

4100 Series Digital Billboard

Service Manual

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DAKTRONICS

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DAKTRONICS, INC.

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Section 1: Overview

This manual provides service and troubleshooting information for the 4100 series of digital billboards. Although this manual provides steps that apply to most displays, there are some display variations. Always refer to project specific drawings for display specific information.

1.1 Important Contact Information

Daktronics Network Operations Center: 1-866-DAKHELP (325-4357)

1.2 Display Identification



Figure 1: Daktronics Digital Billboard Display Label

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.

DB4KG2 - 5 X 18 (40W) MOD				
DB	4K	G2	5 X 18	(40W) MOD
Digital Billboard	4000 Series	Generation 2 or 4100 Series	Display Section Size in Modules: 5 H X 14 W	Module Power

1.3 Manual Sections

This manual is divided into 10 sections.

1. **Overview:** explains the basic information needed to use this manual along with a basic display overview. Take time to read the Overview because it explains concepts and terms used throughout the manual.
2. **Display and Control Overview:** covers basic display power and control overview information. Refer to project specific drawings for display specific information.

3. **Display Troubleshooting:** covers some of the most frequently encountered issues and possible solutions.
4. **Accessing Internal Digital Billboard Components:** provides information on using the rear access doors.
5. **Module Testing and Removal:** provides steps to remove a module from the display face and from the back of the display. This section also provides a module self test procedure.
6. **Replacing Display Components:** provides steps to remove the most frequently serviced components such as the ProLink Router, filter, or fans.
7. **Control Equipment:** provides an overview of control enclosure equipment location and function, as well as replacement procedures.
8. **Multi-Direction Light Testing (MDLS) and Replacement:** Covers testing and replacing the MDLS.
9. **Webcam Repair and Replacement:** provides steps on retracting the webcam arm and servicing the webcam.
10. **Display Maintenance:** Covers basic display power up procedure. This section should be completed while on the phone with Daktronics NOC.

At the end of this manual is **Appendix A: Reference Materials**. Generic drawings, component specific manuals, and quick guides are located in **Appendix A**.

Figure 2 illustrates a Daktronics drawing label. The drawing number is located in the lower-right corner of a drawing. This manual refers to drawings by listing the last set of digits and the letter preceding them. In the example, the drawing would be referred to as **Drawing B-997767**.


 DAKTRONICS, INC. BROOKINGS, SD 57006		<small>THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. NO PART HEREOF IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS WITHOUT THE EXPRESS WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2000 DAKTRONICS, INC.</small>	
PROJ: 4000 SERIES COMMON COMPONENTS			
TITLE: ENCLOSURE; PLR6050, BILLBOARD			
DESIGN: KSTOLZ		DRAWN: KSTOLZ	DATE: 6 APR 10
SCALE: 1 = A			
SHEET:	REV	JOB NO:	FUNC-TYPE-SIZE
1 OF 2	02	1604	E - 07 - B
			997767

Figure 2: Daktronics Drawing Label

1.4 Terms Used in this Manual

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

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

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

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

Louwer: a black, plastic shade positioned horizontally above each pixel row. Louvers increase the contrast level on the display.

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

Module Latch: an assembly using a rotating retainer bar to hold the module firmly to the display frame. There are two per module: one near the top and one near the bottom.

ProLink Router: 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. One power supply can power multiple modules.

Serial Advanced Technology Attachment (SATA) Cable: allows high speed signal from device to device. In digital billboards, they run signal from module to module.

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.

Uninterruptable Power Supply: Provides back up power to the control equipment if the site loses power.

VIP-4060: Digital billboard control card that sends content to the display. The VIP4060 limits the display to static content and regulates content hold times.

Section 2: Display and Control Overview

This section describes generic power and signal paths for Daktronics Digital Billboards. For specific signal and power information, refer to display specific signal and riser drawings.

2.1 Display Control Enclosure Flow Overview

Figure 3 shows the basic signal from inside the control enclosure and to the display. This may vary by display. Refer to project specific drawings for your display signal path.

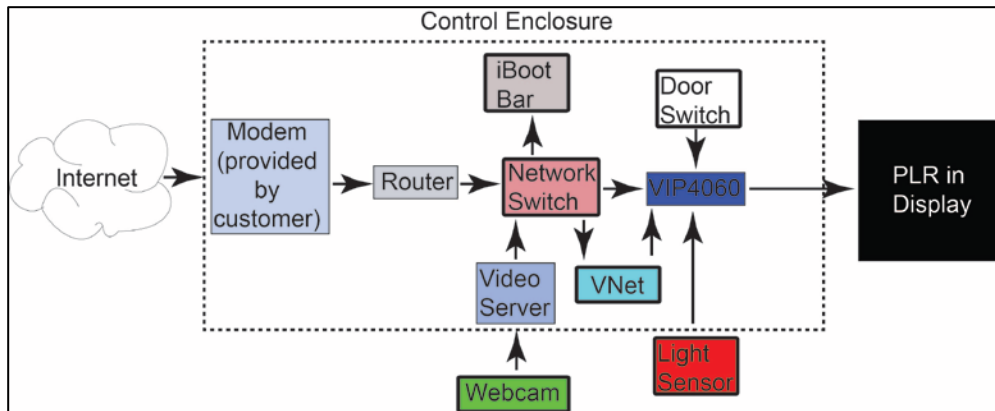


Figure 3: Control Enclosure Signal Overview

2.2 Display Power Overview

The power system for the 4100 series of displays is significantly different than any previous series of Daktronics Digital Billboards. There is a power supply attached to each module. The image below shows a basic overview of what the power system looks like in an individual display section. Power to the display section enters into the term panel and is redistributed to the module rows. There is a main line that runs between module rows and provides power to two rows of modules.

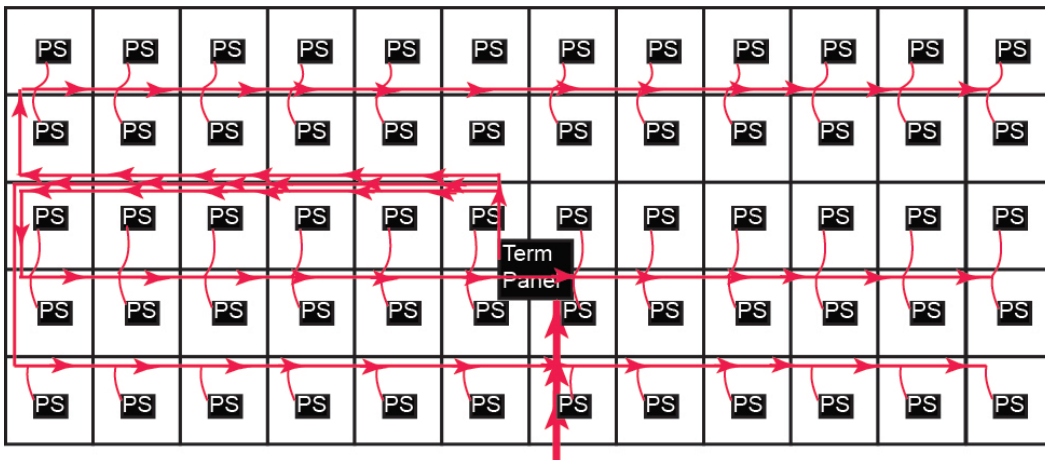


Figure 4: Display Section Power Distribution from Front

2.3 Display Signal Overview

This section provides generic signal path illustration for even tall sections, **Figure 5**, and odd tall sections, **Figure 6**.

Signal enters the display from the control enclosure and is sent to the ProLink Router in the display section. The PLR then sends the signal to the first module in the section. From that module, the signal is then sent to the other modules in the section. The PLR not only sends signal to the first module in the chain but also receives signal from the last module in the chain.

Even Module High Section Signal Path

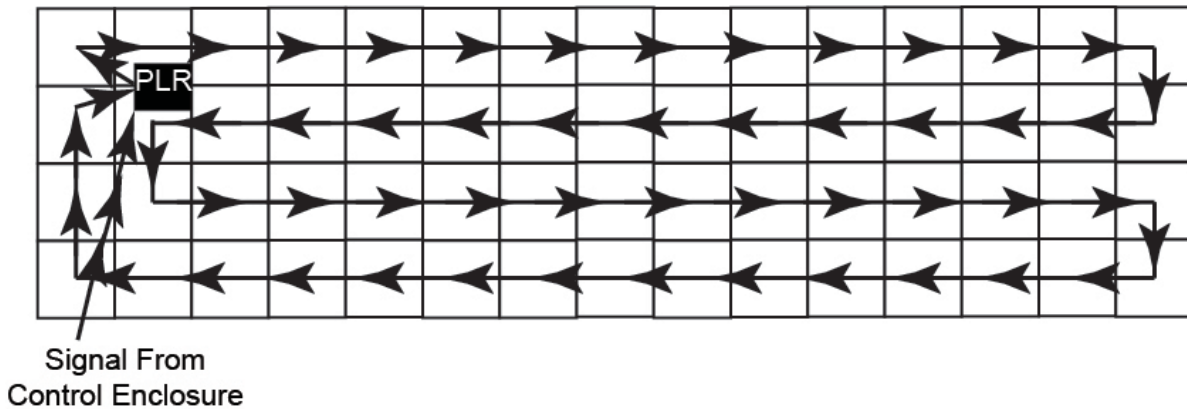


Figure 5: Even Tall Signal Routing from Front

Odd Module High Section Signal Path

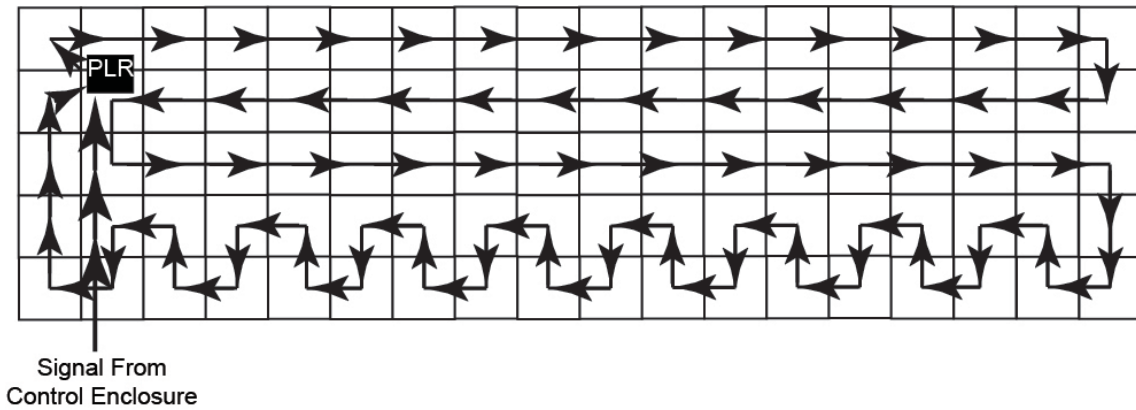




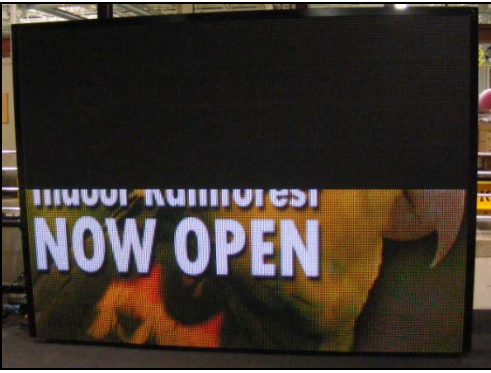



Figure 6: Odd Tall Signal Routing from Front

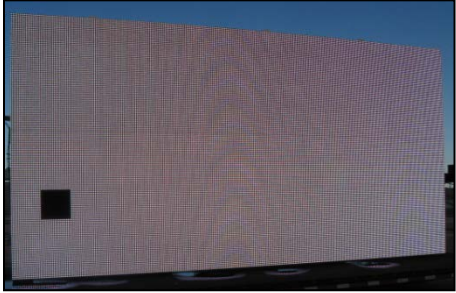

Section 3: Display Troubleshooting

3.1 Display Troubleshooting

This section provides generic guidelines for repairing issues with the 4100 Series of Daktronics Digital Billboards. The repairs suggested in this section are intended to provide guidance. Work with Daktronics NOC or experienced technicians to address display issues.

Image	Issue	Repair
	<p>Entire Display Blank</p>	<ul style="list-style-type: none"> - Verify there is power to the site. Check the power supply indicators to see if they are on. If they are on, there is power to site and it is most likely a signal issue. - Verify fibers and signal cables are connected. If one of the fiber-optic cables is disconnected it could cause the display to be blank. - Verify the content that was supposed to play was successfully uploaded and sent to the display.
	<p>Row or Area of Modules Blank, showing the wrong content, or off color</p>	<ul style="list-style-type: none"> - Check the modules at the beginning and end of the affected area. This issue can be caused by bad SATA cables on both of those modules or power supplies out on both of those modules. If the power supply indicator is on, it is most likely a SATA cable issue. If the power supply indicator is off, it is likely a power supply issue. - Measure site power and verify if it meets Daktronics requirements. If the issue appears when there is a lot of white or light content, it is possible there is insufficient power to the display. If this is the case, work with an electrician to get the right power

		to the display.
	Section of Display Blank	<ul style="list-style-type: none"> - Verify there is power to that display section by checking the indicators on the power supplies. If there isn't power, ensure all breakers on the term panel are on. - Verify the signal cables to this section are connected. It is possible one of the signal cables is broken or has become disconnected.
	Content Mixed Up (content flipped around)	<ul style="list-style-type: none"> - Check the fiber cables coming out of the control enclosure. They may be switched. - Check the splice cables between the top and bottom display section. They may be switched. Port A should be connected to Port A. Port B should be connected to Port B.
	Scattered or Out of Order Content (Module Level)	<ul style="list-style-type: none"> - The SATA cables in the PLR are switched.
	Area of Content Mixed Up – Module ID out of Order	<ul style="list-style-type: none"> - SATA signal path not correct. Verify signal path for the section matches the drawing.

	<p>Module Out</p>	<ul style="list-style-type: none"> - Check the power supply indicator to that module. If the light is off, replace the module. - Although not likely, this issue can be caused if both SATA cables connected to the module are damaged.
	<p>Display Too Bright</p>	<ul style="list-style-type: none"> - Immediately blank the display. - Verify that the MDLS is mounted correctly. If not, remount the MDLS. - Verify the MDLS is connected to the controller. - Have the NOC verify the MDLS is set to multi-direction and automatic.
	<p>Display Too Dim</p>	<ul style="list-style-type: none"> - Verify that the MDLS is mounted correctly. If not, remount the MDLS. - Verify the MDLS is connected to the controller. - Have the NOC verify the MDLS is set to multi-direction and automatic.

Section 4: Accessing Internal Digital Billboard Components

4.1 Rear Access

Required tools: Flat head screwdriver

4100 series digital billboards have hinged doors that are secured with two quarter-turn latches. If the doors are obstructed, they can be lifted off the hinges for easy access. Refer to **Figure 7** and **Figure 8**.

Note: If you remove a door and find there is no safe place to put it, use a safety lanyard to keep the door from falling. Attach the lanyard to the door lanyard ring, and attach the other end to a secure part of the display. Refer to **Figure 9**.

To access the back of the display:

1. With a flat head screwdriver, turn the quarter-turn latches counter-clock wise.
2. If the door is obstructed, lift the door off the hinges.
 - a. Attach the safety lanyard to the door lanyard hook to prevent damage.



Figure 7: Rear Access Door with Vent Hoods

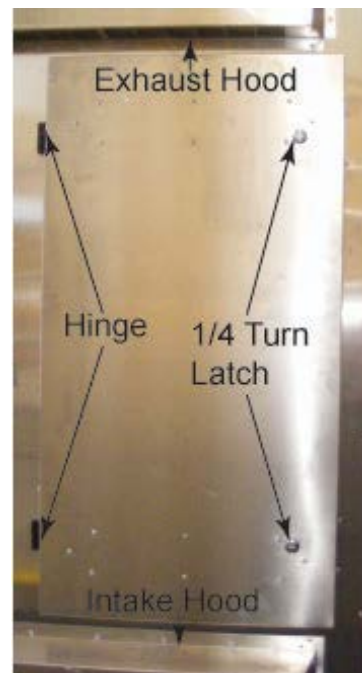


Figure 8: Rear Access door w/o Vent Hoods

- b. Pull the bottom of the display door away from the back of the display.
- c. Carefully place the access door out of the way.

4.2 Front Access

Front access is completed by removing modules. Refer to the steps in **Section 5.1** to remove a module from the front of the display.

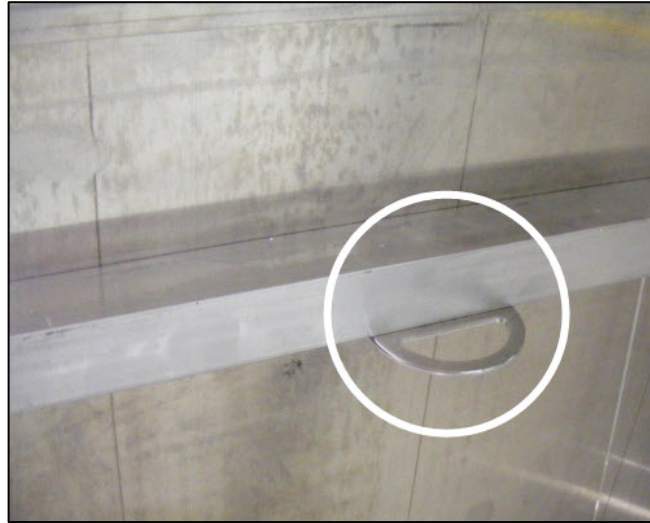


Figure 9: Door Lanyard Ring

Section 5: Module Testing and Removal

5.1 Removing a Module from the Display Face (Front Access)

Required Tools: $\frac{1}{8}$ " hex wrench, module lanyard (from the spare parts box)

To remove a module from the front:

1. With one hand on the module face, insert the $\frac{1}{8}$ " hex wrench into the bottom access hole.
2. Turn the latch release approximately a quarter-turn counter-clockwise.
3. Insert the $\frac{1}{8}$ " hex wrench into the top access hole.
4. Turn the latch release approximately a quarter-turn counter-clockwise. You should feel the module release from the display face.
5. Pull the module from the display just far enough to reach the back of the module.
6. Disconnect the power cable from the back of the power supply and the SATA cables from the back of the module. Refer to **Figure 10**.

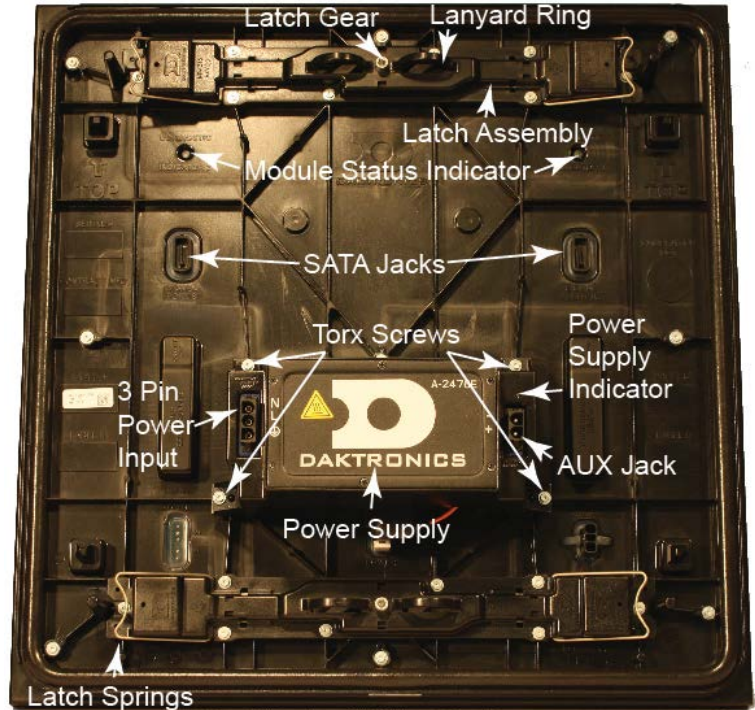


Figure 10: Labeled Module Back

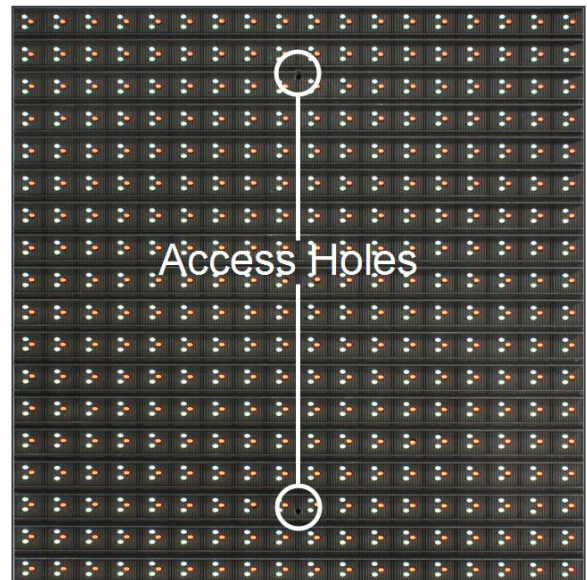


Figure 11: Module Face

7. Gently set the module down on a clean and dry surface.

Note: If there is no place to set the module down, use a safety lanyard to hang the module from the display. Attach the safety lanyard in a way that takes up slack on the lanyard. Carefully let the module hang, ensuring it does not damage the LED or louvers.

5.2 Reinstalling the Module (Front Access)

1. Reinstall the module by aligning the module with the opening.
2. Reattach the power and SATA cables.
3. Carefully insert the module into the opening while verifying that SATA and power cables are not being pinched between the module and the display face.
4. Firmly press the lower half of the module against the display face.
5. Insert the $1/8$ " hex wrench into the bottom access hole and turn approximately a quarter-turn clockwise or until you feel it latch securely in place.
6. Insert the $1/8$ " hex wrench into the top access hole and turn approximately a quarter-turn clockwise or until you feel it latch securely in place.
7. Gently pull on the module to verify it is properly seated.

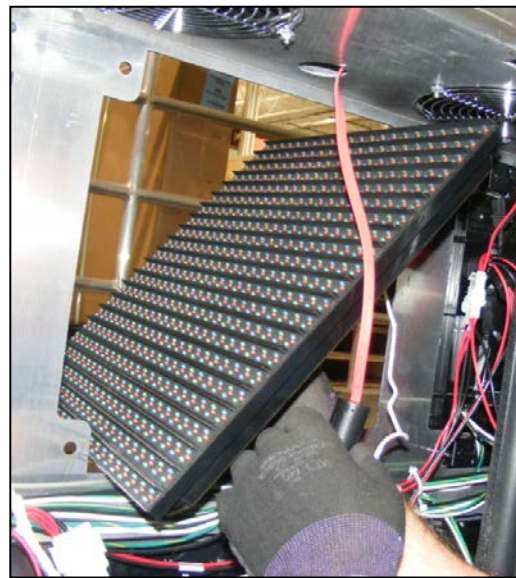


Figure 12: Pulling Module through Display Face

Note: If the module is not latched properly, the latch springs on the module should force the module away from the display face. If you notice this, attempt to reinstall the module.

5.3 Removing a Module (Rear Access)

Sometimes, when removing a module from the back of the display, certain display components may inhibit module removal. If that occurs, remove the component according to the instructions provided in Section 6 and then remove the module. Replace all components when done servicing the module.

Required Tools: $1/8$ " hex wrench, module lanyard (from the spare parts box)

To remove a module from the back of the display:

1. Attach one end of the safety lanyard to a lanyard ring on the top of the module.
2. Feed the lanyard over a wire rod or through a nearby upright in the display. Do not anchor the lanyard to another module.
3. Attach the other end of the lanyard to the lanyard attachment ring on the bottom of the module.
4. Disconnect the SATA cables from the module and the power cable from the power supply. Refer to **Figure 10**.
5. With a $1/8$ " hex wrench, turn the bottom latch gear approximately a quarter-turn clockwise to disengage the latch.
6. With a $1/8$ " hex wrench, turn the top latch gear approximately a quarter-turn clockwise to disengage the latch.

Note: Always maintain a firm grip on the module as you remove the module from the face sheet.

7. Rotate the module in a way that allows you to guide the module through the frame opening without catching the louvers or LEDs on the cabinet. Refer to **Figure 12**.

5.4 Removing a Module from the Bottom Row of a Section (Rear Access)

Daktronics does not recommend removing a power supply from the module because the module and power supply must be sent back to Daktronics together. However, it is necessary to remove the power supply from the module along the bottom row of modules to remove the module from the back. If possible, Daktronics recommends removing the module from the front.

Required Tools: Torx driver, $1/8$ " 90° Allen wrench, module lanyard (from the spare parts box)

To remove a module along the bottom row:

1. Using the procedure outlined in **Removing a Module (Rear Access)**, remove the module above the target module.

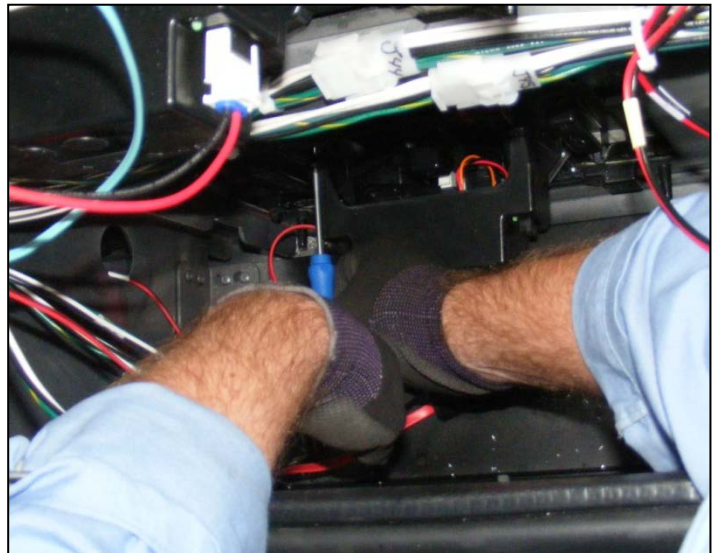


Figure 13: Removing Power Supply Screws

2. Disconnect the power and SATA cables from the module.
3. Using the Torx driver, remove the four screws that secure the power supply to the module. Refer to **Figure 13**.
4. Gently pull the power supply away from the module.
5. Disconnect the power cable that connects the power supply and module. Refer to **Figure 14**.
6. Connect a module lanyard from a lanyard attachment ring on the module to a structural member inside the display.
7. Insert the 90° Allen wrench into the top module latch gear.
8. Turn a quarter-turn clockwise to disengage the module from the face sheet.
9. While holding the back of the module, insert the 90° Allen wrench into the bottom module latch gear.



Figure 14: Disconnecting Power from Module

10. Turn a quarter-turn clockwise to disengage the module from the face sheet.
11. Remove module by pushing it away from the display face, pivoting and rotating it 90° and pulling it through the display face sheet.

Note: Ensure the louver blades run lengthwise when pulling the module through the display face so they do not get damaged by the display face sheet.

12. Repair or replace the module as needed.

Note: If sending the module back to Daktronics send the module and power supply back in the same box, as they are considered one unit.

13. Reverse the above steps to reinstall the module.

5.5 Removing a Module from Behind a Term Panel (Rear Access)

Required Tools: Phillips head screwdriver, $\frac{1}{8}$ " Allen wrench, module lanyard

1. Locate the two $\frac{1}{4}$ turnkeys along the top of the term panel. Refer to **Figure 15**.
2. Turn each turnkey counter-clock wise until the term panel disengages from the display.
3. While holding the term panel, allow it to slowly hinge forward.
4. Follow the steps in the **Removing a Module (Rear Access)** section to remove and reinstall a module.
5. Reverse **Steps 1-3** to replace the term panel.

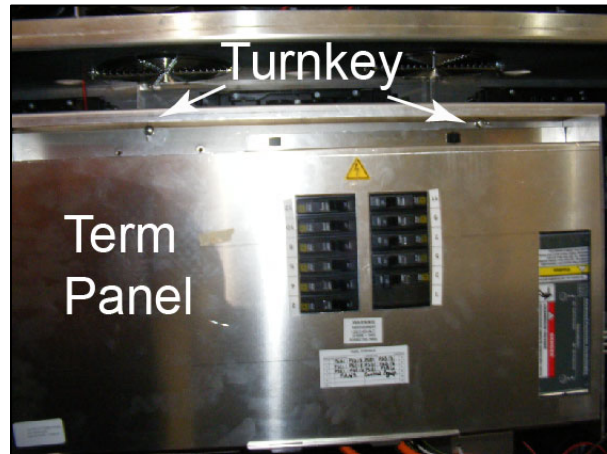


Figure 15: Term Panel

5.6 Reinstalling the Module (Rear Access)

1. Rotate and carefully guide the module through the module opening.
Note: To ensure proper alignment, verify the word TOP printed on the back of the module is to the top left of the module.
2. Once the module is through the display face, align the module with the face sheet so the gravity load pegs fit in the gravity load peg holes. Ensure the lanyard or cables do not pinch between the module and the display.
3. Once the module is in place, use the bottom module lanyard rings or the lanyard to pull the module firmly against the face sheet.
4. With a $\frac{1}{8}$ " hex wrench, turn the bottom latch gear approximately a quarter-turn counter-clockwise to engage the latch.
5. Use the top module lanyard rings or the lanyard to pull the module firmly against the face sheet.
6. With a $\frac{1}{8}$ " hex wrench, turn the top latch gear approximately a quarter-turn counter-clockwise to engage the latch.
7. Connect the SATA cables to the back of the module and the power cable to the back of the power supply.

5.7 Module Status Indicators

Under normal operation, module indicator LEDs (one on each side on the back of the module) should flash once every two seconds.

Note: When troubleshooting, it is important to know that it will take up to eight seconds to change nodes.

5.8 Performing a Module Self Test

If a module is blank and has power supplied to it, you can perform a module self-test. For full self test instructions, refer to **Performing a Daktronics Module Self Test** in **Appendix A**.

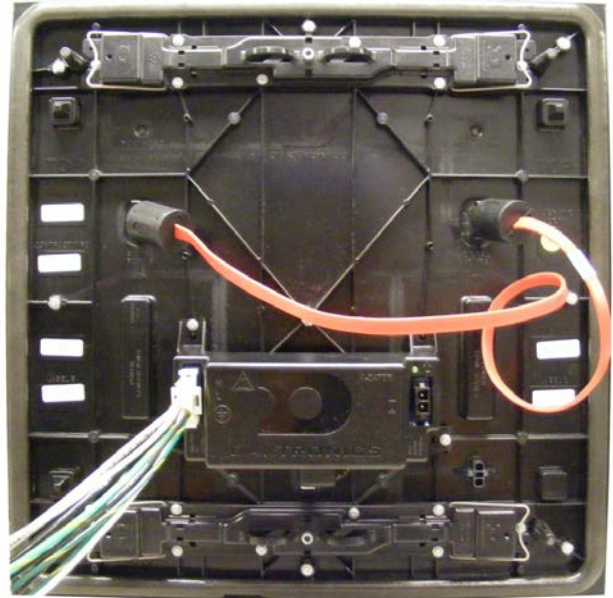


Figure 16: Module Self Test

Section 6: Replacing Display Components

6.1 Replacing a Power Supply

The power supply provides power from the term panel to the module. For the 4100 series of Daktronics digital billboards, each module has a power supply located on the back.

If there is an issue with a power supply, replace the module with another power supply.

6.2 Testing and Replacing a ProLink Router (PLR)

A ProLink Router sends the signal from the VIP-4060 in the control bay out to the modules via a signal cable. For the 4100 series of digital billboards the PLR has redundant power. The PLR is powered off a module which is also connected to a redundant power supply. Refer to **Figure 17**.

Testing a PLR

Before replacing a PLR it may be beneficial to perform a self test. To perform this test:

1. Connect a duplex fiber cable to Fiber Ports A and B. Refer to **Figure 18**.
2. Connect a SATA cable to SATA Port A and B.
3. Connect the power cable to the PLR. This will start the PLR self test.
4. Wait for the test to complete. This may take up to 90 seconds. If the PLR has successfully sent and received data through each of the ports, the letters P.A.S will appear on the Seven Segment Display. If the letters E.r.r appear, the Seven Segment Display will show the port numbers with issues. Refer to the **ProLink Router 6050** manual in **Appendix A** for a full list of error codes.
5. If an error displays on a port, use a known good cable on those ports and perform the test again to rule out the possibility of the cable causing the error.

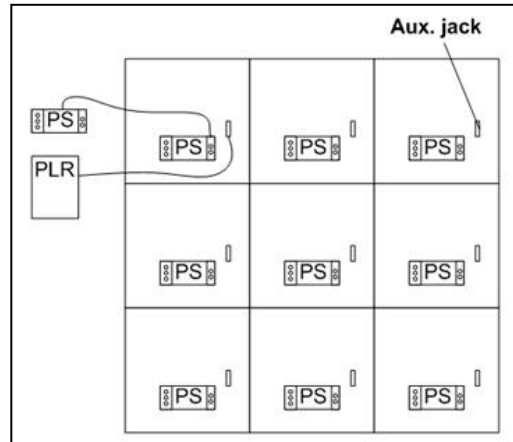


Figure 17: Redundant Power Supply Illustration

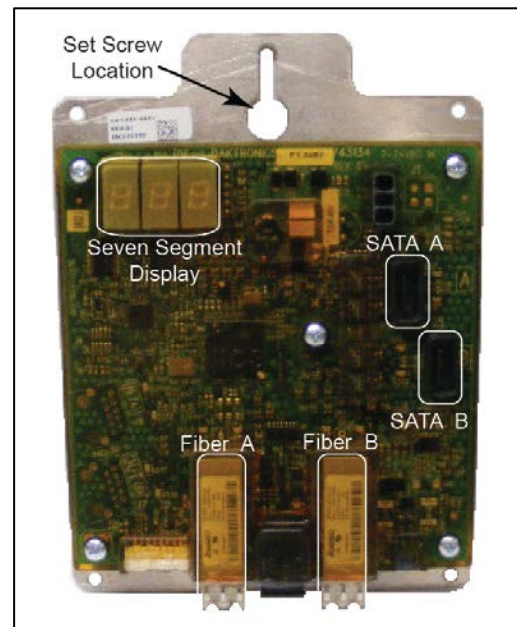


Figure 18: PLR Self Test

6. If the error persists, replace the PLR.

Replacing a ProLink Router

Required Tools: Phillips screwdriver

Refer to **Figure 18** while completing these steps:

1. Access the interior of the display by using the steps provided in **Section 4: Accessing Internal Digital Billboard Components**.
2. Disconnect the PLR SATA and power cables.
3. Using a Phillips screwdriver, loosen the PLR assembly set screw.
4. Lift the PLR assembly to disengage from the display.
5. Install a new PLR.
6. Connect the signal and power cables to the new PLR. Verify the cables are properly seated.

6.3 Replacing a Filter

Check filters at least yearly. If the display is in a high dust or pollution area, check the filters more frequently. To replace a filter:

1. Depress the filter release tab to lower the filter tray. Refer to **Figure 19**.
2. Remove the old filter. Refer to the table below for filter quantities by display size.
3. Install the new filter.
4. Close the filter tray.
5. Inspect around the filter door and tray to verify the filter is in place.

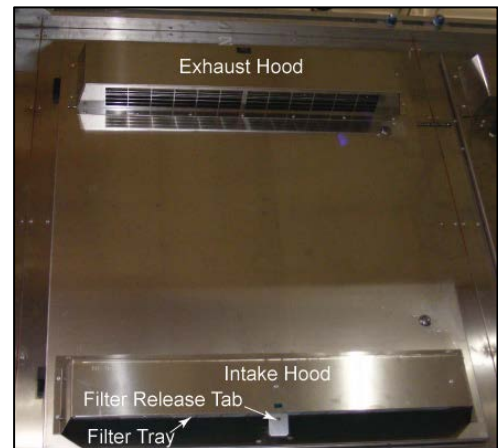


Figure 19: Filter Replacement Details

Display Size	Filter Quantity
20' x 60'	32
14' x 48'	26
12' x 48'	26
14' x 28'	16
21' x 21'	18
11' x 22'	12
10'6" x 36"	10
10' x 30'	8
10' x 20'	6

6.4 Replacing a Fan

Required Tools: Phillips screwdriver, Utility knife, Cable ties

To replace a fan:

1. Access the interior of the display by using the steps provided in **Section 4: Accessing Internal Digital Billboard Components**.
2. Locate and disconnect the 3-pin mate-n-lok connector. It should be cable tied to the wire rod with other cables.
3. Cut the cable ties from the wire rod until the fan power cable is loose.
4. Use the Phillips head screwdriver to loosen the two fan mounting screws. Refer to **Figure 20**.
5. Remove the fan from the display.
6. Reverse **Steps 2-6** to install the new fan.
7. Secure any excess cable to the wire rod with cable ties.

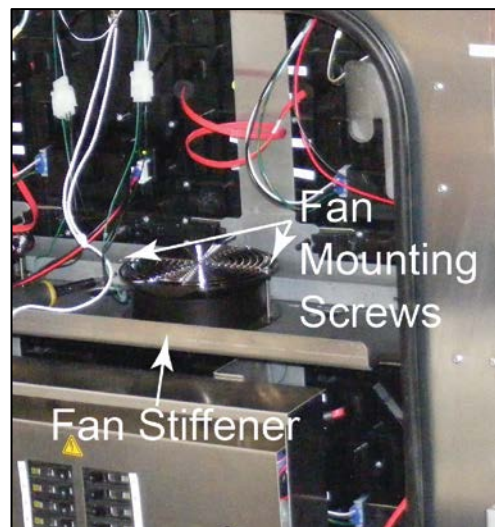


Figure 20: 4100 Series Fan

Section 7: Control Equipment

7.1 Control Enclosure Location

4100 Series control equipment is located in a control box attached to one of the rear-access doors. Refer to **Figure 21**.



Figure 21: 4100 Series Control Enclosure

7.2 Control Equipment Overview

This section provides information on the control equipment and shows the approximate location in the control enclosure. This section does not address customer-specific control equipment. Refer to **Figure 22** and the table below for component location and functions. Refer to the display specific enclosure drawings for a complete component list and location.

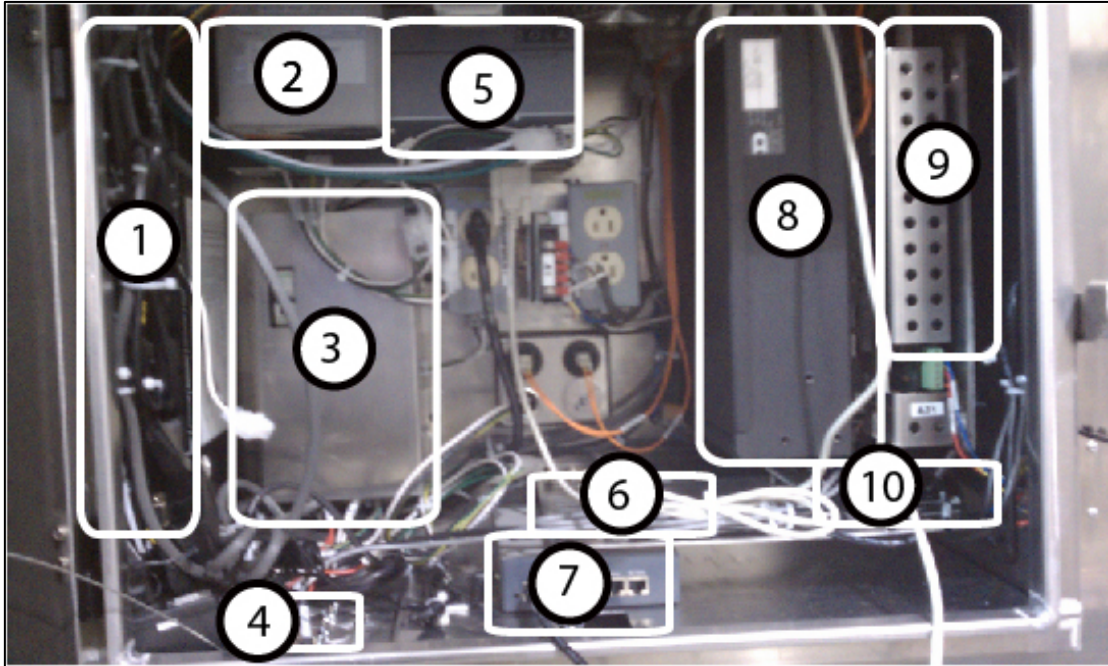


Figure 22: 4100 Series Enclosure

Number	Component	Function
1	iBoot Bar	Internet enabled device that allows power to be cycled to devices plugged into the iBoot Bar.
2	Surge Suppressor	Protects electrical devices from voltage spikes and provides power monitoring.
3	Breaker Panel	Termination panel for the control enclosure.
4	Knockouts	Provides easy access for feeding network and power cables into the control enclosure.
5	Uninterruptible Power Supply	Functions as a short term power source for equipment in the control enclosure.
6	Webcam Video Server	Computer based device dedicated to delivering video.
7	Router	Connects two or more computer networks.
8	V-Net	Composites content onto a single video output to deliver content. This component may vary by customer.
9	VIP-4060	The VIP is the controller card for the digital billboard.
10	Network Switch	A computer networking device that connects network segments.

7.3 Replacing Control Equipment

Replacing the Filter

To replace a digital billboard enclosure filter:

1. Lift the existing filter out of the filter tray. Refer to **Figure 23**.

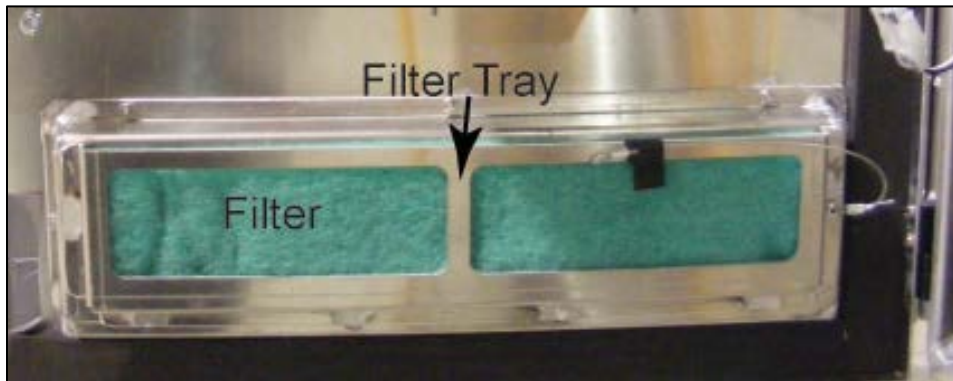


Figure 23: Enclosure Door Filter

2. If needed, measure and cut the new filter to length.
3. Insert the new filter into the filter tray.

Replacing the Router

Required Tools: Side cutters, zip ties, masking tape

1. Use masking tape to mark the port number of each Ethernet cable.
2. Unplug the Ethernet cables from the router.
3. Carefully pull the router out of the control enclosure.
4. Disconnect the power cord from the back of the router.
5. Reverse **Steps 2-4** to reinstall a new router.

Replacing the VIP-4060

Required Tools: Phillips screwdriver, side cutters, zip ties

1. Locate the replacement VIP from the spare parts box.
2. Disconnect the power, fiber, and Cat5 cables. Note their location for reinstalling later.
3. Locate and loosen the bottom VIP-4060 attachment screw.
4. Locate and loosen the top VIP-4060 attachment screw.

5. Carefully lift and pull the VIP assembly out of the control enclosure.
6. Reverse **Steps 2-5** to reinstall the VIP-4060.
7. Neatly secure any excess cable.

Replacing the V-Net

The V-Net is the standard computer, but this procedure will work for customer specific computers.


Required Tools: Phillips screwdriver, side cutters, zip ties

1. Locate the replacement V-Net from the spare parts box.
2. Disconnect the power, fiber, and Cat5 cables. Note their location for reinstalling later.
3. Locate and loosen both bottom V-Net attachment screws.
4. Locate and loosen both top V-Net attachment screw.
5. Carefully lift and pull the V-Net out of the control enclosure.
6. Reverse **Steps 2-5** to reinstall the V-Net.
7. Neatly secure any excess cable.

Section 8: Multi-Direction Light Sensor Testing and Replacement

8.1 Troubleshooting MDLS Issues

There are a few crucial things to check if there are issues with the photocell. The table below lists the item as well as provides a picture of the item and location.

Item	Image
Verify the connection to the control enclosure is secure.	
If there is a splice cable attached, inspect the splice cable connection.	
Inspect the MDLS windows for cleanliness.	
Check the connections inside the control enclosure and make sure they are secure	
Inspect the cable from the control enclosure to the MDLS for damage. Order a replacement cable if needed.	

Inspect the cable going into the bottom on the MDLS to see if it was pulled loose.



8.2 MDLS Testing

To test a MDLS, cover the MDLS with a piece of heavy cloth. The display should dim within a couple of minutes. Remove the fabric and verify the display returns to the brighter setting. If possible, work with the NOC and have them monitor the display IDM dimming levels.

8.3 Replacing the MDLS

Required Tools: Pliers, side cutters

To replace the MDLS:

1. Disconnect the MDLS from the control enclosure.

Note: There may be a splice in the cable from the control enclosure to the MDLS. If so, disconnect the MDLS cable from the splice point to the MDLS.
2. Remove the cable that runs from the control enclosure to the MDLS.
3. Remove the two attachment bolts that secure the MDLS assembly to the mounting arm.

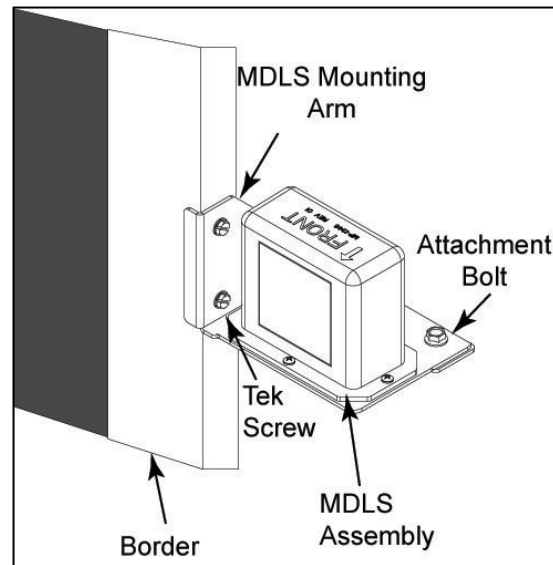


Figure 24: MDLS Assembly

4. Reverse **Steps 1-3** to reinstall a MDLS.
5. Work with the NOC to test the photocell and ensure it is functioning properly.

Section 9: Webcam Access

The information in this section describes how to retract the webcam to the display face for service or cleaning. Work with the NOC to verify the camera is aligned and in focus after servicing or cleaning the webcam.

9.1 Retracting the Webcam to the Display Face

1. To retract the webcam arm, remove the three short bolts from the top of the elbow assembly. Refer to **Figure 25**.

Note: Do not remove the long bolts.

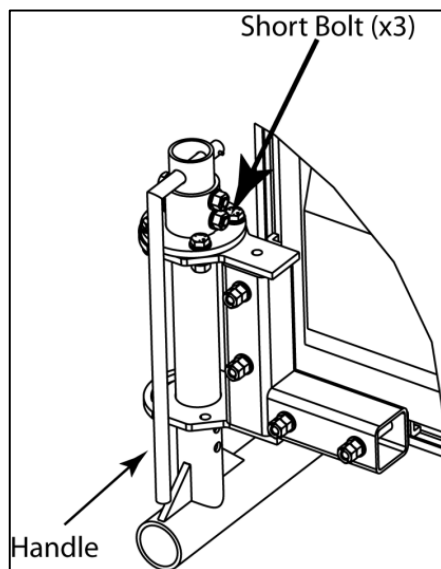


Figure 25: Elbow Assembly

2. Use the handle to carefully pivot the webcam arm to the front of the 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.
4. Replace and tighten the three short bolts.
5. Work with Daktronics NOC to verify the webcam is focused and functioning properly.

Section 10: Display Maintenance

10.1 Service Calls

After addressing the service issue, inspect the following items on every service call:

- Check display filters. Replace if needed.
- Check for loose modules.
- Inspect the display for signs of water intrusion.
- Check for corrosion.
- Check the display for signs of damage.
- Check the control enclosure filters. Replace if needed.
- Inspect the control for damage.
- Inspect the control enclosure for water intrusion.
- Perform an inventory of the spare parts in the spare parts box.
- Have the NOC run a diagnostics check of the display. Work with the NOC to repair any issues found during diagnostics.

10.2 Annual Inspection

It is important to schedule annual maintenance visits on a digital billboard. During the visit, check for water, replace filters, and inspect for loose modules. For a full annual inspection checklist, refer to the **Annual Maintenance Checklist** in **Appendix A: Reference Materials**.

Appendix A: Reference Materials

Digital Billboard Annual Maintenance Checklist	DD1439264
ProLink Router 6050 (PLR6050) Installation and Maintenance	DD1735784
Performing a Daktronics Module Self Test	DD1944805