BLD-0100 SERIES DIGITAL BILLBOARD
INSTALLATION MANUAL
P2053

DD4054465
Rev 01
13 December 2019
**FCC Statement**

**Supplier Declaration of Conformity (SDoC)**

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

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

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

**Industry Canada Regulatory Information**

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

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

**Inquiries**

Contact Daktronics with any questions regarding our product compliance.

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1 Introduction

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

Limitation of Liability

Failure to perform the following may void factory warranties:

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

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

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

Important Contact Information

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

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.

| Display Assembly Number | RMN: Daktronics - 0200 - 12 Manufactured in Sioux Falls, SD |
| Display Serial Number | 120/240 VAC, Single Phase, 60 HZ |
| Manufacture Month/Date Year | AMPS (L1/L2) = 31.9/29.3 Total |
|                          | Total Watts = 7,344 |

Figure 1: BLD-0100 Series Display Label

BLD-0100 Series Improvements

<table>
<thead>
<tr>
<th>Component</th>
<th>Improvement</th>
<th>Image of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Doors</td>
<td>Hook-style doors that hook into slots on the display's internal vertical members</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Handles on each door for easy removal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mechanical stop holds door in place without hardware</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Door shingle each other to reduce water intrusion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eliminated the backsheet to provide more access from the rear</td>
<td></td>
</tr>
<tr>
<td>Component</td>
<td>Improvement</td>
<td>Image of Change</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Mounting</td>
<td>• Rocker mount without offset is standard</td>
<td></td>
</tr>
<tr>
<td>Ventilation</td>
<td>• Ventilation cutouts provided in rear access doors</td>
<td></td>
</tr>
<tr>
<td>Cooling</td>
<td>• Fans located on removable plenums inside the bottom of each display section</td>
<td></td>
</tr>
<tr>
<td>Internet and Webcam Connections</td>
<td>• Located in the right rear bay</td>
<td></td>
</tr>
<tr>
<td>ISP Enclosure/Third Party Player</td>
<td>• Located in the right rear bay</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Third party player is now installed in the ISP enclosure for third party options</td>
<td></td>
</tr>
<tr>
<td>VIP-5160.2</td>
<td>• No fans on VIP-51.60-2 (internal or external)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Located in the ISP enclosure</td>
<td></td>
</tr>
<tr>
<td>Component</td>
<td>Improvement</td>
<td>Image of Change</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>DMP-8000</td>
<td>• No fans on DMP-8000 (internal or external)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Located in the ISP Enclosure</td>
<td></td>
</tr>
<tr>
<td>Module LEDs</td>
<td>• 400 x 400 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Uses the latest technology with a downward-focused LED</td>
<td></td>
</tr>
<tr>
<td>Spare Parts</td>
<td>• Spare parts are located inside the far-left bottom door of display</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Spare parts box is removable to allow for rear service access</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Modules, module tool, and splice tool for sectional displays are included.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Other standard service tools are not included</td>
<td></td>
</tr>
<tr>
<td>Term Panel</td>
<td>• Term panels removed from the display.</td>
<td></td>
</tr>
<tr>
<td>Power Entrance</td>
<td>• Multiple power entrances per section eliminate termination panels.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Located near the center of the display.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Electrician needs to drill conduit hole using the pilot hole labeled as the power entrance.</td>
<td></td>
</tr>
<tr>
<td>Component</td>
<td>Improvement</td>
<td>Image of Change</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Power Supply</td>
<td>• Each power supply powers up to 12 modules.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Power supplies are mounted to the uprights inside the display.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No tools needed to remove power supplies</td>
<td></td>
</tr>
<tr>
<td>Display Cabinet</td>
<td>• Optional borderless display design</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Includes a top cover for environmental protection</td>
<td></td>
</tr>
</tbody>
</table>

**Terms Used in this Manual**

**DMP-8000:** Digital billboard content player that sends content to the 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.

**Latch Release:** Releases the latch that holds the module firmly in the display. The latches are centered near the top and bottom of the module.

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

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

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

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

**Power Supply:** A device that converts AC line voltage from the panel board to low DC voltage for driver boards. In the BLD-0100 series, one power supply powers nine modules, one controller, or a ProLink Router (PLR).

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

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

**VIP-5160:** Video processor that sends video to the display and controls dimming, color settings, and test patterns.
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:

<table>
<thead>
<tr>
<th>Daktronics-Provided Tools (located behind labeled doors)</th>
<th>Daktronics-Provided Tools (located behind labeled doors)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Black cable ties</td>
<td>• Laptop</td>
</tr>
<tr>
<td>• L-Handle hex head wrench: ( \frac{1}{8} )”</td>
<td>• Pry bar</td>
</tr>
<tr>
<td>• Splice wrench</td>
<td>• Ratchet tie-downs/come along</td>
</tr>
<tr>
<td>• T-Handle Hex head wrench: ( \frac{1}{8} )”</td>
<td>• Socket and open end wrench: ( \frac{1}{16} )”</td>
</tr>
<tr>
<td>• T-20 Torx bit</td>
<td>• Socket extension: 3”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer-Provided Tools</th>
<th>Customer-Provided Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Hex head wrenches: Various sizes</td>
<td>• Socket set</td>
</tr>
<tr>
<td>• Flat-head screwdriver</td>
<td>• Tape measure</td>
</tr>
<tr>
<td>• Phillips screw driver</td>
<td>• Torque Allen wrench: ( \frac{1}{8} )”</td>
</tr>
<tr>
<td>• Bucket truck: Customer must provide until final</td>
<td>• Utility knife</td>
</tr>
<tr>
<td>proof of performance</td>
<td>• Taglines</td>
</tr>
<tr>
<td>• Crane</td>
<td>• Fish tape</td>
</tr>
<tr>
<td>• Cordless drill</td>
<td></td>
</tr>
<tr>
<td>• Drill bits</td>
<td></td>
</tr>
<tr>
<td>• Hammers</td>
<td></td>
</tr>
<tr>
<td>• Ladder: 6’, 8’, 10’</td>
<td></td>
</tr>
<tr>
<td>• Laptop</td>
<td></td>
</tr>
<tr>
<td>• Pry bar</td>
<td></td>
</tr>
<tr>
<td>• Ratchet tie-downs/come along</td>
<td></td>
</tr>
<tr>
<td>• Socket and open end wrench: ( \frac{1}{16} )”</td>
<td></td>
</tr>
<tr>
<td>• Socket extension: 3”</td>
<td></td>
</tr>
<tr>
<td>• Socket set</td>
<td></td>
</tr>
<tr>
<td>• Tape measure</td>
<td></td>
</tr>
<tr>
<td>• Torque Allen wrench: ( \frac{1}{8} )”</td>
<td></td>
</tr>
<tr>
<td>• Utility knife</td>
<td></td>
</tr>
<tr>
<td>• Taglines</td>
<td></td>
</tr>
<tr>
<td>• Fish tape</td>
<td></td>
</tr>
</tbody>
</table>

Daktronics Digital Billboard Overview

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

*Figure 2: BLD-0100 Series Display Front and Back*
2 Installation Preparation

Installation Planning
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 A-988359 (use with offset mounts) and DWG 3041598 (use without offset mounts) in Section A: Reference Drawings (p.25).

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

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

This section provides general guidelines for BLD-0100 display installation. Work closely with the Project Manager on all installations. Do not modify the display or control system in any manner without the written permission of the Project Manager. Any unauthorized modifications may void the display warranty.

Display Installation

1. Using a utility knife, carefully cut away all of the white packaging material from the display. Pay special attention when cutting around the Multi-Direction Light Sensor (MDLS) to avoid cutting cables. If possible, do not cut anywhere along the display face as it can damage the LEDs and modules.

2. Remove the wooden strap boards from the top of every display section.

3. Locate the spare parts rack in the bottom-left end bay (when viewed from the back) and verify all installation tools and installation hardware were sent with the display. Contact the Project Manager immediately if missing installation parts.

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.

5. Lift only one section to the structure at a time. Refer to Figure 3.
   a. For sections with two pick points, use straps only if the angle of the strap is greater then 55°.
   b. For sections with four lift eyes, a spreader beam attached to each lift eye must be used.

6. Lift the bottom section 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.

8. Unbolt the bottom section from the trailer by removing the shipping braces.

9. Locate the center-line label on the back 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 it may need to be adjusted while attaching the display to the structure.

11. Lift the bottom section off of the truck.

12. Slowly lift the bottom section to the structure head and guide into place with tag lines.

13. Lower the bottom section along the uprights until it rests on the ledger brackets.

14. Verify the bottom section 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 bottom section. Refer to Figure 4.

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

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

16. Tighten rocker clamp hardware to 75 ft-lbs. Do not exceed 100 ft-lbs.

**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.

17. Tighten all of the nuts on the rocker clamps or offset extrusion bolts to 75 ft-lbs. Do not exceed 100 ft-lbs.

18. Place and tighten all remaining mounting assemblies to 75 ft-lbs. Do not exceed 100 ft-lbs.

19. Remove the crane support from the bottom section.

20. Disconnect the tag lines.

21. Locate the top border cover caps, when equipped, that are fixed to the border cover for shipping. Required screws are taped to the cover.

22. Use supplied Tek screws to install the border caps over the lift eye locations.
4 Section Splicing

Display Section Numbering

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

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

Display Splicing

Note: Always splice horizontal sections together first. Then 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 section and the splice key is inside the display top section splice channel.

5. Starting at one end of the display, insert the top lip of the splice wrench into the top section mounting channel. Refer to Figure 12.

6. Rest the bottom lip of the splice wrench against the back of the bottom section mounting channel.

7. Firmly pull down on the splice wrench until the back of both display sections align and the splice key is fully engaged in the top and bottom section splice channels.

8. Repeat Steps 5 - 7 approximately every foot along the back of the display.

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

LED Alignment

Verify LEDs align in all directions between splices. If the LEDs are more than 1/4 of an LED out of alignment, adjust until properly aligned.
10. Ensure the display sections align from front to back.

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

   Note: Evenly distribute the splice plates along the back of the display. Ensure there is a flat splice plate near each end of the display. Refer to Figure 14.

12. Tighten all of the nuts on the mounting plate to 75 ft-lb. Do not exceed 100 ft-lb.

13. Slide the border splice plates, shown in Figure 16, and covers, shown in Figure 17, when equipped, into place and attach with supplied nuts and Tek screws.

14. Complete the steps in Section 3: Display Installation (p.7) to install the billboard.
15. Connect the signal splice cables from the display top section.

   a. Signal A on the top section PLR to Signal B on the bottom section PLR.

   b. Signal B on the top section PLR to Signal B on the fiber patch panel in the bottom section. Refer to Figure 18.

16. Connect the purple/white relay signal harness from the top section power entrance to the ISP in the bottom section.

Note: Refer to the Block Diagram; Fiber Routing, PLR and PE Wiring drawing in Section A: Reference Drawings (p.25) for purple/white relay signal harness connections.

Figure 18: Power and Signal Splice Connections
5 Multi-Direction Light Sensor Relocation

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

Multi-Direction Light Sensor Relocation

1. From the back of the display, disconnect the cable that connects the MDLS to the display.

2. Carefully cut the zip ties that secure the cables to the anchor locations on the display back.

3. Loosen the attachment bolts that hold the MDLS assembly to the MDLS mounting arm. Refer to Figure 19 and Figure 20.

4. Lift the MDLS assembly off of the MDLS mounting arm.

5. Remove the two tek screws that secure the MDLS mounting arm to the border. Refer to Figure 19 and Figure 20.

6. Remove the MDLS mounting arm from the border.

7. Rotate the MDLS mounting arm vertically 180 degrees until the MDLS assembly can be reattached to the MDLS mounting arm.

8. Place the MDLS assembly on the 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.

Note: Ensure the front label on the MDLS 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 the Daktronics help desk with any questions.

11. Connect the MDLS cable to the Light Sensor connection in the Internet and webcam connections location (rear right bay). Refer to Figure 21.

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

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 Section A: Reference Drawings (p.25).

Mounting 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. Using the wire shipped in the webcam arm, 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 two inches from the end of the webcam arm. Refer to Figure 22.
6. Tighten all four saddle bolts.
7. If necessary, turn the webcam assembly until it will face the display when mounted.

Standard 10-Foot Fixed Webcam Arm Installation

Standard 10-foot fixed webcam arms are used on display less than or equal to 10 modules high and less 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 23.
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.
5. Attach the 5/8″ nuts to the bolts to secure the mounting assembly to the display. Tighten hardware to 75 ft-lb.
6. Using fish tape, feed the webcam cables through the webcam arm tube.
7. Connect the webcam cable to the Primary Webcam connection on the back of the display.
8. Secure the green webcam grounding wire to the groundling lug near either end of the display back.
9. Neatly secure excess power grounding with cable ties.
Standard 10-20 Foot Adjustable-Length Webcam Arm Installation

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

A 20-foot adjustable webcam arm is used on displays less than or equal to 17 modules high and less 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 Section A: Reference Drawings (p.25) 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 display back. Refer to Figure 24.

4. Slide the two remaining channels into the vertical mounting channel on the display back.

5. Place the bolting template over the bolts in the channel. The bolting template is important as it makes mounting the arm assembly easier. Refer to Figure 25.

6. Mount the elbow assembly to the back of the display by sliding the mounting bolts through the arm mounting assembly.

7. Place washers on all four mounting bolts.

8. Securely fasten a nut on each mounting bolt. 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.

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.

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 Primary Webcam connection, located on the signal entrance plate on the third bay from the right on the back of the display.

14. Secure the green webcam grounding wire to the grounding lug near the end of the display back. Refer to **Figure 26**.

15. Neatly secure excess grounding wire with cable ties.

16. Ensure all webcam and webcam mounting bolts are secure prior to hanging the display.

17. After hanging the display, connecting display power, and starting the display, call Daktronics NOC and have a technician verify they can detect the video server. If the video server is not detected, ensure the power and signal cables are securely attached to the camera and display. Make sure the video server has power and is connected with Cat-5e cable to the network switch on the router.

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

**Optional Retracting the Webcam Arm**

1. To retract the webcam arm, 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.

   **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 26:** Webcam Ground Lug

**Figure 27:** Pivoting Webcam Arm Base
7 Electrical Installation

This section provides general guidelines for connecting power to a BLD-0100 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.

Main Disconnect

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

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

SurgeSuppressor Installation

Unless otherwise noted, a surge suppressor is provided by Daktronics that the electrician will install at the main distribution panel.

1. Locate the surge suppressor behind the door labeled surge suppressor located behind this door.
2. Mount the surge suppressor to the side of the main distribution panel.
3. The electrician must install the surge suppressor according to all local and national electrical codes.
4. A 30A breaker typically feeds the surge suppressor.

Electrical Installation

1. Refer to the display riser diagram for site-required power.
2. Run conduit from the main distribution panel (provided by customer) to the display power entrance(s).
3. Route power to the display through a disconnect switch.
4. Power entrance locations are marked. Refer to Figure 29.
5. Use the provided pilot hole to drill required hole size for conduit. The recommended size is 1/2". Refer to Figure 29.
6. Route wire through the conduit into the display.
7. Locate the power entrance junction box and remove the cover with a screwdriver.

8. Route Line 1, Line 2, and Neutral wires through the opening on the bottom of the junction box.

9. Terminate wires into the provided lever nuts as labeled for Line 1, Line 2, and Neutral. Refer to Figure 30.

10. Connect the ground wire to the ground bar below the junction box.

11. Replace and secure the junction box cover.

12. For Installations where a backlit ID is desired, the electrical installation contractor is responsible for supplying an additional branch circuit to the backlit ID. Typically fed with a 15A breaker.

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.

Figure 30: Connect Power Lines
8 **Spare Parts Rack Location**

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

Included in the spare parts rack are:

- Modules
- ISP Enclosure Filters
- Splice Wrench (sectional displays only)
- Hex Head Wrench - 1/8” (L- and T-Handle)
- Power Supply
- T-20 Torx Bit

![Spare Parts Rack in Display](image)

**Figure 31: Spare Parts Rack in Display**

![Spare Parts Rack](image)

**Figure 32: Spare Parts Rack**
Control System Overview

BLD-0100 series control components are enclosed in the display.

Fully Embedded Control System

BLD-0100 series billboards have two major components. The ISP enclosure, located behind the first door from the right; and the 4-port IBoot mounted inside the ISP enclosure. Display back sheets are labeled with component locations to make finding components easy. The table below describes each control system component. Refer to Figure 33 and Figure 34 and the component descriptions below.

![Figure 33: IBoot](image)

<table>
<thead>
<tr>
<th>Component</th>
<th>Function</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermostat</td>
<td>Measures the temperatures inside the ISP enclosure and turns on the fan or the heater as needed.</td>
<td>1</td>
</tr>
<tr>
<td>Heater</td>
<td>Since ISP equipment is affected by lower temperatures, a heater prevents the ISP enclosure from going below a functional range.</td>
<td>2</td>
</tr>
<tr>
<td>Fan</td>
<td>High heat can damage some electronics, the fan cools the ISP enclosure to keep the equipment in a safe functional range.</td>
<td>3</td>
</tr>
<tr>
<td>Laptop and Cell Phone Location</td>
<td>Can be used to charge laptop or cell phones. Do not plug drills or other power tools into this outlet.</td>
<td>4</td>
</tr>
<tr>
<td>Door Switch</td>
<td>Detects if the ISP enclosure door is open. If opened, an alert is created and the content switches to predetermined content.</td>
<td>5</td>
</tr>
<tr>
<td>Ethernet Switch</td>
<td>Connects network devices and provides webcam power.</td>
<td>6</td>
</tr>
<tr>
<td>Z-Filter</td>
<td>Suppresses electrical noise in the electrical line.</td>
<td>7</td>
</tr>
<tr>
<td>VIP-5160</td>
<td>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.</td>
<td>8</td>
</tr>
<tr>
<td>DMP-8000</td>
<td>Converts content data from the content management server into a format recognized by the VIP and sends it out to the VIP-5160.</td>
<td>9</td>
</tr>
<tr>
<td>4-Port IBoot</td>
<td>Remote power reboot device. Four relays control the following components:</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>• 1 - ISP equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 2 - DMP-8000 and VIP-5160</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 3 - Display</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 4 -</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Do not cycle relays on site. Call the help desk to cycle relays.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> IBoot is located behind the VIP-5160.</td>
<td></td>
</tr>
</tbody>
</table>

![Figure 34: ISP Enclosure](image)
Opening the ISP Box

To access ISP box components, complete the following steps:

1. Access the ISP box by opening the rear access door with the control equipment label.

2. Use a Phillips head screw driver to loosen the four screws that secure the cover to the ISP enclosure. Refer to Figure 35.

3. Ensure ISP door is secured after service to guarantee proper function of the door sensor.

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

Figure 35: Control Equipment Door
10 First-Time Power Up

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

First-Time Power Up

1. Loosen the 3/4 turn latches that secure the ISP enclosure cover. Refer to Figure 36.

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 Cat5 cable from port 8 on the network switch of the primary display to port 8 of the network switch on the secondary display.

5. Turn on site power at the main breaker at the structure base.

6. Verify the status lights on the surge suppressor are on.

7. Check the LED indicators on the equipment in the ISP enclosure to ensure they are on.

8. Ensure the DMP-8000 and VIP-5160 LED indicators LEDs 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 help desk at 1-877-DAK-HELP to verify connectivity to the display, perform a diagnostics check, and perform several display setting checks.

11. After the help desk verifies the diagnostics is clean and performs their tasks, disconnect the laptop from the cross-over cable and reinstall the ISP enclosure cover.
11 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 perform some checks to determine if there are any:

- Module issues
- Internet or connectivity issues
- Webcam issues
- Display temperature issues
- Light sensor (MDLS) issues
- Spare parts count

Display Image Quality

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

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

Work with Daktronics NOC to address any visual issues.

Test the Light Sensor (MDLS)

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

1. Carefully cover the MDLS with a heavy piece of cloth.
2. Watch the display for a few minutes to verify the display dims.
3. Have a NOC technician monitor IDM at the same time to verify the display is dimming properly.
4. Work closely with the NOC technician to correct any issues.
5. Remove the fabric from the MDLS.
Appendix A contains drawings and quick guides that are generic to Daktronics digital billboards. Project-specific drawings and documents take precedence over the document in this section.

Click the document or drawing numbers to open electronic copies.

- Daktronics Digital Billboard Horizontal Signal Splice .......................................................... DD3151286
- Billboard Fixed 10-15’ Webcam Arm; 4-Point Mount .................................................. DWG-1142216
- Billboard Fixed 20’ Webcam Arm; 4-Point Mount ....................................................... DWG-1142217
- Billboard Fixed 10’ Webcam Arm, 2-Point Mount ....................................................... DWG-1067554
- Ledger Assembly (use with optional offset mounts) ..................................................... DWG-3041598
- Digital Billboard Webcam Arms Shop Drawing ........................................................ DWG-3498478
- D-Link Webcam Assembly ................................................................................................ DWG-4099307
- Billboard Pivoting 10-15’ Webcam Arm ........................................................................... DWG-1065544
- Internal Control System Shop Drawing, BLD-0100 ................................................... DWG-4128859
- Signal Riser; Internal Control System, BLD-0100 ....................................................... DWG-4118217
- Block Diagram; Fiber Routing, PLR and PE Wiring ...................................................... DWG-4118211
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Daktronics Warranty and Limitation of Liability

Click [here](#) to view Warranty and Limitation of Liability (SL-02374) information.