# Galaxy® AF-3220

## Installation and Operation Manual

*DD1758104*                                          *Rev 04 – 22 July 2014*

# DAKTRONICS

DAKTRONICS

Complete the chart with specific information about this display so the details are readily available when calling for service or replacement parts.

| Information needed for technicians and/or Customer Service | Fill in the blank |
|---|---|
| Location address of the display: | |
| Model number of the display: | AF-3220 34 mm |
| Version of software being used: | |
| Method of communication being used: | |
| Controller version used in the display: | Version 3 |
| Display's address on network | |

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# Table of Contents

# Section 1:    Introduction

This manual provides installation, maintenance and troubleshooting information to help ensure the optimal performance of the Daktronics Galaxy® AF-3220 series display. Diagnostic and parts replacement information are also included. The back and side views of a typical display are shown in **Figure 1**.
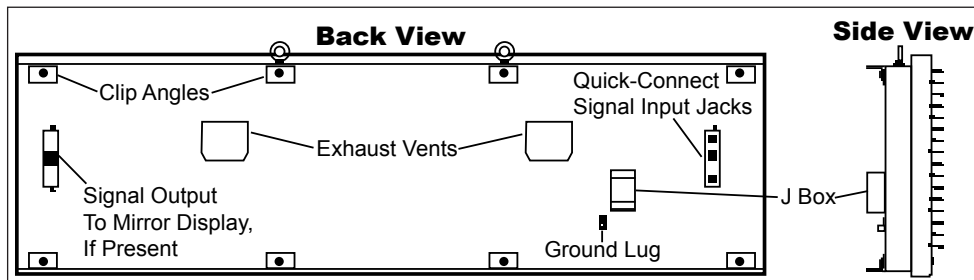


*Figure 1: Back and Side Views of a Typical Display*

## 1.1    Display Details

Galaxy® model numbers are described as follows:

| AF-3220-RRxCCC-34-R, A, RGB-XX | | |
|---|---|---|
| AF-3220 | = | Outdoor Galaxy display |
| 3220 | = | Series Number of Display |
| RR | = | Number of pixel rows high (16 or 24) |
| CCC | = | Number of pixel columns long (up to 96 standard |
| 34 | = | Pixel pitch in millimeters |
| R, A, RGB | = | LED Color: R (Red), A (Amber), RGB (Full Color – Red, Green, Blue) |
| XX | = | SF (Primary) or 2V (Primary/Mirror) |

The displays are offered as SF (single-face) or 2V (two-view) units. With a 2V (two-view) unit, the first display is called the primary and the second display is referred to as the mirror. If the second display will be mounted at a distance of more than 6 feet from the primary display, then two primary displays must be used.

A typical display system is controlled with a Windows®-based personal computer (PC) running Venus® 1500 software.

# Section 2: Mechanical Installation

Daktronics' engineering staff must approve any changes that may affect the weather-tightness of the display. If any modifications are made, detailed drawings of the changes must be submitted to Daktronics for evaluation and approval, or the warranty may be void.

## 2.1 Installation Guidelines

**DO:**

- Inspect the display for damage caused by shipping or uncrating

- Use all lift eyes when lifting the display maintaining 90 degrees between cabinet and lifting method

- Use all clip angles or bolt locations for mounting

- Leave adequate clearance for ventilation

- Ensure mounting location allows for door to pivot open

- Provide an adequate support structure that is straight and level

**DON'T:**

- Drill holes into the cabinet

- Modify the display without written approval from Daktronics Engineering

- Block intake vents on the bottom of the display

- Block exhaust hoods on back of display

- Use the lift eyes for permanent mounting

## 2.2 Support Structure Requirements

Daktronics is not responsible for installations or the structural integrity of support structures done by others. The customer must ensure that a qualified structural engineer approves the mounting structure and hardware.

Because every installation site is unique, no single procedure is approved by Daktronics for mounting Galaxy® displays. The information contained in this section is general information only and may or may not be appropriate for this particular installation.

## 2.3    Display Mounting

The installer must ensure the installation adequately meets local codes and standards, including safe, adequate mounting hardware and procedures.

**Note:** To maintain the structural integrity of the display cabinet, a 90-degree angle between the cabinet and the lifting method must be maintained.
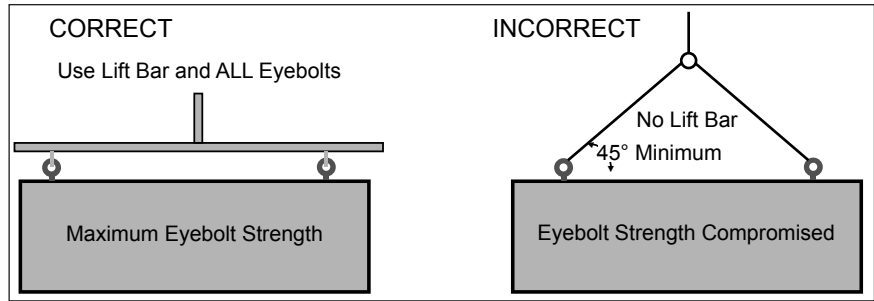


*Figure 2: Correct/Incorrect Lifting Procedures*

CORRECT
Use Lift Bar and ALL Eyebolts
Maximum Eyebolt Strength

INCORRECT
No Lift Bar
45° Minimum
Eyebolt Strength Compromised

1. Lift the display into position on the support structure following the guidelines in **Figure 2**.
   Be sure the mounting location leaves adequate space to pivot the door open, as shown in **Figure 9**.
   Do not attempt to permanently support the display by the eyebolts.

2. Weld or use ½" Grade-5 bolts and hardware to secure ALL clip angles, as shown in **Figure 3**, to the support structure as shown in the Shop Drawing.

3. Refer to **Section 4** and the appropriate communication manual for information on routing power and signal to the display.

4. After installation is complete, carefully inspect the display for any holes that may allow water to seep into the display and seal any openings with silicone.



*Figure 3: Clip Angle*

**Note: If the eyebolts on the top of the display were removed, seal the holes with bolts and/or silicone.**

# Section 3:   Power Installation

## 3.1   Installation Guidelines

**DO:**

- Route power to the display through a fused disconnect switch

- Route power conductors through conduit according to local codes

- Install an earth-ground electrode for each display face – if resistance to ground is greater than 10 ohms, install additional grounding electrodes

- Follow local and national electrical codes

- Provide a main power disconnect for the displays

**DON'T:**

- Connect the display to any voltage other than that listed on the product label

- Share a circuit or neutral with any other electrical devices such as light ballasts, parking lights, etc.

- Connect the neutral to the ground at the disconnect or the display

- Use the display support structure as an earth-ground electrode

## 3.2   Conduit

Daktronics does not include the conduit. Separate conduit must be used to route:

- power

- signal IN wires to the signal termination enclosure, when applicable

- signal OUT wires (if not using the provided interconnect cable)

The power J-box is provided with $^3/_4$" threaded holes for use with $^3/_4$" conduit. Unthreaded $^1/_2$" knockout holes are provided in the signal enclosures used with the display. If not using the provided enclosures, use the knockout/drill holes provided in the display cabinet.

## 3.3   Power Requirements

**Important Note:**

- Daktronics recommends that a separate circuit be run to the electronic display(s) to isolate it and prevent any issues that could be caused by line voltage fluctuations or high frequency noise on the power line caused by other types of equipment. A separate circuit also makes display maintenance and troubleshooting easier. Daktronics assumes no liability for any issues caused by line voltage fluctuations or other improper power conditions if these recommendations are not followed.

- Size conductors of circuits that deliver power to a Daktronics display according to local and national electrical codes so that the power distribution system delivers full-load power to the display while maintaining a voltage within five percent (5%) of the nominal voltage.

- Displays use single-phase power. Proper power installation is imperative for display operation.

## 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.

The disconnecting means must be located either in a direct line of sight from the display or can be locked in the open position. This ensures that power will not be reconnected while service personnel work on the display.

## 3.4 Grounding

Install this sign according national and applicable local codes. This includes proper grounding and bonding of the sign.

Installation with Ground and Neutral Conductors Provided

- These displays are installed with ground and neutral conductors provided. The power cable must contain an isolated earth-ground conductor.

- Do not connect neutral to ground at the disconnect or at the display. This violates electrical codes and voids the warranty.

- Daktronics does not recommend using the support structure as an earth-ground electrode; concrete, primer, corrosion, and other factors make the support structure a poor ground.
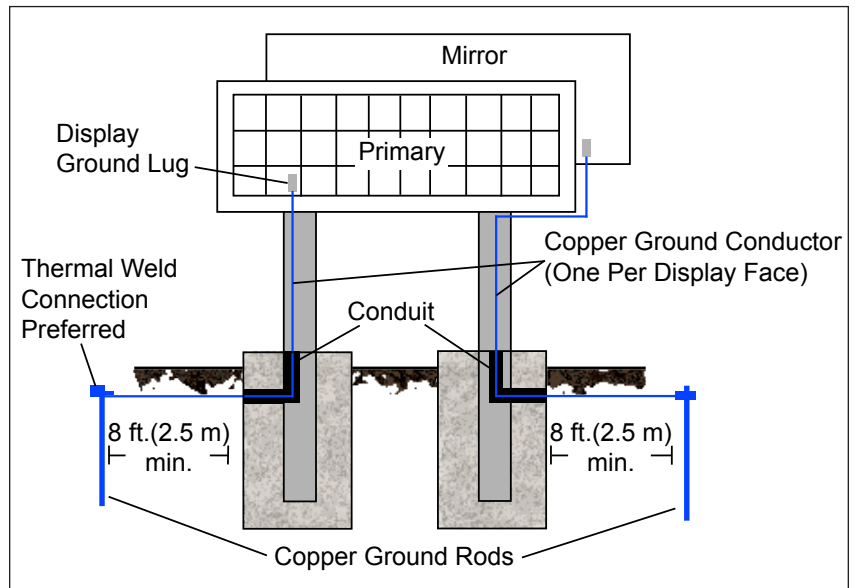


*Figure 4: Correct Grounding*

**Note:** The support structure may be used as an earth-ground electrode only if designed to do so. A qualified inspector must approve the support structure and grounding methods.

The display system must be connected to an earth ground as shown in **Figure 4**. Proper grounding protects the equipment from damaging electrical disturbances and lightning. Daktronics requires a resistance to ground of 10 ohms or less. The display must be properly grounded or the warranty will be void.

## 3.5 Power Connection

1. Route the power cable through conduit to the rear of the display and into the power J-box.

2. The power J-box contains two wires plus a ground coming from the interior of the display. These wires are pre-terminated to the power termination panel inside the display.

3. Inside the external power J-box, connect the power wires to the wires coming from the display interior using wire nuts. Refer to **Figure 5** for a diagram.

**Note:** The following colors are used for the pre-terminated wires:

- Line 1 – Black (Brown – 240V)

- Neutral - White (Blue – 240)

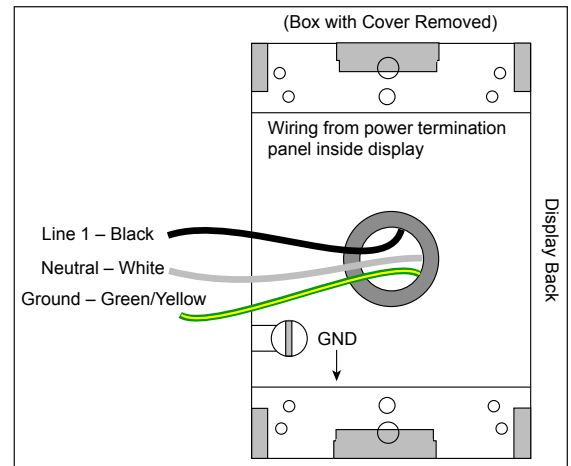- Grounding Conductor – (Green-Yellow)



*Figure 5:* Power Termination Wiring

# Section 4:    Signal Installation Overview

For specific details on installing communications, consult the quick guide and manual included with the communication equipment. Each type of communication is listed below along with manual and quick guide document numbers.

| Communication Type | Communication Manual | Communication Quick Guide |
|---|---|---|
| RS-232 | ED-14739 | ED-14554 |
| RS-422 | ED-14742 | ED-14555 |
| Serial Fiber | ED-14743 | ED-14557 |
| Serial Radio | ED-13932 | ED-14103 |
| Wire Ethernet | ED-14745 | ED-14558 |
| Fiber Ethernet | ED-14746 | ED-14559 |
| Ethernet Radio | DD1685027 | DD1417586 |
| USB to Ethernet Adapter | N/A | DD1790707 |

**Note:** These are the standard communication types. However, each site is unique and may include additional equipment. If problems arise, contact the display's service company or Daktronics Customer Service.

## 4.1    Primary/Mirror Display Interconnections

If the display is a two-sided primary/mirror display, a 6-foot quick-connect cable is provided to connect signal between the two display faces. This cable is limited to 6 feet only and cannot be extended. Refer to **Figure 6** for proper connection. Secure the excess cable to the support structure to prevent damage from weather or vandalism.

If the display faces are mounted more than 6 feet apart, install two primary displays. Hard wiring between the two display faces is required. Refer to the communications manual for information.

## 4.2    USB to Ethernet Adapter

A USB to Ethernet adapter is included with the display and can be used to bypass network configuration in situations where simple point-to-point communication is required. The adapter creates a secondary network that is dedicated to communication with the display, but network operation is still enabled through the primary network.



*Figure 6: Quick-Connect Cable*

The USB to Ethernet Adapter can be used in conjunction with communication kits supplied with the display. Refer to **DD1790707** for more information regarding the adapter.
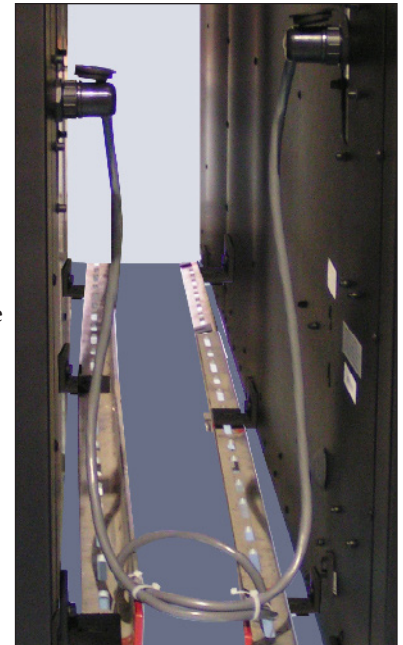
# Section 5:    Start-Up Procedure

Before starting the display, review the following checklist to ensure all parts are ready to operate correctly. Figure 1 shows the basic display components referred to in each step.

## 5.1    Start-up Checklist

- Confirm that power is correctly connected to the display

- Earth-ground electrode is installed with a resistance to ground of 10 ohms or less

- External communication equipment is properly installed

- Inspect signal connections at the control computer, display, and between display faces

- Confirm the control computer has Venus® 1500 software installed and is correctly configured

- Inspect peripheral equipment (temperature sensor, etc.) for proper installation

## 5.2    Boot Sequence

Each time the display is turned on, a boot sequence runs. The information in the second column is shown on the display.

**Note:** The Xs refer to numbers that may vary for each display, such as the hardware address.

After this sequence is complete, a single pixel will flash in the lower-right corner of the display to show that the display has power and is ready for content.

| Topic | Information Shown |
|---|---|
| Product Name | Galaxy® |
| Display Size | #Rows x #Columns |
| Shading | 64 Mono or RGB 32k |
| Bootloader Version | OS XXX |
| Firmware Number | ED-13305 |
| Firmware Revision | Rev X.XX |
| Hardware Address | HW:XX |
| Software Address | SW:XX |
| IP Address | (default: IP: 172.16.192.25 |
| Subnet Msk | (default) MSK: 255.255.0.0 |
| COM1 Configuration | C1:V15 |
| COM 2 Configuration | C2: RTD |
| Socket 3001 | IP 3001: V15 |
| Socket 3002 | IP 3002: RTD |
| Line Frequency | CLK: AUTO (60) |
| Display Description | Display 1 |

# Section 6:    Maintenance

**Note:** Turn off power before doing any repair or maintenance work on the display.

**Figure 7** shows the typical location of internal components. Actual locations may vary slightly depending on the size of the display. The quick-connect to mirror display is only present in two-view (2V) displays.
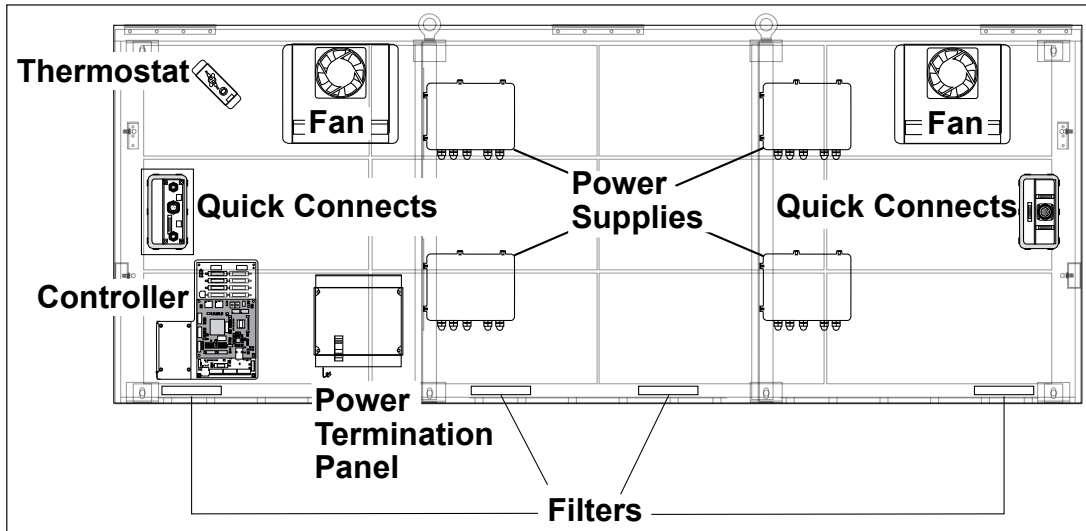


*Figure 7: Internal Component Locations*

## 6.1    Display Access

Open the face panel to access the interior of a display, as shown in **Figure 8**. To access the interior of the display, perform the following steps:

1.   Turn off power to the display.

2.   Locate the access latches on the face panel. With a $^5/_{32}$" hex wrench, turn the latch fasteners a quarter turn counterclockwise.

3.   Lift the face panel from the bottom. Gas springs hold the door open. **Caution:** The door swings upward. Take extra precautions during windy conditions.

4.   To close, lower the face panel and turn the latches a quarter turn clockwise. Be sure to fully latch all fasteners to provide a watertight seal.



*Figure 8: Open Face Panel*
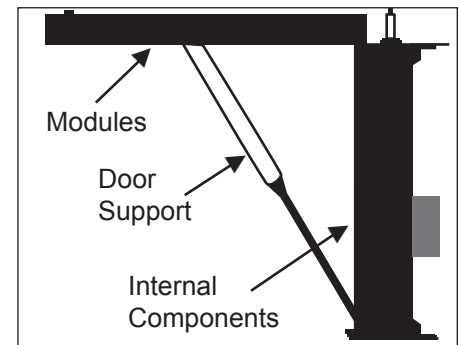
## 6.2    Ventilation System Maintenance

### Fans

Ventilation fans are located inside the display. Air is pulled in from bottom venting slots and exhausted out the back of the display.

Check fans and vents every time the display is opened. Check the fans by pressing the bypass switch located on the thermostat as shown in **Figure 9**.
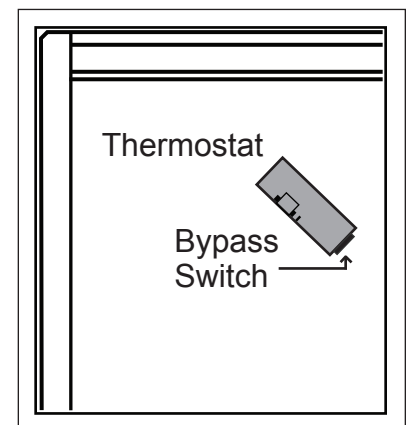


*Figure 9: Thermostat and Bypass Switch*

### Filters

Filters, shown in **Figure 10**, were added to AF-3220 displays in June 2012.

Filters prevent dirt and debris from entering the display cabinet. Check and replace filters every six months, but more frequent inspection may be required depending on conditions around the display, to ensure adequate air flow in the display.

Remove the filter assembly from the display by pushing one of the filter bracket tabs outward and lifting the filter assembly up and out, as shown in **Figure 11**. Remove the filter from the filter assembly and clean with water or compressed air (no greater than 60psi and at least 6" away) blown through the filter in the opposite direction from which air normally flows. Allow filters to dry before placing them back into filter assemblies and inserting them back into their locations.

Daktronics encourages users and service technicians to use their own discretion when deciding whether to clean or replace the filters.



*Figure 10: Filter Installed in Display Cabinet*

## 6.3 Annual Inspection

Complete a yearly inspection to maintain safe and dependable display operation. Open the display to visually inspect the cabinet interior and the components. Refer to Section 6.1 for these directions. The inspection should address the following issues:



*Figure 11: Removing Filter*

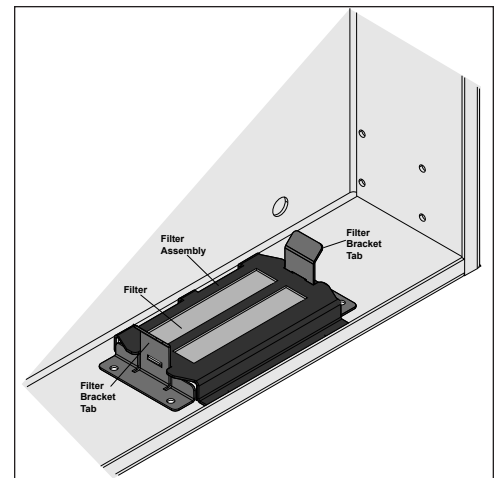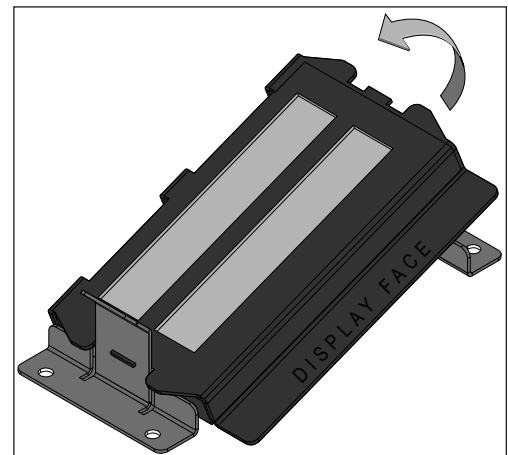| Inspection item | Possible corrective measures |
|---|---|
| Loose bolts, screws, rivets | • Tighten or replace, as required |
| Fans and Filters | • Refer to Section 6.2. Clean or replace as necessary |
| Dust around fans, on cabinet bottom | • Vacuum or carefully wipe away |
| Water intrusion or stains | • Replace weather stripping.<br>• Tighten door latches.<br>• Place silicone sealant around all locations where water might enter.<br>• Replace damaged electronic components |
| Paint corrosion by footings, tie points, ground rods | • Check the metal for structural integrity.<br>• Replace and/or repaint as necessary |

# Section 7:   Diagnostics and Troubleshooting

## 7.1   Controller Diagnostics

The controller is the "brains" of the display, receiving communication from the computer and then sending the appropriate information to the modules. LEDs on the controller show whether the power and communication signal are working correctly.

Since the controller is inside the display, open the face panel to view the diagnostic LEDs, shown in **Figure 12**. To access the interior of the display, refer to Section 6.1 for instructions and illustration.

Remember to turn off power to the display before accessing the interior.

However, once the door is open and the wires are found to be safe, power can be turned back on to view the diagnostic LEDs.

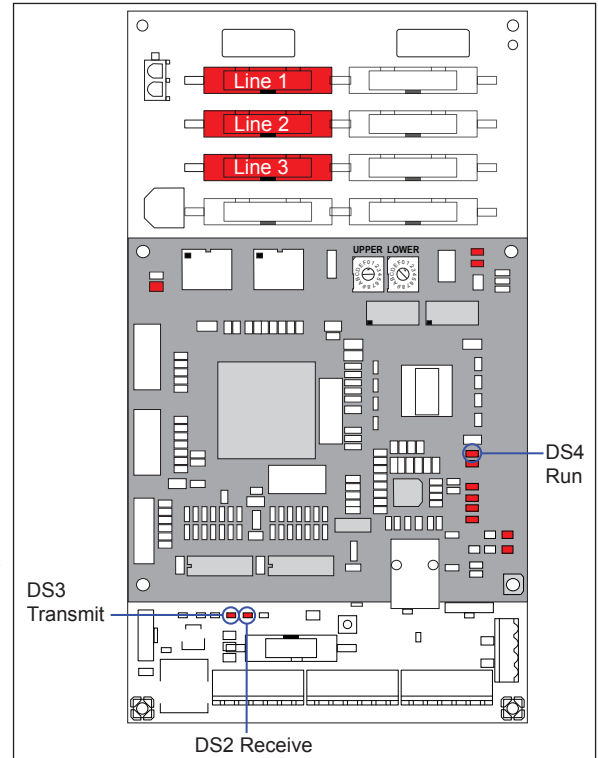| Figure/ Label | LED # | Color | Operation |
|---|---|---|---|
| **Run** | DS4 | Red | Steady FLASH about once per second indicates controller is working properly. |
| **Send signal TX** | DS3 | Yellow | OFF is the normal state. FLASH when transmitting serial communication from the computer. |
| **Receive signal RX1** | DS4 | Yellow | OFF is the normal state. FLASH when receiving serial communication from the computer. |



*Figure 12: Controller Diagnostics*

## 7.2   Troubleshooting Display Problems

This section contains some symptoms that may be encountered in the displays. This list does not include every possible symptom or solution but does represent common situations and simple steps to resolve them. The solutions are listed in priority order, so try the first solution first. If any of the steps referenced do not solve the issue, contact Daktronics Customer Service.

Troubleshooting may require opening the display cabinet. Refer to Section 6.1 for instructions on this procedure. Before closing the cabinet, make sure power and signal cables are reconnected correctly.

### Tools Required for Troubleshooting:

*   $^5/_{32}$" Hex wrench

*   Set of nut drivers

*   Flathead and Phillips screwdrivers

*   Service Laptop computer (recommended)

## One or More LEDs Do Not Light or Are Stuck On

- Check the condition of the ribbon cables on the module

- Check for bent pins on module jacks

- Swap a known good ribbon cable with the suspect cable

- Swap a known good module with the suspect module

## Section of the Display Does Not Work – Extending All the Way to Right End

- Check the ribbon cable from the last working module in the row to the first non-working module, as shown in **Figure 13**.

- Check if the first non-working module is getting power

- Swap the first non-working module with a known good module to see if the problem moves

- Swap the last working module with a known good module to see if the problem moves
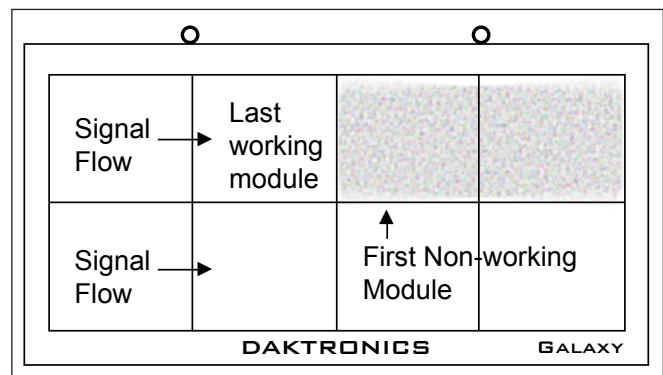
*Figure 13: Modules Not Working*

## One Row of Modules Does Not Work or Shows a Distorted Message

- Check the ribbon cable to the first non-working module

- Check for bent pins on the input and output jacks of the modules

- Swap the first non-working module with a known good module

- Swap the last working module with a known good module

## Entire Display Fails to Work

- Make sure the main power source breaker is on

- Check the diagnostic LEDs on the controller for Power and Run. (Section 7.2)

- Initiate a test pattern using Venus® 1500 software

- Check the ribbon cables from the controller to the modules

## Blank Display Seen After Boot-Up

A blank display is normal after the boot-up procedure. When finished, the display is blank except for a flashing pixel in the lower-right corner. The display is waiting for a message to be sent. Once a message is sent, the flashing pixel is replaced with the message.

## Message Only Appears on One Side of the Display

- Make sure power is connected to the second face of the display

- Make sure the interconnect cable is connected between display faces

### Unable to Communicate (Send Content) to the Display

- Turn power off at the breaker for 1 minute and turn it back on

- Check the display configuration in Venus 1500 software

- Check the diagnostic LEDs on the display controller (Section 7.1)

- Check signal input cable connections and cable connections on the controller

- Refer to the communications manual for more information

### Before Calling for Help

If none of the steps listed solves the issue, call your service provider or Daktronics Customer Service at 1-800-DAKTRONICS.

**Note:** It is helpful to be sitting at the control computer while talking with the service technician.

# Section 8:   Parts Replacement

## 8.1   About Replacement Parts

The following table contains some of the items that may need to be replaced in a display over time. These components are generally located as shown in Figure 7. Most components within the display are labeled with the part number and serial number of the assembly. A typical label is shown in **Figure 14**.
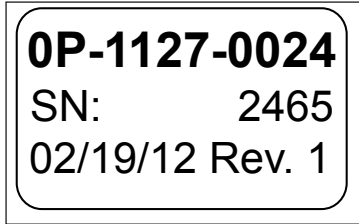
```
0P-1127-0024
SN:          2465
02/19/12 Rev. 1
```

*Figure 14: Typical Label*

| Part Description | Part Number |
|---|---|
| Module, Red | 0P-1620-5000 |
| Module, Amber | 0P-1620-5001 |
| Module, RGB | 0P-1620-5550 |
| Controller II | 0A-1229-0036 |
| Power Supply Assembly, w/Harness | A-2307 |
| Transformer, Primary only | T-1119 |
| Filter, RFI | Z-1007 |
| Filter, Air | EN-2676 |
| AF-32XX Filter Cover | 0M-1086995 |
| Temperature Sensor | 0A-1151-0005 |
| Light Level Detector | 0A-1327-3000 |
| Thermostat | 0A-1327-3104 |
| Fan | B-1053 |
| Ribbon Cable, 20 Pos, 18" | W-1387 |
| Ribbon Assy, 20 Pos, 24" | 0A-1000-0016 |
| Ribbon Assy; 20 Pos, 36" | 0A-1000-0018 |
| Ribbon Assy; 20 Pos, 48" | 0A-1000-0020 |
| Ribbon Assy; 20 Pos, 60" | 0A-1000-0021 |
| Cable; RJ45, CAT5E, Shielded, 2' | W-1537 |
| Cable; 22 AWG, 2-pair, shielded | W-1234 |
| Interconnect Cable; 6' | W-1503 |
| Quick Connect, Primary signal input | 0A-1327-1070 |
| Quick Connect, Primary | 0A-1327-1071 |
| Quick Connect, Mirror | 0A-1327-1072 |

## 8.2   Instructions for Replacing Parts

### Module Removal/Replacement

•   If LEDs have failed, do not attempt to replace individual LEDs.

•   Return a failed module to Daktronics for replacement and/or repair.

Tools required: $^5/_{32}$" hex wrench and $^9/_{32}$" nut driver

1.   Turn off power to the display.

2.   Locate the latch access fasteners on the face panel. With a $^5/_{32}$" hex wrench, turn the latch fasteners a quarter turn counterclockwise.

3.   Lift the face panel from the bottom. Gas springs hold the door open. Refer to **Figure 8** for diagram. **Caution:** The door swings upward. Take extra precautions during windy conditions.

4. Unplug the power cable by squeezing the tabs on the sides of the plug head and pulling out.

5. Disconnect the two ribbon cables from the module by spreading the tabs on the sides and then lifting the cable head from the jack.

6. Using a nut driver, remove the 10 nuts holding the module to the panel. Refer to **Figure 15**.

7. To install a module, place it in position over the bolts and use the nut driver to replace all nuts.

8. Reconnect the signal and power cables to the module, making sure that the plugs make good connections.

9. Carefully close the face panel. Latch the panel by turning the fasteners a quarter turn clockwise. *Be sure to fully close each individual latch to ensure a water tight seal.
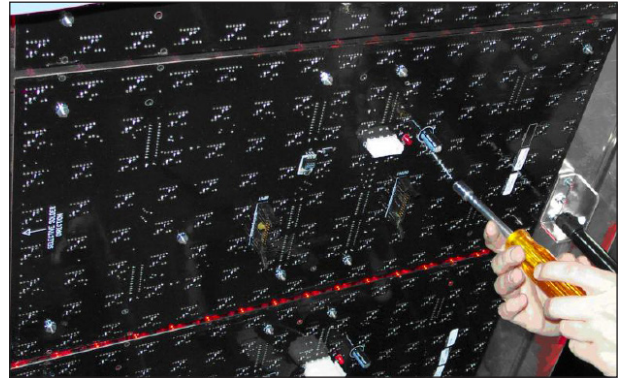


*Figure 15: Removing a Module*

## Controller Replacement

Tools required: $^3/_{16}$" nut driver

1. Turn off power to the display.

2. Open the face panel. The controller, shown in **Figure 16**, is located in the lower-left corner of the primary display.

3. Disconnect the power plug from power input jack.

4. Remove all signal connections, carefully pulling them from their jacks. Label the various cables and wires as they are removed to insure their proper replacement.

5. Remove the six screws holding the board in place using the nut driver.

6. Take note of the address on the controller and set the same address on the replacement controller.

7. Install the replacement controller using all six screws removed, connect signal cables and power connector



*Figure 16: Typical Controller*

8. Turn on power to the display and observe the boot sequence. Once the sequence is complete, a single pixel should flash in the lower-right corner of the display.
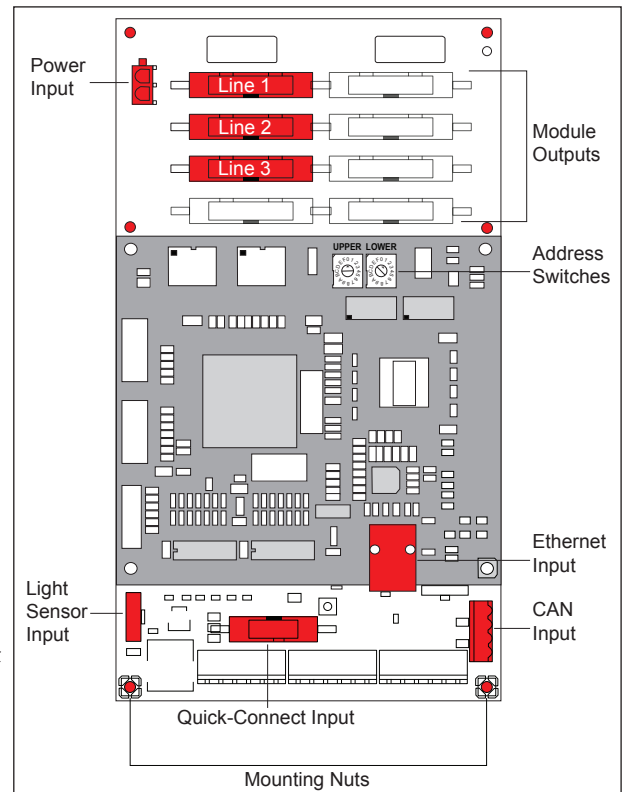
## Controller Address Setting

The rotary switches set the hardware address of the controller. Each Primary display in a network needs a unique address, as shown in **Figure 17**. Each controller in a network also needs a unique address.

Set the switches by rotating them counterclockwise until the arrow points to the desired number. The display's power must be turned off and then turned back on to activate a change in the address.

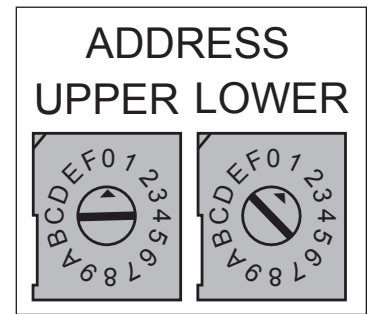**Note:** Setting both rotary switches to address 0 will activate a Test Mode.



*Figure 17: Rotary Switches*

## Power Supply Replacement

Tools required: Phillips screwdriver or nut-driver

Complete the following steps to replace a power supply:

1.  Turn off power to the display.

2.  Access the interior of the display by opening the face panel.

3.  Disconnect the Mate-n-Lok® connectors from the power source as well as those going to the modules. Be sure to label each connector so that it can be properly reconnected.

4.  Loosen, but don't remove, the screw holding the power supply bracket to the cabinet upright and lift off the hooks.

5.  Move the new power supply into place and tighten the screw on the support bracket.

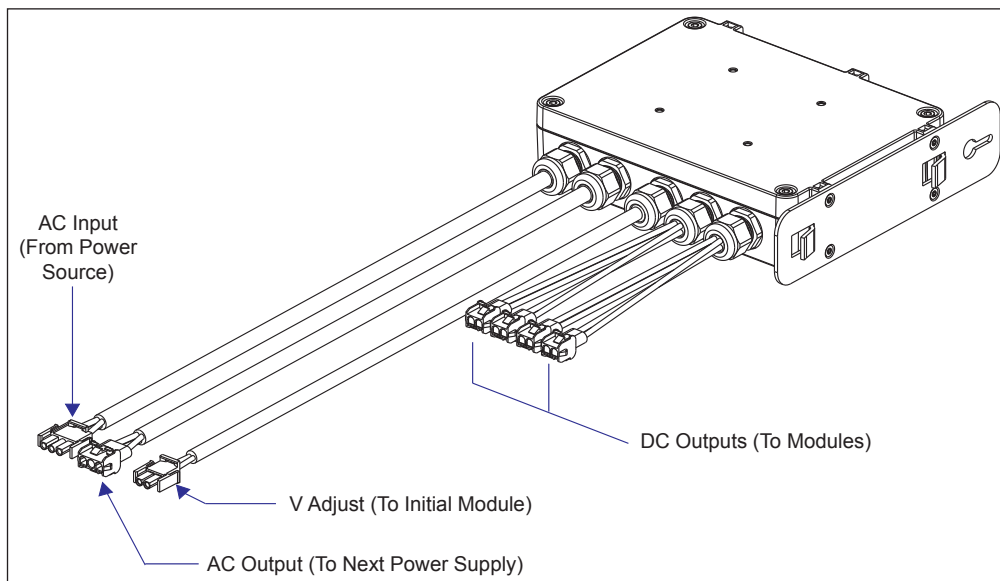6.  Reconnect all the Mate-n-Lok® plugs.



*Figure 18: Power Supply*

# Section 9: Daktronics Exchange and Repair & Return Programs

## 9.1 Exchange Program

The Daktronics Exchange Program is a quick, economical service for replacing key components in need of repair. If a component fails, Daktronics sends a replacement part to the customer who, in turn, returns the failed component to Daktronics. This not only saves money but also decreases equipment downtime. Customers who follow the program guidelines explained below will receive this service.

### Before Contacting Daktronics

Fill in these numbers before calling Customer Service:

Display Serial Number:_____

Display Model Number:_____

Date Installed:_____

Location of Sign:_____

Daktronics Customer ID Number:_____

To participate in the Exchange Program, follow these steps.

1. **Call Daktronics Customer Service:** 888-DAK-SIGN (888-325-7446)

2. **When the new exchange part is received, mail the old part to Daktronics.**
   If the replacement part fixes the problem, send in the failed part within 3 weeks of the ship date.

   a. Package the old part in the same shipping materials in which the replacement part arrived.

   b. Fill out and attach the enclosed UPS shipping document.

   c. Ship the part to Daktronics.

3. A charge will be made for the replacement part immediately, unless a qualifying service agreement is in place.

   In most circumstances, the replacement part will be invoiced at the time it is shipped. If the failed part or replacement part is not returned to Daktronics within 3 weeks of the ship date, it is assumed that the customer is purchasing the replacement part and will be invoiced for the value of the new sale part.

   If the part or parts are returned within 2 weeks of the second invoice date, Daktronics will credit the customer for the amount of the second invoice. If after 2 weeks Daktronics has still not received the parts back, the customer must pay the second invoice and will not be credited for the return of the failed part.

   Daktronics reserves the right to refuse parts that have been damaged due to acts of nature or causes other than normal wear and tear.

## 9.2 Repair & Return Program

For items not subject to exchange, Daktronics offers a Repair & Return Program. To send a part for repair, follow these steps:

1. **Call or fax Daktronics Customer Service:**
   **Phone:** 888-DAK-SIGN (888-325-7446)  **Fax:** 605-697-4000

2. **Receive a Return Materials Authorization (RMA) number before shipping.**
   This expedites repair of the part.

3. **Package and pad the item carefully to prevent damage during shipment.**
   Electronic components, such as printed circuit boards, should be placed in an antistatic bag before boxing. Daktronics does not recommend using packing peanuts when shipping.

4. **Enclose:**

   - Your name

   - Address

   - Phone number

   - The RMA number

   - A clear description of symptoms

### Shipping Address

Daktronics

Customer Service Receiving

PO Box 5128

201 Daktronics Drive

Brookings, SD 57006

Attn: RMA#_____

# Glossary:

**3220:** The series name of the display, for example Galaxy AF-3220

**Controller:** The "brains" of the display. The controller receives signal communication from the computer and sends the appropriate information to the modules. Messages and schedules may also be stored on the controller.

**Display Address:** An identification number assigned to each display of a network. The control software uses the address to locate and communicate with each display. Displays that are on the same network must have different addresses.

**Driver/LED Board:** The components of a module. This board is responsible for the on/off and intensity levels of the LEDs.

**Galaxy®:** The name given to Daktronics LED matrix displays that can be monochrome, tri-color, or RGB.

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

**Mirror:** The second display in a two-face configuration. The mirror display does not have a controller so it displays an exact copy of the information on the primary display. All signal information to the mirror is received through an interconnect cable from the primary display.

**Module:** The board containing the LEDs and driver. Galaxy®AF-3220 34 mm modules are 8 pixels high by 16 pixels wide. Each is individually removable from the front panel of the display.

**Network:** Multiple displays connected to each other. As many as 240 primary displays can exist on one network.

**Pixel:** A cluster of LEDs acting as one unit on the module. The number of LEDs in a pixel will depend on display application.

**Primary:** A single-face unit or the first display in a primary-mirror (2V) configuration. The communication signal, light sensor and temperature sensor will be connected to this display. An interconnect cable transfers information from the primary display to the mirror display so that it shows exactly the same information.

**Venus® 1500 software:** Name of Daktronics software that is used on the control computer to communicate with these displays. This software can create messages and send them to the displays, schedule messages, and perform diagnostics. The Venus® 1500 software manual is included on the installation disk.

# Appendix A:    Reference Drawings

**Figure 19** illustrates a Daktronics drawing label.

Shop drawings show display dimensions, signal and power connection locations, as well as information on service access and power requirements. To obtain copies of shop drawings or other reference drawings specific to your display, contact Daktronics Customer Service:

Phone: 1-800-DAKTRONICS



*Figure 19: Drawing Label*

# Appendix B: Temperature Sensor Installation (ED-14377)

Click **here** to open the temperature sensor installation quick guide.

# Appendix C: Daktronics Warranty and Limitation of Liability (SL-2374)

Click **here** to view Warranty and Limitation of Liability information.