 45
5.3 Daktronics Warranty & Limitation of Liability 45

Glossary 47

Appendix A: Drawings 49

Appendix B: Supplementary Documents 51

Appendix C: Daktronics Warranty & Limitation of Liability 53

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-1118677**.

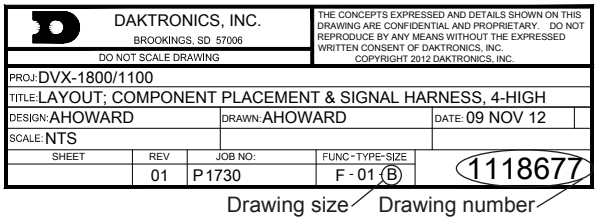


***Figure 1:** Drawing Label*

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

"Refer to **Drawing B-1118677** in **Appendix A** for the locations of internal display components."

In addition, any drawings referenced within a particular section are listed at the beginning of that section. Drawings may be referenced by title or by title and drawing number as seen in the following example:

Reference Document:
Layout; Component Placement & Signal Harness, 4-High .....**Drawing B-1118677**

Daktronics identifies manuals by the DD number located on the cover page of each manual. For example, this manual would be referred to as **DD2513392**.

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

Module Number

Figure 2 explains the module labeling method in more detail, and **Figure 3** illustrates how Daktronics numbers modules on a video display.

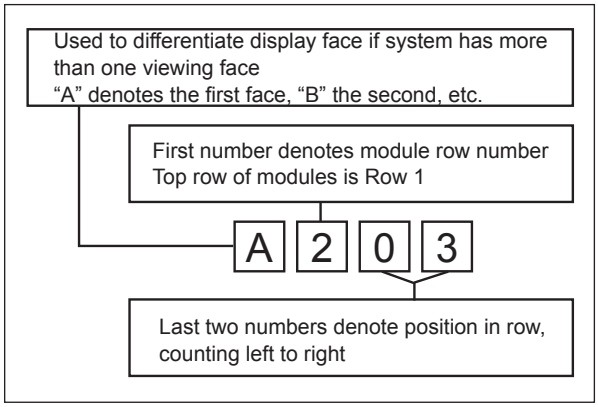


***Figure 2:** Module Numbering Breakdown*

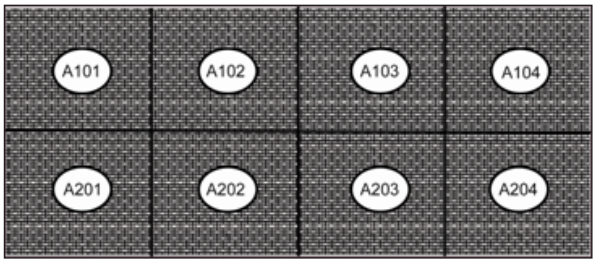


***Figure 3:** Module Numbering*

Part Number

Most display components within this video display carry a white label that lists the part number. The component part number uses the following format: 0A-XXXX-XXXX (multi-component assembly) or 0P-XXXX-XXXX (circuit board). **Section 5.2** contains the Daktronics Exchange Policy as well as the Repair & Return Program. Refer to these instructions if any display components need replacing or repairing. If a circuit board or assembly is not found in the replacement parts list in **Section 5.1**, use the label to order a replacement. **Figure 4** illustrates a typical label. The part number is in bold.

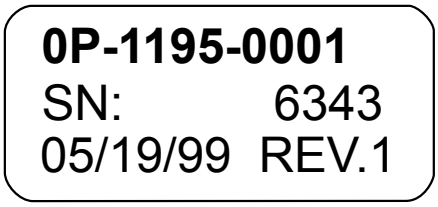


Figure 4: *Typical Label*

Part Type	Part Example	Part Number
Assembly	Display interface board and the plate or bracket to which it mounts	0A-XXXX-XXXX
Individual display interface board	ProLink router (PLR)	0P-XXXX-XXXX
Wire or cable	SATA cable	W-XXXX

Model Number

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

DVX-1100/1500/1800-15MN-HHHxWWW		
DVX	=	Product series
1100/1500/1800	=	Product generation
15MN	=	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

Daktronics engineering staff must approve any changes that may affect the protective integrity of the display enclosure. This includes, but is not limited to, the border shrouding, back sheets, ventilation, and filler panels. If *any* modifications are made to the protective integrity of the display enclosure, detailed drawings of the changes *must* be submitted to Daktronics engineering staff for evaluation and approval, or the warranty will be null and void.

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 Support Structure Selection & Design

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

The deflection/curvature of the members directly behind the display must be limited to prevent structural damage to the cabinets and to ensure the image on the display is not affected. Only the members that will force the display to deform need to be taken into account. The deflection limits are as follows:

- The deflection limit for long-term loading is the span length (in inches) of the structure divided by 400 for both in-plane and out-plane deflection. Examples of long-term loading include dead loads, live loads expected while operating the display, etc.

  Note: Long-term deflection in place before the display face is installed does not need to be considered.

- The deflection limit for short-term loading is the span length (in inches) of the structure divided by 400 for in-plane deflection and the length (in inches) divided by 240 for out-plane deflection. Examples of short-term loading include wind, seismic activity, live loads expected while servicing the display, etc.

Refer to **Figure 5** and **Figure 6** for details. Daktronics is not responsible for display mounting decisions made by others.

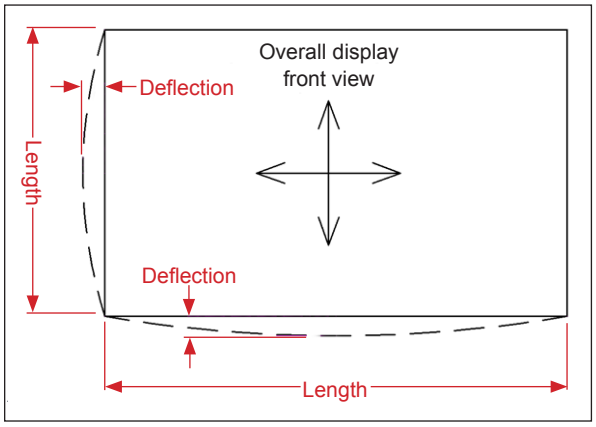


Figure 5: *In-Plane Deflection*

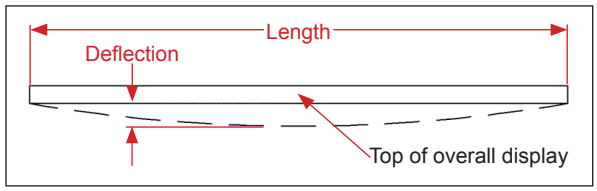


Figure 6: *Out-Plane Deflection*

2.2 Border Type Confirmation

Reference Documents:

DVX-1100/1500/1800 Series Border Installation Guide **DD2540426**
Config Drawing ..... **Contract-Specific**

On most displays, Daktronics provides some form of border around the display face. These borders are typically painted metal pieces that will attach to their appropriate display sections to enclose the active area of the finished display. Prior to picking any sections, it is important to determine the border style for the finished display.

While each site is unique, Daktronics typically provides two standardized border designs that attach to the display sections: flange borders and clean-look borders. Flange borders provide a main front flange to enclose the active area. This flange may be the only finish the customer requires, or it can provide a location for subcontractors to mechanically fasten extra flashing on-site. Clean-look borders are typically installed when an architect specifies that the sides of the display need to be clean in appearance and aesthetically pleasing with no extra work done on-site. These borders hide any mechanical fasteners from the front, sides, and bottom of the display. **Figure 7** shows the difference in appearance between the standard flange and clean-look borders.

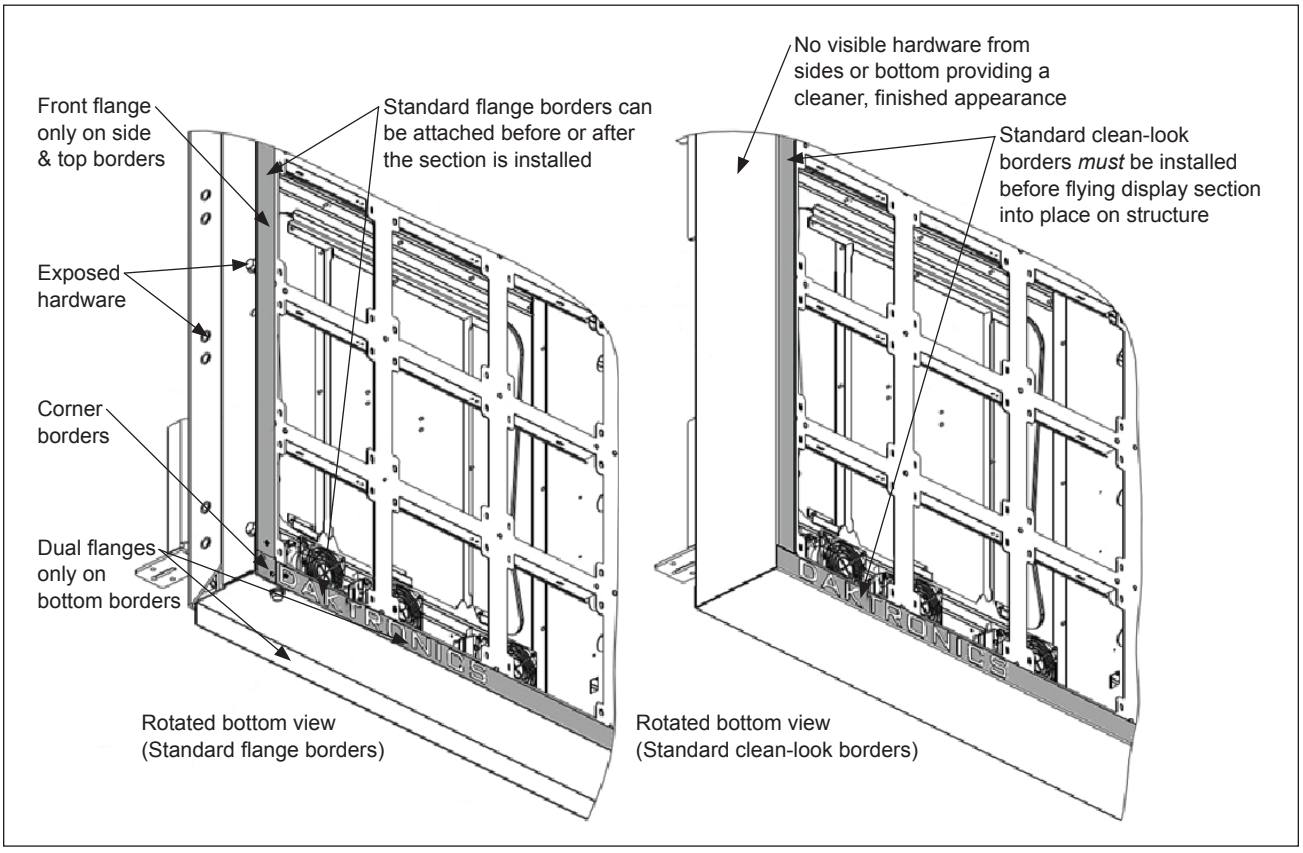


Figure 7: *Standard Flange & Clean-Look Border Differences*

For domestic contracts, standard flange borders may arrive factory-installed on crated display sections as noted on the contract-specific Config Drawing. For international contracts, borders will be shipped in a separate crate. Daktronics recommends that flange borders be attached prior to installing display sections; however, if the installation subcontractor feels it would be easier to install loose flange borders after the entire display is hung, that option is available. If the borders are loose, refer to the contract-specific Config Drawing to determine which borders belong to each section.

Clean-look borders will not arrive on-site attached to their appropriate display sections. *It is critical that the clean-look borders be installed to each section prior to flying that display section into place.* Due to interference issues, they cannot be fully installed when the display has been installed on the structure. Refer to the contract-specific Config Drawing to determine which border parts belong to each section.

Refer to the **DD2540426** DVX-1100/1500/1800 Series Border Installation Guide for instructions.

2.3 Display or Display Section Lifting

Lift points are incorporated into the top of each section. Take care not to exceed the rated load of the lift points.

Figure 8 illustrates both the standard and the alternate method of lifting a display or display section. It is recommended that displays be lifted with a spreader beam using every lift point provided; alternate arrangements can be made using **Figure 8** as a guide. Do not attempt to lift the display when the lift angle is less than 45 degrees, as this may damage the display.

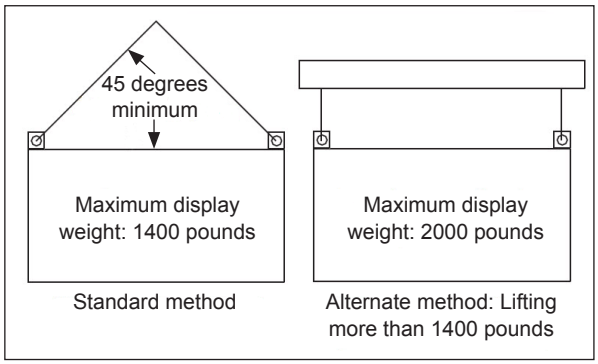


Figure 8: *Display Lifting*

Display Lifting without Spreader Beam (Standard Method)

Displays may be lifted without a spreader beam if they do not exceed the line angle and maximum capacity limits. Lines must be attached to the lifting lugs provided in the attached full-height support tubes by a clevis. Refer to the first image in **Figure 8**. *Lifting from eyebolts is not acceptable, as it will damage the cabinets.* Eyebolts may be installed in $^{1}/_{2}$-inch nutsert locations in display section sides for attaching tag lines.

Display Lifting with Spreader Beam (Alternate Method: Lifting More Than 1400 Pounds)

The highest capacity lifting configuration uses a spreader beam attached to the lifting lugs provided in the full-height aluminum tubes. *Larger display sections may be lifted in this configuration if they do not exceed the maximum capacity limit.* The shipping crate weight must be included. Adjacent sections may be lifted simultaneously if the spreader beam provides attachment points for all available lifting lugs. Refer to the second image in **Figure 8**. Eyebolts may be installed in $^{1}/_{2}$-inch nutsert locations in display section sides for attaching tag lines.

Weight Approximations

The table below lists the weight approximations of the standard cabinet sizes.

Section Size (Modules)	Section Weight (Pounds)		
	DVX-1100	DVX-1500	DVX-1800
3x3	140	140	157
3x4	186	———————	210
3x5	233		262
3x6	279		314
4x3	186		210
4x4	248		279

Section Size (Modules)	Section Weight (Pounds)		
	DVX-1100	DVX-1500	DVX-1800
4x5	310		349
4x6	372		419
5x3	233		262
5x4	310		349
5x5	388		437
5x6	465		524
6x3	279		314
6x4	372		419
6x5	465	———————	524
6x6	558		628
7x3	326		367
7x4	434		489
7x5	543		611
7x6	651		733
8x3	372		419
8x4	496		559
8x5	620		698
8x6	744		838

2.4 Display Mounting

Reference Documents:

Structural Self-Drilling Screws Installation Guide **DD1723952**
DVX-1100/1500/1800 Series Seam Measurement Field Instructions **DD2492555**
DVX-1100/1500/1800 Series Shipping Frame Field Instructions **DD2513403**
DVX-1100/1500/1800 Series Cabinet Alignment Guide **DD2545000**
DVX-1100/1500/1800 Series Go/No-Go Gauge Application Guide **DD2570803**
Shop Drawing ..... **Contract-Specific**

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 on pages 8 through 11 before proceeding with the installation steps on page 11.

Display Section Basics

Figure 9 and **Figure 10** show the basic features around a typical DVX display section. **Figure 9** shows a single cabinet section, and **Figure 10** shows a vertical pair section.

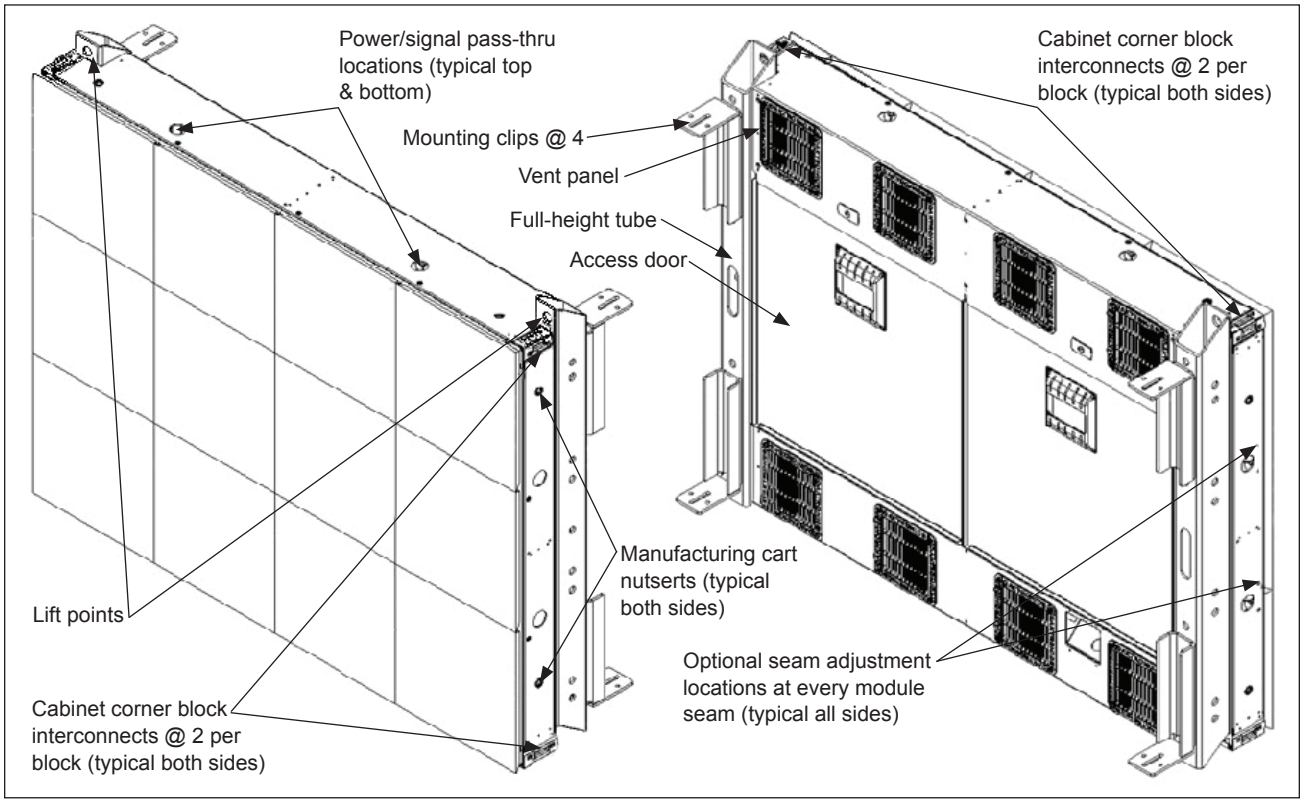


Figure 9: *Typical Single Cabinet Section*

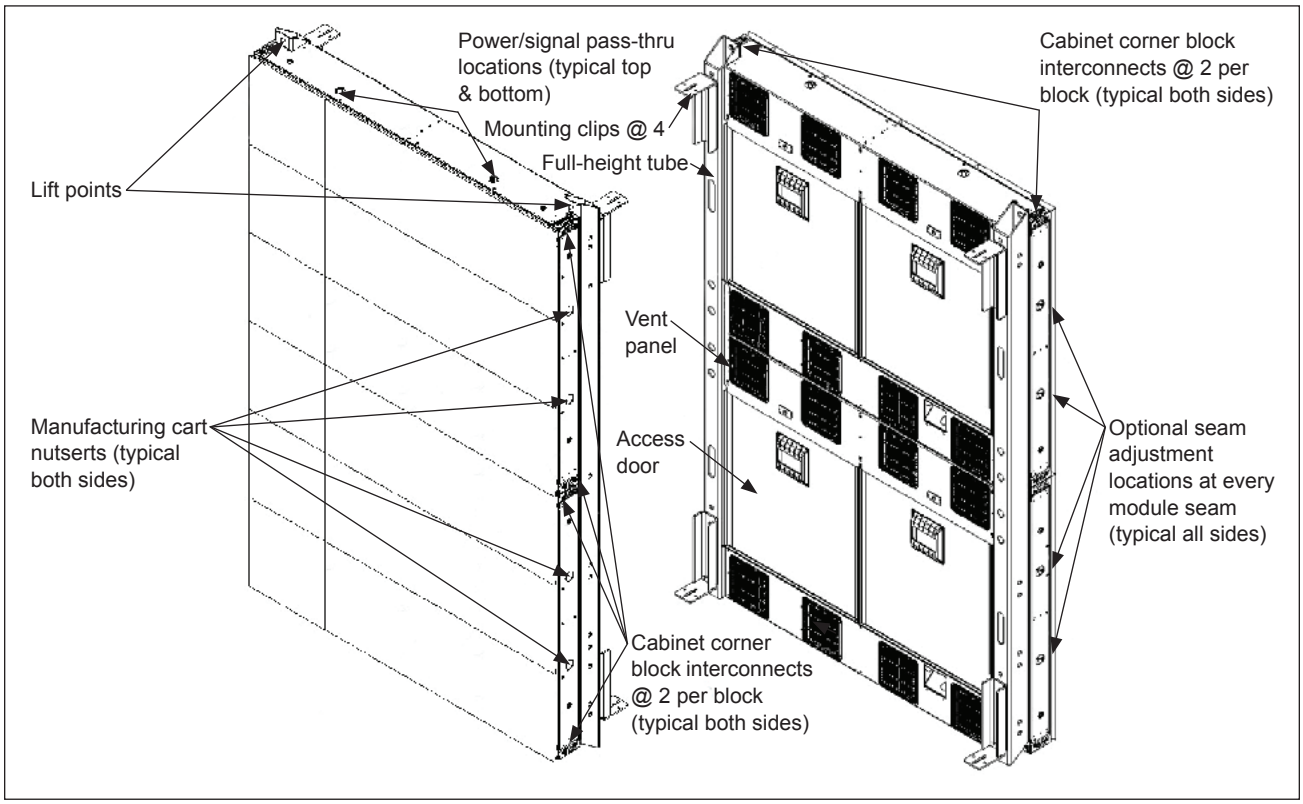


Figure 10: *Typical Vertical Pair Section*

Figure 11 shows the basics of cabinet ventilation. Take note later in this section about the ventilation requirements and the minimum distance required from the vent panels to the stringer faces. Blocked vent panels may result in the display overheating, causing display failure.

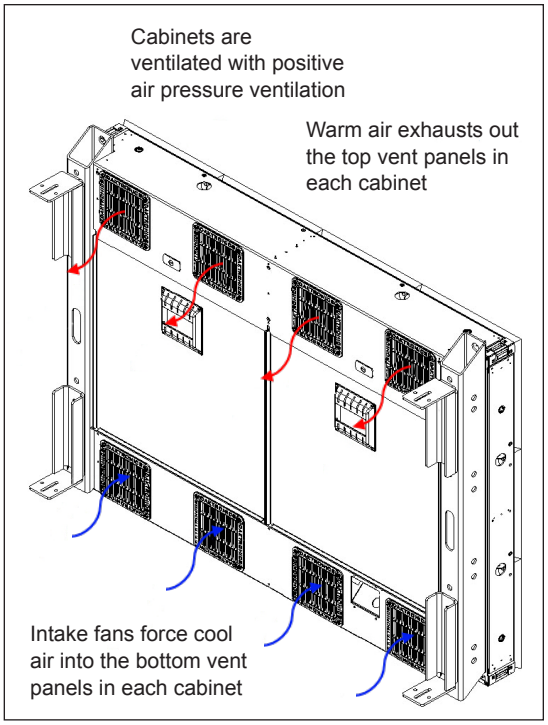


Figure 11: *Ventilation Basics*

Before beginning the installation process, verify the following:

- Verify the mounting structure is square. Refer to **Figure 12** and measure from the top corner of the top stringer to the opposite bottom corner of the bottom stringer, then repeat this process on the two remaining corners. Compare both measurements. If they differ by more than $^{1}/_{4}$ inch, contact the project manager or mechanical systems engineer.

- Verify the stringer height is accurate based on the contract-specific Shop Drawing. Refer to **Figure 13** and measure from the top of steel (TOS) of each stringer to the TOS for each level. Always measure from the lowest stringer at each column location. Stringer spacing should not vary by more than $\pm^{1}/_{2}$ inch across the width of the stringers. If either of these variations is encountered, contact the project manager or mechanical systems engineer.

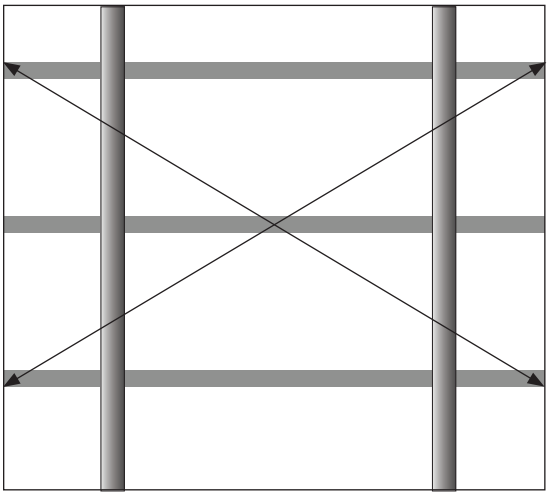


Figure 12: *Verifying Mounting Structure*

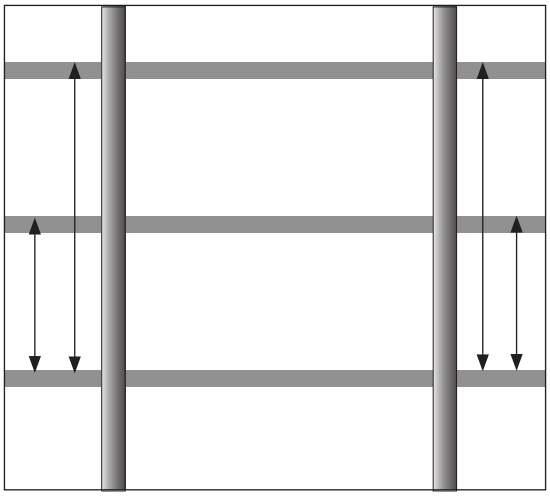


Figure 13: *Verifying Stringer Height*

- Verify the plumbness of the stringer faces. Place a plumb bob against the front of the top stringer and drop the plumb bob down to the bottom stringer, measuring left to right down the length of each stringer and the middle. When installing sections, leave enough room between the full-height tubes and the mounting structure to account for any variation in plumbness. Refer to **Figure 14** and **Figure 15** when it is time to hang the sections.

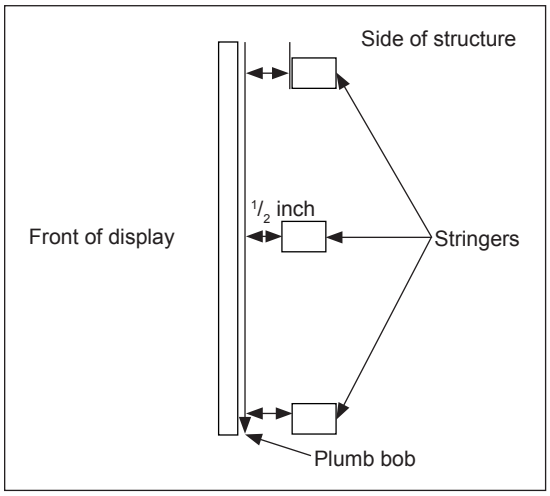


Figure 14: *Verifying Stringer Faces*

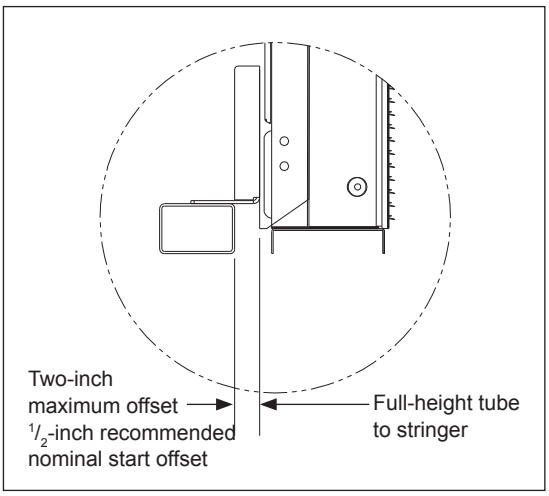


Figure 15: *Cabinet-to-Stringer Offset*

A $^1/_2$-inch minimum gap from the rear of the display's full-height tubes to the stringer farthest out of tolerance to the display side is recommended. Contact the project manager or mechanical systems engineer if a variation of more than $^1/_2$ inch in plumbness in stringers is encountered.

A two-inch maximum gap from the display rear to the stringer farthest away from the display side is permitted.

A one-inch minimum clearance behind the vent panels is required if both the intake and exhaust panels are covered by the stringer face.

- Verify the width of the structure. Refer to **Figure 16** and measure the length of each stringer. This also helps locate the center point of the structure, serving as a reference for where to install the first cabinet.

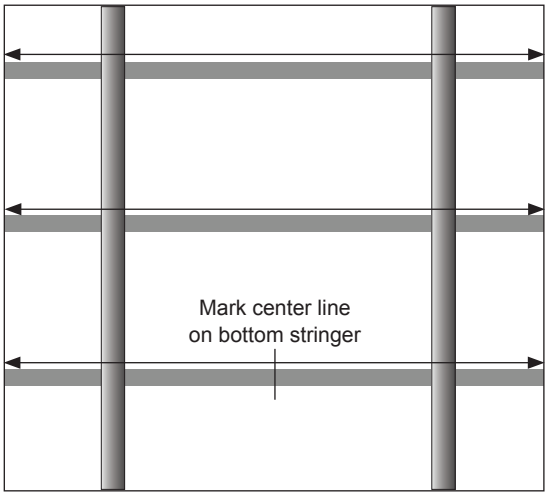


Figure 16: *Verifying Structure Width*

- Verify the stringer is straight. Refer to **Figure 17** and use a string line.

Use a tape measure to measure back the same distance from the front of the stringer on both ends of the bottom stringer and mark those spots. Stretch a string line between the two marks and in 10-foot intervals along the span of the stringer and measure from the front of the stringer to this string line.

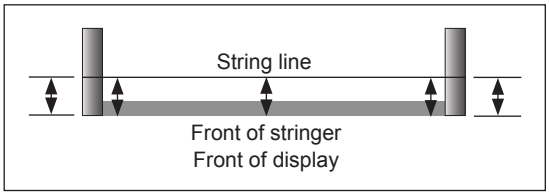


Figure 17: *Verifying Stringer*

This also helps set the bottom row of the display by measuring from the front of the stringer back to the string line and figuring out the variances needed in the clips across the stringers.

If the variance is greater than $\pm^1/_2$ inch, contact the project manager or mechanical systems engineer.

While installing, keep these critical points in mind:

- Ensure the sign installer and the structural engineer designing the sign structure determine the clips supporting the weight per the design of the structure as well as the installation method. Daktronics mounting clips are designed to support each individual sign section weight by either the top or bottom mounting clips (two clips total).

- Do not set the display sections directly on the ground if the display ships in sections that must be removed from the trailer or crates before installation. Place them on spacers at least two inches high and not directly under the module to prevent module damage. Place supports every four to six feet. Refer to the **DD2513403** DVX-1100/1500/1800 Series Shipping Frame Instructions.

- Ensure the sections' bottom mounting angles and stabilizing blocks have been disconnected from the bottom of the crate when removing display sections from wooden crates prior to lifting. Once lifted, remove the countersunk bolt to remove the stabilizing blocks (where attached).

- Wipe any dust or debris off the top of the cabinet sections before lifting the display. This helps with water sealing and module registration.

- Use a clean rag to carefully brush any debris from the module faces before lifting the display and quickly inspect the display faces to ensure all modules are securely latched.

- Ensure the drain holes in the bottom of each section are not obstructed in any way. Inspect the mounting structure to ensure it does not obstruct the drain holes. If the drain holes are obscured, drill $^{3}/_{8}$-inch drain holes through the holes in the display cabinet and the mounting structure. Refer to **Figure 18**.

  Note: A one-inch minimum clearance is required behind the ventilation ports if both the intake and exhaust fans are covered by a stringer face.

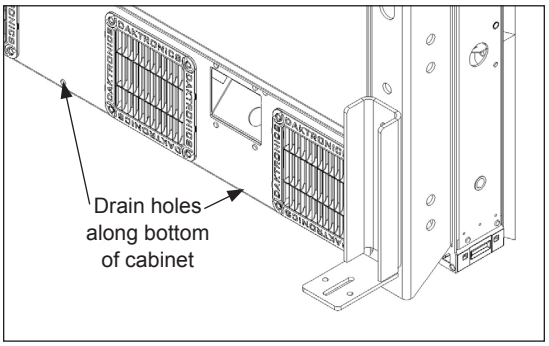


Figure 18: *Drain Hole Locations*

- Attach the clips permanently to the structure. Refer to the contract-specific Shop Drawing for more details on welding or bolting requirements. If both are illustrated on the Shop Drawing, contact the project manager. Refer to **Figure 19** for a typical welded attachment or to **Figure 20** for a typical weldless attachment.

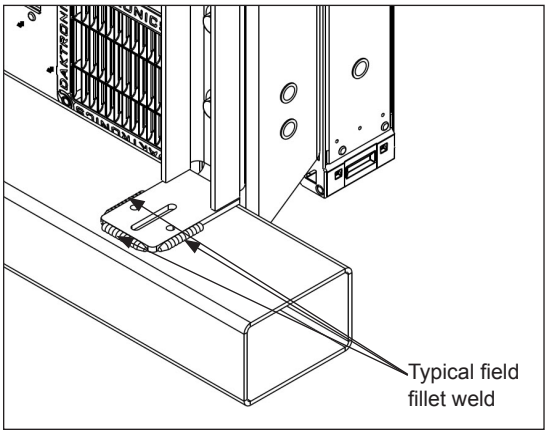


Figure 19: *Typical Welded Attachment*

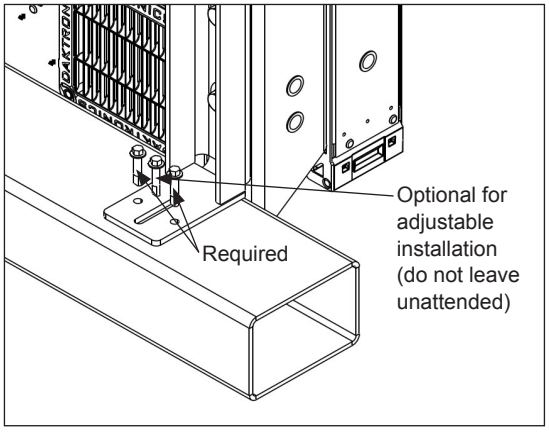


Figure 20: *Typical Weldless Attachment*

Welded attachment: Weld the clip angles on all three sides. It may be necessary to weld on the inside of the clip if two clips are adjacent.

Weldless attachment: Use a screw in the middle slot of the clip to allow for adjustment when hanging the section. Once the section is properly set in place, the screws *must* be securely fastened into the two outer holes of the clip to permanently secure the section to the structure. Refer to the **DD1723952** Structural Self-Drilling Screws Installation Guide in **Appendix B**.

- Ensure all light gaskets are in place (continuous between corner blocks on the top and the right of each cabinet when viewed from the front).

Recommended Section Installation Sequence for Matrix Displays

1. Review the contract-specific Shop Drawing. On the front view, find the overall width of the display and determine the location of the center line of the overall display. This line will be the starting point of the installation.

2. Determine which section in the bottom row of the display lies in that center line.

   If the center line falls somewhere within the width of a section, this section will be the first section installed. In **Figure 21**, Section 203 will be installed first.

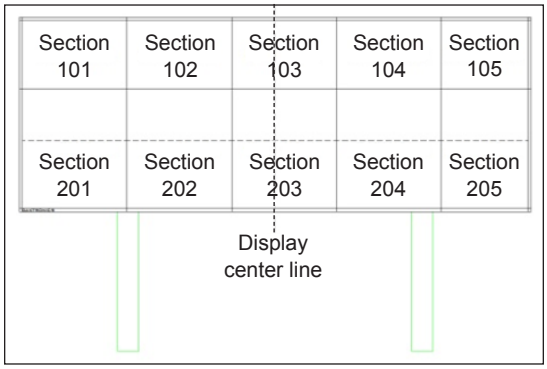


Figure 21: *Determining First Section Installed*

   If the center line falls at the intersection of two sections on the bottom row, the section to the left of the center line will be the first section installed.

3. Use the installation procedure explained in detail on the following page and install the first section on the bottom row. Refer to **Figure 22**.

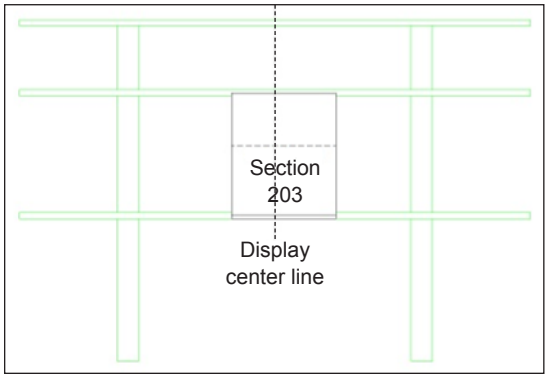


Figure 22: *Installing Center Section on Bottom Row*

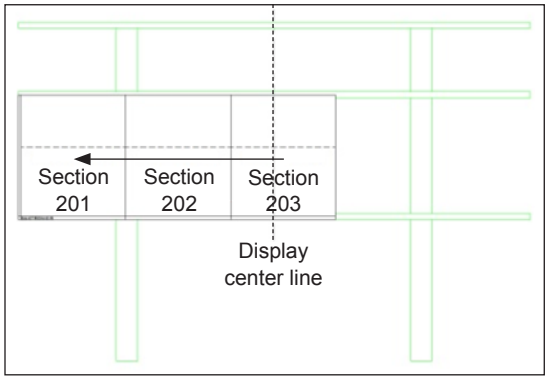


Figure 23: *Installing from Center Section to Left on Bottom Row*

4. Work to the left on the bottom row after the center section is installed until the left edge of the display is reached. As shown in **Figure 23**, install Section 202 and then Section 201 after Section 203 (the center section) is installed square and plumb.

5. Go back to the center and finish the bottom row to the right of the center section after the row has been installed from the center to the left. As shown in **Figure 24**, install Section 204 and Section 205 to reach the far right end of the display and complete the bottom row of sections.

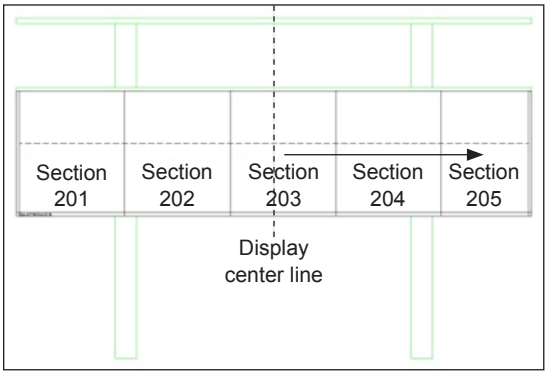


Figure 24: *Installing from Center Section to Right on Bottom Row*

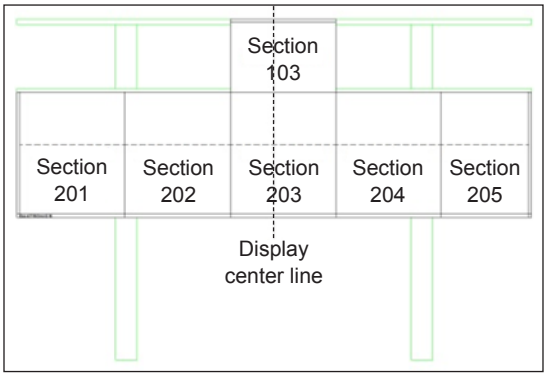


Figure 25: *Installing Center Section on Second Row*

6. Begin the next row of sections up on the center cabinet after the bottom row is completely installed. In **Figure 25**, Section 103 is the center cabinet.

7. Work to the left on the second row after the center section is installed until the left edge of the display is reached. As shown in **Figure 26**, after Section 103 (the center section) is installed, install Section 102 and then Section 101.

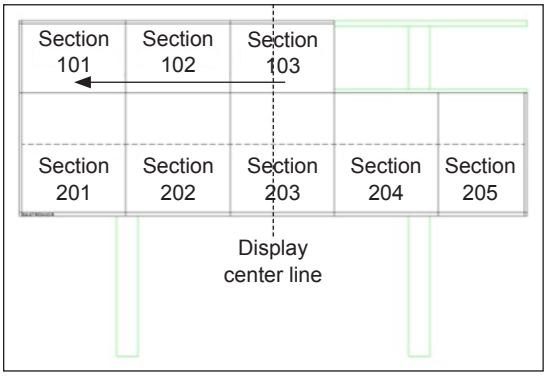


Figure 26: *Installing from Center Section to Left on Second Row*

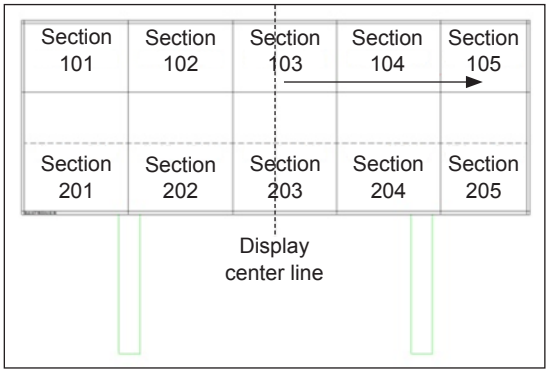


Figure 27: *Installing from Center Section to Right on Second Row*

8. Go back to the center and finish the second row to the right of the center section after the row has been installed from the center to the left. As shown in **Figure 27**, install Section 104 and Section 105 to reach the far right end of the display and complete the second row of sections.

9. Repeat Steps 6-8 until the remainder of the display is fully installed.

Installation

The following information and illustrations provide general guidance on mounting individual sections to a support structure.

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

Seam tolerance is critical and must be maintained throughout the installation process. Go/no-go gauges (Daktronics part number HS-2309) are provided to aid in proper seam spacing during the mechanical installation process and are located in the toolkit in the bottom-left corner (from the rear of the display) of the first section to be installed for the entire display. These gauges should be used throughout the entire installation process. Proper use of these gauges should minimize seams and adjustment that may otherwise be necessary after display fireup. Refer to the **DD2570803** DVX-1100/1500/1800 Go/No-Go Gauge Application Guide for instructions. Measuring seams can also verify spacing. Refer to the **DD2492555** DVX-1100/1500/1800 Seam Measurement Field Instructions in **Appendix B** for information on the seam measurement process.

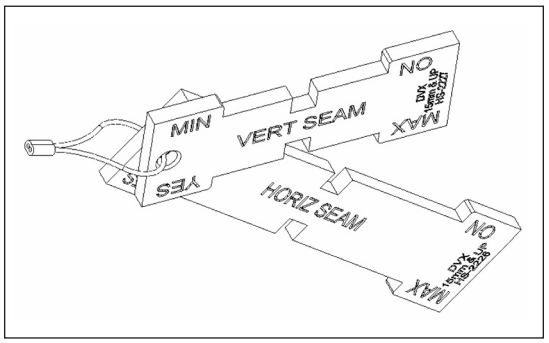


Figure 28: *Go/No-Go Gauges*

To aid in cabinet attachment and alignment, review the **DD2545000** DVX-1100/1500/1800 Cabinet Alignment Guide in **Appendix B**. Using this guide during the installation process will ensure proper seam alignment.

Preparation for Installation of First Section

Refer to **Figure 22**, **Figure 29**, and **Figure 30** while completing Steps 1-4 for placing the first section.

1. Use the dimensions from the contract-specific Shop Drawing and set the bottom clip angles to the approximate correct height from the bottom of the cabinet.

2. Loosen the top clip angles before flying the cabinet into place to easily adjust the clip angle placement on the structure.

   Using tag lines when lifting sections into place is recommended. A $^{1}/_{2}$-inch eyebolt can be installed into the nutserts in the rear of the full-height tubes. Refer to **Figure 29**. Tag lines should be attached to these bolts and *not* to the clip angles, door handles, vent panels, or other areas of the cabinet, as this can damage the cabinet.

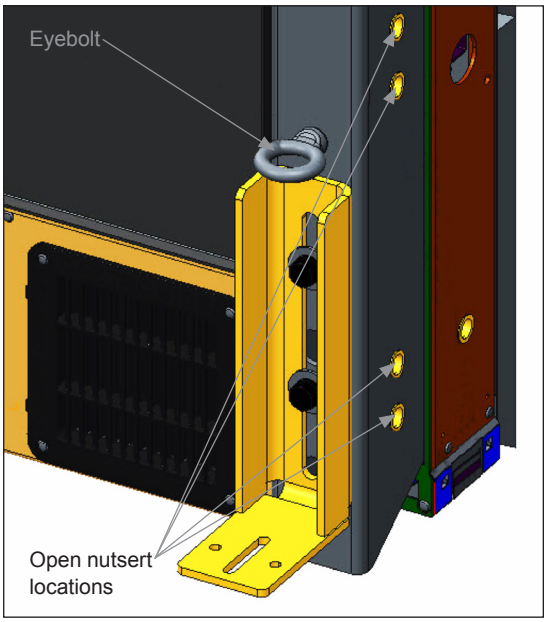


Figure 29: *Recommended Tag Line Attachment*

3. Fly the first section into position; adjust and tighten the clips accordingly. Ensure it is both vertically plumb and horizontally level, as other sections rely on this section's position. Refer to **Figure 30**.

4. Set the clip angles and tighten them to the display after the section is in place; then permanently attach the section to the structure as per the contract-specific Shop Drawing.

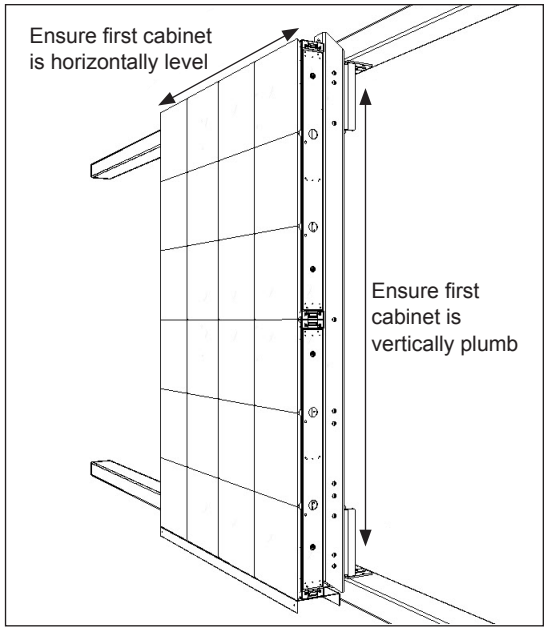


Figure 30: *Horizontally Level & Vertically Plumb Cabinet*

Refer to **Figure 23**, **Figure 24**, and **Figure 31** while completing Steps 5-8 for placing the second section.

5. Loosen the top clip angles and ensure the bottom clip angles are set all the way up on the bolts before flying the next cabinet into place to easily adjust the clip angle placement on the structure. Lift the section and position it beside the first section, ensuring the alignment pyramids on the cabinets nest together.

6. Install all interconnect bolts across the vertical seam immediately after positioning the section to ensure the display sections fit snugly together and the new section is plumb and level. Refer to **Figure 31**. Do not tighten the bolts until there is a bolt in every location and the display modules are properly aligned. If installing from the rear, look down the module seams from the top or side of the cabinet when attaching sections together to ensure the modules align properly at the splice. Use the go/no-go gauges to ensure proper alignment and spacing. After everything is in place, tighten down all splice bolts. If misalignment occurs, loosen the bolts, attempt to adjust and move the section, and retighten the splice bolts. If issues persist, contact the project manager.

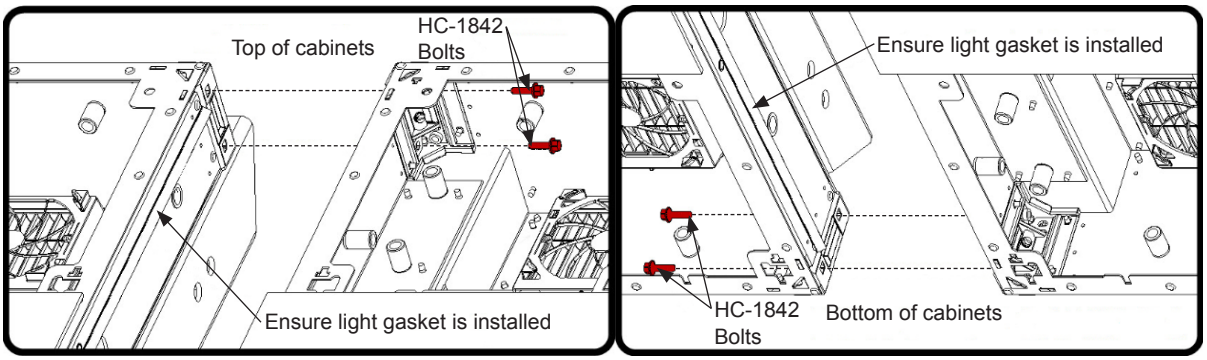


Figure 31: *Vertical Splice Section Bolting*

7. Set the clip angles and tighten them to the display after the splice bolts are tightened. Permanently attach the clip angles to the structure as instructed in Step 4.

8. Repeat Steps 5-7 for all remaining sections in the bottom row. Install the bottom and side borders as necessary if they are not already attached prior to flying the sections into place. Refer to **Figure 23** and **Figure 24**.

Refer to **Figure 25** and **Figure 32** while completing Steps 9-11 for placing the first section on the second row.

9. Loosen the top clip angles and ensure the bottom clip angles are set all the way up on the bolts before flying the cabinet into place to easily adjust the clip angle placement on the structure. Lift the section and position it on top of the appropriate section, ensuring the alignment pyramids on the cabinets nest together.

10. Install all interconnect bolts across the horizontal seam immediately after positioning the section to ensure the display sections fit snugly together, and the new section is plumb and level. Refer to **Figure 25** and **Figure 32**. Do not tighten the bolts until there is a bolt in every location, and the display modules are properly aligned. If installing the display from the rear, look down the module seams from the top or side of the cabinet when attaching the sections together to ensure the modules align properly at the splice. Use the go/no-go gauges to ensure proper alignment and spacing. After everything is in place, tighten down all splice bolts. If misalignment occurs, loosen the bolts, attempt to adjust and move the section, and retighten the splice bolts. If issues persist, contact the project manager.

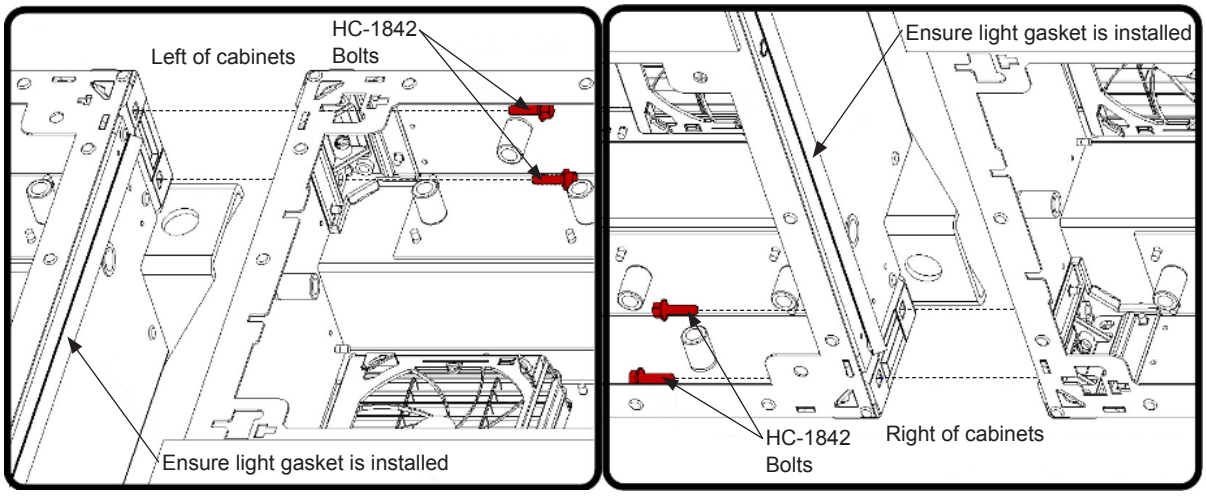


Figure 32: *Horizontal Section Splice Bolting*

11. Set the clip angles and tighten them to the display after the splice bolts are tightened. Permanently attach the section to the structure as instructed in Step 4.

Refer to **Figure 26**, **Figure 27**, **Figure 31**, and **Figure 32** while completing Steps 12-15 for placing the remainder of the sections.

12. Loosen the top clip angles and ensure the bottom clip angles are set all the way up on the bolts before flying the cabinet into place to easily adjust the clip angle placement on the structure. Lift the section and position it on top of the appropriate section, ensuring the alignment pyramids on the cabinets nest together.

13. Install all interconnect bolts through the vertical and horizontal seams immediately after positioning the section to ensure the display sections fit snugly together and the new section is plumb and level. Refer to **Figure 26**, **Figure 31**, and **Figure 32**. Do not tighten the bolts until there is a bolt in every vertical and horizontal location and the display modules are properly aligned. If installing the display from the rear, look down the module seams from the top and side of the cabinet when attaching the sections together to ensure the modules align properly at the splice. Use the go/no-go gauges to ensure proper alignment and spacing. After everything is in place, tighten down all splice bolts. If misalignment occurs, loosen the bolts, attempt to adjust and move the section, and retighten the splice bolts. If issues persist, contact the project manager.

14. Set the clip angles and tighten them to the display after the splice bolts are tightened. Permanently attach the section to the structure as instructed in Step 4.

15. Repeat Steps 12-14 for all remaining sections. Install the top and side borders as necessary if they are not already attached prior to flying the sections into place. Refer to **Figure 27**.

Center Adjustment

Corner blocks provide proper spacing at the ends of section seams, but spacing may vary in the middle where the sections come together. Additional holes are provided along both the horizontal and vertical edges of the cabinet for additional adjustment if required.

For wide center seams, install $^1/_4$-inch bolts through the holes behind the face sheets at the problem locations in the bottom of the top cabinet or the left side of the right cabinet and into the next cabinet's nutsert. Tighten these bolts until the seam is within tolerance. Refer to the **DD2492555** Series DVX-1100/1500/1800 Seam Measurement Field Instructions in **Appendix B** for details on seam tolerance and to **Figure 33** for details on seam adjustment.

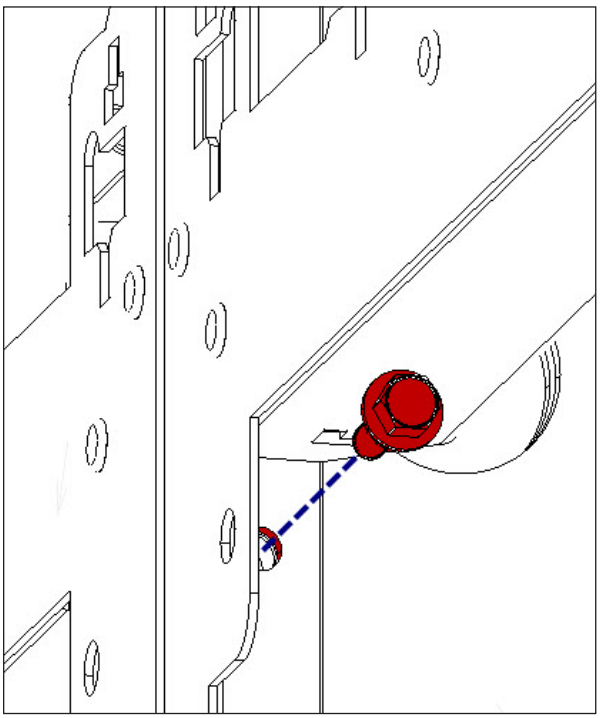


Figure 33: *Adjusting Wide Center Seams*

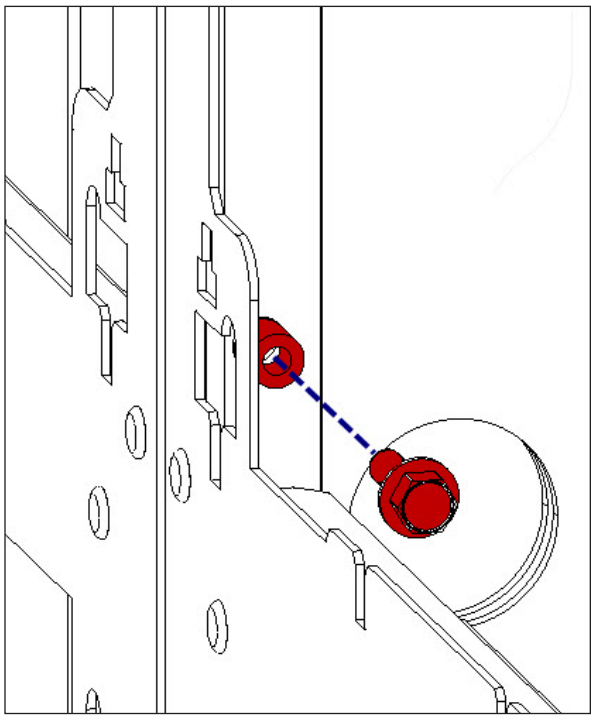


Figure 34: *Adjusting Tight Center Seams*

For tight center seams, install $^1/_4$-inch bolts into the pre-installed nutserts behind the face sheet at the problem locations in the bottom of the top cabinet or the left side of the right cabinet. Tighten the bolts until the seam is within tolerance. Refer to the **DD2492555** DVX-1100/1500/1800 Series Seam Measurement Field Instructions in **Appendix B** for details on seam tolerance and to **Figure 34** for details on seam adjustment.

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 weather tightness of the display. If *any* modifications are made to the weather tightness 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

Reference Documents:

DVX-1100/1500/1800 Series Power Numbers **DD2570782**
System Riser Diagram ..... **Contract-Specific**

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 from the accessory jack of the closest module. Refer to the contract-specific System Riser Diagram for detailed power information.

Refer to the **DD2570782** DVX-1100/1500/1800 Series Power Numbers in **Appendix B** for details.

3.2 Signal Summary

Reference Documents:

VIP-4060 Operator's Manual **DD1804047**
Block Diagram; VAC/VDC Harn, Quad & Dual, 3-High ..... **Drawing B-1117834**
Block Diagram; VAC/VDC Harn, Quad & Dual, 4-High ..... **Drawing B-1117835**
Layout; Component Placement & Signal Harness, 4-High ..... **Drawing B-1118677**
Block Diagram; VAC/VDC Harn, Quad & Dual, 2-High ..... **Drawing B-1122027**
Cabinet Fiber Routing ..... **Drawing B-1122479**
Layout; Component Placement & Signal Harness, 3-High ..... **Drawing B-1122530**
Layout; Component Placement & Signal Harness, 2-High ..... **Drawing B-1122554**
Power Entrance; Field Conduit Location ..... **Drawing B-1123507**
Power Entrance; Field Termination Detail ..... **Drawing B-1123982**
Layout & Block Diagram, DVX-1500, 3x3 ..... **Drawing B-1132791**
Config Drawing ..... **Contract-Specific**
System Riser Diagram ..... **Contract-Specific**

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, and the Video Image Processor (VIP) video interface itself.

The Block Diagrams and Layout Drawings in **Appendix A** illustrate the signal layout of each display section. The contract-specific Config Drawing illustrates the signal connections from the control room to the ProLink Routers (PLRs) in the display or from cabinet section to cabinet section. This is done to some extent in all DVX cabinet displays.

Data from the control system routes over fiber-optic cable to the J5 (Data In) connector on the VIP. Refer to the **DD1804047** VIP-4060 Operator's Manual. The VIP may be located in the control room or in a remote location. The data then routes to the appropriate PLRs via fiber-optic cables. Refer to the appropriate contract-specific System Riser Diagram and Config Drawing for more routing information. Refer to the Cabinet Fiber Routing Drawing and Power Entrance Drawings in **Appendix A** for fiber termination information.

The Cabinet 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 Drawings in **Appendix A** also illustrate how data passes from one PLR to the modules and show power harnessing and component placement.

Each PLR sends data to the modules within the display; refer to the Block Diagrams and Layout Drawings in **Appendix A** for further information. Signal exits from the PLR's ProLink Out jack and routes to ProLink In on the next PLR via fiber-optic cable. Refer to **Figure 33**, as it illustrates a typical signal routing layout. Refer to the contract-specific Config Drawing for further information.

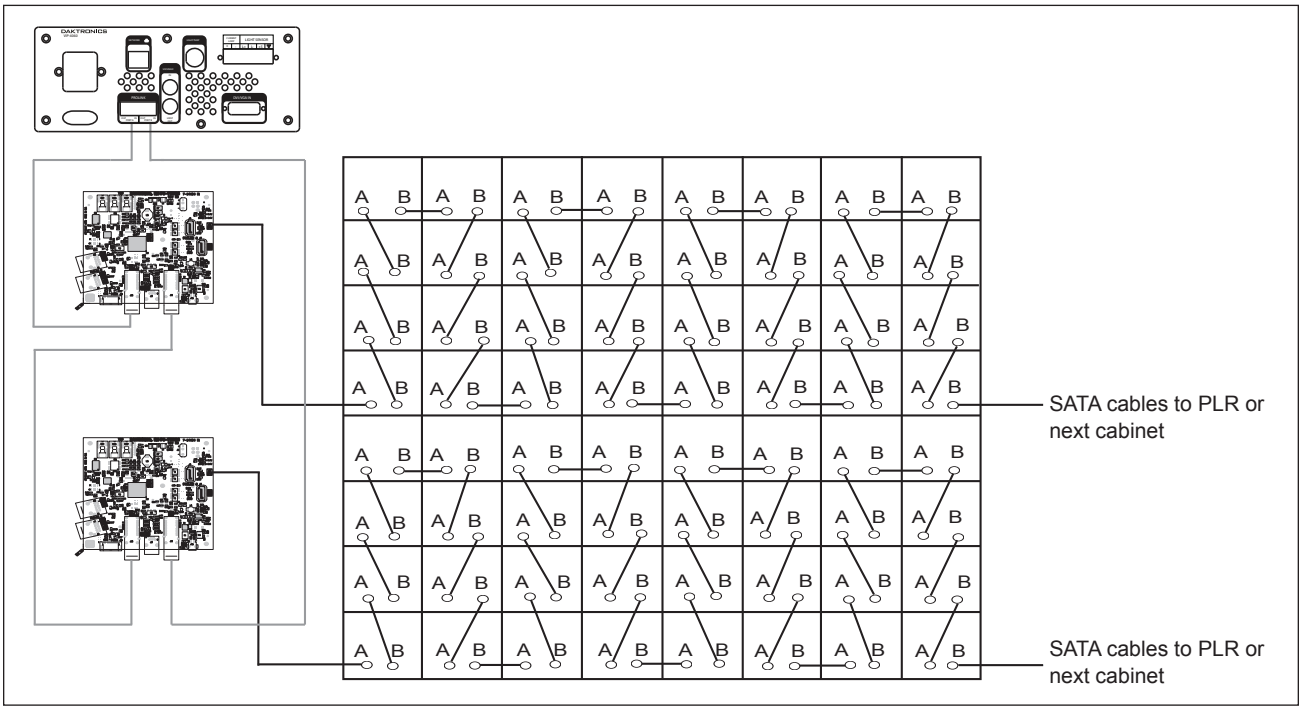


Figure 35: *Signal Routing*

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.

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 36**.

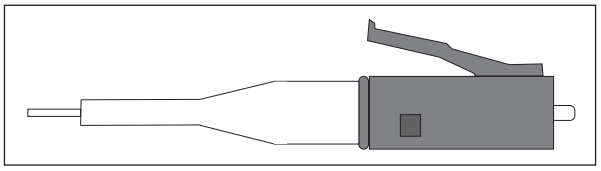


Figure 36: *LC Fiber-Optic Connector*

Water-Tight SATA Cable Connector

Daktronics uses a wide variety of SATA cables and SATA cable connectors. **Figure 37** 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.

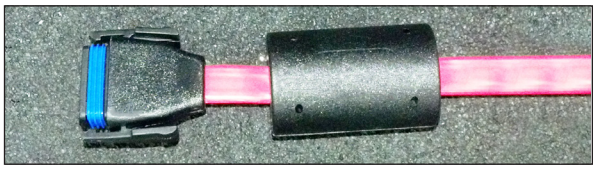


Figure 37: *SATA Cable Connector*

3.4 Control Cable

Reference Documents:

VIP-4060 Operator's Manual **DD1804047**
System Riser Diagram ..... **Contract-Specific**

Refer to the contract-specific System Riser Diagram for specifications on signal and power cable runs. Refer to the **DD1804047** VIP-4060 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 seven inches. 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

Reference Documents:

Power Entrance; Field Conduit Location ..... **Drawing B-1123507**
Power Entrance; Field Termination Detail ..... **Drawing B-1123982**
System Riser Diagram ..... **Contract-Specific**

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 the displays or any of the electrical components. Improper installation could result in serious equipment damage and could be hazardous to personnel.

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 (NEC) 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

1. Connect the grounding electrode cable at the local disconnect, never at the display termination panel.

2. Use a disconnect that opens all ungrounded phase conductors.

This display uses one of four power termination options. Refer to the Power Entrance Drawings in **Appendix A** and **Figure 38** for installation details.

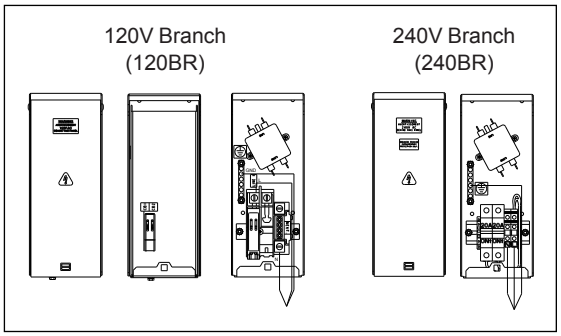


Figure 38: *Power Installation*

Main Disconnect

Refer to the contract-specific System Riser Diagram to determine who must supply a fused main distribution/disconnect 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 agree with local and national codes and standards.

The display allows water to enter, so incoming conduits should be pointed downward or have a fitting attached to prevent water from entering the conduit.

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

Reference Documents:

Cabinet Fiber Routing	**Drawing B-1122479**
Config Drawing	**Contract-Specific**
Power Interconnect Drawing	**Contract-Specific**
Signal Interconnect Drawing	**Contract-Specific**
System Riser Diagram	**Contract-Specific**

Power

After mounting the display and bolting all sections securely together, run power from one section to another.

Route the interconnect power wire through the interconnect holes based on the contract-specific Config Drawing, Power Interconnect Drawing, and System Riser Diagram.

Optional Conduit Whip

Refer to the contract-specific System Riser Diagram to verify where conduit whips should route.

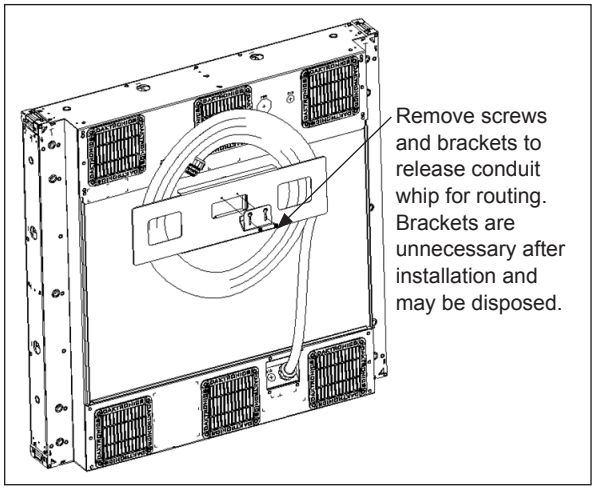


Figure 39: *Conduit Whip*

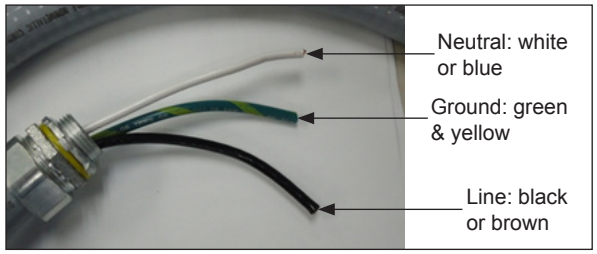


Figure 40: *Conduit End with Wire to Terminate to Junction Box*

Signal

After mounting the display and bolting all sections securely together, run signal from one section to another.

Route the fiber and SATA cables based on the contract-specific Config Drawing, Signal Interconnect Drawing, and System Riser Diagram. Refer to the Cabinet Routing Drawing 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.

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

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 DVX-1100/1800 Optional Power Redundancy

Reference Documents:

Block Diagram; VAC/VDC Harn, Quad & Dual, 3-High	**Drawing B-1117834**
Block Diagram; VAC/VDC Harn, Quad & Dual, 4-High	**Drawing B-1117835**
Layout; Component Placement & Signal Harness, 4-High	**Drawing B-1118677**
Block Diagram; VAC/VDC Harn, Quad & Dual, 2-High	**Drawing B-1122027**
Layout; Component Placement & Signal Harness, 3-High	**Drawing B-1122530**
Layout; Component Placement & Signal Harness, 2-High	**Drawing B-1122554**

When redundant power is included in the system, the display uses an N+1 power supply redundancy configuration for protection against module power failure. If a power supply fails, the redundant power supply provides backup power to the affected module. In regular conditions, the redundant power supply remains auxiliary. Refer to **Figure 41**.

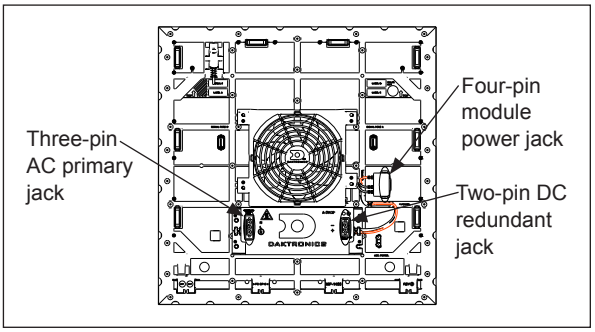


Figure 41: *Module Rear with Jacks*

Testing

To test the redundant power wiring scheme/setup, locate the last module(s) on the redundant harnessing bus system. Refer to the Block Diagrams and Layout Drawings in **Appendix A** for wiring information and component placement. Disconnect the three-pin AC power to the power supply on the module. Verify the LEDs or indicator lights on the module remain lit to ensure the module continues to work after the AC power is disconnected. Refer to **Figure 42**.

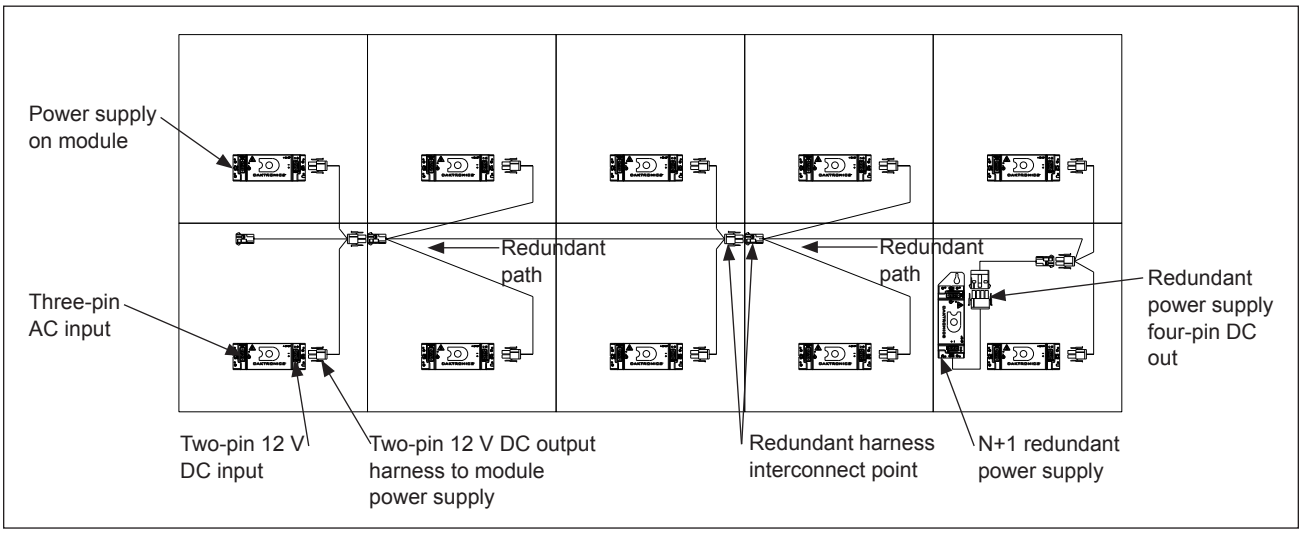


Figure 42: *Power Redundancy*

3.10 Signal Redundancy

Reference Documents:

VIP-4060 Operator's Manual	**DD1804047**
IDM User Manual	**DD2097912**
Signal Interconnect Drawing	**Contract-Specific**

There are two different levels of signal redundancy: module redundancy, which is part of the standard design, and full-data redundancy.

Standard Module Redundancy

Module redundancy provides a primary and redundant SATA connection throughout the entire display to protect the system from signal failure. If a module in the middle of a signal chain fails, the redundant signal path takes over and limits the signal failure to that single module.

Optional 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 43**.

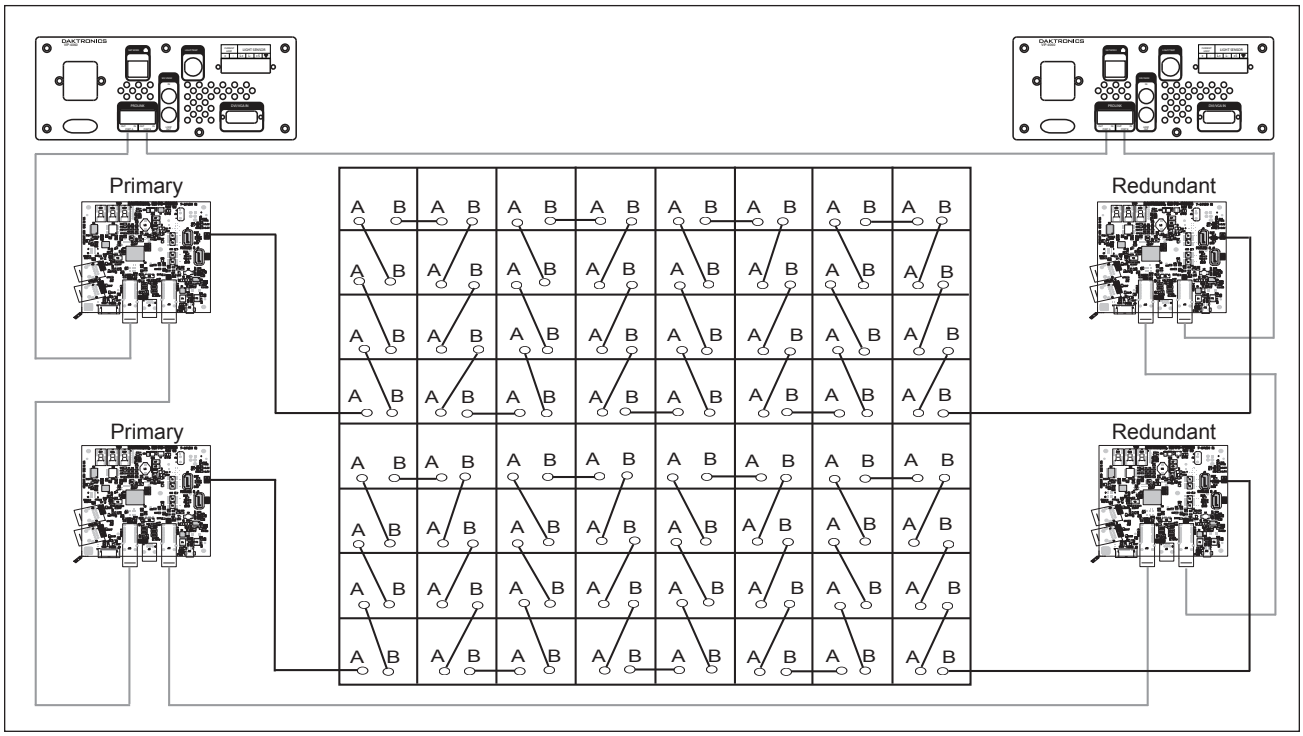


Figure 43: *Signal Routing*

Full-Data Redundancy Testing

To test the module redundancy wiring, locate the contract-specific Signal Interconnect Drawing to verify where the ProLink Routers (PLRs) are located. The display needs to be powered and running content. Disconnect the SATA cable from Port A of each PLR individually and verify all modules still display content correctly; reconnect the SATA cable. Disconnect the SATA cable from Port B of each PLR individually and verify all modules still display content correctly; reconnect the SATA cable.

To test the full-data redundancy wiring, locate the contract-specific Signal Interconnect Drawing to verify where the PLRs are located. Disconnect the SATA cable from Port A of 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.

To test the PLR redundancy, locate the contract-specific Signal Interconnect Drawing to verify where the PLRs are located. Disconnect the fiber cable from Port A of the first PLR and verify all modules still display content correctly; reconnect the fiber cable. Disconnect the fiber cable from Port B of the last PLR in the chain and verify all modules still display content correctly; reconnect the fiber cable. Another method is to ensure the Video Image Processors (VIPs) are powered on and then unplug the fiber cable from Port A on the primary VIP or from Port B on the backup VIP and verify all modules still display content correctly.

To test the VIP redundancy, log into the primary and redundant VIPs and 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 **DD1804047** VIP-4060 Operator's Manual.

If available, Intelligent Device Management (IDM) can also verify the system is working as intended. Refer to the **DD2097912** IDM User Manual.

3.11 DVX-1100/1800 with Embedded Controller

DVX-1100/1800 displays with the embedded DMP-8065 controller consist of the standard product with the added controller.

System Startup

The display shows a boot sequence shortly after the power is turned on. The information in this sequence is very useful when using Venus® 1500 software to configure the display. Ensure all display communications and network connections are made before turning the display on.

Boot Sequence

The information in the boot sequence includes the following:

- Firmware name & version
- Display size (pixels high by pixels wide)
- Dynamic Host Configuration Protocol (DHCP)-assigned name
- IP address & state
- Media access control (MAC) address
- Configuration port
- Status port
- Management port (used to access configuration)
- Description

Startup Checklist

- □ Confirm all communication equipment is installed according to the provided documentation.
- □ Confirm any necessary network connections have been made.
- □ Confirm the Venus® 1500 software is installed on the control computer.
- □ Inspect the peripheral equipment (temperature sensor, light sensor, etc.) for proper installation.

Network & Communication Installation

This section explains the network settings of DVX-1100/1800 displays with the embedded controller and gives guidance for integrating a display with a customer's network. It also provides basic information about available standard communication options.

Daktronics is not responsible for setting up displays on a wide area network (WAN) but does assist with setting up communication on a local area network (LAN) or directly to a laptop.

When installing network and communication, keep the following points in mind:

- Do not turn on the display until all network and communication installation is complete.
- Have a laptop with internet access on-site (preferred).
- Work with a customer's IT professional for network integration (preferred).

Network Connection

DVX-1100/1800 displays with the embedded controller use Dynamic Host Configuration Protocol (DHCP) by default, allowing the customer's network to configure the display and eliminating manual configuration of the player.

When the display is connected to a network that supports DHCP, a default DHCP name similar to "DAKTXXXXXX," "XXXXXX" representing the last six digits of the player's media access control (MAC) address, is used. This information displays during the boot sequence.

Ports 4500-4525 must be open for communication on the switcher or router.

Computer Connection

When connecting the display directly to a computer, and Dynamic Host Configuration Protocol (DHCP) is not available, the display's AutoIP feature assigns an IP address. AutoIP addresses fall into the range of 169.254.0.0 to 169.254.255.255. The IP address displays during the boot sequence when the display first turns on.

Static IP Address Setting

Setting a static IP address on a display requires the following:

- Laptop with Java®, Silverlight®, DisplayFind (installed from the Venus® 1500 V4 software disk in the Utilities folder), and Internet Explorer® applications installed
- Display IP address (provided by customer)
- Ethernet patch cable to connect computer to display

Work with Daktronics Technical Support when programming a static IP address on the player.

Standard Communication Options

DVX-1100/1800 displays with the embedded controller can receive various forms of Ethernet communication. The standard communication options are listed below, along with communication-specific documentation numbers. For additional information, refer to these documents provided in the communication kits.

Communication Type	Manual DD Number	Quick Guide DD Number
Ethernet - wire	DD1417609	DD1417573
Ethernet - fiber	DD1417611	DD1417581
Ethernet bridge radio	DD1685027	DD1417586

These are the standard communication types, but each site is unique and may include additional equipment. Contact Daktronics Technical Support with any questions.

Software Installation

Venus® 1500 software is the standard control software for DVX-1100/1800 displays with the embedded controller. Install Venus® 1500 software either from a disk or from www.daktronics.com/venus1500. Click the **Downloads** tab and **Venus1500setup.exe**. Registration is required for Venus® 1500 software and must be completed within 90 days of installation. Refer to the Venus® 1500 Help File for registration instructions.

Minimum System Requirements	Recommended System Requirements
Windows XP®, Vista®, or 7 operating system with current updates applied (32- or 64-bit versions)	Windows XP®, Vista®, or 7 operating system with current updates applied (32- or 64-bit versions)
800 MHz processor or higher	1.6 GHz processor or higher
512 MB RAM or higher	1.5 GB RAM or higher
1 GB free hard disk space (additional space required for content storage)	1 GB free hard disk space (additional space required for content storage)
Monitor and video adapter capable of 1024x768 resolution or higher with DirectX® 9 support	Monitor and video adapter capable of 1280x1024 resolution or higher with DirectX® 9 support
Microsoft® Internet Explorer® browser version 7 or higher	Microsoft® Internet Explorer® browser version 7 or higher
.NET 3.5 Framework Service Pack 1	.NET 3.5 Framework Service Pack 1
CD-ROM or DVD drive	CD-ROM or DVD drive
Keyboard and mouse or other compatible pointing device	Keyboard and mouse or other compatible pointing device

Software Configuration

Ensure all display communications and network connections are made before using Venus® 1500 software to configure a display. After everything is installed, turn the display on, allow it to complete a boot sequence, and then follow the steps below:

1. Click the Windows® **Start** button. Hover over **All Programs>Daktronics>Venus 1500 V4** and click **Venus 1500**.

2. Click the **Application** button, highlight **Configure**, and click **Displays**. Refer to **Figure 44**.

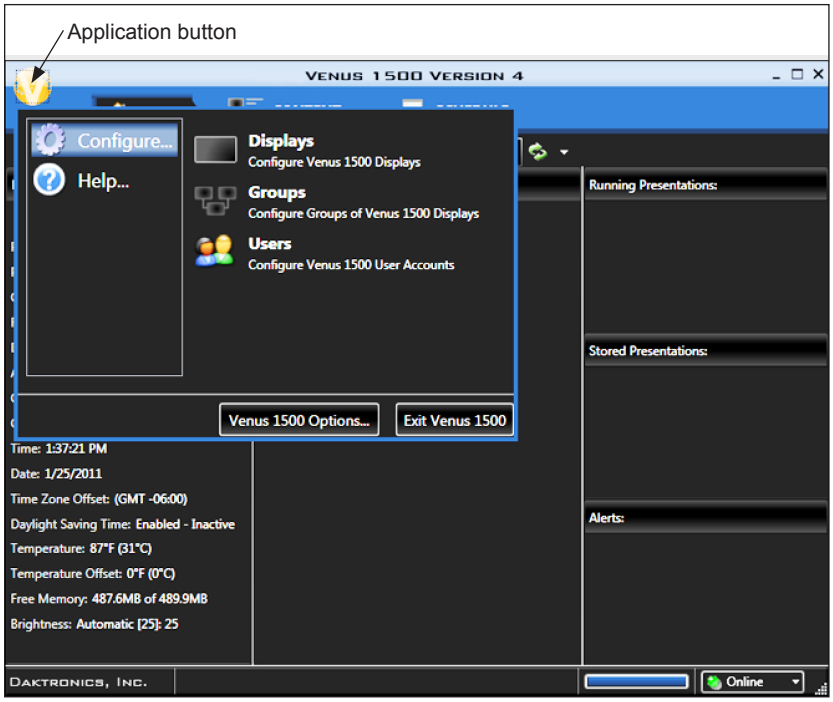


Figure 44: *Beginning Display Configuration*

3. Click **Add Display...** from the **Display Management** window or right-click in the **Display Management** window and select **Add Display...**. Refer to **Figure 45**. The software searches for displays on the local network and returns a list of displays.

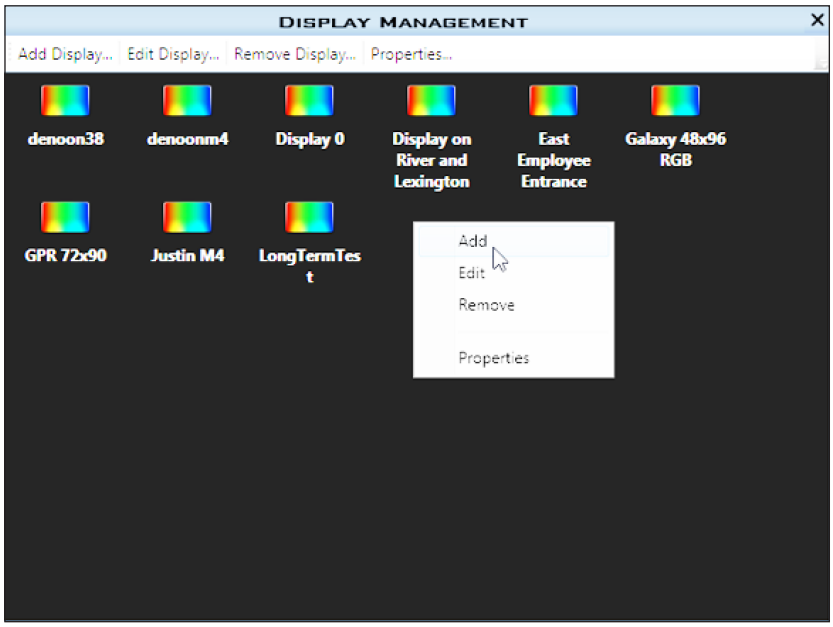


Figure 45: *Configuring a New Display*

4. Select the desired display to configure and click **Continue**. Refer to **Figure 46**.

   Note: If the display is password-protected, enter the password on the **Authentication** page. Save the password in a secure location. Physical access to the display is required to reset the password.

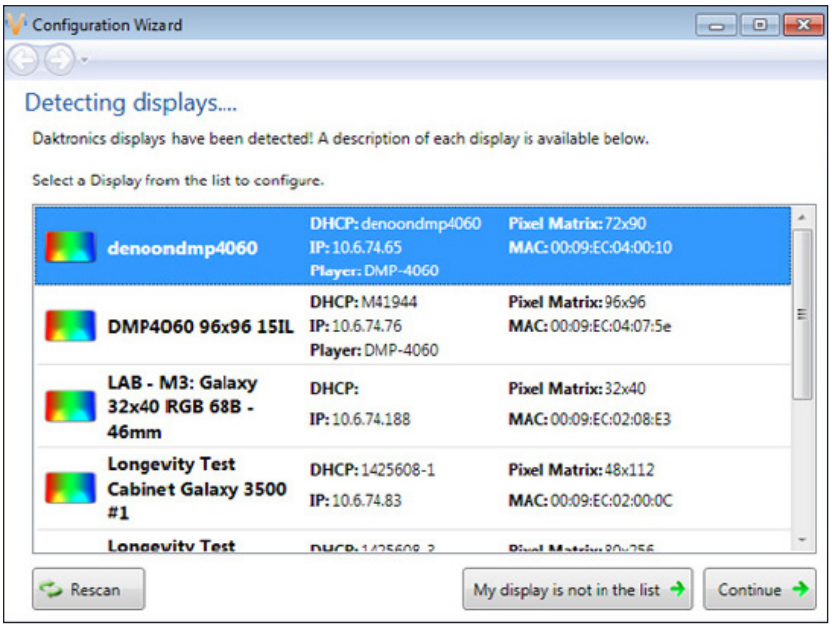


Figure 46: *List of Displays*

5. Give the display a name to easily identify it when the **Display Found** prompt opens. This prompt also provides a brief description of the display. Click **Continue**.

6. Select the correct time zone for the display's location. Greenwich Mean Time (GMT) with country and city/region are the guides used to select the correct time zone.

7. Click **Back to Start** in the **Summary** box to return to the beginning of the process and configure another display. Click **Finish** to complete display configuration. Refer to **Figure 47**.

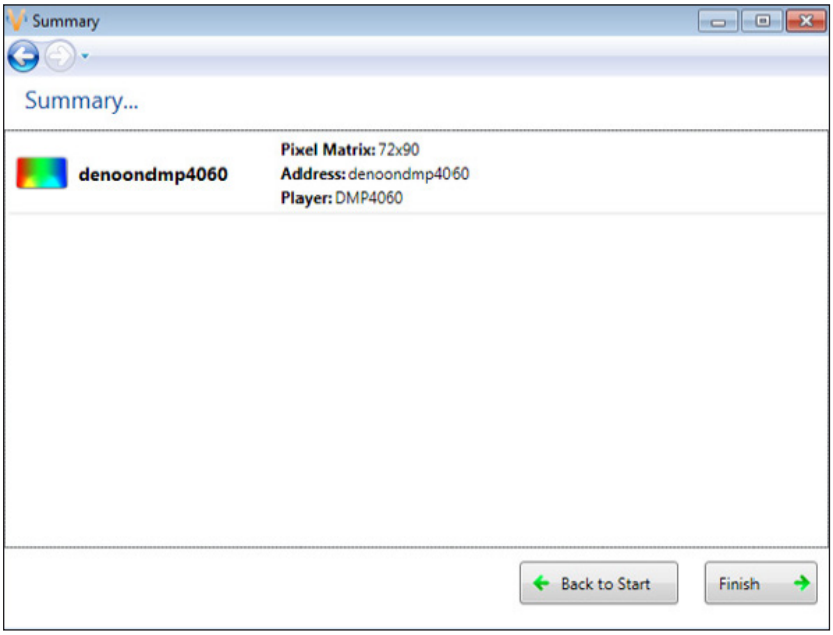


Figure 47: *Display Configuration Summary Window*

3.12 DVX-1100/1800 with Embedded Controller Light Sensor Mounting

Reference Document:

Light Sensor Mount to Border, DVX ..... **Drawing B-1094485**

Light detectors monitor the light levels around the display and adjust the LED intensity accordingly. Refer to **Figure 48**.

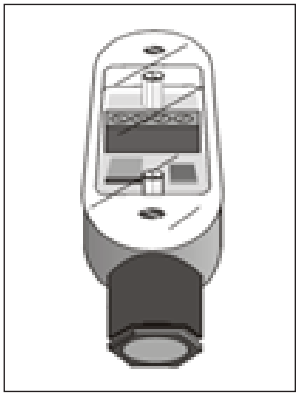


Figure 48: *Light Detector*

To mount the light sensor on the display border (if not previously factory-installed), refer to the instructions on the Light Sensor Drawing in **Appendix A**. Connect the light sensor harness to the quick connect plate.

3.13 Optional Temperature Sensor Mounting

A temperature sensor mounts separately and requires a location away from chimneys, air conditioners, vents, tar roofs, concrete, and parking lots that can cause abnormal temperature fluctuations. Usually a separation of at least 20 to 30 feet horizontally and eight feet vertically is required. Locations where air movement is restricted are also unsatisfactory.

The first choice for temperature sensor location is a north eave or northern exposure, away from direct sunlight and above grass. This location gives extra stability and accuracy to the sensor because of the added shading obtained on a northern exposure. Ensure at least one foot of space exists between the bottom of the eave and the top of the temperature sensor housing for accurate readings. Refer to **Figure 49**.

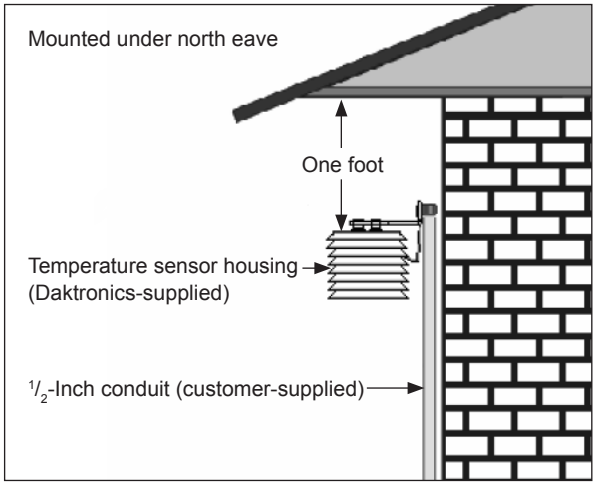


Figure 49: *Temperature Sensor Mounting*

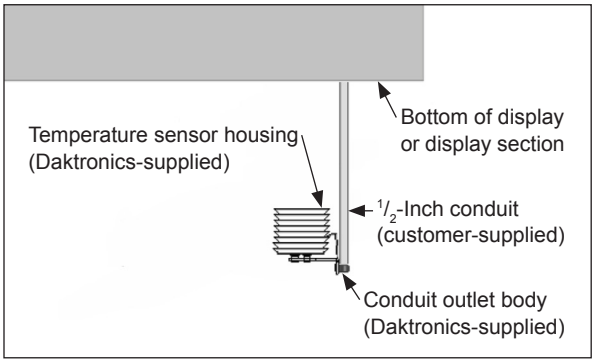


Figure 50: *Temperature Sensor Mounting*

The second choice for temperature sensor location is on the display itself or on the display structure. The location of the sensor should be above, below, or on a northern edge to keep the sensor shaded. If mounting above the display, a minimum height of six feet is required. Mounting a sensor below the display requires a minimum of eight feet above the ground and a minimum of one foot between the sensor and the display. Refer to **Figure 50**. Greater accuracy is obtained with grass below the sign rather than concrete or another material.

Section 4: Maintenance & Troubleshooting

Turn off display power before performing any repair or maintenance work.

Only qualified service personnel may access internal electronics.

Do not operate the display with the back sheets removed. The back sheets direct adequate airflow around the components. Display operation without the back sheets in place and fans running could cause damage to the display and will make the warranty null and void. Ensure the back sheets are securely fastened into place.

Dirt and contaminants may enter the display if it is operated without the fan filters in place. These contaminants may cause premature failure of the electronic components. Operating the display with dirty fans and filters will make the warranty null and void.

Daktronics product managers' engineering staff must approve any changes that may affect the display's weather tightness. This includes, but is not limited to, border shrouding, back sheets, cooling fans, fan filters, and filler panels. If any changes are made to the display's weather tightness, submit detailed drawings to Daktronics engineering 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 the tools listed and placing them in a convenient, easy-to-access location.

Tool	Daktronics Part Number	Use
Module safety lanyard	0A-1175-9000	Prevents modules from falling and breaking
$^{5}/_{16}$-inch nutdriver	TH-1156	Removes doors and attaches components
$^{1}/_{4}$-inch flathead screwdriver	TH-1171	Turns door latches
Module removal tool	TH-1212	Removes modules in DVX-1800 displays
$^{3}/_{8}$-inch socket set	TH-1244	Interconnects sections

These tools are found in the toolkit (Daktronics part number 0A-1730-0001) shipped with each display. 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

Video displays are designed for either front or rear access, depending on site requirements and customer preference. While components in front-access displays are simply removed from the front, rear-access displays require removing the access doors from the rear of the display to reach the internal display components.

To remove the access doors, follow the steps on the next page while referring to **Figure 51**:

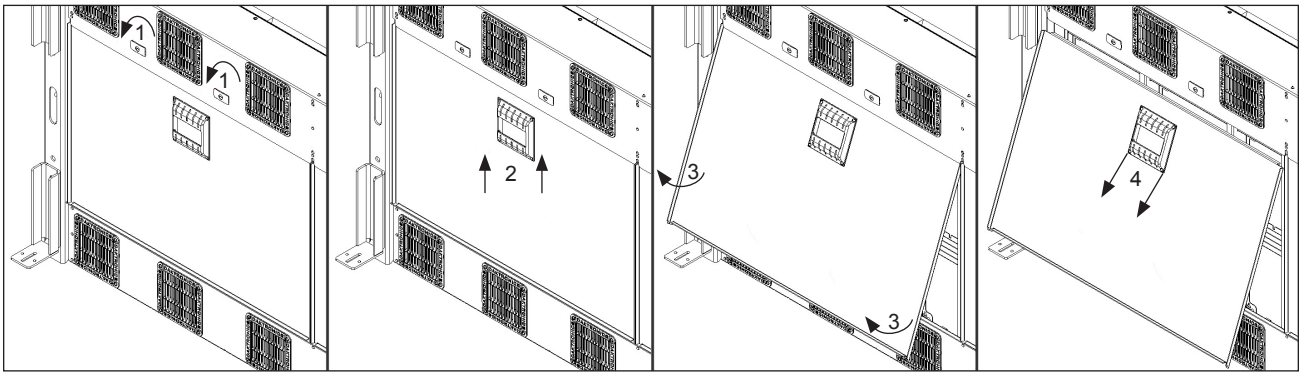


Figure 51: *Removing Door*

1. Use a flathead screwdriver to turn both latches counterclockwise.
2. Slide the door upward to disengage the bottom locks on the door.
3. Rotate the bottom of the door out about two inches from the rear of the display.
4. Slide the door downward to disengage the top clamp on the door.
5. Pull the door away from the cabinet.

4.3 Display Components

Reference Documents:

ProLink Router 6X5X Installation & Maintenance Manual **DD1735784**
VIP-4060 Operator's Manual **DD1804047**

For information on removing and replacing components, refer to **Section 4.4**.

ProLink Router

Figure 52 illustrates a ProLink Router (PLR). The PLR is a display interface board that passes display data from the ProLink6 control system modules and other PLRs.

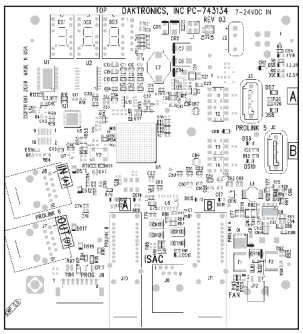


Figure 52: *PLR*

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

Video Image Processor

Figure 53 illustrates a Video Image Processor (VIP). The VIP is an interface that drives video to the display while also dimming, providing gamma and color controls, and displaying test patterns.

Refer to the **DD1804047** VIP-4060 Operator's Manual for further information.

Figure 53: *VIP*

Line Filter

Figure 54 illustrates a line filter. Line filters remove electromagnetic noise that might otherwise interfere with local communications channels from the power system. The line filter is mounted to the sectional termination panel.

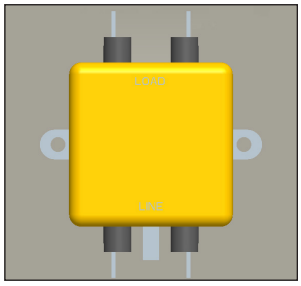


Figure 54: *Line Filter*

Power Supply

Figure 55 illustrates a typical power supply, also referred to as a power module. 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 incoming power.

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

The power supply mounts to the module.

If a power supply fails, send the module (with the power supply) in for repair. Refer to **Section 5.2** for details on the repair process.

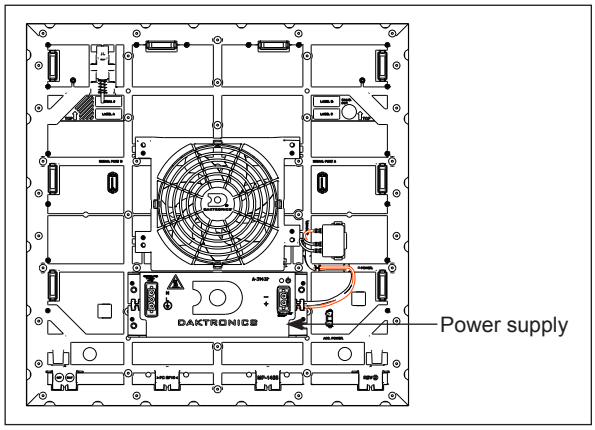


Figure 55: *Power Supply*

4.4 Service & Diagnostics

Reference Documents:

Layout; Component Placement & Signal Harness, 4-High .....**Drawing B-1118677**
Layout; Component Placement & Signal Harness, 3-High .....**Drawing B-1122530**
Layout; Component Placement & Signal Harness, 2-High .....**Drawing B-1122554**

Internal components for DVX displays, including ProLink Routers (PLRs), mount to a bracket with keyholes. **Figure 56** and **Figure 57** how typical component layouts.

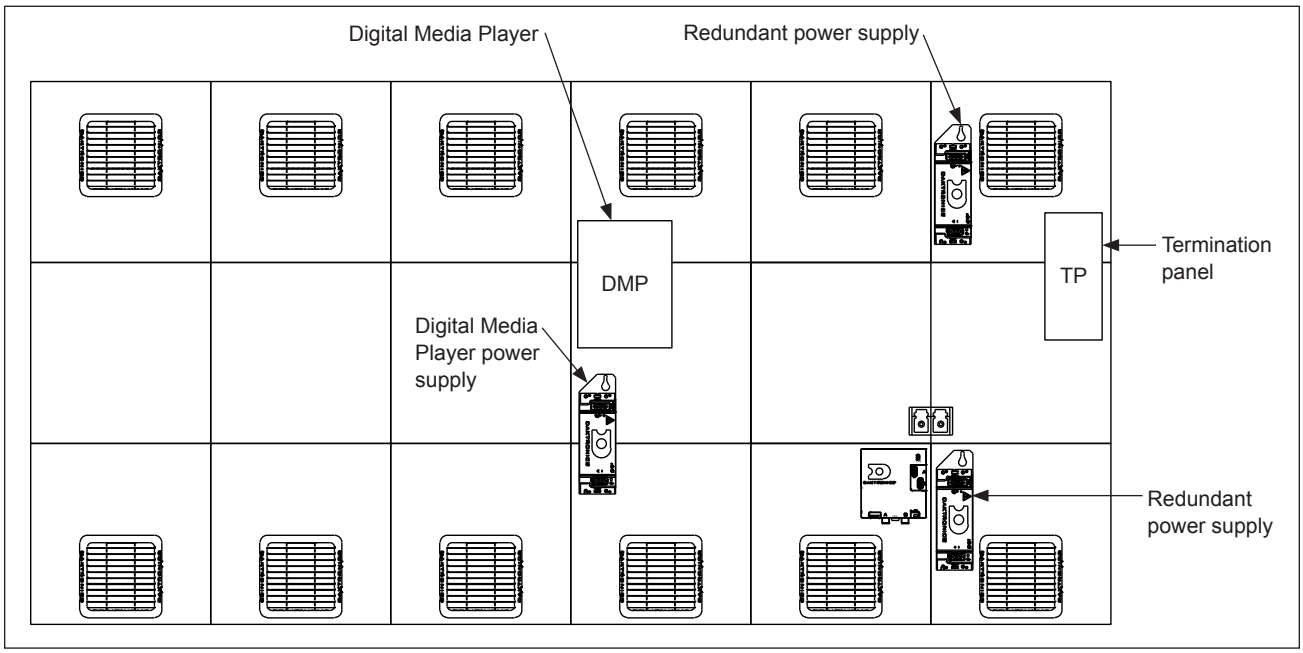


Figure 56: *Typical DVX-1100/1800 Component Layout*

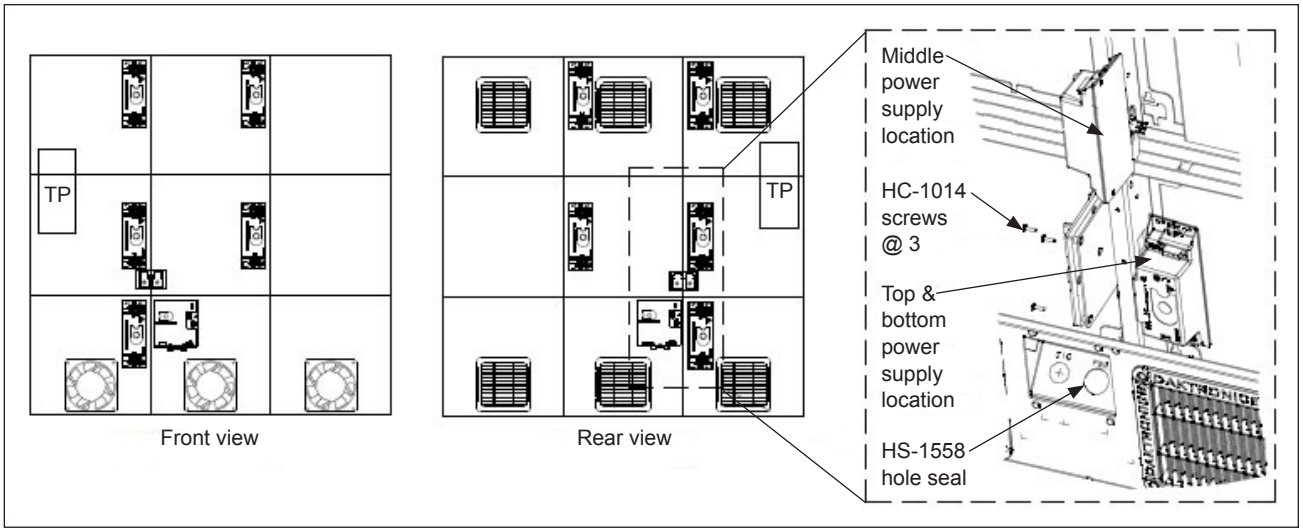


Figure 57: *Typical DVX-1500 Component Layout*

DVX-1100/1500

Front Access

To remove a component, follow the steps below while referring to the Layout Drawings in **Appendix A**, **Figure 56** (DVX-1100), and **Figure 57** (DVX-1500):

1. Disconnect power to the display.
2. Use a $^{1}/_{8}$-inch Allen wrench to gently remove the module from the display.
3. Use a $^{5}/_{16}$-inch nutdriver to loosen the set screw holding the mounting plate to the display.
4. Detach the cables and gently remove the component from the display.

Reverse these steps to install a new component, always disconnecting power to the display first. Securely tighten the mounting screw.

Rear Access

To remove a component, follow the steps below while referring to the Layout Drawings in **Appendix A**, **Figure 56** (DVX-1100), and **Figure 57** (DVX-1500):

1. Disconnect power to the display.
2. Loosen and remove the access door. Refer to **Section 4.2**.
3. Use a $^{5}/_{16}$-inch nutdriver to loosen the set screw holding the mounting plate to the display.
4. Detach the cables and gently remove the component from the display.

Reverse these steps to install a new component, always disconnecting power to the display first. Securely tighten the mounting screw.

Front Access

To remove a component, follow the steps below while referring to the Layout Drawings in **Appendix A** and **Figure 57**):

1. Disconnect power to the display.

2. Position the module removal tool so the arrows on the handle are pointing up. Use slight thumb pressure to insert the tool into the module until it clicks. Refer to **Figure 58**.

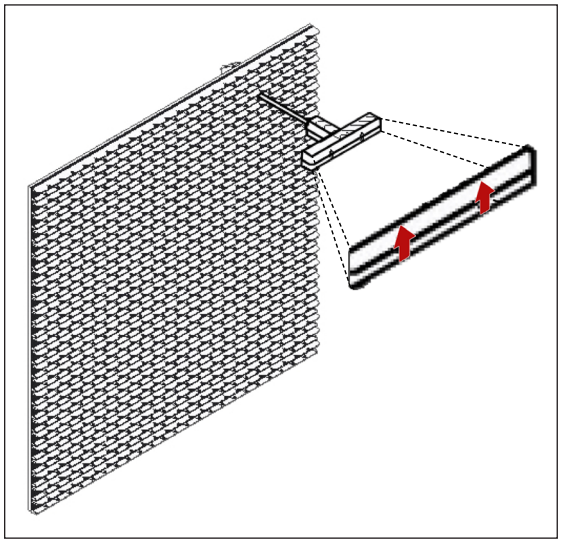


Figure 58: *Front-Access Latch Release*

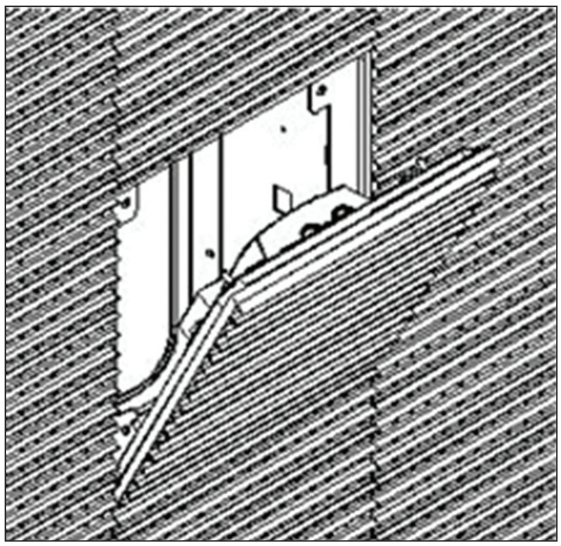


Figure 59: *Front-Access Angle*

3. Pull the module from the display just far enough to reach around to the back of the unit. Turn the tool so the arrows on the handle are pointing down and remove it from the module. Refer to **Figure 59**.

   Note: When performing Step 4, take care not to damage the louver by tilting the module at too severe an angle.

4. Attach the safety lanyard to the rings on the top of the module to prevent the module from falling if dropped. Refer to **Figure 60** and **Figure 61**.

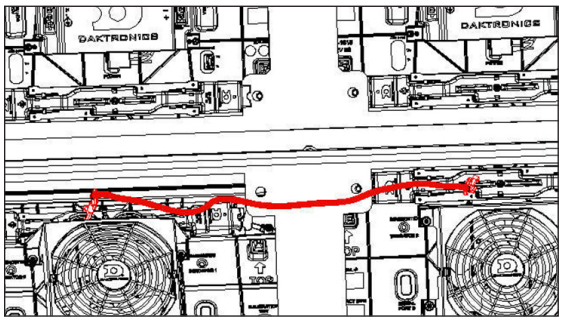


Figure 60: *Safety Lanyard Attached to Rings*

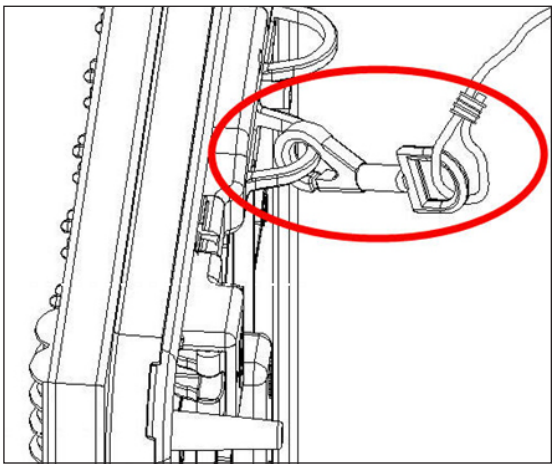


Figure 61: *Safety Lanyard*

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

Reverse these steps to install a new component in a display, always disconnecting the power to the display first.

Rear-Access

To remove a component, follow the steps below while referring to the Layout Drawings in **Appendix A** and **Figure 57**):

1. Disconnect power to the display.
2. Loosen and remove the access door. Refer to **Section 4.2**.
3. Use a $^{5}/_{16}$-inch nutdriver to loosen the set screw holding the mounting plate to the display.
4. Detach the cables and gently remove the component from the display.

Reverse these steps to install a new component in a display, always disconnecting the power to the display first. Securely tighten the mounting screw.

4.5 Module

DVX-1100/1500

Figure 62 and **Figure 63** show a front and rear view of the module.

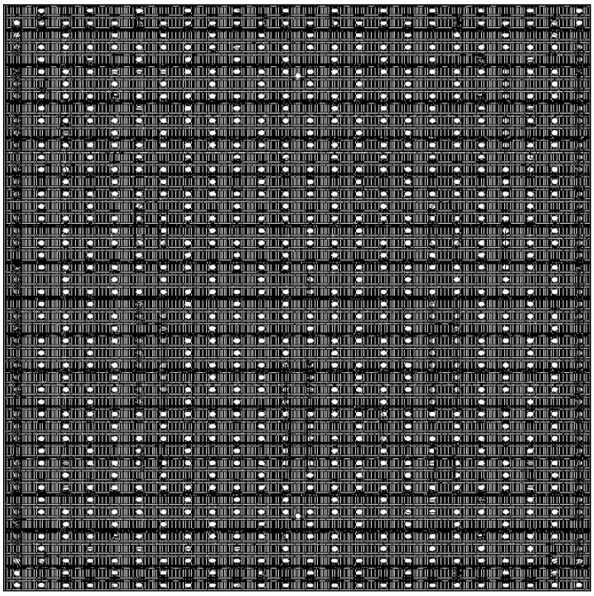


Figure 62: *Module Front*

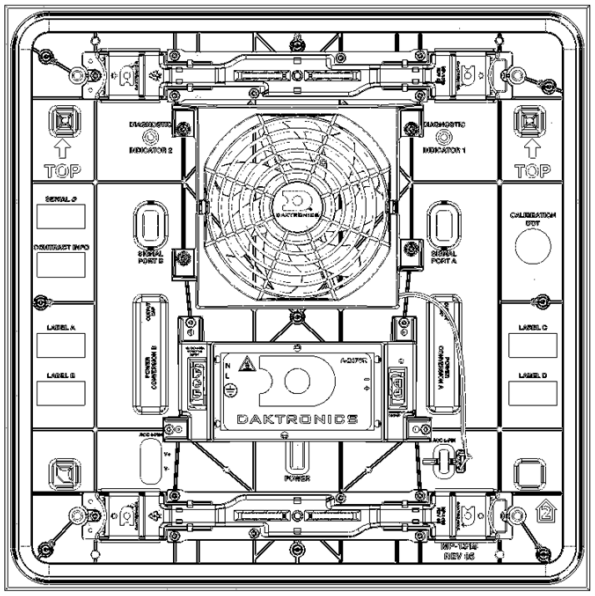


Figure 63: *Module Rear*

Front Access

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

1. Disconnect power to the display.
2. Use a $^{1}/_{8}$-inch Allen wrench to turn the top and bottom latch release a $^{1}/_{4}$ turn counterclockwise.
3. Pull the module from the display just far enough to reach around to the back of the unit. 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.
4. Disconnect the power and signal cables from the rear of the module.

Reverse these steps to install a module in a front-access display.

Rear Access

Depending on display configuration, a power supply and/or ProLink Router (PLR) board may need to be removed in order to access a module from the rear.

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

1. Remove the access panels to open the display from the rear. Refer to **Section 4.2**.

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

3. 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.

4. Disengage the upper and lower latch release on the back of the module so the spring clips push the module from the face of the display. Maintain a firm grip on the unit and use the safety lanyard provided. With a $^{1}/_{4}$-inch flathead screwdriver, turn the top and bottom latch release a $^{1}/_{4}$ turn clockwise.

5. Maintain a firm grip on the module, push it through the front of the display, and rotate it in a manner that allows it to be pulled back through its frame opening.

Reverse these steps to install a module in a rear-access display.

DVX-1800

Figure 64 and **Figure 65** show a front and rear view of the module.

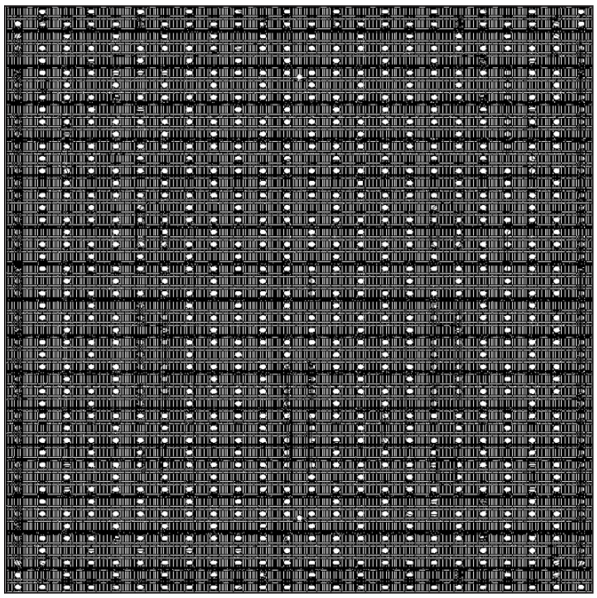


Figure 64: *Module Front*

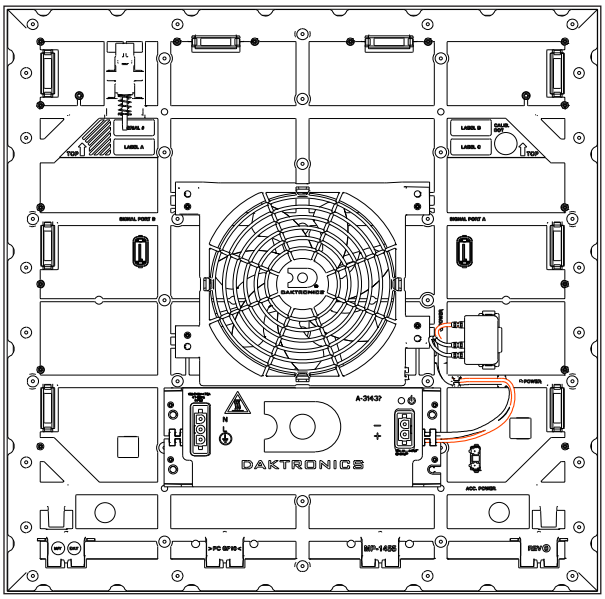


Figure 65: *Module Rear*

Front Access

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

1. Disconnect power to the display.
2. Position the module removal tool so the arrows on the handle are pointing up. Refer to **Figure 66**. Use slight thumb pressure to insert the tool into the module until it clicks. Refer to **Figure 58**.
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 tool so the arrows on the handle are pointing down and remove it from the module. Refer to **Figure 59**.

   Note: When performing Step 3, take care not to damage the louver by tilting the module at too severe an 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. Refer to **Figure 60** and **Figure 61**.
5. Disconnect the power and signal cables from the rear of the module.

Figure 66: *Access Tool*

Reverse these steps to install a module in a display.

Rear Access

Depending on display configuration, a power supply and/or ProLink router (PLR) board may need to be removed in order to access a module from the rear.

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

1. Remove the access panels to open the display from the rear. Refer to **Section 4.2**.
2. Disconnect the power and signal cables from the rear of the module.
3. 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. Refer to **Figure 60** and **Figure 61**.
4. Squeeze the orange latch release in the upper-left corner lightly until the latch clears the face sheet. Refer to **Figure 67**.

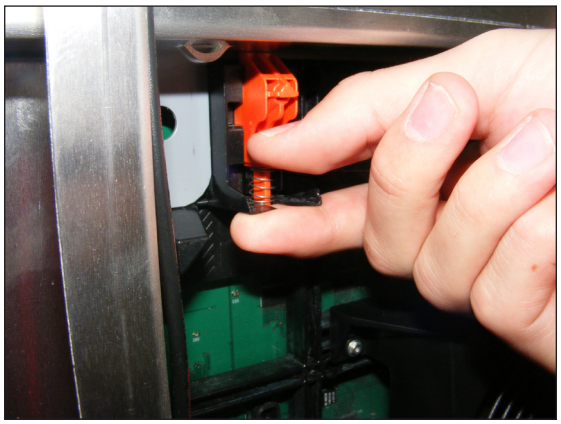
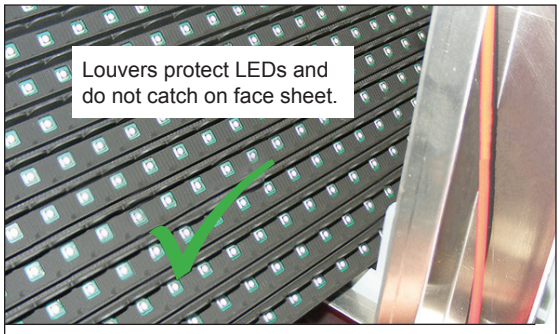


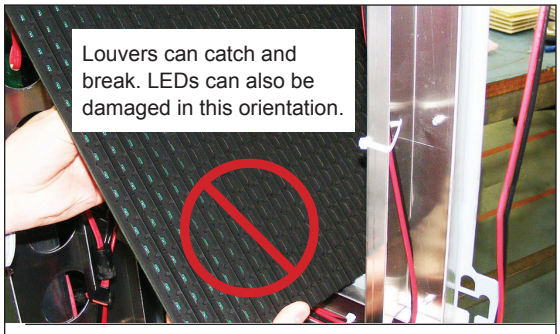
Figure 67: *Rear Latch Release*

5. Maintain a firm grip on the module and carefully push it away from the front of the display. Lift the module up and away from the face sheet. Rotate it in a manner that allows it to be pulled back through its frame opening. Refer to **Figure 68** and **Figure 69** for details on proper handling.



Proper orientation for service
Module easily moves in and out of face sheet cutout

Figure 68: *Proper Orientation for Service*



Improper orientation for service
Louvers catch on face sheet cutout

Figure 69: *Improper Orientation for Service*

Reverse these steps to install a module in a rear-access display.

4.6 Ventilation Systems

This display is filterless. Inspect the display for excess dust or debris during scheduled maintenance. If there is excess dust or debris, filters can be added. If needed, contact Customer Support at 1-800-325-8766.

Ventilation Maintenance

Each section of the display has upper and lower openings for air circulation and vents. The fans are located behind the lower openings. They pull air into the cabinet and then force the air up and across the electronic components, then out through the upper opening.

Fans should be checked during the pre-season inspection and during scheduled maintenance. To check the fan operation, hold a piece of lightweight paper up to the vent opening that incorporates the fan to detect air movement. If the fan does not rotate or does not operate smoothly, replace it.

After replacing 10 percent of the fans, Daktronics recommends replacing all cooling fans to reduce the associated maintenance costs that may incur with increased heat buildup from fan failure.

Filter Maintenance (If Applicable)

Shut off power to the display when not in use. If the power is left on when the display is not operating, the filters will need to be cleaned and replaced more often.

Check the display ventilation fans and filters after 1,500 hours of operation and every 1,500 hours after to ensure the display cools properly. Check the fans and filters more often if the display is located in a dusty or harsh weather environment (e.g. along a gravel road with dust-laden air).

- 1,500 hours is equivalent to 83 days if the display operates for 18 hours a day, and the power to the display is turned off when not in use.
- 1,500 hours is equivalent to 62 days if the display runs non-stop for 24 hours a day.

To check the fan operation, use the procedure above.

Filters are either disposable or cleanable. After one year or 1,500 hours of operation, remove the filter and replace it with a new filter or clean the existing filter. If the display has cleanable filters, clean the filters with water and a mild detergent, such as dish soap. Compressed air can also be used to clean the filters if these criteria are met:

- The nozzle is held at least six inches away from the filter.
- The pressure is no greater than 60 psi.
- The air is blown through the filter in the opposite direction from which air normally flows. The arrow on the filter indicates the downstream side of the filter.

The filter in the upper opening may not need to be changed or cleaned because the air moving through it has already been filtered. Please check this filter each year or every 1,500 hours of operation to ensure the filter does not need to be replaced or cleaned. For information on ordering replacement filters, refer to the replacement parts list in **Section 5.1**. Failure to change or clean the filters may cause the display to overheat, decreasing the display life. If the display provides rear access only, remove the back panels to service the fans and filters.

4.7 Structural Inspection

Perform annual visual inspections of the display to facilitate problem repairs and to lengthen display life.

- Check for paint and possible corrosion, especially at structural tie points and on ground rods.
- Check, tighten, and replace the fasteners as required.
- Check the electronic components closely for signs of corrosion.
- Check the inside of the display at least once a year for signs of water intrusion (i.e. water stain marks). Water can enter a display where weather stripping has loosened or deteriorated, where fasteners have loosened, allowing gaps in the panels, or where moisture may enter around the hardware in the top of the display.

4.8 Troubleshooting

Reference Documents:

PLR 6X5X Installation & Maintenance Manual **DD1735784**
MOD.PL50.04.PAV0K Module Manual..... **DD1782180**
VIP-4060 Operator's Manual **DD1804047**
MOD.PL51.09.PAV0 Module Manual **DD2508554**

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 ProLink Router (PLR). • Perform a module self-test. Refer to the **DD1782180** MOD.PL50.04PAV0K Module Manual (DVX-1100/1500) or the **DD2508554** MOD.PL51.09PAV0 Module Manual (DVX-1800) for instructions.

Display Problem	Troubleshooting Steps
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 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 **DD1804047** VIP 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.

Section 5: Replacement Parts

5.1 Replacement Parts List

Part Description	Part Number
Temperature sensor	0A-1151-0010
Photo sensor	0A-1327-3018
Vent panel	0A-1446-1998
Toolkit	0A-1730-0001
34-piece interconnect kit	0A-1730-0010
ProLink Router (PLR)	0P-1525-0004
Fan	B-1072
Filter (if applicable)	EN-2345
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 the following:**

   - 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.

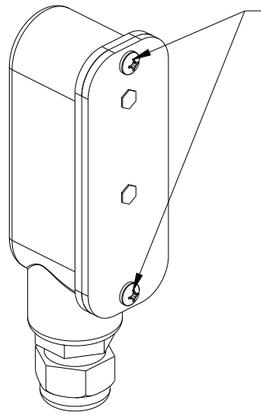
Video Image Processor (VIP): an interface that drives video to the display while also dimming, providing gamma and color controls, and displaying test patterns.

Appendix A: Drawings

Refer to Section 1.2 for information regarding how to read the drawing number.

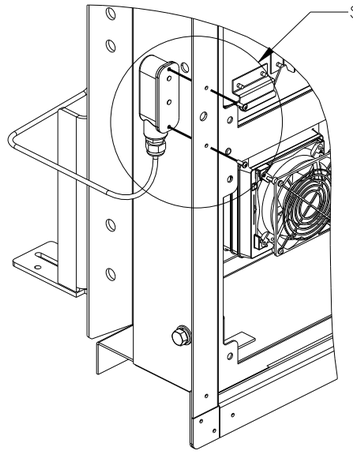
These drawings offer general information pertaining to most DVX displays and are listed in alphanumeric order. Any contract-specific drawings take precedence over the general drawings.

Light Sensor Mount to Border, DVX ..... **Drawing B-1094485**
Block Diagram; VAC/VDC Harn, Quad & Dual, 3-High ..... **Drawing B-1117834**
Block Diagram; VAC/VDC Harn, Quad & Dual, 4-High ..... **Drawing B-1117835**
Layout; Component Placement & Signal Harness, 4-High ..... **Drawing B-1118677**
Block Diagram; VAC/VDC Harn, Quad & Dual, 2-High ..... **Drawing B-1122027**
Block Diagram; DVX-1800 w/Embedded Controller ..... **Drawing B-1122420**
Cabinet Fiber Layout; DVX-1800 ..... **Drawing B-1122479**
Layout; Component Placement & Signal Harness, 3-High ..... **Drawing B-1122530**
Layout; Component Placement & Signal Harness, 2-High ..... **Drawing B-1122554**
Layout; DVX-1800 w/Embedded Control ..... **Drawing B-1122645**
Power Entrance; Field Conduit Location ..... **Drawing B-1123507**
Power Entrance; Field Termination Detail ..... **Drawing B-1123982**
Layout & Block Diagram, 3x3 ..... **Drawing B-1132791**

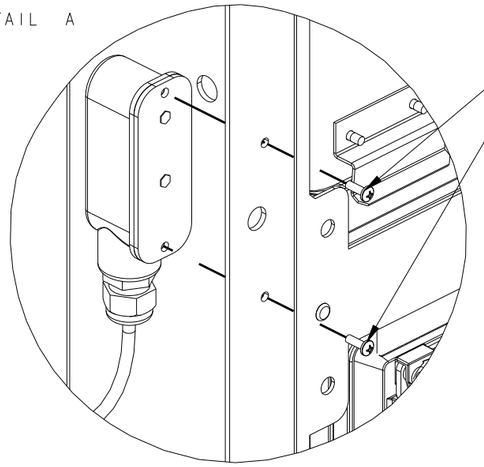


0A-1327-3016
LIGHT SENSOR ASSEMBLY WILL ARRIVE WITH HC-1144 (#8-32 X 0.500) MACHINE SCREWS ASSEMBLED INTO FRONT OF ASSY.

ROTATED FRONT VIEW LIGHT SENSOR ASSEMBLY
SCALE 1/2

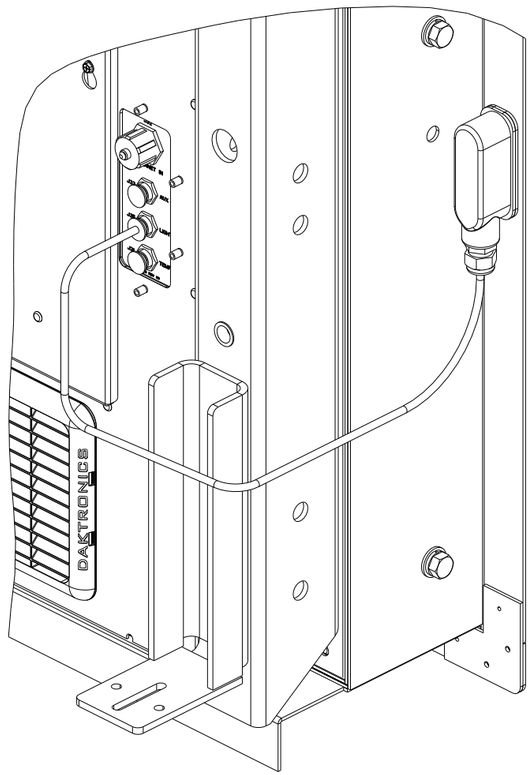


FRONT ROTATED VIEW LIGHT SENSOR TO BORDER EXPLODED



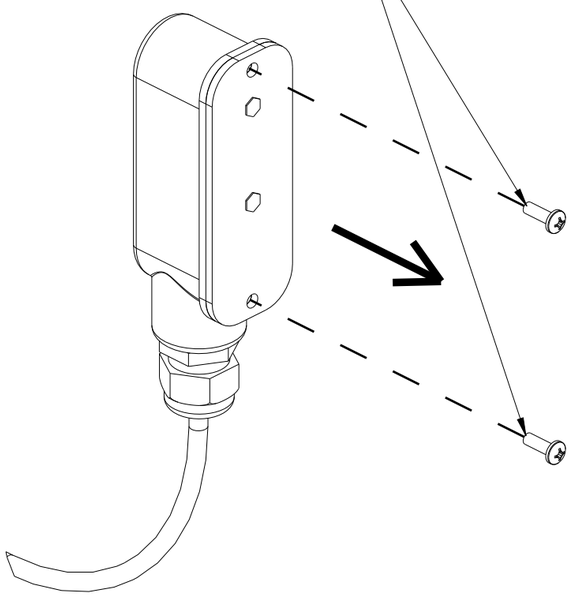
HC-1144 SCREWS ⌀2
FROM 0A-1327-3016 REUSED TO ATTACH SENSOR TO BORDER

DETAIL A
SCALE 1/3

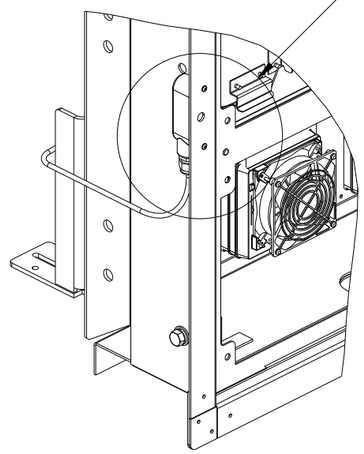


ROTATED REAR VIEW LIGHT SENSOR ASSEMBLED
SCALE 1/5

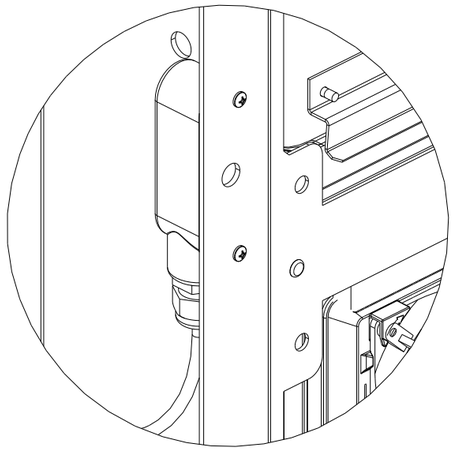
THESE SCREWS WILL NEED TO BE REMOVED TEMPORARILY IN ORDER TO BE ATTACHED TO BORDER.



ROTATED FRONT VIEW LIGHT SENSOR SCREWS REMOVED
SCALE 1/2



FRONT ROTATED VIEW LIGHT SENSOR TO BORDER ASSEMBLED



DETAIL B
SCALE 1/3

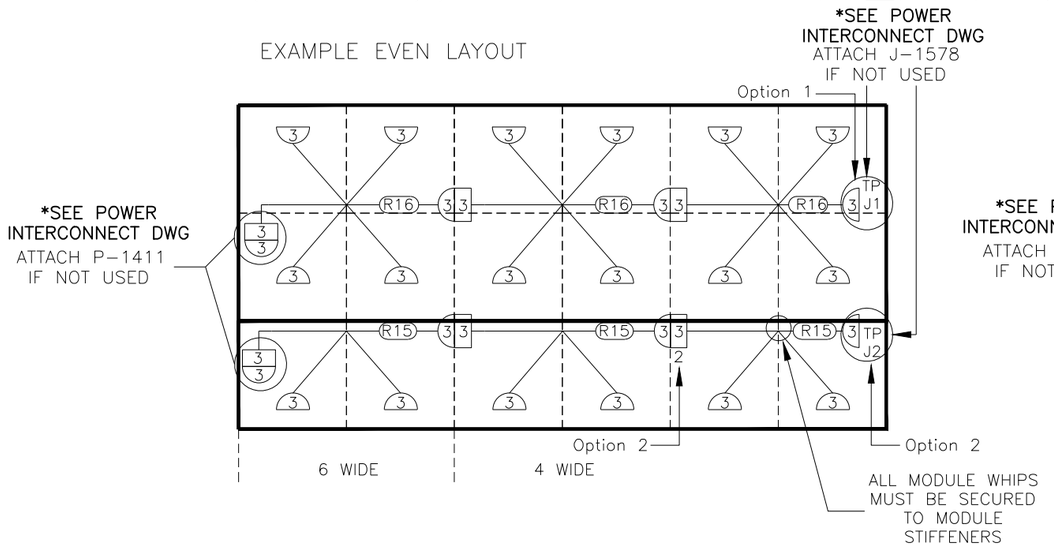
REV	DATE:		BY:	

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

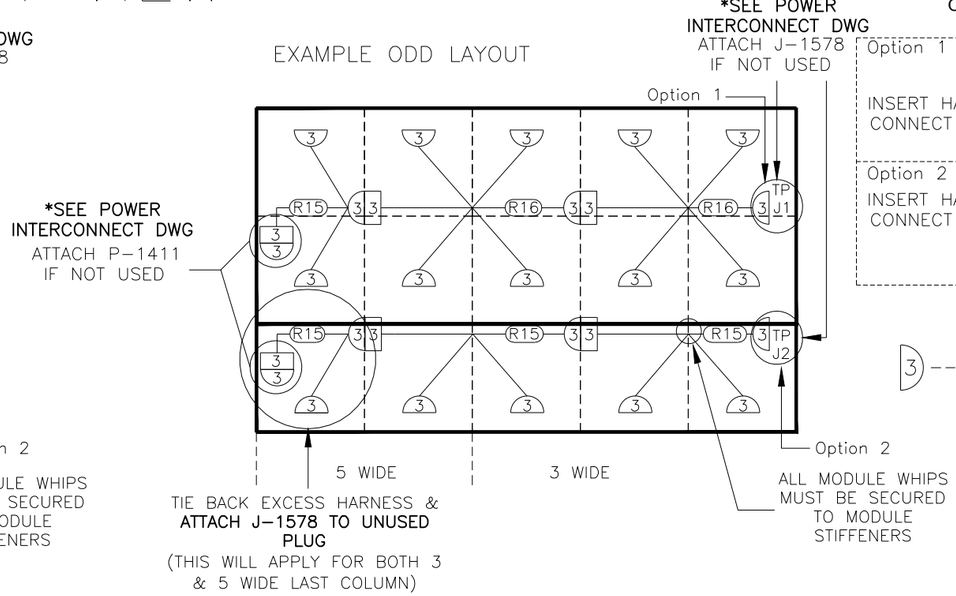
PROJ: DVX PRODUCT DEVELOPMENT, GEN3				
TITLE: LIGHT SENSOR MOUNT TO BORDER, DVX				
DESIGN: RSOUKUP	DRAWN: RSOUKUP			DATE: 19-APR-12
SCALE: 1-8				
SHEET:	REV	JOB NO:	FUNC-TYPE-SIZE	1094485
1 OF 1	00	P 1678	E-10-B	

3 HIGH VAC (Primary) REAR VIEW

EXAMPLE EVEN LAYOUT

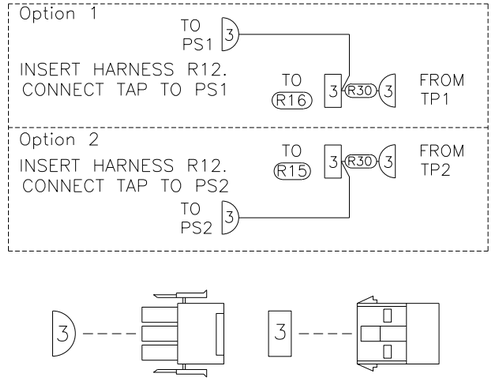


EXAMPLE ODD LAYOUT



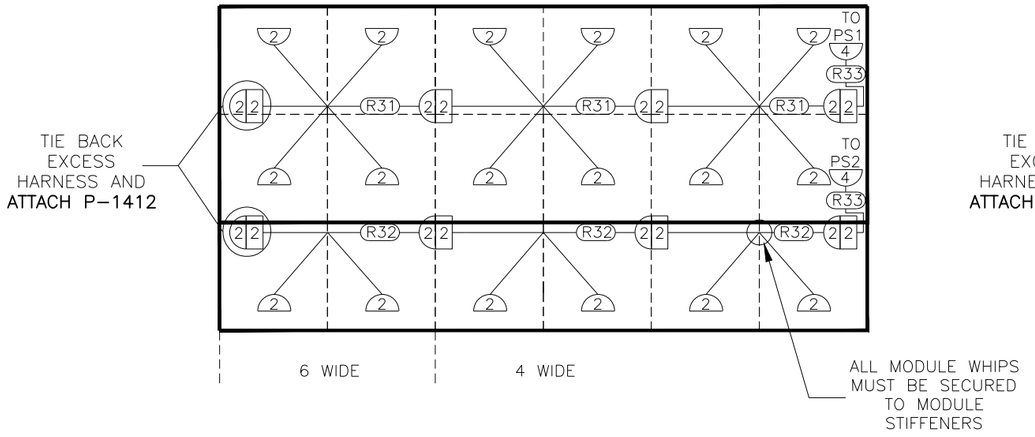
"Optional"

ONLY USED WITH VDC REDUNDANT AND DMP POWER SUPPLIES

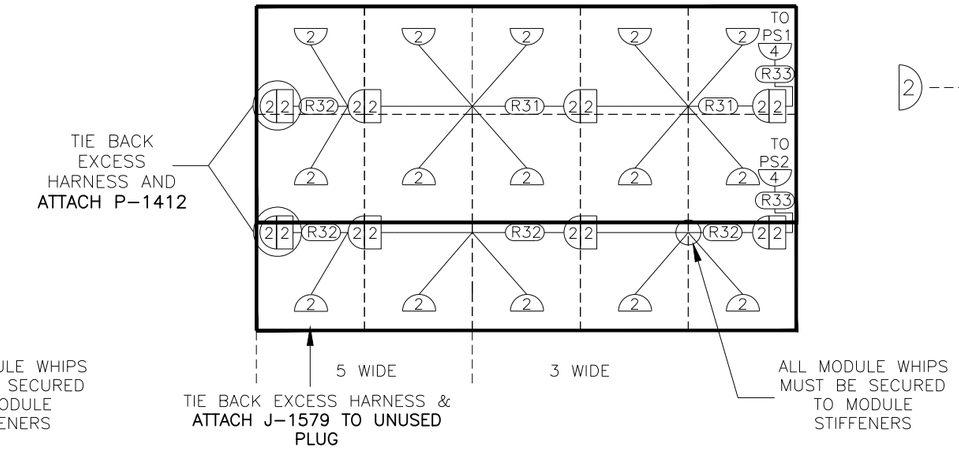


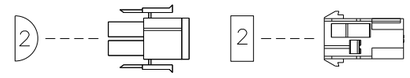
3 HIGH VDC (Redundant)"Optional" REAR VIEW

EXAMPLE EVEN LAYOUT



EXAMPLE ODD LAYOUT





PART NUMBERS

- (R15) W-2346 HARNESS;AC PWR,65W,2MOD,29",CNTR TAP, RVS
- (R16) W-2347 HARNESS;AC PWR,65W,4MOD,29",CNTR TAP, RVS
- (R30) W-2556 HARNESS; 3F TO 3M MNL,12AWG,6",W/3P M MNL WHIP
- (R32) W-2558 HARN; PWR, 65W RD, 2MOD, 2 PIN, 29", CNTR TAP, RVS
- (R31) W-2557 HARN; PWR, 65W RD, 4MOD, 2 PIN, 29", CNTR TAP, RVS
- (R33) W-2559 HARNESS; 2 PIN F MNL TO 4 PIN F MNL

REV	DATE:		BY:
01	25 MAR 13	UPDATED PER PREPOD FEEDBACK	ADH

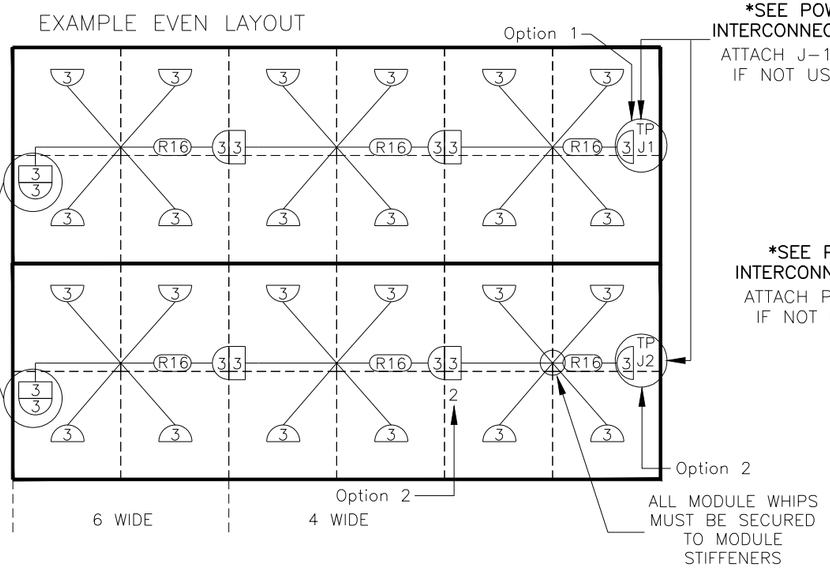
DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

PROJ: DVX-1800/1100
TITLE: BLOCK DAIGRAM; VAC/VDC HARN, QUAD & DUAL, 3-HIGH
DESIGN: AHOWARD | DRAWN: AHOWARD | DATE: 31 OCT 12
SCALE: NTS

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	01	P1730	R - 01 - B	1117834

4 HIGH VAC (Primary) REAR VIEW

EXAMPLE EVEN LAYOUT

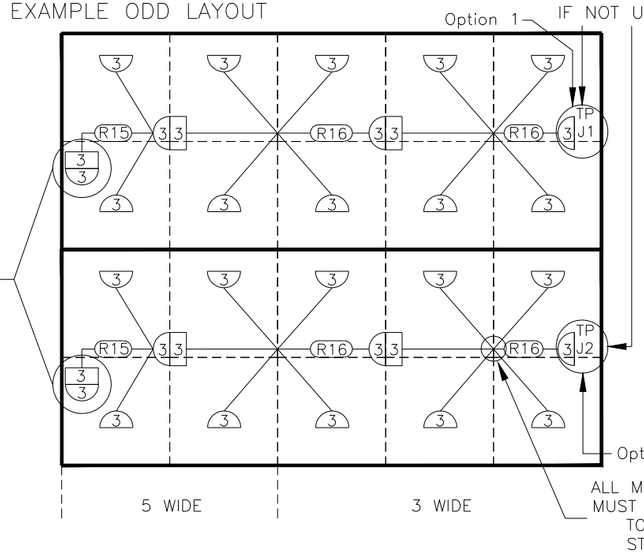


*SEE POWER INTERCONNECT DWG
ATTACH P–1411
IF NOT USED

*SEE POWER INTERCONNECT DWG
ATTACH J–1578
IF NOT USED

ALL MODULE WHIPS MUST BE SECURED TO MODULE STIFFENERS

EXAMPLE ODD LAYOUT



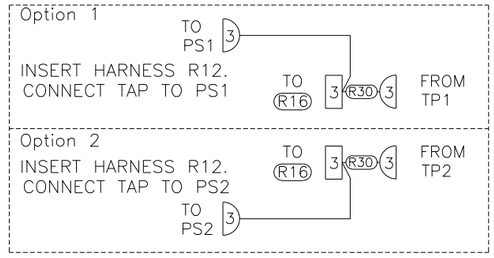
*SEE POWER INTERCONNECT DWG
ATTACH P–1411
IF NOT USED

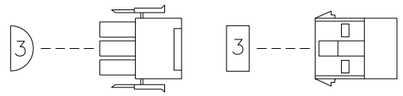
*SEE POWER INTERCONNECT DWG
ATTACH J–1578
IF NOT USED

ALL MODULE WHIPS MUST BE SECURED TO MODULE STIFFENERS

”Optional”

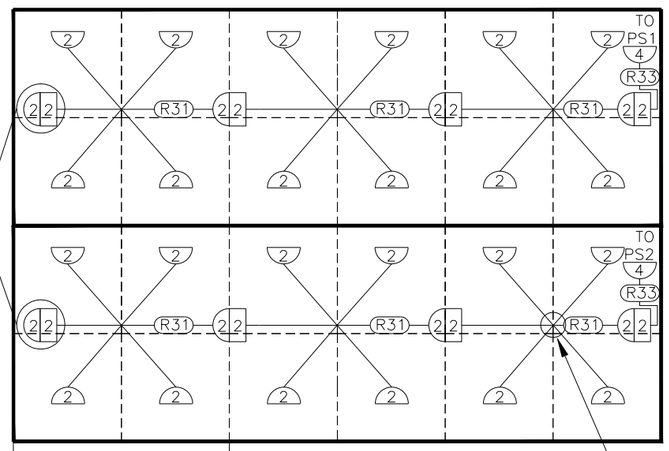
ONLY USED WITH VDC REDUNDANT AND DMP POWER SUPPLIES





4 HIGH VDC (Redundant)”Optional” REAR VIEW

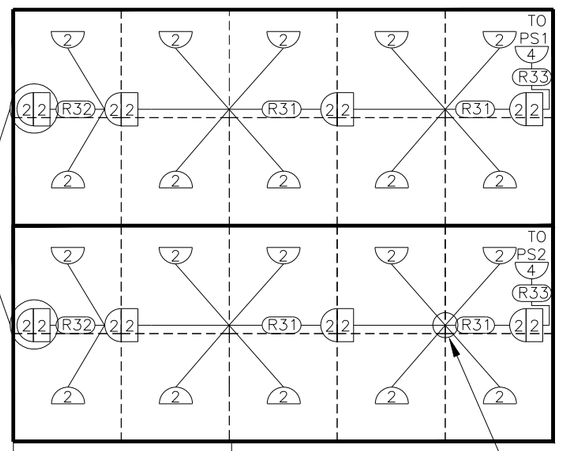
EXAMPLE EVEN LAYOUT



TIE BACK EXCESS HARNESS AND ATTACH P–1412

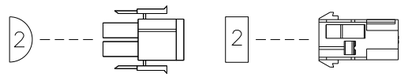
ALL MODULE WHIPS MUST BE SECURED TO MODULE STIFFENERS

EXAMPLE ODD LAYOUT



TIE BACK EXCESS HARNESS AND ATTACH P–1412

ALL MODULE WHIPS MUST BE SECURED TO MODULE STIFFENERS



PART NUMBERS

- (R15) W–2346 HARNESS;AC PWR,65W,2MOD,29”,CNTR TAP, RVS
- (R16) W–2347 HARNESS;AC PWR,65W,4MOD,29”,CNTR TAP, RVS
- (R30) W–2556 HARNESS; 3F TO 3M MNL,12AWG,6”,W/3P M MNL WHIP
- (R32) W–2558 HARN; PWR, 65W RD, 2MOD, 2 PIN, 29”, CNTR TAP, RVS
- (R31) W–2557 HARN; PWR, 65W RD, 4MOD, 2 PIN, 29”, CNTR TAP, RVS
- (R33) W–2559 HARNESS; 2 PIN F MNL TO 4 PIN F MNL

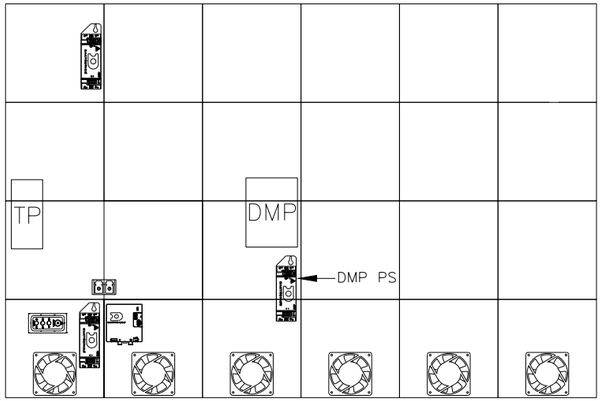
REV	DATE:	UPDATED PER PREPOD FEEDBACK	BY:
01	25 MAR 13		ADH

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

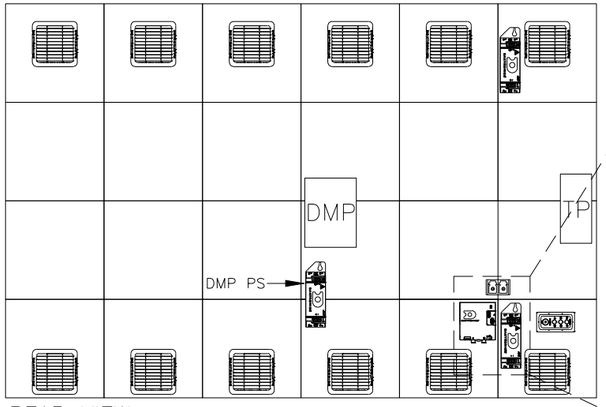
PROJ: DVX-1800/1100			
TITLE: BLOCK DIAGRAM; VAC/VDC HARN, QUAD & DUAL, 4-HIGH			
DESIGN: AHOWARD	DRAWN: AHOWARD	DATE: 31 OCT 12	
SCALE: NTS			

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	01	P1730	R - 01 - B	1117835

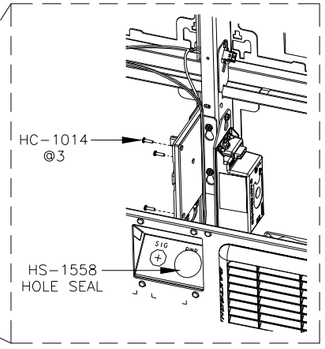
EXAMPLE LAYOUT



FRONT VIEW

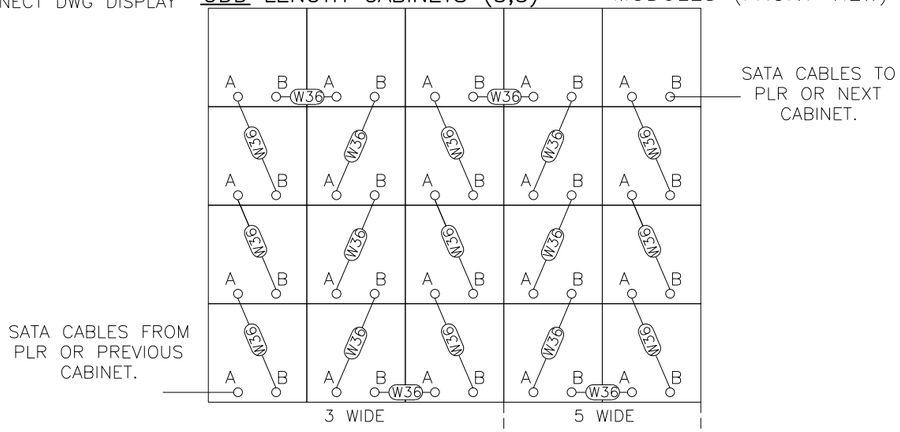


REAR VIEW

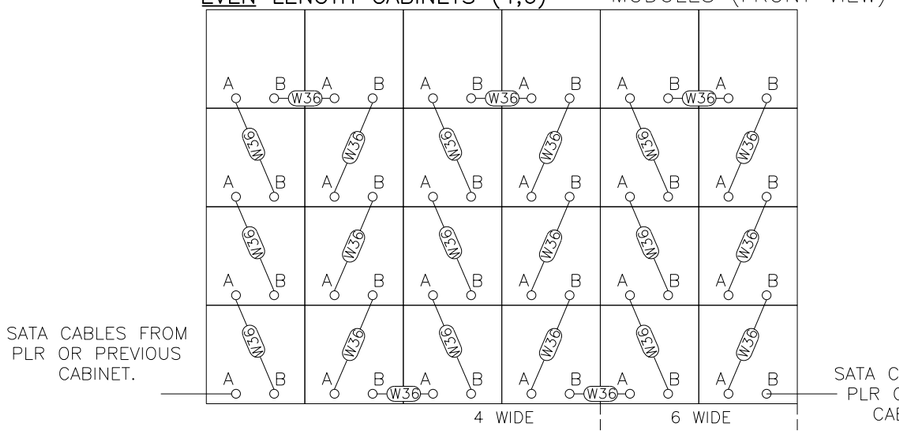


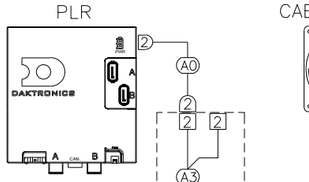
NOTE: REFERENCE SIGNAL INTERCONNECT DWG DISPLAY SPECIFIC

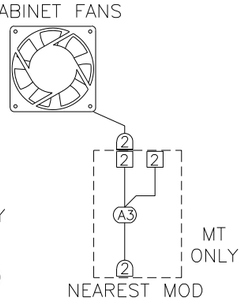
ODD LENGTH CABINETS (3,5) MODULES (FRONT VIEW)



EVEN LENGTH CABINETS (4,6) MODULES (FRONT VIEW)







CONFIGURABLE COMPONENTS

		MOUNTING HARDWARE
	CABINET FAN B-1072	NONE
	QUICK CONNECT 0M-1098905	HC-1354 @6 TORQUE 27.5 IN-LBS
DMP	DMP-8065	HC-1763 @1 TORQUE 27.5 IN-LBS
	REDUNDANT POWER SUPPLY / DMP POWER SUPPLY	HC-1763 @1 TORQUE 27.5 IN-LBS

		MOUNTING HARDWARE
TP	TERM PANEL	HC-1763 @ 1, TORQUE 27.5 IN-LBS
	PROLINK ROUTER 0P-1525-0004	HC-1014 @3, TORQUE 5 IN-LBS
	PLR MTG PLATE 0M-1120785	HC-1763 @2, TORQUE 27.5 IN-LBS
	FIBER COUPLER DUAL LC J-1435	NONE

(W36) W-2410
CABLE; SATA PLUG TO SATA PLUG, 28 INCHES, CROSSOVER

(A0) W-2152
CABLE; SLC PLUG TO SLC PLUG, 36", 18AWG, PLATFORM

(A3) W-2154
HARNESS; PWR, 18 AWG Y, SLC PLUG TO (2) SLC JACK

NOTE: NO MORE THAN ONE Y CABLE PER MODULE ACCESSORY JACK

REV	DATE:		BY:
01	25 MAR 13	ADDED MT ONLY NOTE ADDED PART NUMBERS	ADH

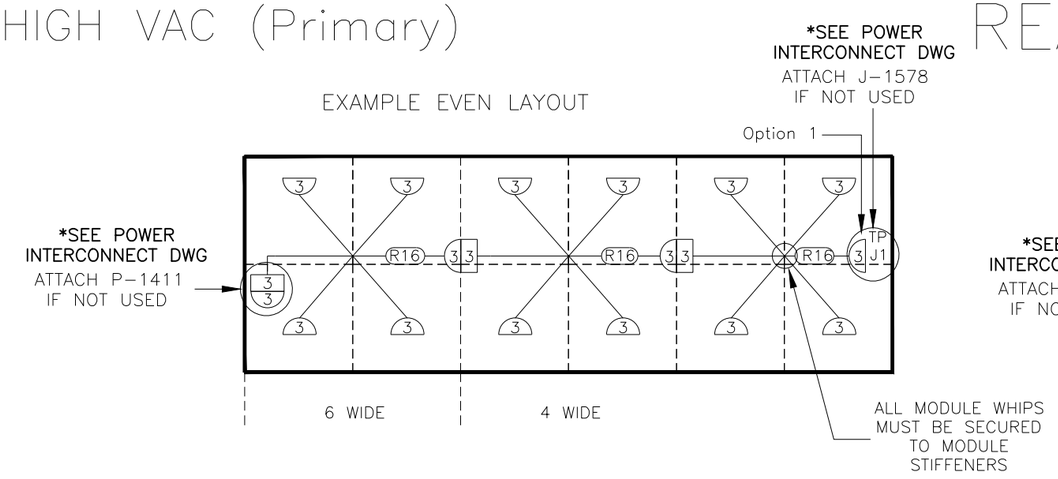
DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

PROJ: DVX-1800/1100
TITLE: LAYOUT; COMPONENT PLACEMENT & SIGNAL HARNESS, 4-HIGH
DESIGN: AHOWARD | DRAWN: AHOWARD | DATE: 09 NOV 12
SCALE: NTS

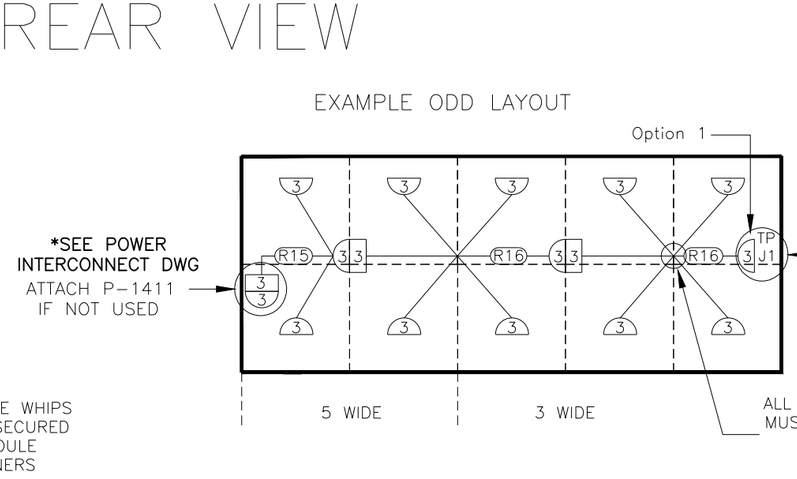
SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	01	P1730	F - 01 - B	1118677

2 HIGH VAC (Primary) REAR VIEW

EXAMPLE EVEN LAYOUT

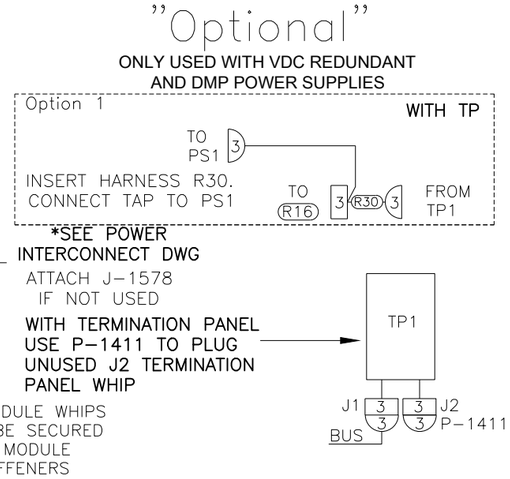


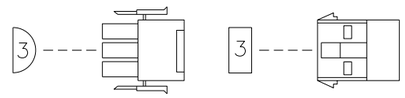
EXAMPLE ODD LAYOUT



"Optional"

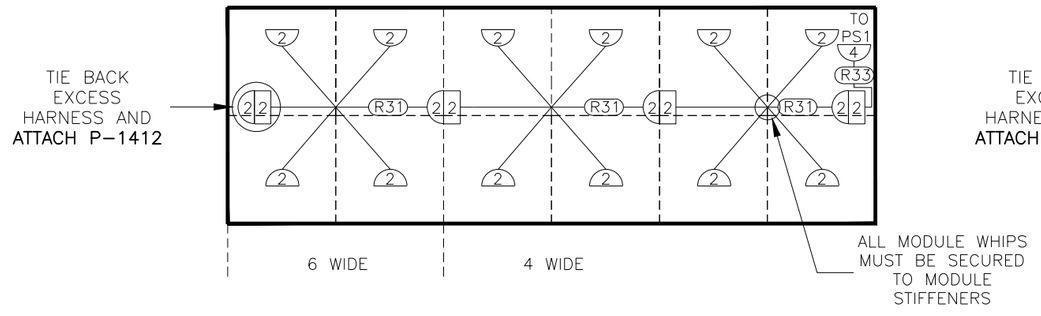
ONLY USED WITH VDC REDUNDANT AND DMP POWER SUPPLIES



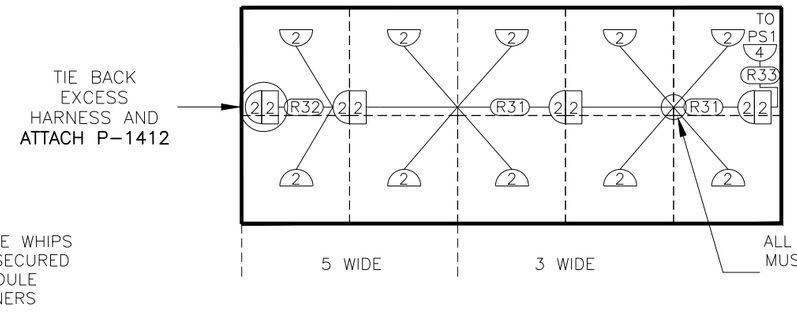


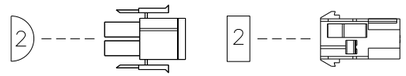
2 HIGH VDC (Redundant)"Optional" REAR VIEW

EXAMPLE EVEN LAYOUT



EXAMPLE ODD LAYOUT





PART NUMBERS

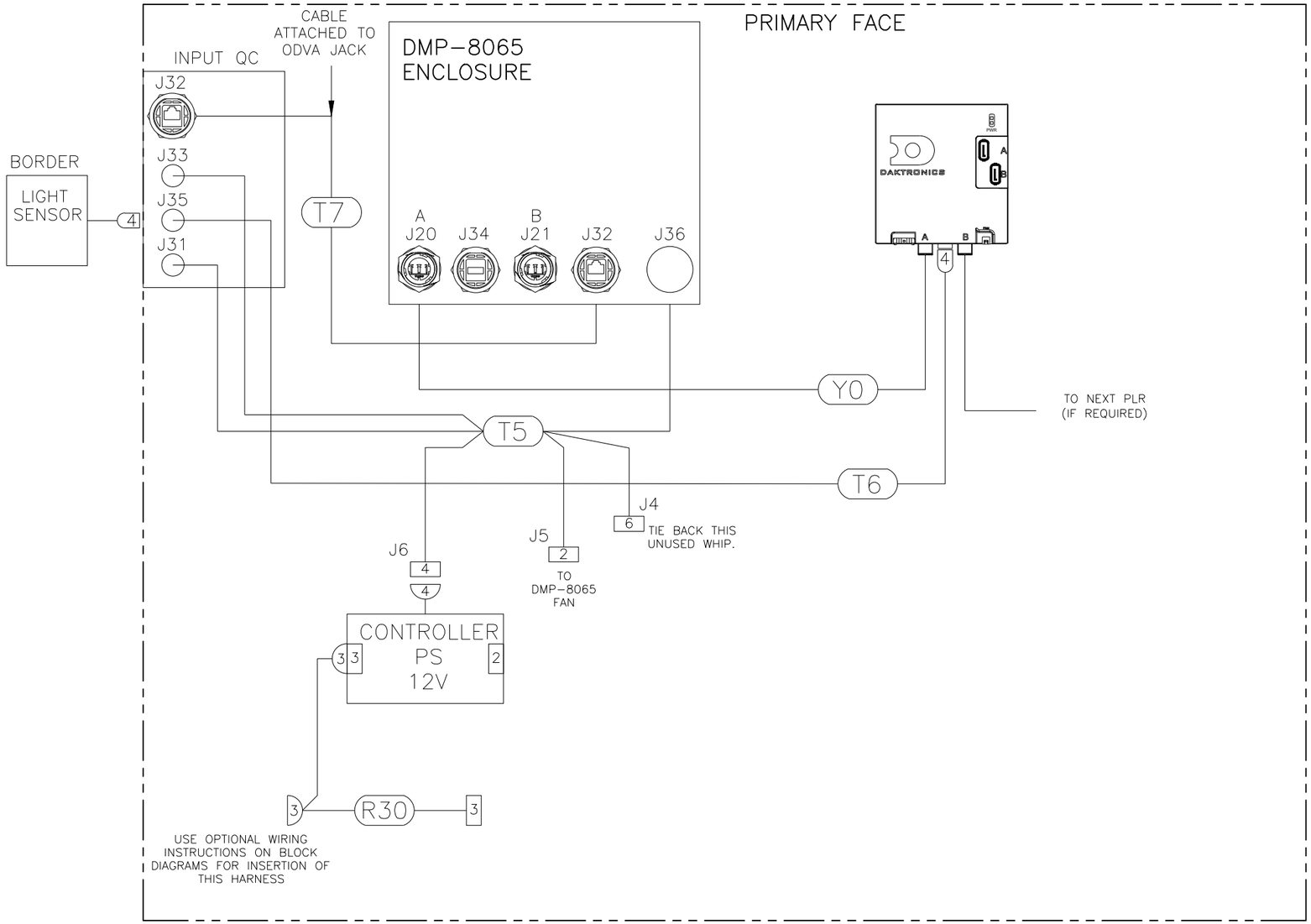
- (R15) W-2346 HARNESS;AC PWR,65W,2MOD,29",CNTR TAP, RVS
- (R16) W-2347 HARNESS;AC PWR,65W,4MOD,29",CNTR TAP, RVS
- (R30) W-2556 HARNESS; 3F TO 3M MNL,12AWG,6",W/3P M MNL WHIP
- (R32) W-2558 HARN; PWR, 65W RD, 2MOD, 2 PIN, 29", CNTR TAP, RVS
- (R31) W-2557 HARN; PWR, 65W RD, 4MOD, 2 PIN, 29", CNTR TAP, RVS
- (R33) W-2559 HARNESS; 2 PIN F MNL TO 4 PIN F MNL

REV	DATE:		BY:
01	25 MAR 13	UPDATED PER PREPOD FEEDBACK	ADH

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

PROJ: DVX-1800/1100			
TITLE: BLOCK DIAGRAM; VAC/VDC HARN, QUAD & DUAL, 2-HIGH			
DESIGN: AHOWARD	DRAWN: AHOWARD	DATE: 14 DEC 12	
SCALE: NTS			

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	01	P1730	R - 01 - B	1122027



HARNESS – REFER TO BOM FOR QTY

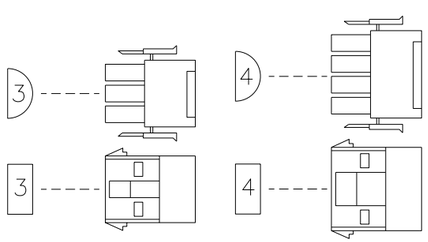
(R30) W–2556
HARN, 3F MNL 3M MNL, 12AWG, 6", W/3M MNL WHIPS @2

(T5) W–2499
HARN, 20 PIN DMP–8065 BREAKOUT, M12 CAN, DVX/GP3

(T6) W–2497
M12 CONNECTOR TO MMNL 4PIN, 3FT, DWG–1095280

(T7) W–2560
CABLE; 3FT ETHERNET CABLE W/ CABLE ODVA

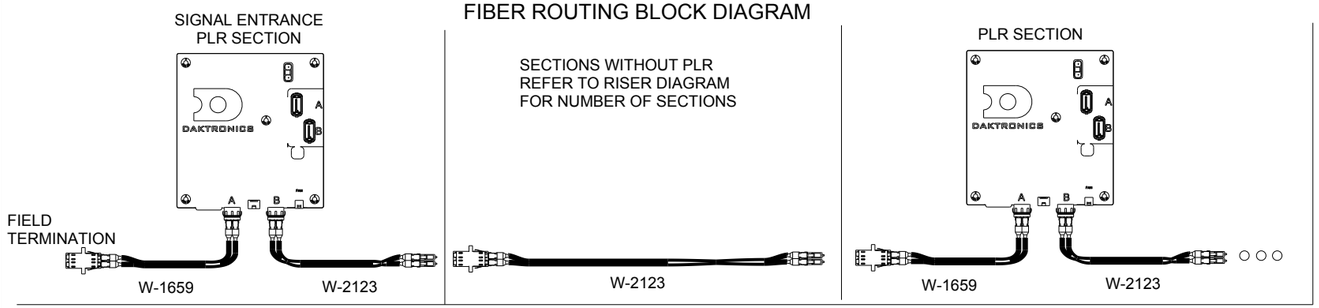
(Y0) W–1659
FIBER; DUPLEX PATCH, 50UM 10GIG LC–LC, 3'



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

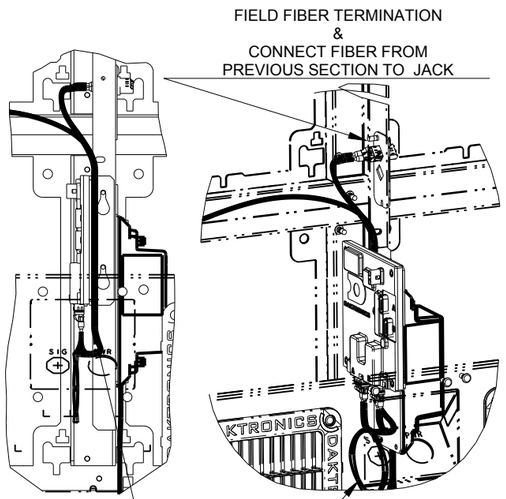
PROJ: DVX-1800				
TITLE: BLOCK DIAGRAM; DVX-1800 W/EMBEDDED CONTROLLER				
DESIGN: MGAARD		DRAWN: MGAARD		DATE: 18 DEC 12
SCALE: NTS				
SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	1122420
	00	P1730	R - 01 - B	

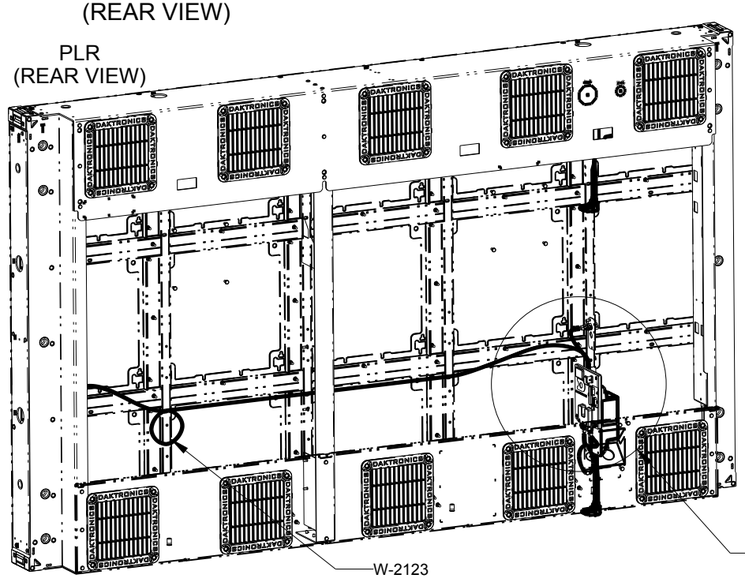
FIBER ROUTING BLOCK DIAGRAM

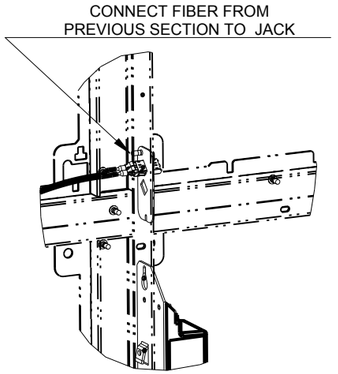


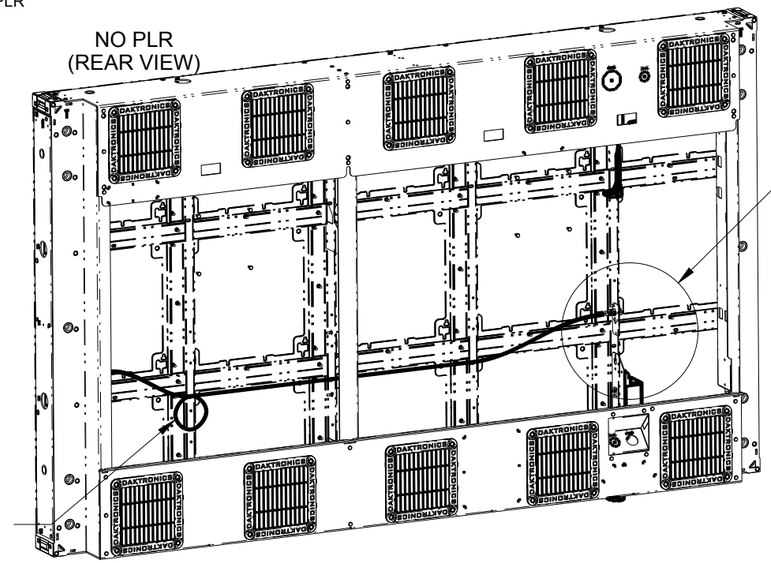
HORIZONTAL FIBER ROUTING

(REAR VIEW)



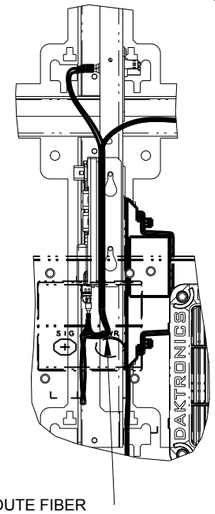


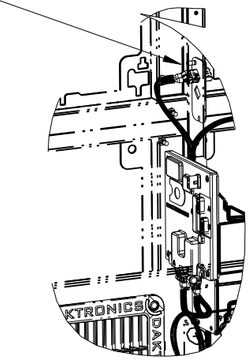


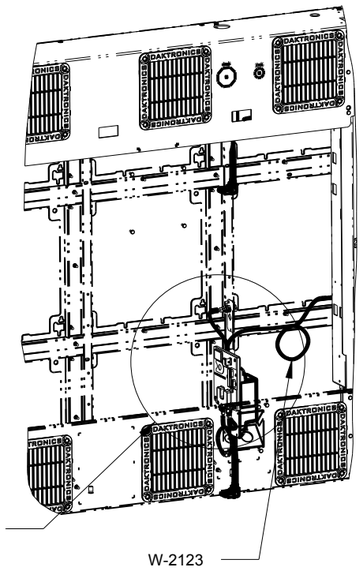


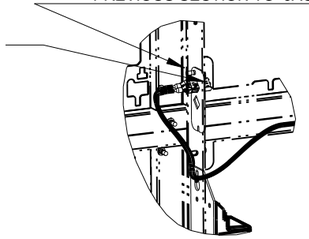
VERTICAL FIBER ROUTING

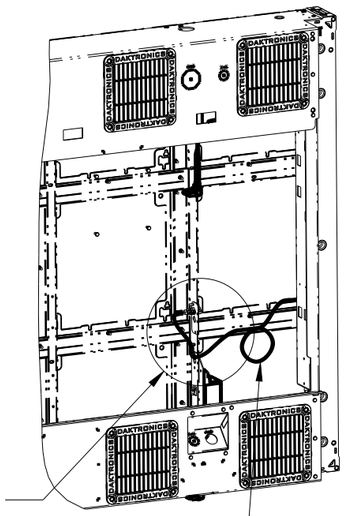
(REAR VIEW)









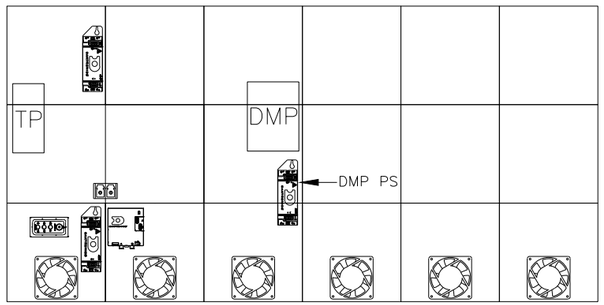


REV	DATE:		BY:
01	29 MAR 13	CHANGED FRONT VIEWS TO REAR VIEWS	ADH

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

PROJ:	DVX-1800				
TITLE:	CABINET FIBER LAYOUT; DVX-1800				
DESIGN:	MGAARD	DRAWN:	MGAARD	DATE:	20 DEC 12
SCALE:	NTS				
SHEET:	REV	JOB NO:	FUNC-TYPE-SIZE		1122479
1 OF 1	01	P1487	F - 01 - B		

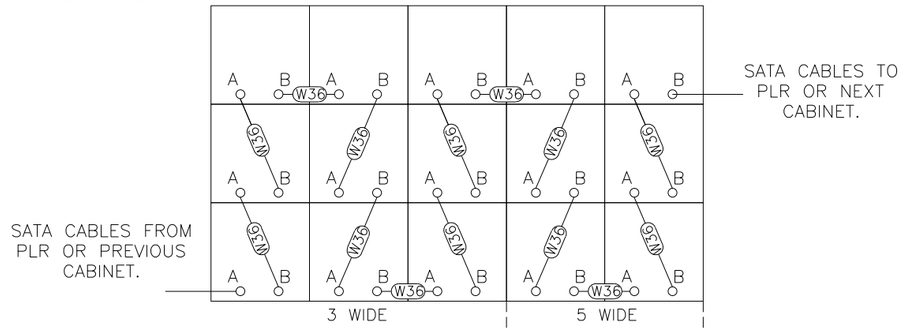
EXAMPLE LAYOUT

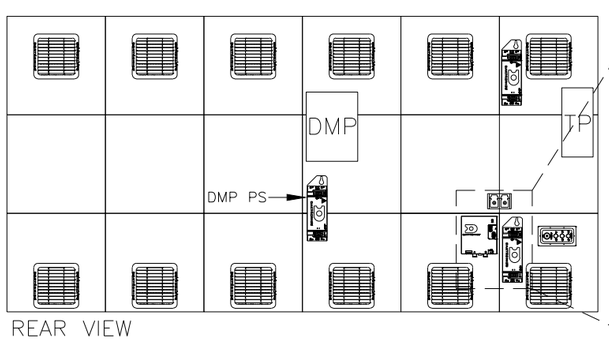


FRONT VIEW

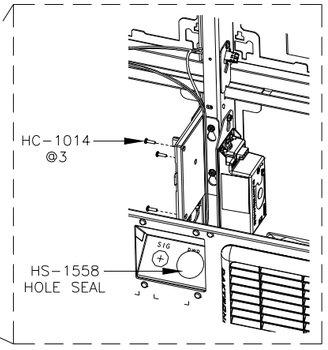
NOTE: REFERENCE SIGNAL INTERCONNECT DWG DISPLAY SPECIFIC

ODD LENGTH CABINETS (3,5) MODULES (FRONT VIEW)

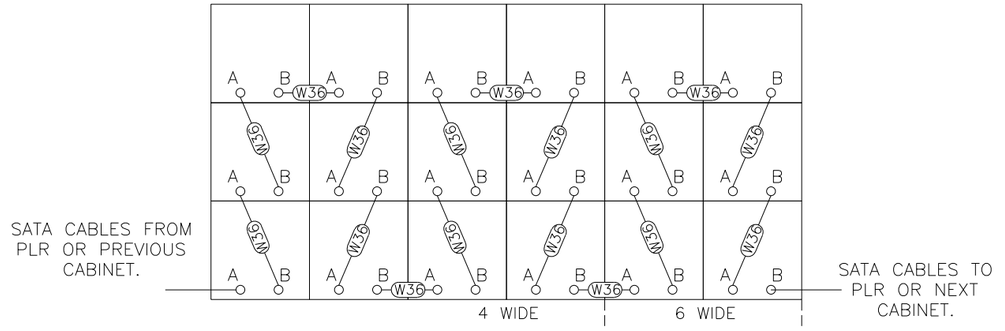




REAR VIEW



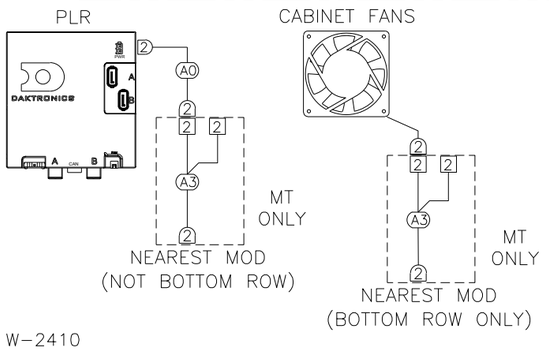
EVEN LENGTH CABINETS (4,6) MODULES (FRONT VIEW)



CONFIGURABLE COMPONENTS

		MOUNTING HARDWARE
	CABINET FAN B-1072	NONE
	QUICK CONNECT 0M-1098905	HC-1354 @6 TORQUE 27.5 IN-LBS
DMP	DMP-8065	HC-1763 @1 TORQUE 27.5 IN-LBS
	REDUNDANT POWER SUPPLY / DMP POWER SUPPLY	HC-1763 @1 TORQUE 27.5 IN-LBS

		MOUNTING HARDWARE
TP	TERM PANEL	HC-1763 @ 1, TORQUE 27.5 IN-LBS
	PROLINK ROUTER 0P-1525-0004	HC-1014 @3, TORQUE 5 IN-LBS
	PLR MTG PLATE 0M-1120785	HC-1763 @2, TORQUE 27.5 IN-LBS
	FIBER COUPLER DUAL LC J-1435	NONE



(W36) W-2410
CABLE; SATA PLUG TO SATA PLUG, 28 INCHES, CROSSOVER

(A0) W-2152
CABLE; SLC PLUG TO SLC PLUG, 36", 18AWG, PLATFORM

(A3) W-2154
HARNESS; PWR, 18 AWG Y, SLC PLUG TO (2) SLC JACK

NOTE: NO MORE THAN ONE Y CABLE PER MODULE ACCESSORY JACK

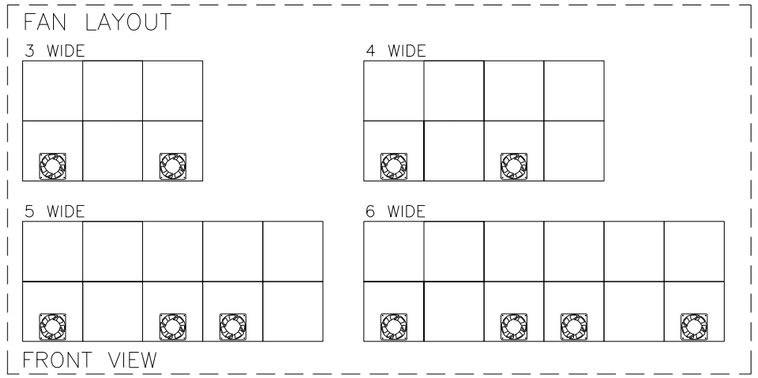
REV	DATE:		BY:
01	25 MAR 13	ADDED MT ONLY NOTES ADDED PART NUMBERS	ADH

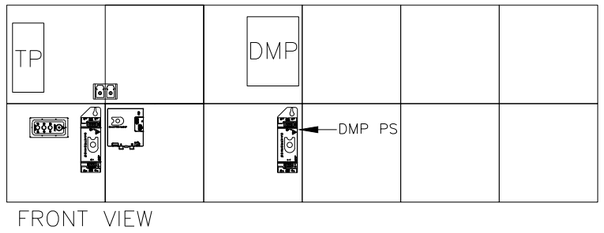
DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

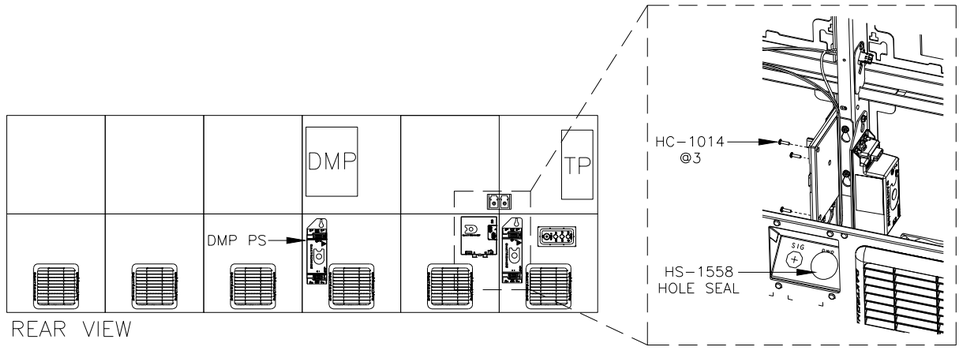
PROJ: DVX-1800/1100
TITLE: LAYOUT; COMPONENT PLACEMENT & SIGNAL HARNESS, 3-HIGH
DESIGN: AHOWARD | DRAWN: AHOWARD | DATE: 19 DEC 12
SCALE: NTS

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	01	P1730	F - 01 - B	1122530

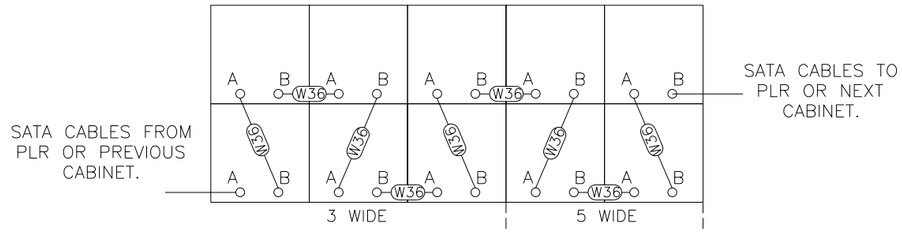
EXAMPLE LAYOUT

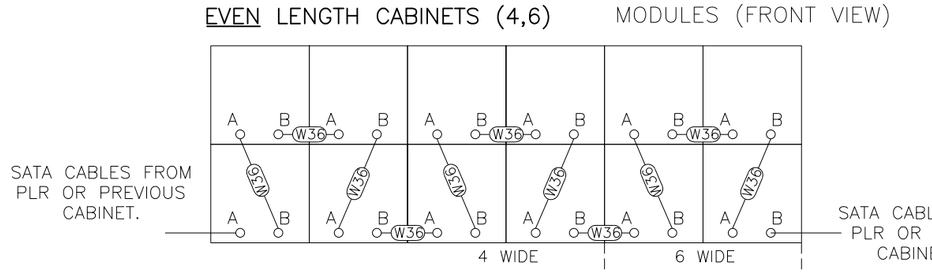


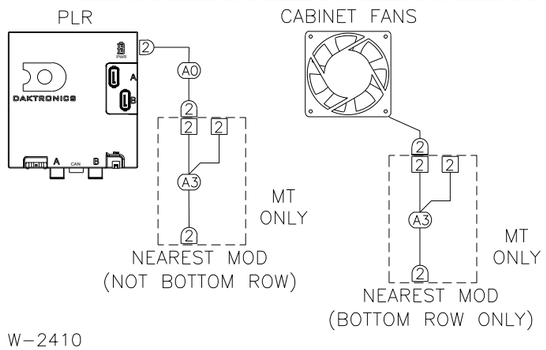




NOTE: REFERENCE SIGNAL INTERCONNECT DWG DISPLAY SPECIFIC







CONFIGURABLE COMPONENTS

		MOUNTING HARDWARE
	CABINET FAN B-1072	NONE
	QUICK CONNECT 0M-1098905	HC-1354 @6 TORQUE 27.5 IN-LBS
DMP	DMP-8065	HC-1763 @1 TORQUE 27.5 IN-LBS
	REDUNDANT POWER SUPPLY / DMP POWER SUPPLY	HC-1763 @1 TORQUE 27.5 IN-LBS

		MOUNTING HARDWARE
TP	TERM PANEL	HC-1763 @ 1, TORQUE 27.5 IN-LBS
	PROLINK ROUTER 0P-1525-0004	HC-1014 @3, TORQUE 5 IN-LBS
	PLR MTG PLATE 0M-1120785	HC-1763 @2, TORQUE 27.5 IN-LBS
	FIBER COUPLER DUAL LC J-1435	NONE

(W36) W-2410
CABLE; SATA PLUG TO SATA PLUG, 28 INCHES, CROSSOVER

(A0) W-2152
CABLE; SLC PLUG TO SLC PLUG, 36", 18AWG, PLATFORM

(A3) W-2154
HARNESS; PWR, 18 AWG Y, SLC PLUG TO (2) SLC JACK

NOTE: NO MORE THAN ONE Y CABLE PER MODULE ACCESSORY JACK

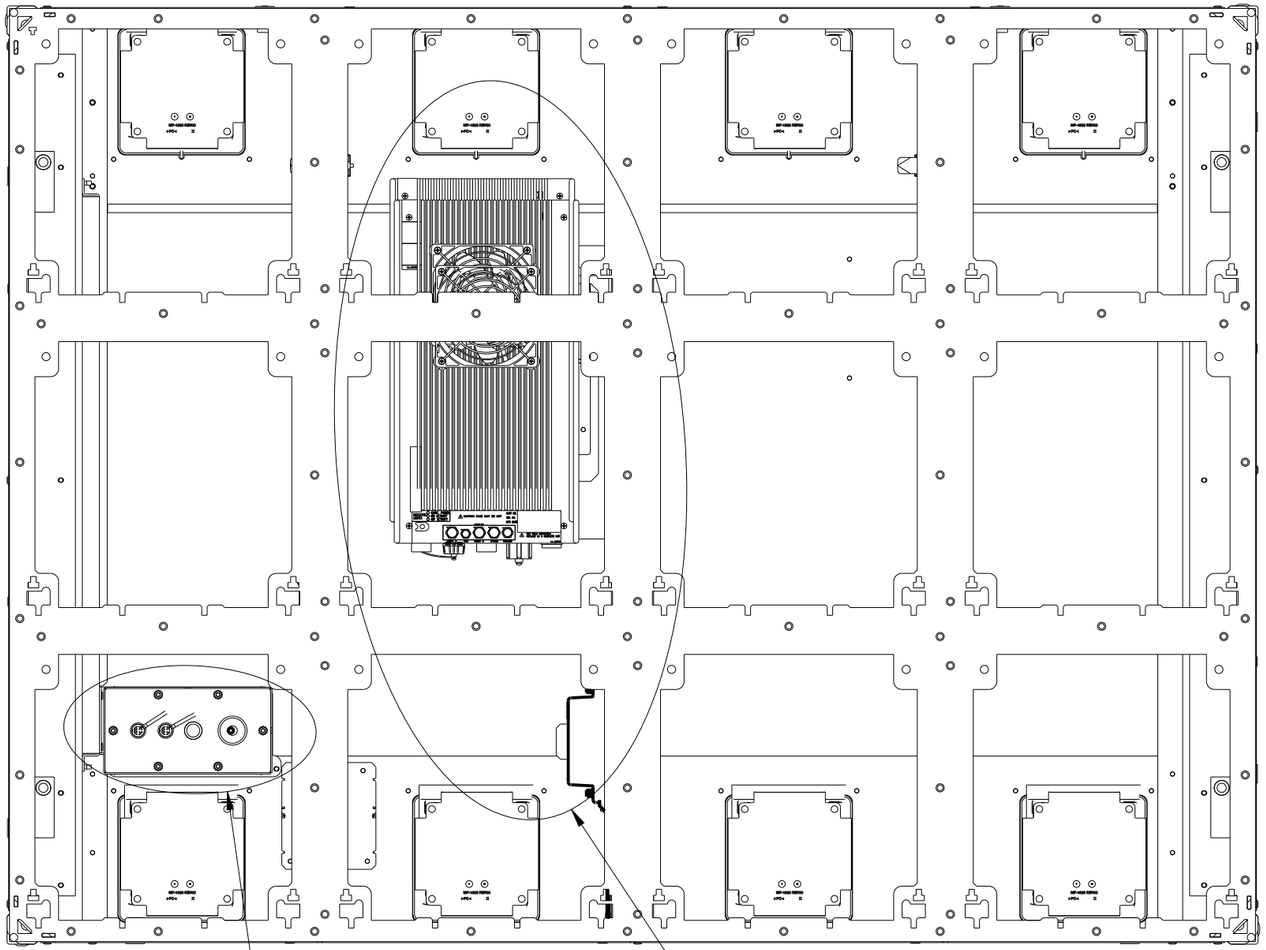
REV	DATE:		BY:
01	25 MAR 13	ADDED MT ONLY NOTES ADDED PART NUMBERS	ADH

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

PROJ: DVX-1800/1100
TITLE: LAYOUT; COMPONENT PLACEMENT & SIGNAL HARNESS, 2-HIGH
DESIGN: AHOWARD | DRAWN: AHOWARD | DATE: 20 DEC 12
SCALE: NTS

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	01	P1730	F - 01 - B	1122554

FRONT VIEW

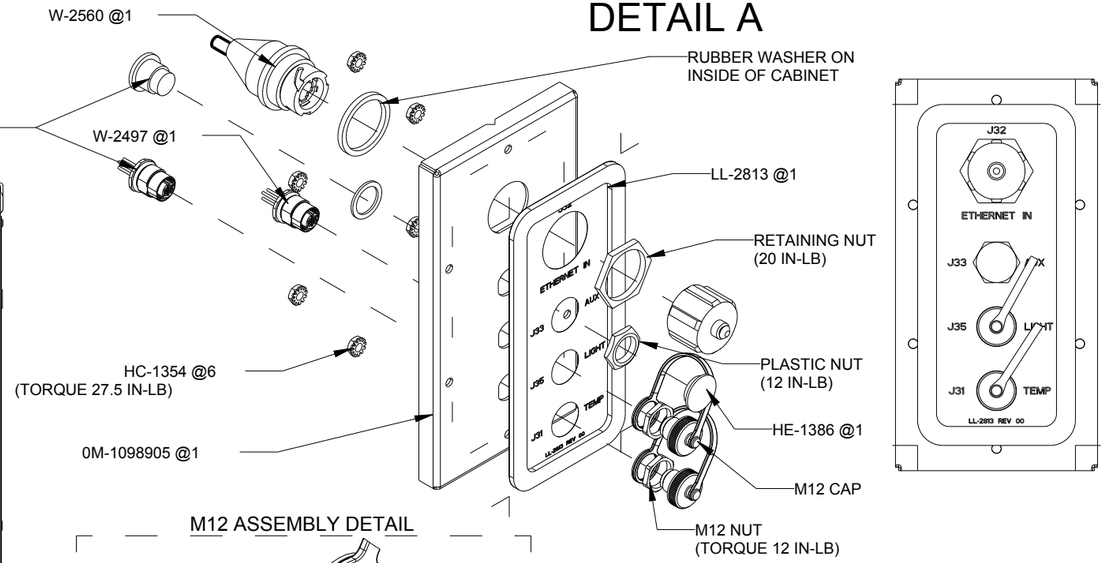


SEE DETAIL B

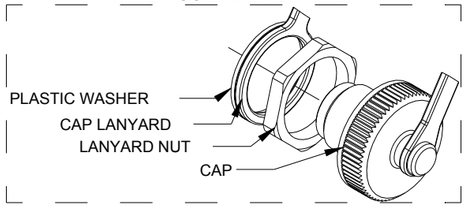
SEE DETAIL A

COMPONENTS ARE LOCATED IN SAME POSITION
FROM THE LEFT (FRONT VIEW) AND BOTTOM
FOR 3&4 HEIGHTS AND WIDTHS.

DETAIL A

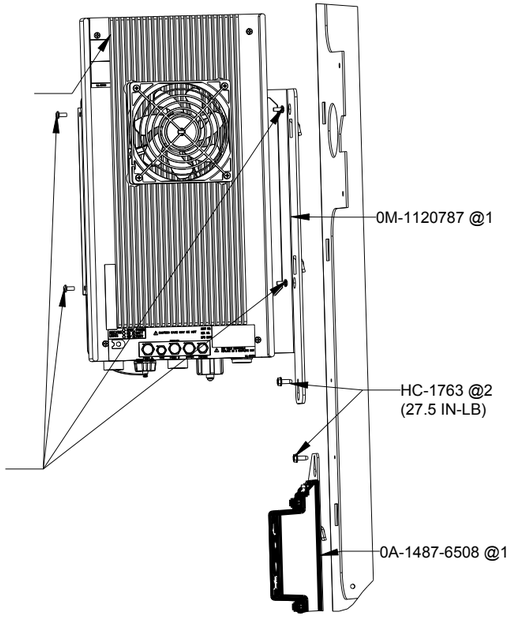


M12 ASSEMBLY DETAIL



0A-1603-3000 @1

DETAIL B



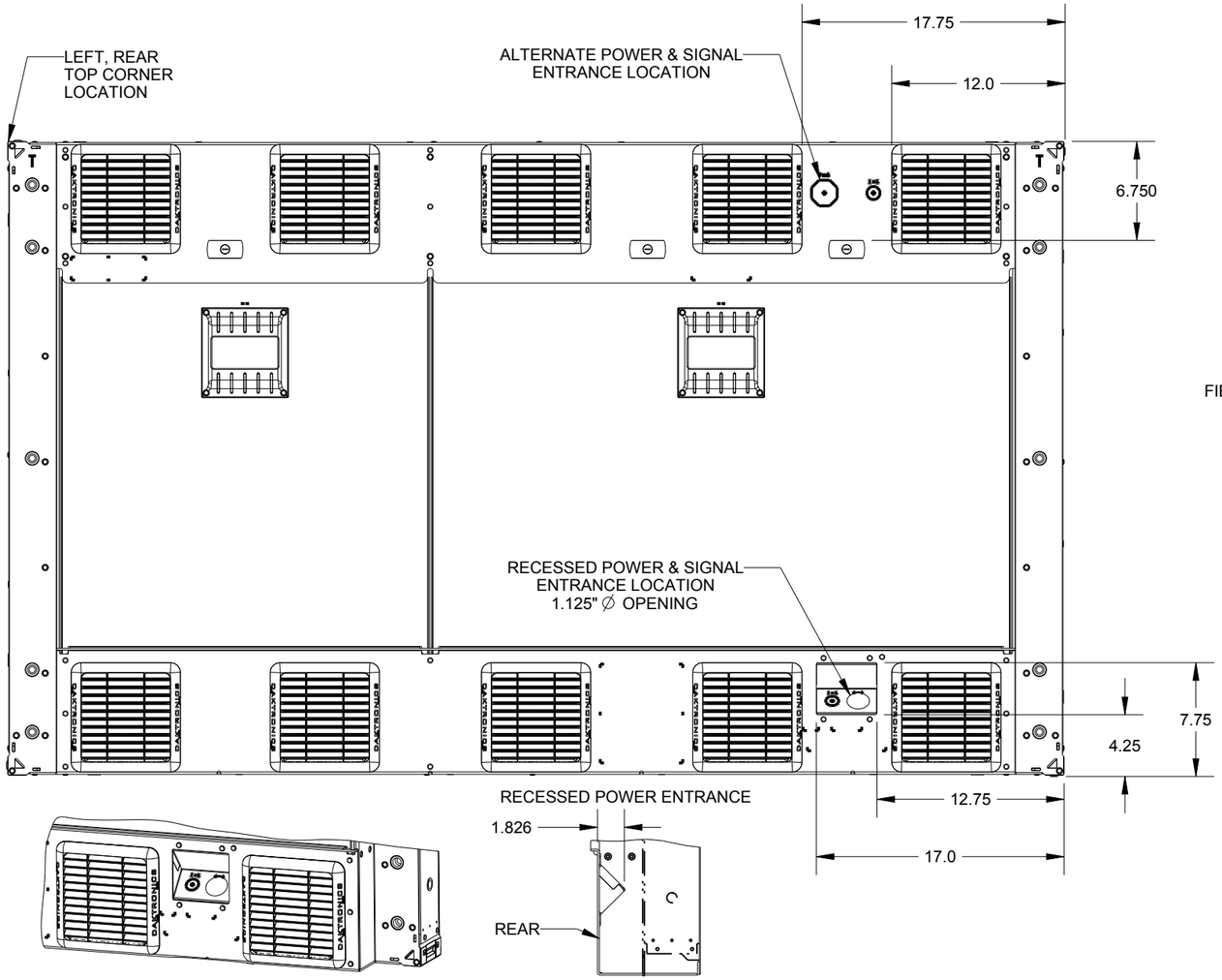
REV	DATE:		BY:
03	27 MAY 15	FLIPPED QUICK CONNECT PLATE PER EC-17850	ADH
02	31 JAN 14	ADDED M12 ASSEMBLY DETAIL PER EC-12561	ADH
01	11 APR 13	MOVED LEADER LEADER NOTES PER EC-9941	ADH

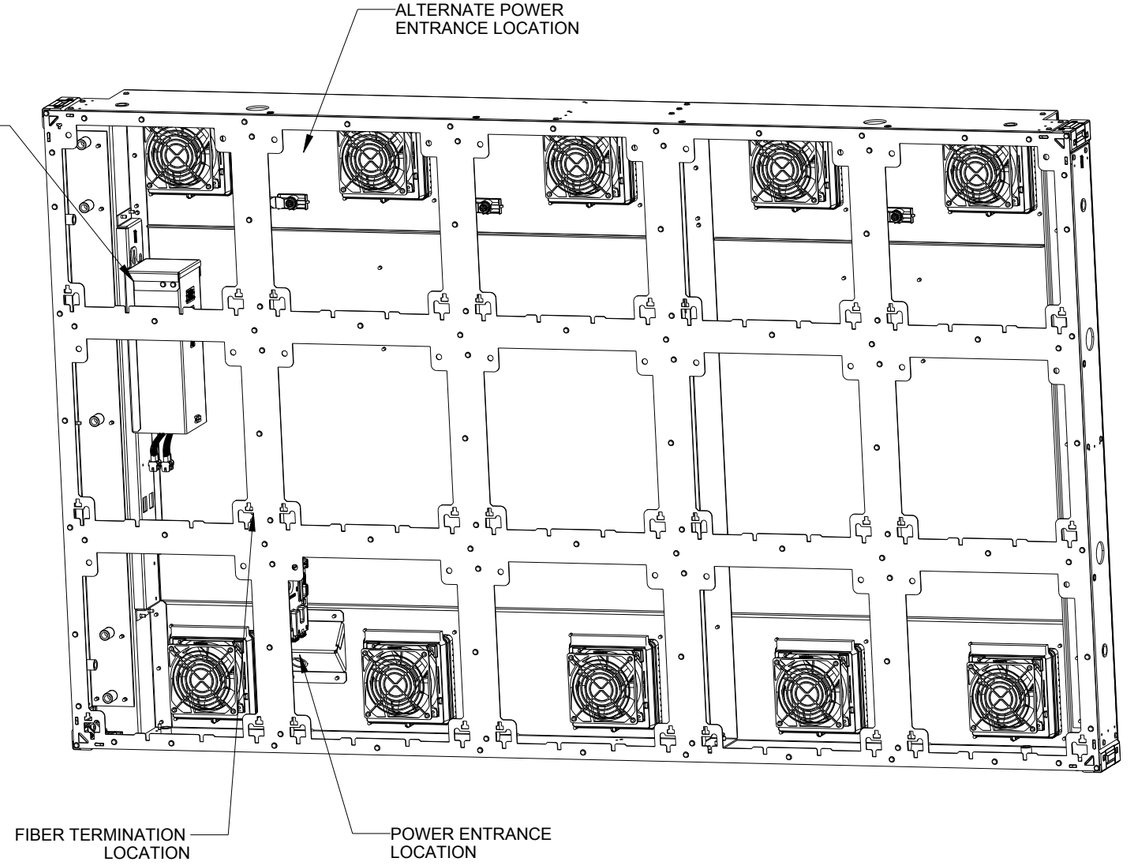
DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

PROJ:	DVX-1800 W/ EMBEDDED CONTROLLER				
TITLE:	LAYOUT; DVX-1800 W/ EMBEDDED CONTROL				
DESIGN:	MGAARD	DRAWN:	MGAARD	DATE:	22-MAY-15
SCALE:	NTS				
SHEET:	REV	JOB NO:	FUNC-TYPE-SIZE		1122645
1 OF 1	03	P 1730	F - 04 - B		

IT IS THE RESPONSIBLITY OF THE ELECTRICAL INSTALLATION CONTRACTOR TO ENSURE CONDUIT USED AND ELECTRICAL WORK PERFORMED ON-SITE MEETS OR EXCEEDS AL LOCAL AND NATIONAL ELECTRIC CODES FOR WIRING AND SPECIFICATIONS.

DISPLAY CABINET IS NOT A WEATHERTIGHT ENCLOSURE



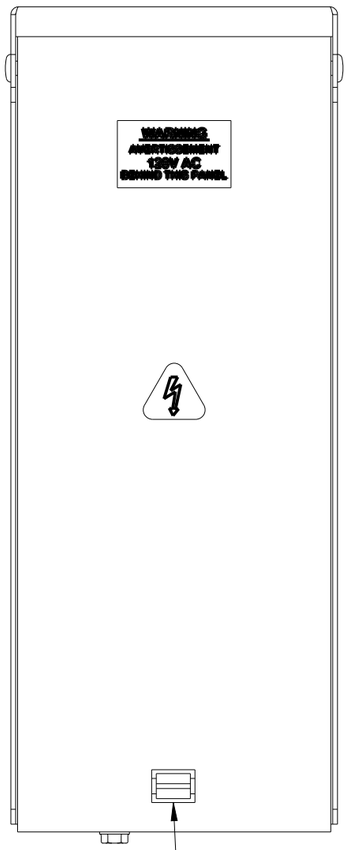


REV	DATE:		BY:

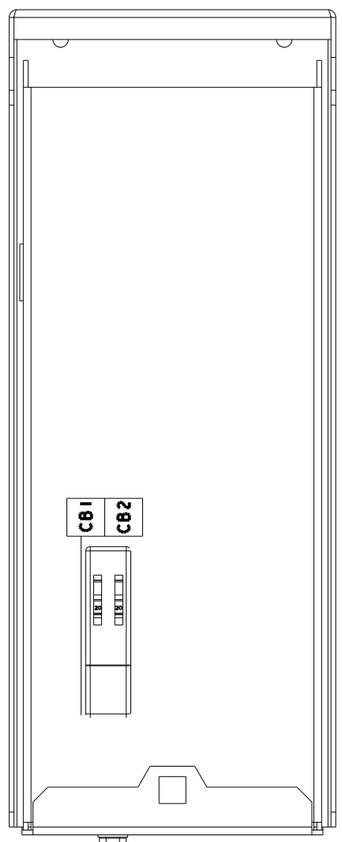
DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

PROJ: DVX				
TITLE: POWER ENTRANCE; FIELD CONDUIT LOCATION				
DESIGN: MGAARD		DRAWN: MGAARD		DATE: 10-JAN-13
SCALE: 1:2				
SHEET:	REV	JOB NO:	FUNC-TYPE-SIZE	1123507
1 OF 1	00	P 1730	E - 07 - B	

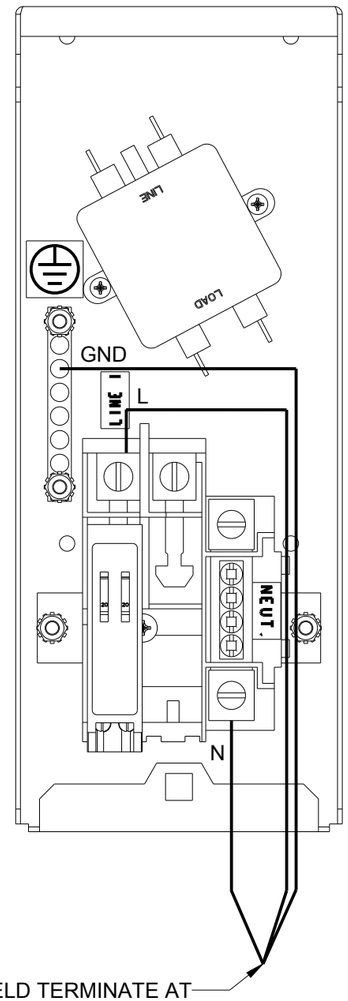
120V BRANCH



RELEASE LATCH
LIFT COVER



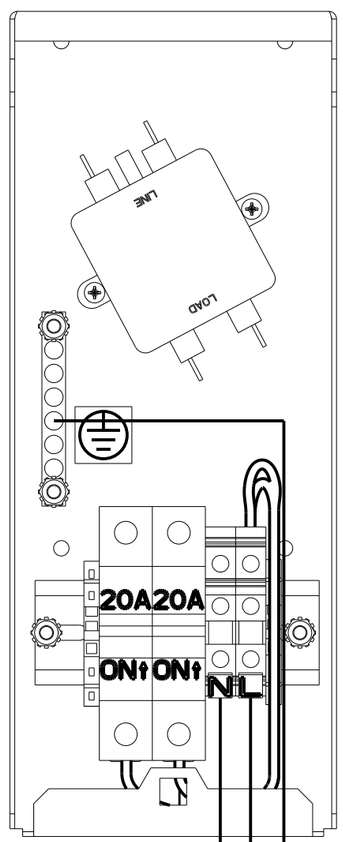
REMOVE SCREW
REMOVE INTERNAL COVER



FIELD TERMINATE AT
THESE LOCATIONS

240V BRANCH

RELEASE LATCH
LIFT COVER



FIELD TERMINATE AT
THESE LOCATIONS

IT IS THE RESPONSIBILITY OF THE ELECTRICAL INSTALLATION CONTRACTOR TO ENSURE THAT ALL ELECTRICAL WORK PERFORMED ON SITE MEETS OR EXCEEDS ALL LOCAL & NATIONAL ELECTRIC CODES FOR WIRING AND SPECIFICATIONS. THESE ARE ALSO REFERENCED ON CONTRACT SPECIFIC RISER DIAGRAMS.

REV	DATE:		BY:

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

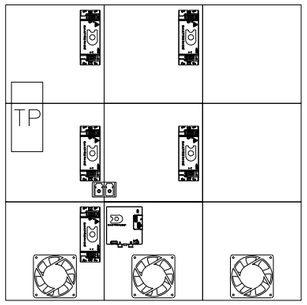
PROJ: DVX-1800
TITLE: POWER ENTRANCE; FIELD TERMINATION DETAIL

DESIGN:	DRAWN:	DATE:
MGAARD	MGAARD	10-JAN-13

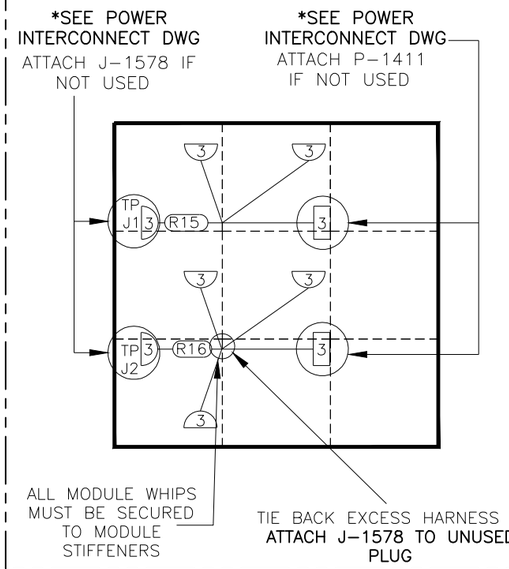
SCALE: 1:2

SHEET:	REV	JOB NO:	FUNC-TYPE-SIZE	
1 OF 1	00	P 1730	E _ 07 _ B	1123982

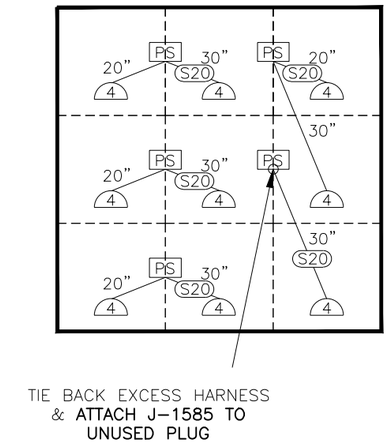
COMPONENT PLACEMENT (FRONT VIEW)



BLOCK DIAGRAM PRIM HARN (FRONT VIEW)

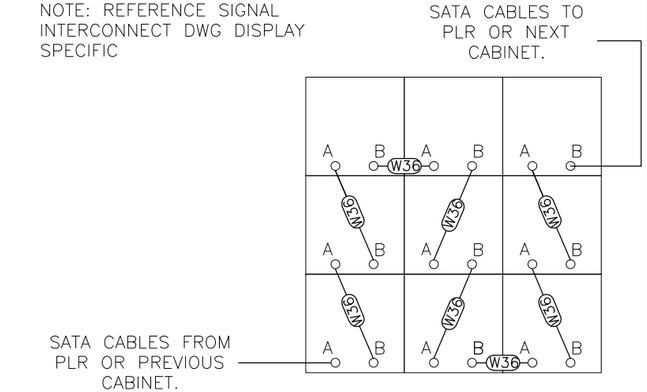


BLOCK DIAGRAM SEC HARN (FRONT VIEW)



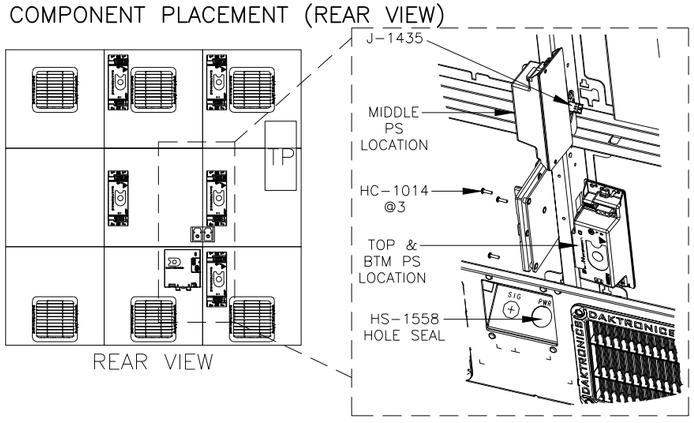
SATA ROUTING (FRONT VIEW)

NOTE: REFERENCE SIGNAL INTERCONNECT DWG DISPLAY SPECIFIC

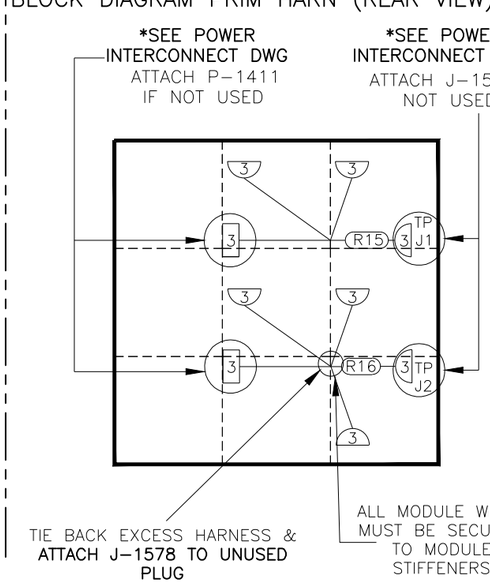


W36 W-2410
CABLE; SATA PLUG TO SATA PLUG, 28 INCHES, CROSSOVER

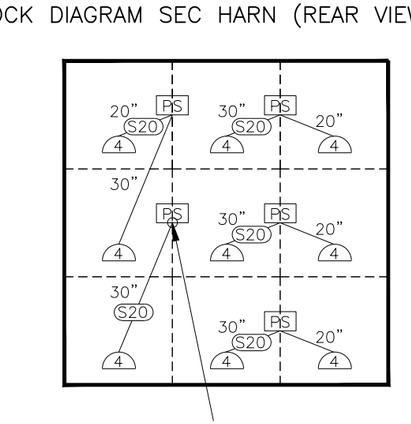
COMPONENT PLACEMENT (REAR VIEW)

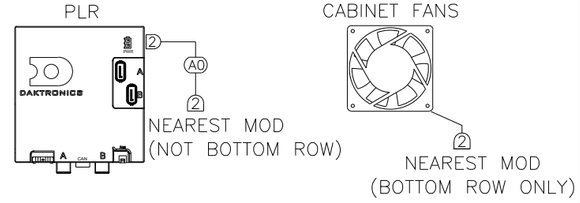


BLOCK DIAGRAM PRIM HARN (REAR VIEW)



BLOCK DIAGRAM SEC HARN (REAR VIEW)





A0 W-2152
CABLE; SLC PLUG TO SLC PLUG, 36", 18AWG, PLATFORM

MOUNTING HARDWARE

	CABINET FAN B-1072	NONE
	PS & PS MTG PLATE A-2476 & 0M-1120794 OR A-3143 & 0M-1120813 (SEE BOM)	NONE HC-1763 @2, TORQUE 27.5 IN-LBS

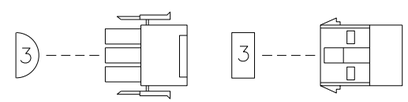
CONFIGURABLE COMPONENTS

TP	TERM PANEL	HC-1763 @ 1, TORQUE 27.5 IN-LBS
	PROLINK ROUTER 0P-1525-0004	HC-1014 @3, TORQUE 5 IN-LBS
	PLR MTG PLATE 0M-1120785	HC-1763 @2, TORQUE 27.5 IN-LBS
	FIBER COUPLER DUAL LC J-1435	NONE

R15 W-2346
HARNESS;AC PWR,65W,2MOD,29",CNTR TAP, RVS

R16 W-2347
HARNESS;AC PWR,65W,4MOD,29",CNTR TAP, RVS

S20 W-2505
HARN; 4P MNL F TO 4P MNL M @2 SEALED, 20" & 30"



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

PROJ: DVX-1500				
TITLE: LAYOUT & BLOCK DIAGRAM, 3X3				
DESIGN: CJOANNE		DRAWN: CJOANNE		DATE: 10 APR 13
SCALE: NTS				
SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	1132791
	00	P1760	F - 01 - B	

Appendix B: Supplementary Documents

This section includes the following:

- **DD2492555** DVX-1100/1500/1800 Series Seam Measurement Field Instructions
- **DD2545000** DVX-1100/1500/1800 Series Cabinet Alignment Guide
- **DD2570782** DVX-1100/1500/1800 Series Power Numbers
- **ED-14158** Face Cleaning Procedures for Daktronics LED Matrix Displays

General Notes

- Take all measurements between module cutouts from the areas shown in **Figure 1** and **Figure 2**.
- Keep the caliper within $^{1}/_{2}$" of the corner to avoid burrs from punching that will throw off the measurements.

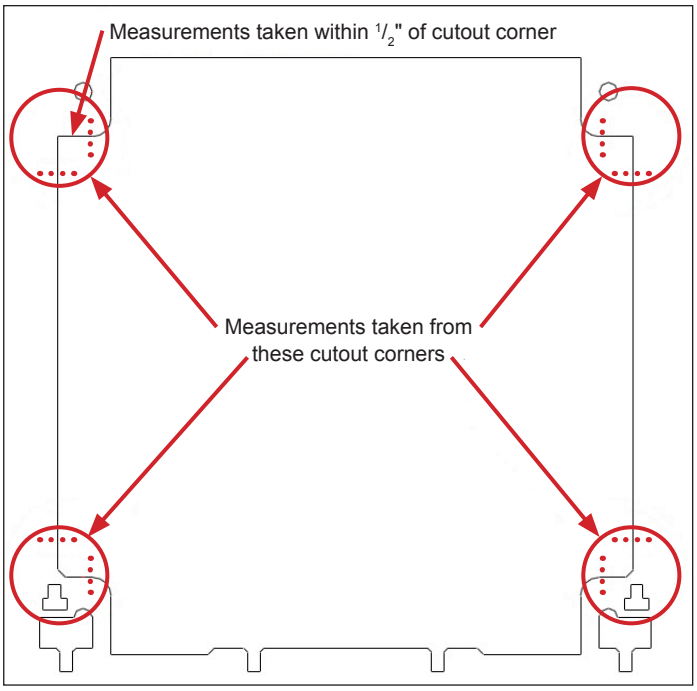


Figure 1: *Measurement Locations in a Module Cutout*

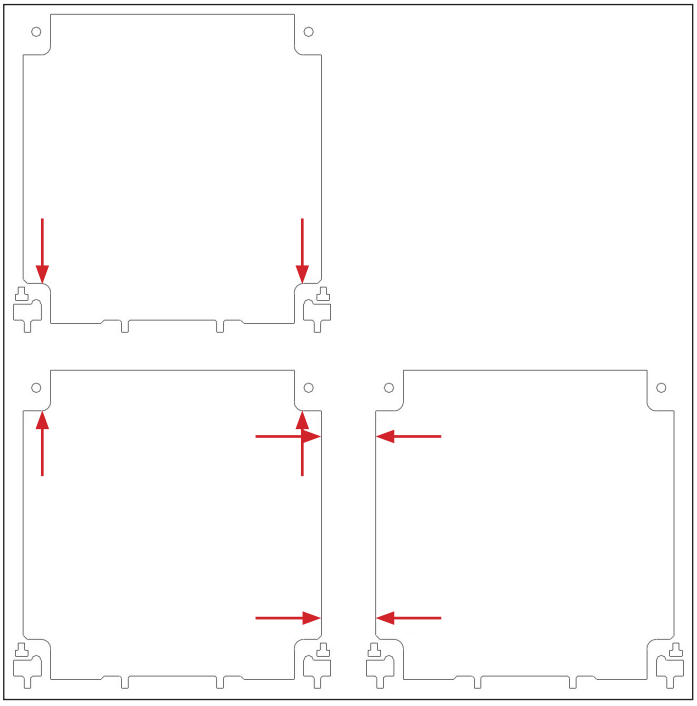


Figure 2: *Measurement Locations in a Module Cutout*

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006
tel: 866-343-6018 fax: 605-697-4700
www.daktronics.com

DAKTRONICS

- Ensure the caliper jaws are square on the sheet metal.
- Ensure both caliper jaws are located identically on the sheet metal (e.g. not closer to the tip on one jaw, etc.).
- Apply slight pressure to the caliper jaws while measuring.

1. Use the values below to fill out the display information on the attached Seam Measurement Sheet. Tolerances apply to both horizontal and vertical seams.

Product Type	Module Size (mm)	Seam Tolerance (in)	Tolerance Range (in)		Seam Tolerance (mm)	Tolerance Range (mm)	
			Lower Limit	Upper Limit		Lower Limit	Upper Limit
DVX-1100/1500	15IL	0.0120	-0.0120	+0.0120	0.3048	-0.3048	+0.3048
	16IL/MT	0.0130	-0.0130	+0.0130	0.3302	-0.3302	+0.3302
	20IL/MT	0.0160	-0.0160	+0.0160	0.4064	-0.4064	+0.4064
	26MT	0.0210	-0.0210	+0.0210	0.5334	-0.5334	+0.5334
DVX-1800	10mm	0.0080	-0.0080	+0.0080	0.2032	-0.2032	+0.2032
	15mm	0.0120	-0.0120	+0.0120	0.3048	-0.3048	+0.3048

2. Measure between module cutouts within a module sheet to calibrate the caliper. With the jaws tight between the two cutouts, press "origin" or "zero" to zero the caliper to that distance. Measure between at least three cutouts to ensure the caliper is accurately zeroed.

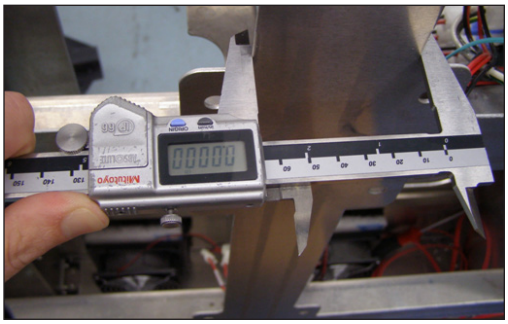


Figure 3: *Caliper*

3. Measure vertically between module cutouts on a horizontal seam as shown in **Figure 4**. Measure vertical seams in the same manner but horizontally between module cutouts.

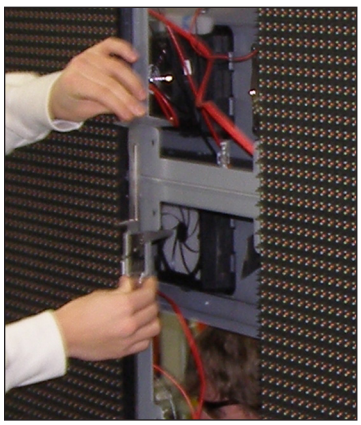


Figure 4: *Seam Measurement*

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006
tel: 866-343-6018 fax: 605-697-4700
www.daktronics.com

4. Measure all seams as shown in **Figure 4**. **Figure 5** shows measurement locations along horizontal seams, and **Figure 6** shows measurement locations along vertical seams.

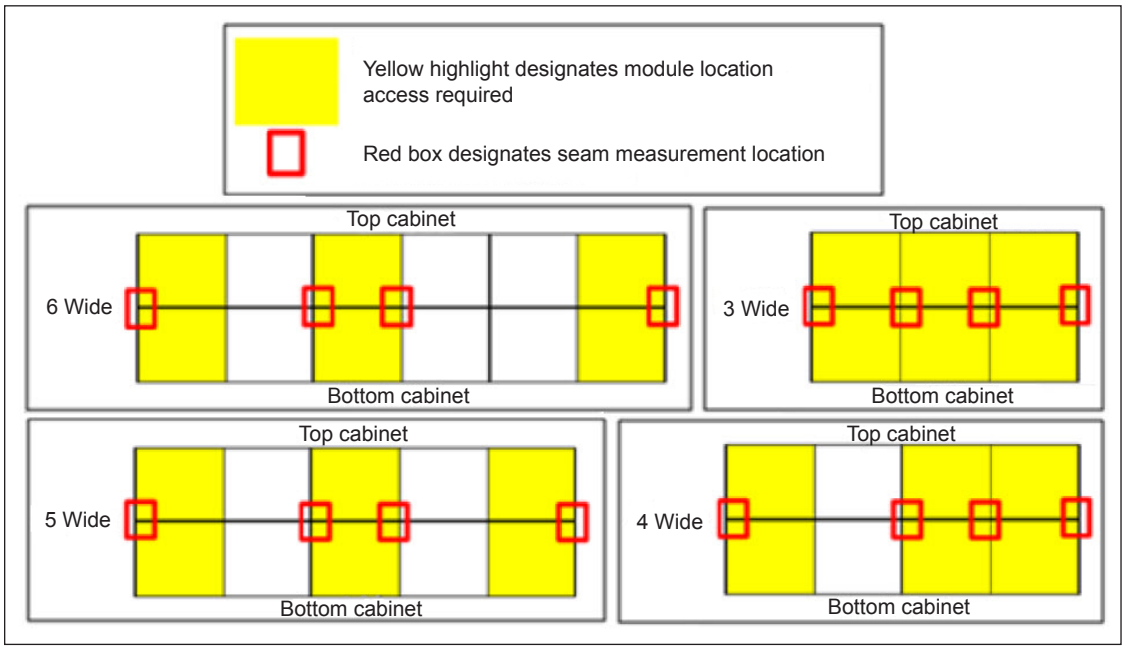


Figure 5: *Horizontal Seam Measurement Locations*

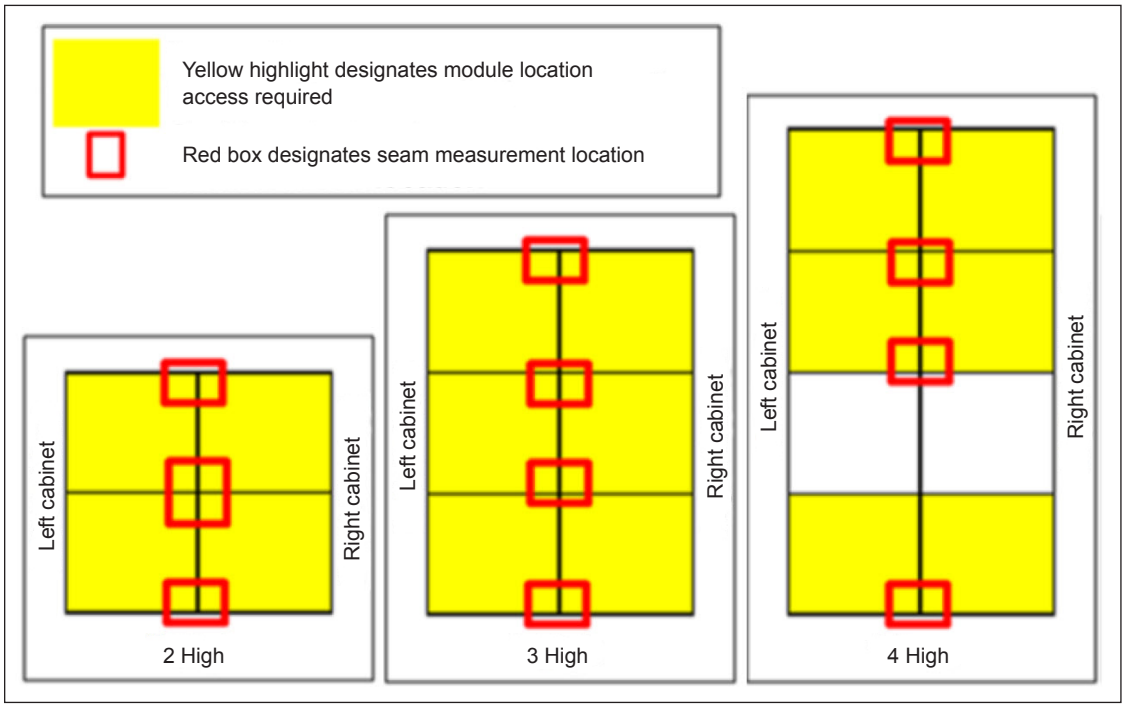


Figure 6: *Vertical Seam Measurement Locations*

5. Indicate on the Seam Measurement Sheet whether the measurement is for a horizontal or vertical seam, as well as the section(s) measured. Examples: “Hrz w/in S204,” “Hrz btwn S301 & S401,” “Vrt btwn S202 & S203.”

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006
tel: 866-343-6018 fax: 605-697-4700
www.daktronics.com

6. Record the data on the Seam Measurement Sheet exactly as it appears on the caliper. Examples: "+0.0120," "-0.0035," "0.0000." Submit the Seam Measurement Sheet to the Commissioning Coordinator.

7. Use an "X" to indicate any seam where one or more measurements are out of tolerance. Mark the "X" in the appropriate column to indicate whether the measurement was below the lower limit or above the upper limit.

*ONLY one display per form

Contract Number: C12345					Display Task Number: 3300				Date: 01/28/2013	
Product Type: (Circle One)		DVX-1100/1500 (circled)			DVX-1800				Other_____	
Module Size (mm): (Circle One)	10	15 (circled)		16		20		26		Other_____
Seam Tolerance (in)	Module Spacing (in)	Tolerance Range (in)								
		Lower Limit				Upper Limit				
+/- 0.0120	3.6000	-0.0120				+0.0120				
Section #		Seam Measurement (Left to Right)				Out of Tolerance (X)				
		1	2	3	4	Tight Seam		Wide Seam		
Hrz w/in S204		+0.0020	+0.0035	+0.0050	-0.0065					
Hrz btwn S301 & S401		+0.0110	+0.0130	+0.0135	+0.0085			X		
Vrt btwn S202 & S203		-0.0070	-0.0095	-0.0150	-0.0065	X				

Figure 7: *Seam Measurement Sheet*

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006
tel: 866-343-6018 fax: 605-697-4700
www.daktronics.com

DAKTRONICS

*ONLY one display per form

Contract Number:	Display Task Number:	Date:

Product Type: (Circle One)	DVX-1100/1500	DVX-1800	Other________			
Module Size (mm): (Circle One)	10	15	16	20	26	Other________

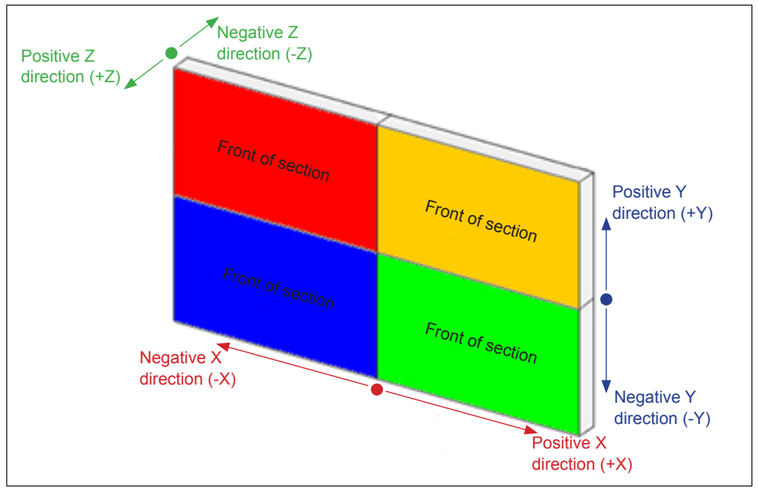
Seam Tolerance (in)	Module Spacing (in)	Tolerance Range (in)	
		Lower Limit	Upper Limit
+/-			

Section #	Seam Measurement (Left to Right)				Out of Tolerance (X)	
	1	2	3	4	Tight Seam	Wide Seam

Purpose

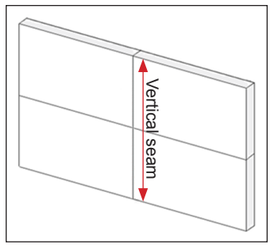
Cabinet alignment is critical to the final appearance of an LED video display and is most easily corrected during the installation process. As pixel spacing of a display becomes tighter, alignment becomes even more critical.

Axis Definition



Seam Definition

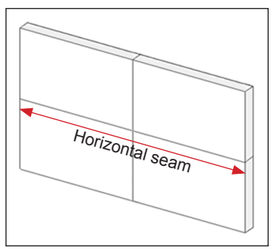
Vertical seam: a location where two vertically oriented edges come together



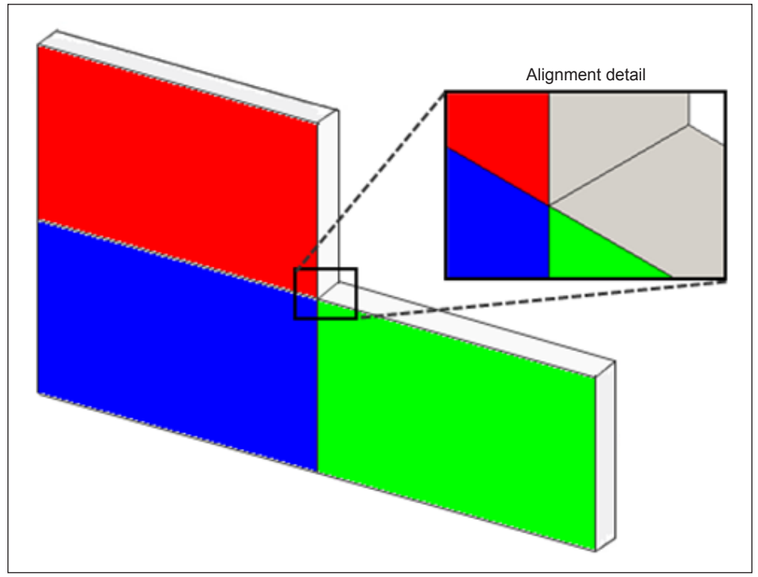
Horizontal seam: a location where two horizontally oriented edges come together

Wide seam (dim seam or cold seam): a location where the spacing between adjacent pixels is larger than that of the pixels surrounding the seam

Tight seam (bright seam or hot seam): a location where the spacing between adjacent pixels is smaller than that of the pixels surrounding the seam

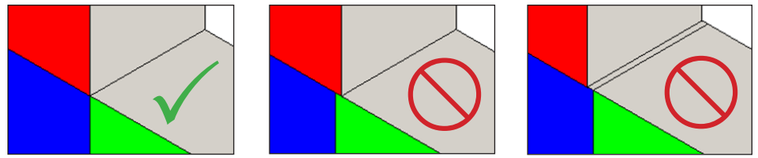


Alignment



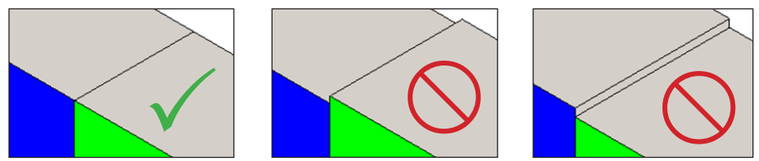
X-Direction Alignment

X-direction alignment issues can cause vertical seams to appear either bright or dim, but a vertical seam caused by X-direction misalignment will not change with the direction from which it is viewed.



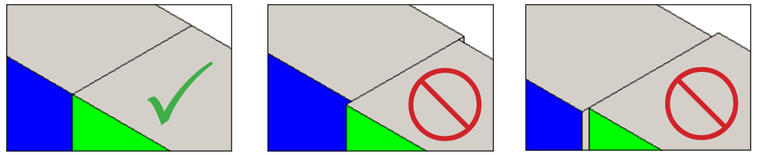
Y-Direction Alignment

Y-direction alignment issues can cause horizontal seams to appear either bright or dim, but a horizontal seam caused by Y-direction misalignment will not change with the direction from which it is viewed.



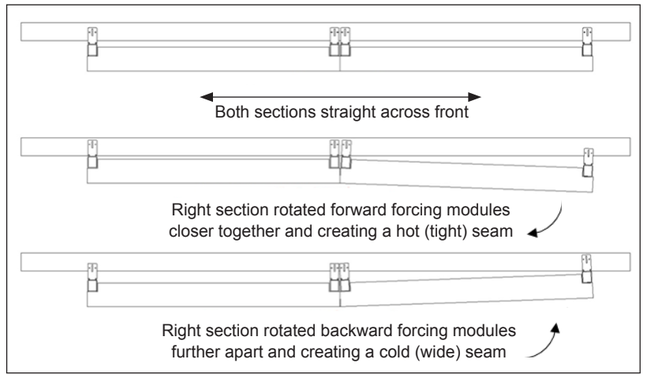
Z-Direction Alignment

Z-direction misalignment can be either vertical or horizontal but will appear as a dim seam when viewed from one angle and a bright seam when viewed from the opposite angle across the seam.



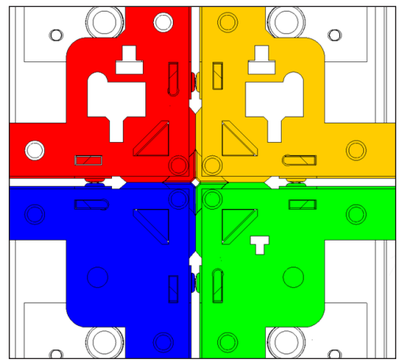
Rotational Alignment

Rotational misalignment can be either vertical or horizontal and will not change with the direction from which it is viewed.



Precision Block Alignment

Precision block alignment features bring cabinet corners into alignment, but tolerance within alignment features could allow slight alignment variation and should always be checked during installation.



201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006
tel: 866-343-6018 fax: 605-697-4700
www.daktronics.com

DAKTRONICS

DVX-1100/1500/1800 Power Numbers

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

Domestic

DVX-11X0-13HD		
120V ~ -1P 60Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 56x84	480	4.0
2x4 – 56x112	636	5.3
2x5 – 56x140	792	6.6
2x6 – 56x168	936	7.8
3x3 – 84x84	720	6.0
3x4 – 84x112	960	8.0
3x5 – 84x140	1200	10.0
3x6 – 84x168	1440	12.0
4x3 – 112x84	960	8.0
4x4 – 112x112	1272	10.6
4x5 – 112x140	1596	13.3
4x6 – 112x168	1908	15.9

DVX-11X0-15HD		
120V ~ -1P 60Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 48x72	456	3.8
2x4 – 48x96	612	5.1
2x5 – 48x120	756	6.3
2x6 – 48x144	912	7.6
3x3 – 72x72	708	8.9
3x4 – 72x96	924	7.7
3x5 – 72x120	1152	9.6
3x6 – 72x144	1392	11.6
4x3 – 96x72	924	7.7
4x4 – 96x96	1224	10.2
4x5 – 96x120	1524	12.7
4x6 – 96x144	1836	15.3

DVX-11X0-16HD		
120V ~ -1P 60Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 44x66	456	3.8
2x4 – 44x88	600	5.0
2x5 – 484x110	756	6.3
2x6 – 44x132	900	7.5
3x3 – 66x66	696	5.8
3x4 – 66x88	924	7.7
3x5 – 66x110	1152	9.6
3x6 – 66x132	1368	11.4
4x3 – 88x66	924	7.7
4x4 – 88x88	1224	10.2
4x5 – 88x110	1524	12.7
4x6 – 88x132	1812	15.1

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006
tel: 866-343-6018 fax: 605-697-4700
www.daktronics.com

DAKTRONICS

DVX-11X0-20HD		
120V ~ -1P 60Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 36x54	396	3.3
2x4 – 36x72	528	4.4
2x5 – 36x90	660	5.5
2x6 – 36x108	780	6.5
3x3 – 54x54	612	5.1
3x4 – 54x72	816	6.8
3x5 – 54x90	1008	8.4
3x6 – 54x108	1212	10.1
4x3 – 72x54	804	6.7
4x4 – 72x72	1080	9.0
4x5 – 72x90	1332	11.1
4x6 – 72x108	1596	13.3

DVX-11X0-8MN		
120V ~ -1P 60Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 90x135	480	4.0
2x4 – 90x180	636	5.3
2x5 – 90x225	804	6.7
2x6 – 90x270	960	8.0
3x3 – 135x135	732	6.1
3x4 – 135x180	972	8.1
3x5 – 135x225	1212	10.1
3x6 – 135x270	1452	12.1
4x3 – 180x135	960	8.0
4x4 – 180x180	1272	10.6
4x5 – 180x225	1596	13.3
4x6 – 180x270	1908	15.9

DVX-11X0-10MN		
120V ~ -1P 60Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 72x108	480	4.0
2x4 – 72x144	636	5.3
2x5 – 72x180	804	6.7
2x6 – 72x216	960	8.0
3x3 – 108x108	732	6.1
3x4 – 108x144	972	8.1
3x5 – 108x180	1212	10.1
3x6 – 108x216	1452	12.1
4x3 – 144x108	960	8.0
4x4 – 144x144	1272	10.6
4x5 – 144x180	1596	13.3
4x6 – 144x216	1908	15.9

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006
tel: 866-343-6018 fax: 605-697-4700
www.daktronics.com

DVX-1100/1500/1800 Power Numbers

DVX-11X0-16MT		
120V ~ -1P 60Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 44x66	480	4.0
2x4 – 44x88	636	5.3
2x5 – 44x110	792	6.6
2x6 – 44x132	936	7.8
3x3 – 66x66	720	6.0
3x4 – 66x88	960	8.0
3x5 – 66x110	1200	10.0
3x6 – 66x132	1440	12.0
4x3 – 88x66	960	8.0
4x4 – 88x88	1272	10.6
4x5 – 88x110	1584	13.2
4x6 – 88x132	1908	15.9

DVX-11X0-20MT		
120V ~ -1P 60Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 36x54	456	3.8
2x4 – 36x72	600	5.0
2x5 – 36x90	744	6.2
2x6 – 36x108	888	7.4
3x3 – 54x54	634	5.7
3x4 – 54x72	912	7.6
3x5 – 54x90	1140	9.5
3x6 – 54x108	1368	11.4
4x3 – 72x54	912	7.6
4x4 – 72x72	1200	10.0
4x5 – 72x90	1512	12.6
4x6 – 72x108	1812	15.1

DVX-11X0-26MT		
120V ~ -1P 60Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 28x42	384	3.2
2x4 – 28x56	504	4.2
2x5 – 28x70	624	5.2
2x6 – 28x84	744	6.2
3x3 – 42x42	576	4.8
3x4 – 42x56	768	6.4
3x5 – 42x70	972	8.1
3x6 – 42x84	1152	9.6
4x3 – 56x42	768	6.4
4x4 – 56x56	1008	8.4
4x5 – 56x70	1272	10.6
4x6 – 56x84	1524	12.7

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006
tel: 866-343-6018 fax: 605-697-4700
www.daktronics.com

DAKTRONICS

DVX-15X0-15HD		
120V ~ -1P 60Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 48x72	192	1.6
2x4 – 48x96	240	2.0
2x5 – 48x120	300	2.5
2x6 – 48x144	360	3.0
3x3 – 72x72	288	2.4
3x4 – 72x96	384	3.2
3x5 – 72x120	456	3.8
3x6 – 72x144	564	4.7
4x3 – 96x72	372	3.1
4x4 – 96x96	480	4.0
4x5 – 96x120	600	5.0
4x6 – 96x144	732	6.1

DVX-15X0-16HD		
120V ~ -1P 60Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 44x66	192	1.6
2x4 – 44x88	240	2.0
2x5 – 44x110	312	2.6
2x6 – 44x132	360	3.0
3x3 – 66x66	288	2.4
3x4 – 66x88	384	3.2
3x5 – 66x110	456	3.8
3x6 – 66x132	564	4.7
4x3 – 88x66	372	3.1
4x4 – 88x88	480	4.0
4x5 – 88x110	600	5.0
4x6 – 88x132	732	6.1

DVX-15X0-16MT		
120V ~ -1P 60Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 44x66	192	1.6
2x4 – 44x88	240	2.0
2x5 – 44x110	312	2.6
2x6 – 44x132	360	3.0
3x3 – 66x66	288	2.4
3x4 – 66x88	384	3.2
3x5 – 66x110	456	3.8
3x6 – 66x132	564	4.7
4x3 – 88x66	372	3.1
4x4 – 88x88	480	4.0
4x5 – 88x110	600	5.0
4x6 – 88x132	732	6.1

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006
tel: 866-343-6018 fax: 605-697-4700
www.daktronics.com

DVX-15X0-20MT		
120V ~ -1P 60Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 36x54	192	1.6
2x4 – 36x72	240	2.0
2x5 – 36x90	300	2.5
2x6 – 36x108	360	3.0
3x3 – 54x54	288	2.4
3x4 – 54x72	384	3.2
3x5 – 54x90	456	3.8
3x6 – 54x108	564	4.7
4x3 – 72x54	372	3.1
4x4 – 72x72	480	4.0
4x5 – 72x90	600	5.0
4x6 – 72x108	732	6.1

DVX-18X0-15MN		
120V ~ -1P 60Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 48x72	480	4.0
2x4 – 48x96	636	5.3
2x5 – 48x120	804	6.7
2x6 – 48x144	960	8.0
3x3 – 72x72	732	6.1
3x4 – 72x96	972	8.1
3x5 – 72x120	1212	10.1
3x6 – 72x144	1452	12.1
4x3 – 96x72	960	8.0
4x4 – 96x96	1272	10.6
4x5 – 96x120	1596	13.3
4x6 – 96x144	1908	15.9

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006
tel: 866-343-6018 fax: 605-697-4700
www.daktronics.com

DAKTRONICS

International

DVX-11X0-13HD		
240V ~ -1P 50Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 56x84	455	1.9
2x4 – 56x112	615	2.6
2x5 – 56x140	751	3.1
2x6 – 56x168	911	3.8
3x3 – 84x84	706	2.9
3x4 – 84x112	934	3.9
3x5 – 84x140	1161	4.8
3x6 – 84x168	1389	5.8
4x3 – 112x84	934	3.9
4x4 – 112x112	1252	5.2
4x5 – 112x140	1526	6.4
4x6 – 112x168	1845	7.7

DVX-11X0-15HD		
240V ~ -1P 50Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 48x72	433	1.8
2x4 – 48x96	592	2.5
2x5 – 48x120	729	3.0
2x6 – 48x144	888	3.7
3x3 – 72x72	660	2.8
3x4 – 72x96	911	3.8
3x5 – 72x120	1116	4.6
3x6 – 72x144	1344	5.6
4x3 – 96x72	888	3.7
4x4 – 96x96	1184	4.9
4x5 – 96x120	1480	6.2
4x6 – 96x144	1776	7.4

DVX-11X0-16HD		
240V ~ -1P 50Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 44x66	433	1.8
2x4 – 44x88	592	2.5
2x5 – 484x110	729	3.0
2x6 – 44x132	865	3.6
3x3 – 66x66	660	2.8
3x4 – 66x88	888	3.7
3x5 – 66x110	1116	4.6
3x6 – 66x132	1344	5.6
4x3 – 88x66	888	3.7
4x4 – 88x88	1161	4.8
4x5 – 88x110	1480	6.2
4x6 – 88x132	1753	7.3

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006
tel: 866-343-6018 fax: 605-697-4700
www.daktronics.com

DAKTRONICS

DVX-1100/1500/1800 Power Numbers

DVX-11X0-20HD		
240V ~ -1P 50Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 36x54	387	1.6
2x4 – 36x72	501	2.1
2x5 – 36x90	638	2.7
2x6 – 36x108	774	3.2
3x3 – 54x54	592	2.5
3x4 – 54x72	774	3.2
3x5 – 54x90	979	4.1
3x6 – 54x108	1161	4.8
4x3 – 72x54	774	3.2
4x4 – 72x72	1025	4.3
4x5 – 72x90	1298	5.4
4x6 – 72x108	1549	6.5

DVX-11X0-8MN		
240V ~ -1P 50Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 90x135	455	1.9
2x4 – 90x180	615	2.6
2x5 – 90x225	774	3.2
2x6 – 90x270	934	3.9
3x3 – 135x135	706	2.9
3x4 – 135x180	934	3.9
3x5 – 135x225	1184	4.9
3x6 – 135x270	1389	5.8
4x3 – 180x135	911	3.8
4x4 – 180x180	1230	5.1
4x5 – 180x225	1549	6.5
4x6 – 180x270	1845	7.7

DVX-11X0-10MN		
240V ~ -1P 50Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 72x108	455	1.9
2x4 – 72x144	615	2.6
2x5 – 72x180	774	3.2
2x6 – 72x216	934	3.9
3x3 – 108x108	706	2.9
3x4 – 108x144	934	3.9
3x5 – 108x180	1184	4.9
3x6 – 108x216	1389	5.8
4x3 – 144x108	911	3.8
4x4 – 144x144	1230	5.1
4x5 – 144x180	1549	6.5
4x6 – 144x216	1845	7.7

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006
tel: 866-343-6018 fax: 605-697-4700
www.daktronics.com

DAKTRONICS

DVX-11X0-16MT		
240V ~ -1P 50Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 44x66	455	1.9
2x4 – 44x88	615	2.6
2x5 – 44x110	751	3.1
2x6 – 44x132	911	3.8
3x3 – 66x66	706	2.9
3x4 – 66x88	934	3.9
3x5 – 66x110	1161	4.8
3x6 – 66x132	1389	5.8
4x3 – 88x66	934	3.9
4x4 – 88x88	1252	5.2
4x5 – 88x110	1526	6.4
4x6 – 88x132	1845	7.7

DVX-11X0-20MT		
240V ~ -1P 50Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 36x54	433	1.8
2x4 – 36x72	569	2.4
2x5 – 36x90	729	3.0
2x6 – 36x108	865	3.6
3x3 – 54x54	660	2.8
3x4 – 54x72	888	3.7
3x5 – 54x90	1093	4.6
3x6 – 54x108	1321	5.5
4x3 – 72x54	888	3.7
4x4 – 72x72	1161	4.8
4x5 – 72x90	1457	6.1
4x6 – 72x108	1753	7.3

DVX-11X0-26MT		
240V ~ -1P 50Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 28x42	364	1.5
2x4 – 28x56	478	2.0
2x5 – 28x70	615	2.6
2x6 – 28x84	729	3.0
3x3 – 42x42	569	2.4
3x4 – 42x56	751	3.1
3x5 – 42x70	934	3.9
3x6 – 42x84	1116	4.6
4x3 – 56x42	751	3.1
4x4 – 56x56	979	4.1
4x5 – 56x70	1230	5.1
4x6 – 56x84	1480	6.2

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006
tel: 866-343-6018 fax: 605-697-4700
www.daktronics.com

DAKTRONICS

DVX-15X0-15HD		
240V ~ -1P 50Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 48x72	182	0.8
2x4 – 48x96	228	0.9
2x5 – 48x120	296	1.2
2x6 – 48x144	364	1.5
3x3 – 72x72	273	1.1
3x4 – 72x96	342	1.4
3x5 – 72x120	455	1.9
3x6 – 72x144	547	2.3
4x3 – 96x72	342	1.4
4x4 – 96x96	478	2.0
4x5 – 96x120	569	2.4
4x6 – 96x144	706	2.9

DVX-15X0-16HD		
240V ~ -1P 50Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 44x66	182	0.8
2x4 – 44x88	228	0.9
2x5 – 44x110	296	1.2
2x6 – 44x132	364	1.5
3x3 – 66x66	273	1.1
3x4 – 66x88	342	1.4
3x5 – 66x110	455	1.9
3x6 – 66x132	547	2.3
4x3 – 88x66	342	1.4
4x4 – 88x88	478	2.0
4x5 – 88x110	592	2.5
4x6 – 88x132	706	2.9

DVX-15X0-16MT		
240V ~ -1P 50Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 44x66	182	0.8
2x4 – 44x88	228	0.9
2x5 – 44x110	296	1.2
2x6 – 44x132	364	1.5
3x3 – 66x66	273	1.1
3x4 – 66x88	342	1.4
3x5 – 66x110	455	1.9
3x6 – 66x132	547	2.3
4x3 – 88x66	342	1.4
4x4 – 88x88	478	2.0
4x5 – 88x110	592	2.5
4x6 – 88x132	706	2.9

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006
tel: 866-343-6018 fax: 605-697-4700
www.daktronics.com

DVX-1100/1500/1800 Power Numbers

DVX-15X0-20MT		
240V ~ -1P 50Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 36x54	182	0.8
2x4 – 36x72	228	0.9
2x5 – 36x90	296	1.2
2x6 – 36x108	364	1.5
3x3 – 54x54	280	1.2
3x4 – 54x72	350	1.5
3x5 – 54x90	465	1.9
3x6 – 54x108	559	2.3
4x3 – 72x54	350	1.5
4x4 – 72x72	489	2.0
4x5 – 72x90	582	2.4
4x6 – 72x108	722	3.0

DVX-18X0-15MN		
240V ~ -1P 50Hz 2W + GND		
Section	**Max Watts**	**Max Amps**
2x3 – 48x72	455	1.9
2x4 – 48x96	615	2.6
2x5 – 48x120	774	3.2
2x6 – 48x144	934	3.9
3x3 – 72x72	706	2.9
3x4 – 72x96	934	3.9
3x5 – 72x120	1184	4.9
3x6 – 72x144	1389	5.8
4x3 – 96x72	911	3.8
4x4 – 96x96	1230	5.1
4x5 – 96x120	1549	6.5
4x6 – 96x144	1845	7.7

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006
tel: 866-343-6018 fax: 605-697-4700
www.daktronics.com

DAKTRONICS

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)

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006-5128
tel 605-697-4000 or 800-325-8766 Fax 605-697-4700
www.daktronics.com

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.

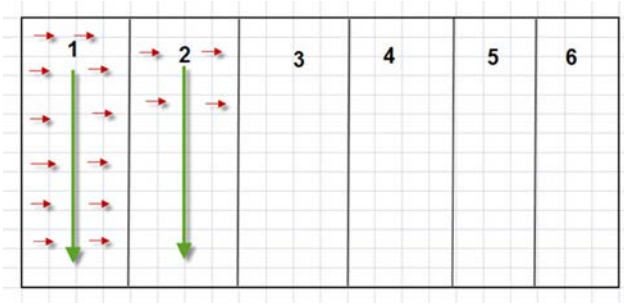


Figure 1: *Display Washing Direction for Modules*

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.

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006-5128
tel 605-697-4000 or 800-325-8766 Fax 605-697-4700
www.daktronics.com

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*

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006-5128
tel 605-697-4000 or 800-325-8766 Fax 605-697-4700
www.daktronics.com

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**.

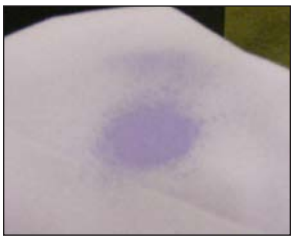


Figure 4: *Moistened Cloth*

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**.

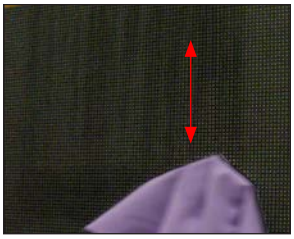


Figure 5: *Up & Down*

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

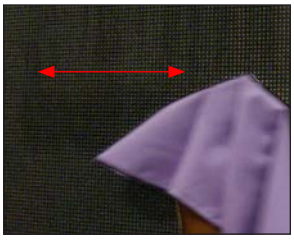


Figure 6: *Left & Right*

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

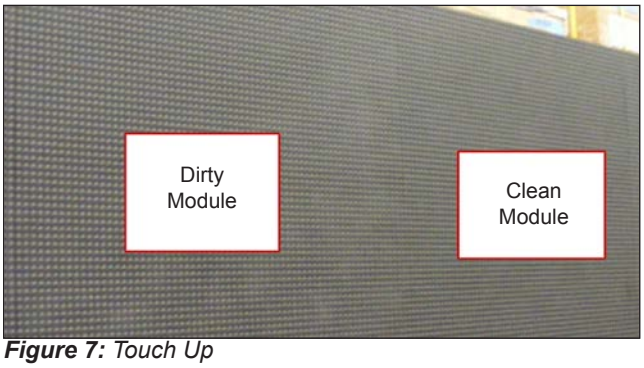


Figure 7: *Touch Up*

201 Daktronics Dr. P.O. Box 5128 Brookings, SD 57006-5128
tel 605-697-4000 or 800-325-8766 Fax 605-697-4700
www.daktronics.com

Appendix C: Daktronics Warranty & Limitation of Liability

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

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 agrees 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 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 Purchaser 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 either Purchaser or 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 Purchaser 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 Purchaser and shall ship such items DDP Purchaser's designated facility; otherwise, Purchaser shall pay transportation charges to return the Equipment back to the Purchaser 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. Purchaser 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. The limited warranty provided by Daktronics does not impose any duty or liability upon Daktronics for partial LED pixel degradation nor does the limited warranty 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, ACCURACTY OR QUALITY OF DATA. NO ORAL OR WRITTEN INFORMATION, OR ADVICE GIVEN BY THE COMPANY, ITS AGENTS OR EMPLOYEES, SHALL 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

The limited warranty provided by Daktronics does not impose any duty or liability upon Daktronics for:

A. Any 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, Purchaser assumes all risk of loss or damage, and agrees to use any shipping containers that might be provided by Daktronics and to ship the Equipment in the manner prescribed by Daktronics;

B. Any damage caused by the improper installation, adjustment, repair or service of the Equipment by anyone other than 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) a failure or sudden surge of electrical power, (iii) improper air conditioning, humidity control, or other environmental conditions outside of the Equipment's technical specifications such as extreme temperatures, corrosives and metallic pollutants, or (iv) any other cause other than ordinary use;

D. Damage caused by fire, flood, earthquake, water, wind, lightning or other natural disaster, strike, inability to obtain materials or utilities, war, terrorism, civil disturbance or any other cause beyond Daktronics' reasonable control;

DAKTRONICS

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. Any 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 Purchaser and are not part of the contract of sale;

G. Any 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. Any performance of preventive maintenance;

J. 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;

K. Incorporation of accessories, attachments, software or other devices not furnished by Daktronics; or

L. 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 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, lost data, injury to property or any damages or sums paid by Purchaser 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 to Purchaser or any other party 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 actually delivered to and paid for by the Purchaser. The Purchaser'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 original 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. Both parties consent to the application of the laws of the State of South Dakota to govern, interpret, and enforce all of Purchaser and Daktronics 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 Purchaser's protection, in addition to that afforded by the warranties set forth herein, Purchaser 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).

DAKTRONICS