

**Galaxy AF-3300 Series
Outdoor LED Display**

Display Manual

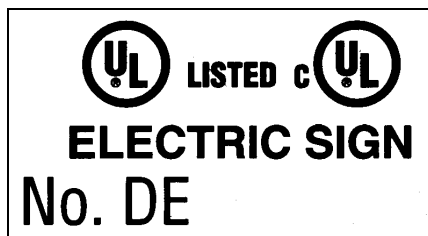
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DAKTRONICS, INC.

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Section 1: Introduction

This manual explains the installation, maintenance, and troubleshooting of Daktronics Galaxy® AF-3300 series LED displays. For questions regarding the safety, installation, operation, or service of this system, please refer to the telephone numbers listed on the cover page of this manual.

The manual is divided into six sections: Introduction, Mechanical Installation, Electrical Installation, Maintenance and Troubleshooting, Appendix A and Appendix B.

- **Introduction** covers the basic information needed to make the most of the rest of this manual – take time to read the entire introduction as it defines terms and explains concepts used throughout the manual
- **Mechanical Installation** provides general guidance on display mounting
- **Electrical Installation** gives general guidance on terminating power and signal cables at the display
- **Maintenance and Troubleshooting** addresses such things as removing basic display components, troubleshooting the display, performing general maintenance, and exchanging display components
- **Appendix A** lists the drawings referenced within this manual
- **Appendix B** includes information on the Optional Temperature Sensor

Daktronics identifies manuals by an ED number located on the cover page of each manual. For example, this manual would be referred to as **ED-15507**.

Listed below are a number of drawing types commonly used by Daktronics, along with the information that each is likely to provide. This manual might not contain all of these drawings:

- **Shop Drawings:** Fan locations, mounting information, power and signal entrance points, and access method (front and rear)
- **Schematics:** Power and signal wiring for various components
- **Component Placement Diagrams:** Locations of critical internal display components, such as power supply assemblies, controller boards, thermostats, and light detectors

Figure 1 illustrates the Daktronics drawing label. The drawing number is located in the lower-right corner of the drawing. Listing the last set of digits and the letter preceding them identifies drawings in the manual. In the example below, the drawing would be referred to as **Drawing B-222544**. Reference drawings are inserted in **Appendix A**.

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:			
TITLE: SHOP DWG, AF-3300-48X64-12-RGB, 32X80-20-R			
DES. BY: MMAMMENGA		DRAWN BY: MMAMMENGA	
DATE: 31AUG04			
REVISION:	APPR. BY:	1338-E10 B-222544	
04	SCALE: 1=20		

Figure 1: Drawing Label

All references to drawing numbers, appendices, figures, or other manuals are presented in **bold** typeface, as shown below.

“Refer to **Drawing B-222544** in **Appendix A** for the display power requirements.”

Additionally, drawings referenced in a particular section are listed at the beginning of that section as seen in the following example:

Reference Drawing:

Shop Dwg, AF-3300-48x34-12-RGB, 32x80-20-R **Drawing B-222544**

Daktronics displays are built for long life and require little maintenance. However, from time to time, certain display components will need replacing. The **Replacement Parts List** in **Section 4.12** provides the names and numbers of components that may need to be ordered during the life of the display. Most display components have a white label that lists the part number. The component part number is in the following format: OP-____-____ (component) or OA-____-____ (multi-component assembly).

Following the **Replacement Parts List** is the **Daktronics Exchange and Repair and Return Programs** in **Section 4.13**. Refer to these instructions if any display component needs replacement or repair.

1.1 Safety Precautions

Important Safeguards:



1. Read and understand these instructions before installing
2. Be sure the display and external signal enclosures are properly grounded with an earth ground electrode at the display
3. Disconnect power when servicing the display
4. **Do not** modify the display structure or attach any panels or coverings to the display without the written consent of Daktronics, Inc

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

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

1.2 Network Concepts

The concept of using LED displays as a cost effective, high impact method of communication is rapidly growing throughout many industries and businesses. The reasons for this growth are many, but the need for additional features and the complexity of multiple display installations has emerged. Daktronics display systems have been designed to meet those needs.

The common thread to most client requests is a means of programming and controlling a group of displays from a central control point. Daktronics responded by developing a powerful system of interconnecting and controlling displays. Great care has been taken to design products that will satisfy a wide variety of installations. Some of the design goals of these systems include the following:

- Easy transfer of messages
- The ability to tell a display or group of displays in the network which message should run
- The ability to determine the status of any display on the network
- The ability to control multiple display technologies on the same network

1.3 Display Overview

Reference Drawing:

Shop Dwg, AF-3300-48x48-12-RGB, 32x48-20-R **Drawing B-241264**

Shop Dwg, AF-3300-48x64-12-RGB, 32x80-20-R **Drawing B-240560**

Daktronics, AF-3300 Galaxy[®] displays are designed and manufactured for performance, reliability, easy maintenance, and long life. A light sensor on the front of the primary display is used for automatic dimming of the LEDs based on the ambient light levels.

The Daktronics AF-3300 display contains two separate LED matrices. The pixels have either a 12 mm or a 20 mm center-to-center spacing, and are lit using LEDs (light emitting diodes). Although the matrices are different sizes and have different color capacities, a single controller provides signal to the display.

The Galaxy[®] model numbers are described as follows:

AF-3300-RR x CC-12-RGB/RR x CC-20-R

AF-3300	=	Outdoor Louvered Galaxy Display
RR	=	Number of Rows High
CC	=	Number of Columns Long
12/20	=	12 mm/20 mm pixel to pixel spacing
RGB/R	=	Color Capability-RGB (32,000 colors), R-Monochrome Red

Refer to appropriate shop drawing for your display for the approximate size, weight, and power requirements for your display.

Refer to **Sections 4.2 and 4.3** for the summaries of how signal and power are routed through the displays.

1.4 Component Identification

The following illustrations depict some of the more commonly accessed Galaxy[®] display components.

This is only a brief overview. Refer to **Section 4** for additional information on maintaining the various display components.

Controller: The display’s controller is the “brains” of the display (refer to **Figure 2**). The controller receives, translates, and activates the signal information from the computer to the appropriate pixels on the display.

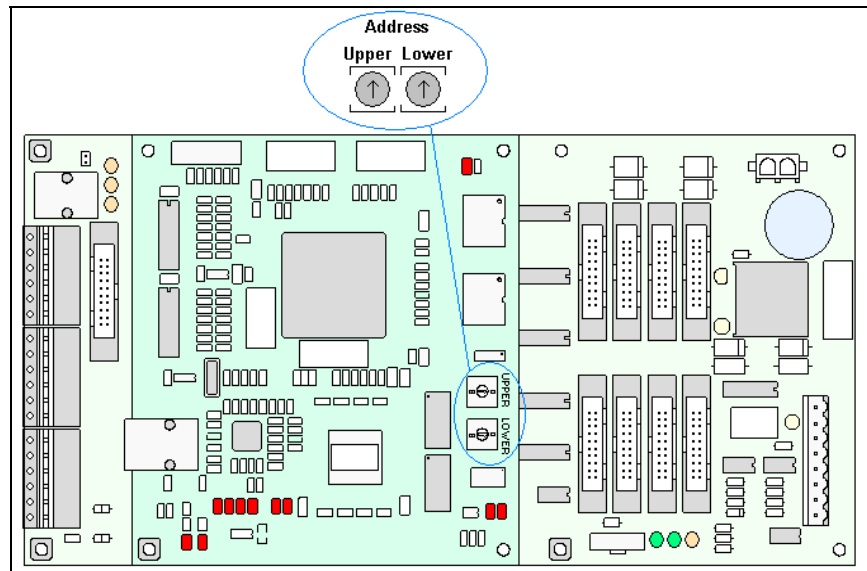


Figure 2: Version 3 Controller

Display Address: The display address is an identification number assigned to each display of a network. Rotating the address switches on the controller sets the display address. The control software uses the address to locate and communicate with each display. Displays that are on the same network cannot have the same address.

Driver/Pixel Board: For the 20 mm pixel boards, the LEDs are mounted directly onto the driver/pixel board. In the case of the 12 mm boards, there is a separate LED board and a separate driver that attaches to it. The driver board, whether separate or built-in, is responsible for the switching and intensity levels of the LEDs.

Galaxy[®]: Daktronics trademarked name for LED monochrome, tri-colored, or RGB matrix displays.

LED (light emitting diode): This is a low energy, high intensity lighting unit.

Louver: Black plastic shade positioned horizontally above each pixel row. The louvers increase the level of contrast on the display face and direct LED light.

Mirror: A mirror display is the second display in a Primary-Mirror or Double-Face configuration. The mirror display **does not** have a controller. All signal information to the mirror is received through a signal interconnect cable from the primary.

Module: There are two types of modules in the AF-3300, 12 mm RGB and 20 mm monochrome red. Each is individually removable from the front of the display.

Module Latch Assembly: This is a device utilizing a sliding retainer bar to hold the module firmly to the display frame. There are two latches on the 12 mm modules (refer to **Figure 3**) and four latches on the 20 mm modules (refer to **Figure 4**). A $\frac{1}{8}$ " Hex wrench is used to turn the different latches.



Figure 3: 12 mm 2-point latches



Figure 4: 20 mm 4-point latches

Network: A network consists of multiple displays connected to each other. Up to 240 primary displays can exist on one network.

Pixel: A pixel is a single LED or cluster of LEDs. The number and color of the LEDs depends on display application.

Power Supply: Converts AC line voltage from the load center to low DC voltage for one or more module driver boards.

Primary: A primary display is a signal-faced unit or the first display in a Primary-Mirror or Double-Face configuration. The communication and temperature sensor input will be connected to this display. The light sensor is also internally mounted in this display. An interconnect cable will transfer information from the primary to the mirror display in the Double-Face configuration.

1.5 Daktronics Nomenclature

To fully understand some Daktronics drawings, such as schematics, it is necessary to know how various components are labeled in those drawings. This information is also useful when trying to communicate maintenance or troubleshooting efforts.

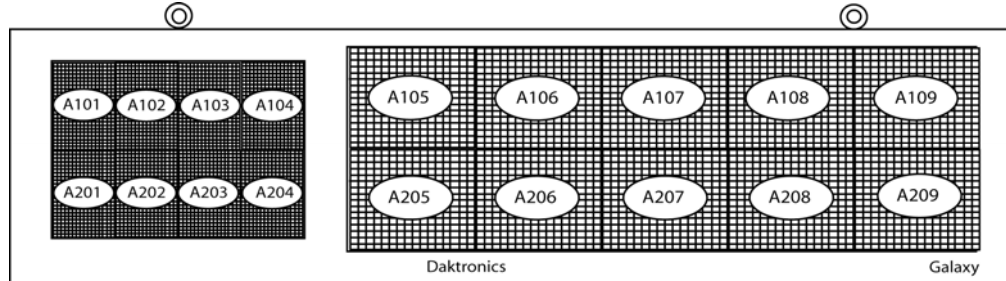


Figure 5: Module Numbering for Reference

A module is the building block of the Galaxy[®] display. The 12 mm modules measure 24 pixels high by 16 pixels wide and the 20 mm modules measure 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. **Figure 5** shows how Daktronics numbers modules on a Galaxy[®] display. **Figure 6** illustrates the module numbering method.

In addition, the following labeling formats might be found on various Daktronics drawings:

- “TB_ _” signifies a termination block for power or signal cable
- “F_ _” represents a fuse
- “E_ _” shows a grounding point
- “J_ _” denotes a power or signal jack
- “P_ _” stands for a power or signal plug for the opposite jack

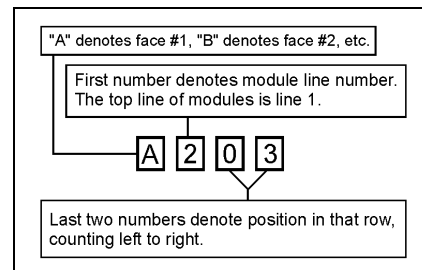


Figure 6: Module Numbering Technique

Finally, Daktronics part numbers are commonly found on drawings. Those part numbers can be used when requesting replacement parts from Daktronics Customer Service. Take note of the following part number formats:

- “0P-____-____” indicates an individual circuit board, such as the internal fiberboard
- “0A-____-____” stands for an assembly, such as a circuit board and the plate or bracket to which it is mounted
- “W-____” represents a wire or cable

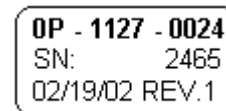


Figure 7: Typical Label

Note: A collection of circuit boards working as a single unit may carry an assembly label. Cables may also carry the assembly numbering format in certain circumstances. This is especially true of ribbon cables.

Most circuit boards and components within this display carry a label that lists the part number of the unit. If a circuit board or assembly is not listed in the **Replacement Parts List** in **Section 4**, use the label to order a replacement. A typical label is shown in **Figure 7**. The part number is in bold.

Section 2: Mechanical Installation

Note: Daktronics does not guarantee the warranty in situations where the display is not constantly in a stable environment.

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. It is the customer's responsibility to ensure that a qualified structural engineer approves the structure and any additional hardware.

2.1 Mechanical Installation Overview

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

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

Read both the mechanical and electrical installation sections of this manual before beginning any installation procedures.

2.2 Support Structure Design

Support structure design depends on the mounting methods, display size, and weight. The structure design is critical and should be done only by a qualified individual. Display height and wind loading are also critical factors. It is the customer's responsibility to ensure that the structure and mounting hardware are adequate.

Daktronics is not responsible for the installations or the structural integrity of support structures done by others.

It is the installer's responsibility to ensure the mounting structure and hardware is capable of supporting the display, and will agree with local codes.

Before beginning the installation process, verify the following:

- All clip angles or mounting holes must be attached to the support structure
- The mounting structure will provide a straight and square-mounting frame for the display
- The mounting structure is capable of supporting the display and will not yield at any unsupported points after mounting
- Clearance: 4" of unobstructed space is available above the top of the display to remove the eyebolt

Note: No clearance is required once the eyebolt is removed.

Correct any deficiencies before installation.

2.3 Ventilation Requirements

Reference Drawing:

Shop Dwg, AF-3300-48x48-12-RGB, 32x48-20-R..... **Drawing B-241264**

Shop Dwg, AF-3300-48x64-12-RGB, 32x80-20-R..... **Drawing B-240560**

Vents are provided in the face of the display for ventilation. Vents and fans draw air into the display at the bottom, and the warm air is expelled out at the top through vents in the front. Both of the intake and exhaust vents run the length of the display and should not be obstructed. Refer to the appropriate **Shop Drawing** for additional information.

The display cabinet may be completely enclosed on the sides and in the back, so long as the vents in the face are not obstructed.

If these requirements are not met, the Galaxy[®] display warranty may be void.

2.4 Lifting the Display

The top of the display is equipped with eyebolts that are used to lift the unit. Take special care to ensure that the rated load of the eyebolts is not exceeded. Refer to the information at the end of this section labeled **Eyebolts** to determine the allowable load of the eyebolts shipped with the display.

Figure 8 illustrates both the correct (left example) and the incorrect (right example) method of lifting a display. Lift the display as shown on the left, with the lifting bar. Use every lifting point provided.

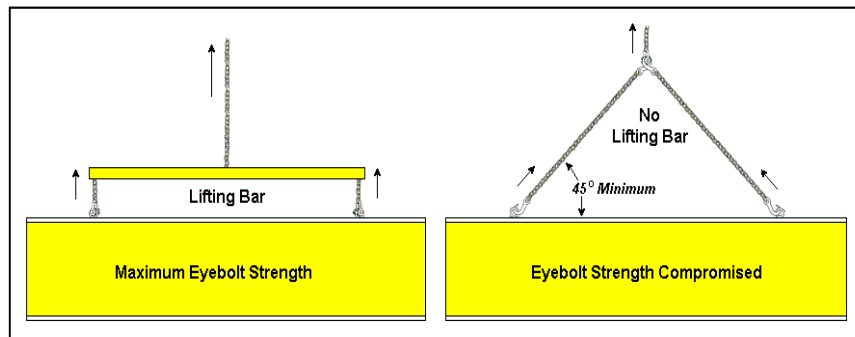


Figure 8: Lifting the Display (Correct, Left; Incorrect, Right)

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

Eyebolts can be removed for the display to eliminate the need for overhead clearance.

2.5 Display Mounting

Reference Drawing:

Shop Dwg, AF-3300-48x48-12-RGB, 32x48-20-R **Drawing B-241264**

Shop Dwg, AF-3300-48x64-12-RGB, 32x80-20-R **Drawing B-240560**

The method used to mount displays can vary greatly from location to location. For this reason, only general mounting topics can be addressed in this manual.

It is the responsibility of the installer to ensure the installation will adequately meet local codes and standards, as well as the mounting hardware and method.

Before beginning the installation process, verify the following items:

- The mounting structure will provide a straight and square-mounting frame for the display – **height variation in any four-foot horizontal section may not exceed ¼-inch**
- The mounting structure will not give way at any unsupported points after the display is mounted

The back of the display is equipped with 2x2x¼" thick angles on the top and bottom of the display (Refer to the **Shop Drawings**). All mounted displays and wind loading must meet local codes and be inspected by a qualified structural engineer.

1. Carefully uncrate the display and inspect each side of the display for possible damage that may have occurred during shipping
2. Following the guidelines described in **Section 2.4**, lift the display into position on the support structure
3. Weld or use ½" Grade-5 bolts and hardware to secure the clip angles to the support structure as shown in the **Shop Drawings**.
4. Refer to **Section 3** for information on routing power to the display
5. 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 or fill the nut insert with silicone (unless there is an overhead structure)**

2.6 Optional Temperature Sensor Mounting

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

Section 3: Electrical Installation

Only a qualified individual should terminate power and signal cable at this Daktronics display.

The Daktronics engineering staff must approve **any** changes made to the display. Before altering the display, submit detailed drawings for the proposed modifications to the Daktronics engineering staff for evaluation and approval or the warranty will be rendered null and void.

3.1 Common Connectors in the Display

The power and signal connections in the displays use many different types of connectors. Take special care when disengaging any connector so as not to damage the connector, the cable, or the circuit board.

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

The following information presents some common connectors encountered during display installation and maintenance:

1. Ribbon Cable Connectors:

Figure 9 illustrates a typical ribbon connector. To disconnect the ribbon cable, push the plastic clips on the sides out to unlock and 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.

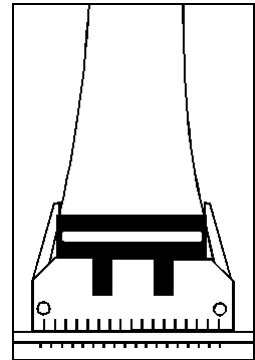


Figure 9: Ribbon Cable Connector

2. Termination Blocks:

Termination blocks are commonly used to connect internal power and signal wires to wires of the same type coming into the display from an external source. Power wires need to have one-half inch of insulation stripped from the end of the wire prior to termination. Insert wires in terminations and make sure the clamp holds the wire firmly. Refer to **Figure 10** for more information.

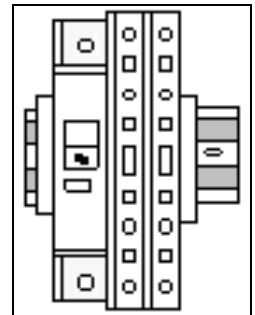


Figure 10: One Breaker Termination Block

3. Phoenix™ -Style Connectors:

Phoenix-style connectors, which are usually green, are often used for signal termination on circuit boards. Refer to **Figure 11**. Strip one-quarter inch of insulation from the wire prior to termination. To remove a wire, turn the above 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.

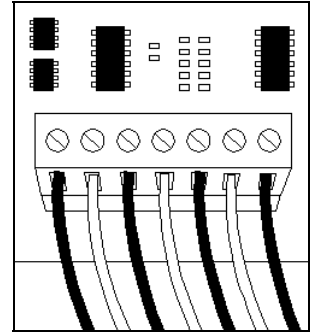


Figure 11: Phoenix Connector

4. Mate-n-Lok™ Connectors:

The Mate-n-Lok connectors found in the displays are white and come in a variety of sizes. **Figure 12** 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.

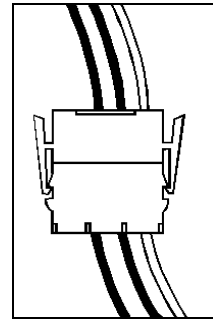


Figure 12: Mate-n-Loc Connector

5. Phone/Network Jacks (RJ11/RJ45 Connectors):

RJ connectors, as seen in **Figure 13**, are similar to the telephone connectors or network jacks found in homes and businesses and 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.

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.

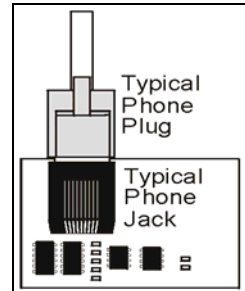


Figure 13: RJ11 Connector

6. Quick Connect Jack:

The display uses quick connect jacks for the connection of the signal termination enclosure, the temperature sensor and possible connection to a mirror display. There are three input and one output quick connect jacks located on the back of the primary display, and when not used the attached dust cover should be kept closed.

To attach the cable to a jack, make sure to line up the plug to match the jack, push the plug in then turn the outer collar to lock in place. **Figure 14** illustrates the 6-pin quick connect jack.

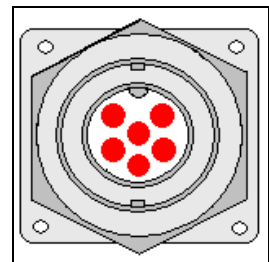


Figure 14: RS232/6-pin Quick Connect Jack

3.2 Conduit

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

- Power
- Signal IN wires to the signal termination enclosure, when applicable
- Signal OUT wires (if not using the provided interconnect cable)

The power J-box is provided with $\frac{3}{4}$ " threaded holes for use with $\frac{3}{4}$ " conduit. Unthreaded knockout holes are provided in the signal enclosures used with the display. If necessary, there are knockout/drill holes in the display itself when not using the provided enclosures.

For displays with more than one face, signal wiring between displays is normally done using a quick connect interconnect cable (length 6 feet).

3.3 Preparing for Power/Signal Connection

1. Enclosures are provided with the display for termination of power. Signal termination is dependent upon communication type.
2. 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.

3. Power conductors from the disconnect to the display should be routed through conduit in agreement with local code
4. Display power will terminate to the display at the external power termination J-box mounted to the back of the display
5. Connect the grounding electrode conductor, at the grounding lug, to the display at this time
6. Both signal communication interfaces will complete connection with a quick connect cable. Refer to Section **3.7** for more detailed connection information

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

3.4 Power

Reference Drawings:

Shop Dwg, AF-3300-48x48-12-RGB, 32x48-20-R..... **Drawing B-241264**

Shop Dwg, AF-3300-48x64-12-RGB, 32x80-20-R..... **Drawing B-240560**

Power Requirements

Refer to the appropriate **Shop Drawing** for voltage and current requirements for your display size. Each uses a 120VAC single-phase power source.

Do not connect the displays to any voltage other than that listed on the Daktronics product label.

Proper power installation is imperative for proper display operation. The following sub-sections give details of display power installation.

Grounding

This sign is intended 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.

Displays **must** be grounded according to the provisions outlined in Article 250 of the National Electrical Code®. Daktronics requires a resistance to ground of 10 ohms or less.

The display system **must** be connected to earth-ground. 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.**

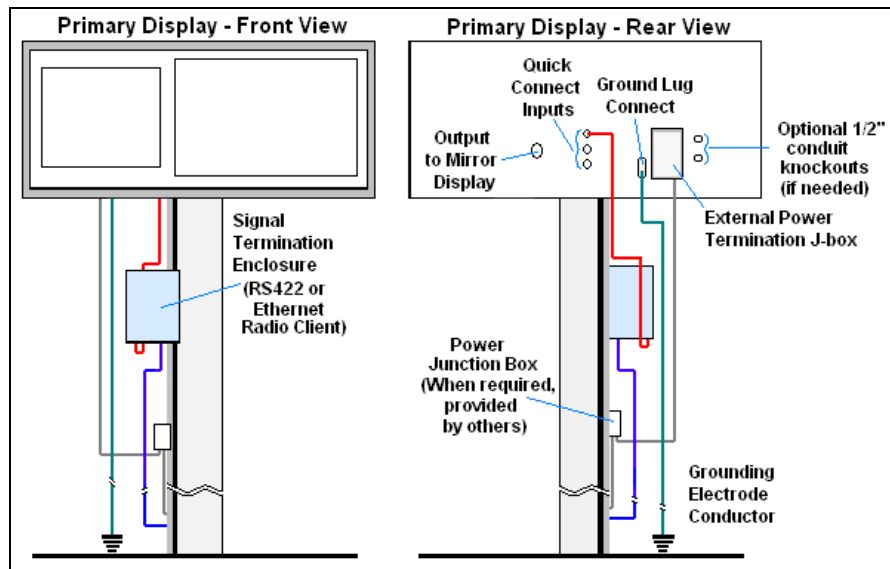


Figure 15: Primary Display with Enclosures

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. The support structure of the display **cannot** be used as an earth-ground electrode. The support is generally embedded in concrete, and if in earth, the steel is either primed or it corrodes, making it a poor ground.

A minimum of one grounding electrode must be installed 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. Daktronics requires that the resistance to ground be 10 ohms or less. 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 terminal lug on the back of the display.

Power Installation

There are two considerations for power installation: installation with ground and neutral conductors provided, and installation with only a neutral conductor provided. For these displays, installation with ground and neutral conductors provided is used.

Installation with Ground and Neutral Conductors Provided

For this type of installation, 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.

Power Connection

Reference Drawings:

Schematic, Power Term Panel, 1 Circuit..... **Drawing A-211950**

Display power is connected to the power termination enclosure on the back of the display. Complete the following steps to terminate the hot, neutral, and ground wires at the termination enclosure.

1. Route the power cable through 1/2" conduit to the rear of the display and into the power termination enclosure.
2. The power termination enclosure will contain two wires plus a ground coming from the interior of the display – these wires are pre-terminated to the power termination panel inside the display
3. Inside the external power termination J-box, connect the power wires to the wires coming from the display interior using wire nuts. Refer to **Figure 16** for further information.

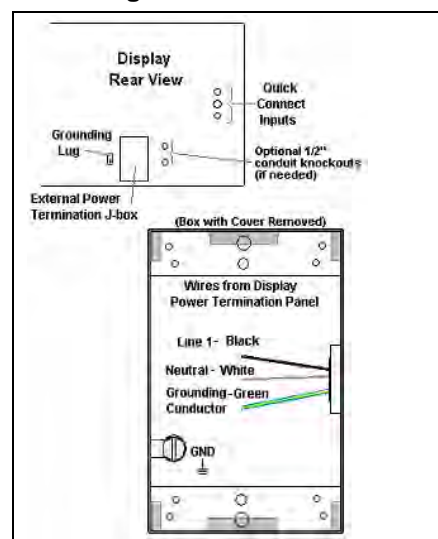


Figure 16: Connections in Power Termination J-box

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

- Line 1 – Black
- Neutral - White
- Grounding Conductor - (Green-Yellow)

If these power terminations cannot be made at the enclosure, they can be made directly to the power termination panel in the display. The following steps need to be done to complete internal connections:

1. Open the display as explained in Section 4.4 and locate the power termination panel for these displays.
2. Route the cable through conduit to the back of the display – use one of the ½" knockouts for access, being careful not to damage any internal components.
3. Disconnect the wires to the terminal block to the external J-box, and connect the wires from the direct cable using a small flat screwdriver to open the cage clamps. Release the jumper wires connected to the external power termination box.
4. Install the wires from the direct circuit into the breaker and cage clamps following the directions in **Figure 17**.
 - Hot to circuit breaker 1 (line side)
 - Neutral to gray terminal block (line side)
 - Ground to green/green yellow terminal block
5. Power will need to be connected to all display faces.

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 to the display. A main disconnect is to be provided for each supply circuit to the display.

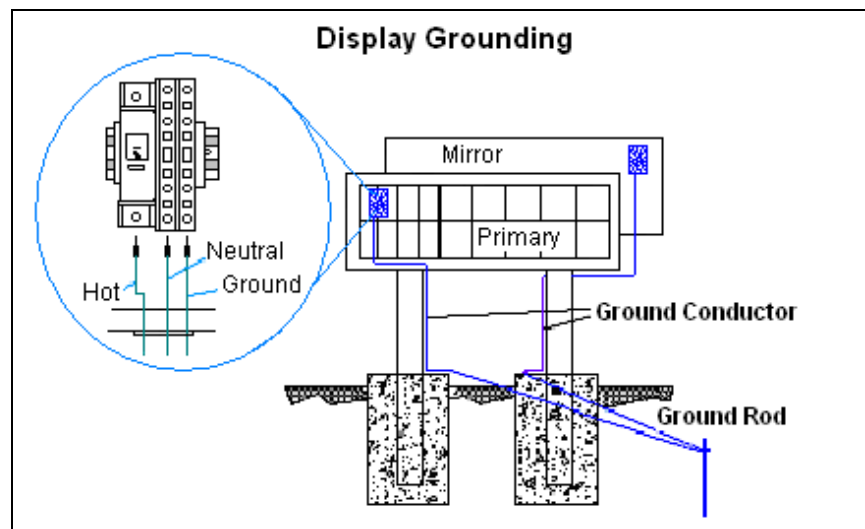


Figure 17: Power Installation to Power Termination Box)

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

Exception: Disconnecting means that are capable of being locked in the open position may be located elsewhere.

3.7 Signal Termination from Computer to Display

The AF-3300 is designed for quicker signal and power connection to the display and between displays.

- Signal will terminate to a watertight enclosure, which connects to the primary display using a quick connect cable
- Mounting the temperature sensor to the display structure and at least one foot away from the display is preferred – terminate it to the primary display with a quick connect cable (**Do Not** mount the temperature sensor between display, or anywhere that the airflow is restricted)
- The primary display will connect to the mirror display (2V installations) with a 6-foot, quick connect, inter-connect cable. In the case of those cables that have right-angle connector, make sure the cable extends to the side or down (never up) to prevent stress on the cable

A separate manual is provided for explaining the connection to the signal termination enclosure. There are seven different methods of communication; your manual will be one of these types:

Communication Type	Communication Manual ED #
RS232	ED-14739
RS422	ED-14742
Fiber	ED-14743
Radio	ED-13932
Modem	ED-14744
Ethernet	ED-14745
Fiber Ethernet	ED-14746

3.8 Signal Termination Between Displays (Primary – Mirror)

Most displays are shipped as either a single Primary display or two displays in a 2V, Primary-Mirror configuration.

The Primary - Mirror (2V) quick connect cable is used to terminate signal between two displays. The six-foot cable goes from the Signal OUT (J34) on the primary display to Signal IN (J32) on the mirror display.

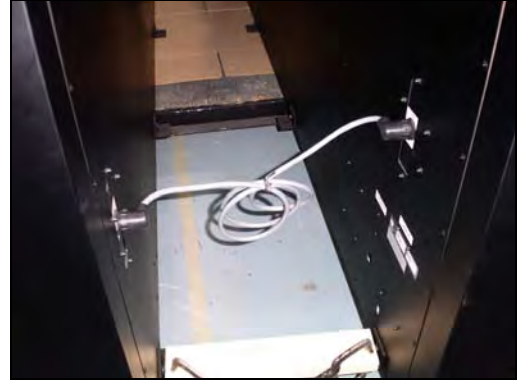


Figure 18: Display Interconnect

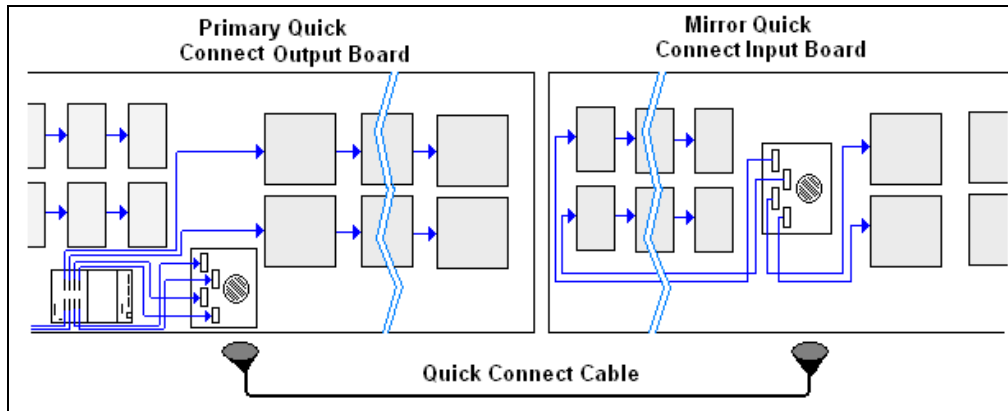


Figure 19: Quick Connect Cable

3.9 Optional Temperature Sensor Installation

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

Section 4: Maintenance and Troubleshooting



Important Notes:

1. **Power must be turned off before any repair or maintenance work is done on the display.**
2. **Qualified service personnel must make any access to internal display electronics.**
3. **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.**

4.1 Maintenance and Troubleshooting Overview

Daktronics Galaxy[®] AF-3300 series displays are front accessible; meaning access to the internal components can be gained only from the front of the display.

This section provides the following Galaxy[®] display information:

- **Signal Routing Summaries** provide a basic explanation of the way signal travels through the display
- **Power Routing Summaries** offer a basic explanation of the way power travels through the display
- **Service and Diagnostics** give instructions for removing various display components, and explains the functions of circuit board connectors and the meanings of any diagnostic LEDs
- **Maintenance** includes a number of steps to take to keep this Galaxy[®] display in a safe, working order
- **Troubleshooting** lists some possible display malfunctions, and provides a number of possible causes for that malfunction
- **Replacement Parts List** includes the description and part number of display components that may need replacing during the life of this display
- **Exchange and Repair and Return Programs** explain Daktronics component return policy

Note: A single pixel flashing in the lower right hand corner of the display indicates that the display has power, but no messages are currently running.

4.2 Signal Summary

The signal routing for the display can be summarized as follows:

1. Data from the control computer, which runs Venus® 1500 software, travels via RS232, RS422, modem, fiber optic cable, radio signal, or Ethernet to the signal termination enclosure at the primary display.
2. From the signal enclosure, signal is sent to the primary display via a quick connect cable, which connects to the quick connect input board.
3. From the quick connect input board, the signal is transferred to the display's controller via a 20-conductor ribbon cable.
4. From the controller, the signal then travels over one or more 20-conductor ribbon cables (J11 through J18 provide signal out) to J1 input on the driver of the first row of modules in the display.
5. Data exits at J2 output and is relayed to J1 of the next driver board and so on, traveling down the entire row of modules – the drivers use this display data to control the LEDs.
6. On the primary display, in a primary-mirror (2V) configuration, the output leaves the J2 output on the last column of modules via a 20-conductor ribbon cable and connects to one or more 31-pin quick connect output boards.
7. A quick connect interconnect cable transfers data from the primary to the mirror display.
8. The 31-pin quick connect input board on the mirror display receives the signal and transmits it to J1 on each row of the first column of modules, via a 20-conductor ribbon cable
9. Data exits at J2 and is relayed to J1 of the next driver board and so on, traveling down the entire row on modules in the mirror face- this display data is used to control the LEDs on this face.
10. The data displayed on the mirror face will be the same as that displayed on the primary face.

4.3 Power Summary

Reference Drawing:

Schem, AF-3300-48x64-12-RGB/32x80-20-R,P/M..... **Drawing B-242469**

Shcem, AF-3300-48x48-12-RGB/32x48-20-R, P/M **Drawing B-242471**

The power routing for the display can be summarized as follows:

1. Power terminates at the power J-box on the back of the display
2. Wires are pre-terminated from there to the power termination box in the display
3. Before leaving the enclosure, power is sent through a circuit breaker and an RFI electrical filter or filters
4. Power for the controller board passes through a transformer located in the power termination box

Note: Power supplies are preset. Contact Daktronics Customer Service for the proper settings.

- Fans are located along the bottom of the display to draw in cool air, which exits out through vents located in the face at the top of the display

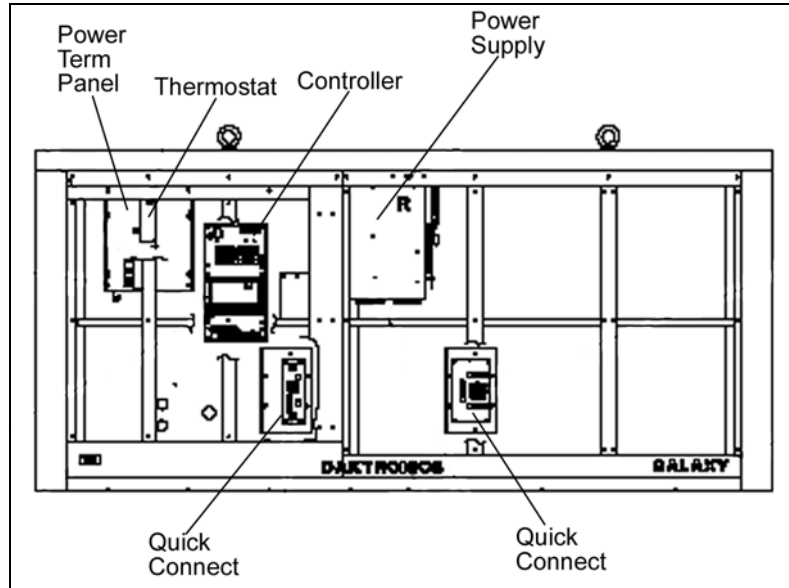


Figure 20: Control Component Locations

4.4 Display Access

Daktronics Galaxy AF-3300 series displays are front accessible; meaning access to the internal components can be gained only from the front of the display.

- Locate the latch access fasteners on the module (one is centered below the second row of pixels and one is centered above the bottom two rows)
- With a $\frac{1}{8}$ " Allen wrench, turn the latch access fasteners a quarter turn as shown in **Figure 21** – on the 12 mm modules, one latch turns clockwise and the other counter-clockwise to open, and the reverse to close. On the 20 mm modules turn both latches counter-clockwise to open and the reverse to close.
- Gently pull the module far enough forward to reach behind the back and disconnect the power and ribbon cables



Figure 21: Removing a Module

When installing a module, reverse the previous steps and take note of the following points.

- 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

The module and driver board are a single functional unit. Each module assembly is made up of a module housing (containing LEDs and the driver) and a louver assembly.

Figure 20 shows the location of several basic components inside the display. The placement may vary slightly depending on the height of the display. Refer to this figure for additional troubleshooting component locations.

4.5 Service and Diagnostics

Reference Drawings:

- Layout, AF-3300-48x64-12-RGB/32x80-20-R..... **Drawing A-241869**
- Layout, AF-3300-48x48-12-RGB/32x48-20-R..... **Drawing A-241870**
- Schem, AF-3300-48x64-12-RGB/32x80-20-R,P/M..... **Drawing B-242469**
- Schem, AF-3300-48x48-12-RGB/32x48-20-R,P/M..... **Drawing B-242471**

The following sub-sections address servicing of the following display components:

- transformer, RFI filter
- controller
- power supplies

The sub-sections also address any diagnostic LEDs, fuses, and signal/power connectors found on the unit. On **Component Layout Drawings** the components are denoted as follows.

Component...	Denoted As...	Location...
Power Term Panel	0A-1327-0100	Behind modules A101 and A102
Controller	0A-1229-0013	Behind modules B103 and B104
Modules	0A-1266-4100 (20 mm Red) 0A-1337 4551(12 mm RGB)	Over entire face of the display A101 through B109 (includes driver)
Power Supply	0A-1327-0011	Behind module A105
Light Detector	0A-1327-3000	Above module A105

Transformer and RFI Filter

Reference Drawings:

Schematic. Power Termination Panel, 1 Circuit **Drawing A-211950**

Remember: Disconnect power before servicing any internal components

Transformer

The transformer is located in the upper portion of the primary display's power termination box as shown in **Figure 22**.

Turn off power to the display before removing the wires.

To replace the transformer

1. Disconnect and label all the wires attached to the transformer
2. Release the hardware securing it to the inside of the enclosure
3. Position the new transformer in its place, and replace the fastening hardware
4. Re-connect all the wires using **Drawing A-211950** as a reference

RFI Filter

The RFI electrical filters are mounted to the side of the power termination box (Z1 in **Drawing A-211950**).

- 1 Like the transformer, label all connecting wires and then remove them
- 2 Release the attachment hardware
- 3 Install the new filter using **Drawing A-211950** as a wiring reference

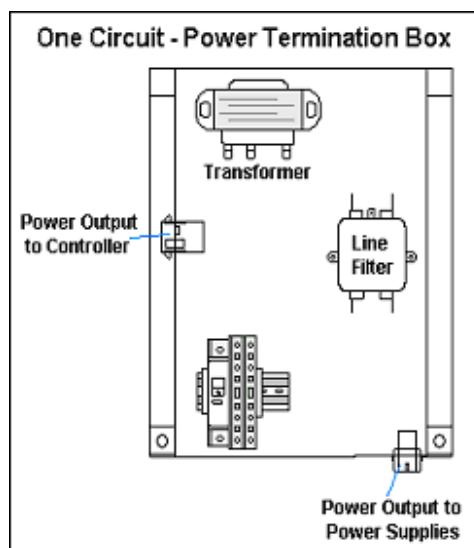


Figure 22: Primary Display Power Termination Box

Controller

Reference Drawings:

CNTRLR II, Galaxy, 8 Conn, J1087 **Drawing B-204771**

The controller sends data to the modules. Refer to the signal summary in **Section 4.2** for more information and for the possible location of the controller board. **Figure 23** illustrates a typical controller.

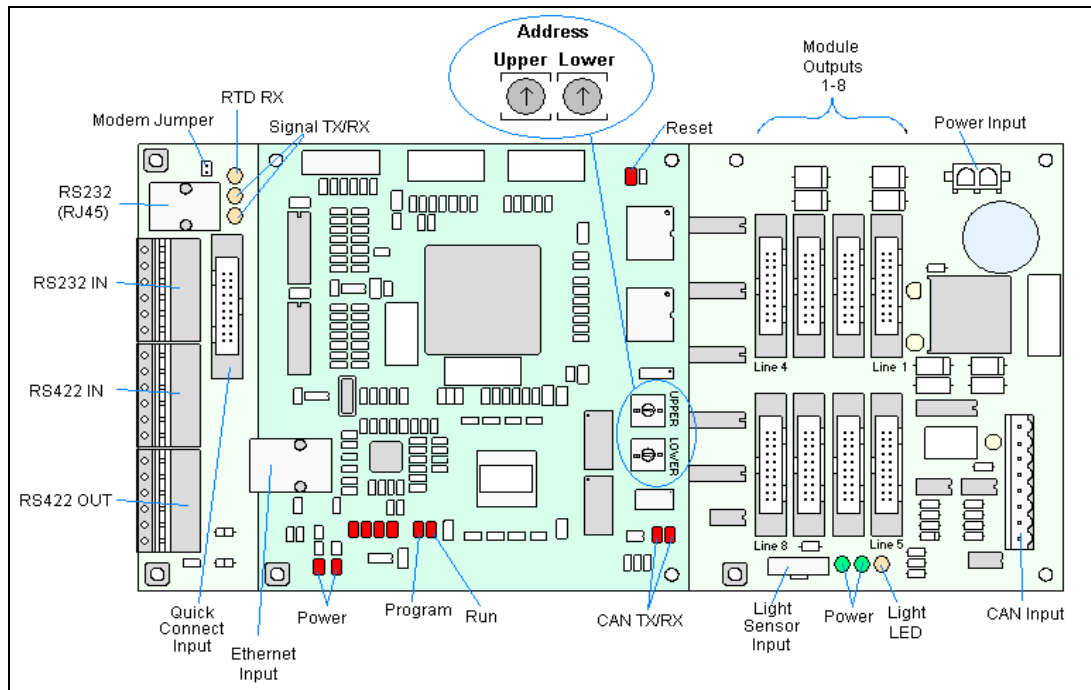


Figure 23: Controller Component Layout

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

Tools required: $\frac{1}{8}$ " hex wrench and $\frac{3}{16}$ " nut driver

1. Turn off power to the display
2. Remove the modules A203 and A204 that are positioned directly in front of the controller of the primary display
3. Disconnect power plug from J5
4. Remove all power and signal connections from the board (pushing apart the latches and carefully pulling them from the jack will release the "Locked" connectors) – when replacing the board, it is helpful to have the cables labeled as to which was removed from which connector
5. Remove the six screws holding the board in place using a $\frac{3}{16}$ " nut driver
6. Take note of the address of the controller and ensure the address on the replacement board is the same

Follow the previous steps in reverse order to install a new controller board.

The rotary switches set the hardware address, which the software uses to identify that particular display. When replacing a controller board, be sure to set the rotary switches in the same address configuration as the defective controller. Each controller in a network needs a unique address.

Note: Setting both rotary switches to address 0 (set the switches to 0 by rotating them counter clockwise until the arrow points to 0) can activate a test mode. The display's power must be turned off and then turned back on to activate the test mode.

Controller Address Settings					
Address	Upper	Lower	Address	Upper	Lower
Test Mode	0	0	10	0	A
1	0	1	11	0	B
2	0	2	12	0	C
3	0	3	13	0	D
4	0	4	14	0	E
5	0	5	15	0	F
6	0	6	16	1	0
7	0	7	17	1	1
8	0	8
9	0	9	240	F	0

Diagnostic LEDs are located on the controller; the table below tells what each LED denotes:

CPU			
LED	Color	Function	Operation
DS1	Red	CAN TxD	Flashes when controller is transmitting CAN information.
DS2	Red	CAN RxD	Flashes when controller is receiving CAN information.
DS3	Red	System Reset	Off when controller is functioning properly. Flashes at 1.5-second rate if controller is not resetting the watchdog timer.
DS4	Red	Run	A steady flash indicates the controller is running properly. Normal flash rate is about once per second.
DS5	Red	U15 Programmed	On when U15 contains a valid logic program.
DS7	Red	Link	On when Ethernet interface is in the link-up condition. Flashes when the Ethernet chip detects transmits or receives activity.
DS8	Red	Speed	On when the Ethernet interface is at 100Mbps. Off when the Ethernet interface is at 10Mbps.
DS9	Red	Duplex	On when the Ethernet interface is at full duplex. Off when the Ethernet interface is at half-duplex.
DS10	Red	Collision	Flashes when the Ethernet interface detects a collision in half-duplex.

DS12	Red	+2.5V	On when +2.5V power supply is functioning.
DS13	Red	+3.3V	On when +3.3V power supply is functioning.
Product Board			
LED	Color	Function	Operation
DS1	Green	+5V	On when +5V power supply is functioning.
DS2	Green	+3.3V	On when +3.3V power supply is functioning.
DS3	Yellow	COM1 TxD	Flashes when transmitting serial information.
DS4	Yellow	COM1 RxD	Flashes when receiving serial information.
DS5	Yellow	Light	Flashes when receiving signal from light sensor
DS6	Yellow	Com 2 RX2	Normal state is ON. When connected to receive RTD input, the LED will be OFF. The LED flashes when receiving signal from RTD input device.
Temp Sensor			
LED	Color	Function	Operation
DS1	Green	+5V	On when +5V power supply is functioning.
DS2	Red	Run	A steady flash indicates the controller is running correctly. Normal flash rate is about once a second. Flashes faster when the sensor is transmitting temperature or light information.

4.6 Ventilation Systems

Ventilation fans should be checked after 1,500 hours of operation and every 1,500 hours after that to ensure the display is being cooled properly. Fans should be checked more often if the display is located in a dusty or harsh weather environment (i.e. along a gravel road with dust laden air).

- 1,500 hours is equivalent to 83 days if the display is operated for 18 hours a day and the power to the display is turned off when not in use
- 1,500 hours is equivalent to 62 days if the display is running non-stop for 24 hours a day
- Each time a module is removed, for whatever reason, take a minute to inspect the fans
- 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 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

To check the operation of the fans, push the bypass button (momentary contact) on the thermostat enclosure to temporarily turn the fans on: (The bypass button is located behind A103, top row, and third module on the left.)

- Hold your hand or a piece of light paper in front of the display to detect air movement
- If the fan does not turn or does not operate smoothly, replace it

Make sure that the intake vents and exhaust vents on the front of the display are not blocked, and are free of dust or other debris.

4.7 Thermostats

A thermostat controls when the ventilation fans are turned on in the display. Refer to **Figure 20** for the location of the thermostat. The ventilation fans turn on when the inside of the display reaches 85° F (29° C), and turn off at 65° F (21° C).

4.8 Weather Stripping

To ensure that the display is waterproof, weather stripping has been provided around the entire display and around each module. It is important that the weather stripping is installed properly at all times or water may leak into the display and damage the components.

4.9 Display Maintenance

A yearly inspection should be completed to maintain safe and dependable display operation. This inspection should address the following issues:

- **Loose Hardware**
Verify fasteners, such as bolts and rivets, have not come loose. Fasteners should be checked and tightened or replaced as required.
- **Excessive Dust Buildup**
Occasionally it may be necessary to vacuum the inside of the display cabinet to remove dust/dirt buildup that may interfere with airflow.
- **Water Intrusion – Water Stain Marks**
Water can enter the display where weather stripping has come loose or deteriorated or where fasteners have come loose allowing gaps in the panels or where moisture may be entering around hardware. Be sure to check around the lift eyes and bolts to ensure that water has not entered there. If so, replace hardware immediately to prevent more water from entering the display. Also, check electronic components for possible corrosion.
- **Corrosion**
Check the paint, and look for possible corrosion especially at footings, structural tie points, and ground rods.

If any of the above conditions are noticed, action must be taken to correct the situation.

4.10 Troubleshooting

This sub-section contains some symptoms that may be encountered in the displays.

This list does not include every possible symptom, but does represent common situations that may occur.

Symptom/Condition	Possible Cause/Remedy
One or more LEDs on a single module fail to light.	<ul style="list-style-type: none"> • Replace/check ribbon cables on the module. • Replace the module.
One or more LEDs on a single module fail to turn off.	<ul style="list-style-type: none"> • Replace/check ribbon cables on module. • Replace the module.
A section of the display is not working. The section extends all the way to the right side of the display.	<ul style="list-style-type: none"> • Replace/check the ribbon cable. • Replace/move the first module/driver that is not working • Replace/move the first module/driver on the left side of the module that is not working.
One row of modules does not work or is distorted.	<ul style="list-style-type: none"> • Replace/check ribbon cable to and from first non-working module. • Check for bent pins on module and controller. • Replace/move module that is distorted • Replace/move the first module to the left of the one that is not working • Replace controller.
A group of modules, (a column or block) fail to work.	<ul style="list-style-type: none"> • Check the voltage to the module. • Check the wire connections at the power supply and at the module.
Entire display fails to work.	<ul style="list-style-type: none"> • Check for proper line voltage to the power J-box. • Check for correct power at power termination panel • Check for correct power to controller (10 VAC) and modules (3.5 or 5.3 VDC). • Check the breakers in the power termination panel. • Check/replace the ribbon cable from the controller to the modules. • Check the voltage settings on the power supply. • Check the signal cable to the controller. • Replace the controller.
Temperature always reads –196F/-127C degrees F/0 degrees C.	<ul style="list-style-type: none"> • Check temperature sensor cable connections. • Check for correct power on temperature sensor. • Check that the temperature is set to address 1 • Replace the temperature sensor.
Display is stuck on bright or dim.	<ul style="list-style-type: none"> • Check light detector cable/wiring. • Check light detector for obstructions. • Replace the light detector. • Replace the controller.

4.11 Initial Operation Information

Every time the display is operated, the display will run through an initialization in which it will display the following:

1. Product Name (Galaxy®)
2. Display Size (Row x Column)
3. Shading (32K 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. COM1 Configuration (C1:WGRNS)
10. COM 2 Configuration (C2: RTD)
11. Line Frequency (CLK: AUTO (60))
12. Display Name Description (Galaxy Row x Column)

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.

4.12 Replacement Parts List

The following table contains some of the items that may need to be replaced in these displays over a period of time. Many of the parts within the display also list their part number on labels affixed to them.

To prevent theft, Daktronics recommends purchasing a lockable cabinet to store manuals and replacement/spare parts.

Part Description	Part Number
Controller III, Louvered Galaxy, 8-connector	0A-1229-0013
Module, 1R, 16x16, (20 mm) Red	0A-1266-4100
Module, 1R1G1B 24x16, (12 mm) RGB	0A-1377-4551
Power Supply Assembly	0A-1327-0011
Light Level Detector	0A-1327-3000
Fan; 134 CFM, 120V @60Hz, 22 watt	B-1053
Transformer; Pri 115V, Sec 10VCT@3A	T-1119
Filter, RFI Line 20 AMP 120 VAC	Z-1007
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, 42"	0A-1000-0019
Ribbon Assy; 20 Pos, 60"	0A-1000-0021
Interconnect Cable; 31-pin male to 31-pin male, 6', QC	W-1503
Quick Connect Interface, Input, w/Ethernet	0P-1229-2004
Quick Connect Bd, Primary, 31 Pin	0P-1229-2013

Quick Connect Bd, Mirror, 31 Pin	0A-1327-1014
Electrical Contact Cleaner Lubricant / Cal-Lube	CH-1019
Hex Wrench, T-Handle 1/8" RT	TH-1062
Temper Resistant Screwdriver Bit for External Communication Box	TH-1103
Torx Screws for the Communication Box	HC-1550
Torx Screws for the Communication Box Lid	HC-1549

4.13 Daktronics Exchange and Repair and Return Programs

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

Daktronics' unique Exchange Program is a quick, economical service for replacing key components in need of repair. If a component fails, Daktronics sends the customer a replacement, and the customer, in turn, sends the failed component to Daktronics. This not only saves money, but also decreases display downtime. Daktronics provides these plans to ensure users get the most from their Daktronics products, and it offers the service to qualified customers who follow the program guidelines explained below. Please call the Help Desk – 877-605-1113 – if you have questions regarding the Exchange Program or any other Daktronics service.

When you call the Help Desk, a trained service technician will work with you to solve the equipment problem. You will work together to diagnose the problem and determine which replacement part to ship. If, after you make the exchange, the equipment still causes problems, please contact our Help Desk immediately.

If the replacement part fixes the problem, package the defective part in the same box and wrapping in which the replacement part arrived, fill out and attach the enclosed UPS shipping document, and **return the part to Daktronics**. In most circumstances, you will be invoiced for the replacement part at the time it is shipped. This bill, which represents the exchange price, is due when you receive it.

Daktronics expects immediate return of an exchange part if it does not solve the problem. The company also reserves the right to refuse equipment that has been damaged due to acts of nature or causes other than normal wear and tear.

If you do not ship the defective equipment Daktronics within 30 working days from the invoice date, Daktronics assumes you are purchasing the replacement part outright (with no exchange), and you will be invoiced for it. This second invoice represents the difference between the exchange price and the full purchase price of the equipment.

The balance is due when you receive the second invoice. If you return the exchange equipment after 30 working days from the invoice date, you will be credited for the amount on the second invoice, minus a restocking fee. **To avoid a restocking charge, you must return the defective equipment within 30 days from the invoice date.**

Daktronics also offers a Repair and Return Program for items not subject to exchange.

Return Materials Authorization: To return parts for service, contact your local representative prior to shipment to acquire a Return Material Authorization (RMA) number. If you do not have a local representative, call the Daktronics Help Desk for the RMA. This expedites repair of your component when it arrives at Daktronics.

Packaging for Return: Package and pad the item well to prevent damage during shipment. Electronic components, such as printed circuit boards, should be installed in an enclosure or placed in an antistatic bag before boxing. Please enclose your name, address, phone number, and a clear description of symptoms.

This is how to reach us:

Mail: Customer Service, Daktronics Inc.
PO Box 5128
331 32nd Ave
Brookings SD 57006

Phone: Daktronics Help Desk: 877-605-1113 (toll free)
or 605-697-4034

Fax: 605-697-4444

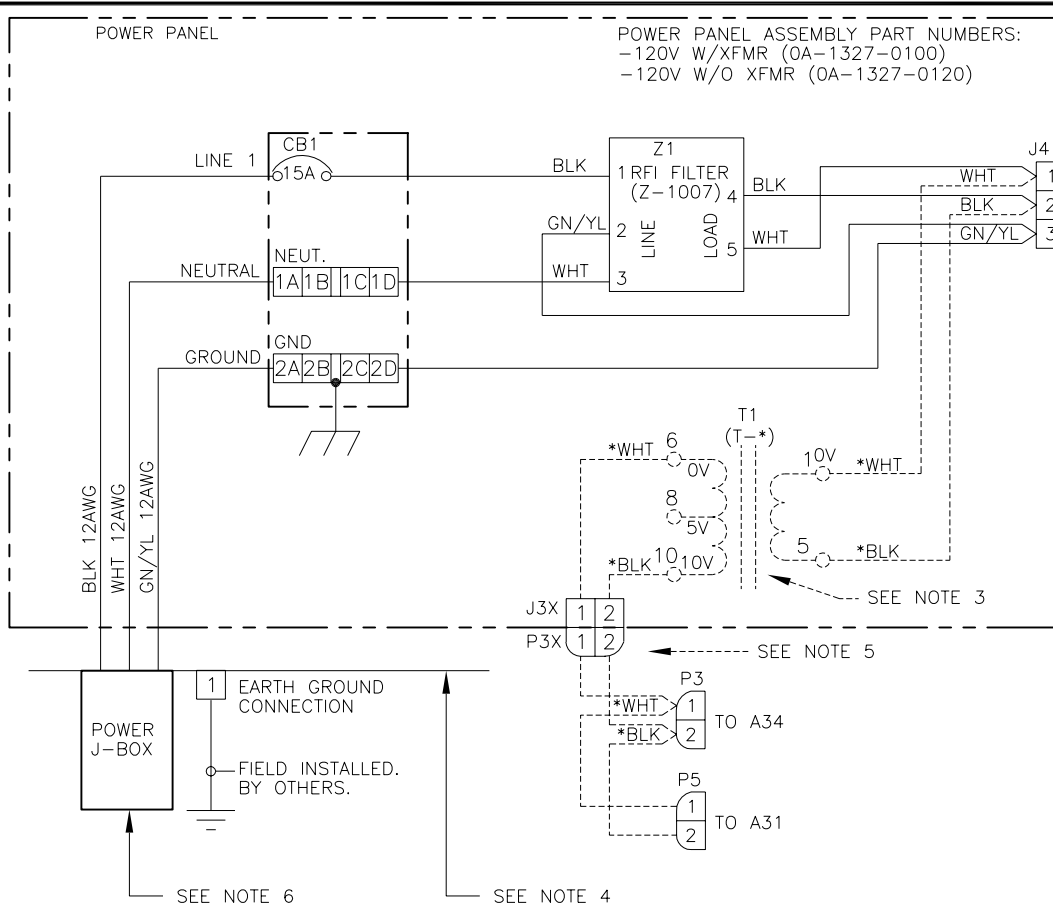
E-mail: helpdesk@daktronics.com

Appendix A: Reference Drawings

Refer to **Section 1** for information on reading drawing numbers. The following drawings are listed in numerical order by size (A, B, etc.). The drawings following this section are split into sections according to drawing type. Those drawings are listed according to size.

Schematic, Power Termination Panel, 1 Circuit.....	Drawing A-211950
Layout, AF-3300-48x64-12-RGB/32x80-20-R.....	Drawing A-241869
Layout, AF-3300-48x48-12-RGB/32x48-20-R.....	Drawing A-241870
CNTRLR II, Galaxy, 8 Conn, J1087	Drawing B-204771
Shop Dwg, AF-3300-48x48-12-RGB,32x48-20-R	Drawing B-241264
Shop Dwg, AF-3300-48x64-12-RGB, 32x80-20-R	Drawing B-240560
Schem, Primary Signal, Internal, W/QC	Drawing B-206146
Schem, AF-3300-48x64-12-RGB/32x80-20-R,P/M	Drawing B-242469
Schem, AF-3300-48x48-12-RGB/32x48-20-R,P/M	Drawing B-242471

REV.	DATE	DESCRIPTION	BY	APPR.
03	14JUL08	ADDED PART NUMBER 0A-1327-0120	JMG	DJM
02	19OCT04	REMOVED MIRROR ASSEMBLY MOVED FROM P1321 TO P1322 CORRECTED THE PART NUMBER OF THE 240V PANEL W/O XFMR: 0A-1327-0122	WRS	DJM
01	29JUL04		DJM	



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DAKTRONICS, INC. BROOKINGS, SD 57006

Proj: BUSINESS PRODUCTS DISPLAY COMPONENTS

Title: SCHEMATIC- POWER TERM PANEL- 1 CIRCUIT

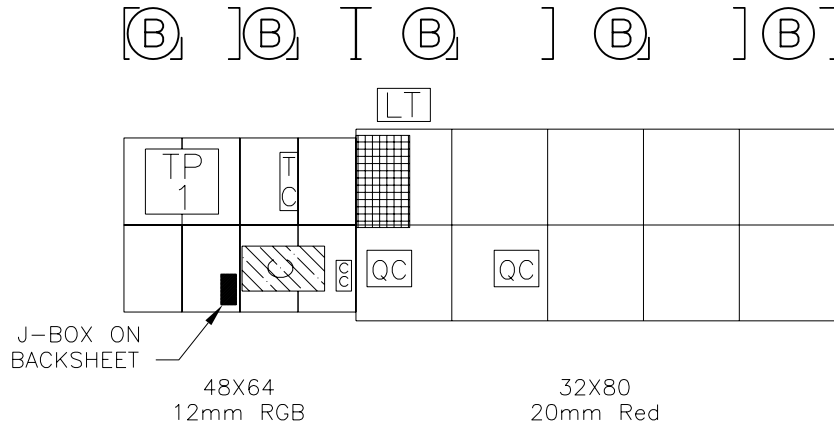
DES. BY: DMATHER DRAWN BY: DMATHER DATE: 14 MAY 04

REVISION 03 Appr. By: SCALE: 1=1 1327-R01A-211950

NOTES:

- 1) ALL WIRE IS 14 AWG EXCEPT * IS 18 AWG, UNLESS OTHERWISE NOTED.
- 2) CB1 IS A 15AMP 277VAC BREAKER. DAK. PART NUMBER (S-1187)
- 3) FOR 120VAC INPUT * IS T-1119. 0A-1327-0120 DOES NOT HAVE TRANSFORMER AND ASSOCIATED WIRING.
- 4) POWER J-BOX & EARTH GROUND CONNECTION ARE LOCATED ON DISPLAY REAR. THEY ARE NOT INCLUDED WITH POWER TERM PANEL ASSY.
- 5) INCLUDED WITH DISPLAY, WHEN REQUIRED. J3X IS FOR SIGNAL TERMINATIONS (10VAC).
- 6) COIL OF WIRE LOCATED INSIDE 120VAC LINE 1(BLK), NEUT(WHT), GND(GN/YL)

FAN		B-1053	PRIMARY QUICK CONNECT LEFT LEFT SIDE PRIMARY OPENING		0A-1327-1000
THERMOSTAT		0A-1327-3101	PRIMARY QUICK CONNECT RIGHT RIGHT SIDE PRIMARY OPENING		0A-1327-1013
1 POWER SUPPLY		0A-1327-0011	MIRROR QUICK CONNECT LEFT LEFT SIDE MIRROR OPENING		0A-1327-1014
POWER TERM PANEL		0A-1327-0100 (1)CIRCUIT	MIRROR QUICK CONNECT BLANK RIGHT SIDE MIRROR OPENING		0A-1327-1003
**CONTROLLER (PRIMARY ONLY)		0A-1229-0013	LIGHT DETECTOR PRIMARY ONLY		0A-1327-3000
MODULE		12.48" X 12.48" 16 PIXEL X 16 PIXEL 20MM C-C / 0.78" C-C	LIGHT DETECTOR BLANK MIRROR ONLY		0A-1213-4009
MODULE		11.328" X 7.552" 24 PIXEL X 16 PIXEL 12MM C-C / 0.472" C-C	POWER J-BOX		EC-1178
			COMMUNICATION CARD **(PRIMARY ONLY) OPTIONAL		SEE BOM FOR NUMBER


















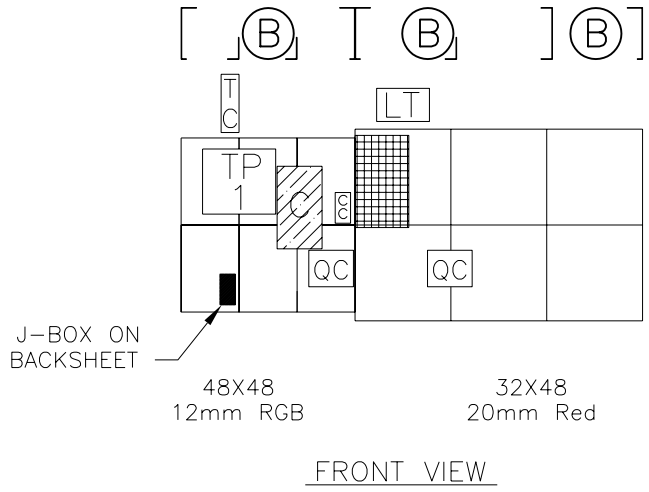
FRONT VIEW

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

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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GALAXY AF-3300 12/20MM FRONT VENTILATION			
TITLE: LAYOUT, AF-3300-48X64-12-RGB/32X80-20-R			
DES. BY: KMILLER		DRAWN BY: KMILLER	
		DATE: 16MAY05	
REVISION	APPR. BY:	1350-E10A-241869	
00	SCALE: 1=25		

REV.	DATE	DESCRIPTION	BY	APPR.

FAN		B-1053	PRIMARY QUICK CONNECT LEFT LEFT SIDE PRIMARY OPENING		0A-1327-1000
THERMOSTAT		0A-1327-3101	PRIMARY QUICK CONNECT RIGHT RIGHT SIDE PRIMARY OPENING		0A-1327-1013
1 POWER SUPPLY		0A-1327-0011	MIRROR QUICK CONNECT LEFT LEFT SIDE MIRROR OPENING		0A-1327-1014
POWER TERM PANEL		0A-1327-0100 (1)CIRCUIT	MIRROR QUICK CONNECT BLANK RIGHT SIDE MIRROR OPENING		0A-1327-1003
CONTROLLER **(PRIMARY ONLY)		0A-1229-0013	LIGHT DETECTOR PRIMARY ONLY		0A-1327-3000
MODULE		12.48" X 12.48" 16 PIXEL X 16 PIXEL 20MM C-C / 0.78" C-C	LIGHT DETECTOR BLANK MIRROR ONLY		0A-1213-4009
MODULE		11.328" X 7.552" 24 PIXEL X 16 PIXEL 12MM C-C / 0.472" C-C	POWER J-BOX		EC-1178
			COMMUNICATION CARD **(PRIMARY ONLY) OPTIONAL		SEE BOM FOR NUMBER



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

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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GALAXY AF-3300 12/20MM FRONT VENTILATION			
TITLE: LAYOUT, AF-3300-48X48-12-RGB/32X48-20-R			
DES. BY: KMILLER		DRAWN BY: KMILLER	
		DATE: 16MAY05	
REVISION	APPR. BY:	1350-E10A-241870	
00	SCALE: 1=25		

REV.	DATE	DESCRIPTION	BY	APPR.

INSTALL JUMPER FOR MODEM USE.

FUNCTION	PIN	PIN	FUNCTION
D1IN-P	1	A	I/O_00
D1IN-N	2	B	D1OUT-P
+V_UNREG	3	C	D1OUT-N
TX_COM1	4	D	AGND_IN
GND	5	E	D2_OUT-N
D2OUT-P	6	F	D2IN-N
RX_COM1	7	H	D2IN-P
DCD_COM1	8	J	AGND
CANH	9	K	+5V_CAN
CANL	10	L	GND_CAN

FUNCTION	PIN	PIN	FUNCTION
TD01	1	2	N.C.
TD11	3	4	TRST1
N.C.	5	6	+3.3V
TCK1	7	8	N.C.
TMS1	9	10	N.C.
HALT	11	12	N.C.
N.C.	13	14	KEYING PIN
N.C.	15	16	GND

PIN	FUNCTION
1	GND
2	RTS
3	I/O
4	TX
5	GND
6	RX
7	DCD
8	GND

RS232 IN

PIN	FUNCTION
1	+VUNREG
2	CLIN+
3	TX
4	GND
5	RX
6	CLIN-

RS232 IN

PIN	FUNCTION
1	N.C.
2	OUT+
3	OUT-
4	IN+
5	IN-
6	N.C.

RS422 IN

PIN	FUNCTION
1	AGND
2	OUT-
3	OUT+
4	IN-
5	IN+
6	AGND

RS422 OUT

INSTALL JUMPER FOR RESET USE.

PIN	FUNCTION
1	TX+
2	TX-
3	RX+
4	CHGND
5	CHGND
6	RX-
7	CHGND
8	CHGND

ETHERNET J4

LL 1002

ASSY #
SERIAL #
DATE: REV X

LL 1002

TESTED BY
DATE

PRODUCT BOARD
OP 1229 0014

PRODUCT BOARD
OP 1229 0013

M2
CNTRLR
COATED
OP 1229 1001

HC 1395

HE 1071

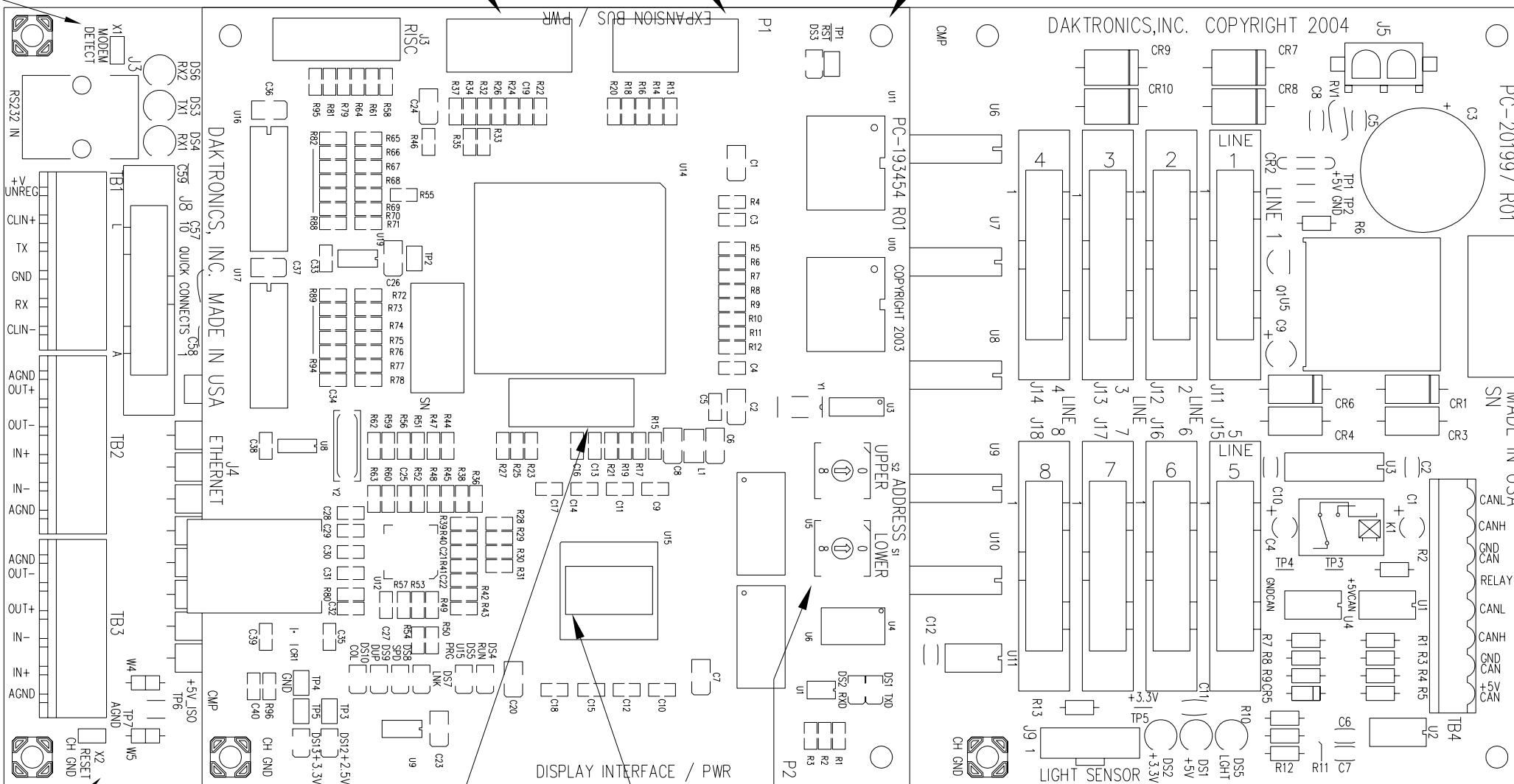
HC 1395

SCREW

STANDOFF

SCREW

TYPICALLY @4 PLACES



PIN	FUNCTION
2	10VAC
1	10VAC

PIN	FUNCTION
8	CANL
7	CANH
6	CAN_GND
5	RELAY
4	CANL
3	CANH
2	CAN_GND
1	CAN_+5V

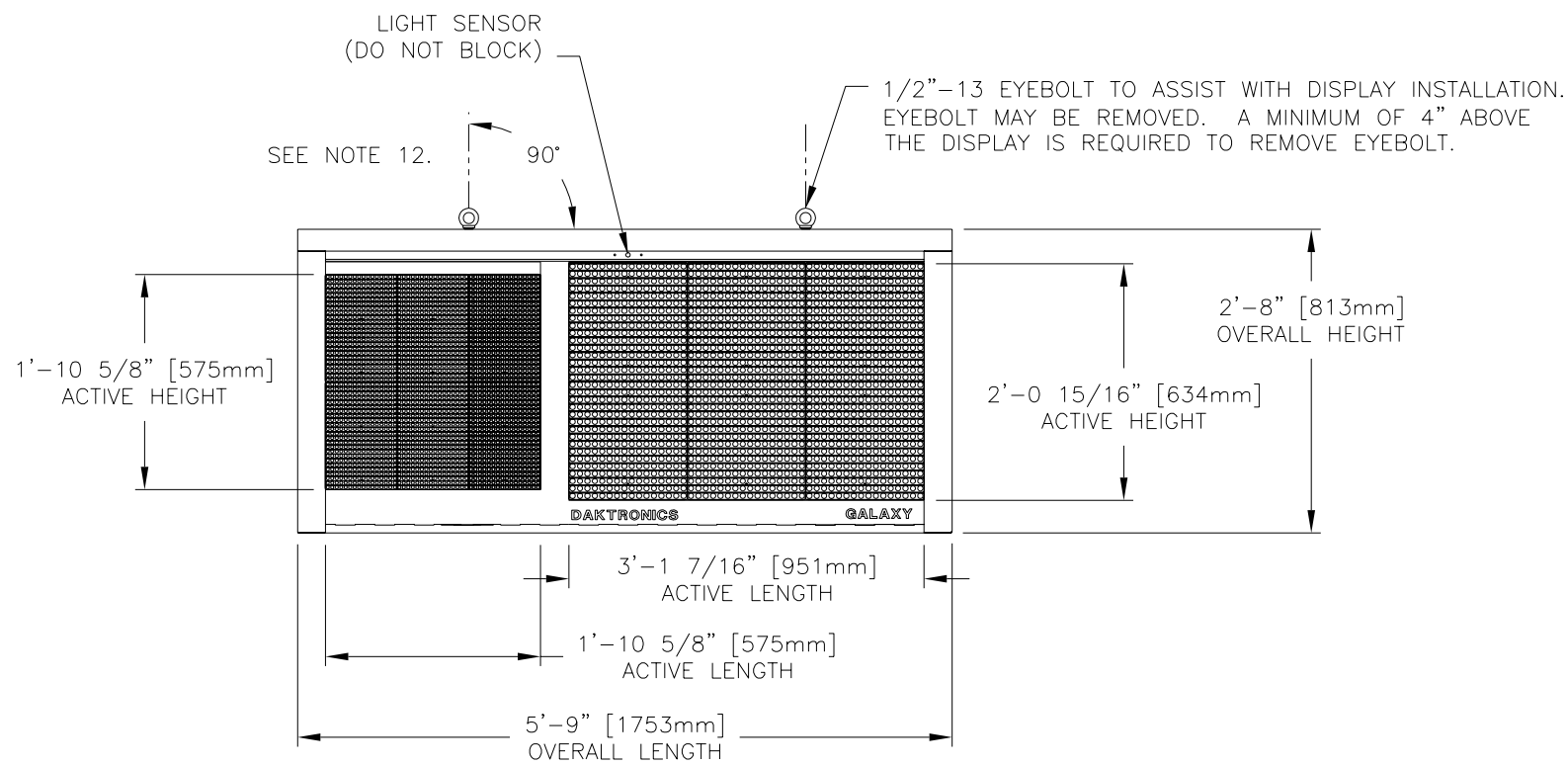
PIN	FUNCTION
1	LIGHT-P
2	LIGHT-N
3	+5V-P
4	GND-N
5	SHIELD-N
6	N.C.

REV.	DATE	DESCRIPTION	BY	APPR.
02	14 FEB 07	REMOVED HC-1149 FROM M2 PRODUCT BOARD MOUNTING. SPACING 1/2".	RBN	
01	26 MAR 04	FIXED PINOUT OF J8. J8-F (D2IN-N) AND J8-H (D2IN-P).	MER	

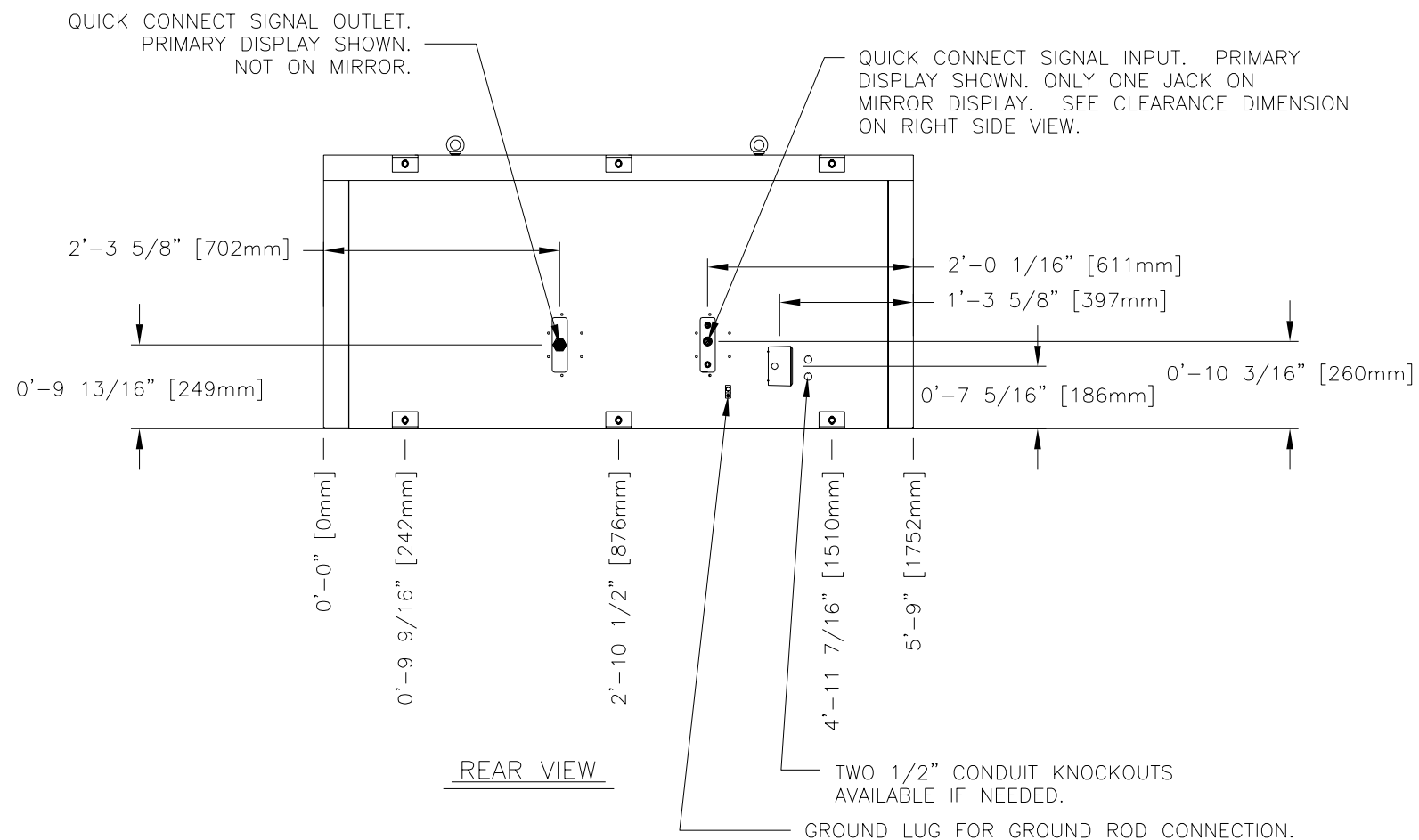
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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:	CNTRLR II, GALAXY, 8 CONN, J1087		
DES. BY:	DRAWN BY:	M.RICHARDSON DATE: 26 FEB 04	
REVISION	APPR. BY:	1229-R10B-204771	
02	SCALE:	1=1	



FRONT VIEW



REAR VIEW

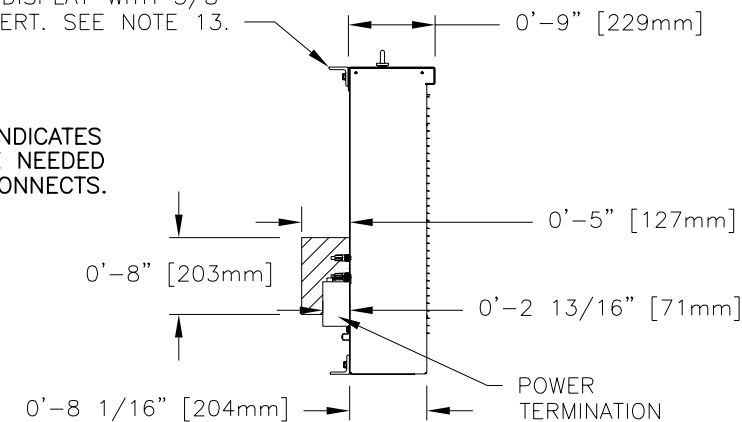
CHART 1					CHART 2				
POWER REQUIREMENTS PER SINGLE FACE					POWER REQUIREMENTS PER DOUBLE FACE				
COLOR	120 VOLT DOMESTIC (MAXIMUM)		120 VOLT DOMESTIC (TYPICAL)		COLOR	120 VOLT DOMESTIC (MAXIMUM)		120 VOLT DOMESTIC (TYPICAL)	
	WATTS	AMPS	WATTS	AMPS		WATTS	AMPS	WATTS	AMPS
RGB/RED	685	5.70	343	2.85	RGB/RED	1370	11.42	685	5.70

NOTES:

- ALL DIMENSIONS ARE IN FEET AND INCHES [MILLIMETERS].
- DISPLAY IS ALL ALUMINUM CONSTRUCTION.
- DISPLAY CABINET COLOR IS FLAT BLACK.
- FRONT ACCESS FOR SERVICE.
- ESTIMATED WEIGHT IS: 140 LBS [64 KG] PER SINGLE FACE. 280 LBS [128 KG] PER DOUBLE FACE.
- DAKTRONICS IS NOT RESPONSIBLE FOR THE MAIN ELECTRICAL DISCONNECT.
- DAKTRONICS IS NOT RESPONSIBLE FOR THE MOUNTING HARDWARE OR THE INTEGRITY OF THE STRUCTURE THE DISPLAY IS MOUNTED TO.
- THE DISPLAY CONSISTS OF A 48X48-12MM MATRIX ON THE LEFT AND 32X48-20MM MATRIX ON THE RIGHT.
- 48X48-12MM L.E.D. DISPLAY COLOR IS RGB.
- 32X48-20MM L.E.D. DISPLAY COLOR IS RED.
- EYEBOLTS MAY NOT BE USED FOR PERMANENT INSTALLATION.
- IN ORDER TO MAINTAIN THE STRUCTURAL INTEGRITY OF THE DISPLAY CABINET, THE 90° ANGLE BETWEEN THE CABINET AND THE LIFTING METHOD MUST BE MAINTAINED.
- ALL CLIP ANGLES (OR THEIR LOCATIONS) MUST BE USED FOR DISPLAY INSTALLATION.
- DISPLAY IS FRONT VENTILATED SO NO PORTION OF THE FRONT FACE CAN BE COVERED.
- POWER REQUIREMENTS ARE LISTED IN CHART 1 PER SINGLE FACE, LISTED IN CHART 2 PER DOUBLE FACE.
- TYPICAL POWER SERVICE REQUIREMENT: ONE 20 AMP @ 120 VAC, SINGLE PHASE CIRCUIT PER DOUBLE FACE DISPLAY.

L2X2X1/4X3" WIDE ASTM A36 STEEL CLIP ANGLE FOR MOUNTING. ATTACHED TO DISPLAY WITH 3/8" BOLT AND NUT INSERT. SEE NOTE 13.

SHADED AREA INDICATES CLEARANCE NEEDED FOR QUICK CONNECTS.



LEFT SIDE

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF-3300 12/20mm MIX

TITLE: SHOP DWG, AF-3300-48X48-12-RGB, 32X48-20-R

DES. BY: K MILLER DRAWN BY: K MILLER DATE: 10MAY05

REVISION 00 APPR. BY: SCALE: 1=20

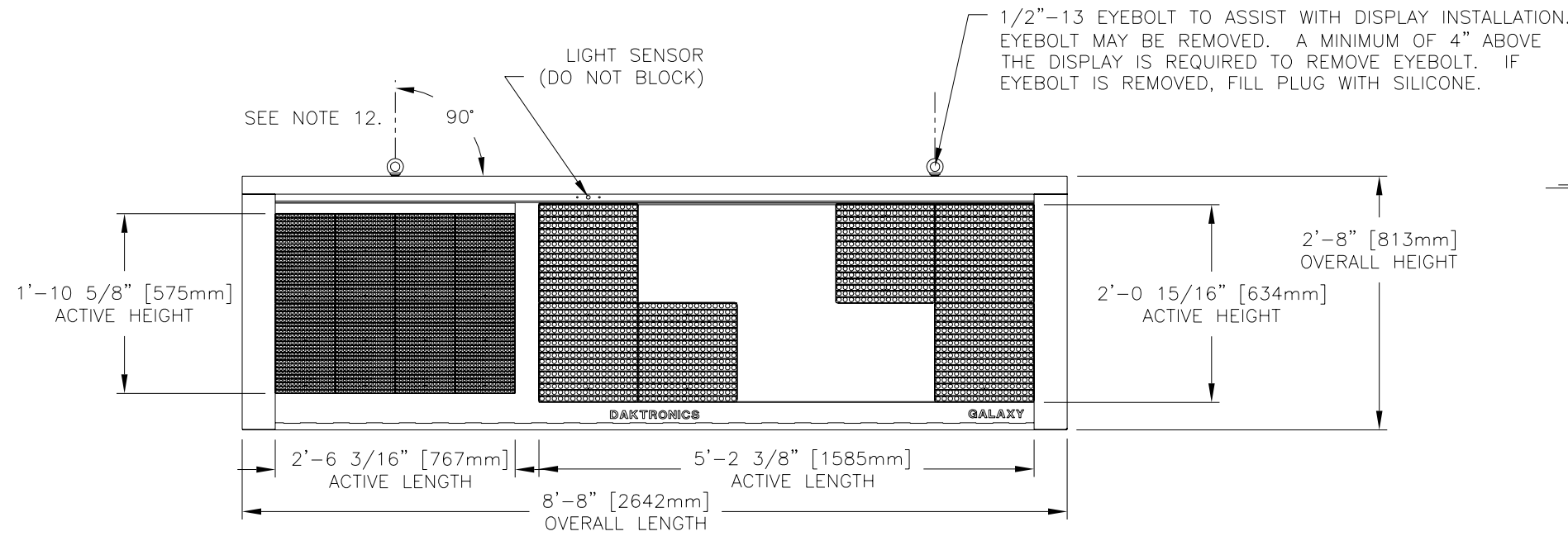
1350-E10B-241264

REV.	DATE	DESCRIPTION	BY	APPR.

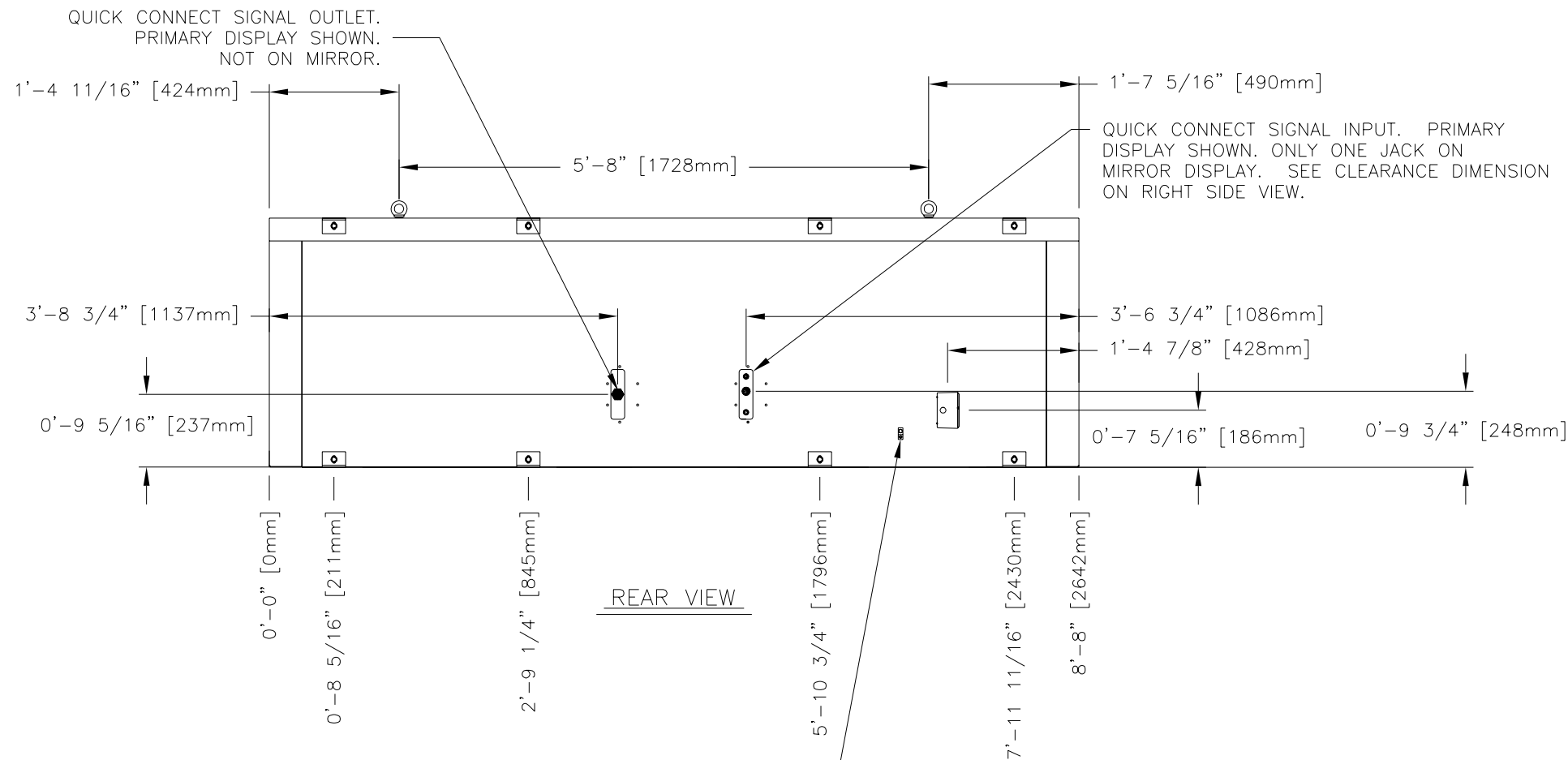
CHART 1					CHART 2				
POWER REQUIREMENTS PER SINGLE FACE					POWER REQUIREMENTS PER DOUBLE FACE				
COLOR	120 VOLT DOMESTIC (MAXIMUM)		120 VOLT DOMESTIC (TYPICAL)		COLOR	120 VOLT DOMESTIC (MAXIMUM)		120 VOLT DOMESTIC (TYPICAL)	
	WATTS	AMPS	WATTS	AMPS		WATTS	AMPS	WATTS	AMPS
RGB/RED	960	8.00	480	4.00	RGB/RED	1920	16.00	960	8.00

NOTES:

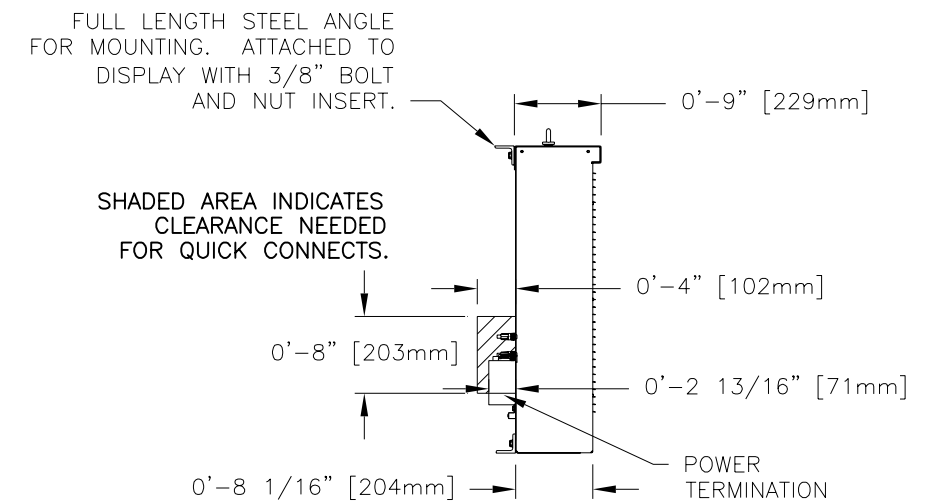
- ALL DIMENSIONS ARE IN FEET AND INCHES [MILLIMETERS].
- DISPLAY IS ALL ALUMINUM CONSTRUCTION.
- DISPLAY CABINET COLOR IS FLAT BLACK.
- FRONT ACCESS FOR SERVICE.
- ESTIMATED WEIGHT IS: 230 LBS [102 KG] PER SINGLE FACE. 460 LBS [204 KG] PER DOUBLE FACE.
- DAKTRONICS IS NOT RESPONSIBLE FOR THE MAIN ELECTRICAL DISCONNECT.
- DAKTRONICS IS NOT RESPONSIBLE FOR THE MOUNTING HARDWARE OR THE INTEGRITY OF THE STRUCTURE THE DISPLAY IS MOUNTED TO.
- THE DISPLAY CONSISTS OF A 48X64-12MM MATRIX ON THE LEFT AND 32X80-20MM MATRIX ON THE RIGHT.
- 48X64-12MM L.E.D. DISPLAY COLOR IS RGB.
- 32X80-20MM L.E.D. DISPLAY COLOR IS RED.
- EYEBOLTS MAY NOT BE USED FOR PERMANENT INSTALLATION.
- IN ORDER TO MAINTAIN THE STRUCTURAL INTEGRITY OF THE DISPLAY CABINET, THE 90° ANGLE BETWEEN THE CABINET AND THE LIFTING METHOD MUST BE MAINTAINED.
- ALL CLIP ANGLES (OR THEIR LOCATIONS) MUST BE USED FOR DISPLAY INSTALLATION.
- DISPLAY IS FRONT VENTILATED SO NO PORTION OF THE FRONT FACE CAN BE COVERED.
- POWER REQUIREMENTS ARE LISTED IN CHART 1 PER SINGLE FACE, LISTED IN CHART 2 PER DOUBLE FACE.
- TYPICAL POWER SERVICE REQUIREMENT: ONE 20 AMP @ 120 VAC, SINGLE PHASE CIRCUIT PER DOUBLE FACE DISPLAY.



FRONT VIEW



REAR VIEW



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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF-3300 12/20mm MIX

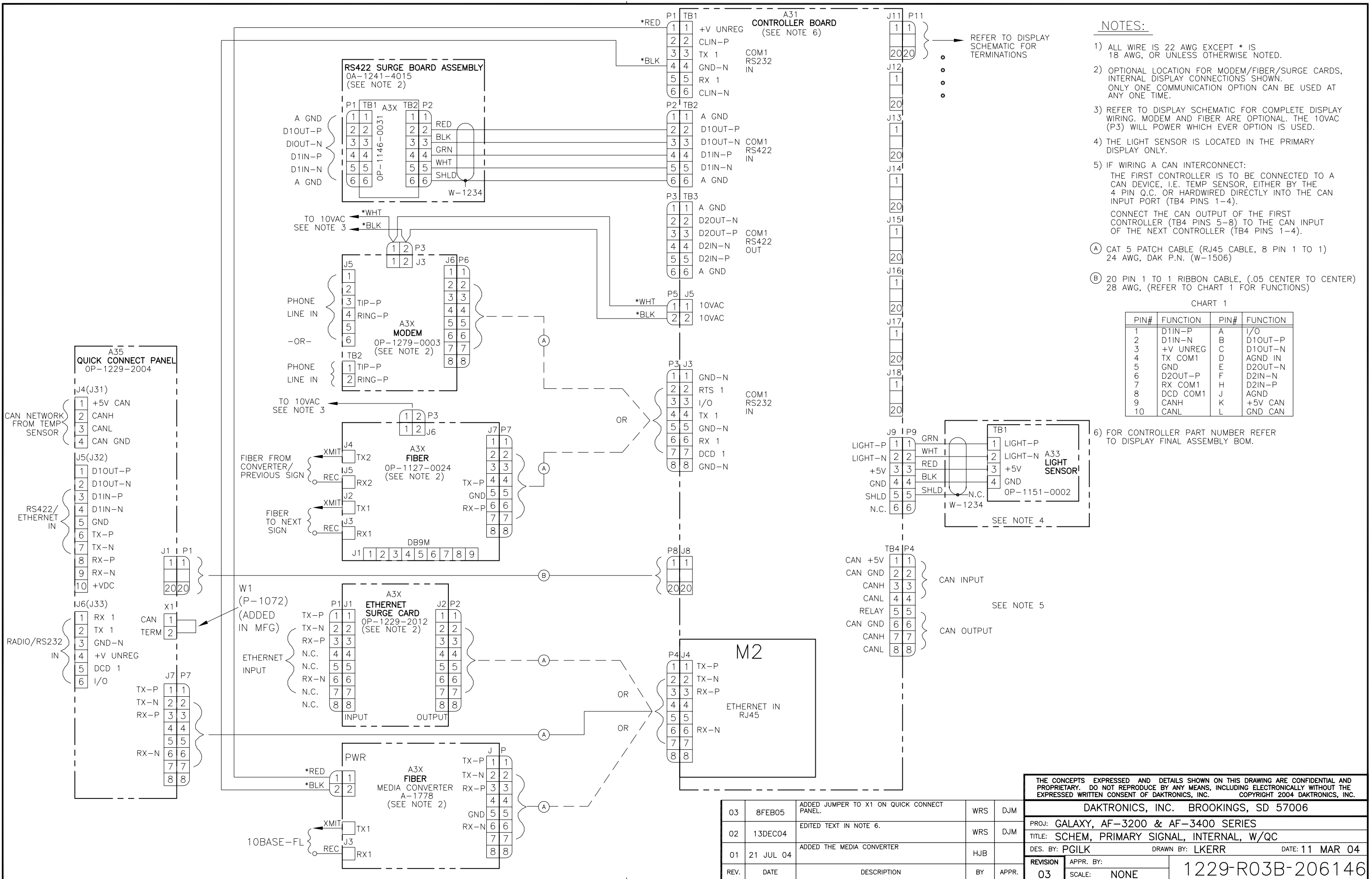
TITLE: SHOP DWG, AF-3300-48X64-12-RGB, 32X80-20-R

DES. BY: K MILLER DRAWN BY: K MILLER DATE: 10MAY05

REVISION 01 APPR. BY: SCALE: 1=20

1350-E10B-240560

REV.	DATE	DESCRIPTION	BY	APPR.
01	18MAY05	ADDED CLIP ANGLES.	KSM	



NOTES:

- 1) ALL WIRE IS 22 AWG EXCEPT * IS 18 AWG, OR UNLESS OTHERWISE NOTED.
 - 2) OPTIONAL LOCATION FOR MODEM/FIBER/SURGE CARDS, INTERNAL DISPLAY CONNECTIONS SHOWN. ONLY ONE COMMUNICATION OPTION CAN BE USED AT ANY ONE TIME.
 - 3) REFER TO DISPLAY SCHEMATIC FOR COMPLETE DISPLAY WIRING. MODEM AND FIBER ARE OPTIONAL. THE 10VAC (P3) WILL POWER WHICH EVER OPTION IS USED.
 - 4) THE LIGHT SENSOR IS LOCATED IN THE PRIMARY DISPLAY ONLY.
 - 5) IF WIRING A CAN INTERCONNECT: THE FIRST CONTROLLER IS TO BE CONNECTED TO A CAN DEVICE, I.E. TEMP SENSOR, EITHER BY THE 4 PIN Q.C. OR HARDWIRED DIRECTLY INTO THE CAN INPUT PORT (TB4 PINS 1-4).
CONNECT THE CAN OUTPUT OF THE FIRST CONTROLLER (TB4 PINS 5-8) TO THE CAN INPUT OF THE NEXT CONTROLLER (TB4 PINS 1-4).
- (A) CAT 5 PATCH CABLE (RJ45 CABLE, 8 PIN 1 TO 1) 24 AWG, DAK P.N. (W-1506)
- (B) 20 PIN 1 TO 1 RIBBON CABLE, (.05 CENTER TO CENTER) 28 AWG. (REFER TO CHART 1 FOR FUNCTIONS)

CHART 1

PIN#	FUNCTION	PIN#	FUNCTION
1	D1IN-P	A	I/O
2	D1IN-N	B	D1OUT-P
3	+V UNREG	C	D1OUT-N
4	TX COM1	D	AGND IN
5	GND	E	D2OUT-N
6	D2OUT-P	F	D2IN-N
7	RX COM1	H	D2IN-P
8	DCD COM1	J	AGND
9	CANH	K	+5V CAN
10	CANL	L	GND CAN

6) FOR CONTROLLER PART NUMBER REFER TO DISPLAY FINAL ASSEMBLY BOM.

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03		8FEB05	ADDED JUMPER TO X1 ON QUICK CONNECT PANEL.	WRS	DJM
02		13DEC04	EDITED TEXT IN NOTE 6.	WRS	DJM
01		21 JUL 04	ADDED THE MEDIA CONVERTER	HJB	
REV.	DATE		DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, AF-3200 & AF-3400 SERIES

TITLE: SCHEM, PRIMARY SIGNAL, INTERNAL, W/QC

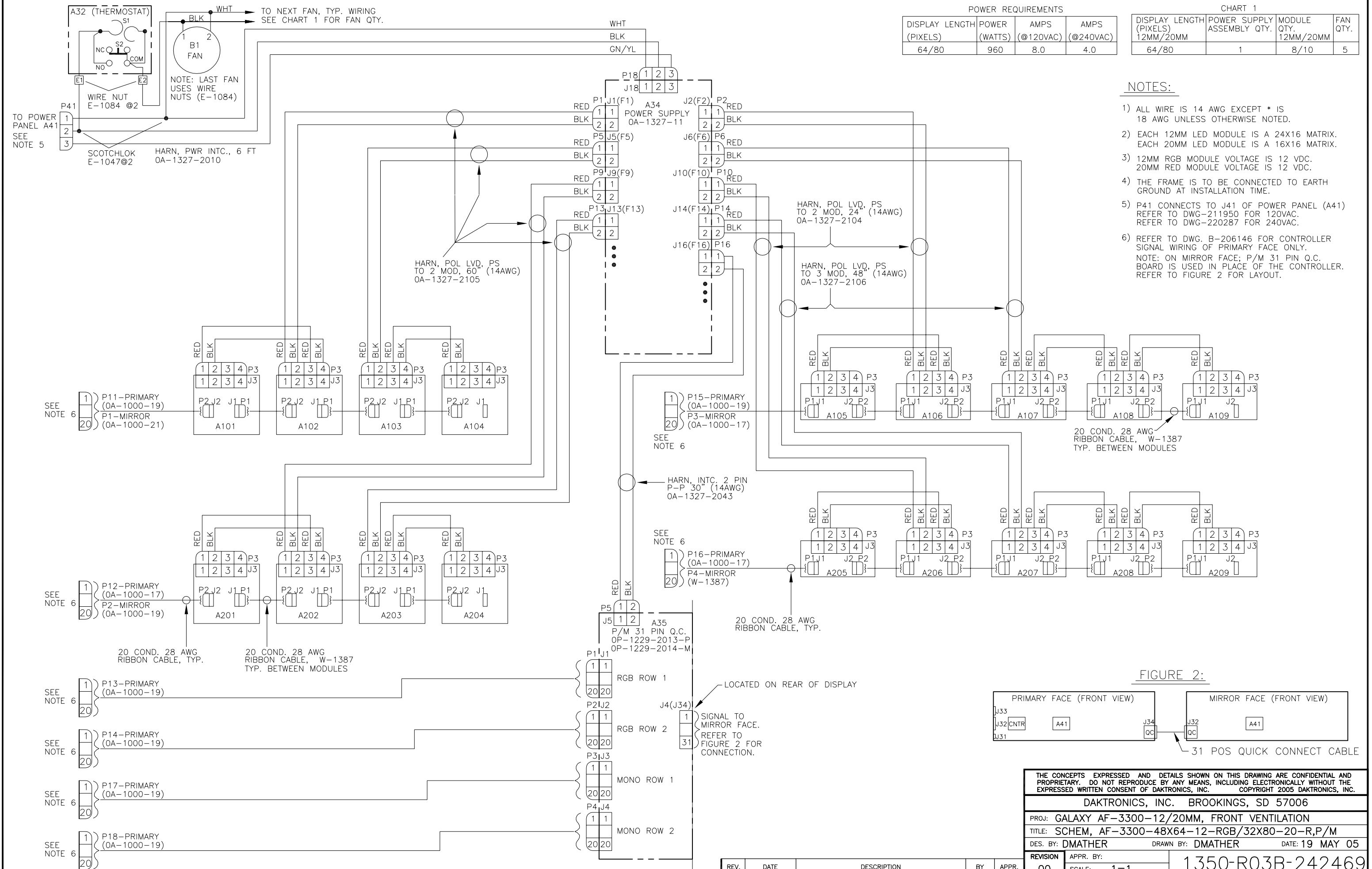
DES. BY: PGILK DRAWN BY: LKERR DATE: 11 MAR 04

REVISION: 03 APPR. BY: SCALE: NONE

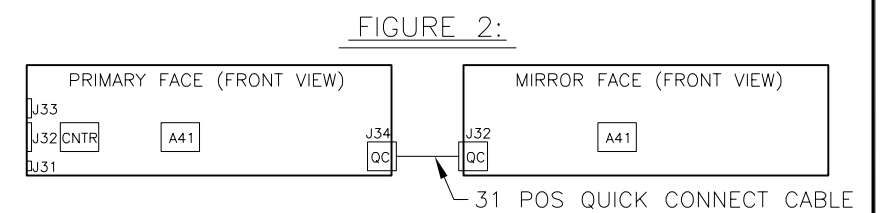
1229-R03B-206146

POWER REQUIREMENTS			
DISPLAY LENGTH (PIXELS)	POWER (WATTS)	AMPS (@120VAC)	AMPS (@240VAC)
64/80	960	8.0	4.0

CHART 1			
DISPLAY LENGTH (PIXELS) 12MM/20MM	POWER SUPPLY ASSEMBLY QTY.	MODULE QTY. 12MM/20MM	FAN QTY.
64/80	1	8/10	5



- NOTES:**
- 1) ALL WIRE IS 14 AWG EXCEPT * IS 18 AWG UNLESS OTHERWISE NOTED.
 - 2) EACH 12MM LED MODULE IS A 24X16 MATRIX. EACH 20MM LED MODULE IS A 16X16 MATRIX.
 - 3) 12MM RGB MODULE VOLTAGE IS 12 VDC. 20MM RED MODULE VOLTAGE IS 12 VDC.
 - 4) THE FRAME IS TO BE CONNECTED TO EARTH GROUND AT INSTALLATION TIME.
 - 5) P41 CONNECTS TO J41 OF POWER PANEL (A41) REFER TO DWG-211950 FOR 120VAC. REFER TO DWG-220287 FOR 240VAC.
 - 6) REFER TO DWG. B-206146 FOR CONTROLLER SIGNAL WIRING OF PRIMARY FACE ONLY. NOTE: ON MIRROR FACE; P/M 31 PIN Q.C. BOARD IS USED IN PLACE OF THE CONTROLLER. REFER TO FIGURE 2 FOR LAYOUT.



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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GALAXY AF-3300-12/20MM, FRONT VENTILATION			
TITLE: SCHEM, AF-3300-48X64-12-RGB/32X80-20-R,P/M			
DES. BY: DMATHER		DRAWN BY: DMATHER	
DATE: 19 MAY 05		REVISION	
APPR. BY:		SCALE: 1=1	
1350-R03B-242469			

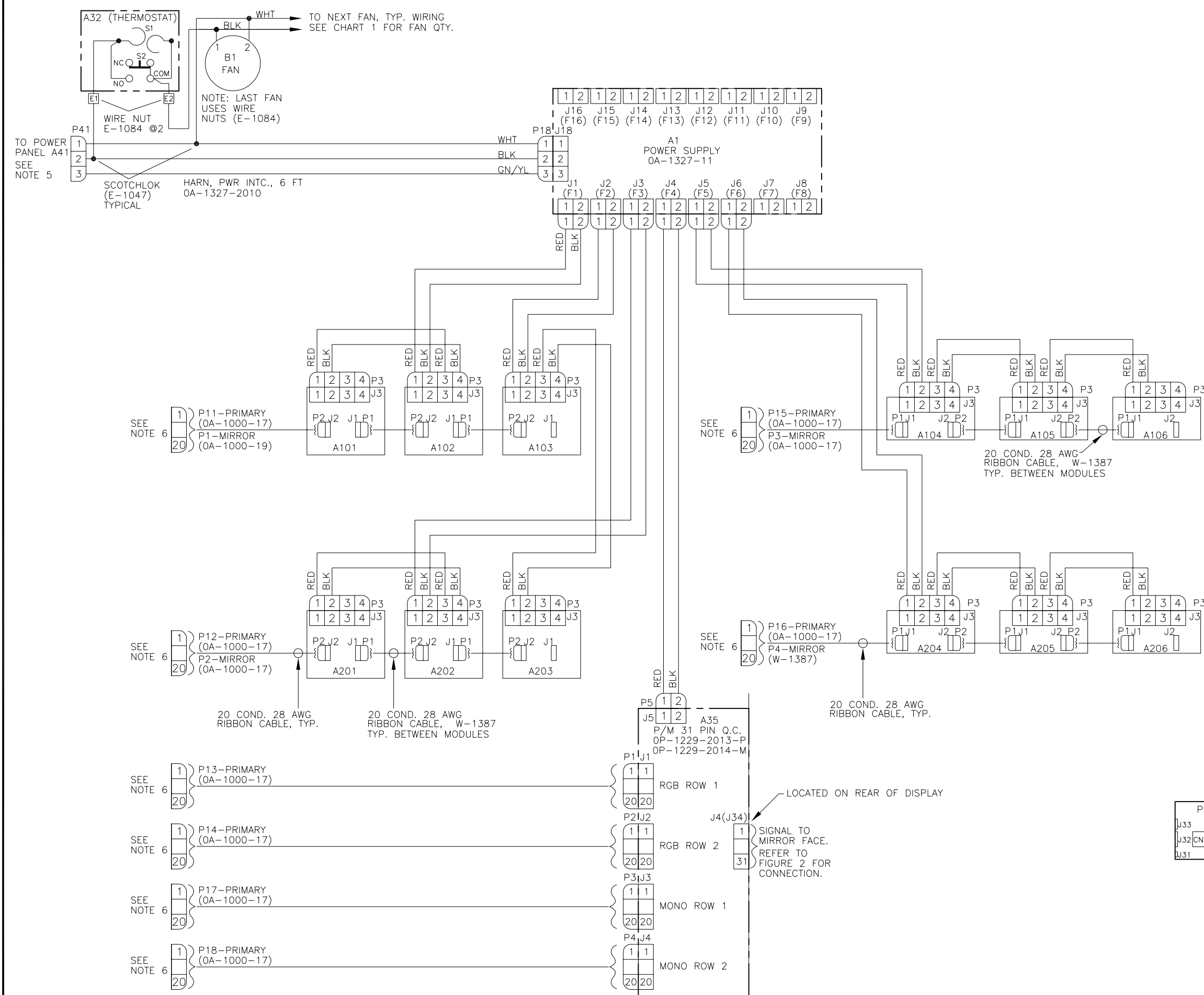
REV.	DATE	DESCRIPTION	BY	APPR.
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CHART 1

DISPLAY LENGTH (PIXELS)	POWER SUPPLY ASSEMBLY QTY.	MODULE QTY. 12MM/20MM	FAN QTY.
48/48	1	6/6	4

POWER REQUIREMENTS

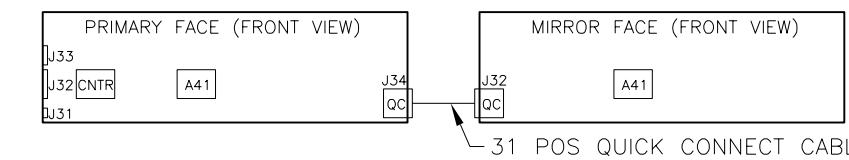
DISPLAY LENGTH (PIXELS)	POWER (WATTS)	AMPS (@120VAC)	AMPS (@240VAC)
48/48	685	5.70	2.85



NOTES:

- 1) ALL WIRE IS 14 AWG EXCEPT * IS 18 AWG UNLESS OTHERWISE NOTED.
- 2) EACH 12MM LED MODULE IS A 24X16 MATRIX. EACH 20MM LED MODULE IS A 16X16 MATRIX.
- 3) 12MM RGB MODULE VOLTAGE IS 12 VDC. 20MM RED MODULE VOLTAGE IS 12 VDC.
- 4) THE FRAME IS TO BE CONNECTED TO EARTH GROUND AT INSTALLATION TIME.
- 5) P41 CONNECTS TO J41 OF POWER PANEL (A41) REFER TO DWG-211950 FOR 120VAC. REFER TO DWG-220287 FOR 240VAC.
- 6) REFER TO DWG. B-206146 FOR CONTROLLER SIGNAL WIRING OF PRIMARY FACE ONLY. NOTE: ON MIRROR FACE; P/M 31 PIN Q.C. BOARD IS USED IN PLACE OF THE CONTROLLER. REFER TO FIGURE 2 FOR LAYOUT.

FIGURE 2:



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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY AF-3300-12/20MM, FRONT VENTILATION

TITLE: SCHEM, AF-3300-48X48-12-RGB/32X48-20-R,P/M

DES. BY: DMATHER DRAWN BY: WSCHNEI DATE: 19 MAY 05

REVISION 00 APPR. BY: DJM SCALE: 1=1

1350-R03B-242471

REV.	DATE	DESCRIPTION	BY	APPR.