# Galaxy® AF-3400
# 20 mm Monochrome/RGB

## Installation and Operation Manual

*ED-16421* *Rev 3* *23 March 2009*

DAKTRONICS

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DAKTRONICS

**ED-16421**
**Product 1321**
**Rev 3 – 23 March 2009**

Fill in the chart with specific information about this display so these details will be 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-3400 20 mm** |
| Version of software being used:<br>*(Right-click on Venus 1500 name in toolbar, choose "About Venus 1500")* | |
| Method of communication being used:<br>*(Refer to Section 4 for guidance)* | |
| Controller version used in the display: | **Version 3** |
| Display address on network: | |

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# Section 1: Overview of the Displays

Daktronics Galaxy® displays are built for long life and easy maintenance. To ensure the optimal performance of the display, this manual provides information on installation, maintenance and troubleshooting. Diagnostic and parts replacement information are also included within these sections. Definitions of terms and explanations of connectors used in the displays can be found in **Section 8**.

## 1.1 Display Details

Galaxy® model numbers are described as follows:

| AF-3400-RRxCCC-20-R-X | | |
|---|---|---|
| **AF-3400** | = | Outdoor louvered Galaxy display |
| **RR** | = | Number of rows high (16, 32, 48 or 64) |
| **CCC** | = | Number of columns long<br>(Up to 144 Columns Standard) |
| **20** | = | 20 mm pixel to pixel spacing |
| **R, A, RGB** | = | LED color, R (Red), A (Amber),<br>RGB (Red, Green, Blue - 32,000 color) |
| **X** | = | P - Primary or 2V – Primary/Mirror |

The displays are offered as single-face or double-face units. If the display is double-face, 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 six feet (1.8m) from the primary display, then two primary displays will need to be utilized.

A module is the building block of the Galaxy® display. Each module measures 16 pixels high by 16 pixels wide. By placing modules side-by-side and on top of one another, a display of any size can be designed and built. Individual modules can be easily removed from the display, if required.

A typical display system is run with a Windows®-based personal computer (PC) running Venus® 1500 software. Venus® 1500 is a software package that runs under Windows® 98, ME™, NT® 4.0, 2000, or XP Home/Professional operating systems on an IBM®-compatible computer. This software can manage up to 240 displays on one network. Refer to the Venus® 1500 operations manual (**ED-13530**) for installation and operation of the Venus® 1500 software.

The diagrams **Figure 2** and **Figure 3** give an overview of the displays. The first figure shows the front and back views of a typical display. The second figure shows a simplified diagram of basic display set-up. These diagrams will help in the understanding of the display manual information.

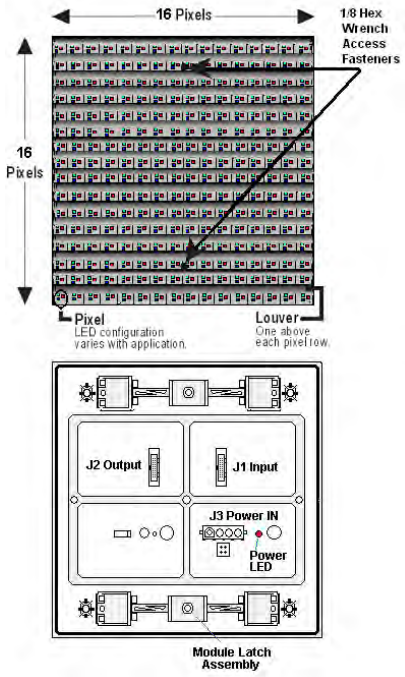


***Figure 1:** Module, Front and Back*

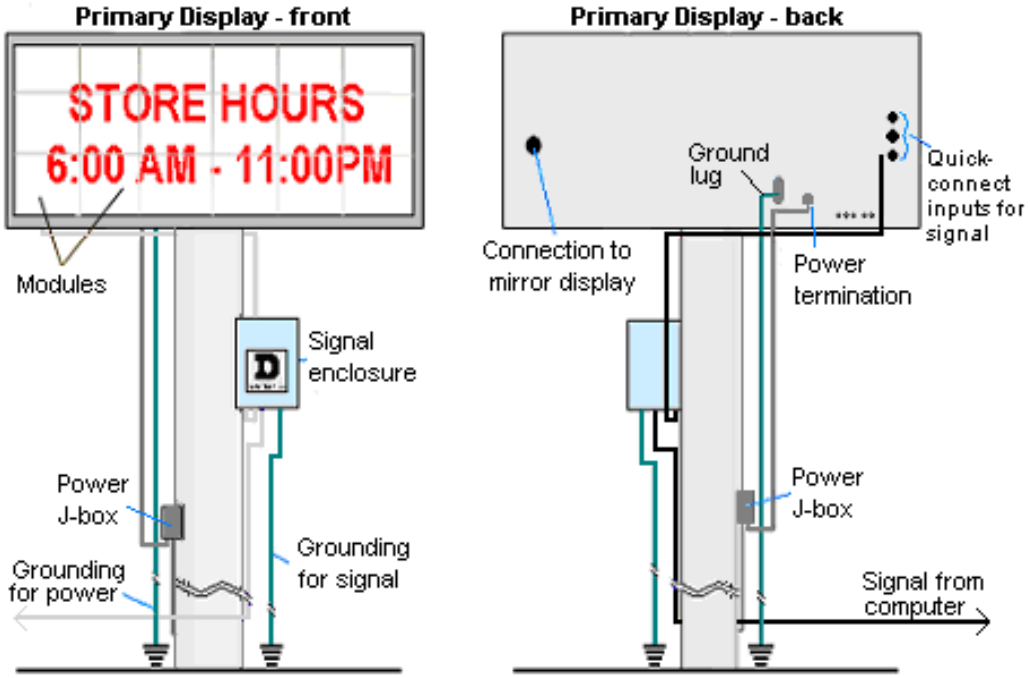


***Figure 2**: Front and Rear View of a Display*

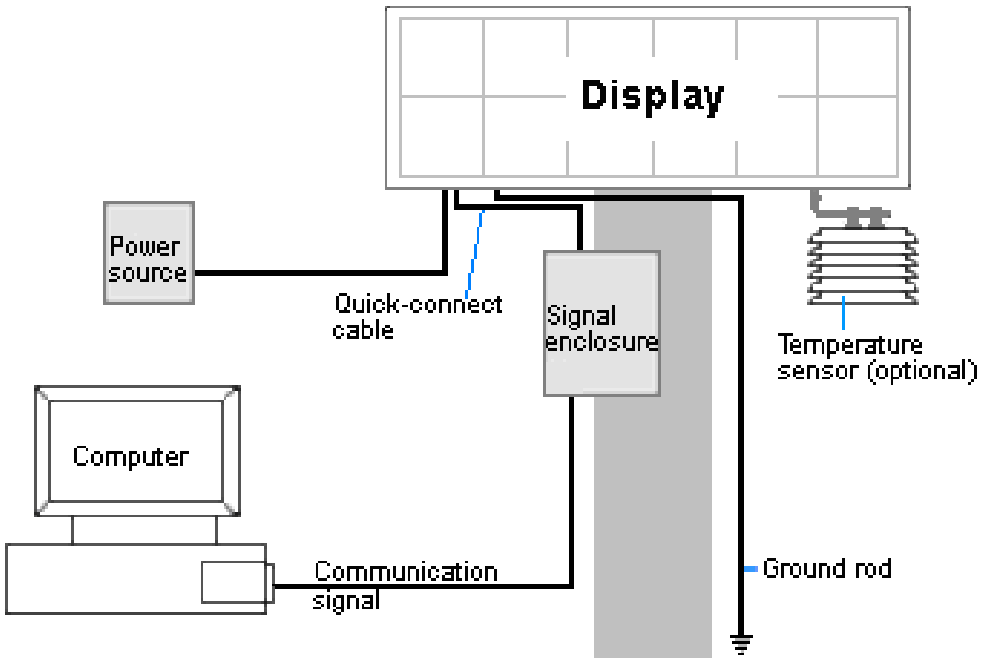


***Figure 3:** Basic Display Set-up*

# Section 2: Mechanical Installation

**Read the Mechanical, Power, and Signal Installation sections before installing the display(s).**

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.

**Daktronics is not responsible for installations or the structural integrity of support structures done by others**. The customer is responsible for ensuring that a qualified structural engineer approves the structure and any additional hardware.

## 2.1 Support Structure Requirements

The installer is responsible for ensuring that the mounting structure and hardware are capable of supporting the display, and the structure follows all local codes.

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. Refer to **Figure 2** and **Figure 3** for basic display set-ups.

**A qualified individual must make all decisions regarding the mounting of this display**.

Support structure design depends on the mounting methods, display size, and weight. In general, the front of the display needs to be unobstructed to allow for air flow and internal access. Also keep in mind the location of the mounting clips and the power/signal termination box or knockouts on the back of the display. Refer to **Figure 4** for the back view of a typical display. Display height and wind loading are also critical factors to be considered. This information can be found in the following places:

- Size and weight information – Specifications charts in **Appendix A**
- Mounting hardware location – Shop Drawings listed in **Section 2.2**
- Signal and power termination – Shop Drawings listed in **Section 2.2**

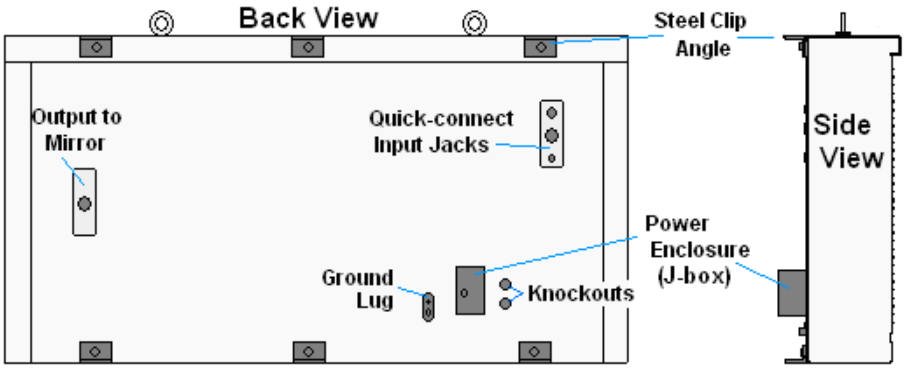


***Figure 4:*** *Back and Side Views of Typical Display*

### Pre-installation Checklist

Verify the following before proceeding with installation:

- The display is in good condition after shipping and uncrating.
- All clip angles or mounting holes are attached to the support structure.
- A straight and square mounting frame is provided for the display.
  **Height variation in any four-foot horizontal section may not exceed ¼-inch.**
- Adequate support is provided for the display so that the structure will not yield at any unsupported points after mounting.
- Clearance of 4" of unobstructed space above the top of the display is allowed to remove the eyebolt.
  **Note:** No clearance is required once the eyebolt is removed.
- Clearance in front of the display is maintained to allow unobstructed air flow through the vents and to allow access to internal components.
- On larger displays, clearance needs to be maintained in the area of the fans on the back of the display.

## 2.2 List of Reference Drawings

A Shop Drawing was provided when the display order was placed. However, if one is needed, use this list to find the correct number to request from Daktronics Customer Service. Note that they are listed by the pixel matrix size of the display.

**Shop drawings, listed by pixel matrix size**

Shop Drawing, AF-3400-16x48-20.....**Drawing B-212106**
Shop Drawing, AF-3400-16x64-20.....**Drawing B-212107**
Shop Drawing, AF-3400-16x80-20.....**Drawing B-212108**
Shop Drawing, AF-3400-16x96-20.....**Drawing B-212109**
Shop Drawing, AF-3400-16x112-20.....**Drawing B-212110**
Shop Drawing, AF-3400-16x128-20.....**Drawing B-212111**
Shop Drawing, AF-3400-16x144-20.....**Drawing B-212112**

Shop Drawing, AF-3400-32x48-20.....**Drawing B-212113**
Shop Drawing, AF-3400-32x64-20.....**Drawing B-212114**
Shop Drawing, AF-3400-32x80-20.....**Drawing B-212115**
Shop Drawing, AF-3400-32x96-20.....**Drawing B-212116**
Shop Drawing, AF-3400-32x112-20.....**Drawing B-212117**
Shop Drawing, AF-3400-32x128-20.....**Drawing B-212118**
Shop Drawing, AF-3400-32x144-20.....**Drawing B-212119**

Shop Drawing, AF-3400-48x48-20.....**Drawing B-212120**
Shop Drawing, AF-3400-48x64-20.....**Drawing B-212121**
Shop Drawing, AF-3400-48x80-20.....**Drawing B-212122**
Shop Drawing, AF-3400-48x96-20.....**Drawing B-212123**
Shop Drawing, AF-3400-48x112-20.....**Drawing B-212124**
Shop Drawing, AF-3400-48x128-20.....**Drawing B-212125**
Shop Drawing, AF-3400-48x144-20.....**Drawing B-212126**

Shop Drawing, AF-3400-64x80-20.....**Drawing B-221966**
Shop Drawing, AF-3400-64x96-20.....**Drawing B-221968**
Shop Drawing, AF-3400-64x112-20.....**Drawing B-221969**
Shop Drawing, AF-3400-64x128-20.....**Drawing B-221970**
Shop Drawing, AF-3400-64x144-20.....**Drawing B-221971**

## 2.3 Display Mounting

The installer is responsible for ensuring that the installation adequately meets local codes and standards, including safe, adequate mounting hardware and procedures.

**Note: In order to maintain the structural integrity of the display cabinet, the 90° angle between the cabinet and the lifting method must be maintained.**

1. Lift the display into position on the support structure following the guidelines in **Figure 5**.

**Do not attempt to permanently support the display by the eyebolts.**

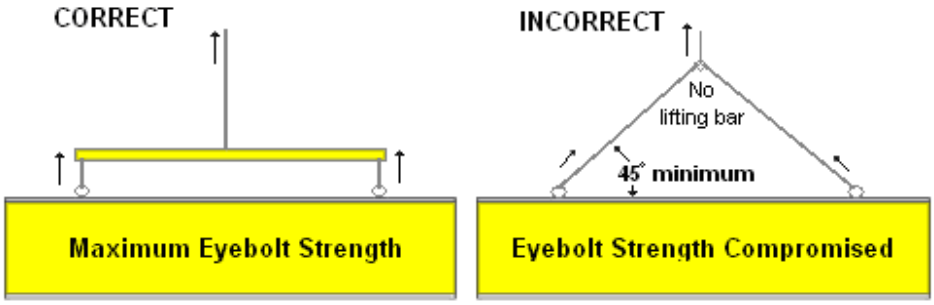


***Figure 5:*** *Correct/Incorrect Lifting Procedures*

2. Weld or use ½" Grade-5 bolts and hardware to secure the clip angles to the support structure as shown in the **Shop Drawing** for a specific display.
3. Refer to **Section 3** 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.

**If the eyebolts on the top of the display have been removed, plug the holes with bolts and the rubber-sealing washer that was removed with the eyebolt, unless an overhead structure protects the area.**

## 2.4 Optional Temperature Sensor Mounting

If a temperature sensor will be used with this display, see **Appendix B** for mounting and signal connections.

# Section 3: Power Installation

**Read the Mechanical, Power, and Signal Installation sections before installing the display(s).**

- Only a qualified individual should terminate power and signal cable at this Daktronics display.
- All proposed changes must be approved by Daktronics engineering staff or the warranty will be rendered null and void.

## 3.1 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 conduit. Unthreaded 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.

## 3.2 Overview of Power/ Signal Connection

Following is a brief summary of the power and signal connections to the display.

1. **Enclosures** are provided with the display for termination of both signal and power. If the installation does not allow for the use of the power j-box, refer to **Section 3.5** for diagrams on internal power termination.
2. Possible methods for signal termination are shown in the manual for the specific communication type.
3. Route power to the display through a **fused disconnect switch** capable of opening all ungrounded power conductors. Install this disconnect within the line-of-sight of any personnel performing maintenance on the display. If the disconnect is located out of sight of the display, it must be capable of being locked in the open position.

**Note:** Displays are equipped with supplemental protection devices that carry a **UL1077 (IEC 60947, VDE 660)** rating. These devices are only intended to protect the components within the display. Suitable devices must be used for the equipment and feeders supplying power to the display.

4. Power conductors from the disconnect to the display should be **routed through conduit** in agreement with local code.
5. Display power will terminate to the display at the external **power termination j-box** mounted to the back of the display. If the display has two faces, power will run from the primary display to the mirror display.
6. Connect the grounding electrode conductor at the **grounding lug** on the back of the display.

7. **Signal cable** is routed to the signal termination enclosure. A grounding electrode may also be connected there (when required).
8. Signal into the enclosures must be routed through 1/2"conduit.
9. The **signal quick-connect cable** from the enclosure to the display can be routed through conduit or through the display pole.

**Note:** Daktronics strongly recommends that the quick-connect cable be secured to protect it from weather and vandalism.

## 3.3 Power Requirements

Conductors of circuits delivering power to a Daktronics display shall be sized in accordance with NEC and local electrical codes so that the power distribution system is capable of delivering full load power to the display while maintaining a voltage within 5% of the utility nominal voltage.

Each display uses a 120VAC or 120/240 VAC single-phase power source. Proper power installation is imperative for proper display operation. Some basic power information for various display sizes can be found in the specifications chart in **Appendix A**. The following sub-sections provide details for display power installation.

### Main Disconnect

The National Electrical Code requires the use of a lockable power disconnect near the display. Provide a lockable disconnect switch (knife switch) at the display location so that all power lines can be completely disconnected. Use a 3-conductor disconnect so that both hot lines and the neutral can be disconnected. The main disconnect should be mounted at or near the point of power supply connection. A main disconnect is to be provided for each supply circuit to the display.

The disconnecting means must be located in a direct line-of-sight from the display or outline lighting that it controls. This requirement enables a worker to keep the disconnecting means within view while working on the display.

**Exception:** Disconnect components that are capable of being locked in the open position may be located elsewhere.

## 3.4 Grounding

**Note:** This sign is to be installed in accordance with the requirements of Article 600 of the National Electrical Code and/or other applicable local codes. This includes proper grounding and bonding of the sign.

### Installation with Ground and Neutral Conductors Provided

These displays use installation with ground and neutral conductors provided. The power cable **must** contain an isolated earth-ground conductor.

Under this circumstance, **do not** connect neutral to ground at the disconnect or at the display. This would violate electrical codes and void the warranty. Use a disconnect so that all hot lines and neutral can be disconnected. The National Electrical Code requires the use of a lockable disconnect within sight of or at the display.

The display system **must** be connected to earth-ground (**Figure 6**). Proper grounding is necessary for reliable equipment operation. It also protects the equipment from damaging electrical disturbances and lightning.

The display must be properly grounded, or the warranty will be void.

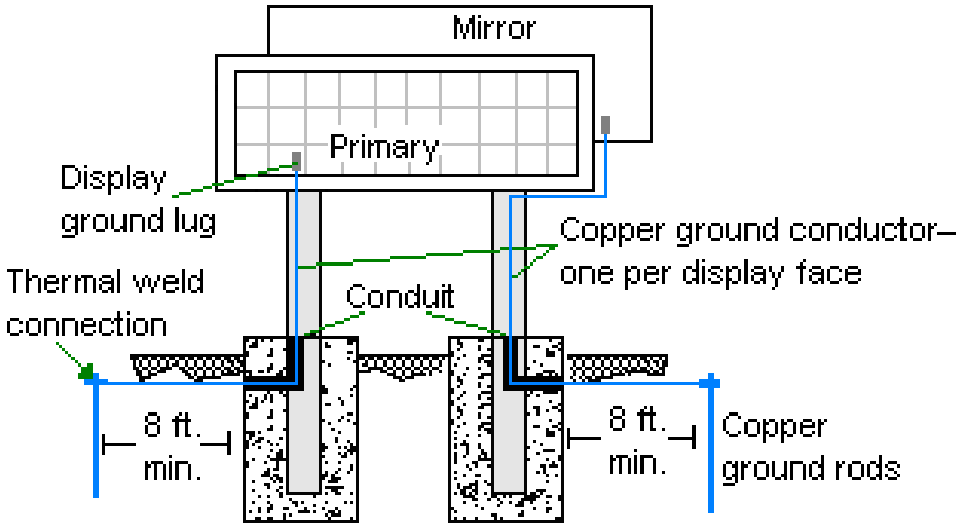


***Figure 6:*** *Correct Grounding*

**Important points about grounding:**

- Follow local and national codes: The material of an earth-ground electrode differs from region to region and from conditions present at the site. Consult the National Electrical Code and any local electrical codes that may apply.
- Support structure **cannot** be used as an earth-ground electrode: The support is generally embedded in concrete. If embedded in earth, the steel is either primed or it corrodes, making it a poor ground.

- One grounding electrode for each display face: The grounding electrode is typically one grounding rod for each display face. Other grounding electrodes as described in Article 250 of the National Electric Code may be used.
- Resistance to ground 10 ohms or less: This is required by Daktronics for proper display performance. If the resistance to ground is higher than 10 ohms, it will be necessary to install additional grounding electrodes to reduce the resistance. The grounding electrode should be installed within 25 feet of the base of the display. The grounding electrode must be connected to the ground lug on the back of the display.

## 3.5 Power Connection

Two options are possible for terminating power to the display:

**Option 1**: terminating to the power termination enclosure on the back of the display.

**Option 2**: terminating directly to the power termination panel inside the display. This applies to displays that require more than two 15A circuits; they will not have an external junction box.

Installation instructions for both are provided in this section.

### Option 1: Terminating hot, neutral, and ground wires at the enclosure

1. Route the power cable through 3/4" conduit to the rear of the display and into the power termination enclosure (**Figure 7**).
2. The power termination enclosure will contain two or three 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 termination j-box, connect the power wires to the wires coming from the display interior using wire nuts. Refer to **Figure 8** for a diagram.

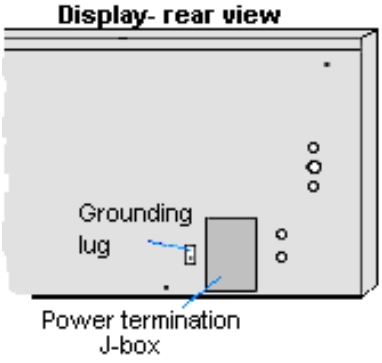


***Figure 7:*** *J-box Location*

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

- Line 1 – Black (Brown – 240V)
- Line 2 – Red (only on three wire installations – 120/240V)
- Neutral - White (Blue – 240V)
- Grounding Conductor – (Green-Yellow)

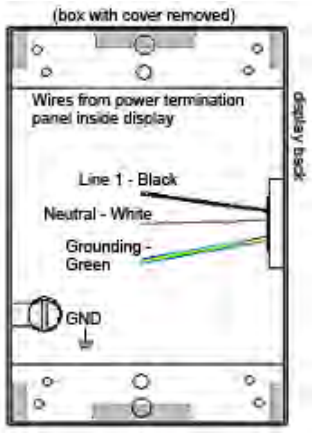


***Figure 8:*** *Power Termination Wiring*

### Option 2: Terminating power through direct internal connections

1. Open the display as explained in **Section 6.1** and locate the power termination panel (**Figure 9**).
2. Route cable through conduit to the back of the display. Use one of the knockouts for access, being careful not to damage internal components.
3. Disconnect the wires to the terminal block going to the external power j-box, and connect the wires from the direct cable.
4. Using a small flat screwdriver, open the cage clamps. Release the jumper wires connected to the external wires going to the external power termination box.
5. Install the wires from the direct circuit into the cage clamps (**Figure 10**).

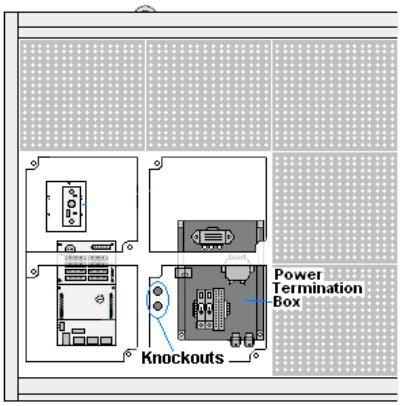


***Figure 9:*** *Power Panel Location*

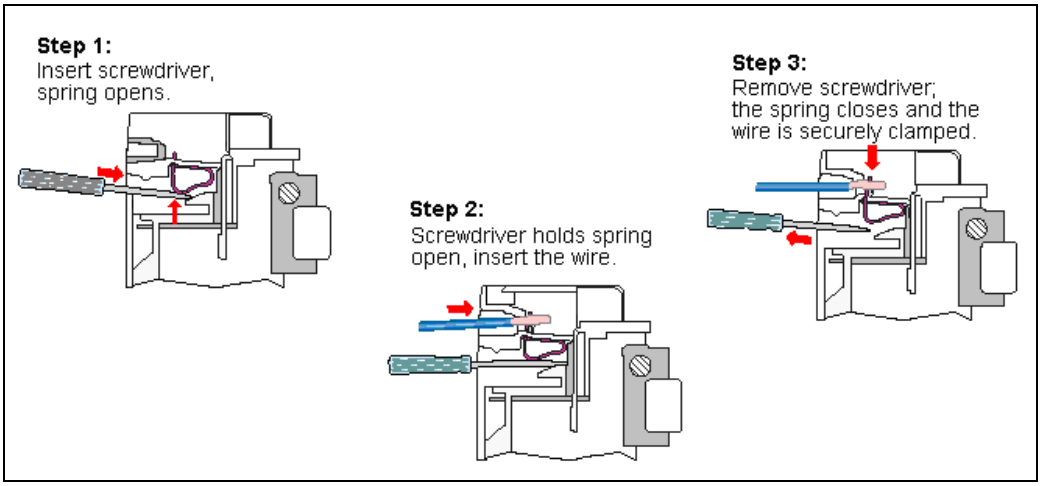


***Figure 10:*** *Cage Clamp Connection*

6. Make the following connections:

   - Hot to circuit breaker 1 (line side)
   - Hot to circuit breaker 2 (line side in three wire connections)
   - Neutral to gray terminal block (line side)
   - Ground to green/green yellow terminal block

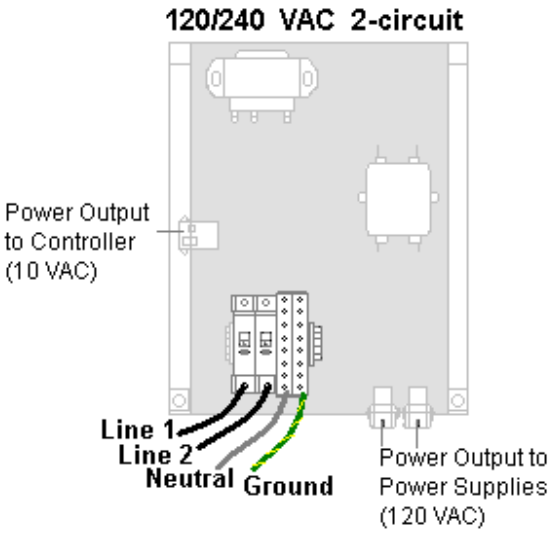


***Figure 11:*** *Two-breaker Circuit*

## 3.6 Power Routing in the Display

Following is a basic overview of power routing. This may vary depending on the pixel dimensions and LED color of each display. Check for exact power routing on the **Shop Drawing** for the specific display.

A general power routing, shown in **Figure 12**, is summarized as follows. The numbers in this list correspond with the numbers in the diagram.

1. Power terminates to the j-box on the back of the display or internally to the power termination panel.
2. If terminating at the j-box, power continues through pre-terminated wires to the power termination panel, which includes the transformer and filter.
3. From the termination panel, power travels through the transformer which adjusts power to appropriate voltage for use by the controller.
4. Power is routed to the power supplies which run the modules.
5. Power is also sent to the fans and to the thermostat, if installed.

**Note:** Power supplies are preset to proper voltage levels. Depending on the pixel count and LED color, either 3.6 VDC or 5.3 VDC power supplies are used to power the modules. Contact Daktronics Customer Service for correct voltage settings.

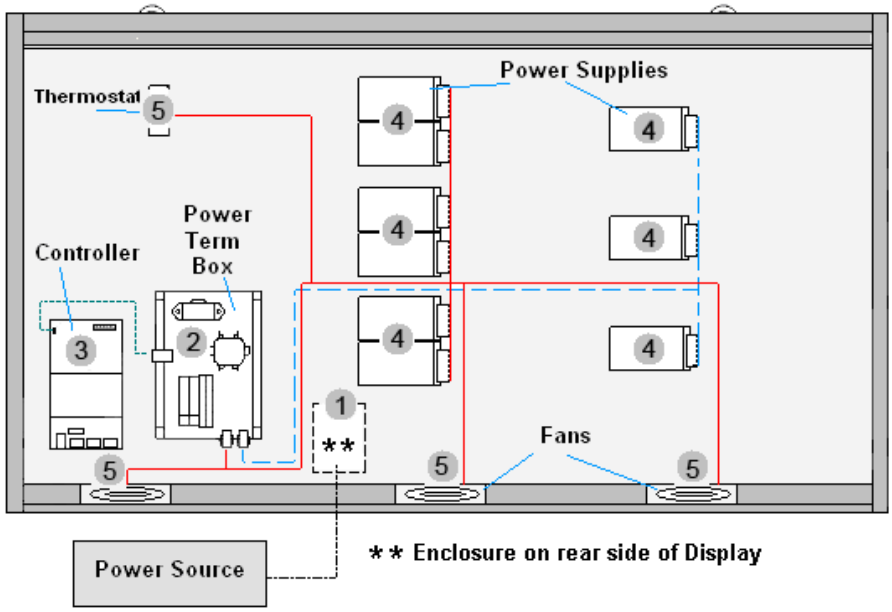


***Figure 12:*** *Power Routing Summary*

# Section 4: Signal Installation Overview

Daktronics Galaxy® displays are equipped to receive many types of communication signals. The following sections include a brief description of each available communication type. Also included is a list of troubleshooting tips to check that the display is connected and configured correctly.

For specific details on installing the signal, consult the quick guide and the manual. These were included in the shipment of the communications equipment. Each type is listed below with its manual number.

| Communication Type | Communication Manual ED# |
|---|---|
| RS-422 | **ED-14742** |
| Fiber | **ED-14743** |
| Radio | **ED-13932** |
| RS-232 | **ED-14739** |
| Ethernet | **ED-14745** |
| Fiber Ethernet | **ED-14746** |
| Ethernet Radio | **ED-16483** |
| Modem | **ED-14744** |

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

## 4.1 Primary/Mirror Signal Connection

If this display is a two-sided primary/mirror display, a quick-connect cable will be provided to connect the signal between the two display faces. Refer to **Figure 13** for proper connection. This cable has right-angle plugs at each end. These need to be installed with the cable facing either down or to the side to provide the least stress on the connection. In addition, secure the excess cable to the supports to prevent damage from weather or vandalism.

***Figure 13**: Quick-connect Cable*

## 4.2 RS-422 Communication

If the communication system is RS-422, look for:

- a signal converter near the computer.
- wires from the signal converter connecting to an enclosure at the display.

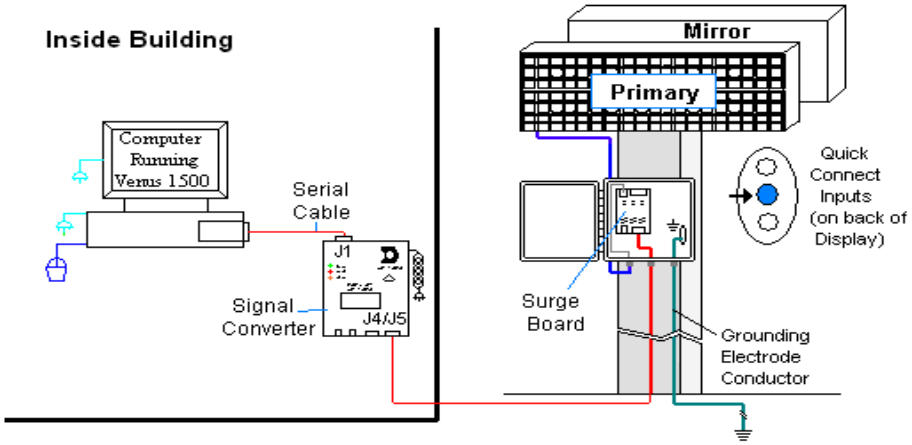


***Figure 14:*** *RS-422 Communication Layout*

**Connections**

- Computer to signal converter – six-foot (1.8m) serial cable with 9-pin plug connecting to computer port or USB adaptor and 25-pin plug connecting to the signal converter at J1, RS232 IN.
- Signal converter plugged into a 120 volt AC outlet.
- Signal converter to surge board at display – four individual wires from green Phoenix plug at either J4 or J5 run to Phoenix plug on surge board.
- Surge board to display – quick-connect cable from enclosure to the center jack on display back.

| **Troubleshooting** | |
|---|---|
| **Component** | **Check** |
| Cable Connections | • The serial cable connects the computer to the signal converter.<br>• All the wires are connected at the signal converter and the surge board. They need to be making good electrical contact with the metal, no interference.<br>• The color sequence of the wires should be the same to both signal converter and surge board (e.g. black, white, red and black, white, red).<br>• The quick-connect cable is connected from the enclosure to the center jack on the back of the display. |
| Diagnostic LEDs | • The green LED on the signal converter should be on when plugged into power.<br>• The red transmit and amber receive LEDs will flash when sending and receiving signal from the display; otherwise they are off. |
| Display Power | • The display is either running a message or showing a single pixel flashing in the bottom right corner of the display when power is on. |
| Software | • The software and the display are set for the same network address.<br>• Refer to the software manual for other possible conditions. |

## 4.3 Fiber Optic Communication

If the communication system is fiber optic, look for:

- a signal converter near the computer.
- fiber-optic cables connecting the signal converter to an enclosure at the display.

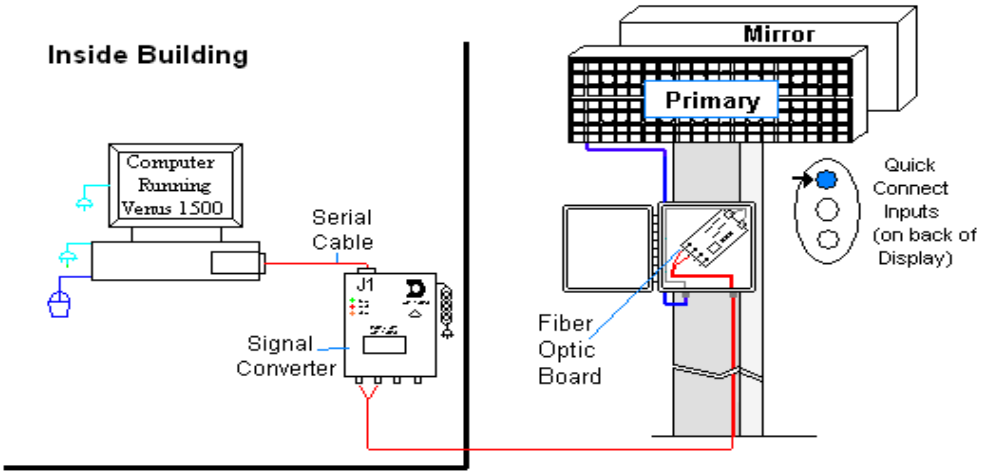


***Figure 15:*** *Fiber Serial Communication Layout*

**Connections**

- Computer to signal converter – six-foot (1.8m) cable with 9-pin plug connecting to computer port or USB adaptor and 25-pin plug connecting to the signal converter at J1, RS232 IN.
- Signal converter plugged into a 120 volt AC outlet.
- Signal converter to fiber optic board at display – two individual cables connect to signal converter at either J4 and J5 or J3 and J2; other end runs to fiber optic board at display.
- Fiber optic board to display – quick-connect cable from enclosure to the top jack on display back.

**DO NOT SHARPLY BEND fiber-optic cable at any point along the fiber cable.**

| **Troubleshooting** | |
|---|---|
| **Component** | **Check** |
| Cable Connections | • The serial cable is connected from the computer to the signal converter.<br>• Both fiber optic cables are connected at the signal converter and the fiber board.<br>• The cable from the enclosure is connected to the top jack on display back. |
| Diagnostic LEDs | • The green LEDs on the signal converter and the fiber optic board in the enclosure will be on when they have power.<br>• The red transmit and amber receive LEDs on both components will flash when sending and receiving signal from the display; otherwise they are off. |
| Display Power | • The display is either running a message or showing a single pixel flashing in the bottom right corner of display when power is on. |
| Software | • The software and the display are set for the same network address.<br>• Refer to the software manual for other possible conditions. |

## 4.4 Radio Communication

If the communication system is radio, look for:

- a radio j-box near the computer.
- a server radio outside the building and a second radio at the display.

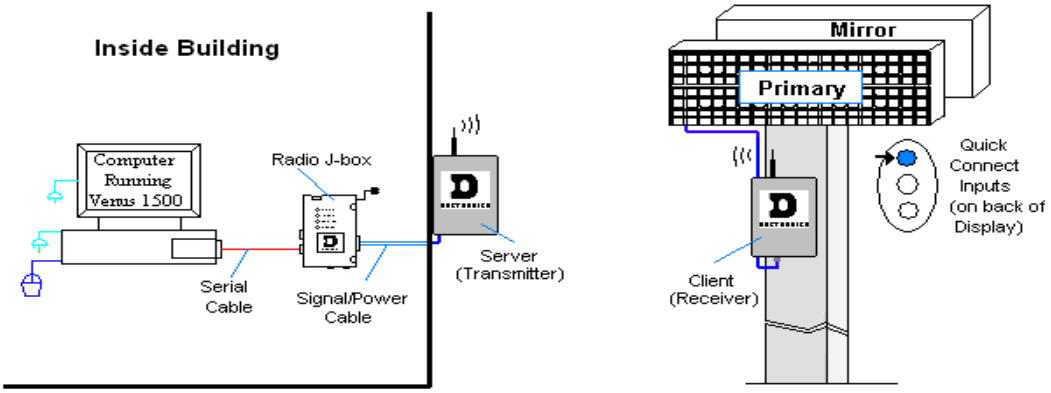


***Figure 16:*** *Radio Communication Layout*

**Connections**

- Computer to radio j-box – 10-foot (3m) cable with 9-pin plugs on both ends, one connecting to computer or USB adaptor and the other plug connecting to radio j-box at "DB9 Female V1500 PC Connect".
- Radio j-box 12 volt power pack plugged into outlet.
- Radio j-box to radio transmitter on building – Phoenix plug on side of j-box to Phoenix plug inside radio transmitter.
- Radio signal between transmitter and receiver.
- Radio receiver to display – quick-connect cable from receiver to top jack on display back.

| **Troubleshooting** | |
|---|---|
| **Component** | **Check** |
| Cable Connections | • The cable connects the computer to the radio j-box.<br>• All the wires are connected at the radio j-box and at the "server" radio; the wires make good electrical contact with the metal, no interference.<br>• The color sequence of the wires should be the same to both the radio j-box and the server (e.g. black, white, red and black, white, red).<br>• The cable is connected from the radio client to the top jack on back of display. |
| Diagnostic LEDs | • The green LEDs will be on when the radio j-box has power.<br>• The amber LED is on when the computer is connected to the radio j-box.<br>• The red and amber transmit and receive LEDs will flash when sending and receiving signal from the display; otherwise they are off. |
| Display Power | • The display is either running a message or showing a single pixel flashing in the bottom right corner of the display when power is on. |
| Software | • The software and the display are set for the same network address.<br>• Refer to the software manual for other possible conditions. |

## 4.5 RS-232 Communication

If the communication system is RS-232, look for:

- no indoor connectors.
- one enclosure at the display.

This communication type is designed to work over short distances and typically connects to an indoor display.

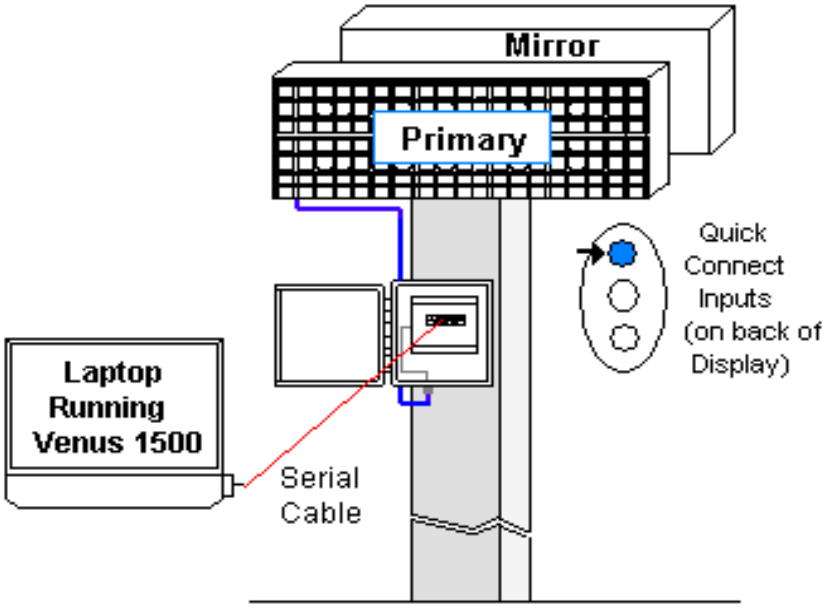


***Figure 17:*** *RS-232 Communication Layout*

**Connections**

- Computer to display enclosure – six-foot (1.8m) serial cable with 9-pin plug into laptop computer or USB adaptor and a 25-pin jack into enclosure.
- Enclosure to display – quick-connect cable (maximum 25 feet/8m) from back of enclosure to top jack on back of display.

| **Troubleshooting** | |
|---|---|
| **Component** | **Check** |
| Cable Connections | • The serial cable is connected from the laptop to the enclosure.<br>• The cable is connected from the enclosure to the top jack on the back of the display. |
| Display Power | • The display is either running a message or showing a single pixel flashing in the bottom right corner of the display when power is on. |
| Software | • The software and the display are set for the same network address.<br>• Refer to software manual for other possible conditions. |

## 4.6 Ethernet Communication

If the communication system is Ethernet, look for:

- a network card in the computer connecting to a network switch/router.
- a network jack that looks similar to an oversized phone jack.

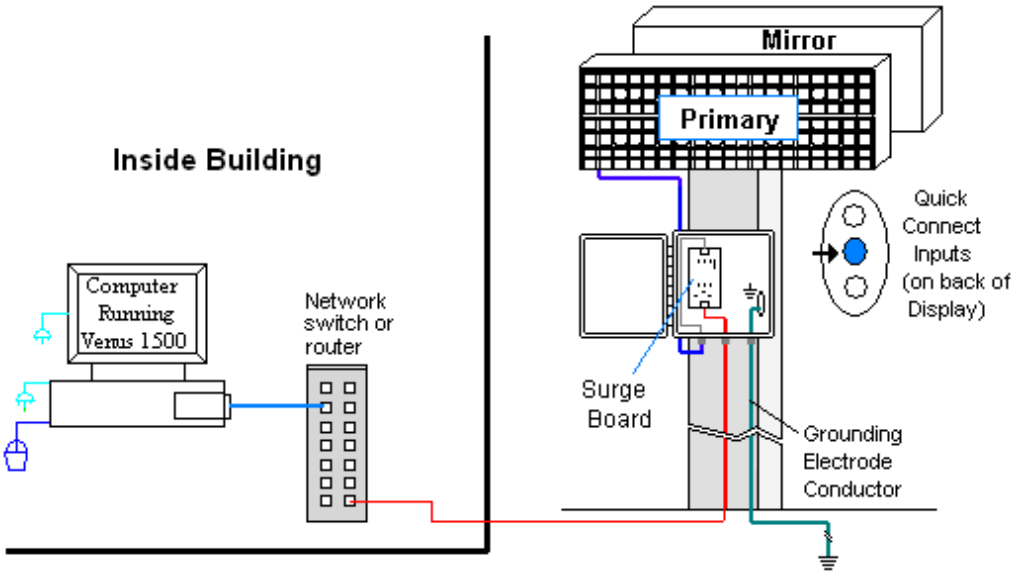


***Figure 18:*** *Ethernet Communication Layout*

**Connections**

- Computer to network – RJ45 cable from computer port to network server in building.
- Network switch to surge board – another RJ45 cable from network switch/router to surge board in enclosure at display.
- Enclosure at the display to display – quick-connect cable from signal enclosure to middle jack on back of display.

| **Troubleshooting** | |
|---|---|
| **Component** | **Check** |
| Cable Connections | • The network cable connects the computer to the network switch/router.<br>• An RJ45 cable from the server is connected to the input jack on Ethernet surge board.<br>• The quick-connect cable runs from the enclosure to the middle jack on display back. |
| Display Power | • The display is either running a message or showing a single pixel flashing in the bottom right corner of the display when power is on. |
| Software | • The software is configured for TCP/IP communication.<br>• The software and the display are set for the same network address.<br>• Refer to the software manual for other possible conditions. |

## 4.7 Fiber Ethernet Communication

If the communication system is fiber Ethernet, look for:

- an indoor media converter connected to the network and to fiber cable.
- a second media converter outdoors located in an enclosure at the display.

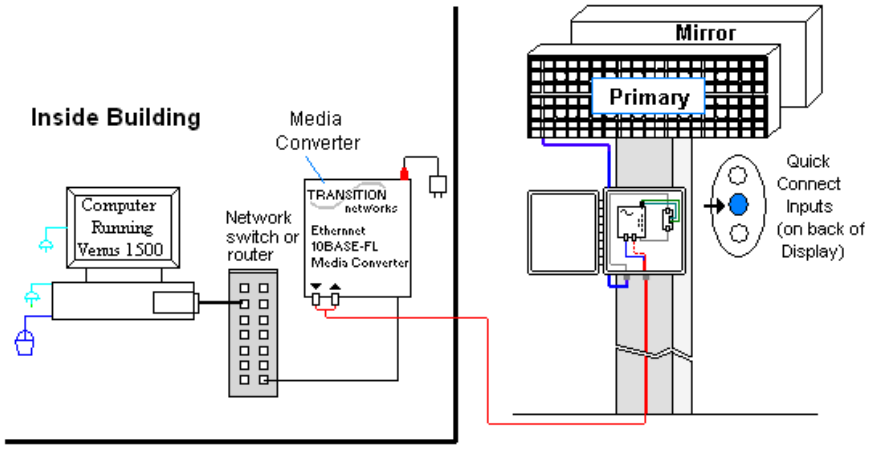


***Figure 19:*** *Fiber Ethernet Communication Layout*

**Connections**

- Computer to network – RJ45 cable from computer port into network switch/router.
- Network switch to first media converter – RJ45 cable into media converter.
- Media converter's 9-volt power adaptor plugged into 120 VAC outlet.
- Indoor media converter to outdoor media converter – two fiber-optic cables run from indoor media converter to second converter in the enclosure at display.
- Enclosure to display – quick-connect cable to the middle jack on display back.

**DO NOT SHARPLY BEND fiber-optic cable at any point along the fiber cable.**

| **Troubleshooting** | |
|---|---|
| **Component** | **Check** |
| Cable Connections | • The serial cable is connected from the computer to the network switch/router.<br>• The network cable connects from network switch to media converter in building.<br>• The indoor media converter power adaptor is plugged in.<br>• The fiber cables connect from the first media converter to the second one at display. The "out" arrow on one will connect to an "in" arrow on the other.<br>• The quick-connect cable connects from enclosure to middle jack on display back. |
| Diagnostic LEDs | • Each media converter has a green power LED on, indicating power.<br>• When the media converter transmits data, the "link" is ON and the RX LEDs flash. |
| Display Power | • The display is either running a message or showing a single pixel flashing in the bottom right corner of the display when power is on. |
| Software | • The software is configured for TCP/IP communication.<br>• The software and the display are set for the same network address.<br>• Refer to the software manual for other possible conditions. |

## 4.8 Ethernet Bridge Radio Communication

If the communication system is a wireless Ethernet radio, look for:

- a network card in the computer connecting to a network switch/router.
- a server radio mounted on the building and a client radio at the display.

**Note:** This system is referred to as Ethernet "bridge" communication because it requires a pair of matched radios to create a signal connection or bridge.

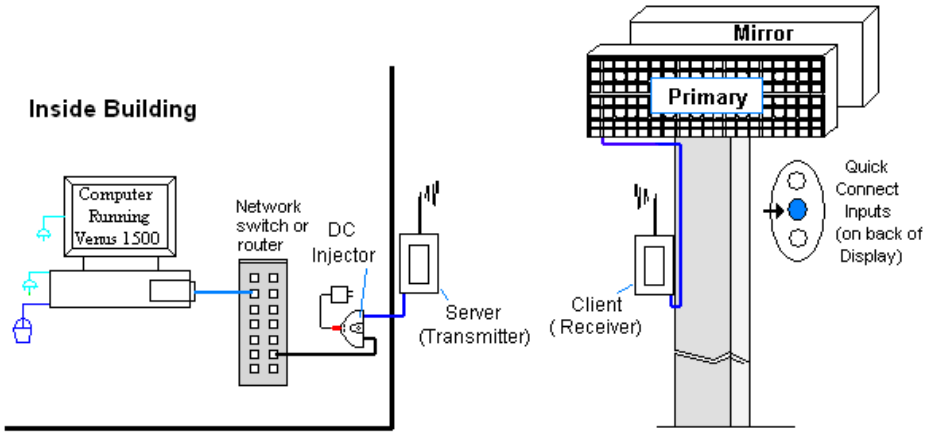


***Figure 20:*** *Ethernet Bridge Radio Layout*

**Connections**

- Computer to network – RJ45 cable from computer port into network switch/router.
- Network switch to DC injector - RJ45 cable from network to "DATA IN" jack.
- Wall power pack - DC injector power adaptor plugged into 120 VAC outlet.
- DC injector to server radio - RJ45 cable from "P+DATA OUT" to server radio.
- Server radio to client radio - clear line of sight for signal transmission.
- Client radio to display – quick-connect cable to the middle jack on display back.

| **Troubleshooting** | |
|---|---|
| **Component** | **Check** |
| Cable Connections | • A cable connects the computer to the network switch/router.<br>• A cable runs from the network through the DC injector to the server radio (max. 330 ft/100m).<br>• The DC injector is plugged into a 120 VAC outlet.<br>• A cable runs from DC injector to server radio.<br>• The quick-connect cable connects from client radio to top jack on display back. |
| Diagnostic LEDs | • The DC injector's green LED should be on, indicating power.<br>• Both radios have internal LEDs: refer to manual for their specifications.<br>• The same channel LEDs will be on for both radios when locked together. |
| Display Power | • The display is either running a message or showing a single pixel flashing in the bottom right corner of the display when power is on. |
| Software | • The software is configured for TCP/IP communication.<br>• The software and the display are set for the same network address.<br>• Refer to the software manual for other possible conditions. |

## 4.9 Modem Communication

If the communication system works with a modem, look for:

- a modem (internal or external) at the computer that connects to a phone jack.
- a phone line connects to the display.

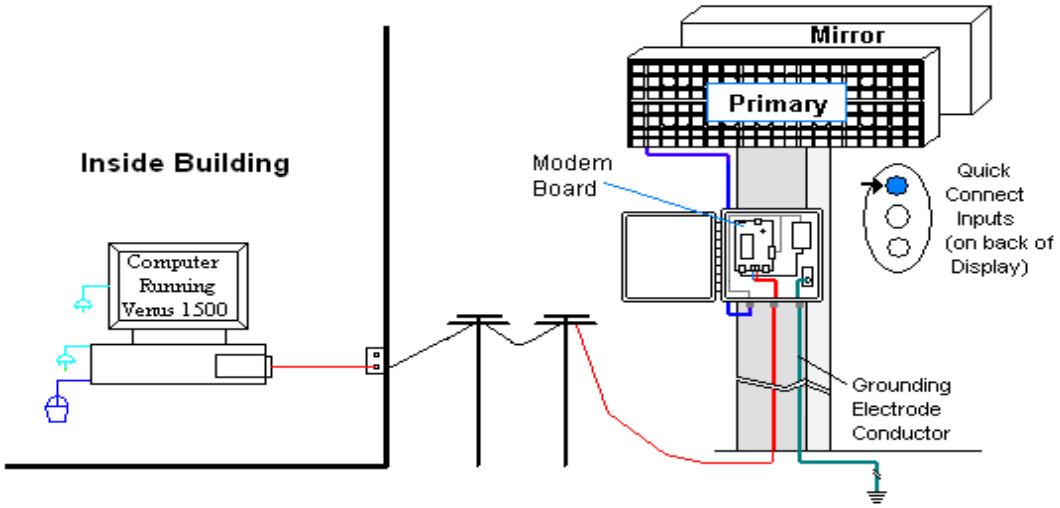


***Figure 21:*** *Modem Communication Layout*

**Connections**

- Computer modem (internal or external) to phone jack on wall – phone cable plugs into both.
- Phone jack to modem at display – signal runs on local telephone lines.
- Modem board in enclosure to display – quick-connect cable from enclosure to top jack on display back.

| **Troubleshooting** | |
|---|---|
| **Components** | **Check** |
| Cable Connections | • The phone line is connected from the modem at the computer to the phone jack.<br>• The two phone wires are connected at the modem board (Wire color is determined by the phone company.)<br>• The wires are making good electrical contact with the metal, no interference.<br>• The cable is connected from the enclosure to the top jack on the display back. |
| Diagnostic LEDs | • The modem in the enclosure has the green LED on, indicating power.<br>• The bottom red LED (carrier detect) is on when the modems are connected.<br>• Transmit and receive LEDs flash when sending and receiving signal over the telephone line; otherwise, they are off. |
| Display Power | • The display is either running a message or showing a single pixel flashing in the bottom right corner of the display when power is on. |
| Software | • The software and the display are configured for dial-up communication and the phone number is correct.<br>• Refer to the software manual for other possible conditions. |

# Section 5: Start-up Procedure

Before starting up the display, go over this checklist to ensure that all parts are ready to operate correctly. **Figure 22** shows the basic display components referred to in each step.

## 5.1 Start-up Checklist

✔ **Is power connected to the display?**

The power conduit will leave the display from the rear and connect to a power source either on the display structure or inside a building. Refer to **Figure 2** for approximate location of the power cable or conduit.

✔ **If the display has two faces, are the two sides connected?**

Check that a quick-connect cable runs between the back connections of the two display cabinets. Refer to the illustration in **Figure 13.**

✔ **Is the control computer connected to the display?**

Some type of communication line or wireless device will send signal between the control computer and the display, depending on the communication method. Refer to **Section 4** for assistance with identifying the communication type.

✔ **Is the computer software set up to work with the display?**

The software manual provides the information necessary to allow the computer to communicate with this display. Follow the step-by-step directions in the **Configuration** section for correct set-up.

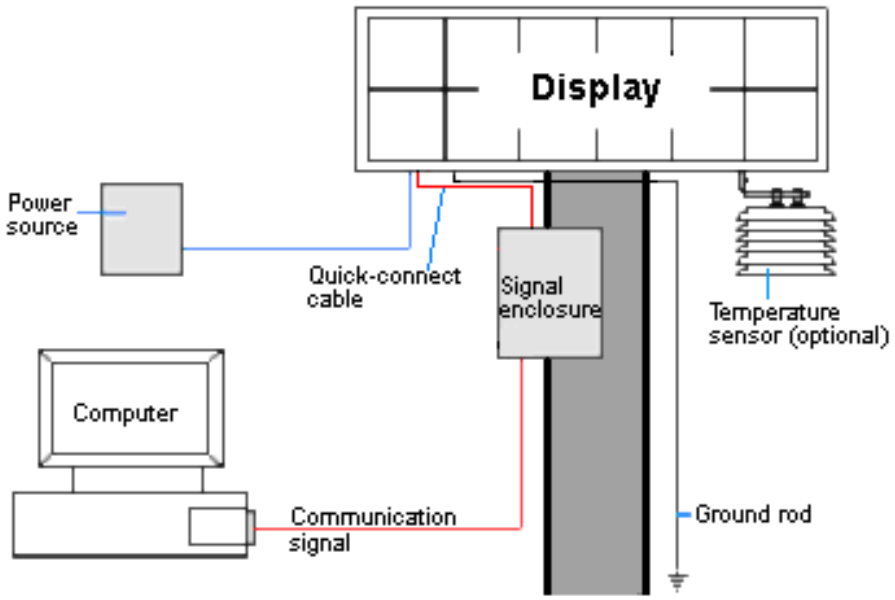


***Figure 22:*** *Basic Display Set-up*

## 5.2 Start-up Sequence

Each time the display is turned on, an initialization sequence will run. The information in the second column will then be shown on the display.

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

| | Topic | Information shown |
|---|---|---|
| **1.** | Product Name | • Galaxy® |
| **2.** | Display Size | • Row x Column |
| **3.** | Shading | • 64 Mono/RGB |
| **4.** | Bootloader Version | • OS X.XX |
| **5.** | Firmware Number | • **ED-13305** |
| **6.** | Firmware Revision | • Rev X.XX |
| **7.** | Hardware Address | • HW:XX |
| **8.** | Software Address | • SW:XX |
| **9.** | IP Address: | • (default: IP: 172.16.192.25) |
| **10.** | Subnet Msk: | • (default) Msk: 255.255.0.0) |
| **11.** | COM1 Configuration | • C1:V15<br>(modem: C1:V15 if a modem is present) |
| **12.** | COM 2 Configuration | • C2: RTD |
| **13.** | Socket 3001: | • IP 3001: V15 |
| **14.** | Socket 3002: | • IP 3002: RTD |
| **15.** | Line Frequency | • CLK: AUTO (60) |
| **16.** | Display Description | • Galaxy # rows x # columns |

After this sequence is complete, the display will blank. A single pixel will flash in the lower right hand corner of the display to show that the display has power but no messages are currently running.

# Section 6: Maintenance

**Important Notes:**

- Power must be turned off before any repair or maintenance work is done on the display.
- Qualified service personnel must make any access to internal display electronics.
- The Daktronics engineering staff must approve ANY changes made to the display. Before altering the display, detailed drawings for the proposed modifications must be submitted to the Daktronics engineering staff for evaluation and approval or the warranty will be rendered null and void.

Daktronics Galaxy® AF-3400 series 20 mm displays are front accessible, meaning that access to the internal components is gained by removing the front modules of the display. The display may need to be opened to perform maintenance or for troubleshooting. The following diagram (**Figure 23**) shows the typical location of internal components.

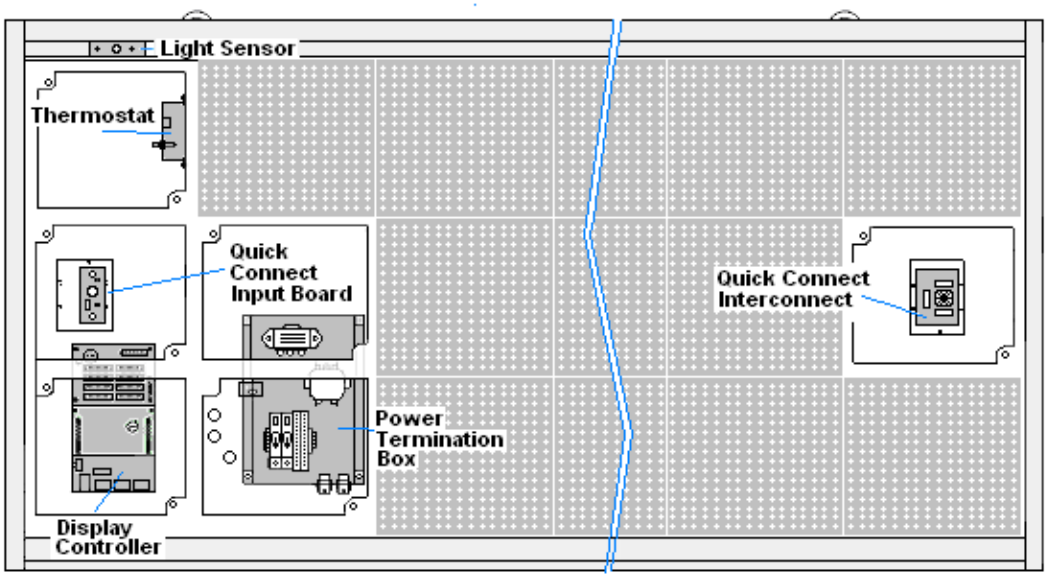


***Figure 23:*** *Location of Internal Components*

## 6.1 Display Access

To gain access to the interior of a display, single modules are able to be removed. Refer to **Figure 23** to locate the internal components which may need to be accessed. In the case of fans, consult the **Shop Drawing** for the specific display. The module in front of the specific component may be removed to perform maintenance or for troubleshooting.

To access the interior of the display, perform the following steps:

1. Turn off power to the display.
2. Locate the latch access fasteners on the module (**Figure 24**). One is centered below the second row of pixels and one is centered above the bottom two rows.
3. With a $^1/_8$" hex wrench, turn the latch access fasteners a quarter turn counterclockwise. Gently pull the module far enough forward to reach behind the back and disconnect the power and ribbon cables (**Figure 25**). Note the cable connections so they can later be reconnected correctly.
4. Disconnect the two ribbon cables from the module by spreading the tabs on the sides and then lifting the cable head from the jack. Note how they are connected to the back.
5. Unplug the power cable by squeezing the tabs on the sides of the plug head and pulling out.
6. When ready to reinstall the module, reconnect the cables to the module, making sure that the tabs are tightly pushed against the cable head. Carefully push the ribbon wires back into the cabinet so they are clear of the module edges.
7. Place the module into its proper location, checking that the weather stripping is in place. Latch the module both top and bottom using the hex wrench.

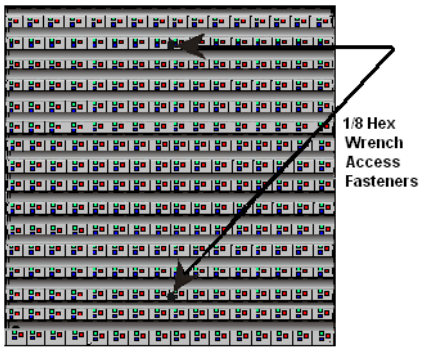


***Figure 24:*** *Module Access Locations*

***Figure 25:*** *Removing a Module*

**Note:**

- The weather-stripping on the back edge of the module must be intact and in good condition if it is to prevent water from seeping into the display.

- The module latches must be fully engaged to create a watertight seal around the edge of the module. The module should be firmly seated against the display when the latches are fully engaged.

## 6.2 Ventilation System/ Fans

### Frequency of Inspection

Ventilation fans may be located either on the bottom or back of the display. In smaller displays, fans are located on the bottom of the cabinet. They pull air into the cabinet, exhausting it out the top vent. (**Figure 26**). In larger displays, fans are located on the back under a hood. Air is pulled in the front of the cabinet and exhausted out the back (**Figure 27**).

Fans should be checked every time the display is opened for service or at a minimum of annually. Fans should be checked more often if the display is located in a dusty or harsh weather environment.

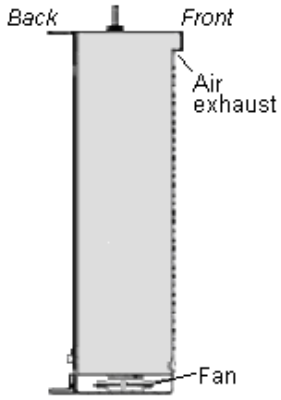


***Figure 26:*** Fans in Small Displays

### Fan Blades

Check the fan blades for dirt and debris, cleaning them and the inside of the display if necessary. Fan blades must be kept clean to maintain fan efficiency and to ensure proper cooling. Spin the fan blades with a pen or pencil to ensure that the bearings are free and the fan is still in balance.

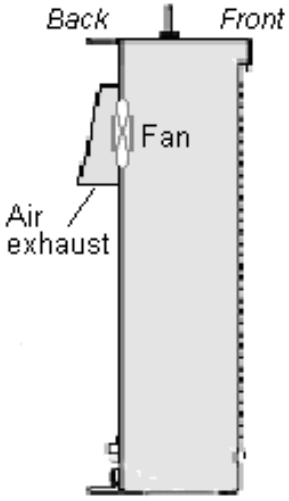


***Figure 27:*** *Fans in Larger Displays*

### Air Flow

To check the operation of the fans, open the display to expose the thermostat in the top left corner of the cabinet behind the first module (**Figure 28**). Push the bypass button on the thermostat enclosure to temporarily turn on the fans. If a fan does not rotate or does not operate smoothly, replace it.

Make sure that the intake and exhaust vents are not blocked and are free of dust or other debris. Hold your hand or a piece of lightweight paper in front of the vents to detect air movement.

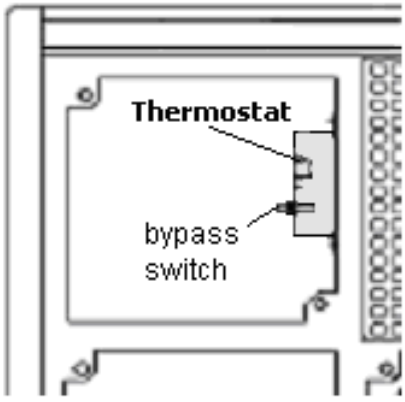


***Figure 28:*** *Thermostat*

## 6.3 Annual Inspection

A yearly inspection should be completed to maintain safe and dependable display operation. The display will need to be opened to visually inspect the cabinet interior and the components. Refer to **Section 6.1** for these directions. The inspection should address the following issues:

| Inspection item | Possible corrective measures |
|---|---|
| Loose bolts, screws, rivets | Tighten or replace, as required |
| Dust around fans, on cabinet bottom | Vacuum or carefully wipe away |
| Water intrusion or stains | • Replace weather-stripping<br>• Tighten module latches<br>• Place silicon 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

### Safety Precautions

- **Disconnect power when servicing the display.**
- **Do not** modify the display structure or attach any panels or coverings to the display without written consent of Daktronics.

## 7.1 Diagnostics

### Controller Diagnostics

The controller is one of the internal components shown in **Figure 29**. The controller is the "brains" of the display, receiving communication from the computer and then sending the appropriate information to the modules. The LEDs on the controller are able to show whether the power and communication signal are working correctly.

Since the controller is inside the display, a module or two will need to be removed to view the diagnostic LEDs. To access the interior of the display, refer to **Section 6.1** for instructions and illustrations.

**Remember to turn off power to the display before accessing the interior.**
However, once the modules are removed and wires are found to be safe, power can be turned back on to view the diagnostic LEDs.

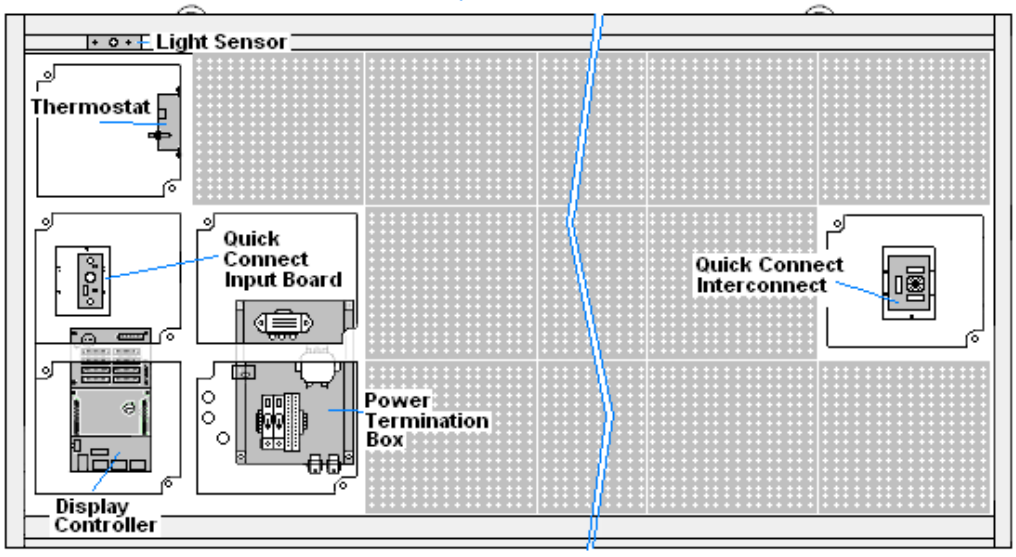


***Figure 29:*** *Interior Component Locations*

The controller is the component that receives communication from the computer and then sends data to the modules. A typical controller is illustrated here.

Diagnostic LEDs are located at various places on the controller. The following table details some essential LEDs to monitor and the information that each LED provides. The LED name and number are noted in **Figure 30**.

Note that some LEDs, such as "Run" and "Receive signal", have the same number. This occurs because the controller includes two layers of circuit board which are not easily shown in an illustration. Be sure to note the name as well as the number of the LED when looking at the diagnostics chart.

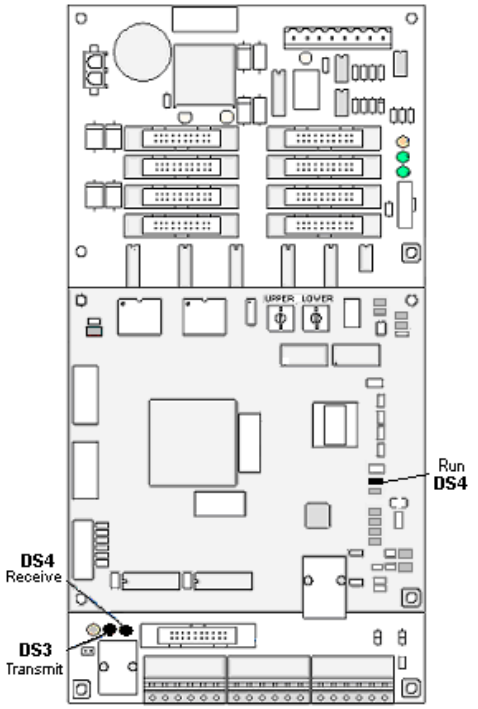


***Figure 30:*** *Controller Component Layout*

| Figure/ label | LED # | Color | Operation |
|---|---|---|---|
| **Run** | DS4 | Red | Steady FLASH about once per second indicates controller is working properly. |
| **Send signal TX1** | DS3 | Yellow | OFF is the normal state. FLASH when transmitting communication from the computer. |
| **Receive signal RX1** | DS4 | Yellow | OFF is the normal state. FLASH when receiving communication from the computer. |

## Temperature Sensor Diagnostic

If the display includes a temperature function, the temperature sensor board will also provide diagnostic information. The temperature sensor board is located inside the temperature sensor housing which hangs near the display (**Figure 31**). The sensor board diagram below shows the red diagnostic LED (DS2) near the bottom edge of the component.

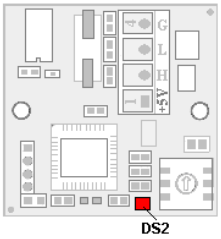


***Figure 31:*** *Temperature Sensor Board*

| Temperature Sensor | | | |
|---|---|---|---|
| DS2 | Red | Run | FLASH at variable rates when sending temperature information; evidence that the unit has power. |

## 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 given in priority order so try the first solution first.

Troubleshooting may require removal and replacement of modules. Refer to **Section 6.1** for instructions on this procedure. When replacing modules, make sure that the power and signal cables are reconnected correctly and the latches are tightly closed.

### Module and LED problems

**One or more LEDs are not lighting**

- Check/replace the ribbon cables on the module.
- Check for bent pins on module jacks.
- Move the module to a different location.
- If that does not help, the module may need to be replaced.

**One or more LEDs on a single module will not turn off**

- Check/replace the ribbon cables on the module.
- Check for bent pins on module jacks.
- Move the module to a different location.
- If that does not help, the module may need to be replaced.

**A section of the display is not working, all the way to the right end**

- Check/replace ribbon cables from the last working module in the row to the first non-working module next to it (**Figure 32**).
- Move or replace the first non-working module.
- Move or replace the last working module.
- Check that the power LED is on at the back of the modules.
- Make sure the power cable to the module is connected.

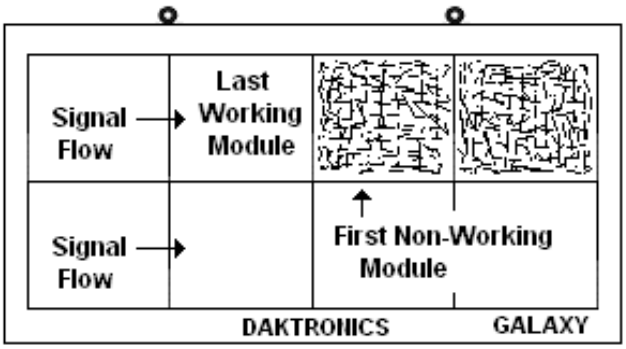


***Figure 32:*** *Modules Not Working*

**One row of modules is not working or shows a distorted message**

- Check/replace the ribbon cables to and from the first non-working module.
- Check for bent pins on the jack going to a non-working module.
- Move or replace the modules that show distorted text.
- Move or replace the last working module.
- Make sure that the first module in the row is receiving power.

**A column of the display does not work.**

- Check that the ribbon and power cable are plugged into the first module in the row.
- While power is on, look at the back of the first malfunctioning module to see if the diagnostic LED is off, implying a power supply problem.

**Entire display fails to work**

- Check diagnostic LEDs on the controller for Power and Run (**Figure 30**).
- Check the breakers in the building connected to main power source.
- Check the breakers in the power termination panel.
- Check/replace the ribbon cable(s) from the controller to the modules.
- Verify proper use of the software by checking the software manual.

## Brightness problems

**Display is stuck on bright or dim**

- Check Manual/Auto dimming in Venus 1500 software. The Brightness is typically set to Automatic. If not, perform the following step:
  > In Display Manager/ Diagnostics, change the slide bar and click Set Brightness.
- Check the light sensor cable and wiring for secure connections.
- Check the light sensor lens for obstructions (top left edge, front of primary cabinet).
- Replace the light sensor assembly.

**Display is too bright at night**

Set the Dimming Schedule. Refer to the Venus 1500 manual.

## Message problems

**Blank display seen after boot-up**

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

**LED flashes in the lower right corner**

The flashing pixel indicates that the display is receiving power and waiting for a message to be sent. Once a message is sent, the flashing LED should be replaced with the message.

**Message only shows up on one side of the display**

Determine if the displays are set up as two primary displays or one primary and one mirror display. To do this, turn off the power, then turn it back on and observe the two display faces.

- If the set-up involves two primary displays, one should show "HW001" and the other "HW002".
  - Verify that two different addresses are set up for these two primary displays in the Venus 1500 Administrator.
  - Verify that two different addresses are set on the controllers.
  - Send a different message to each display separately by clicking on that display name in the list. Note: With two controllers, messages may not always run synchronously.
- If the set-up consists of a primary/mirror display, check the cable between them.
  - Verify that the cable is firmly plugged into both cabinets.
  - Check that the cable and plugs are in good condition.

## Temperature problems

*(For displays with a temperature sensor installed.)*

**How to show the current temperature on the display**

1. Open the **Venus 1500 Message Studio**.
2. Choose **File→ New** if the temperature will be part of a new message or **File→ Open** if this will be added to a current message.
3. Open the message field and click **Data Fields** at the top.
4. Choose **Temperature**.
5. Select the desired format. The field is now in the message.
6. Send the message to the display and the temperature will now be shown.

**Note:** The temperature sensor must be correctly installed before a current temperature can be shown.

**Temperature always reads –196F/-127C degrees**

- Check the temperature sensor cable connections.
- Look for bent pins on connectors.
- Check that the temperature sensor is set to address 1.
- Make sure the sensor has power by checking that the LED is blinking.
- Replace the temperature sensor.

**Temperature shown is too high or too low**

The temperature on the display can be adjusted either up or down to become more accurate.

1. Open the **Venus 1500 Display Manager** and click **Diagnostic Control**.
2. Click on the name of this display under the *Display List*.
3. To the right of the *Set Temperature Offset* button, use the up and down arrows to adjust the temperature being shown. The range is ± 9°C (1°C=1.8°F).
4. Once the adjustment is made, click **Set Temperature Offset** to send this change to the display.

**Note:** Repeat these steps for each primary display that shows the temperature.

## Testing displays

**Start and stop the test pattern**

1. Open the Venus 1500 Display Manager and click **Diagnostic Control**, represented by the gears in the top section.
2. Click the name of the chosen display under the *Display List*, then click **Start Test**.
3. Once testing is finished, click on the name of the display, then click **Stop Test**.

**Note:** This procedure must be done for each primary display being tested.

## Before calling for help

**Steps to take before calling Daktronics Customer Service:**

1. Turn off the power breaker switch. Wait a few minutes and turn it back on. Have someone watch the display(s) to make sure that the initialization sequence runs.
2. Once the sequence is complete, try to communicate with the display.
3. Check the *Communication* and *Troubleshooting* sections of this manual.

If none of these steps is helpful, fill out the chart below and call the service technician or Daktronics Customer Service at 866-343-3122.

This chart is also provided inside the front cover of this manual for easy reference.

| Information needed for technicians and/or Customer Service | Fill in the blank |
|---|---|
| Location address of the display: | |
| Model number of the display: | **AF-3400 20 mm** |
| Version of software being used: *(Right-click on Venus 1500 name in toolbar, choose "About Venus 1500")* | |
| Method of communication being used: *(See Section 3 for guidance)* | |
| Controller version used in the display: | **Version 3** |
| Display address on network: | |

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

# Section 8: Parts Replacement

- **Turn off power when servicing the display.**
- **Do not** modify the display structure or attach any panels or coverings to the display without the written consent of Daktronics.

## 8.1 Obtaining Replacement Parts

Daktronics AF-3400 Galaxy® displays are designed and manufactured for performance, reliability, easy maintenance, and long life. However, on occasion, parts may need to be replaced. **Section 9** provides information on obtaining replacement parts from Daktronics. **Sections 8.3** and **8.4** include information on the connectors and terms mentioned in replacement instructions.

This section provides replacement instructions for the following parts:

- modules
- controller
- power supplies
- light sensor
- temperature sensor

These components are typically located as shown in **Figure 33**. Verify component location by looking at the **Layout Drawing** in **Appendix A** for a particular display.

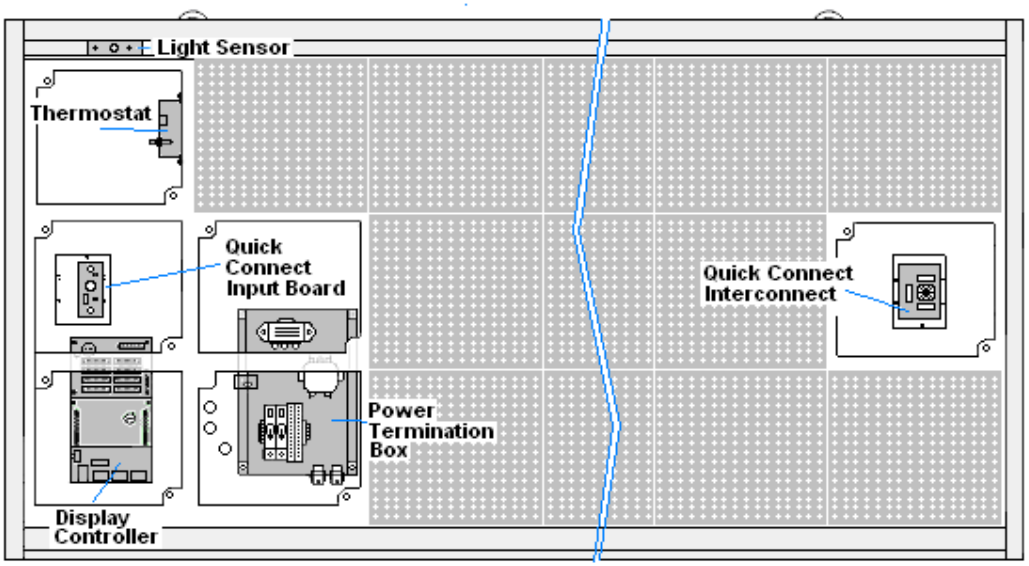


***Figure 33:*** *Interior Location of Components*

The following table contains some of the items that may need to be replaced in a display over a period of time. If a circuit board or assembly is not listed in the Replacement Parts List, look at the label attached to the part to find the part number. Most circuit boards and components within this display carry a label that lists the part number of the unit. A typical label is shown in **Figure 34** with the part number in bold.

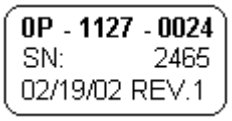


***Figure 34:*** *Typical Label*

Cables will not carry a part number label. To assist with correct identification of cables and connectors, refer to the descriptions in **Section 8.3**.

| Part Description | Part Number |
|---|---|
| Module, 1R, 16X16 (30x70), Red | 0A-1266-4000 |
| Module, 1A, 16x16 (30x70), Amber *(used before 1 Oct.'07*) | 0A-1266-4001 |
| Module, 1A, 16x16 (30x70), Amber (*used after 1 Oct. '07*) | 0A-1266-4002 |
| Module, 1R1G1B (1:1) 16x16 (30x70), RGB | 0A-1266-4550 |
| Controller III, Louvered Galaxy, 8-connector | 0A-1229-0013 |
| Power Supply Assembly, w/Harness, A-1577, RGB Displays | 0A-1327-0001(1)<br>0A-1327-0002(2) |
| Power Supply Assembly, w/Harness, A-1620, Mono Displays | 0A-1327-0005(1)<br>0A-1327-0006(2) |
| Transformer, Pri 115V, Sec 10VCT@3A | T-1119 |
| Transformer, Pri 115/230V, Sec 10VCT@2.5A | T-1121 |
| Filter, RFI Line 20 AMP 120 VAC | Z-1007 |
| Digital Temperature Sensor | 0P-1247-0008 |
| Light Level Detector | 0P-1151-0002 |
| Fan; 134 CFM, 120V @60Hz, 22 watt (120V) | B-1053 |
| **Ribbon Cables; 20 Position** | |
| Cable Assy; 20 pos Ribbon, 18", Dual Row | W-1387 |
| Ribbon Assy; 20 Pos, 30" | 0A-1000-0017 |
| Ribbon Assy; 20 Pos, 36" | 0A-1000-0018 |
| Ribbon Assy; 20 Pos, 60" | 0A-1000-0021 |
| Interconnect Cable; 31-pin male to 31-pin male, 6', QC | W-1503 |
| Electrical Contact Cleaner Lubricant / Cal-Lube | CH-1019 |
| Hex Wrench, T-Handle 1/8" RT for modules | TH-1062 |
| Manual; Venus 1500 Operator's, Version 3.0 | **ED-13530** |

## 8.2 Instructions for Replacing Parts

### Module Replacement

If LEDs have failed, do not attempt to replace individual LEDs.
Return a failed module to Daktronics for replacement and/or repair.

Each module may be removed separately without moving other components of the display.

1. Turn off power to the display.
2. Follow the instructions in **Section 6.1** to release the module from the display cabinet (**Figure 35**).
3. Disconnect the two ribbon cables from the module, noting their connection to the back. (**Figure 36**). Release ribbon cables by spreading the tabs on the sides and then lifting the cable head from the jack.
4. Unplug the power cable by squeezing the tabs on the sides of the plug head and pulling out.
5. Connect all three cables to the new module, making sure that the ribbon cable tabs are tightly pushed against the cable head. Carefully push the ribbon wires back into the cabinet so they are clear of the module edges.
6. Place the module into its proper location, checking that the weather stripping is in place. Latch the module tightly both top and bottom using the hex wrench.

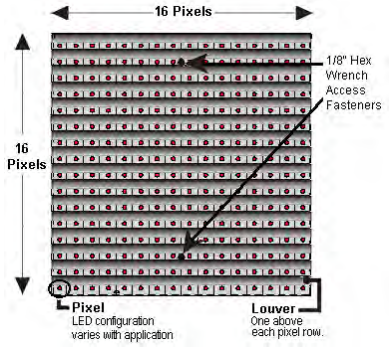


***Figure 35:*** *Access Locations*

***Figure 36:*** *Removing a Module*

**Notes:**

- The weather-stripping on the back edge of the module must be in good condition and returned to its proper position if it is to prevent water from seeping into the display.
- The module latches must be fully engaged to create a watertight seal around the edge of the module. The module should be firmly seated against the display when the latches are fully engaged.

## Controller Replacement

Complete the following steps to remove the controller from the display:

**Tools required: 1/8" hex wrench and 3/16" nut driver**

1. Turn off power to the display.
2. Remove the module directly in front of the controller in the lower left corner of the primary display.
3. Disconnect the power plug from power input jack.
4. Remove all power and signal connections from the board, 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 a 3/16" nut driver.
6. Take note of the address of the controller and set the same address on the replacement controller.

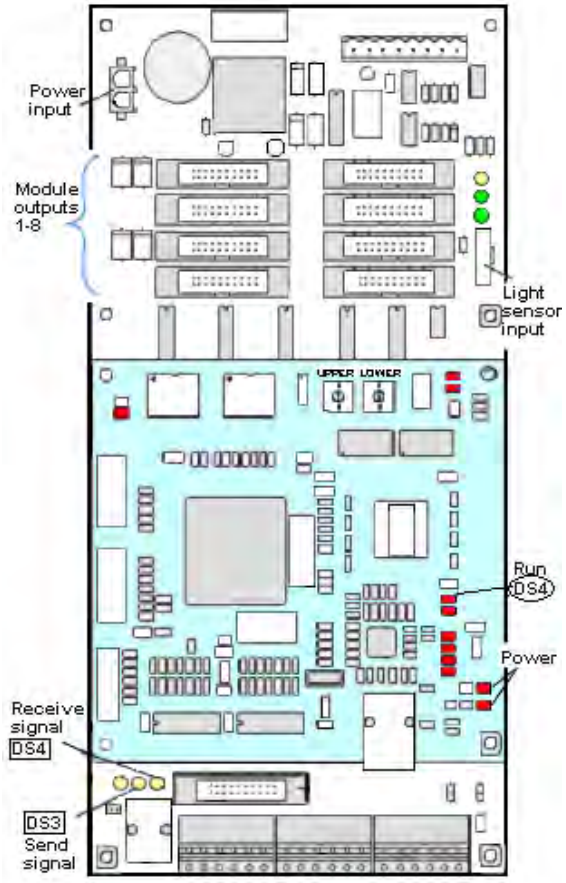


***Figure 37:*** *Typical Controller*

### Controller Address Setting

The rotary switches set the hardware address which the software uses to identify that particular display (**Figure 38**). Each controller in a network needs a unique address.

Set the switches by rotating them counter clockwise until the arrow points to the desired number . The display's power must be turned off and then turned back on to activate the test mode or to change the address.

**Note:** Setting both rotary switches to address 0 will activate a Test Mode. Turn the display's power off and back on to activate testing. After testing, set the addresses to numbers other than 0/0. The software will not communication with a controller set to address 0.

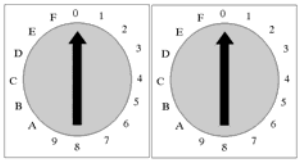

***Figure 38:*** *Rotary Switches*

## Power Supply Replacement

The modules in a display rely on power supplies that receive 120VAC from the power termination panel and send out DC power to the modules. Power supply voltage differs depending on the LED color of the display.

- **Monochrome:** Each 3.6 VDC power supply provides power for up to four modules in a display that uses either monochrome red or amber LEDs. The assembly 0A-1327-0006 contains two power supplies, and the assembly 0A-1327-0005 only one.

- **RGB:** Each 5.3 VDC power supply provides power for up to four RGB modules. The assembly 0A-1327-0002 contains two power supplies and the assembly 0A-1327-0001 only one.

Power supplies may be installed as single or double units depending on the pixel size of the display. A double unit consists of two single units connected together. The wiring for a single unit power supply is shown in **Figure 39**.

**Tools required: 1/8" hex wrench, Phillips screwdriver**

Complete the following steps to replace a power supply:

1. Turn off power to the display.
2. Access the interior of the display by removing the module in front of the power supply to be replaced. Use a 1/8" hex wrench to turn the latch fasteners. Refer to Section 6.1 for additional instructions, if needed.
3. Disconnect and label all the wires connected to the power supply.
4. Remove the hardware holding the power supply in place.
5. Follow these steps in reverse order to install a new power supply.

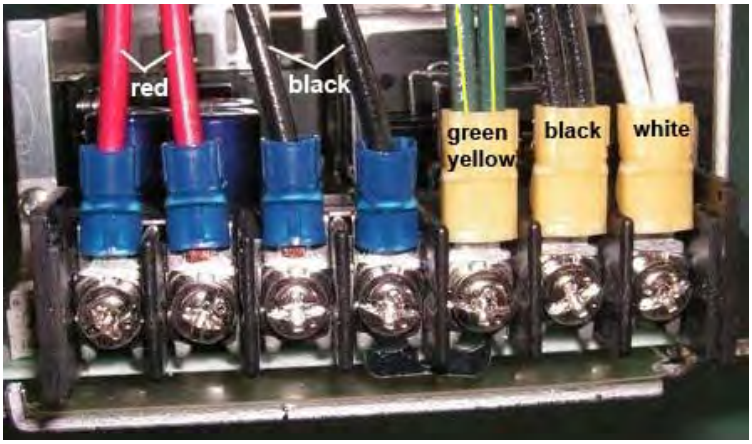


***Figure 39:*** *Single Unit Power Supply*

## Light Sensor

The light sensor assembly is mounted inside the top left of the cabinet. Refer to **Figure 29** for location. The entire assembly fits over two screws.

If the light sensor should fail, only the circuit board needs to be replaced. Remove the top left module on the display to access the light sensor. To replace a light sensor circuit board (**Figure 40**), follow these steps.

**Note:** The hardware mentioned in each step is given a corresponding number in the drawing. For instance, the nuts mentioned in step 2 are labeled #2 in the figure.

1. Remove the nuts behind the circuit board plate, and then remove the plate and circuit board from the assembly.
2. Remove the nuts securing the circuit board to the plate.
3. Remove the standoffs and attachment screws from the board.
4. Disconnect the four electrical wires on the sensor by unscrewing each screw that holds a wire in place. Note the order that the wires are connected.
5. The light sensor plug on the controller does not need to be detached.
6. Reattach the new circuit board, following these steps in reverse.

**Note**: Align the new circuit board so that the lens lines up with the ½" circular opening in the top edge of the display when the assembly is in place.

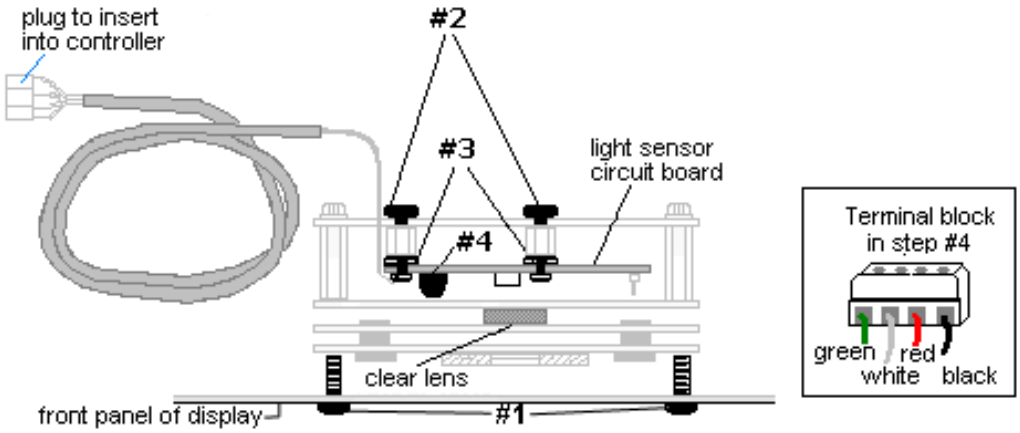


***Figure 40:*** *Light Sensor Assembly*

## Temperature Sensor

The temperature component is a small sensor board inside a plastic housing (**Figure 42**). This will be mounted outside, typically either near the display or near a building. If the temperature sensor is not working correctly, the internal sensor can be replaced by accessing it in the following steps:

1. Open the temperature sensor housing by removing the four nuts from the bottom, and removing the five bottom discs. Three of the discs are solid, while the center two have a square hole in them to fit around the sensor.
2. Label the wires connected to the temperature sensor board and then disconnect the cable from the temperature sensor terminal block in the sensor housing.
3. Remove the two screws holding the board to the plastic disc. Install the new board, and replace the two screws.
4. Reconnect the cable to the temperature sensor board, making sure all the wires make a good electrical connection.
5. Route cable around the sensor board (**Figure 41**) and then reassemble the sensor enclosure.

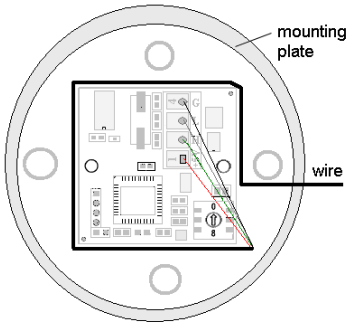


***Figure 41:*** *Wire Around Sensor Board*

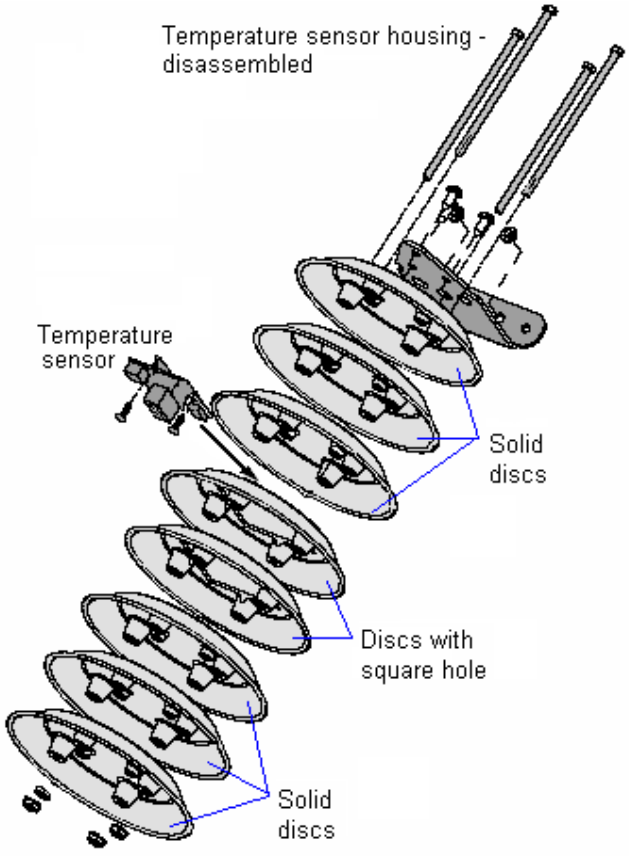


***Figure 42:*** *Temperature Sensor*

## 8.3 Common Power and Signal Connectors

When pulling a connector plug from a jack, **do not pull on the wire or cable**; pull on the plug head itself. Pulling on the wires may damage the connector.

The power and communication signal connections in the displays use many different types of connectors. The following information presents some common connectors encountered during display installation and maintenance.

**Ribbon Cable Connectors:**
A typical ribbon connector is shown in **Figure 43**. To disconnect the ribbon cable, push out the plastic clips on the sides to unlock the cable and then remove the jack.

Before replacing a ribbon cable connector, spray it with DeoxIT™ contact cleaner to remove any foreign matter that may cause signal problems. In addition, apply a generous amount of CaiLube™ protector paste to the plug before inserting it into the jack. This paste will protect both the plug and the jack from corrosion.

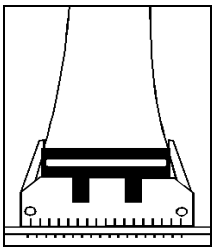

***Figure 43:*** *Ribbon Cable Connector*

**Termination Blocks:**
Termination blocks are commonly used to connect internal power to an external power source. Power wires need to have one-half inch of insulation stripped from the end of the wire prior to termination. Insert wires into terminations and make sure the clamp holds the wire firmly. A typical termination block is shown in **Figure 44**.

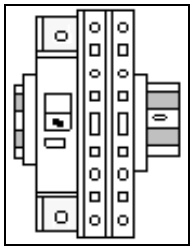

***Figure 44:*** *One Breaker Termination Block*

**Phoenix™-Style Connectors:**
Phoenix connectors, which are usually green, are often used for communication signal termination on circuit boards. Refer to **Figure 45**. Strip one-quarter inch of insulation from the wire prior to insertion. To remove a wire, turn the corresponding screw counter-clockwise to loosen the connector's grip on the wire. To insert a wire, push the bare wire into the connector and turn the above screw clockwise to lock the wire into place.

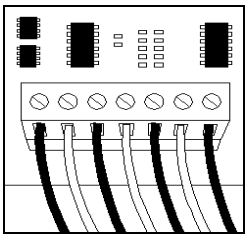

***Figure 45:*** *Phoenix Connector*

**Mate-n-Lok™ Connectors:**
The Mate-n-Lok connectors found in the displays are white and come in a variety of sizes. **Figure 46** illustrates a four-pin Mate-n-Lok connector. To remove the plug from the jack, squeeze the plastic locking clasps on the side of the plug and pull it from the jack.

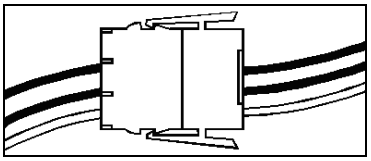

***Figure 46:*** *Mate-n-Lok Connector*

**Phone/Network Jacks (RJ11/RJ45 Connectors):**
RJ connectors, as seen in **Figure 47**, are similar to the telephone connectors or network jacks found in homes and businesses. These jacks are used on the ends of RJ11 or RJ45 cable. In order to remove this plug from the jack, depress the small clip on the underside of the plug.

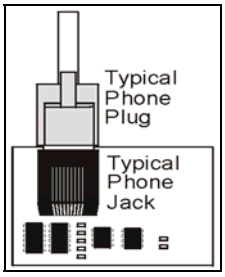


***Figure 47:*** *RJ11/RJ45 Connector*

Before replacing an RJ connector, spray it with DeoxIT™ contact cleaner to remove any foreign matter that may cause signal problems. In addition, apply a generous amount of CaiLube™ protector paste to the plug before inserting it into the jack. This paste will protect both the plug and the jack from corrosion.

**Quick-connect Jack:**
The display uses quick-connect jacks for the connection of the signal, the temperature sensor and the connection to a mirror display. Three input and one output quick-connect jacks are located on the back of the primary display. When not in use, the attached dust cover should be kept closed.

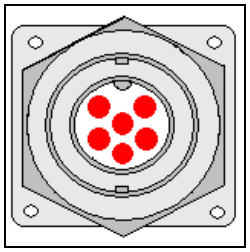

***Figure 48:*** *RS232/6-pin Quick-connect Jack*

To attach the cable to a jack, match the configuration of wires in the plug to the pattern in the jack. Push the plug in, then turn the outer collar to lock it into place. **Figure 48** illustrates the 6-pin quick-connect jack.

**Fiber Optic Cable:**
A fiber optic network transmits light (signal) through a glass fiber. Because fiber optic cable is glass, the cable must never be bent. The cable is usually a 4-fiber cable, with two fibers used for display communications and the other two saved for spares (**Figure 49**).

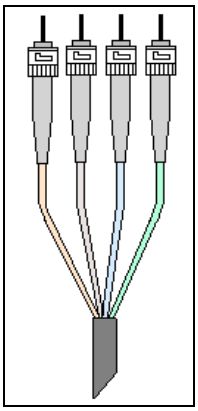

***Figure 49****: Fiber Optic Cable*

## 8.4 Glossary

**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. The driver board is responsible for the on/off and intensity levels of the LEDs.

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

**LED** (**L**ight **E**mitting **D**iode): A low energy, high intensity lighting unit.

**Louver:** A black plastic ledge positioned horizontally above each pixel row. The louvers block sunlight, thus increasing the contrast on the display face.

**Mirror:** The second display in a two-sided 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 one or more interconnect cables from the primary display.

**Module:** The building block of a Galaxy® display. The modules in a 20 mm display are 16 pixels high by 16 pixels wide. Each is individually removable from the front of the display.

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

**Pixel:** A single LED or cluster of LEDs. The number and color of the LEDs 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. The information from these components will be relayed from the primary display to the mirror display so that it shows exactly the same information. An interconnect cable will transfer this information from the primary to the mirror display in this configuration.

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

# Section 9: Daktronics Exchange and Repair & Return Programs

To serve customers' repair and maintenance needs, Daktronics offers both an Exchange Program and a Repair & Return Program.

## Exchange Program

Daktronics' unique Exchange Program is a quick, economical service for replacing key parts in need of repair. If a part requires repair or replacement, Daktronics sends the customer a replacement, and the customer sends the problem part to Daktronics. This decreases display downtime.

### Before Contacting Daktronics

Write important part numbers here:

_____

_____

_____

To participate in the Exchange Program, follow these steps.

1. Call Daktronics Customer Service: 866-343-3122.

2. When the new exchange part is received, mail the old part to Daktronics.
   If the replacement part fixes the problem, send in the problem part which is being replaced.
   - **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 you have a qualifying service agreement in place.
   In most circumstances, the replacement part will be invoiced at the time it is shipped.

4. If the replacement part does not solve the problem, return the part within 30 working days or the full purchase price will be charged.
   If the equipment is still defective after the exchange is made, please contact Customer Service immediately. Daktronics expects immediate return of an exchange part if it does not solve the problem. The company also reserves the right to refuse parts that have been damaged due to acts of nature or causes other than normal wear and tear.

## 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: 866-343-3122 Fax: 605-697-4444

2. Receive a Return Materials Authorization (RMA) number before shipping.
   This expedites repair of your component.

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 Styrofoam peanuts in packaging.

4. Enclose:
   - your name
   - address
   - phone number
   - the RMA number
   - a clear description of symptoms

**Shipping Address**
Daktronics Customer Service
PO Box 5128
331 32nd Avenue
Brookings, SD 57006

## 9.1 Daktronics Warranty and Limitation of Liability

Daktronics Warranty and Limitation of Liability is located in Appendix C. The Warranty is independent of the Extended Service agreement and is the authority in matters of service, repair, and display operation.

# Appendix A: Reference Drawings

Following are drawings included in this appendix. Note that the drawings differ between monochrome and RGB displays. The layout drawings also include specific matrix sizes. For example, the first layout drawing includes displays that are 16, 32, or 48 pixels high and 144 or160 pixels long as well as monochrome red or amber color. Be sure to refer to the correct drawing for the specific display.


Power Specs, 16X144-48X144 RGB Displays ..... **Drawing A-211980**
Power Specs, 16x144-48x160/80x112 Mono Displays ..... **Drawing A-211981**

*Listed by matrix size and LED color:*
Layout, AF-3400-16/32/48 x 48/64/80-20-Mono ..... **Drawing A-212184**
Layout, AF-3400-16/32/48 x 48/64/80-20-RGB ..... **Drawing A-212194**
Layout, AF-3400-16/32/48 x 96/112/128-20-Mono ..... **Drawing A-212186**
Layout, AF-3400-16/32/48 x 96/112/128-20-RGB ..... **Drawing A-212197**
Layout, AF-3400-16/32/48 x 144/160-20-Mono ..... **Drawing A-212188**
Layout, AF-3400-16/32/48 x 144/160-20, RGB ..... **Drawing A-212199**
Layout, AF-3400-16/32/48 x 176/192-20-Mono ..... **Drawing A-212191**
Layout, AF-3400-16/32/48 x 176/192-20-RGB ..... **Drawing A-212238**

Layout, AF-3400-64/80x48/64/80-20-Mono ..... **Drawing A-212185**
Layout, AF-3400-64/80x48/64/80-20-RGB ..... **Drawing A-212195**
Layout, AF-3400-64/80x96/112/128-20-Mono ..... **Drawing A-212187**
Layout, AF-3400-64/80x96/112/128-20-RGB ..... **Drawing A-212198**
Layout, AF-3400-64/80x144/160-20-Mono ..... **Drawing A-212189**
Layout, AF-3400-64/80x144/160-20-RGB ..... **Drawing A-212200**
Layout, AF-3400-64/80x176/192-20-Mono ..... **Drawing A-212193**
Layout, AF-3400-64/80x176/192-20-RGB ..... **Drawing A-217686**

# 20mm LOUVERED RGB GALAXY DISPLAYS
# POWER SPECIFICATION CHART

| MATRIX SIZE | TOTAL WATTS | 120V AMPS | 120/240 3, wire LINE 1 AMPS | 120/240 3, wire LINE 2 AMPS | 240V AMPS |
|---|---|---|---|---|---|
| 16X48 | 279 | 2.32 | 120/240 VAC IS NOT | | 1.16 |
| 16X64 | 359 | 2.99 | AVAILABLE FOR SIZE | | 1.49 |
| 16X80 | 438 | 3.65 | | | 1.83 |
| 16X96 | 518 | 4.32 | | | 2.16 |
| 16X112 | 622 | 5.19 | | | 2.59 |
| 16X128 | 702 | 5.85 | | | 2.93 |
| 16X144 | 782 | 6.52 | | | 3.26 |
| 32X48 | 518 | 4.32 | | | 2.16 |
| 32X64 | 678 | 5.65 | | | 2.82 |
| 32X80 | 838 | 6.98 | | | 3.49 |
| 32X96 | 1021 | 8.51 | | | 4.26 |
| 32X112 | 1181 | 9.84 | | | 4.92 |
| 32X128 | 1341 | 11.17 | | | 5.59 |
| 32X144 | 1501 | 12.50 | | | 6.25 |
| 48X48 | 758 | 6.31 | 2.99 | 3.33 | 3.16 |
| 48X64 | 1021 | 8.51 | 3.19 | 5.32 | 4.26 |
| 48X80 | 1261 | 10.51 | 5.85 | 4.66 | 5.25 |
| 48X96 | 1501 | 12.50 | 8.51 | 3.99 | 6.25 |
| 48X112 | 1764 | 14.70 | 8.71 | 5.99 | 7.35 |
| 48X128 | 2004 | 16.70 | 8.71 | 7.98 | 8.35 |
| 48X144 | 2243 | 18.69 | 8.71 | 9.98 | 9.35 |
| 48X176 | 2771 | 23.09 | 11.78 | 11.31 | 11.55 |
| 64X128 | 2667 | 22.22 | 10.65 | 11.58 | 11.11 |

THE ABOVE DISPLAY SIZES CAN BE POWERED BY EITHER 120VAC (2 WIRE + GND), 120/240 (3 WIRE + GND) OR 240VAC (2 WIRE + GND) SERVICES (EXCEPT WHERE NOTED).

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DAKTRONICS, INC. BROOKINGS, SD 57006

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 02 | 16AUG04 | ADDED SIZES: 48X176 AND 64X128 POWER REQUIREMENTS. REMOVED SIZES FROM TITLE BLOCK. | DJM | |
| 01 | 01JUN04 | UPDATED POWER SPECS BECAUSE OF A FAN QUANTITY AND FAN TYPE CHANGE. | DJM | |

PROJ: GALAXY; AF-3400-20-RGB SERIES

TITLE: POWER SPECS, AF-3400-**X***20-RGB, DISPLAYS

DES. BY: DMATHER DRAWN BY: DMATHER DATE: 15 MAY 04

REVISION 02 APPR. BY:

SCALE: 1=1

1321-R10A-211980

# 20mm LOUVERED MONOCHROME GALAXY DISPLAYS
# POWER SPECIFICATION CHART

| MATRIX SIZE | TOTAL WATTS | 120V AMPS | 120/240 3, wire LINE 1 AMPS | 120/240 3, wire LINE 2 AMPS | 240V AMPS |
|---|---|---|---|---|---|
| 16X48 | 155 | 1.29 | 120/240 VAC IS NOT | | 0.65 |
| 16X64 | 194 | 1.62 | AVAILABLE FOR SIZE | | 0.81 |
| 16X80 | 233 | 1.94 | | | 0.97 |
| 16X96 | 271 | 2.26 | | | 1.13 |
| 16X112 | 334 | 2.78 | | | 1.39 |
| 16X128 | 373 | 3.11 | | | 1.55 |
| 16X144 | 412 | 3.43 | | | 1.71 |
| 32X48 | 271 | 2.26 | | | 1.13 |
| 32X64 | 349 | 2.91 | | | 1.45 |
| 32X80 | 426 | 3.55 | | | 1.78 |
| 32X96 | 528 | 4.40 | | | 2.20 |
| 32X112 | 605 | 5.04 | | | 2.52 |
| 32X128 | 682 | 5.69 | | | 2.84 |
| 32X144 | 760 | 6.33 | | | 3.17 |
| 48X48 | 387 | 3.23 | | | 1.61 |
| 48X64 | 528 | 4.40 | | | 2.20 |
| 48X80 | 644 | 5.36 | | | 2.68 |
| 48X96 | 760 | 6.33 | | | 3.17 |
| 48X112 | 900 | 7.50 | | | 3.75 |
| 48X128 | 1016 | 8.47 | | | 4.23 |
| 48X144 | 1132 | 9.43 | | | 4.72 |
| 48X160 | 1272 | 10.60 | 4.84 | 5.77 | 5.30 |
| 64x176 | 1957 | 14.31 | 9.03 | 7.28 | 7.16 |
| 80X112 | 1529 | 12.74 | 6.77 | 5.97 | 6.37 |

THE ABOVE DISPLAY SIZES CAN BE POWERED BY EITHER 120VAC (2 WIRE + GND), 120/240 (3 WIRE + GND) OR 240VAC (2 WIRE + GND) SERVICES (EXCEPT WHERE NOTED).

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY; AF-3400-20-MONOCHROME SERIES

TITLE: POWER SPECS, 16X144-48X160/80X112 DISPLAYS

DES. BY: DMATHER DRAWN BY: DMATHER DATE: 15 MAY 04

REVISION 01 APPR. BY: SCALE: 1=1

1321-R10A-211981

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 01JUN04 | UPDATED POWER SPECS BECAUSE OF A FAN QUANTITY CHANGE. | DJM | |

FAN Ⓑ B−1053 (16/32/48) HIGH

THERMOSTAT T C 0A−1327−3101

1 POWER SUPPLY 0A−1327−0005

2 POWER SUPPLIES 0A−1327−0006

POWER TERM PANEL TP 1 0A−1327−0100 (1)CIRCUIT

CONTROLLER **(PRIMARY ONLY) C 0A−1229−0013

MODULE 12.48" X 12.48"
16 PIXEL X 16 PIXEL
20MM C−C / 0.78" C−C

DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT QC 0A−1327−1000

PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS QC 0A−1327−1010

MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS QC 0A−1327−1011

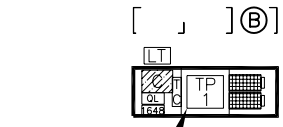
QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE QC 0A−1327−1003

(16X48 ONLY) QUICK CONNECT QL 1648 0A−1327−1012 PRIMARY
0P−1229−2008 MIRROR

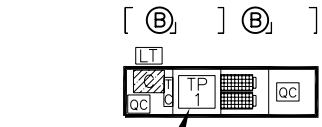
LIGHT DETECTOR PRIMARY ONLY LT 0A−1327−3000 (16/32/48) HIGH

LIGHT DETECTOR BLANK MIRROR ONLY LT 0A−1213−4009

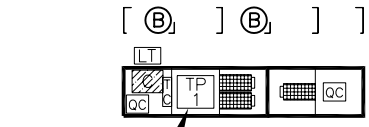
AREA POWERED BY Z1 (J41)



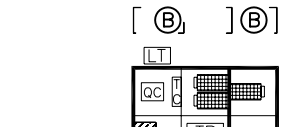
16X48
20mm MONO



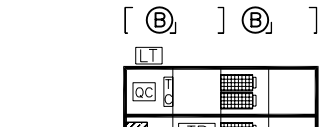
16X64
20mm MONO



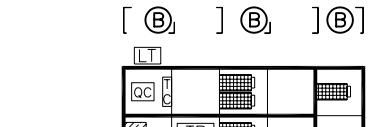
16X80
20mm MONO



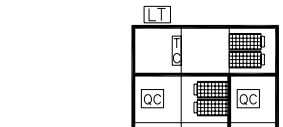
32X48
20mm MONO



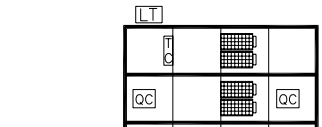
32X64
20mm MONO



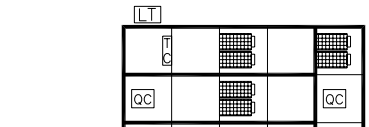
32X80
20mm MONO



48X48
20mm MONO



48X64
20mm MONO



48X80
20mm MONO

NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY IS IN THE QUICK CONNECTS, AND THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 29 NOV 04 | UPDATED LAYOUT. | RTV | |

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF−3400 20 MM FRONT VENTILATION

TITLE: LAYOUT, AF−3400−16/32/48X48/64/80−20−MONO

DES. BY: WTUCKER DRAWN BY: RVOSS DATE: 22 NOV 04

REVISION 01 APPR. BY:

SCALE: 1 = 50

1321-E10A-212184

FAN Ⓑ B−1053 (16/32/48) HIGH

THERMOSTAT TC 0A−1327−3101

1 POWER SUPPLY 0A−1327−0001

2 POWER SUPPLIES 0A−1327−0002

POWER TERM PANEL TP # 0A−1327−0100 (1)CIRCUIT
0A−1327−0101 (2)CIRCUIT

CONTROLLER **(PRIMARY ONLY) C 0A−1229−0013

MODULE 12.48" X 12.48"
16 PIXEL X 16 PIXEL
20MM C−C / 0.78" C−C

DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

(16X48 ONLY) QUICK CONNECT QL 1648 0A−1327−1012 PRIMARY
0P−1229−2008 MIRROR

PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT QC 0A−1327−1000

PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS QC 0A−1327−1010

MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS QC 0A−1327−1011

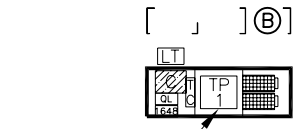
QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE QC 0A−1327−1003

LIGHT DETECTOR PRIMARY ONLY LT 0A−1327−3000 (16/32/48) HIGH

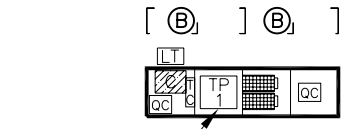
LIGHT DETECTOR BLANK MIRROR ONLY LT 0A−1213−4009

AREA POWERED BY Z1 (J41)

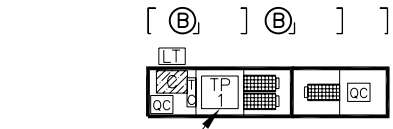
AREA POWERED BY Z2 (J42)



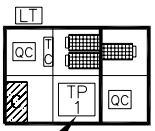
16X48
20mm RGB



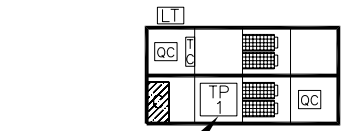
16X64
20mm RGB



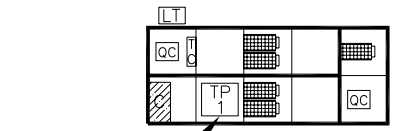
16X80
20mm RGB



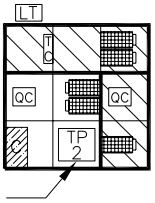
32X48
20mm RGB



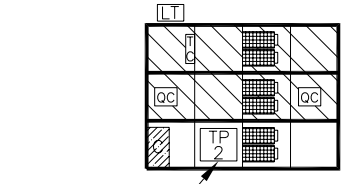
32X64
20mm RGB



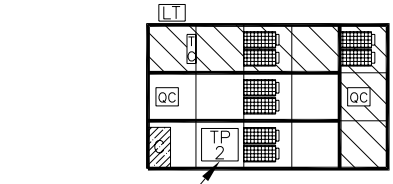
32X80
20mm RGB



48X48
20mm RGB



48X64
20mm RGB



48X80
20mm RGB

NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY INVOLVES THE QUICK CONNECTS. THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 23NOV04 | UPDATED LAYOUT | JJP | |

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF−3400 20 MM FRONT VENTILATION

TITLE: LAYOUT, AF−3400−16/32/48X48/64/80−20−RGB

DES. BY: WTUCKER DRAWN BY: JPOMMER DATE: 22NOV04

REVISION 01 APPR. BY:

SCALE: 1=50

1321-E10A-212194

FAN Ⓑ B-1053 (16/32/48) HIGH

THERMOSTAT [TC] 0A-1327-3101

1 POWER SUPPLY 0A-1327-0005

2 POWER SUPPLIES 0A-1327-0006

POWER TERM PANEL [TP 1] 0A-1327-0100 (1)CIRCUIT

CONTROLLER **(PRIMARY ONLY) [C] 0A-1229-0013

MODULE 12.48" X 12.48"
16 PIXEL X 16 PIXEL
20MM C-C / 0.78" C-C

DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT [QC] 0A-1327-1000

PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS [QC] 0A-1327-1010

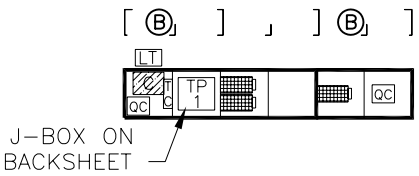
MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS [QC] 0A-1327-1011

QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE [QC] 0A-1327-1003

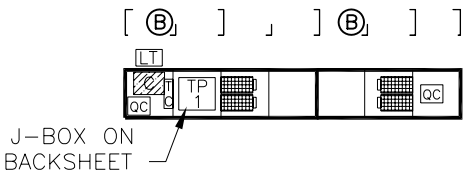
LIGHT DETECTOR PRIMARY ONLY [LT] 0A-1327-3000 (16/32/48) HIGH

LIGHT DETECTOR BLANK MIRROR ONLY [LT] 0A-1213-4009

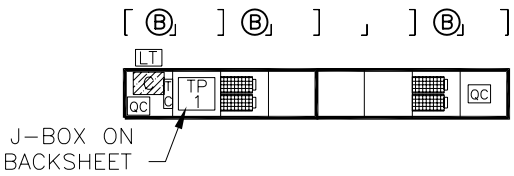
[ ] AREA POWERED BY Z1 (J41)



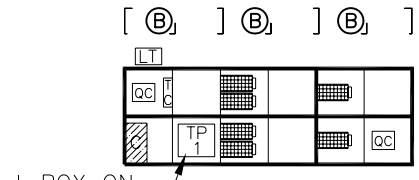
16X96
20mm MONO



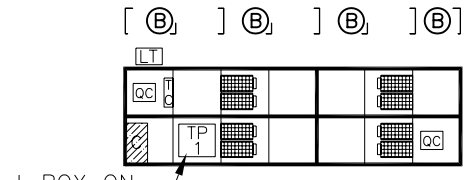
16X112
20mm MONO



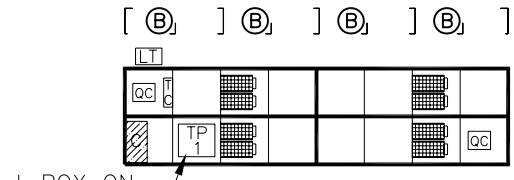
16X128
20mm MONO



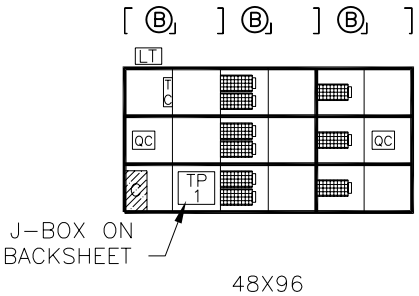
32X96
20mm MONO



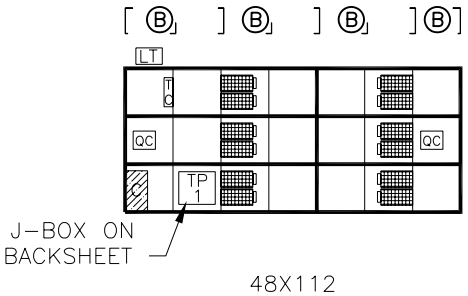
32X112
20mm MONO



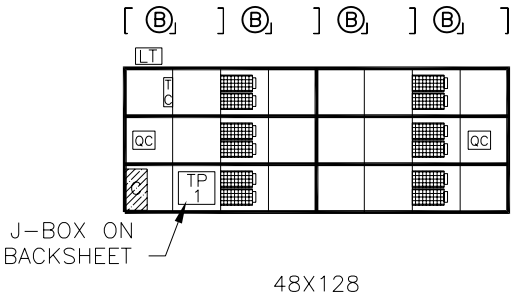
32X128
20mm MONO



48X96
20mm MONO



48X112
20mm MONO



48X128
20mm MONO

NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY IS IN THE QUICK CONNECTS, AND THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 29 NOV 04 | UPDATED LAYOUT. | RTV | |

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF-3400 20 MM FRONT VENTILATION

TITLE: LAYOUT, AF-3400-16/32/48X96/112/128-20-MONO

DES. BY: WTUCKER DRAWN BY: RVOSS DATE: 22 NOV 04

REVISION 01 APPR. BY:

SCALE: 1 = 50

1321-E10A-212186

FAN Ⓑ B−1053 (16/32/48) HIGH

THERMOSTAT TC 0A−1327−3101

1 POWER SUPPLY 0A−1327−0001

2 POWER SUPPLIES 0A−1327−0002

POWER TERM PANEL TP # 0A−1327−0100 (1)CIRCUIT
0A−1327−0101 (2)CIRCUIT

CONTROLLER **(PRIMARY ONLY) C 0A−1229−0013

MODULE 12.48" X 12.48"
16 PIXEL X 16 PIXEL
20MM C−C / 0.78" C−C

DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT QC 0A−1327−1000

PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS QC 0A−1327−1010

MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS QC 0A−1327−1011

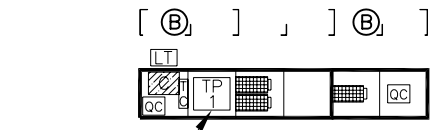
QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE QC 0A−1327−1003

LIGHT DETECTOR PRIMARY ONLY LT 0A−1327−3000 16/32/48 HIGH

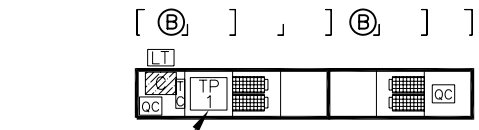
LIGHT DETECTOR BLANK MIRROR ONLY LT 0A−1213−4009

AREA POWERED BY Z1 (J41)

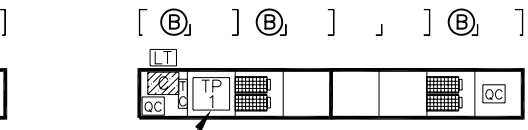
AREA POWERED BY Z2 (J42)



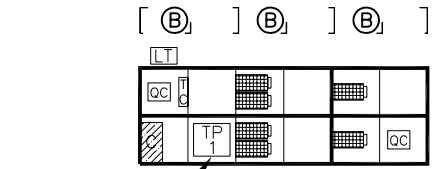
16X96
20mm RGB



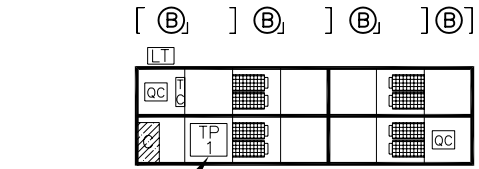
16X112
20mm RGB



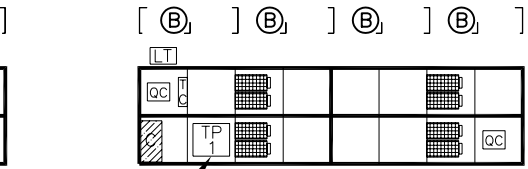
16X128
20mm RGB



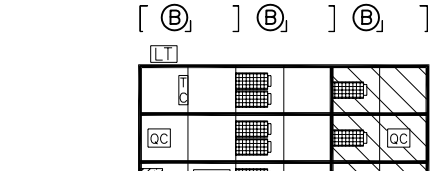
32X96
20mm RGB



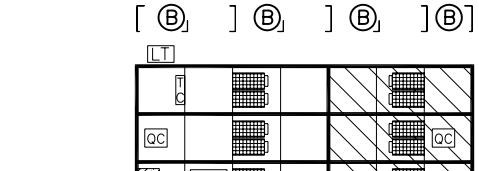
32X112
20mm RGB



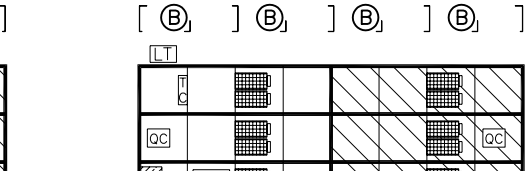
32X128
20mm RGB



48X96
20mm RGB



48X112
20mm RGB



48X128
20mm RGB

NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY IS IN THE QUICK CONNECTS, AND THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 23NOV04 | UPDATED LAYOUT | JJP | |

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF−3400 20MM FRONT VENTILATION

TITLE: LAYOUT, AF−3400−16/32/48X96/112/128−20−RGB

DES. BY: WTUCKER DRAWN BY: JPOMMER DATE: 23NOV04

REVISION 01 APPR. BY:

SCALE: 1=50

1321-E10A-212197

FAN Ⓑ B−1053 (16/32/48) HIGH

THERMOSTAT [TC] 0A−1327−3101

1 POWER SUPPLY 0A−1327−0005

2 POWER SUPPLIES 0A−1327−0006

POWER TERM PANEL [TP #] 0A−1327−0100 (1)CIRCUIT
0A−1327−0101 (2)CIRCUIT

CONTROLLER **(PRIMARY ONLY) [C] 0A−1229−0013

MODULE 12.48" X 12.48"
16 PIXEL X 16 PIXEL
20MM C−C / 0.78" C−C

DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT [QC] 0A−1327−1000

PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS [QC] 0A−1327−1010

MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS [QC] 0A−1327−1011

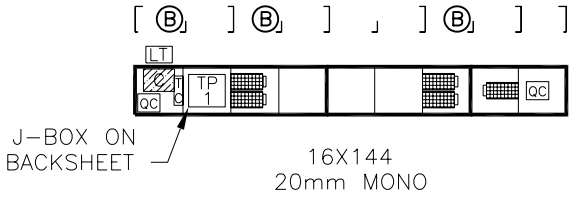
QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE [QC] 0A−1327−1003

LIGHT DETECTOR PRIMARY ONLY [LT] 0A−1327−3000 (16/32/48) HIGH

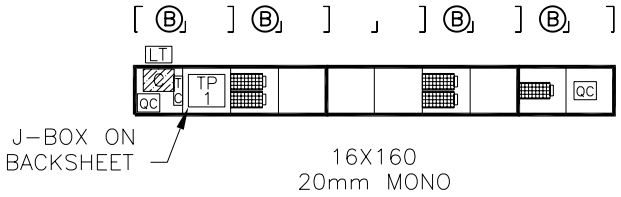
LIGHT DETECTOR BLANK MIRROR ONLY [LT] 0A−1213−4009

AREA POWERED BY Z1 (J41)

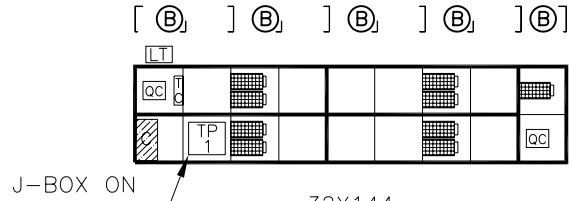
AREA POWERED BY Z2 (J42)



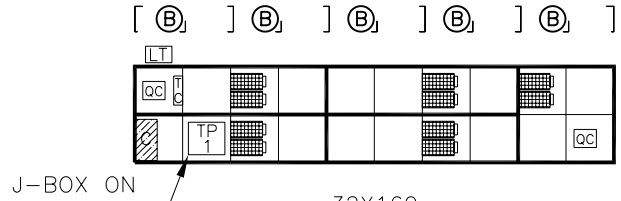
16X144
20mm MONO



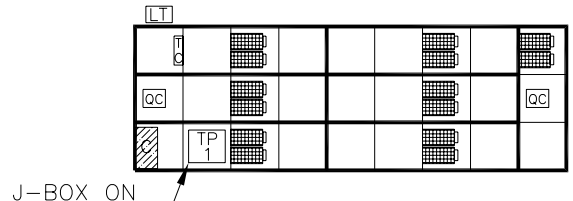
16X160
20mm MONO



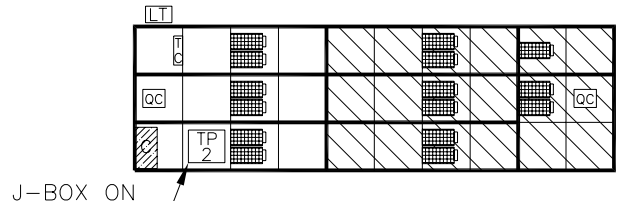
32X144
20mm MONO



32X160
20mm MONO



48X144
20mm MONO



48X160
20mm MONO

NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY IS IN THE QUICK CONNECTS, AND THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 29 NOV 04 | UPDATED LAYOUT. | RTV | |

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF−3400 20 MM FRONT VENTILATION

TITLE: LAYOUT, AF−3400−16/32/48X144/160−20−MONO

DES. BY: WTUCKER DRAWN BY: RVOSS DATE: 22 NOV 04

REVISION 01 APPR. BY: SCALE: 1 = 50

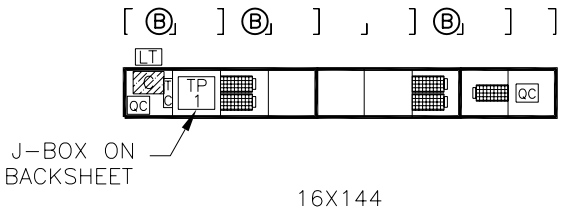
1321-E10A-212188

| | | |
|---|---|---|
| FAN | Ⓑ | B−1053 (16/32/48) HIGH |
| THERMOSTAT | TC | 0A−1327−3101 |
| 1 POWER SUPPLY | | 0A−1327−0001 |
| 2 POWER SUPPLIES | | 0A−1327−0002 |
| POWER FILTER | Z4 | 0A−1327−0201 (4)FILTERS |
| POWER TERM PANEL | TP # | 0A−1327−0100 (1)CIRCUIT<br>0A−1327−0101 (2)CIRCUIT<br>0A−1327−0104 (4)CIRCUIT |
| CONTROLLER **(PRIMARY ONLY) | C | 0A−1229−0013 |
| MODULE | | 12.48" X 12.48"<br>16 PIXEL X 16 PIXEL<br>20MM C−C / 0.78" C−C |

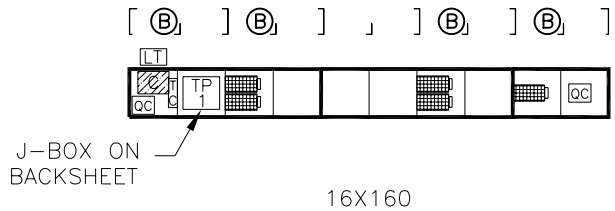
DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

| | | | |
|---|---|---|---|
| PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT | QC | 0A−1327−1000 | |
| PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS | QC | 0A−1327−1010 | |
| MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS | QC | 0A−1327−1011 | |
| QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE | QC | 0A−1327−1003 | |
| LIGHT DETECTOR PRIMARY ONLY | LT | 0A−1327−3000 | 16/32/48 HIGH |
| LIGHT DETECTOR BLANK MIRROR ONLY | LT | 0A−1213−4009 | |

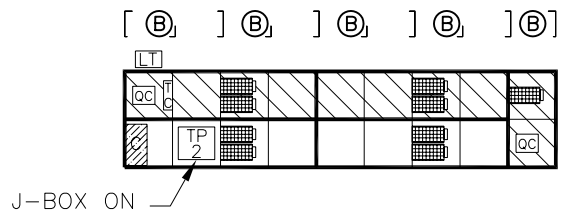
AREA POWERED BY Z1 (J41)
AREA POWERED BY Z2 (J42)
AREA POWERED BY Z3
AREA POWERED BY Z4



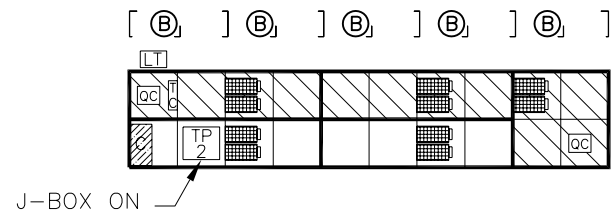

16X144
20mm RGB



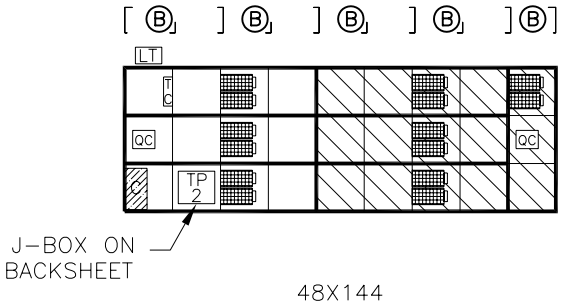

16X160
20mm RGB



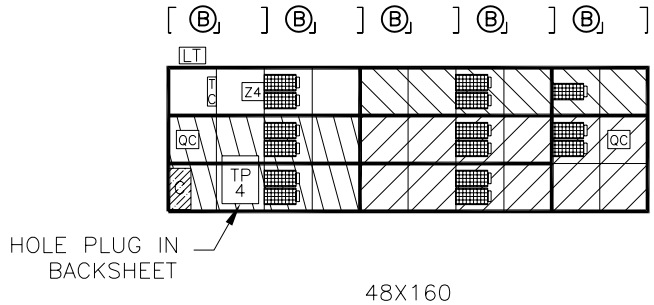

32X144
20mm RGB




32X160
20mm RGB




48X144
20mm RGB




48X160
20mm RGB

NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY IS IN THE QUICK CONNECTS, AND THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 23NOV04 | UPDATED LAYOUT | JJP | |

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF−3400 20MM FRONT VENTILATION
TITLE: LAYOUT, AF−3400−16/32/48X144/160−20−RGB
DES. BY: WTUCKER DRAWN BY: JPOMMER DATE: 23NOV04
REVISION 01 APPR. BY: SCALE: 1=50

1321-E10A-212199

FAN Ⓑ B−1053 (16/32/48) HIGH

THERMOSTAT TC 0A−1327−3101

2 POWER SUPPLIES 0A−1327−0006

POWER TERM PANEL TP # 0A−1327−0100 (1)CIRCUIT
0A−1327−0101 (2)CIRCUIT

CONTROLLER **(PRIMARY ONLY) C 0A−1229−0013

MODULE 12.48" X 12.48"
16 PIXEL X 16 PIXEL
20MM C−C / 0.78" C−C

DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT QC 0A−1327−1000

PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS QC 0A−1327−1010

MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS QC 0A−1327−1011

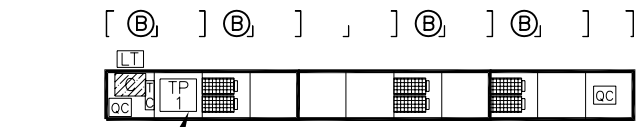
QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE QC 0A−1327−1003

LIGHT DETECTOR PRIMARY ONLY LT 0A−1327−3000 (16/32/48) HIGH

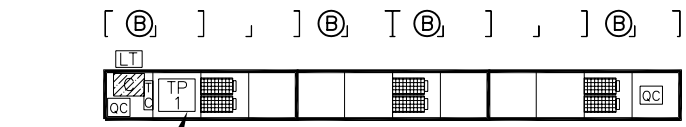
LIGHT DETECTOR BLANK MIRROR ONLY LT 0A−1213−4009

AREA POWERED BY Z1 (J41)

AREA POWERED BY Z2 (J42)

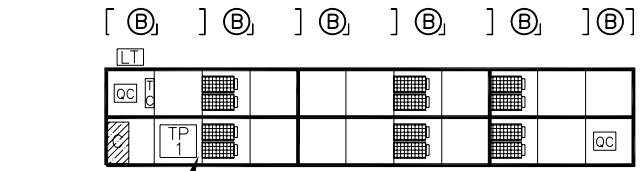



16X176
20mm MONO

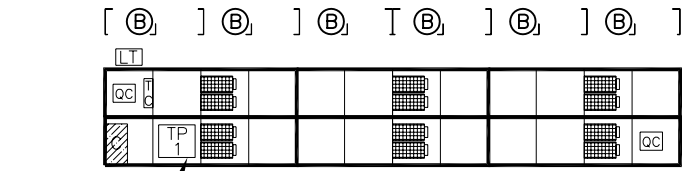



J−BOX ON BACKSHEET

16X192
20mm MONO

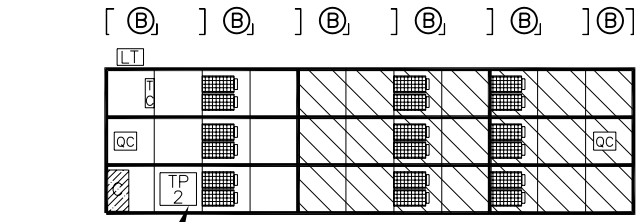



32X176
20mm MONO

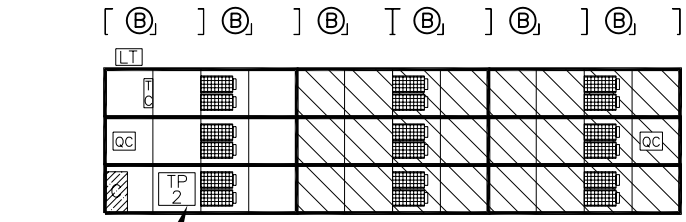



J−BOX ON BACKSHEET

32X192
20mm MONO




48X176
20mm MONO




J−BOX ON BACKSHEET

48X192
20mm MONO

NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY IS IN THE QUICK CONNECTS, AND THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 29 NOV 04 | UPDATED LAYOUT. | RTV | |

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF−3400 20 MM FRONT VENTILATION

TITLE: LAYOUT, AF−3400−16/32/48X176/192−20−MONO

DES. BY: WTUCKER DRAWN BY: RVOSS DATE: 23 NOV 04

REVISION 01 APPR. BY:

SCALE: 1 = 50

1321-E10A-212191

FAN Ⓑ B-1053 (16/32/48) HIGH

THERMOSTAT [TC] 0A-1327-3101

2 POWER SUPPLIES 0A-1327-0002

POWER FILTER [Z4] 0A-1327-0201 (4)FILTERS

POWER TERM PANEL [TP #] 0A-1327-0100 (1)CIRCUIT
0A-1327-0101 (2)CIRCUIT
0A-1327-0104 (4)CIRCUIT

CONTROLLER **(PRIMARY ONLY) [C] 0A-1229-0013

MODULE 12.48" X 12.48"
16 PIXEL X 16 PIXEL
20MM C-C / 0.78" C-C

DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT [QC] 0A-1327-1000

PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS [QC] 0A-1327-1010

MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS [QC] 0A-1327-1011

QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE [QC] 0A-1327-1003

LIGHT DETECTOR PRIMARY ONLY [LT] 0A-1327-3000 16/32/48 HIGH

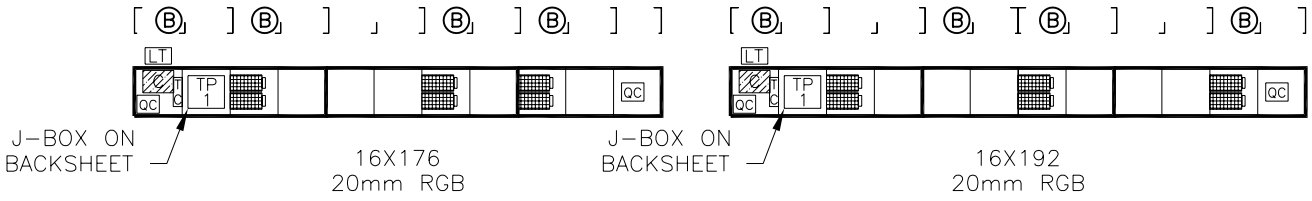
LIGHT DETECTOR BLANK MIRROR ONLY [LT] 0A-1213-4009

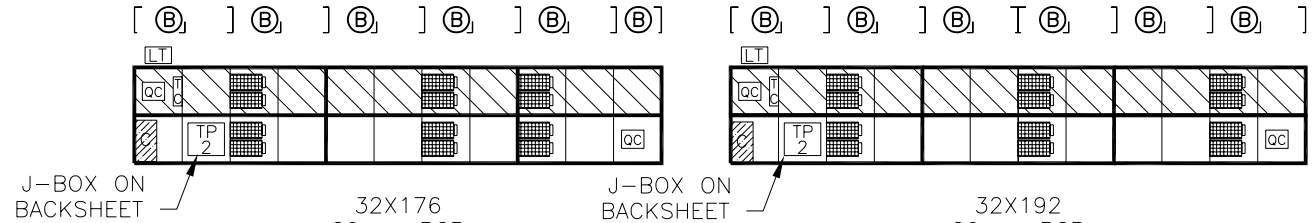
AREA POWERED BY Z1 (J41)

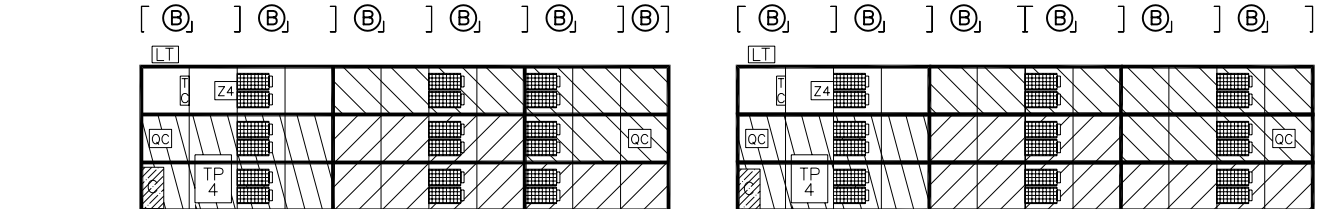
AREA POWERED BY Z2 (J42)

AREA POWERED BY Z3

AREA POWERED BY Z4




NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY IS IN THE QUICK CONNECTS, AND THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 02 | 19SEP05 | UPDATED CHANGES PER ECO 048301 | NKJ | |
| 01 | 23NOV04 | UPDATED LAYOUT | JJP | |

THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2004 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF-3400 20MM FRONT VENTILATION

TITLE: LAYOUT, AF-3400-16/32/48X176/192-20-RGB

DES. BY: WTUCKER DRAWN BY: JPOMMER DATE: 23NOV04

REVISION 02 APPR. BY:

SCALE: 1=50

1321-E10A-212238

FAN — 0A-1327-3500 (64/80) HIGH, FULL BAY
0A-1327-3501 (64/80) HIGH, HALF BAY

THERMOSTAT — 0A-1327-3101

1 POWER SUPPLY — 0A-1327-0005

2 POWER SUPPLIES — 0A-1327-0006

POWER TERM PANEL — 0A-1327-0101 (2)CIRCUIT

CONTROLLER **(PRIMARY ONLY) — 0A-1229-0013

MODULE — 12.48" X 12.48"
16 PIXEL X 16 PIXEL
20MM C-C / 0.78" C-C

DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT — QC — 0A-1327-1000

PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS — QC — 0A-1327-1010

MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS — QC — 0A-1327-1011

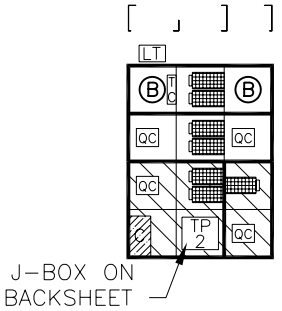
QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE — QC — 0A-1327-1003

LIGHT DETECTOR PRIMARY ONLY — LT — 0A-1327-3003 (64/80) HIGH

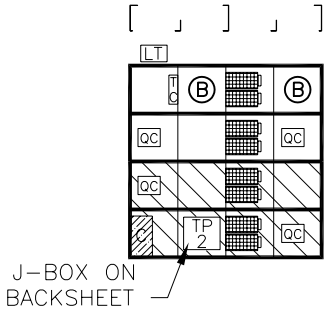
LIGHT DETECTOR BLANK MIRROR ONLY — LT — 0A-1213-4009

AREA POWERED BY Z1 (J41)

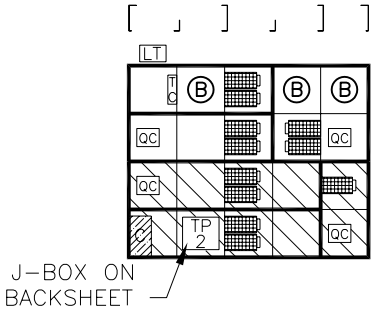
AREA POWERED BY Z2 (J42)



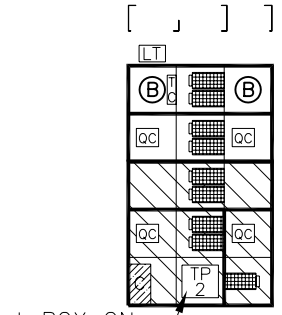

64X48
20mm MONO



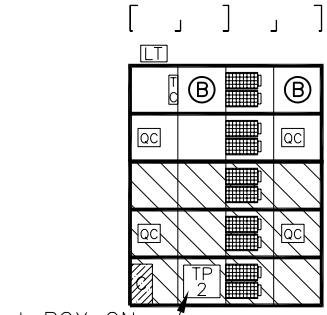

64X64
20mm MONO



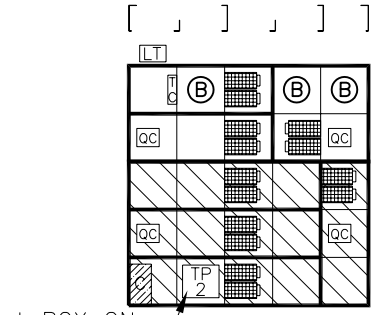

64X80
20mm MONO




80X48
20mm MONO




80X64
20mm MONO




80X80
20mm MONO

NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY IS IN THE QUICK CONNECTS, AND THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 29 NOV 04 | UPDATED LAYOUT. | RTV | |

THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2004 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF-3400 20 MM FRONT VENTILATION

TITLE: LAYOUT, AF-3400-64/80X48/64/80-20-MONO

DES. BY: WTUCKER DRAWN BY: RVOSS DATE: 22 NOV 04

REVISION 01 APPR. BY:

SCALE: 1 = 50

1321-E10A-212185

FAN Ⓑ 0A-1327-3500 (64/80) HIGH, FULL BAY
0A-1327-3501 (64/80) HIGH, HALF BAY

THERMOSTAT TC 0A-1327-3101

1 POWER SUPPLY 0A-1327-0001

2 POWER SUPPLIES 0A-1327-0002

POWER TERM PANEL TP 2 0A-1327-0101 (2)CIRCUIT

CONTROLLER **(PRIMARY ONLY) C 0A-1229-0013

MODULE 12.48" X 12.48"
16 PIXEL X 16 PIXEL
20MM C-C / 0.78" C-C

DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT QC 0A-1327-1000

PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS QC 0A-1327-1010

MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS QC 0A-1327-1011

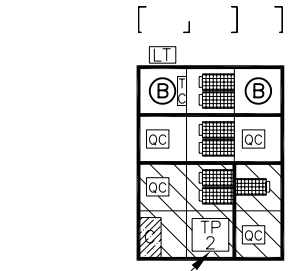
QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE QC 0A-1327-1003

LIGHT DETECTOR PRIMARY ONLY LT 0A-1327-3003 (64/80) HIGH

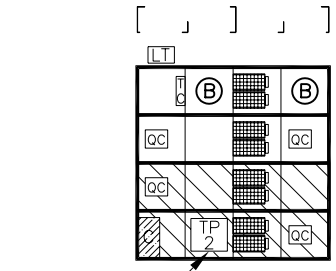
LIGHT DETECTOR BLANK MIRROR ONLY LT 0A-1213-4009

AREA POWERED BY Z1 (J41)

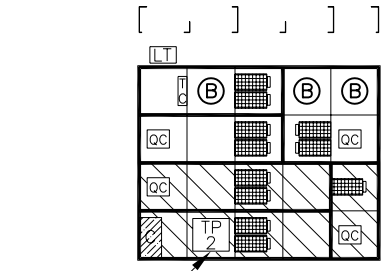
AREA POWERED BY Z2 (J42)



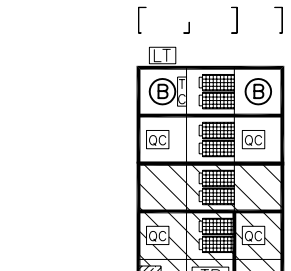

64X48
20mm RGB



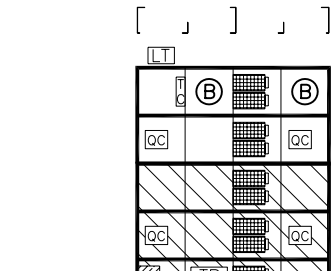

64X64
20mm RGB



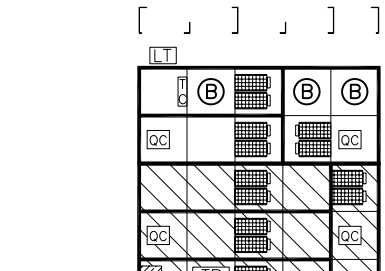

64X80
20mm RGB




80X48
20mm RGB




80X64
20mm RGB




80X80
20mm RGB

NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY INVOLVES THE QUICK CONNECTS. THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 23NOV04 | UPDATED LAYOUT | JJP | |

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF-3400 20MM FRONT VENTILATION

TITLE: LAYOUT, AF-3400-64/80x48/64/80-20-RGB

DES. BY: WTUCKER DRAWN BY: JPOMMER DATE: 23NOV04

REVISION 01 APPR. BY:

SCALE: 1=50

1321-E10A-212195

FAN Ⓑ 0A-1327-3500 (64/80) HIGH, FULL BAY
0A-1327-3501 (64/80) HIGH, HALF BAY

THERMOSTAT [TC] 0A-1327-3101

1 POWER SUPPLY 0A-1327-0005

2 POWER SUPPLIES 0A-1327-0006

POWER TERM PANEL [TP 2] 0A-1327-0101 (2)CIRCUIT

CONTROLLER **(PRIMARY ONLY) [C] 0A-1229-0013

MODULE 12.48" X 12.48"
16 PIXEL X 16 PIXEL
20MM C-C / 0.78" C-C

DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT [QC] 0A-1327-1000

PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS [QC] 0A-1327-1010

MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS [QC] 0A-1327-1011

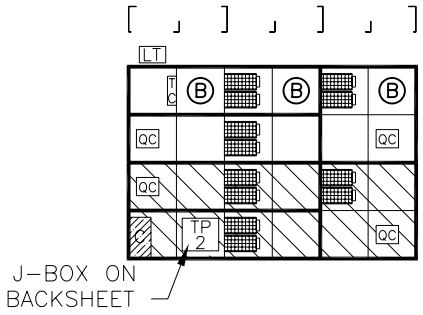
QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE [QC] 0A-1327-1003

LIGHT DETECTOR PRIMARY ONLY [LT] 0A-1327-3003 (64/80) HIGH

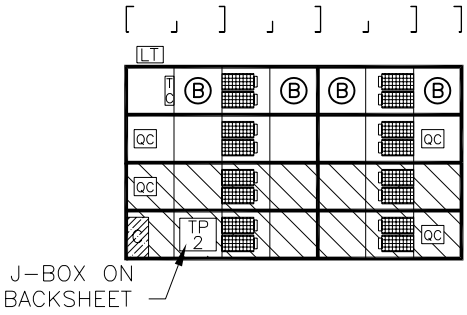
LIGHT DETECTOR BLANK MIRROR ONLY [LT] 0A-1213-4009

AREA POWERED BY Z1 (J41)

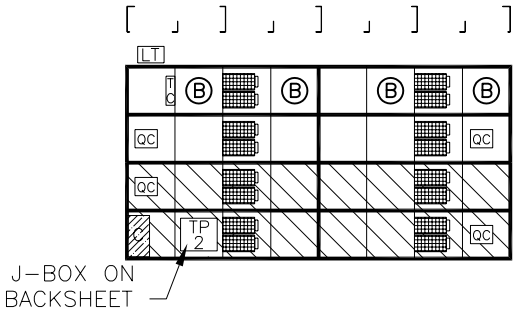
AREA POWERED BY Z2 (J42)



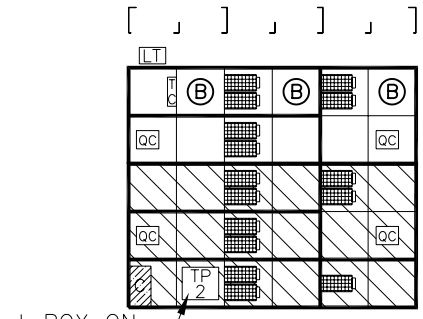

64X96
20mm MONO



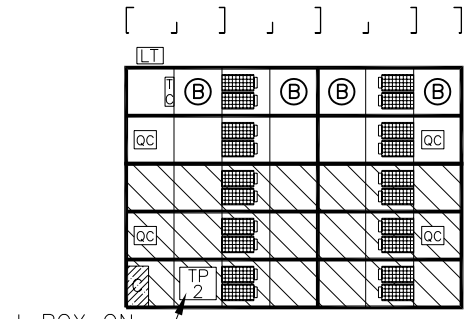

64X112
20mm MONO



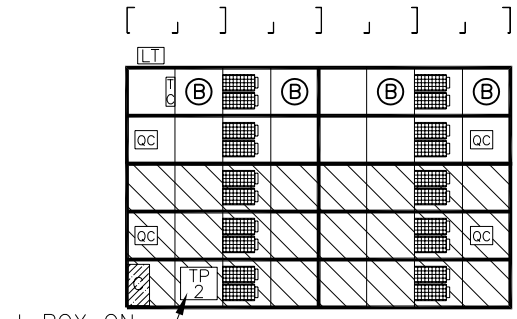

64X128
20mm MONO




80X96
20mm MONO




80X112
20mm MONO




80X128
20mm MONO

NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY IS IN THE QUICK CONNECTS, AND THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 29 NOV 04 | UPDATED LAYOUT. | RTV | |

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF-3400 20 MM FRONT VENTILATION

TITLE: LAYOUT, AF-3400-64/80X96/112/128-20-MONO

DES. BY: WTUCKER DRAWN BY: RVOSS DATE: 22 NOV 04

REVISION 01 APPR. BY:

SCALE: 1 = 50

1321-E10A-212187

| | | |
|---|---|---|
| FAN | Ⓑ | 0A-1327-3500 (64/80) HIGH, FULL BAY<br>0A-1327-3501 (64/80) HIGH, HALF BAY |
| THERMOSTAT | TC | 0A-1327-3101 |
| 1 POWER SUPPLY | | 0A-1327-0001 |
| 2 POWER SUPPLIES | | 0A-1327-0002 |
| POWER FILTER | Z4 | 0A-1327-0201 (4)FILTERS |
| POWER TERM PANEL | TP # | 0A-1327-0101 (2)CIRCUIT<br>0A-1327-0104 (4)CIRCUIT |
| CONTROLLER **(PRIMARY ONLY) | C | 0A-1229-0013 |
| MODULE | | 12.48" X 12.48"<br>16 PIXEL X 16 PIXEL<br>20MM C-C / 0.78" C-C |

DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

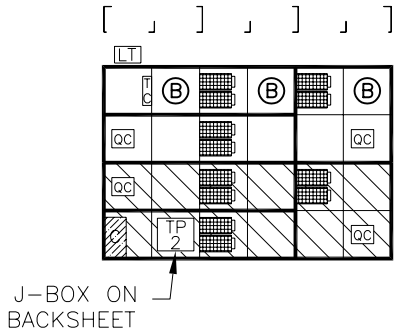
| | | |
|---|---|---|
| PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT | QC | 0A-1327-1000 |
| PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS | QC | 0A-1327-1010 |
| MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS | QC | 0A-1327-1011 |
| QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE | QC | 0A-1327-1003 |
| LIGHT DETECTOR PRIMARY ONLY | LT | 0A-1327-3003 (64/80) HIGH |
| LIGHT DETECTOR BLANK MIRROR ONLY | LT | 0A-1213-4009 |

AREA POWERED BY Z1 (J41)

AREA POWERED BY Z2 (J42)

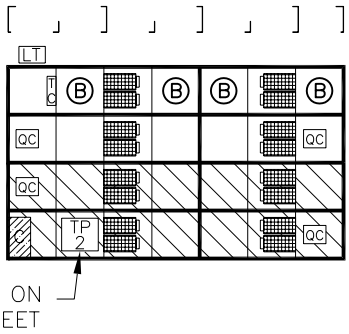
AREA POWERED BY Z3

AREA POWERED BY Z4



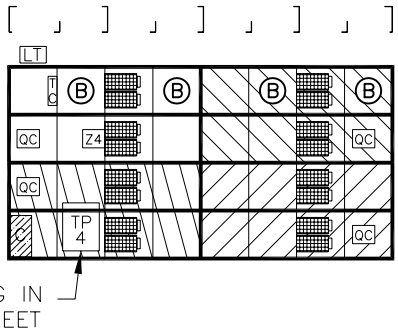

J-BOX ON BACKSHEET

64X96
20mm RGB



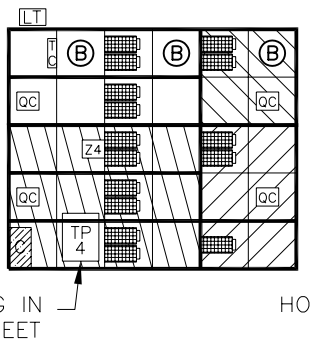

J-BOX ON BACKSHEET

64X112
20mm RGB



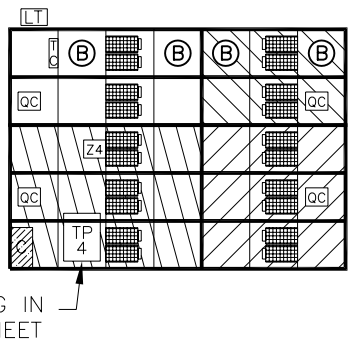

HOLE PLUG IN BACKSHEET

64X128
20mm RGB



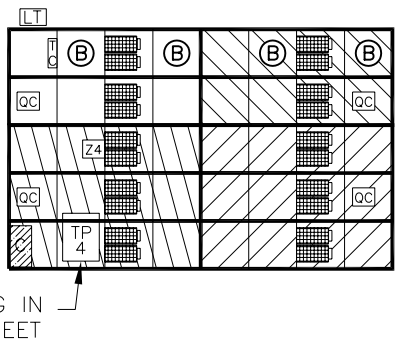

HOLE PLUG IN BACKSHEET

80X96
20mm RGB




HOLE PLUG IN BACKSHEET

80X112
20mm RGB




HOLE PLUG IN BACKSHEET

80X128
20mm RGB

NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY IS IN THE QUICK CONNECTS, AND THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 23NOV04 | UPDATED LAYOUT | JJP | |

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF-3400 20MM FRONT VENTILATION

TITLE: LAYOUT, AF-3400-64/80X96/112/128-20-RGB

DES. BY: WTUCKER DRAWN BY: JPOMMER DATE: 23NOV04

REVISION 01 | APPR. BY: | SCALE: 1=50

1321-E10A-212198

| | | |
|---|---|---|
| FAN | Ⓑ | 0A-1327-3500 (64/80) HIGH, FULL BAY<br>0A-1327-3501 (64/80) HIGH, HALF BAY |
| THERMOSTAT | TC | 0A-1327-3101 |
| 1 POWER SUPPLY | | 0A-1327-0005 |
| 2 POWER SUPPLIES | | 0A-1327-0006 |
| POWER FILTER | Z4 | 0A-1327-0201 (4)FILTERS |
| POWER TERM PANEL | TP # | 0A-1327-0101 (2)CIRCUIT<br>0A-1327-0104 (4)CIRCUIT |
| CONTROLLER **(PRIMARY ONLY) | C | 0A-1229-0013 |
| MODULE | | 12.48" X 12.48"<br>16 PIXEL X 16 PIXEL<br>20MM C-C / 0.78" C-C |

DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

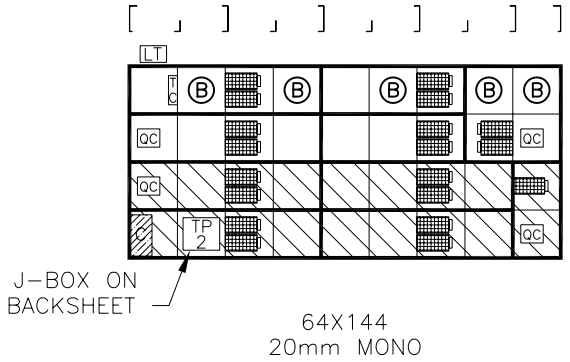
| | | |
|---|---|---|
| PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT | QC | 0A-1327-1000 |
| PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS | QC | 0A-1327-1010 |
| MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS | QC | 0A-1327-1011 |
| QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE | QC | 0A-1327-1003 |
| LIGHT DETECTOR PRIMARY ONLY | LT | 0A-1327-3003 (64/80) HIGH |
| LIGHT DETECTOR BLANK MIRROR ONLY | LT | 0A-1213-4009 |

AREA POWERED BY Z1 (J41)

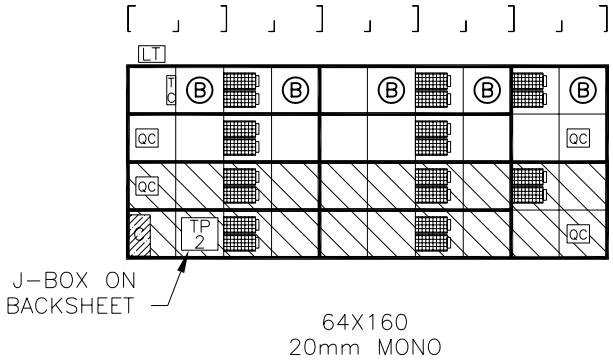
AREA POWERED BY Z2 (J42)

AREA POWERED BY Z3

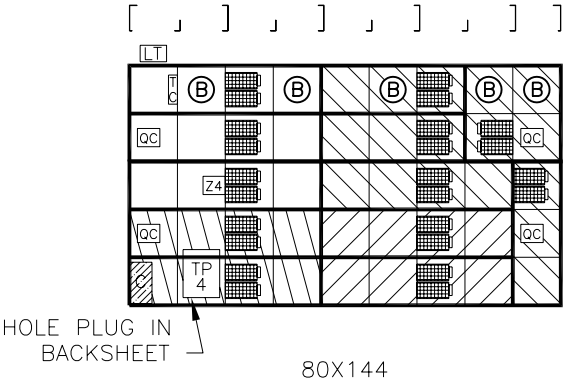
AREA POWERED BY Z4



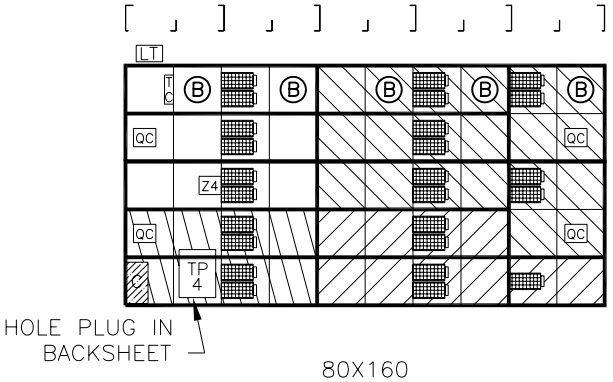

64X144
20mm MONO




64X160
20mm MONO




80X144
20mm MONO




80X160
20mm MONO

NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY IS IN THE QUICK CONNECTS, AND THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 29 NOV 04 | UPDATED LAYOUT. | RTV | |

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF-3400 20 MM FRONT VENTILATION

TITLE: LAYOUT, AF-3400-64/80X144/160-20-MONO

DES. BY: WTUCKER DRAWN BY: RVOSS DATE: 23 NOV 04

REVISION 01 APPR. BY:

SCALE: 1 = 50

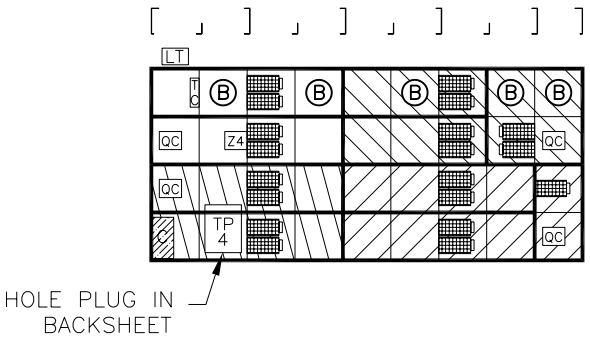
1321-E10A-212189

| | | |
|---|---|---|
| FAN | Ⓑ | 0A-1327-3500 (64/80) HIGH, FULL BAY<br>0A-1327-3501 (64/80) HIGH, HALF BAY |
| THERMOSTAT | TC | 0A-1327-3101 |
| 1 POWER SUPPLY | | 0A-1327-0001 |
| 2 POWER SUPPLIES | | 0A-1327-0002 |
| POWER FILTER | Z# | 0A-1327-0200 (2)FILTERS<br>0A-1327-0201 (4)FILTERS |
| POWER TERM PANEL | TP # | 0A-1327-0104 (4)CIRCUIT<br>0A-1327-0105 (6)CIRCUIT |
| CONTROLLER **(PRIMARY ONLY) | C | 0A-1229-0013 |
| MODULE | | 12.48" X 12.48"<br>16 PIXEL X 16 PIXEL<br>20MM C-C / 0.78" C-C |

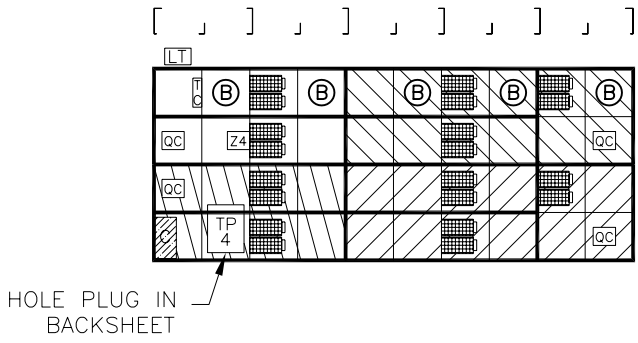
DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

| | | |
|---|---|---|
| PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT | QC | 0A-1327-1000 |
| PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS | QC | 0A-1327-1010 |
| MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS | QC | 0A-1327-1011 |
| QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE | QC | 0A-1327-1003 |
| LIGHT DETECTOR PRIMARY ONLY | LT | 0A-1327-3003 (64/80) HIGH |
| LIGHT DETECTOR BLANK MIRROR ONLY | LT | 0A-1213-4009 |

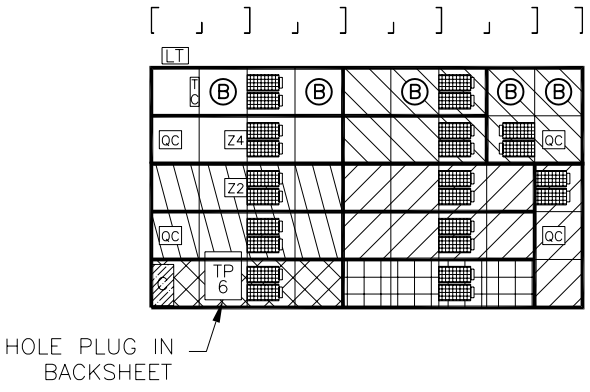
- AREA POWERED BY Z1 (J41)
- AREA POWERED BY Z2 (J42)
- AREA POWERED BY Z3
- AREA POWERED BY Z4
- AREA POWERED BY Z5
- AREA POWERED BY Z6



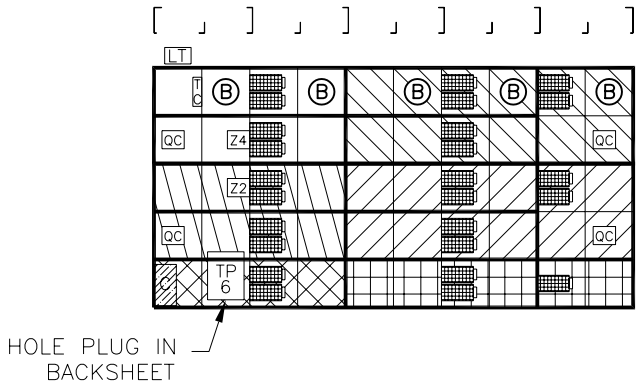

64X144
20mm RGB




64X160
20mm RGB




80X144
20mm RGB




80X160
20mm RGB

NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY IS IN THE QUICK CONNECTS, AND THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 23NOV04 | UPDATED LAYOUT | JJP | |

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF-3400 20MM FRONT VENTILATION

TITLE: LAYOUT, AF-3400-64/80X144/160-20-RGB

DES. BY: WTUCKER DRAWN BY: JPOMMER DATE: 23NOV04

REVISION 01 | APPR. BY: | SCALE: 1=50

1321-E10A-212200

| | | |
|---|---|---|
| FAN | Ⓑ | 0A-1327-3500 (64/80) HIGH, FULL BAY<br>0A-1327-3501 (64/80) HIGH, HALF BAY |
| THERMOSTAT | TC | 0A-1327-3101 |
| 2 POWER SUPPLIES | | 0A-1327-0006 |
| POWER FILTER | Z4 | 0A-1327-0201 (4)FILTERS |
| POWER TERM PANEL | TP # | 0A-1327-0101 (2)CIRCUIT<br>0A-1327-0104 (4)CIRCUIT |
| CONTROLLER **(PRIMARY ONLY) | C | 0A-1229-0013 |
| MODULE | | 12.48" X 12.48"<br>16 PIXEL X 16 PIXEL<br>20MM C-C / 0.78" C-C |

DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

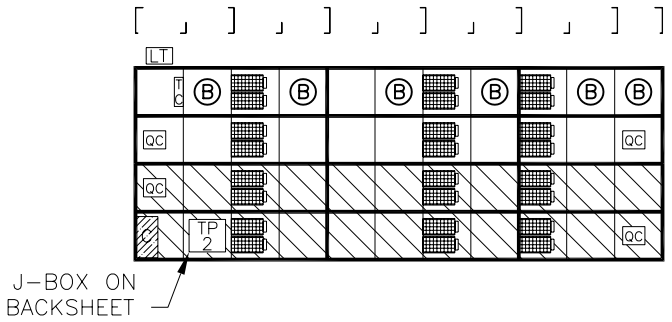
| | | |
|---|---|---|
| PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT | QC | 0A-1327-1000 |
| PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS | QC | 0A-1327-1010 |
| MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS | QC | 0A-1327-1011 |
| QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE | QC | 0A-1327-1003 |
| LIGHT DETECTOR PRIMARY ONLY | LT | 0A-1327-3003 (64/80) HIGH |
| LIGHT DETECTOR BLANK MIRROR ONLY | LT | 0A-1213-4009 |

AREA POWERED BY Z1 (J41)

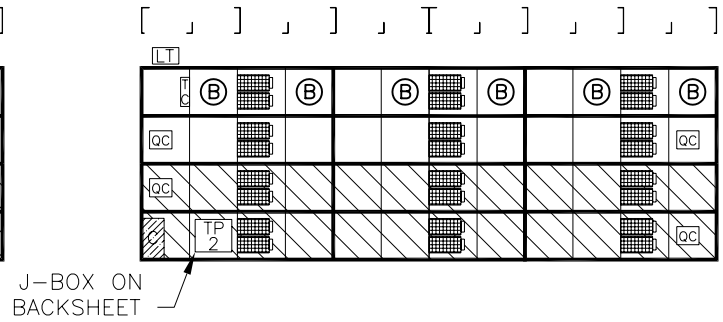
AREA POWERED BY Z2 (J42)

AREA POWERED BY Z3

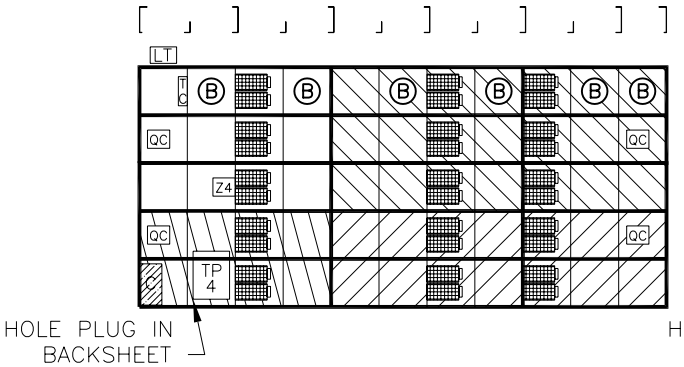
AREA POWERED BY Z4



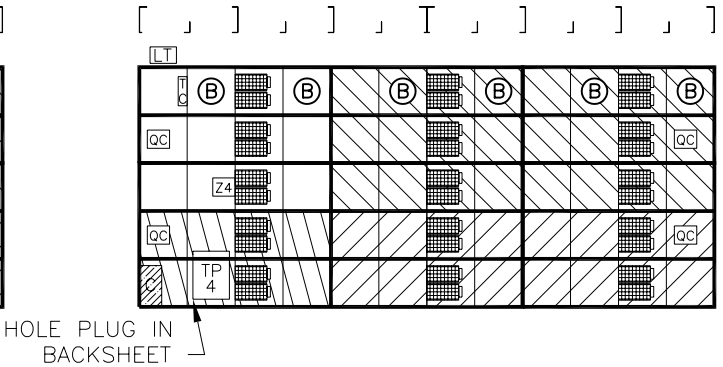

64X176
20mm MONO




64X192
20mm MONO




80X176
20mm MONO




80X192
20mm MONO

NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY IS IN THE QUICK CONNECTS, AND THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 29 NOV 04 | UPDATED LAYOUT. | RTV | |

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF-3400 20 MM FRONT VENTILATION

TITLE: LAYOUT, AF-3400-64/80X176/192-20-MONO

DES. BY: WTUCKER DRAWN BY: RVOSS DATE: 23 NOV 04

REVISION 01 APPR. BY:

SCALE: 1 = 50

1321-E10A-212193

FAN Ⓑ 0A-1327-3500 (64/80) HIGH, FULL BAY
0A-1327-3501 (64/80) HIGH, HALF BAY

THERMOSTAT TC 0A-1327-3101

2 POWER SUPPLIES 0A-1327-0002

POWER FILTER Z# 0A-1327-0200 (2)FILTERS
0A-1327-0201 (4)FILTERS

POWER TERM PANEL TP # 0A-1327-0104 (4)CIRCUIT
0A-1327-0105 (6)CIRCUIT

CONTROLLER **(PRIMARY ONLY) C 0A-1229-0013

MODULE 12.48" X 12.48"
16 PIXEL X 16 PIXEL
20MM C-C / 0.78" C-C

DARK GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A SINGLE OR DOUBLE UNIT OF POWER SUPPLIES.

PRIMARY QUICK CONNECT LEFT LOWER LEFT CORNER CUTOUT QC 0A-1327-1000

PRIMARY QUICK CONNECT RIGHT ALL RIGHT SIDE CUTOUTS QC 0A-1327-1010

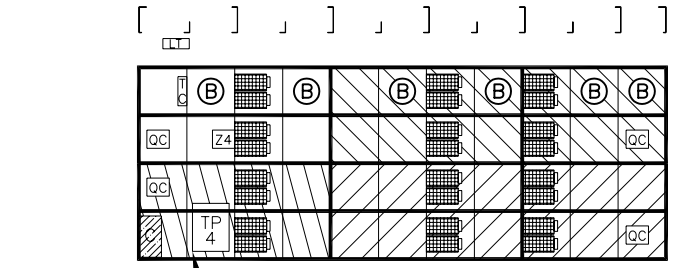
MIRROR QUICK CONNECT LEFT ALL LEFT SIDE CUTOUTS QC 0A-1327-1011

QUICK CONNECT BLANK CUTOUTS NOT FILLED BY ABOVE QC 0A-1327-1003

LIGHT DETECTOR PRIMARY ONLY LT 0A-1327-3003 (64/80) HIGH

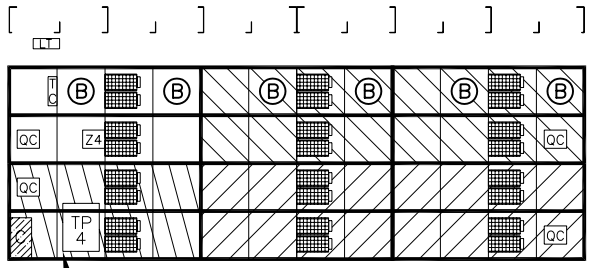
LIGHT DETECTOR BLANK MIRROR ONLY LT 0A-1213-4009

AREA POWERED BY Z1 (J41)
AREA POWERED BY Z2 (J42)
AREA POWERED BY Z3
AREA POWERED BY Z4
AREA POWERED BY Z5
AREA POWERED BY Z6



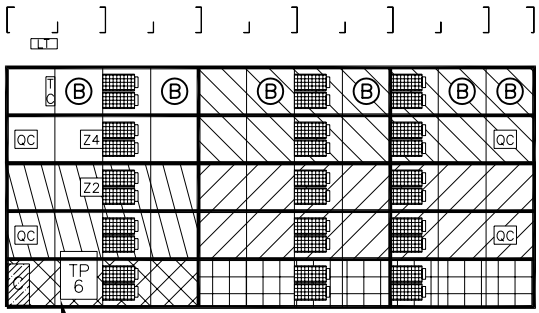

HOLE PLUG IN BACKSHEET

64X176
20mm RGB



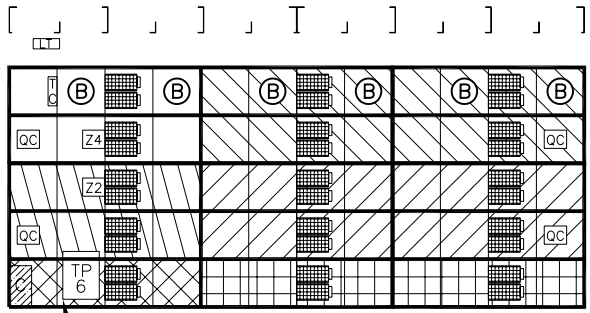

HOLE PLUG IN BACKSHEET

64X192
20mm RGB




HOLE PLUG IN BACKSHEET

80X176
20mm RGB




HOLE PLUG IN BACKSHEET

80X192
20mm RGB

NOTE: THE DIFFERENCE BETWEEN A MIRROR AND A PRIMARY DISPLAY IS IN THE QUICK CONNECTS, AND THE PRIMARY HAS A CONTROLLER WHILE THE MIRROR DOES NOT. SEE ABOVE LEGENDS FOR ASSY NUMBERS.

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|
| 01 | 23NOV04 | UPDATED LAYOUT | JJP | |

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF-3400 20MM FRONT VENTILATION

TITLE: LAYOUT, AF-3400-64/80X176/192-20-RGB

DES. BY: WTUCKER DRAWN BY: JPOMMER DATE: 23NOV04

REVISION 01 APPR. BY: SCALE: 1=50

1321-E10A-217686

# Appendix B: Temperature Sensor Installation

# Optional Temperature Sensor Mounting



**For Galaxy displays only**

**Reference Drawings:**

Temperature Sensor Cable Routing Schematic ..... **Drawing A-197884**
Exploded Temperature Housing Assembly..... **Drawing A-198371**

## 1.1 Temperature Sensor Overview

The temperature sensor enclosure is made up of eight plastic disks, a metal mounting bracket, and a 25-foot weather resistant cable. Refer to **Figure 1**.

In most cases, the enclosure will be mounted using two screws. The cable will be plugged into the back of the display.

In certain cases, it may be necessary to disassemble the enclosure or rewire the temperature sensor board. Instructions are provided for those situations. If replacement or additional parts are needed, refer to the following chart for part numbers.

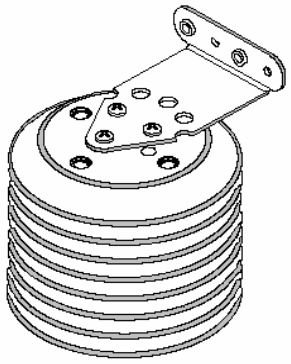


***Figure 1:*** *Temperature Sensor*

| Parts List | |
|---|---|
| **Part description** | **Daktronics part number** |
| Temperature sensor housing | 0A-1151-0005 |
| Temperature sensor | 0P-1247-0008 |
| 4-pin Mal Conxall cable | W-1819 |
| 22 AWG 2-pair shielded cable | W-1234 |
| 30-foot extension cable | W-1820 |
| 100-foot extension cable | W-1821 |
| 200-foot extension cable | W-1822 |

## 1.2 Mounting Locations

For greater accuracy of temperature, follow these mounting recommendations:

- An ideal location is under a north eave or on a northern exposure away from direct sunlight (**Figure 4**).
- Mount the sensor above grass or vegetation rather than concrete or other paving.
- Mount at least 20 feet away from chimneys, vents, air conditioners, or other items that would influence correct temperature readings.
- **Do not** mount between displays or in any location that restricts air movement.
- Mount the sensor so that the cable can be protected from weather and vandalism.

The most common locations for the temperature sensor are on the display cabinet (**Figure 2**), or on the display structure (**Figure 3**). A light-colored display is preferred in this location. Location of the sensor should be below or on a northern edge of the display to keep the sensor shaded.

***Figure 2:*** *Located on the Display*

***Figure 3:*** *Located on Structure*

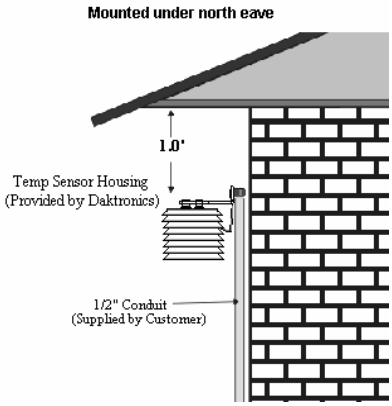



***Figure 4:*** *Located on the North Eave*

When exposed to outdoor conditions, it is necessary to route cable through conduit. In cases such as this, the quick-connect cable must be extended or replaced with four-conductor, 22-AWG, shielded cable. The maximum length of the cable should be no more than 500 feet.

### Mounting to a sheet metal surface

Follow these instructions when mounting the sensor to a sheet metal surface:

1. Drill two pilot holes using a 5/32″ drill bit. Horizontally space the holes 1.5″ apart.
2. Insert two self-drilling screws through the holes of the mounting bracket, and screw into the pilot holes.
3. Route cable up to the quick-connect jack on the back of the display and plug into J31. Refer to **Section 1.3** for an example of connection.

## 1.3 Temperature Signal Connection

Three options for signal connection are explained in this section:

- Using the 25-foot quick-connect cable.
- Using the quick-connect cable but less than 25 feet.
- Using more than 25-feet including extension cables or 22 AWG shielded cable.

### Using the provided 25-foot quick-connect cable

1. The temperature sensor is provided with a 25-foot weather-resistant cable. This cable does not need to be in conduit. The sensor connects to the display at J31. Refer to **Figure 5** for the location of the quick-connect plug.
2. Secure any excess cable to discourage vandalism.
3. Between displays, the quick-connect signal cable connects both communication and temperature signal, thus no additional wiring is required from display to display for the temperature sensor.

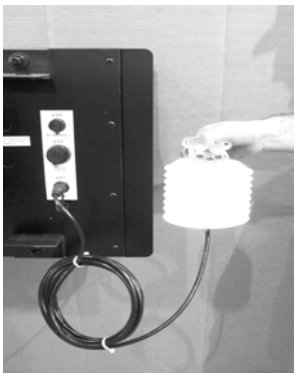


***Figure 5:*** *Quick-connect Cable*

## Using the quick-connect cable and less than the 25-foot cable

1. Open the temperature sensor housing by removing the four nuts from the bottom and then removing the five bottom disks. Refer to **Drawing A-198371** for details on sensor housing disassembly.
2. Disconnect the quick-connect CAN temperature sensor cable from the temperature terminal block in the CAN temperature sensor housing.
3. Cut the cable to the desired length and reattach to the temperature sensor terminal block in the CAN temperature sensor housing. Refer to the table and **Figure 6** for the temperature sensor wiring.
4. Make sure to route cable around the sensor board as shown in **Figure 7** and **Drawing A-197884**.
5. Reconnect the cable and reassemble the sensor.

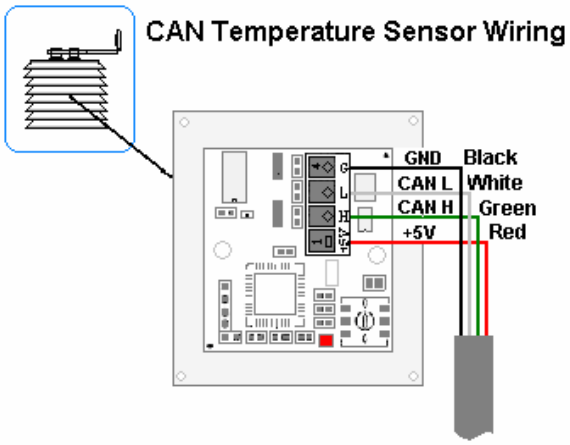



***Figure 6:*** *CAN Temperature Sensor Wiring*

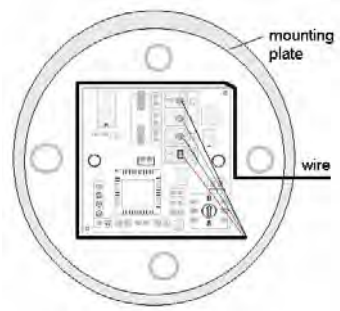



***Figure 7:*** *Wiring Around Sensor*

| Wire Color | Temperature Sensor Terminal Block (TB1) |
|---|---|
| Red | +5V CAN (Pin 1) |
| Green | CANH (Pin 2) |
| White | CANL (Pin 3) |
| Black | GND (Pin 4) |
| ***Note:** Do not terminate shield at this point. | |

## Using more than 25-feet of cable

To meet customer needs, Daktronics has designed extension cables that allow extra length from the sensor to the display without separate rewiring. These cables contain the correct circular ends to be used with the quick-connect cable and quick-connect input. Refer to the parts list in **Section 1.1** for the cable options available.

If 22 AWG shielded cable is used instead of the cable extensions, follow these steps:

1. Run 1/2" conduit from the temperature sensor to a knockout on the back of the primary display. The cable must be routed through 1/2" metal conduit that should be earth-grounded to protect the sensor and controller from lightning damage.
2. Use a 2-pair 22 AWG individually shielded cable to connect the sensor to the 8-position terminal block in the display labeled "CAN US/DS" (A31/TB4). Connect to the controller as shown in **Figure 8**.
3. Open the temperature sensor housing by removing the four nuts from the bottom and then removing the five bottom disks. Refer to **Drawing A-198371** for details on sensor housing disassembly.
4. Disconnect the quick-connect temperature sensor cable from the terminal block in the temperature sensor housing.
5. Connect the cable coming from the display's terminal block to the temperature sensor board in the temperature sensor housing. Refer to **Figure 8** and table below for wiring locations at the sensor and to the controller.
6. Make sure to route cable around the sensor board as shown in **Drawing A-197884**. Connect the cable and reassemble the sensor. Refer to **Figure 8** and to the table below for the temperature sensor wiring.

**Note: The cable length from the sensor to the display should not exceed 500 feet.**

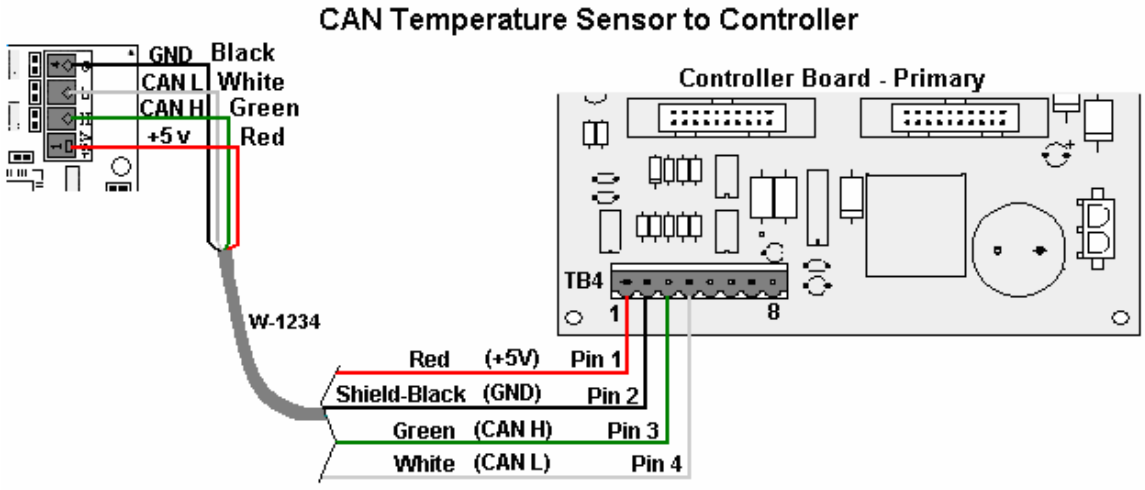



***Figure 8:*** *CAN Temperature Sensor Connection*

| CAN Temperature Sensor (TB1) | Field Cabling | Primary - Controller Board CAN US (A31-TB4) |
|---|---|---|
| Pin 1 (+5V CAN) | Red | Pin 1 (+5V CAN) |
| Pin 2 (CAN H) | Green | Pin 3 (CAN H) |
| Pin 3 (CAN L) | White | Pin 4 (CAN L) |
| Pin 4 (GND CAN) | Black | Pin 2 (GND CAN) |
| | Shield | Pin 2 (Shield) |

## 1.4 Temperature Interconnection Between Displays

If the display uses the quick-connect interconnect cable, this connection is already complete.

If the interconnect cable was not used, a 4-conductor shielded cable is needed to terminate the temperature sensor from side one to side two. One end terminates at the "CAN US/DS" 8-position terminal block (A31-TB4) on the Primary display. The other end terminates at the "CAN US/DS" 8-position terminal block (A31-TB4) at the second Primary display. Refer to **Figure 9** and the table for correct interconnect locations.

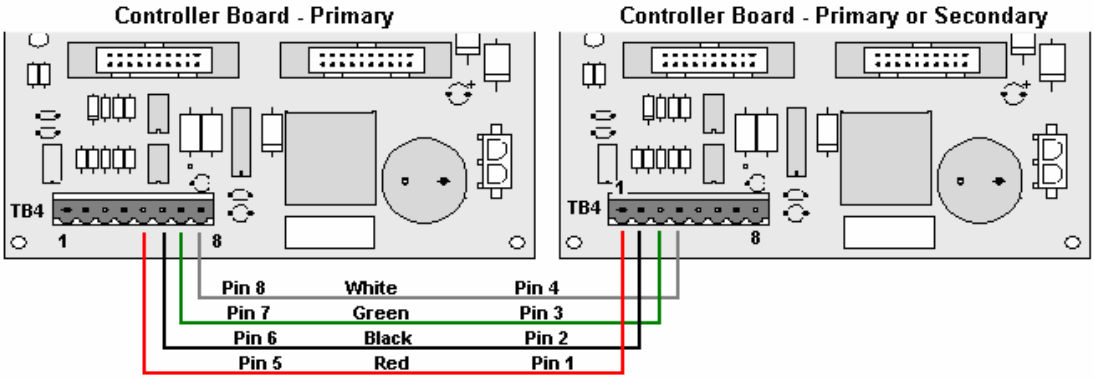



***Figure 9:*** *CAN Controller Interconnect*

| Primary - CAN DS (A31-TB4) | Field Cabling | Secondary - CAN US (A31-TB4) |
|---|---|---|
| Pin 7 (CAN H) | Green | Pin 3 (CAN H) |
| Pin 8 (CAN L) | White | Pin 4 (CAN L) |
| Pin 6 (GND CAN) | Black | Pin 2 (GND CAN) |
| Pin 5 (Relay) | Red | Pin 1(CAN +5V) |
| | Shield | |

## 1.5 Sensor Board Replacement

If a problem occurs with the temperature sensor board or the wiring to the sensor, the board can be accessed in the following method:

1. Open the temperature sensor housing by removing the four nuts from the bottom, and removing the five bottom disks. Refer to **Figure 10** or **Drawing A-198371** for details on sensor housing disassembly.
2. Label the wires connected to the temperature sensor board and then disconnect the cable from the temperature sensor terminal block in the temperature sensor housing.
3. Remove the two screws holding the board to the plastic disk. Install the new board, and replace the two screws.
4. Reconnect the cable to the temperature sensor board, making sure all the wire make a good electrical connection.
5. Make sure to route cable around the sensor board as shown in **Drawing A-197884**, and reassemble the sensor enclosure.

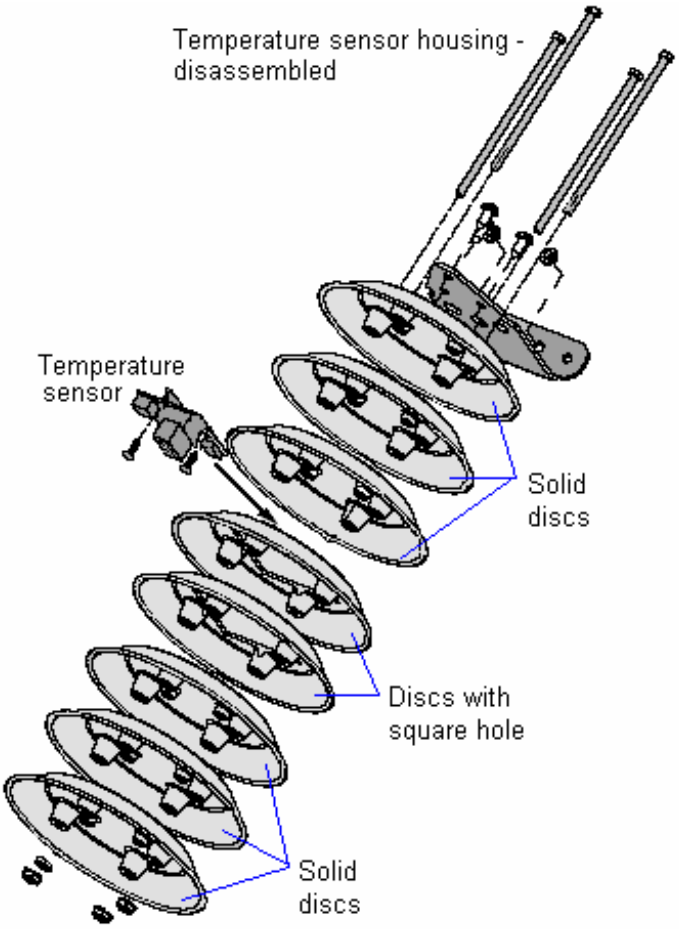
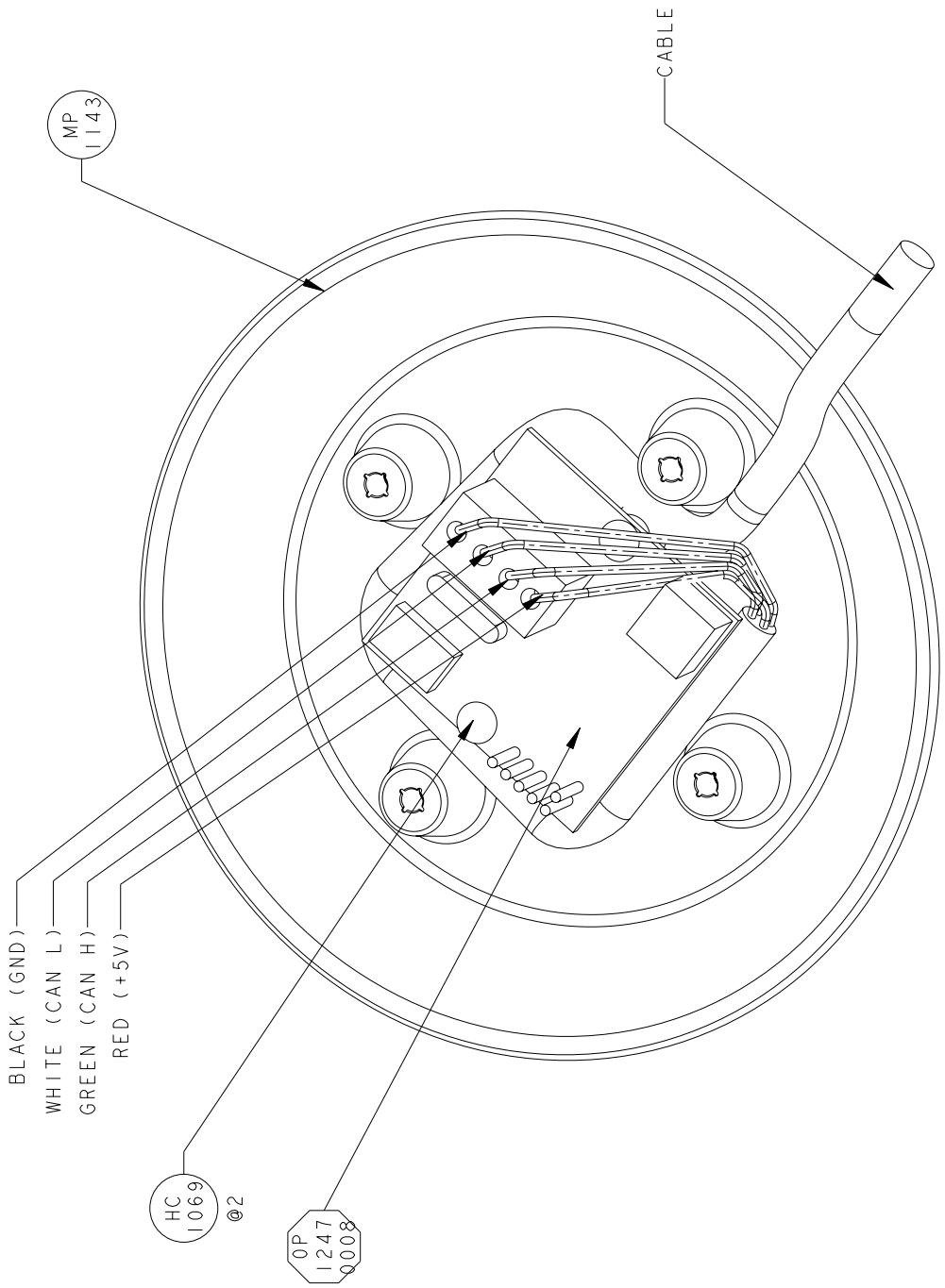



**Figure 10:** *Temperature Sensor Housing Disassembled*




**ASSEMBLY INSTRUCTIONS:**

ATTACH PC BOARD TO MP-1143 W/ HC-1069.
STRIP JACKET OF W-1819 2". STRIP INSULATION
OF INDIVIDUAL WIRES APPROXIMATELY 1/4".
INSERT WIRES INTO TERMINALS AS SHOWN & TIGHTEN.
ROUTE CABLE AS SHOWN.

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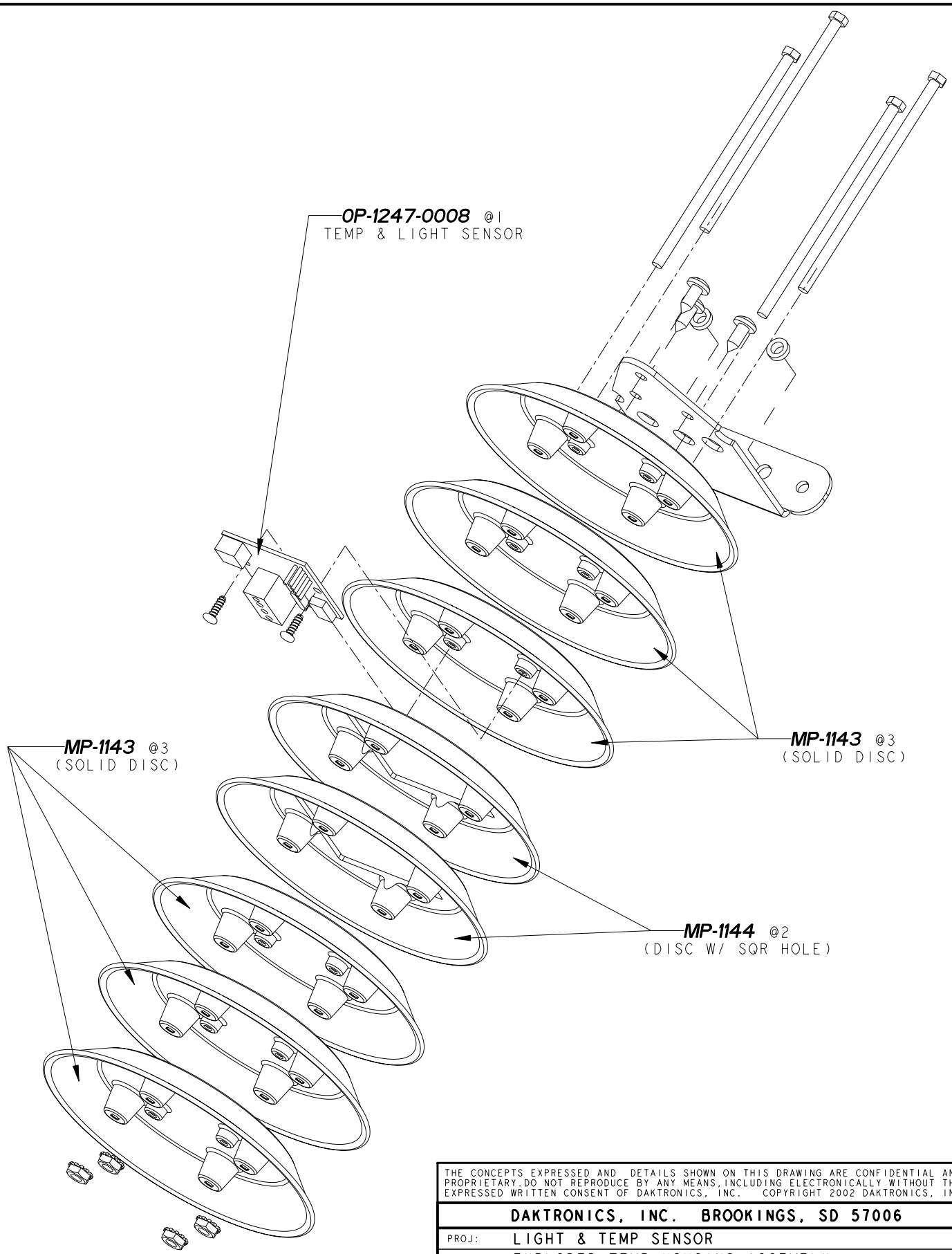
| | |
|---|---|
| | DAKTRONICS, INC. BROOKINGS, SD 57006 |
| PROJ: | LIGHT & TEMP SENSORS |
| TITLE: | TEMP SENSOR CABLE ROUTING SCHEMATIC |
| DES. BY: KMILLER | DRAWN BY: KMILLER DATE: 030CT03 |
| REVISION | SHEET 1 OF DWG 197884 |
| | SCALE: 1=1 |

1151-E10A-197884

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|

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DAKTRONICS, INC. BROOKINGS, SD 57006

| | |
|---|---|
| PROJ: | LIGHT & TEMP SENSOR |
| TITLE: | EXPLODED TEMP HOUSING ASSEMBLY |
| DES. BY: | KMILLER |
| DRAWN BY: | KMILLER |
| DATE: | 14OCT03 |
| REVISION | SHEET 1 OF DWG 198371 |
| SCALE: | 1=3 |

1151-E10A-198371

| REV. | DATE | DESCRIPTION | BY | APPR. |
|---|---|---|---|---|

# Appendix C: Daktronics Warranty and Limitation of Liability (SL-02374)