DXB SERIES DIGITAL BILLBOARD

INSTALLATION MANUAL

P2177

DD4139792
Rev 04
09 November 2021

Models	
DXB-0100	DXB-0200

201 Daktronics Drive
Brookings, SD 57006-5128
www.daktronics.com/support
800.325.8766

DAKTRONICS

FCC Statement

Supplier Declaration of Conformity (SDoC)

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

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

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

Industry Canada Regulatory Information

This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Inquiries

Contact Daktronics with any questions regarding our product compliance.

Mail:

Daktronics
201 Daktronics Dr.
Brookings, SD 57006 USA

Phone:

800-325-8766

Website:

www.daktronics.com

DAKTRONICS

Table of Contents

This page intentionally left blank.

1 Introduction

This manual provides information to install a Daktronics DXB series 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.25)**.

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

Important Contact Information

Daktronics Customer Service: 1-800-DAK-TRON (325-8766)

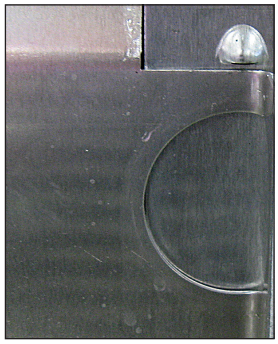
Display Identification

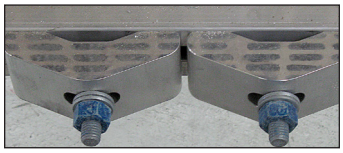
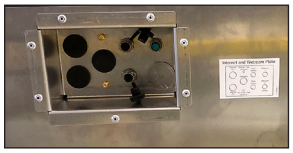
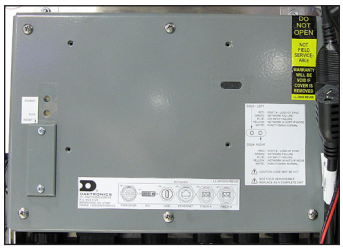
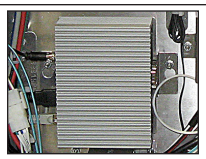
This section provides information that is helpful in understanding a Daktronics digital billboard display label. Refer to **Figure 1** while reading the table below.

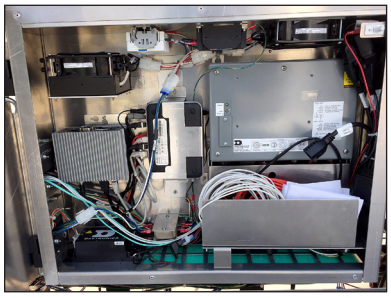
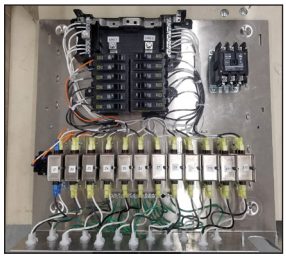
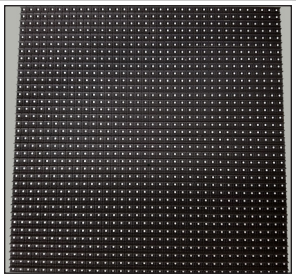
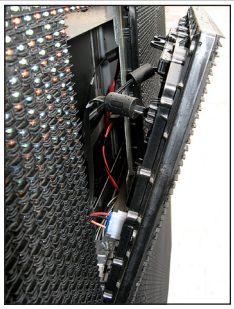
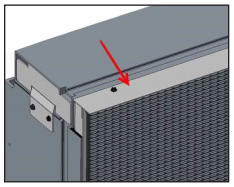
Figure 1: *DXB Series Display Label*

Display Assembly Number **Display Serial Number** **Manufacture Date (Day/Month/Year)**	DXB-0X00 Modules High X Modules Wide RMN: Daktronics - 0204 - 09 Manufactured in Sioux Falls, SD 120/208/240 VAC, Single Phase, 60 HZ AMPS (L1/L2) Total Watts

DXB Series Improvements

Component	Improvement	Image of Change
Display Doors	• Hook-style doors hook into slots on the display's back sheet. • Handles on each door allow for easy removal. • Mechanical stops hold the door in place without hardware.	 

Component	Improvement	Image of Change
Mounting	• Rocker mount without offset is standard. • Offset extrusion mount is optional.	 
Ventilation	• Intake and exhaust vents replace intake and exhaust hoods.	
Cooling	• Fans are located on removable plenums inside the bottom of each display section.	
Internet and Webcam Connections	• Located three bays in from the right	
SmartLink	• Moved to display's interior • Located in the first or second bay from the right side of the display	
VIP-5160.2	• No fans on VIP-5160.2 (internal or external) • Located in the ISP enclosure	
DMP-8000	• No fans on DMP-8000 (internal or external) • Located in the ISP enclosure	 

Component	Improvement	Image of Change
ISP Enclosure/ Third Party Player	• Location varies; door is labeled for easy control equipment location • Third party player now installed in the ISP enclosure for third party options	
Term Panel	• Location varies; door is labeled for easy termination panel location	
Module LEDs	• Latest technology with hook mount on bottom of module	 
Display Cabinet	• Optional borderless display design • Included top cover for environmental protection	
Power Entrance Box	• Located to the left of the far-right bottom door	
Power Supply	• One power supply powers multiple modules. • Low-profile power supplies are mounted to the uprights inside the display. • Power harness changed to fused harness.	 

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:

Daktronics-Provided Tools (located behind labeled doors)	• Black cable ties • L-Handle hex head wrench: 1/8" • Splice wrench • T-Handle Hex head wrench: 1/8"	
Customer-Provided Tools	• 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: 11/16" • 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. Component locations vary by display size; refer to display-specific drawings.

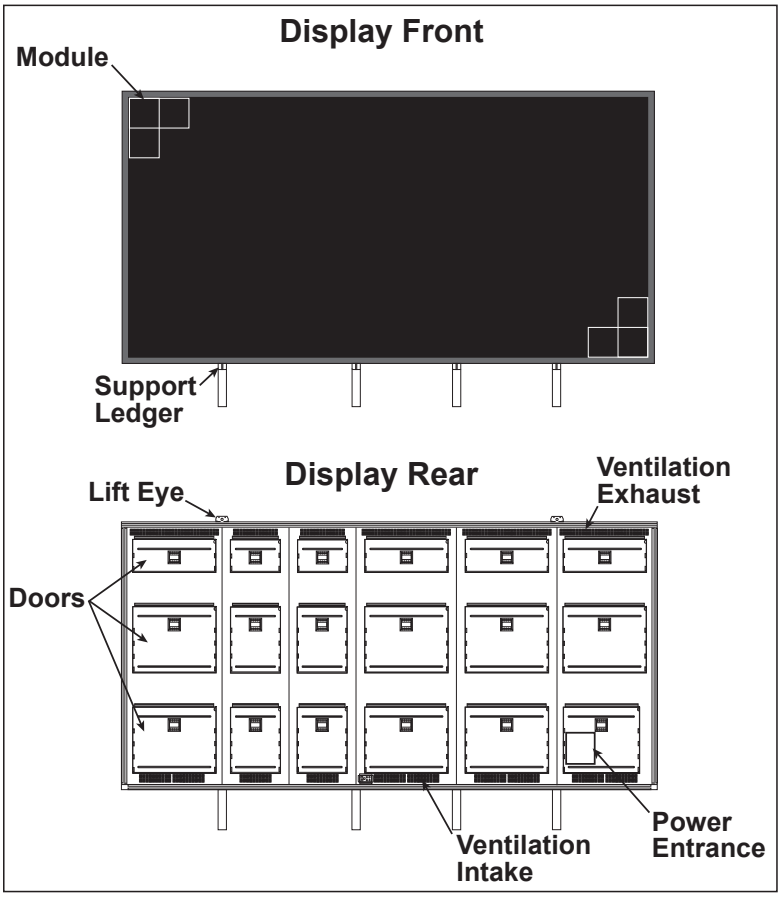


Figure 2: *DXB Series Display Front and Rear*

2 Installation Preparation

Plan the Installation

Prior to the display arriving on site, review installation plans with the electrician, Internet Service 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 **Appendix A: Reference Documents (p.23)**.

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 DXB series billboard 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. Use a utility knife to 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. Locate the spare parts rack in the bottom-left end bay (when viewed from the rear), and verify all installation tools and installation hardware were sent with the display. Contact the Project Manager immediately if any installation parts are missing.
4. Verify that the lift eyes are installed and the lift eye bolts and set bolts are in place. Refer to **Figure 3**. Lift eye spacing is set at Daktronics and should not be moved without the Project Manager's permission.

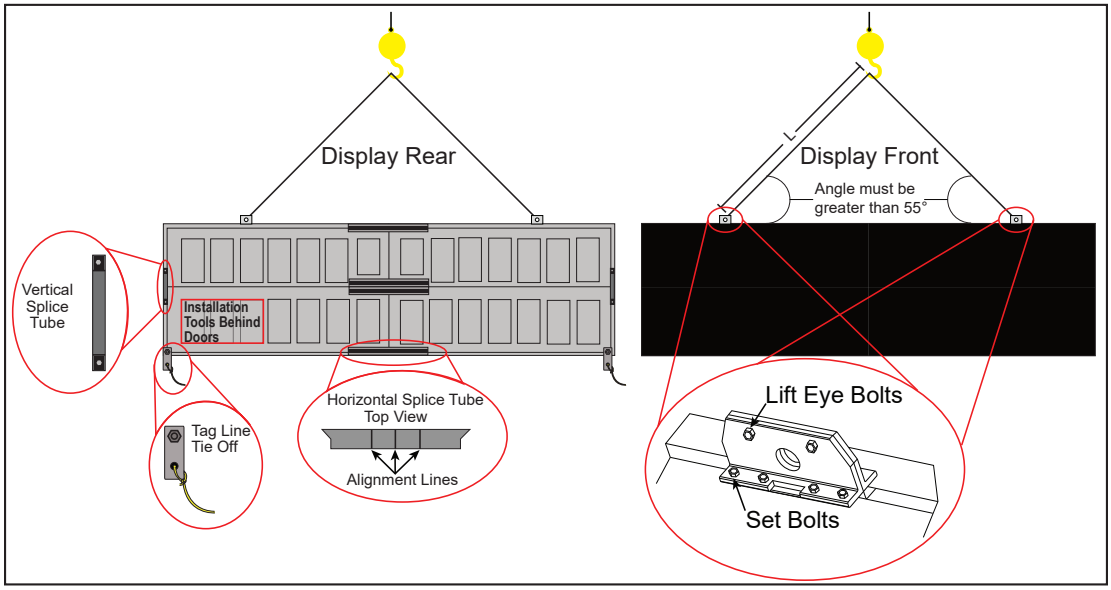


Figure 3: *Display Lifting*

5. Attach lift lines from the crane to the lift eyes. Ensure the angle between the top of the display and the lifting strap is greater than 55°. Refer to **Figure 3** and the following table for recommended strap lengths for common display sizes:

Display Dimensions	Minimum Strap Length (L)
14' x 48'	27'
10'6" x 36'	22'
14' x 28'	22'
11' x 22'	17'

6. Lift the display to apply some tension to the lift lines.

7. Tie tag lines to the provided tag line tie off on the bottom corners of the display. Refer to **Figure 3**.
8. 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: Splice Sections (p.9)** before continuing the installation process.

9. Locate the center-line label on the rear of the display.
10. From the center of the display, measure and align the display mounting components 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 components at this time as adjustments may be needed while attaching the display to the structure.

11. After aligning the mounting brackets, verify the ISP enclosure door will not experience interference during installation.
12. 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 3**.

> **Note:** 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.

   a. If needed, loosen and slide the horizontal splice tube until one of the alternate alignment lines on top of the tube is aligned with the section splice.
   b. Tighten all splice tube bolts before lifting the display.

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

> **Note:** The support ledger is provided by the customer prior to display installation. Refer to **Figure 2** and **Figure 4**.

17. Slide the rocker clamps over until they engage the upright flanges. Refer to **Figure 5**.

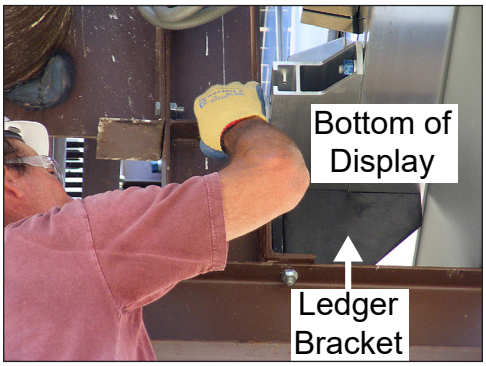


Figure 4: *Display Resting on Ledger*

Figure 5: *Rocker Clamp Engaging Upright*

18. Tighten all of the nuts on the rocker clamps or offset extrusion bolts to 75 ft-lbs with an impact wrench and the provided torque stick.

> **Note:** If the backer channel for the rocker clamp or the optional offset extrusion aligns with an opening in the display perimeter, shift the entire display left or right until the U-channel is at least 1" from the opening. Refer to **Figure 6**.

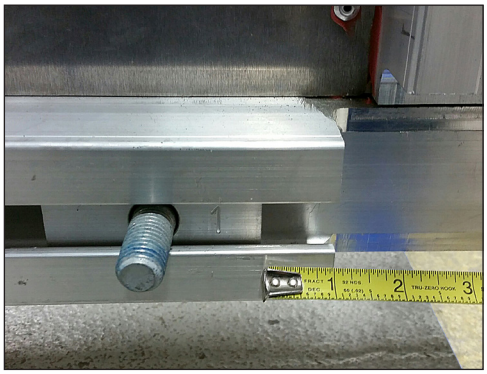


Figure 6: *Display Offset*

19. Place and tighten all remaining mounting assemblies to 75 ft-lbs.
20. Remove the crane support.
21. Disconnect the tag lines.
22. Locate the top border cover caps, when equipped, that are fixed to the border cover for shipping. Required screws are taped to the cover.
23. Use supplied Tek screws to install the border caps over the lift eye locations.

4 Splice Sections

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**.

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**.

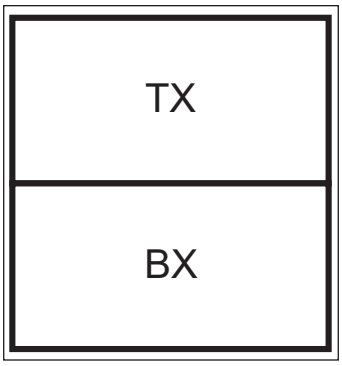


Figure 7: *Two-Section Display Section Numbering*

Display Splicing

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

1. Ensure the splice key is in the splice channel and the alignment brackets are installed as shown 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 rear of the bottom section mounting channel.
7. Firmly pull down on the splice wrench until the rear 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 rear of the display.
9. Verify the LEDs on both display sections align in all directions between splices. If the LEDs are more than 1/4 of an LED out of alignment, adjust until properly aligned.

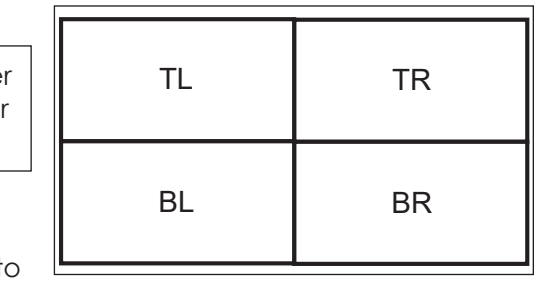


Figure 8: *Four-Section Display Section Numbering*

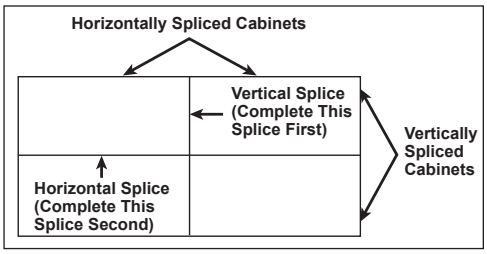


Figure 9: *Splicing Display Sections*

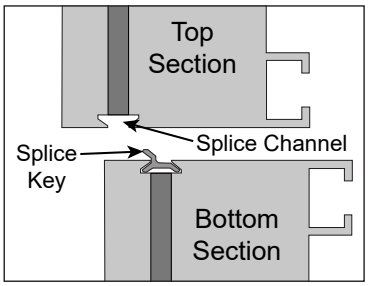


Figure 10: *Installed Splice Key*

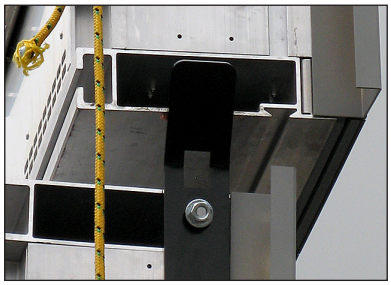


Figure 11: *Alignment Bracket*

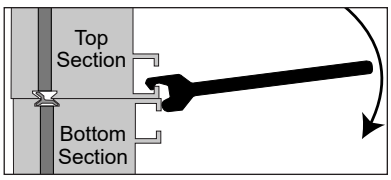


Figure 12: *Aligning Sections with Splice Tool*

10. Ensure the display sections align from front to rear.
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 13**.
12. Distribute the splice plates evenly along the rear of the display.

> **Note:** Ensure there is a flat splice plate near each end of the display. Refer to **Figure 14**.

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

Figure 13: *Attaching Splice Plate*

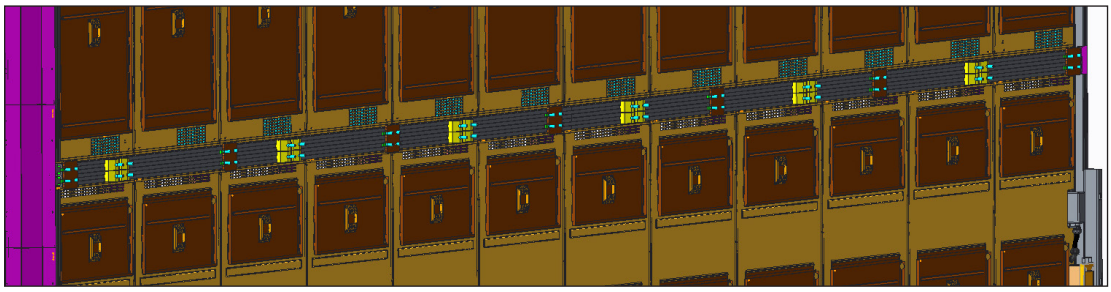


Figure 14: *Splice Plate Installation Locations*

14. Loosen the nuts that hold the vertical splice tube in the bottom section. Refer to **Figure 15**.
15. Slide the vertical splice tube so it is split evenly between the top and bottom display sections.
16. Tighten the vertical splice tube nuts to 75-100 ft-lbs.
17. Repeat **Steps 15–16** for all vertical splice tubes.
18. Slide the border splice plates and covers into place (when equipped). Attach with supplied Tek screws and nuts. Refer to **Figure 17** and **Figure 18**.

Figure 15: *Aligning and Installing the Vertical Splice Tubes*

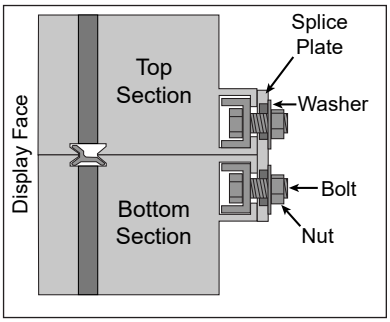


Figure 16: *Installed Flat Splice Plate*

Figure 17: *Attached Border Splice Plate*

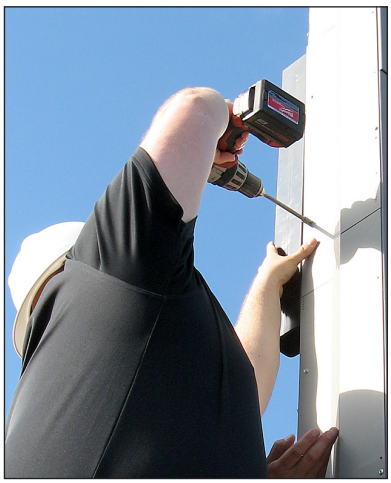


Figure 18: *Attaching Vertical Splice Cover*

19. Complete the steps in **Section 3: Display Installation (p.6)** to install the billboard.

20. Connect the signal splice cables from the display top section. Refer to **Figure 19** and **DWG-4131265**.

    a. Connect Signal A on the top section PLR to signal A of the internal fiber patch panel in the section below.

    b. Connect Signal B on the top section PLR to signal B of the internal fiber patch panel in the section below.

21. Connect the purple/white contactor signal harness from the top section term panel to the bottom section term panel. Refer to **Figure 20** and **DWG-4626307**.

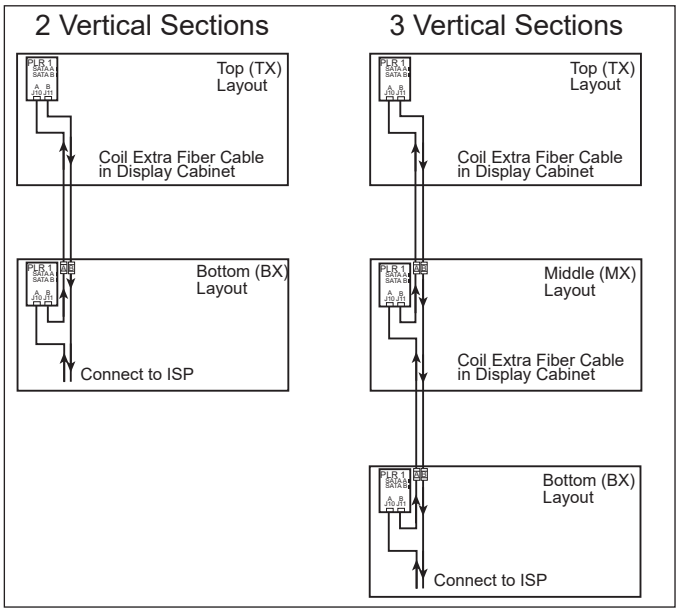


Figure 19: *Signal Splice Connections*

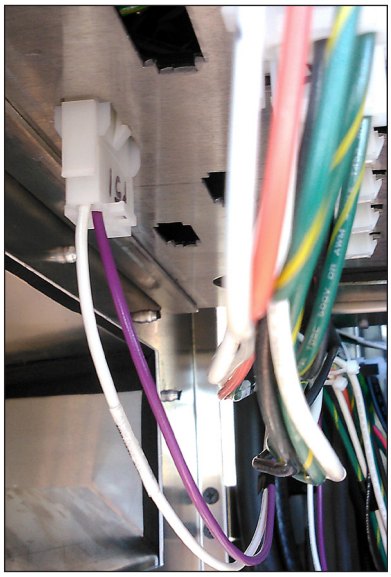


Figure 20: *Contactor Signal Harness*

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 rear 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 locations on the rear of the display.
3. Loosen the attachment bolts that hold the MDLS assembly to the MDLS mounting arm. Refer to **Figure 21** and **Figure 22**.
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 21** and **Figure 22**.
6. Remove the MDLS mounting arm from the border.
7. Rotate the MDLS mounting arm vertically 180° until the MDLS assembly can be reattached to the MDLS mounting arm.
8. Place the MDLS assembly on the MDLS mounting arm.
9. Use the attachment bolts and nuts to secure the MDLS assembly to the mounting arm.
10. Use Tek screws to secure the MDLS mounting arm and MDLS assembly to the border at the new location.

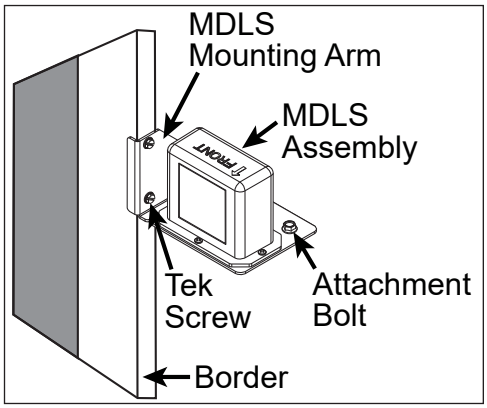


Figure 21: *MDLS on Right Side of Display (From Front)*

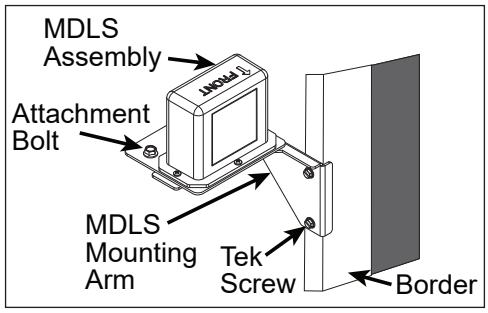


Figure 22: *MDLS on Left Side of Display (From Front)*

> **Note:** Ensure the front label on the MDLS assembly is on top, the arrows are facing away from the display face, and all three light sensor windows are free from obstruction. Contact the Project Manager or Daktronics help desk with any questions.

11. Connect the MDLS cable to the **Light Sensor** connection in the Internet and webcam connections location (third bay from the right).

> **Note:** If after moving the MDLS, the cable is not long enough, request an extension cable from the project manager. Connect the extension cable to the MDLS cable and to the rear of the display.

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

6 Mount Webcam

The display ships with a fixed length webcam arm unless the optional retractable webcam arm is requested. For additional mounting or assembly details, refer to the arm-specific drawings located in **Appendix A: Reference Documents (p.23)**.

Mount the Webcam to the Arm

1. Locate the webcam assembly inside the display behind a door labeled "Webcam Located Here".
2. Identify all webcam mounting components.
3. Use the wire shipped in the webcam arm to pull the Ethernet and ground cables through the webcam arm.
4. Verify there is enough excess cable to allow the webcam arm to pivot if needed.
5. Slide the webcam arm between the top and bottom tube saddles until the webcam assembly is 2" from the end of the webcam arm. Refer to **Figure 23**.

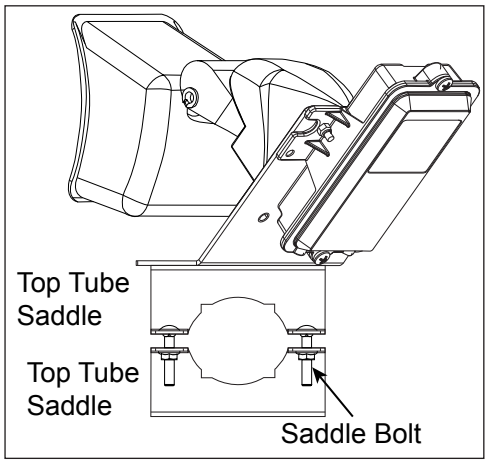


Figure 23: *Mobotix Webcam Mounting*

6. Tighten all four saddle bolts.
7. If necessary, turn the webcam assembly until it will face the display when mounted.

Standard 10' Fixed Webcam Arm Installation

Standard 10' fixed webcam arms are used on displays fewer than or equal to 10 modules high and fewer than or equal to 33 modules wide.

1. The webcam arm ships with all hardware and arm components. Remove the 5/8" nuts and washers from the arm assembly before installing the webcam arm. Refer to **Figure 24**.
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 mounting channel assembly bolts.
4. Place a washer on each 5/8" bolt.

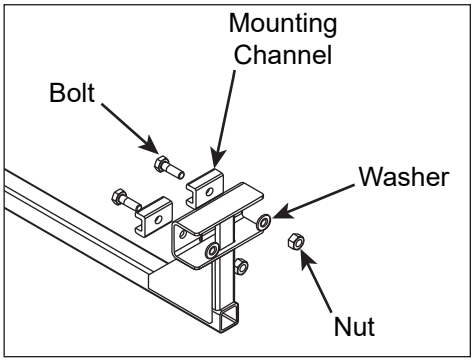


Figure 24: *Fixed Webcam Arm Mounting*

5. Attach the 5/8" nuts to the bolts to secure the mounting assembly to the display. Tighten hardware to 75 ft-lbs.
6. Use fish tape to feed the webcam cables through the webcam arm tube.
7. Connect the webcam cable to the **WEB CAM 1** connection on the rear of the display.
8. Secure the green webcam grounding wire to the grounding lug near either end of the rear of the display.
9. Neatly secure excess power grounding wire with cable ties.

Standard 10-20' Adjustable Webcam Arm Installation

A 10-15' adjustable webcam arm is used on displays fewer than or equal to 15 modules high and fewer than or equal to 48 modules wide.

A 20' adjustable webcam arm is used on displays fewer than or equal to 17 modules high and fewer than or equal to 50 modules wide.

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. Refer to **DWG-1142216** and **DWG-1142217** in **Appendix A: Reference Documents (p.23)** while following the installation instructions.

Installation

1. Determine which side of the display to mount the arm. Mount the webcam 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, the mounting channel, and the bolt template from the webcam arm assembly.
3. Slide two of the mounting channels and bolts into the horizontal mounting channel on the rear of the display. Refer to **Figure 25**.
4. Slide the two remaining channels into the vertical mounting channel on the rear of the display.

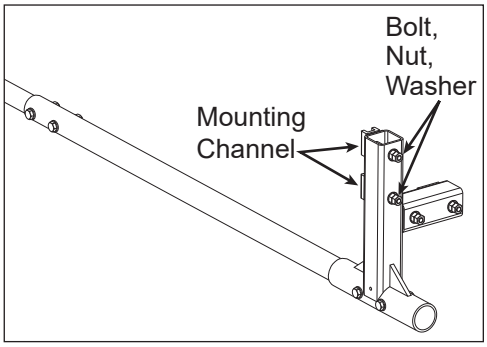


Figure 25: *10-20' Adjustable Webcam Arm Mounting*

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 26**.
6. Mount the elbow assembly to the rear 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. Torque to 75 ft lbs.
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.

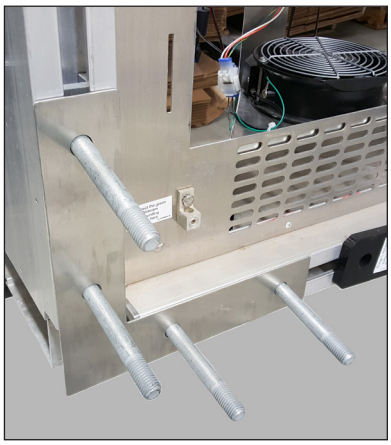


Figure 26: *Webcam Bolting Template*

11. Ensure the webcam is on the top of the webcam arm and tighten the arm set bolts.

    Refer to **DWG-1142216** for 10-15' for adjustable web camera arms.

    a. For a 10' arm, slide the 6' round pipe into the 4-point display mount and then slide the 10' round pipe into the 6" round pipe until all three parts holes align in the 4-point display mount. Install bolts through all three parts. This sets the web camera 10' from the display face.

    b. For a 15' arm, slide the 6' round pipe into the 4-point display mount, align holes, and install bolts. On the other end of the 6' pipe, slide the 10' round pipe into and align holes between the two parts and install bolts. This sets the web camera 15' from the display face.

    c. Refer to **DWG-1142217** for 20' web camera arms.

12. Tighten all mounting hardware to 75 ft-lbs. and webcam assembly bolts to 25 ft-lbs.

13. Connect the webcam cable to the **WEB CAM 1** connection, located on the signal entrance plate on the third bay from the right on the rear of the display.

14. Secure the green webcam grounding wire to the grounding lug near the end of the rear of the display. Refer to **Figure 27**.

Figure 27: *Webcam Ground Lug*

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 Cat5e cable to the network switch on the router.

18. Work with the NOC to ensure the camera is aligned properly.

Retracting the Webcam Arm (Optional)

1. Remove the two short bolts from the top of the elbow assembly and loosen the third bolt that is located in the slot for rotation. Refer to **Figure 28**.

   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 do not get 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.

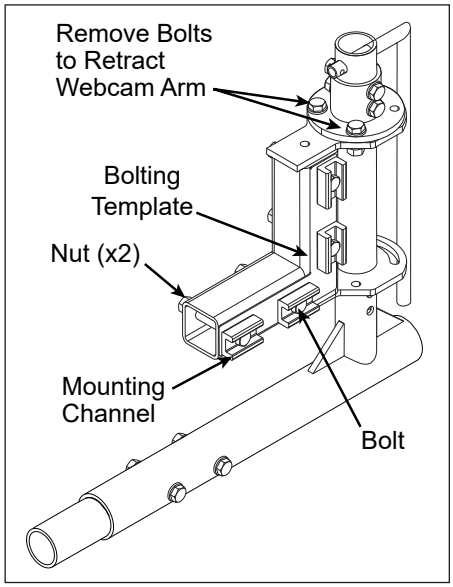


Figure 28: *Pivoting Webcam Arm Base*

7 Electrical Installation

This section provides general guidelines for connecting power to a DXB 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.

Figure 29: *Power Entrance Box*

Main Disconnect

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

The disconnect switch must be located 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.

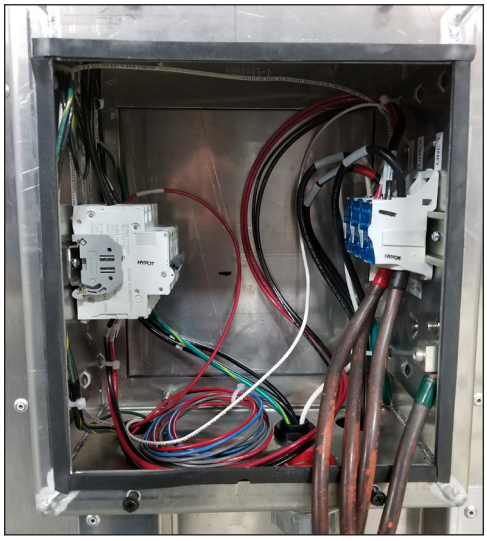


Figure 30: *Power Entrance Access*

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) marked on the cabinet.
3. Route power to the display through a disconnect switch.
4. Loosen the four screws that secure the power entrance cover and lift it off of the power entrance. Refer to **Figure 29**.
5. Feed power cable through the conduit into the power entrance. Refer to **Figure 30**.
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 3/16" hex head wrench. Refer to **Figure 31**.
7. Connect power line 1 (L1) to Line 1 of the tap and use a 15/64" hex head wrench to tighten to 120 in-lbs.

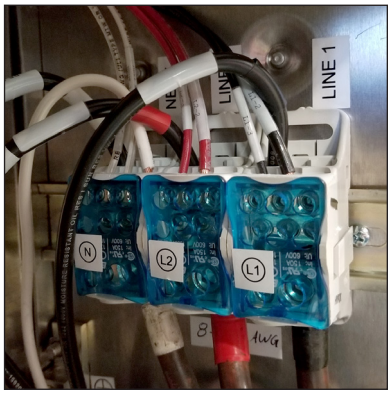


Figure 31: *Connect Ground Wire*

8. Connect power line 2 (L2) to Line 2 of the tap and use a 15/64" hex head wrench to tighten to 120 in-lbs, as shown in **Figure 32**.
9. Connect the neutral line to the neutral tap and use a use a 15/64" hex head wrench to tighten to 120 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.

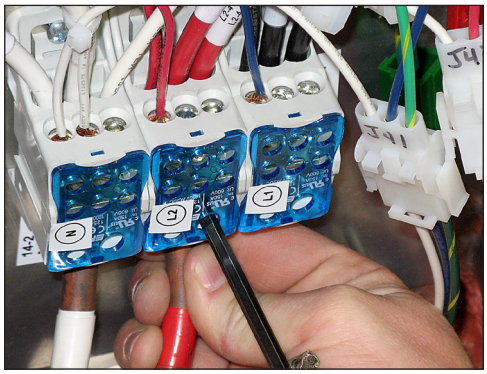


Figure 32: *Connect Power Lines*

Display Grounding

- All components of a display system—including but not limited to displays, control equipment, and connected peripheral equipment—must be electrically grounded. Only qualified individuals may perform electrical work, including verification of ground resistance. Daktronics is not responsible for improper grounding or damage incurred as a result of improper grounding.
- Grounding methods must meet the provisions of all applicable local and national codes. Inspect and verify all grounding methods meet the provisions of all applicable local and national codes.
- Proper grounding is necessary for reliable equipment operation and general electrical safety. Failure to properly ground the display system may void the warranty, disrupt operation, damage equipment, and cause bodily harm or death.

8 Control System Overview

DXB series billboard control components are enclosed in the display.

Open the ISP Box

To access ISP enclosure components, follow these steps:

1. Access the ISP enclosure by opening the rear access door with the control equipment label.
2. Use a Phillips screwdriver to loosen the four screws and lift the door from keyed slots. Refer to **Figure 33**.

   Note: For easier access to ISP components, the door can be lifted off the hinges.
3. Ensure the ISP door and latches are secured after service to guarantee proper function of the door sensor.

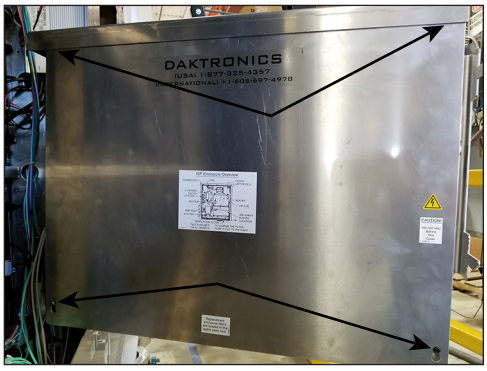


Figure 33: *Control Equipment Door*

4. After performing service or completing connections, replace the display door and ensure it is attached to the safety lanyard and securely mounted.

Fully Embedded Control System

DXB series billboards have two major components: the ISP enclosure (located behind the third door from the right) and the SmartLink™ (mounted inside the first or second door from the right). Display back sheets are labeled with component locations to make finding components easy. The table below describes each control system component. Refer to **Figure 34** and **Figure 35** and the component descriptions below.

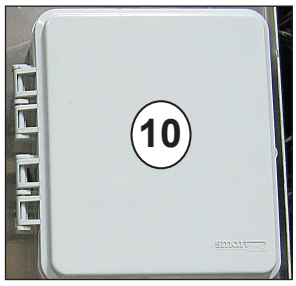


Figure 34: *SmartLink™*

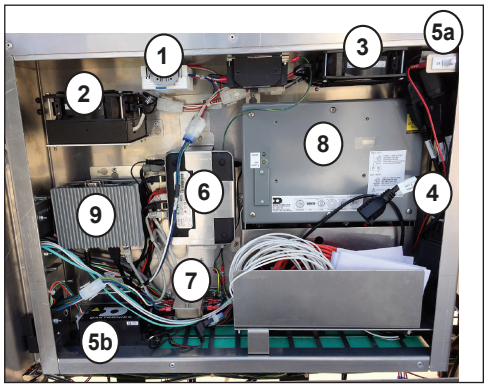


Figure 35: *ISP Enclosure*

Component	Function	Number
Thermostat	Measures the temperatures inside the ISP enclosure and turns on the fan or the heater as needed.	1
Heater	Since ISP equipment is affected by lower temperatures, a heater prevents the ISP enclosure from going below a functional range.	2
Fan	High heat can damage some electronics; the fan cools the ISP enclosure to keep the equipment in a safe functional range.	3
Laptop and Cell Phone Location	Can be used to charge laptop or cell phones. Do NOT plug drills or other power tools into the outlet.	4

Component	Function	Number
Door Switch	Detects if the ISP enclosure door is open. If opened, an alert is created and the content switches to predetermined content. (5a = DXB-0100 location; 5b = DXB-0200 location)	5a/5b
POE Ethernet Switch	Connects network devices and provides webcam power.	6
Z-Filter	Suppresses electrical noise in the electrical line.	7
VIP-5160	Converts DMP-8000 content to a format recognized by the display and sends the signal to the PLRs in the display. The VIP-5160 also gathers diagnostic data from the display and sends it to IDM.	8
DMP-8000	Converts content data from the content management server into a format recognized by the VIP and sends it out to the VIP-5160.	9
SmartLink™	Remote power reboot device. Four relays control the following components: • Relay 1 - ISP equipment • Relay 2 - DMP-8000 and VIP-5160 • Relay 3 - Display • Relay 4 - Auxiliary components **Note:** Do not cycle relays on site. Call the help desk.	10

9 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 port on the laptop.

First-Time Power Up

1. Use a Phillips screwdriver to loosen the four screws that secure the cover to the ISP enclosure. Refer to **Figure 33**.
2. Remove the ISP enclosure cover, including the lanyard, and set aside.
3. Install the modem according to the ISP schematic. Ensure the modem has power and is connected to the network switch. Ensure the webcam is connected to the POE network switch.
4. For displays sharing the Internet connection, connect a Cat5e 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-8000 and VIP-5160 LED indicators are on. The power light runs steadily and the VIP run indicator flashes.
9. Connect a laptop to the red crossover cable in the ISP enclosure.
10. Call Daktronics customer service at 1-800-DAK-TRON (325-8766) to verify connectivity to the display, perform a diagnostics check, activate the SmartLink™, and perform several display setting checks.

> **Note:** 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 36**.

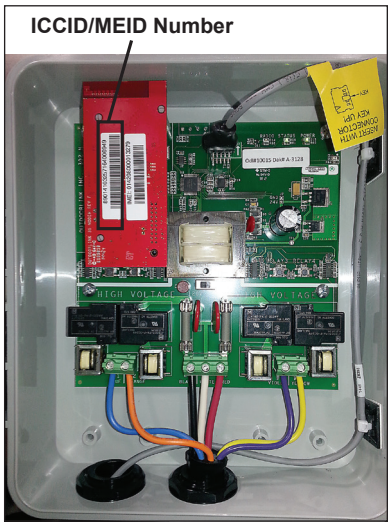


Figure 36: *ICCID/MEID Number on Mezzanine Card*

11. After the help desk verifies the diagnostics are clean and performs their tasks, disconnect the laptop from the crossover cable and reinstall the ISP enclosure cover.

10 Display Testing and Adjustment

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.

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
- Light sensor (MDLS) issues

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 (MDLS)

To verify the MDLS is functioning properly, contact Daktronics NOC and follow these steps:

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.

Glossary

DMP-8000: a Digital Media Player that sends display content to the Video Image Processor (VIP).

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.

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 communication channels.

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 housing, a module latch assembly, and a louver. Each module is individually removable from either the front or rear of the display.

Module latch: a safety device that mechanically holds the module firmly in the display. The latches are centered near the top and bottom 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 display component that converts incoming AC line voltage to low DC voltage.

ProLink Router (PLR): a data interface component that receives a signal from the display control system and converts and distributes the signal. There is typically one PLR per display section.

Remote power controller: a device capable of remotely controlling the display and components. Current billboards use a SmartLink.

Serial Advanced Technology Attachment (SATA): a type of cable that allows high speed signal flow from device to device. In digital billboards, these cables run signal from module to module and from the PLR to the modules.

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.

VIP-5160: a Video Image Processor that sends video signal to the display and controls dimming, color settings, and test patterns.

Webcam: a camera connected to the internet used to monitor the display. Current billboards use a Mobotix PoE camera.

A Reference Documents

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

- When viewing a digital version of this manual, simply click a link below to open it.
- When referencing the printed version of this manual, open an Internet browser and go to **www.daktronics.com/web-documents/Drawings/#######.pdf**, or **www.daktronics.com/web-documents/Manuals/DD#######.pdf** where "#######" is a 7- or 8-digit number shown below).

Reference Drawings:

Ledger Assy; DB-4000 Series Displays (use with offset mounts)..... **DWG-00988359**
Billboard Pivoting 10-15' Webcam Arm..... **DWG-1065544**
Billboard Fixed 10' Webcam Arm..... **DWG-1067554**
Billboard Fixed 10-15' Webcam Arm; 4-Point Mount **DWG-1142216**
Billboard Fixed 20' Webcam Arm; 4-Point Mount **DWG-1142217**
Ledger Assy; Short, DB Displays (use without offset mounts) **DWG-3041598**
Mobotix Webcam Assembly **DWG-3114277**
Shop DWG; Digital Billboard Webcam Arms..... **DWG-3498478**
Block Diagram, Fiber Routing, Multi PLR and PE Location, DXB-0100..... **DWG-4131265**
Block Diagram; Contactor Control Routing; TP/PE Locations **DWG-4626307**

Reference Documents:

Daktronics Digital Billboard Horizontal Signal Splice..... **DD3151286**
Digital Billboard 4G Modem Installation Quick Guide **DD3777414**

This page intentionally left blank.

B Daktronics Warranty and Limitation of Liability

This section includes the Daktronics Warranty & Limitation of Liability statement (SL-02374).

This page intentionally left blank.

DAKTRONICS WARRANTY & LIMITATION OF LIABILITY

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

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

1. Warranty Coverage.

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

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

B. Daktronics' obligation under this Warranty is limited to, at Daktronics' option, replacing or repairing, any Equipment or part thereof that is found by Daktronics not to conform to the Equipment's specifications. Unless otherwise directed by Daktronics, any defective part or component shall be returned to Daktronics for repair or replacement. This Warranty does not include on-site labor charges to remove or install these components. Daktronics may, at its option, provide on-site warranty service. Daktronics shall have a reasonable period of time to make such replacements or repairs and all labor associated therewith shall be performed during regular working hours. Regular working hours are Monday through Friday between 8:00 a.m. and 5:00 p.m. at the location where labor is performed, excluding any holidays observed by Daktronics.

C. Daktronics shall pay ground transportation charges for the return of any defective component of the Equipment. All such items shall be shipped by End User DDP Daktronics designated facility per Incoterms® 2020. If returned Equipment is repaired or replaced under the terms of this Warranty, Daktronics will prepay ground transportation charges back to End User and shall ship such items DDP End User's designated facility per Incoterms® 2020; otherwise, End User shall pay transportation charges to return the Equipment back to the End User and such Equipment shall be shipped Ex Works Daktronics designated facility per Incoterms® 2020. All returns must be pre-approved by Daktronics before shipment. Daktronics shall not be obligated to pay freight for any unapproved return. End User shall pay any upgraded or expedited transportation charges

D. Any replacement parts or Equipment will be new or serviceably used, comparable in function and performance to the original part or Equipment and warranted for the remainder of the Warranty Period. Purchasing additional parts or Equipment from the Seller does not extend the Warranty Period.

E. Defects shall be defined as follows. With regard to the Equipment (excepting LEDs), a "Defect" shall refer to a material variance from the design specifications that prohibit the Equipment from operating for its intended use. With respect to LEDs, "Defects" are defined as LED pixels that cease to emit light. Unless otherwise expressly provided, this Warranty does not impose any duty or liability upon Daktronics for partial LED pixel degradation. Notwithstanding the foregoing, in no event does this Warranty include LED pixel degradation caused by UV light. This Warranty does not provide for the replacement or installation of communication methods including but not limited to, wire, fiber optic cable, conduit, trenching, or for the purpose of overcoming local site interference radio equipment substitutions.

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

THIS LIMITED WARRANTY IS NOT TRANSFERABLE.

2. Exclusion from Warranty Coverage

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

A. damage occurring at any time, during shipment of Equipment unless otherwise provided for in the Agreement. When returning Equipment to Daktronics for repair or replacement, End User assumes all risk of loss or damage, agrees to use any shipping containers that might be provided by Daktronics, and to ship the Equipment in the manner prescribed by Daktronics;

B. damage caused by: (i)the improper handling, installation, adjustment, use, repair, or service of the Equipment, or (ii) any physical damage which includes, but is not limited to, missing, broken, or cracked components resulting from non-electrical causes;

DAKTRONICS

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

C. damage caused by the failure to provide a continuously suitable environment, including, but not limited to: (i) neglect or misuse; (ii) improper power including, without limitation, a failure or sudden surge of electrical power; (iii) improper air conditioning, humidity control, or other environmental conditions outside of the Equipment's technical specifications such as extreme temperatures, corrosives and metallic pollutants; or (iv) any other cause other than ordinary use;

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

E. failure to adjust, repair or replace any item of Equipment if it would be impractical for Daktronics personnel to do so because of connection of the Equipment by mechanical or electrical means to another device not supplied by Daktronics, or the existence of general environmental conditions at the site that pose a danger to Daktronics personnel;

F. statements made about the product by any salesperson, dealer, distributor or agent, unless such statements are in a written document signed by an officer of Daktronics. Such statements as are not included in a signed writing do not constitute warranties, shall not be relied upon by End User and are not part of the contract of sale;

G. damage arising from the use of Daktronics products in any application other than the commercial and industrial applications for which they are intended, unless, upon request, such use is specifically approved in writing by Daktronics;

H. replenishment of spare parts. In the event the Equipment was purchased with a spare parts package, the parties acknowledge and agree that the spare parts package is designed to exhaust over the life of the Equipment, and as such, the replenishment of the spare parts package is not included in the scope of this Warranty;

I. security or functionality of the End User's network or systems, or anti-virus software updates;

J. performance of preventive maintenance;

K. third-party systems and other ancillary equipment, including without limitation front-end video control systems, audio systems, video processors and players, HVAC equipment, batteries and LCD screens;

L. incorporation of accessories, attachments, software or other devices not furnished by Daktronics; or

M. paint or refinishing the Equipment or furnishing material for this purpose.

3. **Limitation of Liability**

A. Daktronics shall be under no obligation to furnish continued service under this Warranty if alterations are made to the Equipment without the prior written approval of Daktronics.

B. It is specifically agreed that the price of the Equipment is based upon the following limitation of liability. In no event shall Daktronics (including its subsidiaries, affiliates, officers, directors, employees, or agents) be liable for any claims asserting or based on (a) loss of use of the facility or equipment; lost business, revenues, or profits; loss of goodwill; failure or increased cost of operations; loss, damage or corruption of data; loss resulting from system or service failure, malfunction, incompatibility, or breaches in system security; or (b) any special, consequential, incidental or exemplary damages arising out of or in any way connected with the Equipment or otherwise, including but not limited to damages for lost profits, cost of substitute or replacement equipment, down time, injury to property or any damages or sums paid to third parties, even if Daktronics has been advised of the possibility of such damages. The foregoing limitation of liability shall apply whether any claim is based upon principles of contract, tort or statutory duty, principles of indemnity or contribution, or otherwise

C. In no event shall Daktronics be liable for loss, damage, or injury of any kind or nature arising out of or in connection with this Warranty in excess of the Purchase Price of the Equipment. The End User's remedy in any dispute under this Warranty shall be ultimately limited to the Purchase Price of the Equipment to the extent the Purchase Price has been paid.

4. Assignment of Rights

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

5. Governing Law; Election of Remedies

A. The rights and obligations of the parties under this Warranty shall not be governed by the provisions of the United Nations Convention on Contracts for the International Sales of Goods of 1980. The parties consent to the application of the laws of the State of South Dakota to govern, interpret, and enforce each of the parties' rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Warranty, without regard to conflict of law principles.

B. Any dispute, controversy or claim arising from or related to this Warranty, the parties shall first attempt to settle through negotiations. In the event that no resolution is reached, then such dispute, controversy, or claim shall be resolved by final and binding arbitration under the Rules of Arbitration of the International Chamber of Commerce. The language of the arbitration

DAKTRONICS

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

6. Availability of Extended Service Agreement

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

Additional Terms applicable to sales outside of the United States

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

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

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

DAKTRONICS

This page intentionally left blank.