

# **4200 Series Digital Billboard**

## **Installation Manual**

*DD2323806*

*Rev 6 – 29 May 2015*

**DD2323806**  
**Product 1604**  
**Rev 6 – 29 May 2015**

## **DAKTRONICS, INC.**

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# Section 1: Introduction

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This manual provides the necessary 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 any questions.

## 1.1 Limitation of Liability

Failure to perform the following may null and void any 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 **Appendix B** at the end of this manual.

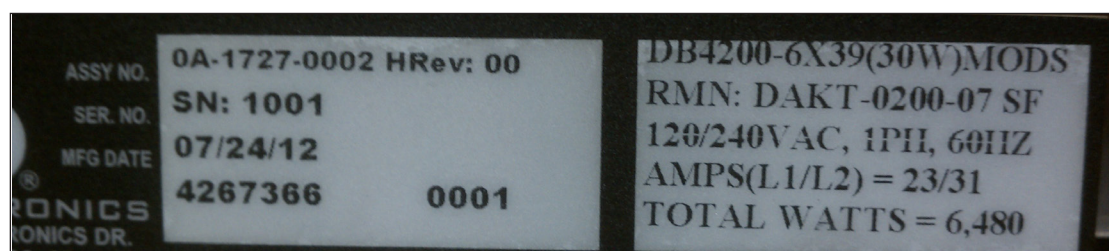
## 1.2 Important Contact Information

Daktronics Help Desk: 1-877-DAK-HELP

Project Manager:\_\_\_\_\_

## 1.3 Display Identification

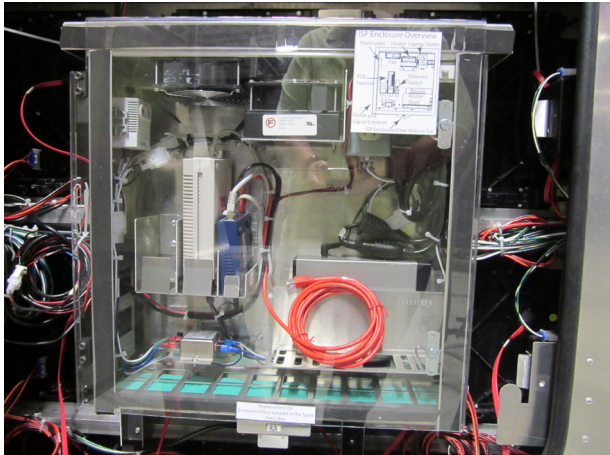



This section provides label information that is helpful in understanding a Daktronics digital billboard display label. Refer to the circled area in **Figure 1** while reading the table below.




**Figure 1:** 4200 Series Display Label

Display Assembly Number	DB-4200 Modules High X Modules Wide (Module power in Watts) MODS
Display Serial Number	RMN: Daktronics - 0200 - 07 Manufactured in Sioux Falls, SD
Manufacture Month/Date/Year	120/240 VAC, Single Phase, 60 HZ
	AMPS (L1/L2) = 23/31
	Total Watts for Display Section = 6,480

## 1.4 4200 Series Improvements

Component	Improvements	Image
Control System	Control system is completely inside of the display.	
Power Supplies	Reduced the number of power supplies in the display.	
Webcam	Mobotix POE webcam replaces Panasonic.	
Power Entrance	Improved power entrance to make electrical installation easier.	

SmartLink™	<p>Daktronics installs a SmartLink™ power cycling device on every new digital billboard. There are four relays in the SmartLink™ that control different components:</p> <ul style="list-style-type: none"> <li>• Relay 1 - ISP equipment</li> <li>• Relay 2 - DMP-8065</li> <li>• Relay 3 - Display</li> <li>• Relay 4 - Auxiliary components</li> </ul>	
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## 1.5 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 latches that hold the module firmly in the display. There are two per module, one near the top of the module and one near the bottom 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 4200 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.

## 1.6 Required Tools

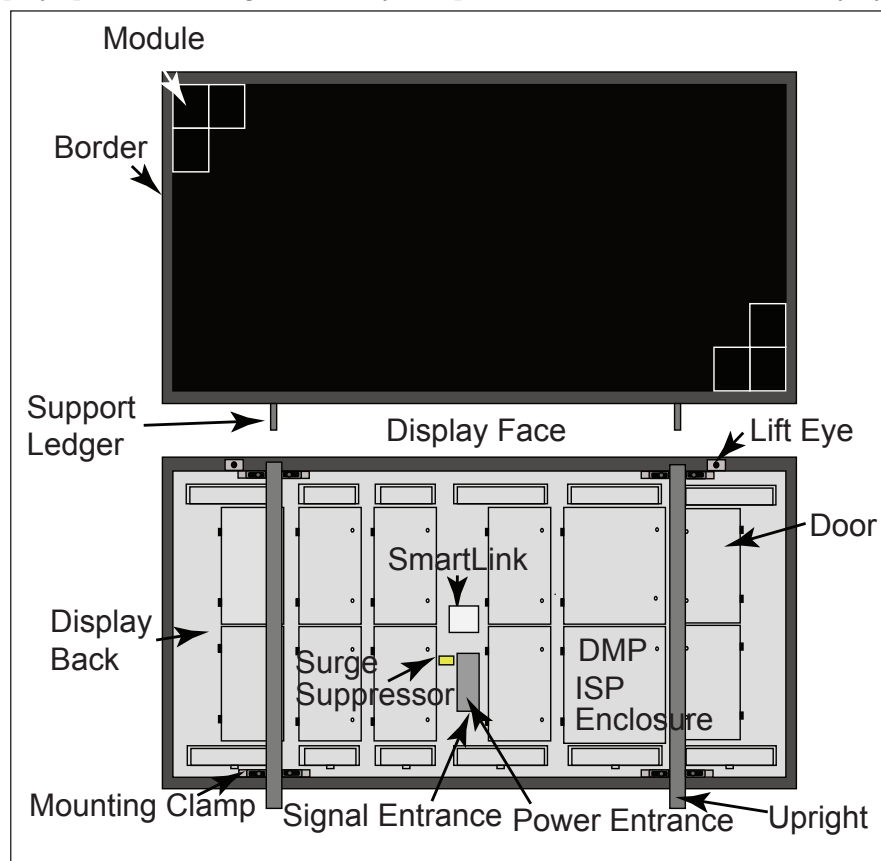
The following table lists the minimum tool requirements Daktronics recommends having on site for each installation. Daktronics provides some specialized tools but it is the installer's responsibility to provide the majority of tools:

<b>Daktronics-Provided Tools (located in the spare parts box)</b>	<ul style="list-style-type: none"><li>• Electrical tape</li><li>• Black cable ties</li><li>• Flat-head screwdriver</li><li>• Phillips screwdriver</li><li>• <math>\frac{3}{8}</math>" Nut driver</li><li>• <math>\frac{5}{16}</math>" Nut driver</li><li>• <math>\frac{7}{16}</math>" Nut driver</li><li>• L-Handle Allen wrench: <math>\frac{1}{8}</math>"</li><li>• Combination wrench: <math>\frac{1}{8}</math>"</li><li>• Splice wrench</li><li>• Torque stick</li><li>• T-Handle Allen wrench: <math>\frac{1}{8}</math>"</li></ul>
<b>Customer-Provided Tools</b>	<ul style="list-style-type: none"><li>• Allen wrenches: Various sizes</li><li>• Bucket truck: Customer must provide until final proof of performance</li><li>• Crane</li><li>• Cordless drill</li><li>• Drill bits</li><li>• Hammers</li><li>• Ladder: 6', 8', 10'</li><li>• Laptop</li><li>• Pry bar</li><li>• Ratchet tie-downs/come along</li><li>• Screw driver: Phillips and flat-head</li><li>• Socket and open end wrench: <math>1\frac{1}{16}</math>"</li><li>• Socket extension: 3"</li><li>• Socket set</li><li>• Tape measure</li><li>• Torque Allen wrench: <math>\frac{1}{8}</math>"</li><li>• Utility knife</li></ul>



## 1.7 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 locations vary by display size.



**Figure 2:** 4200 Series Display Front and Back



## Section 2: Installation Preparation

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### 2.1 Installation Planning

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

### 2.2 Support Ledger

Before the display arrives on site, 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 A-988359** in **Appendix A**.

### 2.3 Display Inspection

As soon as the display arrives on site, verify the packaging is in good condition. When unpacking the display, inspect the display 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 null and void any manufacturer's warranties.

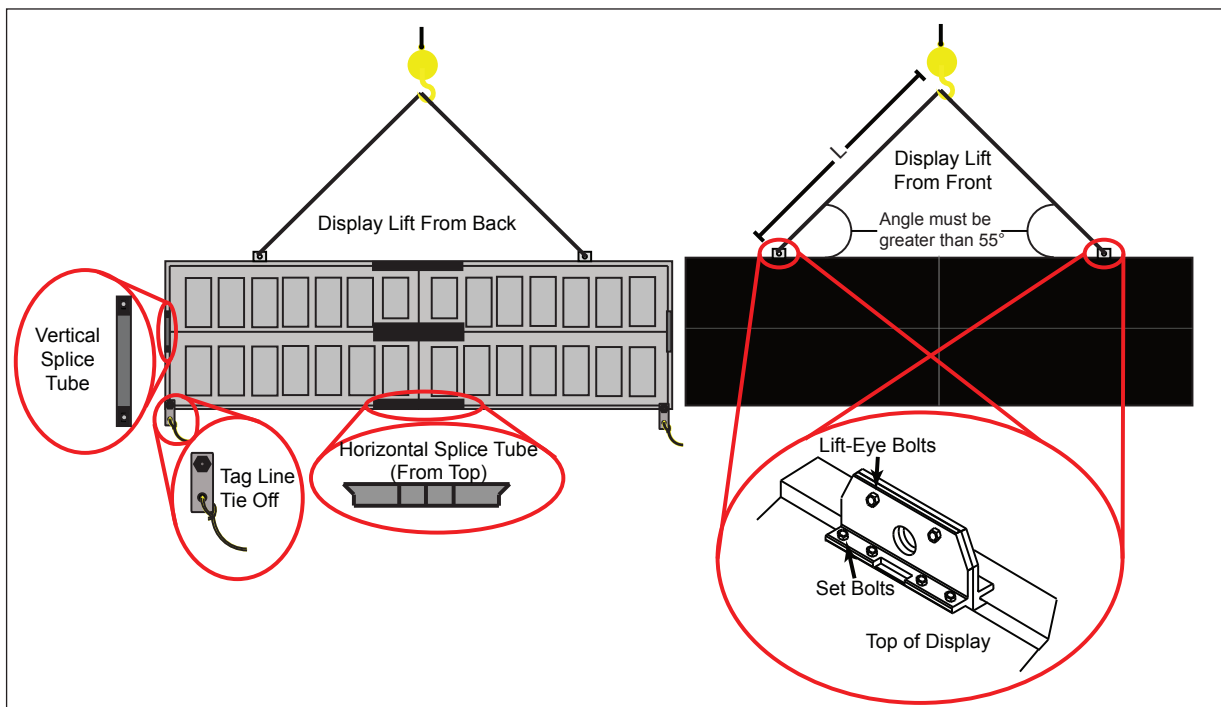


## Section 3: Display Installation

This section provides general guidelines for DB-4200 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 as any unauthorized modifications may null and void the display warranty.

### 3.1 Display Installation

1. Using a utility knife, carefully cut away all of the white packaging material from the display and the spare parts box. 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. Lift the spare parts box off of the trailer and set in a location near the installation site as it contains tools, parts, and documents used for the installation process.
4. Open the spare parts box 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 3**. The lift eye spacing is set at Daktronics and should not be moved without the Project Manager's permission.



**Figure 3:** 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 3**. The table below shows Daktronics recommended strap lengths for some 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 3**.
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** 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 offset extrusion so it matches 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 tighten the offset extrusion 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 has a vertical splice, either from the factory or on site, locate the horizontal splice tube at the splice location. Refer to **Figure 3**. This tube is shipped installed and needs to be secure before lifting the display. This tube also acts as an offset extrusion and can engage an upright. If needed, before lifting the display, you can loosen and slide the splice tube until one of the alternate alignment lines with the display splice. Tighten all splice tube bolts before lifting the display.

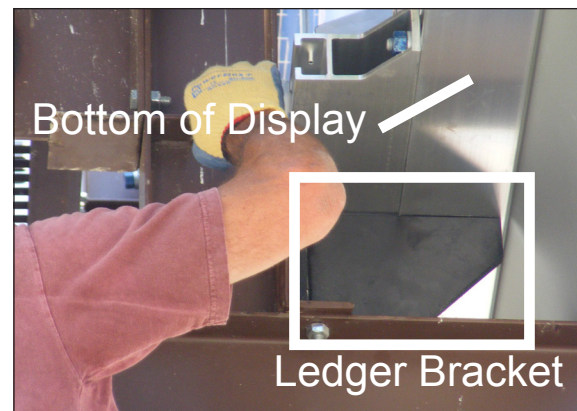
14. Lift the display off of the truck.

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.

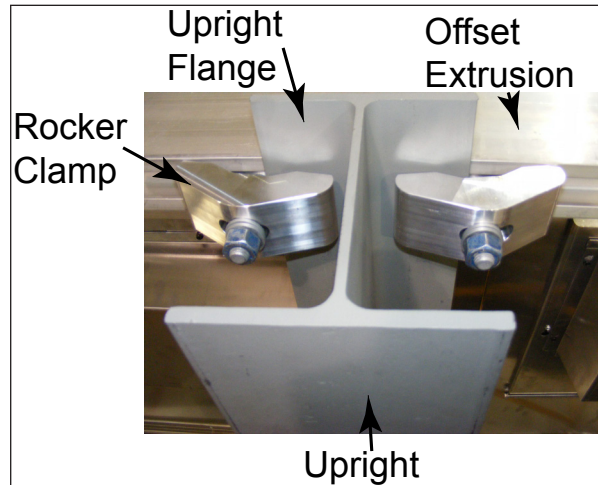
**Note:** The support ledger is provided by the customer prior to display installation. Refer to **Figure 2**.

17. Verify the display is resting on all ledger brackets. If the display is not resting on all ledger brackets, shim the ledger bracket until it is in contact with the display. Refer to **Figure 4**.



**Figure 4:** Display Resting on Ledger

18. On each end of the display, slide the pre-assembled offset extrusion and the rocker clamps over until they engage the upright flanges. Refer to **Figure 5**.
19. Use an impact wrench and the torque stick (provided in the spare parts box) 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.
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 5:** Rocker Clamps Engaging Uprights



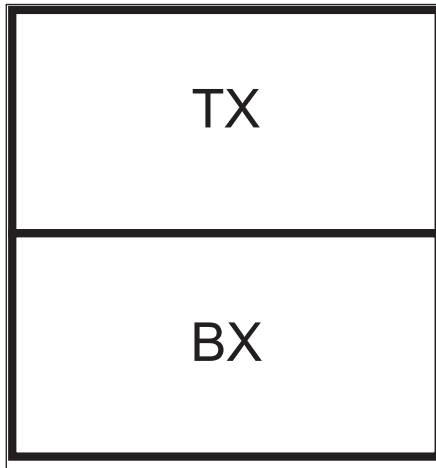


## Section 4: Section Splicing

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### 4.1 Display Section Numbering

For displays with multiple sections, each section is numbered for ease of installation. For a two-section display, the bottom section will be BX and the top section is TX. Refer to **Figure 6**.



*Figure 6: Two-Section Display Section Numbering*

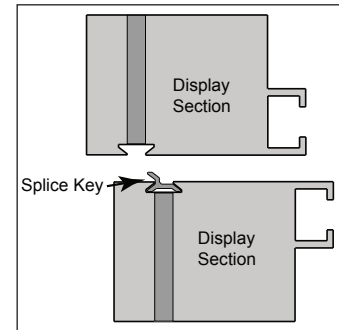
For four-section displays, when looking from the front, the lower-left display section would be BL and the section to the right would be BR; the second row of sections would be TL on the left and TR on the right. Refer to **Figure 7**.



*Figure 7: Four-Section Display Section Numbering*

## 4.2 Display Splicing

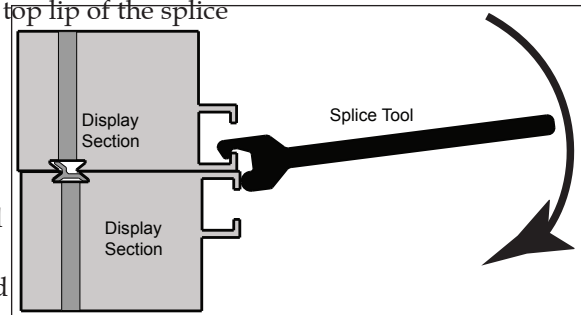
1. Ensure the splice key is in the splice channel and the alignment brackets are installed on the bottom display section. Refer to **Figure 8**.



**Figure 8: Installed Splice Key**

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.

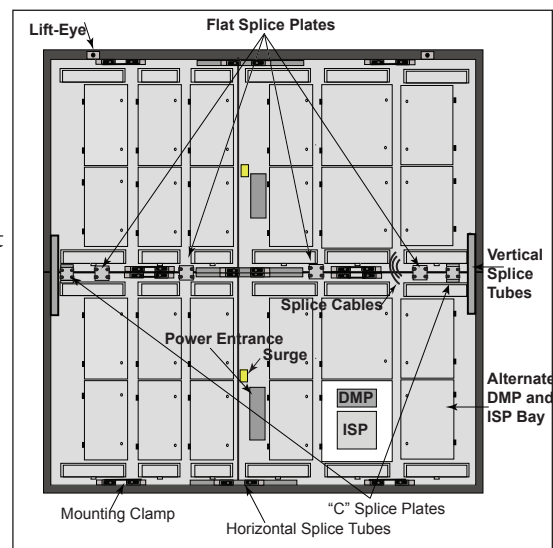
5. Starting at one end of the display, insert the top lip of the splice wrench into the top section mounting channel. Refer to **Figure 9**.



**Figure 9: Aligning Display Sections with Splice Tool**

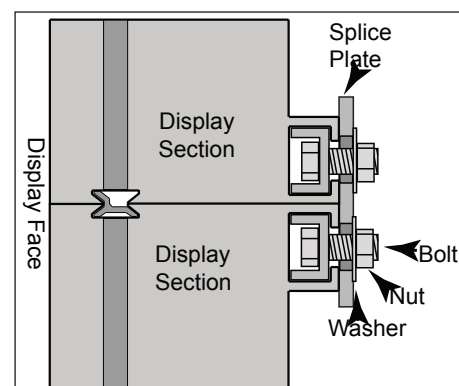
6. Rest the bottom lip of the splice wrench against the back of the bottom section mounting channel.
7. Firmly pull down on the splice wrench until the back of both display sections align and the splice key is fully engaged in the top and bottom section splice channels.
8. Repeat **Steps 5 - 7** approximately every foot along the back of the display.
9. Verify the LEDs in the display top section and the display bottom section align with each other.
10. Ensure the display sections align from front to back.
11. 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 11**.

**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 plate (**Figure 10**) provides support to the bottom display section when lifting and is shipped near the end of the display.



**Figure 10: Splice Plate Installation Locations**

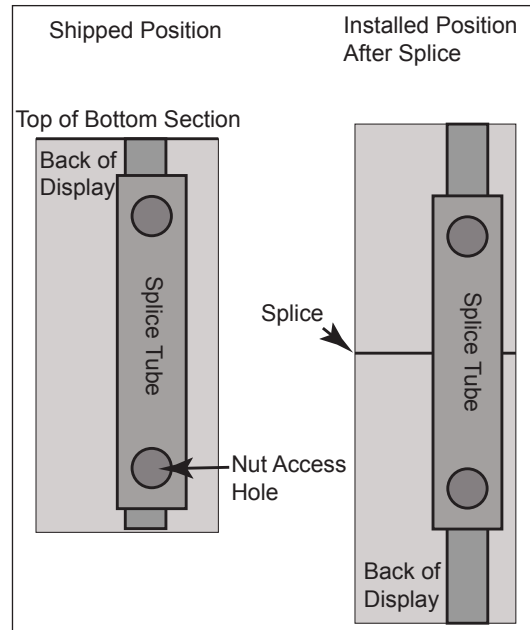
12. Using an impact wrench, the torque stick, and a  $1\frac{1}{16}$ " socket to tighten all of the nuts on the mounting plate to 75 ft-lb.
13. Attach and secure all mounting plates along the section splice. Place one splice plate on each end and evenly distribute the remaining splice plates along the back of the display.
14. Remove the alignment bracket from the bottom display sections.



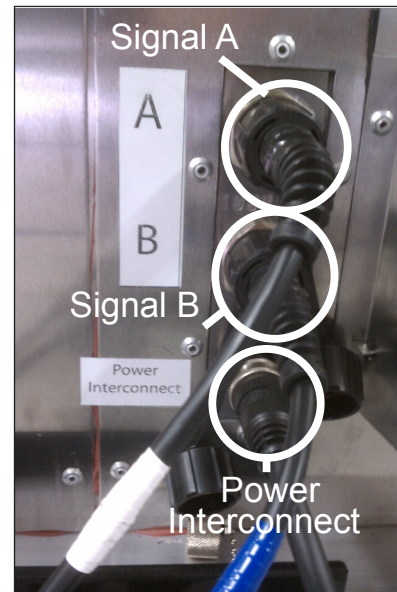
**Figure 11: Installed Flat Splice Plate**

15. Loosen the nuts that hold the vertical splice tube in place. Refer to **Figure 12**.
16. Slide the vertical splice tube until centered between the display sections.
17. Tighten the vertical splice tube nuts to secure the splice tube in place.
18. Repeat **Steps 15 - 18** for all vertical splice tubes.
19. 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.
20. Complete the steps in **Section 3** to install the billboard.
21. Connect the signal splice cables, located in the spare parts box, 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 13**.
22. Connect the power splice cable, located in the spare parts box, to the power interconnect jacks on each display section.
23. Remove the yellow control equipment location sticker from the back of the display.

**Note:** For displays that require a horizontal splice, refer to the **Daktronics Digital Billboard Horizontal Power Splice** quick guide in **Appendix A** for signal and power splicing instructions.



**Figure 12:** Aligning and Installing the Vertical Splice Tubes



**Figure 13:** Power and Signal Splice Connections

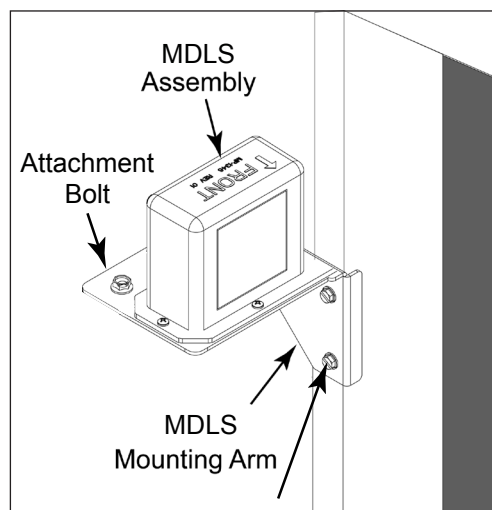


## Section 5: Multi-Direction Light Sensor Relocation

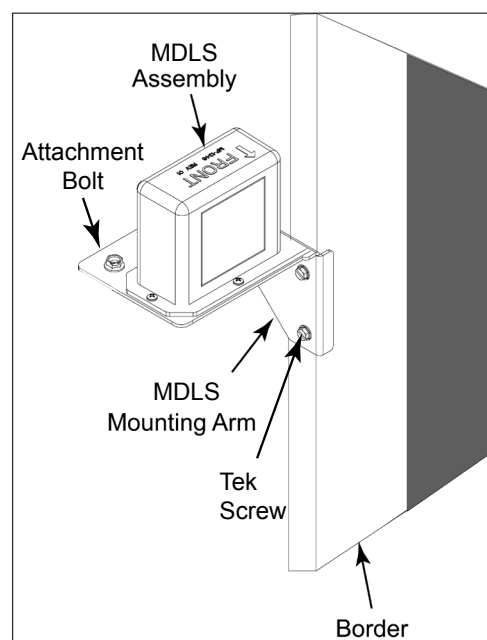
The Multi-Direction Light Sensor (MDLS) is shipped attached to the display borders in a location provided by the Project Manager. If needed, use the following steps to move the MDLS to a location that receives the same light as the display face.

### 5.1 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 14** and **Figure 15**.
  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 14** and **Figure 15**.
  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.
- 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, there is a 30' or 100' extension cable located in the spare parts box. 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.



**Figure 14:** MDLS on Right Side of Display  
(From Front)



**Figure 15:** MDLS on Left Side of Display  
(From Front)



## Section 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 **Appendix A**.

### 6.1 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 16**.
5. Tighten all four saddle bolts.
6. If necessary, turn the webcam assembly until it will face the display when mounted.

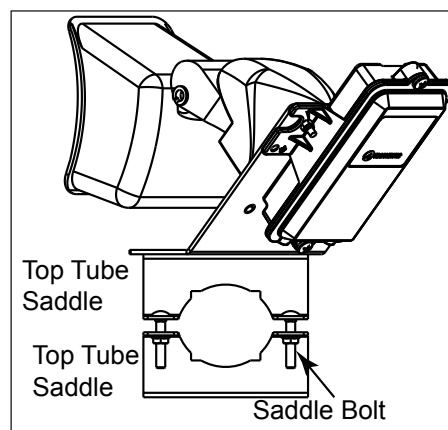


Figure 16: Mobotix Webcam Mounting

### 6.2 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-1065544** and **DWG-1067554** in **Appendix A** while following the installation instructions.

#### 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 17**.
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.

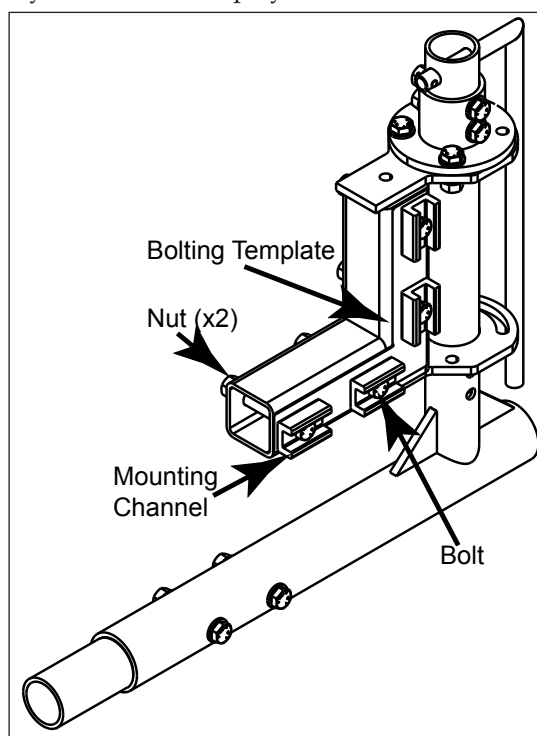


Figure 17: Pivoting Webcam Arm Base

Refer to **Figure 17**.

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.
12. Tighten all mounting and webcam assembly bolts.
13. Insert the handle to the top of the vertical tube and fasten with a clevis pin.
14. Connect the webcam cable to the Webcam 1 connection below the power entrance box on the back of the display.
15. Secure the green webcam grounding wire to the grounding lug along the perimeter of the display back. Refer to **Figure 18**.
16. Neatly secure excess grounding wire with cable ties.
17. Ensure all webcam and webcam mounting bolts are secure prior to hanging the display.
18. 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.
19. 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 18:** Webcam Grounding Lug

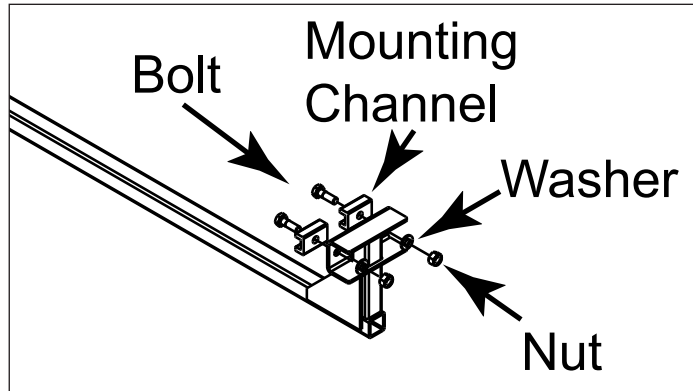
## Retracting the Webcam Arm

1. To retract the webcam arm, remove the three short bolts from the top of the elbow assembly.  
**Note:** Do not remove the long bolts.
2. Use the handle to carefully pivot the webcam arm to the front catwalk.  
**Note:** Verify that the power and signal cables are not getting 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.



## 6.3 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 19**.
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 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 19:** Fixed Webcam Arm Mounting

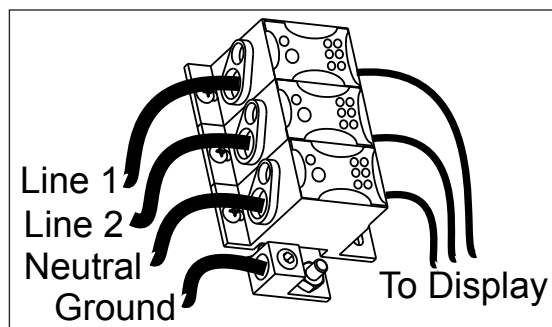


## Section 7: Electrical Installation

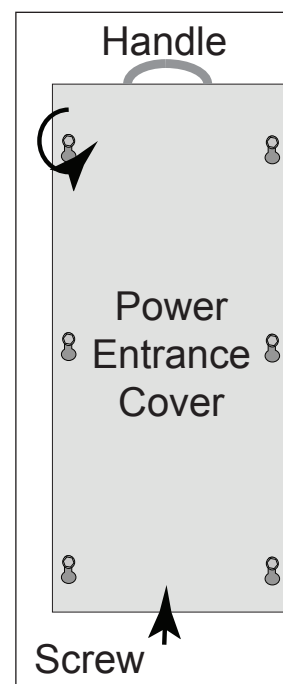
This section provides general guidelines for connecting power to a 4200 series Daktronics digital billboard. For display-specific power requirements, refer to the display-specific riser diagram or contact the Project Manager. It is very important to provide the site-required power to the display as listed on the system riser drawing. Low or poor power can result in dim content, parts of the display out, module flickering, or display damage. It is also important to test the display ground to verify it is grounded to 10 ohms or less. 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 **Appendix A**.

### 7.1 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). On a single section display there is only one power entrance. On multiple-section displays, there is a power entrance for each level.
3. Loosen the six screws that secure the power entrance cover and lift the cover off of the power entrance. Refer to **Figure 21**.
4. Feed power cable through the conduit into the power entrance.
5. 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 20**
6. 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.
7. 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.
8. Connect the neutral line to the neutral tap and use a  $\frac{3}{16}$ " Allen wrench to tighten to 57 in-lbs.
9. Verify the breakers for the control equipment and surge suppressor are on.
10. Verify the breaker for the Backlit ID is off unless there is a backlit ID.
11. Replace and secure the power entrance cover.



**Figure 20: Power Distribution Block**



**Figure 21: Power Entrance Access**

### 7.2 Display Grounding

Daktronics recommends that the customer install a ground rod. Daktronics recommends 10 Ohms or less impedance. 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.



## Section 8: Spare Parts Box Installation

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### 8.1 Spare Parts Box Installation

To properly install a spare parts box:

- do not mount the box in a location that inhibits maintenance personnel from accessing the display.
- ensure the lid is on top.
- ensure the lid latch is easily accessible.
- ensure the lid opens completely.
- mount the spare parts box by welding or bolting the feet to a catwalk.
- always lock the spare parts box when leaving site.



**Figure 22:** Billboard Spare Parts Box

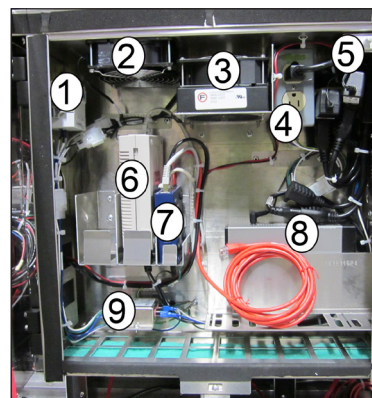


## Section 9: Control System Overview

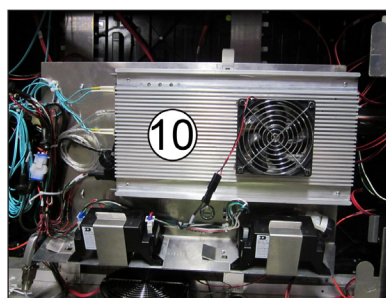
For the 4200 series of displays, the control components are enclosed in the display.

### 9.1 Fully Embedded Control System

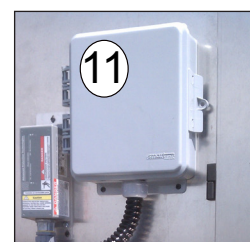
For the 4200 series of digital billboards, Daktronics has three major components. Two of the components, the ISP enclosure and the DMP-8065, are shipped in the same bay. The SmartLink™ is mounted above the power entrance on the back of the display. Display backs are labeled with component locations to make finding components easy. The table below describes each the control system in more detail. Refer to **Figure 23**, **Figure 24**, and **Figure 25** while reading the component descriptions below.



**Figure 23: ISP Enclosure**



**Figure 24: DMP-8065**



**Figure 25: 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 Injector	Supplies power through the webcam Ethernet cable.	6
Ethernet Switch	Connects network devices.	7
Router	Routes data coming in from the Internet.	8
Z-Filter	Suppresses electrical noise in the electrical line.	9
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.	10
SmartLink™	Remote power reboot device. There are four relays that control different components: <ul style="list-style-type: none"><li>Relay 1 - ISP equipment</li><li>Relay 2 - DMP-8065</li><li>Relay 3 - Display</li><li>Relay 4 - Auxiliary components</li></ul> <b>Note:</b> Do not cycle relays on site. Call the help desk to cycle the relays.	11

## 9.2 Opening the ISP Box

To access ISP box components:

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  $\frac{3}{4}$  turn latches counter-clockwise.
3. For easier access to ISP components, the ISP box door can be lifted off the hinges.



## Section 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.

### 10.1 First-Time Power Up

1. Loosen the two  $\frac{3}{4}$  turn latches that secure the Plexiglas ISP enclosure cover. Refer to **Figure 26**.
2. Open the ISP enclosure cover of, if desired, lift and remove the Plexiglas ISP enclosure cover off the hinges.
3. Install the router according to the ISP schematic. Ensure the webcam is connected to the modem, the modem has power, and the modem is connected to the network switch.
4. For displays sharing the internet connection, disconnect the red cross-over cable from port 5 of the network switch and run a Cat-5 cable to the router in 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 on.
8. Ensure the DMP-8065 LED indicators LEDs are on.
9. Connect a laptop to the red crossover cable in the ISP enclosure.  
**Note:** For back to back displays sharing an internet connection, have the held desk check the webcam function before connecting the laptop. After the help desk has verified the webcam function, disconnect the webcam cable from port 4 of the network switch and use a Cat-5 cable to connect the laptop to port 4. When complete, reconnect the webcam cable to port 4.
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 number. This number is located on on the bottom of the SmartLink™ or on the mezzanine card in the SmartLink™. Refer to **Figure 27**.
11. After the help desk verifies the diagnostics is clean and has performed their tasks, disconnect the laptop from the cross-over cable and reinstall the Plexiglas ISP enclosure cover.

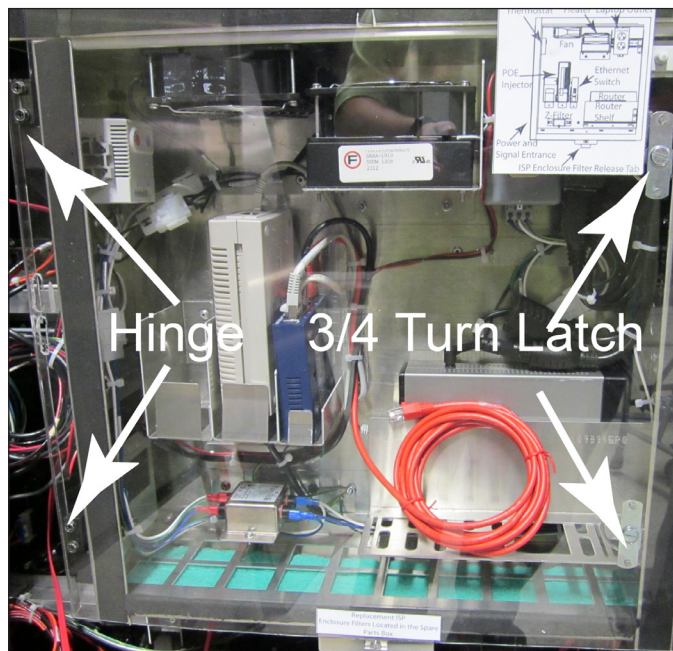


Figure 26: ISP Box Door Removal

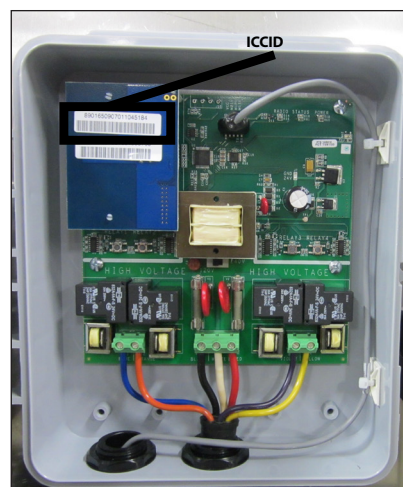


Figure 27: ICCID Number on Mezzanine Card



## Section 11: Display Testing and Adjustment

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This section provides procedures on how to perform some final tests and adjustments on the billboard and billboard components to verify they are functioning and adjusted properly.

### 11.1 Diagnostics Checks

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

- Module issues
- Internet or connectivity issues
- Webcam issues
- Display temperature issues
- MDLS issues

### 11.2 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
- Abnormal flashing
- Modules stuck on
- Pixels stuck on or bright

Work with Daktronics NOC to address any visual issues.

### 11.3 Test the Light Sensor

Contact Daktronics NOC and perform these steps to verify the MDLS in functioning properly. To test the photocell:

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.



# Appendix A: Reference Drawings

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**Appendix A** 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.

Relocating a Digital Billboard ISP Enclosure and Controller.....	<b>DD2398657</b>
Daktronics Digital Billboard Horizontal Power Splice .....	<b>DD2572018</b>
Ledger Assembly .....	<b>DWG-988359</b>
Billboard Pivoting 10-15' Webcam Arm.....	<b>DWG-1065544</b>
Billboard Fixed 10' Webcam Arm .....	<b>DWG-1067554</b>
Tested Mobotix Webcam Assembly; Internal Control System.....	<b>DWG-1103734</b>



# Appendix B: Limitation of Liability

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Daktronics Warranty and Limitation of Liability ..... **SL-02374**