

**5000 SERIES DIGITAL
BILLBOARD**
INSTALLATION MANUAL
P1810

DD3122394
Rev 04
23 May 2019

FCC Statement

Supplier Declaration of Conformity (SDoC)

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

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

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

Industry Canada Regulatory Information

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

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

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1 Introduction

This manual provides information to install and fire up a Daktronics digital billboard. Please read and understand all steps in this manual before beginning the installation process. Contact the Project Manager with questions.

Limitation of Liability

Failure to perform the following may void factory warranties:

- Install the digital billboard according to the steps in this manual
- Provide proper electrical service
- Ground the display properly

For the full Daktronics Warranty and Limitation of Liability, refer to **Section B: Daktronics Warranty and Limitation of Liability (p.27)**.

Note: This applies to initial installation only. Manufacturer does not warranty relocation of displays.

Important Contact Information

Daktronics Help Desk: 1-877-DAK-HELP (325-4357)

Project Manager: _____

Display Identification

This section provides label information that is helpful in understanding a Daktronics digital billboard display label. Refer to **Figure 1** while reading the table below.

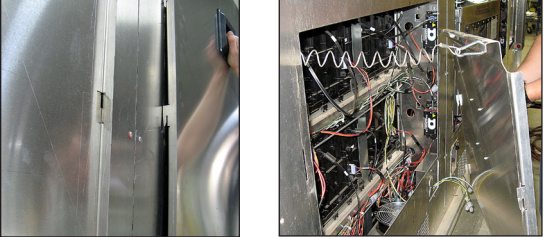
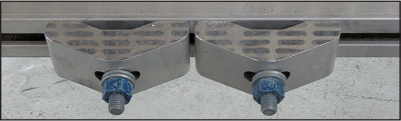



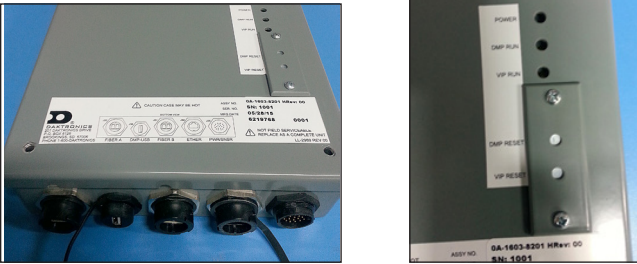
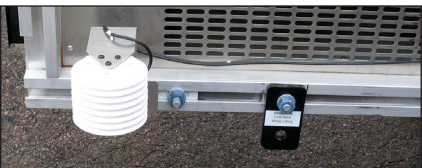


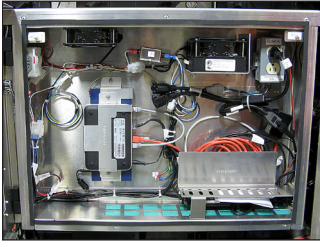

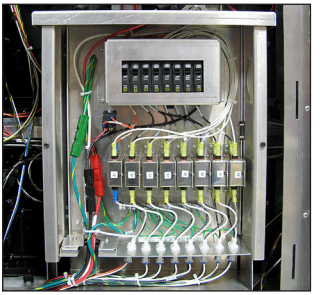

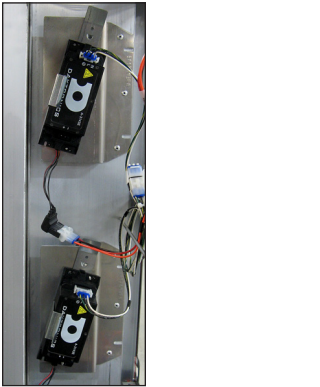
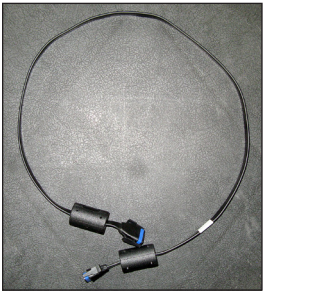
Figure 1: 5000 Series Display Label

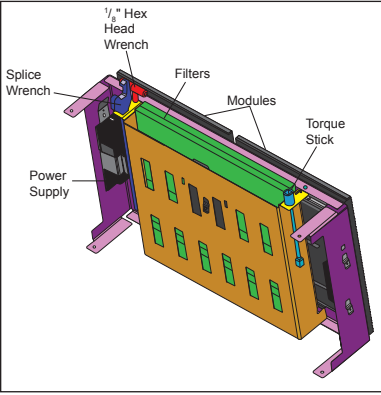
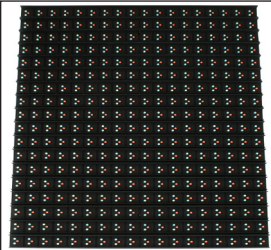
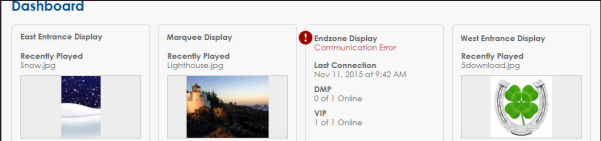
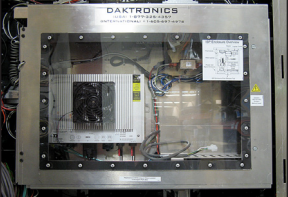
Display Assembly Number Display Serial Number Manufacture Month/Date Year	DB-5000 Modules High X Modules Wide MODS RMN: Daktronics - 0200 - 08 Manufactured in Sioux Falls, SD 120/240 VAC, Single Phase, 60 HZ AMPS (L1/L2) = 4.1/5.1 Total Total Watts for Display Section = 1,104
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50000 Series Improvements

Component	Improvement	Image of Change
Webcam Arm	<ul style="list-style-type: none"> • Fixed webcam arm • Optional rotating webcam arm for sites with front catwalk 	
Cooling	<ul style="list-style-type: none"> • Fans moved to the bottom of the display 	

Component	Improvement	Image of Change
Display Doors	<ul style="list-style-type: none"> Hook-style doors that hook into slots on the display's backsheet Handles on each door for easy removal 	
Mounting	<ul style="list-style-type: none"> Removed offset extrusion 	
Ventilation	<ul style="list-style-type: none"> Intake and exhaust vents replace intake and exhaust hoods 	
Internet and Webcam Connections	<ul style="list-style-type: none"> Recessed due to change in display mounting method 	
SmartLink	<ul style="list-style-type: none"> Moved to display's interior (located in the last column on the right side of the display when viewed from the back) 	
DMP-8065	<ul style="list-style-type: none"> No fans on DMP-8065 (internal or external) Single Power Supply Reset Switches (for DMP and VIP configuration recovery) 	
Temperature Sensor	<ul style="list-style-type: none"> Measures temperature at the display Mounted behind the display 	

Component	Improvement	Image of Change	
Control System	<ul style="list-style-type: none"> DMP-8065 Gen 2 Meraki Router 		
Term Panel	<ul style="list-style-type: none"> Moved location 		
Power Entrance Box	<ul style="list-style-type: none"> Moved to a new location - the last right column (when viewed from the back) See layout examples on Page 6 		
Power Supply	<ul style="list-style-type: none"> Low-profile power supplies One 65 W power supply now powers two modules. Power supplies are mounted to the uprights inside the display 		
SATA Cable	<ul style="list-style-type: none"> Color changed from red to black Part number change Better latch arm functionality Low-profile ferrites 		

Component	Improvement	Image of Change
Spare Parts	<ul style="list-style-type: none"> Spare parts are located inside the display rather than in a separate spare parts box The Spare parts rack is removable to allow for rear service access Module tool, torque stick, and splice tool are included. Other standard service tools are not 	
Module LEDs	<ul style="list-style-type: none"> Uses the latest technology with a downward-focused LED 	
Venus Diagnostics	<ul style="list-style-type: none"> Internet-based diagnostics Dashboard-based view 	
Optional Control System - Third Party	<ul style="list-style-type: none"> Internal location for customer-provided player See DD2879292 for requirements 	

Terms Used in this Manual

Lanyard Attachment Ring: A ring found on the back of each module and on the display doors that attaches to a lanyard and prevents the module from falling.

Latch Release: Releases the latch that holds the module firmly in the display. The latch is centered near the top of the module.

Light Emitting Diode (LED): Low-energy, high-intensity lighting unit.

Line Filter: Removes electromagnetic noise that might interfere with local communication channels from the power system.

Module: Consists of a display board with LEDs, a driver board or logic card, housing, a module latch assembly, and a louver. Each module is individually removable from either the front or back of the display. Module part numbers vary by pixel pitch.

ProLink Router (PLR): The PLR takes data in and then routes that data to other areas in the sign. There is typically one PLR per display section.

Power Supply: A device that converts AC line voltage from the panel board to low DC voltage for driver boards. In the 5000 series, one power supply powers two modules, one controller, or a ProLink Router (PLR).

Serial Advanced Technology Attachment (SATA) Cable: Allows high speed signal from flow from device to device. In digital billboards, they run signal from module to module and from the PLR to the modules.

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

DMP-8065: Digital billboard control card that sends content to the display. The DMP limits the display to static content and regulates content hold times.

Required Tools

The following table lists the minimum tool requirements to have on site for each installation. Daktronics provides some specialized tools but it is the installer's responsibility to provide the majority of tools:

<p>Daktronics-Provided Tools (located behind labeled doors)</p>	<ul style="list-style-type: none"> • Black cable ties • L-Handle Allen wrench: 1/8" • Splice wrench • Torque stick • Hex head wrench: 1/8"
<p>Customer-Provided Tools</p>	<ul style="list-style-type: none"> • Hex head wrenches: Various sizes • Flat-head screwdriver • Phillips screw driver • Bucket truck: Customer must provide until final proof of performance • Crane • Cordless drill • Drill bits • Hammers • Ladder: 6', 8', 10' • Laptop • Pry bar • Ratchet tie-downs/come along • Socket and open end wrench: 1 1/16" • Socket extension: 3" • Socket set • Tape measure • Torque Allen wrench: 1/8" • Utility knife • Taglines • Fish tape

Daktronics Digital Billboard Overview

Figure 2 provides a general overview of display components in a poster (11' x 22') display. Refer to display-specific drawings to identify component locations as they vary by display size.

After performing service or completing connections, replace the display door and ensure it is attached to the safety lanyard and secured with a screw (#10-24 X0.625 hex head, Daktronics part number HC-1554) in the provided location on the top-right side of each door. Refer to **Figure 3**. Find replacement screws in a bag in the spare parts area.

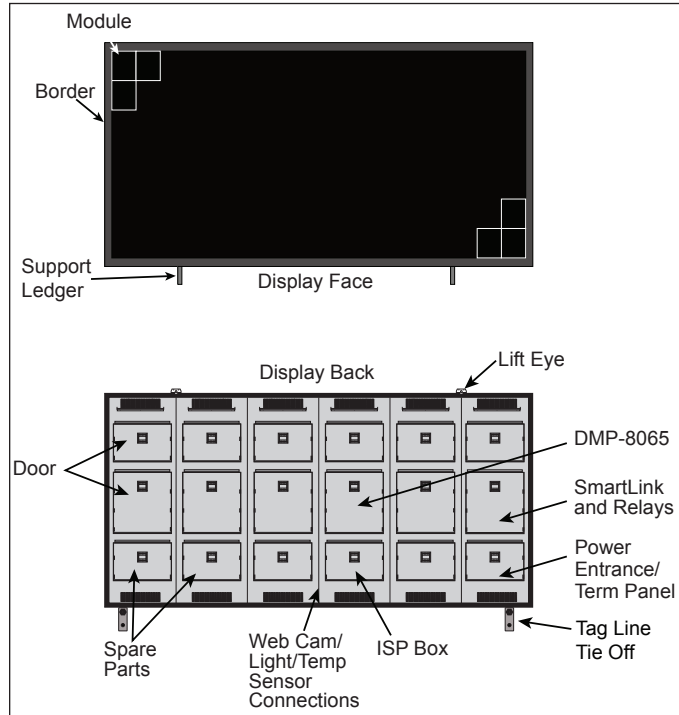


Figure 2: 5000 Series Display Front and Back



Figure 3: Removing Door Screw

2 Installation Preparation

Installation Planning

Prior to the display arriving on site, review installation plans with the electrician, ISP provider, and members of the installation crew.

Support Ledger

Ensure that the ledger brackets are mounted to the upright I-beam. All ledger brackets must be installed prior to lifting the display to the head. For ledger bracket details, refer to DWG-988359 (use with offset mounts) and DWG-3041598 (use without offset mounts) in **Section A: Reference Drawings (p.25)**.

Display Inspection

When the display arrives on site, verify the packaging is in good condition. When unpacking the display, inspect it for damage and potential issues.

Photograph any damage and contact your Project Manager immediately to report issues. Failure to report and document shipping damage may void any manufacturer's warranties.

3 Display Installation

This section provides general guidelines for DB-5000 display installation. Work closely with the Project Manager on all installations. Do not modify the display or control system in any manner without the written permission of the Project Manager. Any unauthorized modifications may void the display warranty.

Display Installation

1. Using a utility knife, carefully cut away all of the white packaging material from the display. Pay special attention when cutting around the Multi-Direction Light Sensor (MDLS) to avoid cutting cables. If possible, do not cut anywhere along the display face as it can damage the LEDs and modules.
2. Remove the wood and the wood braces from the top of every display section.
3. Open the display and verify all installation tools and installation hardware were sent with the display. Contact the Project Manager immediately if missing installation parts.
4. Locate the spare parts box in the left end bays (when viewed from the back) and verify all installation tools and installation hardware were sent with the display. Contact the Project Manager immediately if missing installation parts.
5. Verify that the lift-eyes are installed and the lift-eye bolts and set bolts are in place. Refer to **Figure 4**. Lift eye spacing is set at Daktronics and should not be moved without the Project Manager's permission.

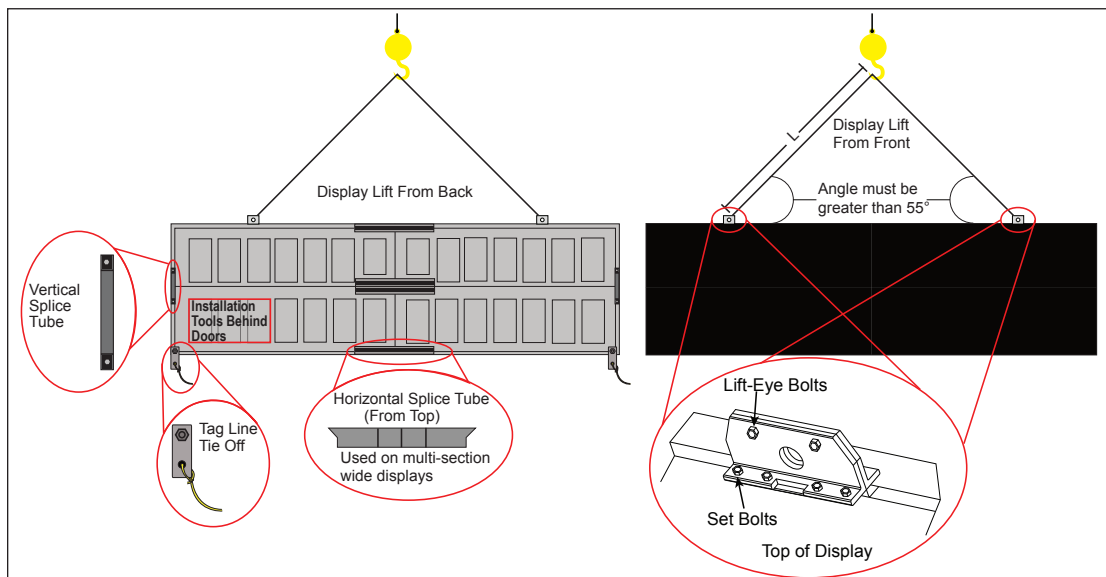


Figure 4: Display Lifting

6. Attach lift lines from the crane to the lift eyes.

Note: Ensure the angle between the top of the display and the lifting strap is greater than 55°. Refer to **Figure 4**. The table shows Daktronics recommended strap lengths for common display sizes.

Display Dimensions	Minimum Strap Length (L)
14' x 48'	25'
10'6" x 36'	20'
14' x 28'	20'
11' x 22'	15'

7. Lift the display to apply some tension to the lift lines.
8. Tie tag lines to the provided tag line tie off on the bottom corners of the display. Refer to **Figure 4**.
9. Unbolt the display from the trailer by removing the shipping braces.

Note: For displays that require a section splice, complete the steps in **Section 4: Section Splicing (p.11)** before continuing the installation process.

10. Locate the center-line label on the back of the display.
11. From the center of the display, measure and align the mounts so they match the structure upright spacing. If a section splice is required, measure the spacing before splicing the display because the splice plates should not be loosened or moved after the display is spliced.

Note: Do not fully tighten the mounting at this time as it may need to be adjusted while attaching the display to the structure.

12. After aligning the mounting brackets and offset extrusion, verify the DMP and the ISP enclosure will not experience interference during installation. If they will experience interference issues and need to be moved, follow the directions in Relocating a Digital Billboard ISP Enclosure and Controller in Appendix A before hanging the display.
13. If the display is two sections wide and has a vertical splice, either from the factory or on site, locate the horizontal splice tube at the splice location. Refer to **Figure 4**. This tube is shipped installed and must be secured before lifting the display. This tube also acts as a mount and can engage an upright. If needed, before lifting the display, loosen and slide the splice tube until one of the alternate alignment lines aligns with the display splice. Tighten all splice tube bolts before lifting the display.

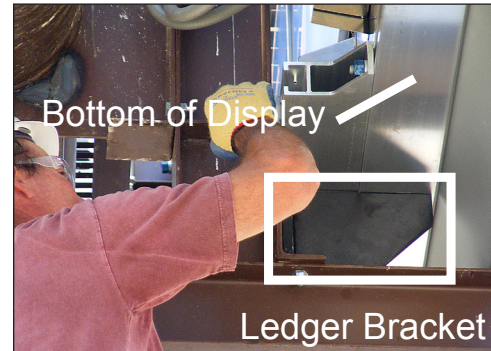


Figure 5: Display Resting on Ledger

14. Lift the display off of the truck.
15. Slowly lift the display to the structure head and guide into place with tag lines.
16. Lower the display along the uprights until it rests on the ledger brackets.

Note: The support ledger is provided by the customer prior to display installation. Refer to **Figure 2**.

17. Verify the display is resting on all ledger brackets. Shim the ledger bracket if the display is not resting on all ledger brackets until it is in contact with the display. Refer to **Figure 5**.
18. On each end of the display, slide the rocker clamps over until they engage the upright flanges. Refer to **Figure 6**.
19. Use an impact wrench and the torque stick (provided with the spare parts) to tighten the nut on the rocker clamp bolt to 75 ft-lbs.

Note: If the U-channel mounted to the offset extrusion bolt aligns with an opening in the mounting channel, shift the entire display left or right until the U-channel is at least 1" from the opening.

20. Slide the right rocker mount into the end of the offset extrusion.
21. Use an impact wrench and the torque stick box to tighten the nut on the rocker clamp to 75 ft-lbs.
22. Tighten all of the nuts on the offset extrusion bolts to 75 ft-lbs with an impact wrench and the torque stick (when present).
23. Place and tighten all remaining mounting assemblies to 75 ft-lbs.
24. Remove the crane support.
25. Disconnect the tag lines.
26. Locate the top border cover caps.
27. If applicable, use tek screws to install the border caps over the lift eye locations.



Figure 6: Rocker Clamp Engaging Upright

4 Section Splicing

Display Section Numbering

For displays with multiple sections, each section is numbered for easy installation. For a two-section display, the bottom section is BX and the top section is TX. Refer to **Figure 7**.

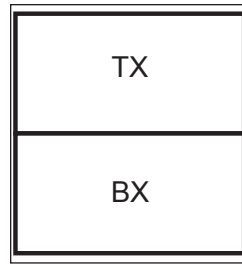


Figure 7: Two-Section Display Section Numbering

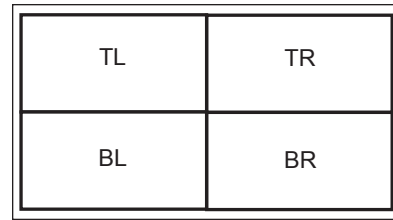


Figure 8: Four-Section Display Section Numbering

For four-section displays, when looking from the front, the lower-left display section is BL and the section to the right is BR; the second row of sections are TL on the left and TR on the right. Refer to **Figure 8**.

Display Splicing

Note: Always splice horizontal sections together first. Then complete vertical splices to prevent seams, as shown in **Figure 9**.

1. Ensure the splice key is in the splice channel and the alignment brackets are installed on the bottom display section. Refer to **Figure 10** and **Figure 11**.
2. Lift the display top section off of the truck.
3. Slowly lower the display top section until it rests above the bottom section.
4. Continue lowering the display until it rests on the display bottom sections and the splice key is inside the display top section splice channel.
5. Starting at one end of the display, insert the top lip of the splice wrench into the top section mounting channel. Refer to **Figure 12**.
6. Rest the bottom lip of the splice wrench against the back of the bottom section mounting channel.
7. Firmly pull down on the splice wrench until the back of both display sections align and the splice key is fully engaged in the top and bottom section splice channels.
8. Repeat Steps 5 - 7 approximately every foot along the back of the display.

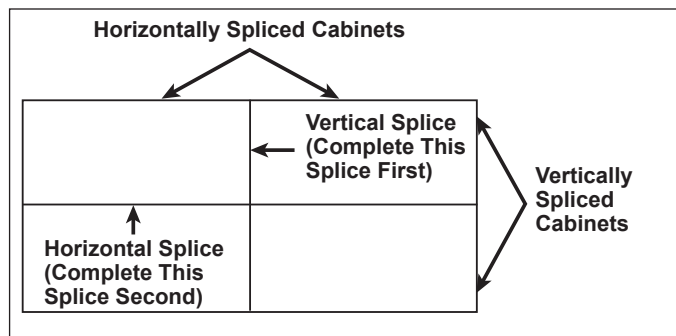


Figure 9: Splicing Display Sections

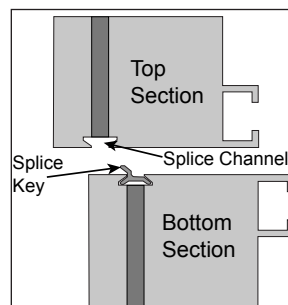


Figure 10: Installed Splice Key

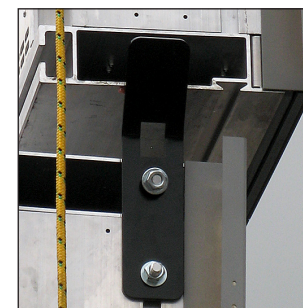


Figure 11: Alignment Bracket

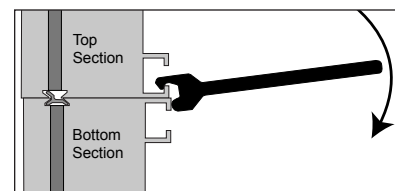


Figure 12: Aligning Display Sections with Splice Tool

- Verify the LEDs in the display top section and the display bottom section align with each other.

- Ensure the display sections align from front to back.

LED Alignment
Verify LEDs align in all directions between splices. If the LEDs are more than 1/4 of an LED out of alignment, adjust until properly aligned.



- Starting at one end of the display, place the flat splice plates over the bolts and place a nut and washer on each bolt. Refer to **Figure 13**.

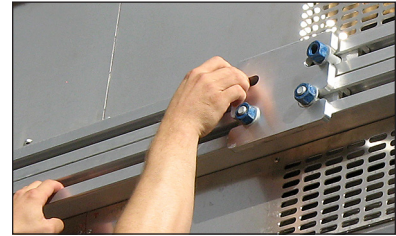


Figure 13: Attaching Splice Plate

Note: There are two different styles of splice plates shipped on the display. The flat splice plates need to be distributed along the back of the display. The "C" style splice plates are located on each end of the display to assist guiding the display during splicing. Refer to **Figure 14**.

- Use an impact wrench, the torque stick, and a 11/16" socket to tighten all of the nuts on the mounting plate to 75 ft-lb.

- Attach and secure all mounting plates along the section splice. Place one splice plate on each end and evenly distribute the remaining splice plates along the back of the display.

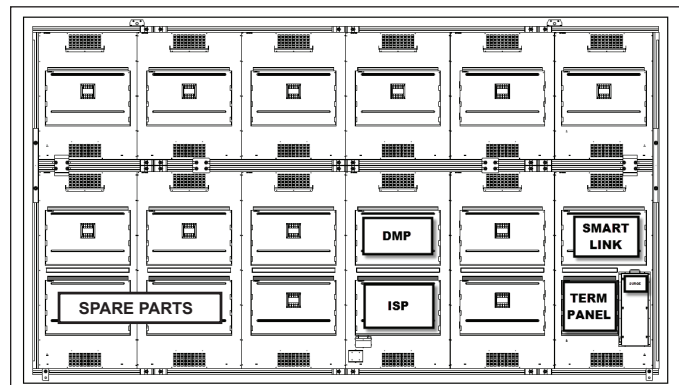


Figure 14: Splice Plate Installation Locations

- Remove the alignment bracket from the bottom display sections.

- Loosen the nuts that hold the vertical splice tube in place. Refer to **Figure 15**.

- Slide the vertical splice tube until centered between the display sections.

- Tighten the vertical splice tube nuts to secure the splice tube in place.

- Repeat Steps 15 - 18 for all vertical splice tubes.

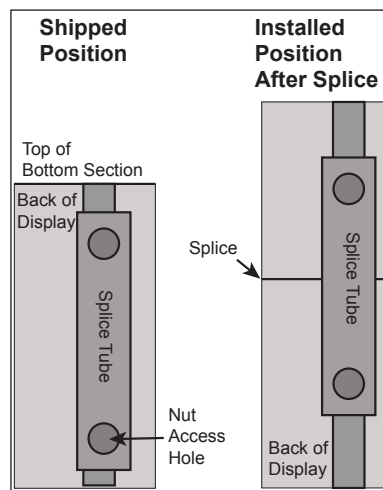


Figure 15: Aligning and Installing the Vertical Splice Tubes

- Locate the border splice plate. Slide the splice plates over the bolts on the top and bottom border section splice opening on each end of the display. Refer to **Figure 17**.

- Complete the steps in **Section 3: Display Installation (p.8)** to install the billboard.

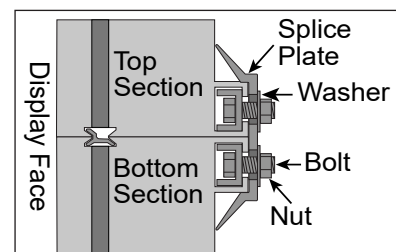


Figure 16: Installed Flat Splice Plate



Figure 17: Attaching Vertical Splice Cover

Section Splicing

21. Connect the signal splice cables from the display top section Signal A on the bottom section to Signal A on the top section and Signal B on the bottom section to Signal B on the top section. Refer to **Figure 18**.
22. Connect the power splice cable to the power interconnect jacks on each display section.

Note: For displays that require a horizontal splice, refer to the Daktronics Digital Billboard Horizontal Power Splice quick guide in **Section A: Reference Drawings (p.25)** for signal and power splicing instructions.

Note: After performing service or completing connections, replace the display door and ensure it is attached to the safety lanyard and secured with a screw (#10-24 X0.625 hex head, Daktronics part number HC-1554) in the provided location on the top-right side of each door. Refer to **Figure 2**. Find replacement screws in a bag in the spare parts area.

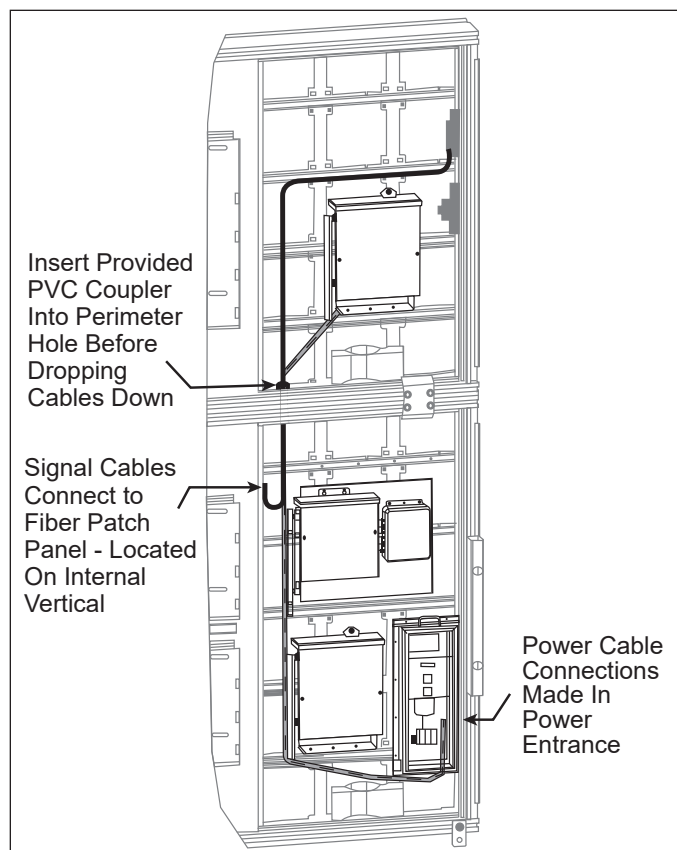


Figure 18: Power and Signal Splice Connections

5 Multi-Direction Light Sensor Relocation

The Multi-Direction Light Sensor (MDLS) ships attached to the display borders in a location provided by the Project Manager. If needed, use the following steps to move the MDLS to a location that receives the same light as the display face.

Multi-Direction Light Sensor Relocation

1. From the back of the display, disconnect the cable that connects the MDLS to the display.
2. Carefully cut the zip ties that secure the cables to the anchor location on the display back.
3. Loosen the attachment bolts that hold the MDLS assembly to the MDLS mounting arm. Refer to **Figure 19** and **Figure 20**.
4. Lift the MDLS assembly off of the MDLS mounting arm.
5. Remove the two tek screws that secure the MDLS mounting arm to the border. Refer to **Figure 19** and **Figure 20**.
6. Remove the MDLS mounting arm from the border.
7. Rotate the MDLS mounting arm vertically 180 degrees until the MDLS assembly can be reattached to the MDLS mounting arm.
8. Place the MDLS assembly on the photocell mounting arm.
9. Use the attachment bolts and nuts to secure the MDLS assembly to the MDLS mounting arm.
10. Use Tek screws to secure the MDLS mounting arm and MDLS assembly to the border at the new location.

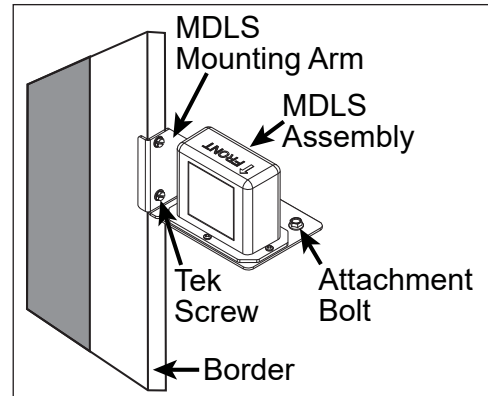


Figure 19: MDLS on Right Side of Display (From Front)

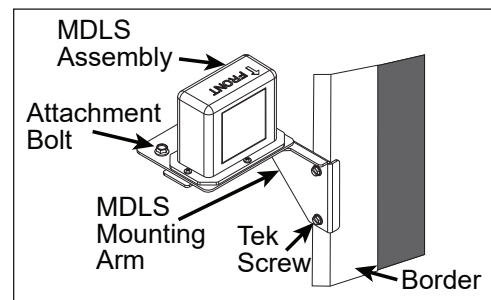


Figure 20: MDLS on Left Side of Display (From Front)

Note: Ensure the front label on the MDLS assembly is on top and the arrows are facing away from the display and all three light sensor windows are free from obstruction. If you have any questions about the MDLS mounting, contact the Project Manager or Daktronics help desk.

11. Connect the MDLS cable to the Light Sensor connection below the power entrance box.

Note: If after moving the MDLS the cable is not long enough, request a 30' extension from the project manager. Connect the extension cable to the MDLS cable and to the back of the display.

12. Secure any excess cable to the provided anchor points on the back of the display.

6 Webcam Mounting

This section provides instructions on mounting the webcam arm to a Daktronics digital billboard display. Depending on size, your display will either be shipped with a fixed length webcam arm or retractable webcam arm. For additional mounting or assembly details, refer to the arm-specific drawings located in **Section A: Reference Drawings (p.25)**.

Mounting the Webcam to the Arm

1. Locate and identify all webcam mounting components.
2. Using the wire shipped in the webcam arm, pull the Ethernet and ground cables through the webcam arm.
3. Verify there is enough excess cable to allow the webcam arm to pivot if needed.
4. Slide the webcam between the top and bottom tube saddles until it is two inches from the end of the webcam arm. Refer to **Figure 21**.
5. Tighten all four saddle bolts.
6. If necessary, turn the webcam assembly until it will face the display when mounted.

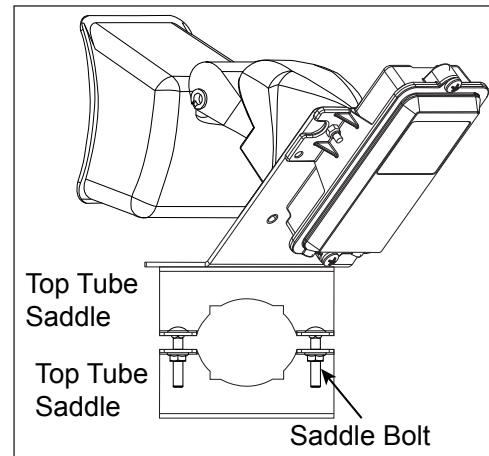


Figure 21: Mobotix Webcam Mounting

Standard Fixed Webcam Arm Installation

1. The webcam arm is shipped with all hardware and arm components. Remove the $\frac{5}{8}$ " nuts and washers from the arm assembly before installing the webcam arm. Refer to **Figure 22**.
2. Before hanging the display, slide both mounting channels with the bolts into the horizontal mounting channel.
3. Align and slide the webcam mounting assembly over the four mounting channel assembly bolts.
4. Place a washer on each $\frac{5}{8}$ " bolt.
5. Attach the $\frac{5}{8}$ " nuts to the bolts to secure the mounting assembly to the display.
6. Using fish tape, feed the webcam cables through the webcam arm tube.
7. Connect the webcam cable to the Webcam 1 connection below the power entrance box on the back of the display.
8. Secure the green webcam grounding wire to the grounding lug along the perimeter of the display back.
9. Neatly secure excess power grounding with cable ties.

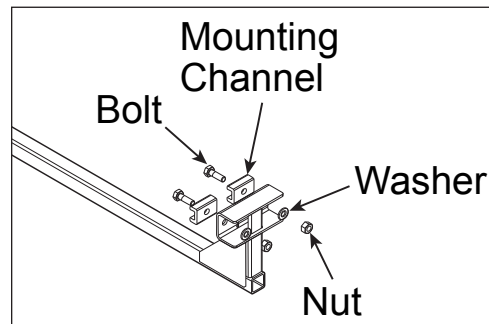


Figure 22: Fixed Webcam Arm Mounting

Adjustable-Length Webcam Arm Installation

Daktronics ships all displays less than 15' tall with a webcam with an adjustable-length arm. The maximum length for the adjustable webcam arm is between 10' and 15'. The reason for the adjustable length is that, for every foot of display height, the webcam must be an equal number of feet from the display face to be able to view all of the modules on the display face. For example, a display 14' tall must have the webcam approximately 14' from the display face. A 20' webcam arm is shipped with all displays taller than 15'. Refer to DWG-1142216 and DWG-1067554 in

Section A: Reference Drawings (p.25) while following the installation instructions.

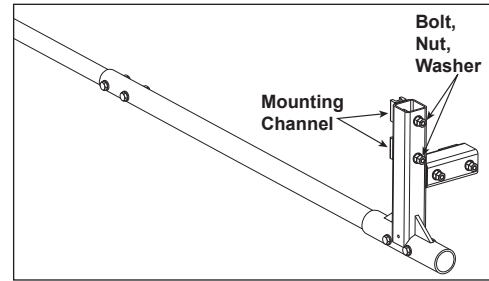


Figure 23: 10-15' Fixed Webcam Arm Mounting

Installation

1. Determine the side of the display to mount the arm. The webcam should be mounted on the side of the display away from oncoming traffic. This ensures the view of the display is not inhibited.
2. Remove the mounting bolts and the mounting channel from the assembly.
3. Slide two of the mounting channels and bolts into the horizontal mounting channel on the display back. Refer to **Figure 23**.
4. Slide the two remaining channels into the vertical mounting channel on the display back.
5. Place the bolting template over the bolts in the channel. The bolting template is important as it makes mounting the arm assembly easier. Refer to **Figure 24**.
6. Mount the elbow assembly to the back of the display by sliding the mounting bolts through the arm mounting assembly.
7. Place washers on all four mounting bolts.
8. Securely fasten a nut on each mounting bolt.
9. Fasten a second nut on each mounting bolt. The second nut serves as a lock nut to secure the first nut.
10. Slide the webcam arm into the lower part of the elbow arm assembly. The webcam arm slides 12" into the elbow assembly.
11. Ensure the webcam is on the top of the webcam arm and tighten the arm set bolts.
 - For a 10' arm, the webcam arm bolts must feed through the pivoting arm, the 6' arm section and the 10' arm section. This will set the webcam 10' from the display face.
 - For a 15' arm, insert one set of bolts through the pivoting arm and the 6' arm section. A second set of bolts is inserted on the end of the 6' arm section away from the display face and at the base of the 10' arm section. This will set the webcam 15' from the display face.

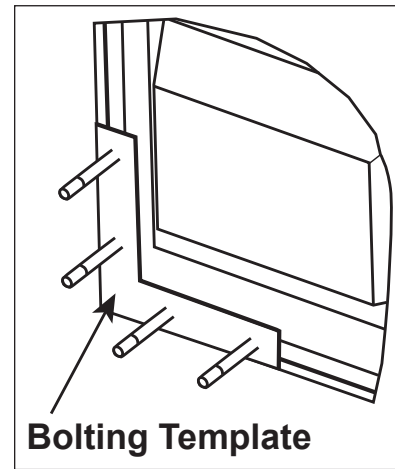


Figure 24: Webcam Bolting Template

12. Tighten all mounting and webcam assembly bolts.
13. Connect the webcam cable to the Webcam 1 connection below the power entrance box on the back of the display.
14. Secure the green webcam grounding wire to the grounding lug along the perimeter of the display back. Refer to **Figure 25**.
15. Neatly secure excess grounding wire with cable ties.
16. Ensure all webcam and webcam mounting bolts are secure prior to hanging the display.
17. After hanging the display, connecting display power, and starting the display, call Daktronics NOC and have a technician verify they can detect the video server. If the video server is not detected, ensure the power and signal cables are securely attached to the camera and display. Make sure the video server has power and is connected with Cat-5e cable to the network switch on the router.
18. Work with the NOC to ensure the camera is aligned properly. If adjustment is required, pivot the arm to the display face and adjust as needed.



Figure 25: Webcam Grounding Lug

Optional Retracting the Webcam Arm

1. To retract the webcam arm, remove the three short bolts from the top of the elbow assembly. Refer to **Figure 26**.

Note: Do not remove the long bolts.

2. Use the handle to carefully pivot the webcam arm to the front catwalk.

Note: Verify the power and signal cables are not pinched when pivoting the webcam arm.

3. Return the webcam arm to the original position when done servicing the webcam arm.
4. Replace and tighten the three short bolts.
5. Work with Daktronics NOC to verify the webcam is focused and functioning properly.

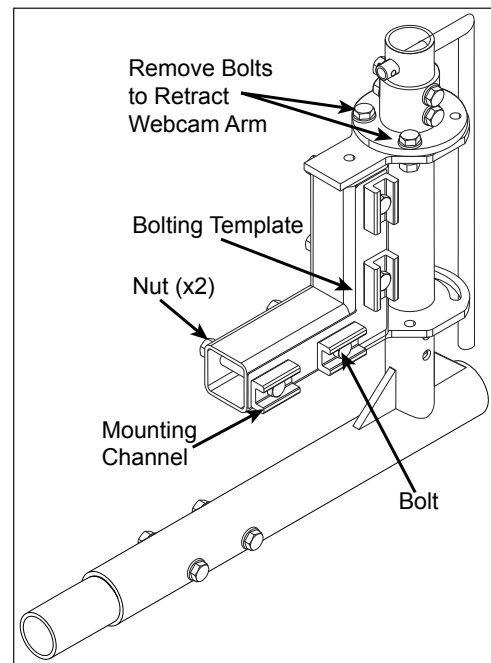


Figure 26: Pivoting Webcam Arm Base

7 Electrical Installation

This section provides general guidelines for connecting power to a 5000 series Daktronics digital billboard. For display-specific power requirements, refer to the riser diagram or contact the Project Manager.

Note: Provide the site-required power to the display as listed on the system riser drawing. Low or poor power can result in dim content, parts of the display out, module flickering, or display damage.

Note: Test the display ground to verify it meets local and national codes. Failure to properly ground the display can result in display damage and may null and void any warranties. For displays that require a horizontal display splice, refer to Daktronics Digital Billboard Horizontal Power Splice in **Section A: Reference Drawings (p.25)**.

Main Disconnect

Daktronics requires using a power disconnect switch with the display. Use a disconnect so that all ungrounded conductors can be disconnected near the point of power connection.

Locate the disconnecting means either in a direct line of sight from the display or so it can be locked in the open position. This ensures that power is not reconnected while service personnel work on the display.

Electrical Installation

1. Refer to the display riser diagram for site-required power.
2. Run conduit from the main distribution panel (provided by customer) to the display power entrance(s).
3. Route power to the display through a disconnect switch.
4. Loosen the six screws that secure the power entrance cover and lift it off of the power entrance. Refer to **Figure 27**.
5. Feed power cable through the conduit into the power entrance.



Figure 27: Power Entrance Access



Figure 28: Power Entrance Box

6. Connect the ground wire to the ground lug at the bottom of the power entrance box (green wire) and tighten to 45 in-lbs with a $\frac{3}{16}$ " Allen wrench. Refer to **Figure 29**
7. Connect power line 1 (L1) to Line 1 of the tap and use a $\frac{3}{16}$ " Allen wrench to tighten to 57 in-lbs.
8. Connect power line 2 (L2) to Line 2 of the tap and use a $\frac{3}{16}$ " Allen wrench to tighten to 57 in-lbs. Refer to **Figure 30**.
9. Connect the neutral line to the neutral tap and use a $\frac{3}{16}$ " Allen wrench to tighten to 57 in-lbs.
10. Verify the breakers for the control equipment and surge suppressor are on.
11. Verify the breaker for the Backlit ID is off unless there is a backlit ID.
12. Replace and secure the power entrance cover.

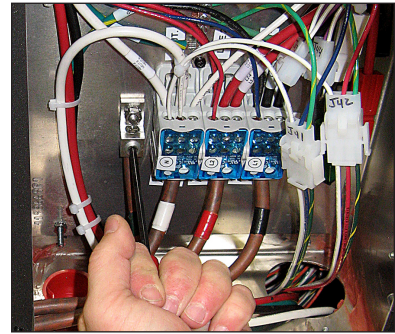


Figure 29: Connect Ground Wire

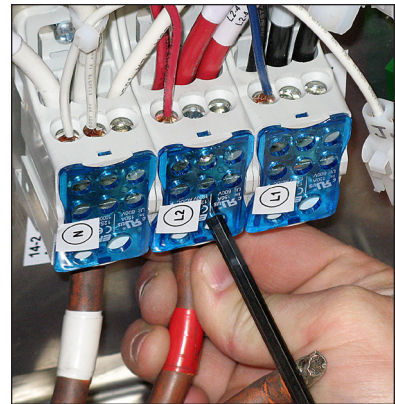


Figure 30: Connect Power Lines

Display Grounding

Daktronics recommends that the customer install a ground rod. Multiple ground rods may be needed to achieve this. Refer to local and national codes on grounding and bonding methods.

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 only if designed to do so. A qualified inspector must approve the support structure and grounding methods.

8 Spare Parts Rack Location

Find spare parts and specialized tools behind the doors in the bottom-left bays of the display.

Note: After performing service or completing connections, replace the display door and ensure it is attached to the safety lanyard and secured with a screw (#10-24 X0.625 hex head, Daktronics part number HC-1554) in the provided location on the top-right side of each door. Refer to **Figure 2**. Find replacement screws in a bag in the spare parts area.

Included in the spare parts rack are:

- Modules
- Filters
- Splice Wrench
- Torque Stick
- Hex Head Wrench - $\frac{1}{8}$ "
- Power Supply

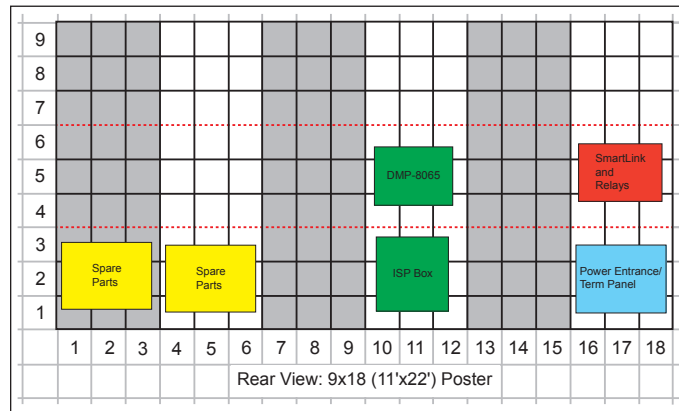


Figure 31: Spare Parts Box in Display

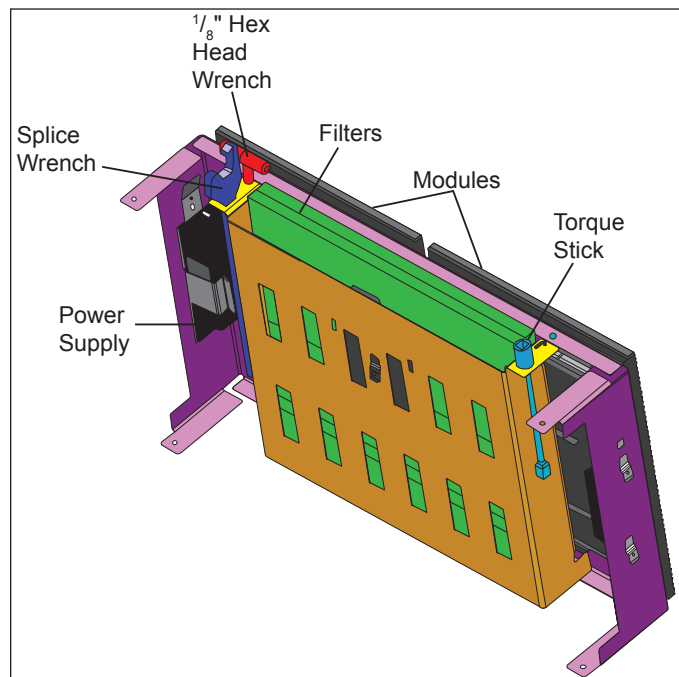


Figure 32: Spare Parts Rack Component Locations

9 Control System Overview

For the 5000 series of displays, the control components are enclosed in the display.

Fully Embedded Control System

For the 5000 series of digital billboards, Daktronics has three major components. Two of the components, the ISP enclosure and the DMP-8065, are shipped in the same bay. The SmartLink™ is mounted inside the display above the power entrance. Display back sheets are labeled with component locations to make finding components easy. The table below describes each the control system in more detail. Refer to **Figure 33**, **Figure 34**, and **Figure 35** while reading the component descriptions below.

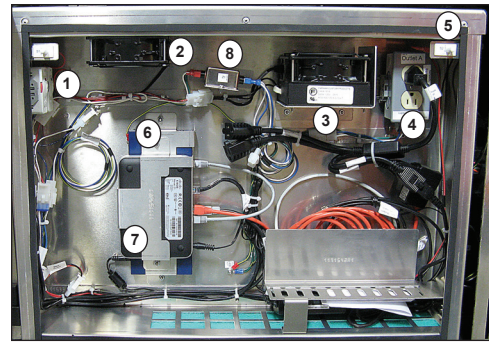


Figure 33: ISP Enclosure

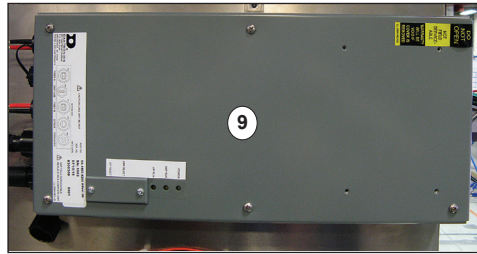


Figure 34: DMP-8065

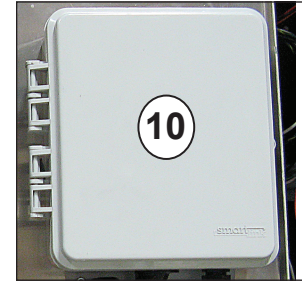


Figure 35: SmartLink™

Component	Function	Number
Thermostat	Measures the temperatures inside the ISP enclosure and turns on the fan or the heater as needed.	1
Fan	High heat can damage some electronics, the fan cools the ISP enclosure to keep the equipment in a safe functional range.	2
Heater	Since ISP equipment is affected by lower temperatures, a heater prevents the ISP enclosure from going below a functional range.	3
Laptop and Cell Phone Outlet	Can be used to charge laptop or cell phones. Do not plug drills or other power tools into this outlet.	4
Door Switch	Detects if the ISP enclosure door is open. If opened, an alert will be created and the content will switch to predetermined content.	5
POE Ethernet Switch	Connects network devices.	6
Router	Routes data coming in from the Internet.	7
Z-Filter	Suppresses electrical noise in the electrical line.	8
DMP-8065	Converts content data from the Internet into a format recognized by the display and sends it out to the ProLink Routers (PLRs) in the display.	9

Opening the ISP Box

To access ISP box components, complete the following steps:

1. Access the ISP box by opening the rear access door with the control equipment label.
2. Using a flat-head screwdriver, turn the two 3/4 turn latches counter-clockwise. Refer to **Figure 36**.
3. For easier access to ISP components, the ISP box door can be lifted off the hinges.
4. Ensure ISP door and latches are secured after service to guarantee proper function of the door sensor.



Figure 36: Control Equipment Door

Note: After performing service or completing connections, replace the display door and ensure it is attached to the safety lanyard and secured with a screw (#10-24 X0.625 hex head, Daktronics part number HC-1554) in the provided location on the top-right side of each door. Refer to **Figure 2**. Find replacement screws in a bag in the spare parts area.

10 First-Time Power Up

A laptop is required to communicate with the display. In the ISP enclosure, connect the red Ethernet cable with the Connect to Laptop tag to an Ethernet power on the laptop.

First-Time Power Up

1. Loosen the two 3/4 turn latches that secure the ISP enclosure cover. Refer to **Figure 37**.
2. Open the ISP enclosure cover, if desired, lift and remove the ISP enclosure cover off the hinges. Hinge locations are shown in **Figure 38**.
3. Install the Modem according to the ISP schematic. Ensure the modem has power and is connected to the Internet connection on the router. Ensure the webcam is connected to the POE network switch.
4. For displays sharing the Internet connection, connect a Cat5 cable from port 8 on the network switch of the primary display to port 8 of the network switch on the secondary display.
5. Turn on site power at the main breaker at the structure base.
6. Verify the status lights on the surge suppressor are on.
7. Check the LED indicators on the equipment in the ISP enclosure to ensure they are on.
8. Ensure the DMP-8065 LED indicators LEDs are on.
9. Connect a laptop to the red crossover cable in the ISP enclosure.
10. Call Daktronics help desk at 1-877-DAK-HELP to verify connectivity to the display, perform a diagnostics check, activate the SmartLink™, and perform several display setting checks. The help desk technician will ask for the SmartLink™ ICCID or MEID number. This number is located on the bottom of the SmartLink™ or on the mezzanine card in the SmartLink™. Refer to **Figure 39**.
11. After the help desk verifies the diagnostics is clean and performs their tasks, disconnect the laptop from the cross-over cable and reinstall the ISP enclosure cover.

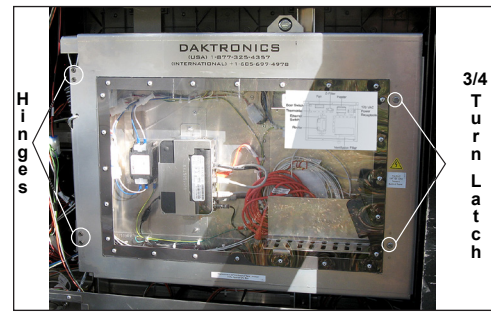


Figure 37: ISP Box Door Removal

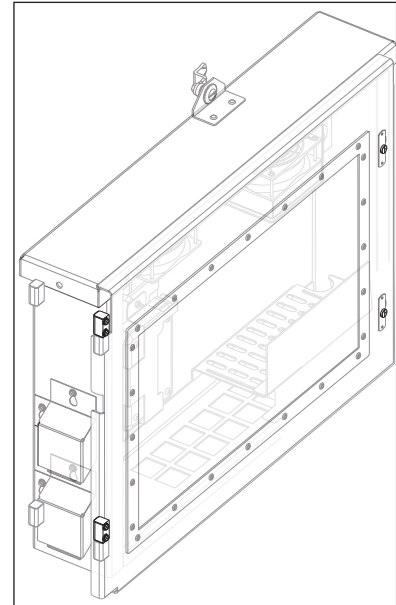


Figure 38: ISP Box Door Removal



Figure 39: ICCID Number on Mezzanine Card

11 Display Testing and Adjustment

Perform the following final tests and adjustments on the billboard and its components to verify they are functioning and adjusted properly.

Diagnostics Checks

After the display is connected to the Internet and running, Daktronics NOC monitors the display and performs some checks to determine if there are any:

- Module issues
- Internet or connectivity issues
- Webcam issues
- Display temperature issues
- MDLS issues
- Spare parts count

Display Image Quality

After the display is showing content, visually inspect the display for:

- Inaccurate or off color
- Module edges
- The display is too dim or bright
- Modules out
- Incorrect content transition
- Modules stuck on
- Pixels stuck on or bright

Work with Daktronics NOC to address any visual issues.

Test the Light Sensor

Contact Daktronics NOC and perform these steps to verify the MDLS is functioning properly.

1. Carefully cover the MDLS with a heavy piece of cloth.
2. Watch the display for a few minutes to verify the display dims.
3. Have a NOC technician monitor IDM at the same time to verify the display is dimming properly.
4. Work closely with the NOC technician to correct any issues.
5. Remove the fabric from the MDLS.

A Reference Drawings

This section contains drawings and quick guides that are generic to Daktronics digital billboards. Project-specific drawings and documents take precedence over the document in this section.

Daktronics Digital Billboard Horizontal Signal Splice.....	<u>DD3151286</u>
Ledger Assembly (use with offset mounts)	<u>DWG-988359</u>
Ledger Assembly (use without offset mounts)	<u>DWG-3041598</u>
Billboard Pivoting 10-15' Webcam Arm.....	<u>DWG-1065544</u>
Billboard Fixed 10-15' Webcam Arm	<u>DWG-1142216</u>
Billboard Fixed 10' Webcam Arm.....	<u>DWG-1067554</u>
Mobotix Webcam Assembly; Internal Control System	<u>DWG-3114277</u>

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B Daktronics Warranty and Limitation of Liability

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