

Galaxy[®] AF-3200
34 mm

Installation and Operation Manual

ED-16958

Rev 2

15 January 2010

DAKTRONICS

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 Call Center	Fill in the blank
Location address of the display:	
Model number of the display:	AF-3200 34 mm
Version of software being used:	
Method of communication being used:	
Controller version used in the display:	Version 3
Display's address on network:	



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Table of Contents

Section 1:	Overview of the Displays	1-1
1.1	Display Details.....	1-1
Section 2:	Mechanical Installation.....	2-1
2.1	Support Structure Requirements	2-1
2.2	Display Mounting.....	2-3
2.3	Optional Temperature Sensor Mounting	2-3
Section 3:	Power Installation	3-1
3.1	Conduit	3-1
3.2	Overview of Power/ Signal Connection	3-1
3.3	Power Requirements.....	3-2
3.4	Grounding.....	3-2
3.5	Power Connection.....	3-4
3.6	Power Routing in the Display	3-6
Section 4:	Signal Installation Overview	4-1
4.1	Introduction to Signal Communication	4-1
Section 5:	Start-up Procedure	5-1
5.1	Start-up Checklist.....	5-1
5.2	Start-up Sequence.....	5-2
Section 6:	Maintenance	6-1
6.1	Display Access	6-2
6.2	Ventilation System Maintenance	6-2
6.3	Annual Inspection.....	6-2
Section 7:	Diagnostics and Troubleshooting.....	7-1
	Safety Precautions.....	7-1
7.1	Display Interior.....	7-1
7.2	Controller Diagnostics	7-2
7.3	Troubleshooting Display Problems.....	7-4
Section 8:	Parts Replacement.....	8-1
8.1	Obtaining Replacement Parts	8-1
8.2	Instructions for Replacing Parts	8-3
	Module Removal/Replacement.....	8-3

	Controller Replacement	8-4
	Power Supply Replacement.....	8-5
	Light Sensor Replacement	8-6
	Temperature Sensor Replacement.....	8-7
8.3	Common Power and Signal Connectors	8-8
8.4	Definitions of Terms.....	8-10
Section 9:	Daktronics Exchange and Repair & Return Programs	9-1
9.1	Exchange Program	9-1
9.2	Repair & Return Program	9-2
9.3	Daktronics Warranty and Limitation of Liability	9-2
Appendix A:	Reference Drawings	1
Appendix B:	Temperature Sensor Installation	1
Appendix C:	Daktronics Warranty and Limitation of Liability (SL-02374)	1

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 information and parts replacement are included within these sections. Definitions of terms used in the displays can be found in **Appendix A** while descriptions of common connectors are located in **Section 8.3**.

Drawings may be referenced at the beginning of some sections. These reference drawings are inserted in **Appendix A** at the end of the manual. The drawings will be identified by the last set of digits and the letter preceding them, located in the lower-right corner of the drawing. **Figure 1** illustrates Daktronics drawing label. In the example, this drawing would be referred to as **Drawing B-206146**.

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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GALAXY, AF-3200 & AF-3400 SERIES			
TITLE: SCHEM, PRIMARY SIGNAL, INTERNAL, W/DC			
DES. BY: PGILK		DRAWN BY: LKERR	
REVISION		DATE: 11 MAR 04	
00	APPR BY:	1229-R03B-206146	
	SCALE:	NONE	

Figure 1: Drawing Label

1.1 Display Details

Galaxy® model numbers are described as follows:

AF-3200-RRxCCC-34-R-X

AF-3200	=	Outdoor louvered Galaxy display
RR	=	Number of rows high (16 or 24)
CCC	=	Number of columns long (up to 96 standard)
34	=	mm pixel to pixel spacing
R, A, RGB	=	LED color: R (Red), A (Amber), RGB ("full color" Red, Green, Blue)
XX	=	SF - single face or 2V -Primary/Mirror

The displays are offered as SF (single-face) or 2V (two-view) units. With a 2V (two-view) unit, the first display is called the primary and the second display is referred to as the mirror. If the second display will be mounted at a distance of more than six feet 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 8 pixels high by 16 pixels wide. Refer to **Figure 2**. By placing modules next to each other, a display of any size can be designed and built. Individual modules can be easily removed from the display, if required.

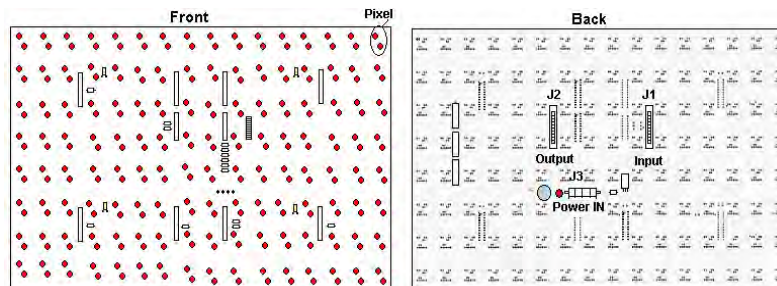


Figure 2: 34 mm Monochrome Red Module

A typical display system is controlled with a Windows®-based personal computer (PC) running Venus® 1500 software. Venus® 1500 is a software package that runs under Windows® XP Home/Professional or Vista operating systems on an IBM®-compatible computer. This software can control up to 240 displays in a network. Refer to the Venus® 1500 operations manual for installation and operation of the Venus® 1500 software.

The diagrams in **Figure 3** and **Figure 4** 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.

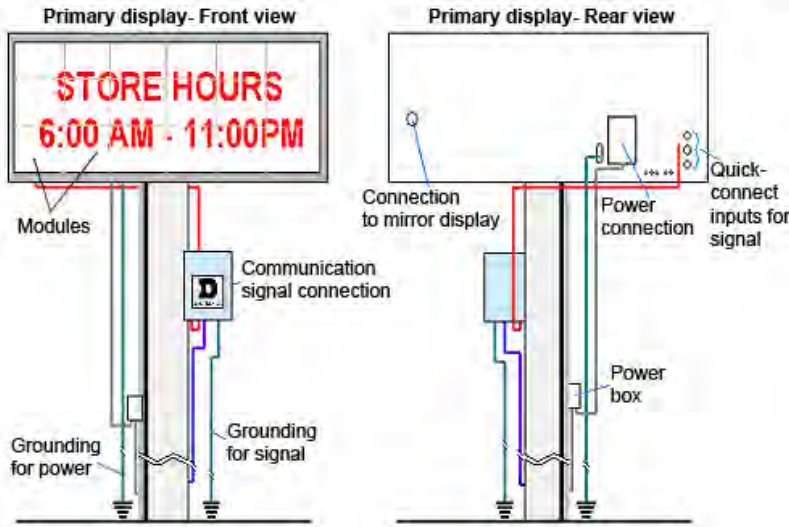


Figure 3: Front and Rear View of a Display

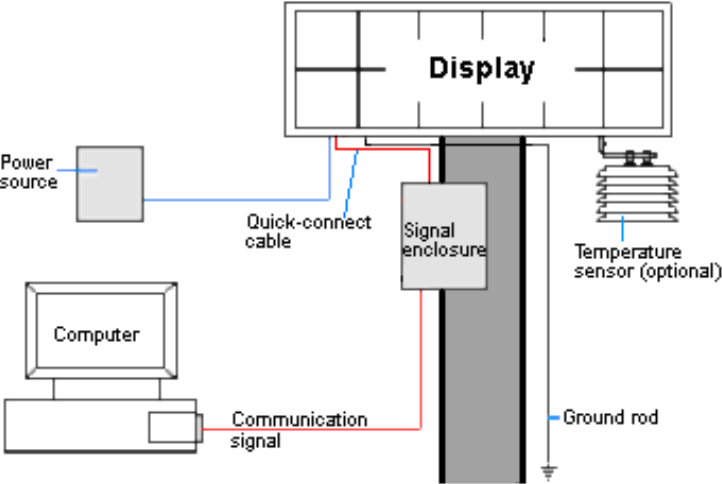


Figure 4: Basic Display Set-up

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 3** and **Figure 4** 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 5** for the back view of a typical display. Display height and wind loading are also critical factors to be considered.

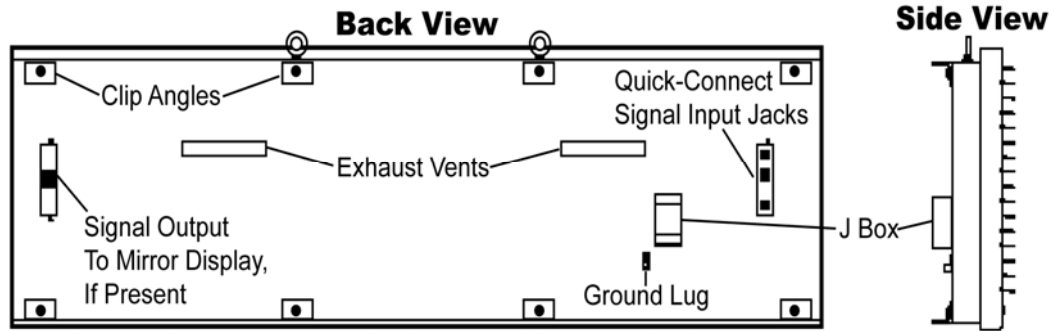


Figure 5: Back and Side Views of Typical Display

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 1/4-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.
- Adequate clearance is maintained in front of the display to allow the front panel to fully open.

Clearance is maintained at the bottom to allow for airflow through the ventilation slots and in the back to allow for the fans to exhaust air from the display interior.

2.2 Display Mounting

The installer is responsible for ensuring 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 6**.

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

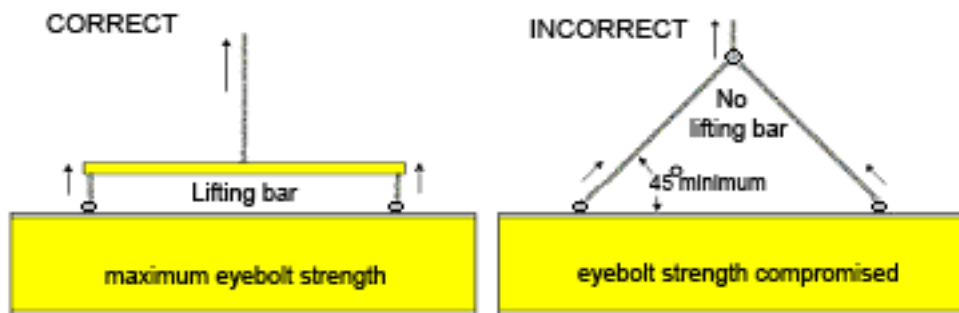


Figure 6: Correct/incorrect Lifting Procedures

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.

2.3 Optional Temperature Sensor Mounting

If a temperature sensor will be used with this display, consult **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 3/4" conduit. Unthreaded 1/2" knockout holes are provided in the signal enclosures used with the display. If not using the provided enclosures, use the knockout/ drill holes provided in the display cabinet.

3.2 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 of the display does not allow for the use of these enclosures, refer to **Section 3.5** for diagrams on internal wiring for the power.
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 for 1 and 2 circuit power termination panels: 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 need to be connected to both the primary and the mirror displays separately.

6. Connect the grounding electrode conductor at the **grounding lug** on the back of the display. If the display has two faces, a ground will need to be connected to each display face.
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



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

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

This sign is to be installed in accordance with the requirements of Articles 250 and 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

For these displays, installation with ground and neutral conductors provided is used. The power cable **must** contain an isolated earth-ground conductor. **The display must be properly grounded, or the warranty will be void.**

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.

In addition to the service ground, the display system **must** be connected to earth-ground by means of ground rod or similar method. Refer to **Figure 7**. Proper grounding is necessary for reliable equipment operation. It also protects the equipment from damaging electrical disturbances and lightning.

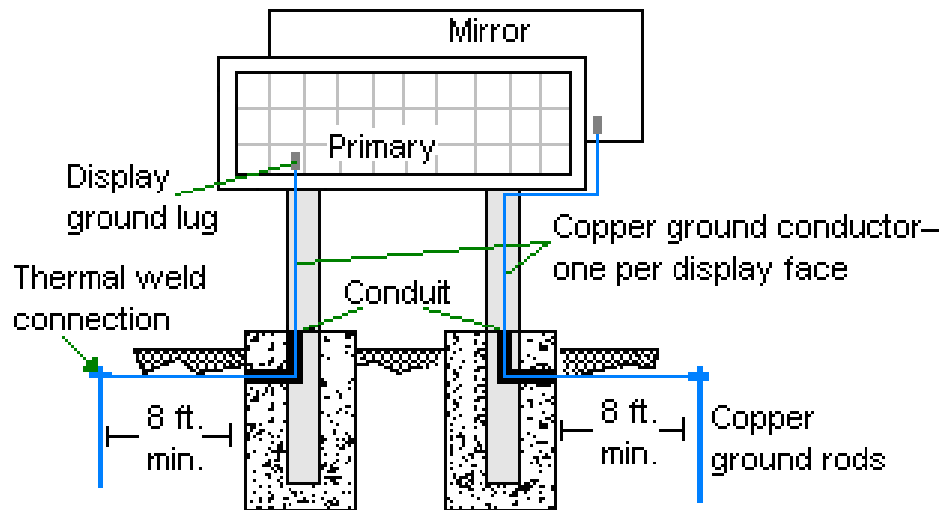


Figure 7: Correct Grounding

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 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: Connecting to the power termination enclosure on the display back.

Option 2: Connecting directly to the power termination panel inside the display.

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 conduit to the rear of the display and into the power termination enclosure.
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.

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 – 240)
- Grounding Conductor – (Green-Yellow)

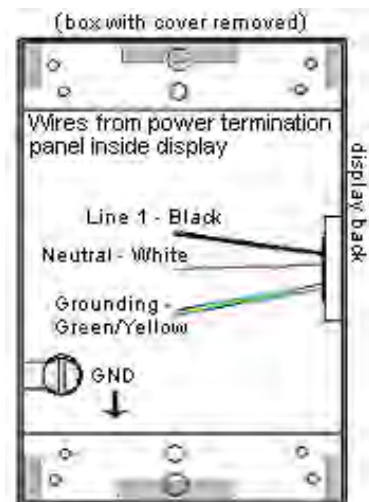


Figure 8: Power Termination Wiring

Option 2: Terminating power at the internal connections

Directions are provided for one and two circuit power termination.

1. Open the display (refer to **Section 6.1**) and locate the power termination panel.
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, if applicable.
4. Remove the panel cover. 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 8**).

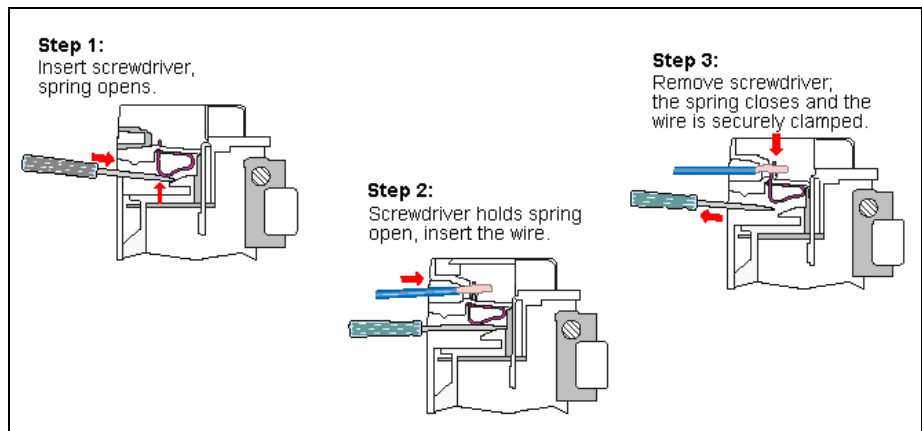


Figure 9: Cage Clamp Connections

6. Make the following connections, as shown in **Figure 9**:

- 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

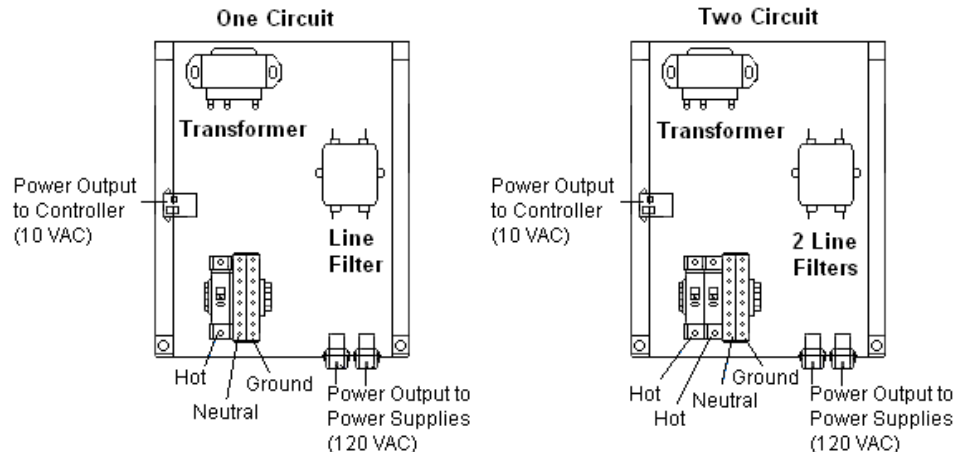


Figure 10: Power Termination - One Circuit, Two Circuit

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 11**, 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.
2. Power continues through pre-terminated wires to the power termination panel, which include the transformer and filter.
3. Power passes through the transformer where 120VAC voltage is stepped down to 10VAC for use by the controller.
4. Power is routed to the power supplies which provide DC voltage to the modules. Power supplies provide 9 VDC power to the amber modules and 6.5 VDC to the red modules.
5. Power is also sent to the fans and to the thermostat, if installed.

Note: Power supplies are preset to proper voltage levels. Contact Daktronics Customer Service for proper settings.

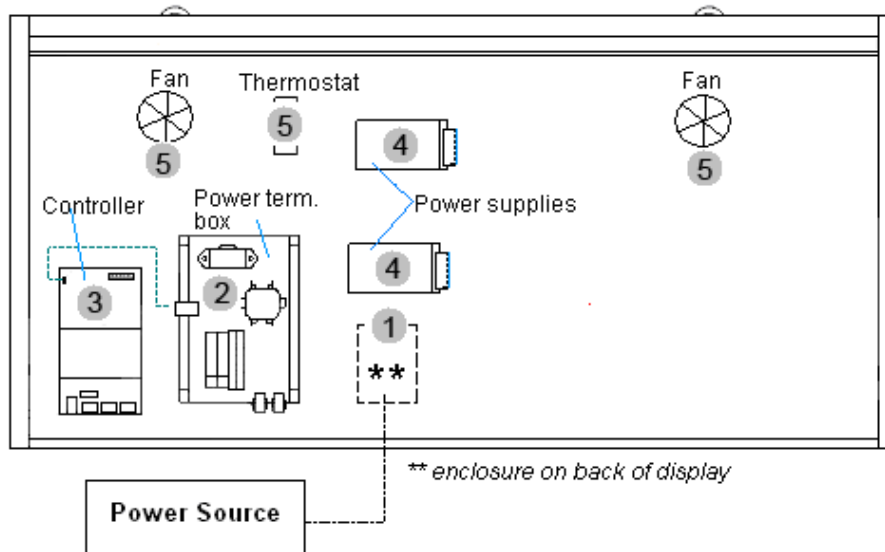


Figure 11: Power Routing Summary

Section 4: Signal Installation Overview

4.1 Introduction to Signal Communication

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 for that communication type. These were included in the shipment of the communications equipment. Each type is listed below with its manual number.

Communication Type	Communication Manual	Communication Quick Guide
RS-422	ED-14742	ED-14555
Serial Fiber	ED-14743	ED-14557
Radio	ED-13932	ED-14103
Ethernet Radio	ED-16483	DD1417586
Wire Ethernet	ED-14745	ED-14558
Fiber Ethernet	ED-14746	ED-14559
Modem	ED-14744	ED-14556
RS-232	ED-14739	ED-14554

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 Call Center.

If the display is a two-sided primary/mirror display, a six-foot quick-connect cable will be provided to connect the signal between the two display faces. This cable is limited to 6 feet only and cannot be extended. Refer to **Figure 12** for proper connection.

If the display faces are mounted at more than the length of the quick-connect cable, two primary displays will be utilized, requiring hard-wiring between the two display faces.



Figure 12: Quick-connect Cable

4.2

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 13** 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 3** 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 or hard-wired communication cable runs between the back connections of the two display cabinets. Refer to the illustration in **Figure 12**.

✓ **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 the display. Follow the step-by-step directions in the **Configuration** section of the manual for correct set-up.

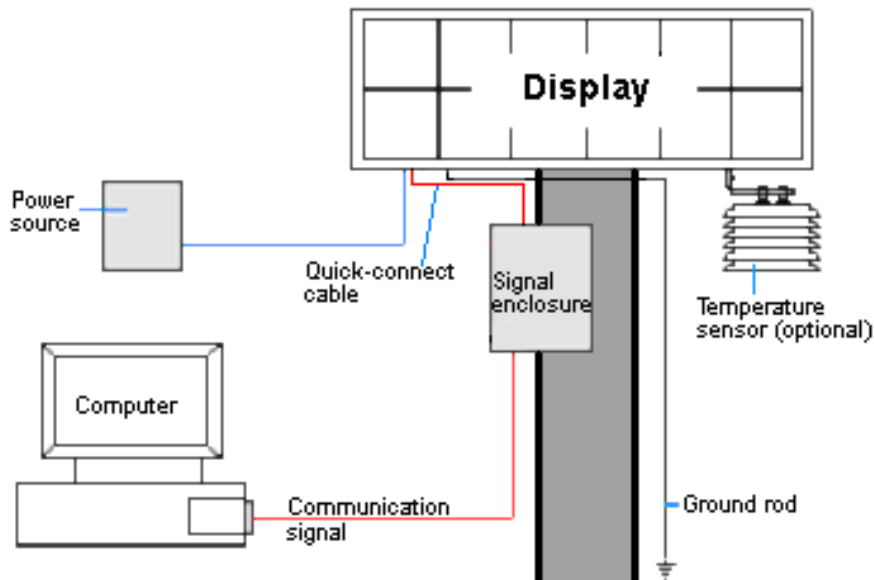


Figure 13: Basic Display Set-up

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 or RGB 32k
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 (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 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-3200 series 34 mm displays are front accessible, meaning that access to the internal components is gained by opening the front panel of the display. The display may need to be opened to perform maintenance or for troubleshooting.

The following diagram (**Figure 14**) shows the typical location of internal components. Note that the location may vary slightly depending on the pixel matrix size of the display. The "quick-connect to mirror display" will not be present in a single-face display.

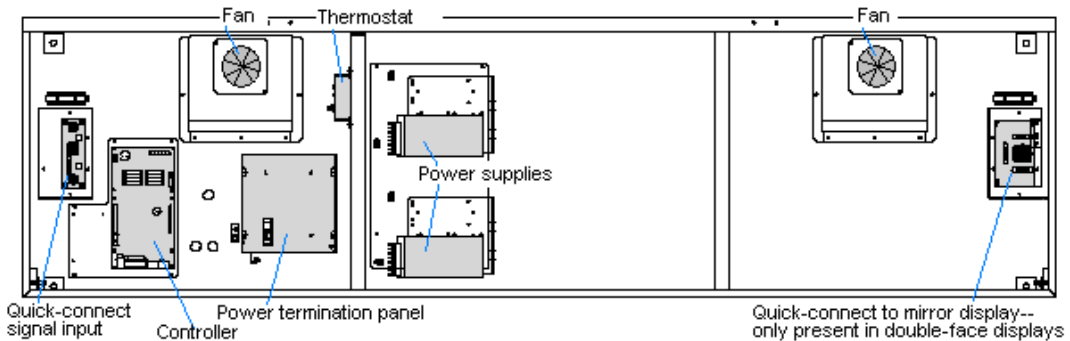


Figure 14: Location of Internal Components in 16 x 64 Display

6.1 Display Access

To gain access to the interior of a display, the face panel needs to be opened. 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 face panel. With a 5/32" hex wrench, turn the latch fasteners a quarter turn counterclockwise.
3. Lift the face panel from the bottom. Gas springs will hold the door open. **Caution:** The door will swing up. Take extra precautions during windy conditions.
4. To close the face panel, turn the latch fasteners a quarter turn clockwise.

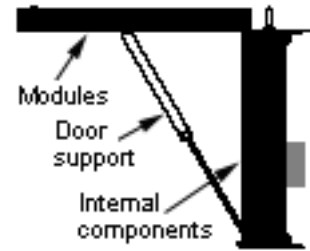


Figure 15: Open Face Panel

6.2 Ventilation System Maintenance

Frequency of Inspection

Ventilation fans are located on the back of the display. Air is pulled in from bottom venting slots and exhausted out the back of the display (Figure 16).

Fans and vents should be checked every time the display is opened or at a minimum of annually to ensure that the display is being cooled properly. Both should be checked more often if the display is located in a dusty or harsh weather environment.

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.

Air Flow

To check the operation of the fans, open the display to expose the thermostat in the top left area of the display (Figure 14). 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.

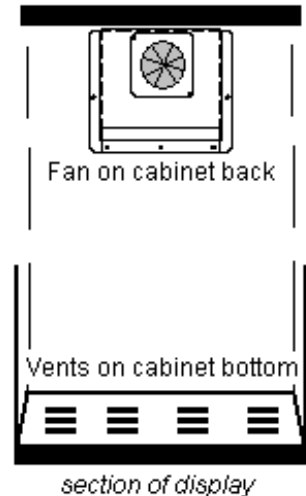


Figure 16: Fans and Vents

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	<ul style="list-style-type: none"> • Tighten or replace, as required.

Fans	<ul style="list-style-type: none"> • Refer to Section 6.2. Clean or replace as necessary.
Dust around fans, on cabinet bottom	<ul style="list-style-type: none"> • Vacuum or carefully wipe away.
Water intrusion or stains	<ul style="list-style-type: none"> • Replace weather-stripping. • Tighten module latches. • Place silicon sealant around all locations where water might enter. • Replace damaged electronic components.
Paint corrosion by footings, tie points, ground rods	<ul style="list-style-type: none"> • Check the metal for structural integrity. • Replace and/or repaint as necessary.

Section 7: Diagnostics and Troubleshooting

Safety Precautions



- Read and understand these instructions for proper operation of the display.
- **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 Display Interior

This section defines the diagnostic LEDs located on the controller and also provides troubleshooting tips for solving display problems.

The controller is one of the internal components labeled in **Figure 17**. 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, the face panel will need to be opened to view the diagnostic LEDs. To access the interior of the display, refer to **Section 6.1** for instructions and illustration.

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

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

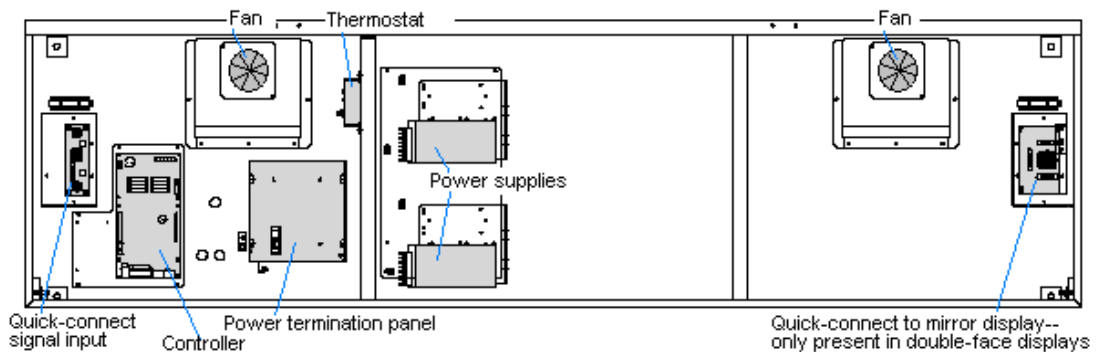


Figure 17: Interior Component Locations

7.2 Controller Diagnostics

The controller is the component that receives communication from the computer and then sends data to the modules. **Figure 18** below illustrates a typical controller.

Diagnostic LEDs are located at various places on the controller. The table following the diagram details some essential LEDs to monitor and the information that each LED provides. The LED name and number are noted in **Figure 18**.

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.

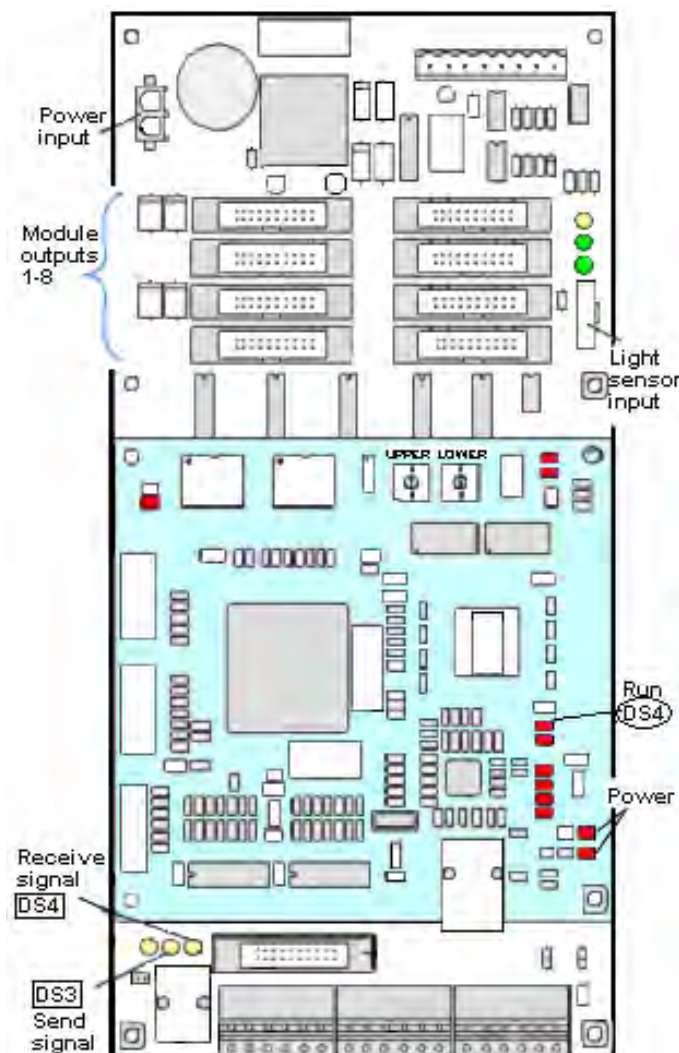


Figure 18: Controller Component Layout

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 at or near the display (**Figure 19**). The sensor board diagram below shows the red diagnostic LED (DS2) near the bottom edge of the component. The LED should be visible within the sensor housing when the sensor is receiving power from the display.

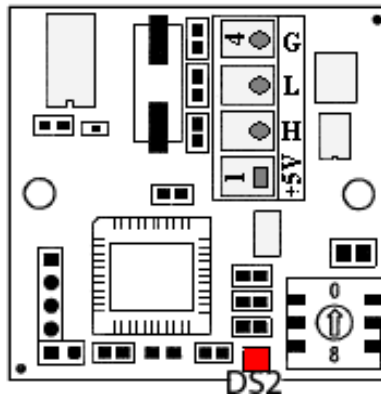


Figure 19: Temperature Sensor Board

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

7.3 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 the opening of the display cabinet. Refer to **Section 6.1** for instructions on this procedure. Before closing the cabinet, 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 doesn't 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 the module jacks.
- Move the module to a different location.
- If that doesn't help, the module may need to be replaced.

A section of the display is not working, extending 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 20**).
- 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.
- Check power to the first non-working module.
- Check output from the appropriate power supply.
- Make sure the power cable to the module is firmly connected.

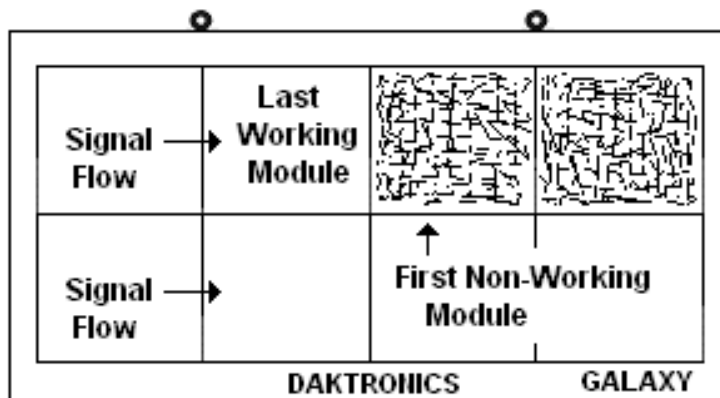


Figure 20: Modules Not Working

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 cables 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 input problem.

Entire display fails to work

- Check the diagnostic LEDs on the controller for Power and Run. (**Section 7.2**)
- Check the breakers in the building connected to main power source.
- Check the breakers in the power termination panel (bottom center of cabinet).
- 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 pixel 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 pixel 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 running 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 on **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 correct temperature can be shown.

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 on **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 $\pm 9^{\circ}\text{C}$ ($1^{\circ}\text{C}=1.8^{\circ}\text{F}$).
4. Once the adjustment is made, click on **Set Temperature Offset** to send this change to the display.

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

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.

Testing displays

Start and stop the test pattern

1. Open the *Venus 1500 Display Manager* and click on **Diagnostic Control**, represented by the gears in the top section.
 2. Click on the name of the chosen display under the *Display List*, then click on **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 Call Center:

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 solves the issue, fill out the following chart and call the service technician or Daktronics Customer Center 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 Call Center	Fill in the blank
Location address of the display:	
Model number of the display:	AF-3200, 34 mm
Version of software being used:	
Method of communication being used:	
Controller version used in the display:	Version 3
Display's address on network:	

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

Section 8: Parts Replacement

8.1 Obtaining Replacement Parts

Daktronics Galaxy® AF-3200 displays are designed and manufactured for performance, reliability, easy maintenance, and long life. However, on occasion, parts may need to be replaced. Refer to **Section 9** for information on obtaining replacement parts from Daktronics. Part numbers are listed in the chart on the following page.

This section provides instructions for replacing the following parts:

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

These components are typically located as shown in **Figure 21**. Verify component location by looking at the **Schematic drawing** for the particular pixel height of the display. The drawing numbers are listed in **Appendix A**.

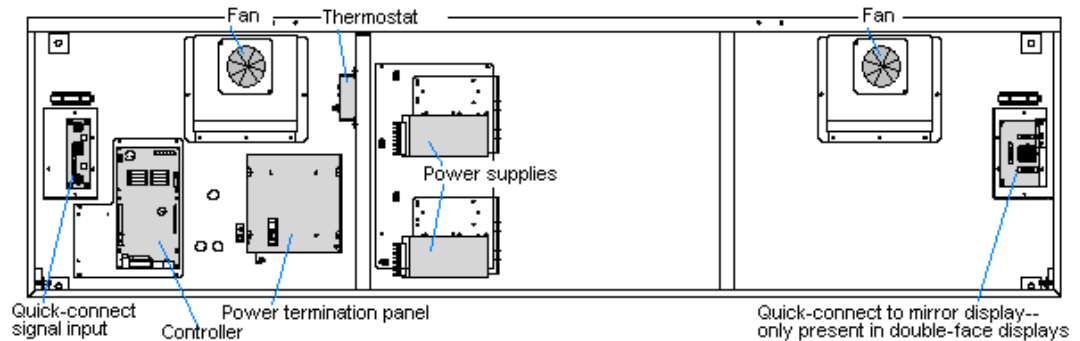


Figure 21: Interior Location of Components

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 22** with the part number in bold.

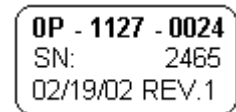


Figure 22: Typical Label

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, 2R, (1:1) 8x16 (30x70), Red	0P-1301-1000
Module, 3A, (1:1) 8x16 (30x70), Amber	0P-1301-1003
Controller II, Louvered Galaxy, 8-connector	0A-1229-0013
Power Supply Assembly, w/Harness, A-1633, Amber Displays	0A-1327-0009@1 0A-1327-0010@2
Power Supply Assembly, w/Harness, A-1591, Red Displays	0A-1327-0003@1 0A-1327-0004@2
Transformer; Pri.115V, Sec 10VCT, 3Amp, Primary only	T-1119
Filter, RFI Line 10 AMP 115-250 VAC	Z-1007
Digital Temperature Sensor	0P-1247-0008
Light Level Detector	0P-1151-0002
Thermostat Enclosure	0A-1213-4024
Fan; 110 CFM@120V @60Hz, 29-24 watt, 4.5"	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
Ribbon Assy; 20 Pos, 72"	0A-1000-0022
Cable; 22 AWG, 2-pair, shielded (light sensor/temp sensor to controller)	W-1234
Interconnect Cable; 31-pin male to 31-pin male, 6', QC	W-1503
Quick-connect interface, input, with Ethernet	0P-1229-2004
31-pin, quick-connect input/output board	0P-1229-2008

8.2 Instructions for Replacing Parts

Module Removal/Replacement



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

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

Tools required: 5/32" hex wrench and 9/32" nut driver

1. **Turn off power to the display.**
2. Locate the latch access fasteners on the face panel. With a 5/32" hex wrench, turn the latch fasteners a quarter turn counterclockwise.
3. Lift the face panel from the bottom. Gas springs will hold the door open. Refer to **Figure 15** for diagram. **Caution:** The door will swing up. Take extra precautions during windy conditions.
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. Using the nut driver, remove the ten nuts holding the module to the panel. Refer to **Figure 23**.



Figure 23: Removing a Module

7. To install a module, place it in position over the bolts and use the nut driver to replace the nuts.
8. Reconnect the power and signal cables to the module, making sure that the plugs make good connection.
9. Carefully close the face panel. Latch the panel by turning the fasteners a quarter turn clockwise.

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. Open the face panel. The controller is located 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 the nut driver.
6. Take note of the address on the controller and set the same address on the replacement controller.

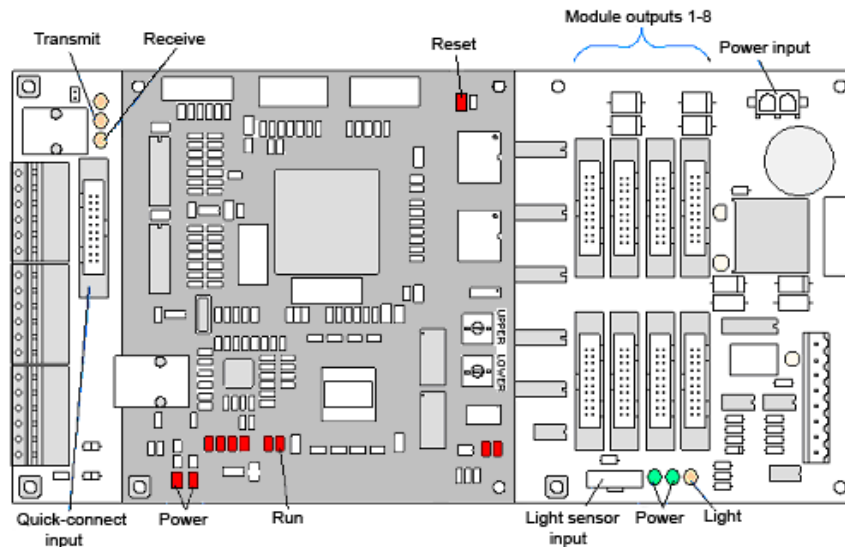


Figure 24: Typical Controller

Controller Address Setting

The rotary switches set the hardware address which the software uses to identify that particular display (**Figure 25**). 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. Then change the address to a number other than 0/0. The software cannot communicate with a controller set to address 0.

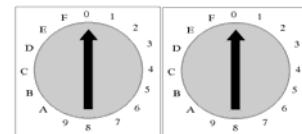


Figure 25: Rotary Switches

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 Red:** Each 6.5 VDC power supply provides power for up to five modules in a display. The assembly 0A-1327-0004 contains two power supplies, and the assembly 0A-1327-0003 only one.
- **Monochrome Amber:** Each 9 VDC power supply provides power for up to five amber LED modules. The assembly 0A-1327-0010 contains two power supplies and the assembly 0A-1327-0009 only one.

Power supplies may be installed as single or double units depending on the pixel matrix 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 26**.

Tools required: 5/32" 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 opening the face panel. Refer to **Section 6.1** for instructions.
3. Disconnect and label all the wires connected to the power supply.
4. The power supply is mounted to a metal plate. Remove the nuts holding the metal plate to the display back.
5. Remove the screws holding the power supply to the mounting plate.
6. Install a new power supply on the mounting plate and replace the nuts that hold the mounting plate to the display back.
7. Reattach the wires to the power supply as shown in **Figure 26**.

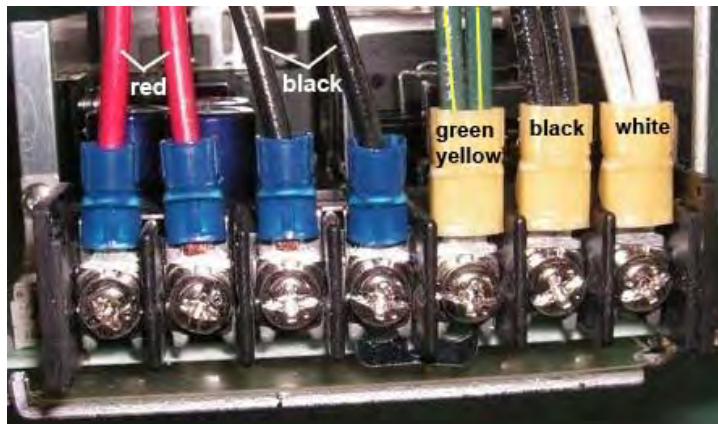


Figure 26: Single-unit Power Supply

Light Sensor Replacement

If the light sensor should fail, only the circuit board needs to be replaced. To do this, open the face panel of the display and locate the light sensor assembly on the upper left edge of the panel door. The assembly is mounted on two screws.

To replace a light sensor circuit board (**Figure 27**), 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.

Tools required: Phillips screwdriver, nutdriver

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 face panel when the assembly is in place.

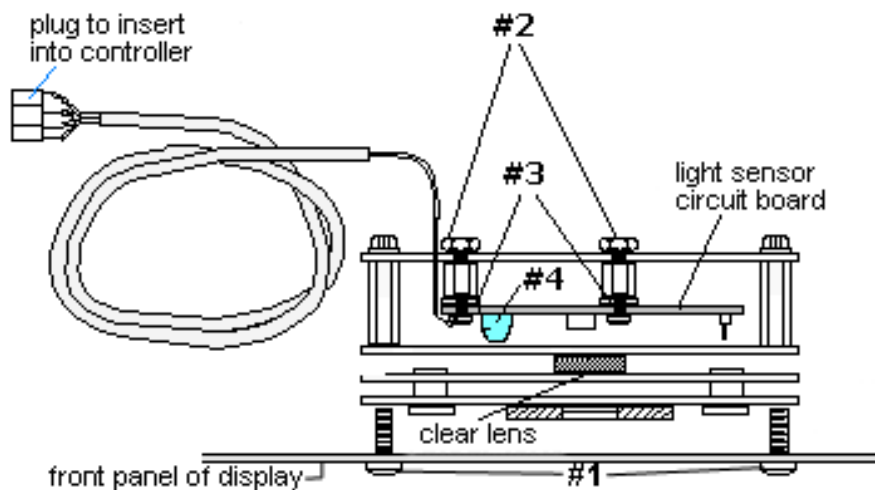


Figure 27: Light Sensor Assembly

Temperature Sensor Replacement

The temperature component is a small sensor board located inside a plastic housing (**Figure 29**). 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 as follows:

Tool required: Phillips screwdriver

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 28**) and then reassemble the sensor enclosure.

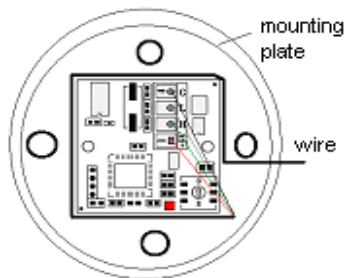


Figure 28: Wire around Sensor Board

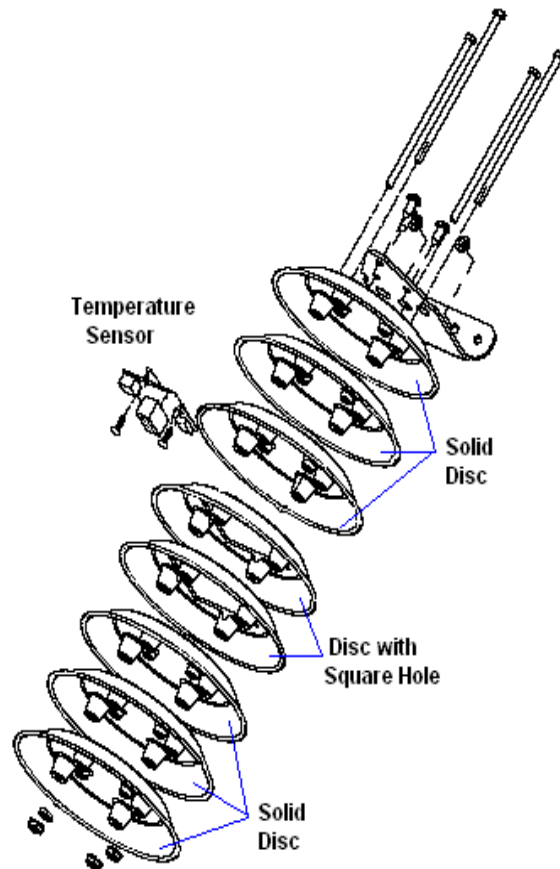


Figure 29: Temperature Sensor

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 cable connector is shown in **Figure 30**. 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.

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 31**.

Phoenix™ -Style Connectors:

Phoenix connectors, which are usually green, are often used for communication signal termination on circuit boards. Refer to **Figure 32**. 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.

Mate-n-Lok™ Connectors:

The Mate-n-Lok connectors found in the displays are white and come in a variety of sizes. **Figure 33** 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.

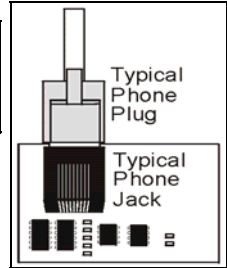


Figure 34: RJ11/RJ45 Connector

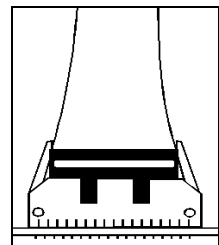


Figure 30: Ribbon Cable Connector

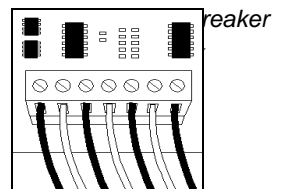
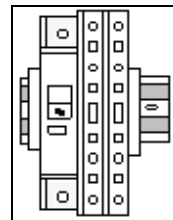


Figure 32: Phoenix Connector

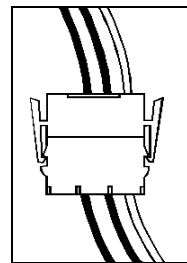


Figure 33: Mate-n-Lok Connector

Phone/Network Jacks (RJ11/RJ45 Connectors):

RJ connectors, as seen in **Figure 34**, 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.

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.

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 35** illustrates the 6-pin quick-connect jack.

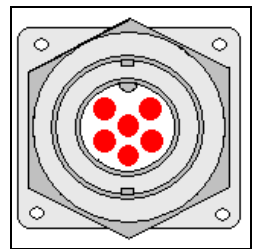


Figure 35: RS232/6-pin Quick-connect Jack

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 four-fiber cable, with two fibers used for display communications and the other two saved for spares (**Figure 36**).

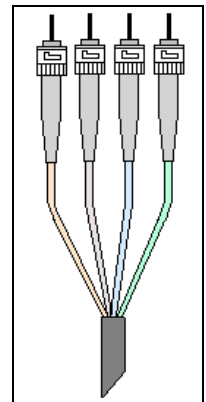


Figure 36: Fiber Optic Cable

8.4 Definitions of Terms

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

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

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

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

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

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

Module: The board containing the LEDs and driver. Galaxy[®]AF-3200 34 mm modules are 8 pixels high by 16 pixels wide. Each is individually removable from the front panel of the display.

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

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

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

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

Section 9: Daktronics Exchange and Repair & Return Programs

9.1 Exchange Program

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

Before Contacting Daktronics

Fill in these numbers before calling Customer Service:

Display Model Number: _____

Date Installed: _____

Location of Display: _____

Daktronics Customer ID Number: _____

To participate in the Exchange Program, follow these steps:

1. **Call Daktronics Customer Service:** (866) 343-3122 (toll free)
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 a qualifying service agreement is in place.** In most circumstances, the replacement part will be invoiced at the time it is shipped.

If the failed part or replacement part is not returned to Daktronics within 3 weeks of the ship date, Daktronics will assume that the customer is purchasing the replacement part and will send an invoice for the value of the new sale part. If the part or parts are returned within 2 weeks of the second invoice date, Daktronics will credit the customer for the second invoice.

If after 2 weeks Daktronics has still not received the parts back, the customer must pay the second invoice and will not be credited for the return of the failed part. Daktronics reserves the right to refuse parts that have been damaged due to acts of nature or causes other than normal wear and tear.

9.2 Repair & Return Program

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

1. **Call your local Daktronics representative or Daktronics Customer Service:**
(866) 343-3122 (toll free)
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.
4. **Enclose:**
 - Your name
 - Address
 - Phone number
 - the RMA number
 - a clear description of symptoms

Shipping Address

Customer Service, Daktronics
PO Box 5128
201 Daktronics Dr.
Brookings SD 57006

9.3 Daktronics Warranty and Limitation of Liability

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

Appendix A: Reference Drawings

The drawings listed here are included in the pages following.

Power Specifications:

Power Specs, 8x96 - 24x96 Amber Displays.....	Drawing A-200044
Power Specs, 8x96 - 24x96 Red Displays.....	Drawing A-200045

When a display is ordered, appropriate drawings are provided for installation and operation. However, if additional drawings are needed, consult this list for the drawing number. These can be requested from Daktronics Customer Call Center at 877-605-1113 (toll free) or 605-697-4034. Note that drawings are listed first by size (A, B) and then numerically.

Shop Drawing, Mounting, AF-3200-**x**-34	Drawing A-202043
Shop Drawing, AF-3200-**x**-34-*-*	Drawing A-205736
Schematic, Power Term Panel, 1 circuit	Drawing A-211950
Schem., Power Supply Configurations, (A-1591)	Drawing A-215014
Schem., Power Supply Configurations, (A-1633)	Drawing A-215015
Controller II, Galaxy 8 Conn. J1087	Drawing B-204771
Schem., Primary Signal, Internal, w/QC	Drawing B-206146
Schematic, AF-3200-24x(32-96)-34-Mono-P/M.....	Drawing B-233115
Schematic, AF-3200-16x(32-96)-34-Mono-P/M.....	Drawing B-235484

AF-3200-34mm LOUVERED AMBER GALAXY DISPLAYS POWER SPECIFICATION CHART


MATRIX SIZE	MAX WATTS	120VAC 1PH 60HZ AMPS	240VAC 1PH 50HZ AMPS
16X64	421	3.51	1.75
16X80	530	4.42	2.21
16X96	609	5.07	2.54
24X64	578	4.81	2.41
24X80	726	6.05	3.02
24X96	843	7.03	3.51

BY USING THE PROPER POWER TERM PANEL,
THE ABOVE DISPLAY SIZES CAN BE POWERED BY
EITHER 120VAC (2 WIRE + GND) OR 240VAC
(2 WIRE + GND) SERVICES (EXCEPT WHERE NOTED).

POWER SPECIFICATION LABEL INSTRUCTIONS:

- 1) REFER TO CHARTS FOR POWER SPECIFICATION INFORMATION.
- 2) LOCATE THE DISPLAY SIZE (MATRIX SIZE).
- 3) IDENTIFY VOLTAGE TYPE:
 - A) FOR 120VAC, 1PH, 60HZ, LIST AMPS GIVEN.
 - B) FOR 240VAC, 1PH, 50HZ, LIST AMPS GIVEN.

EXAMPLE PRODUCT IDENTIFICATION LABEL

 DAKTRONICS, INC. 331 32ND AVE. P.O. BOX 5128 BROOKINGS, SD 57006	ASSY NO. 0A-1301-****	AF-3200-16X80-34-AMB 120VAC, 1PH, 60HZ AMPS PER LINE = 4.42 MAX WATTS = 530
	SER. NO. (NEXT ASSIGNED #)	
MFG DATE (TODAY'S DATE MM/DD/YY) REV XX	WORK ORDER NUMBER	LL-2306

04	03 MAY 07	REMOVED SIZES NOT IN STANDARDIZATION. UPDATED POWER SPECS FOR -06 DESIGN.	LLK	LLK	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 2007 DAKTRONICS, INC.					
03	29 MAR 07	ADDED IDENTIFICATION LABEL	LLK	DJM						
02	24 MAY 05	REMOVED 32 HIGH MATRIX SIZES AND ALL 112 LONG MATRIX SIZES. UPDATED POWER CHART.	WRS	LLK	DAKTRONICS, INC. BROOKINGS, SD 57006 PROJ: GALAXY, LOUVERED, VENUS 1500, 34MM, AF-3200 TITLE: POWER SPECS, AF-3200-(16-24X64-96)-34-AMB-*					
01	01 MAR 04	REVISED POWER SPECS FOR DRIVER WATTAGE	LLK		DES. BY: LKERR DRAWN BY: DMATHER DATE: 18 NOV 03					
REV.	DATE	DESCRIPTION	BY	APPR.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">REVISION</td> <td style="width: 15%;">APPR. BY:</td> <td rowspan="2" style="width: 40%; text-align: center; vertical-align: middle; font-size: 1.5em;">1301-R10A-200044</td> </tr> <tr> <td>04</td> <td>SCALE: 1=1</td> </tr> </table>	REVISION	APPR. BY:	1301-R10A-200044	04	SCALE: 1=1
REVISION	APPR. BY:	1301-R10A-200044								
04	SCALE: 1=1									

AF-3200-34mm LOUVERED RED GALAXY DISPLAYS POWER SPECIFICATION CHART


MATRIX SIZE	MAX WATTS	120VAC 1PH 60HZ AMPS	240VAC 1PH 50HZ AMPS
16X64	317	2.64	1.32
16X80	400	3.33	1.67
16X96	452	3.77	1.88
24X64	421	3.51	1.75
24X80	530	4.42	2.21
24X96	608	5.07	2.53

BY USING THE PROPER POWER TERM PANEL,
THE ABOVE DISPLAY SIZES CAN BE POWERED BY
EITHER 120VAC (2 WIRE + GND) OR 240VAC
(2 WIRE + GND) SERVICES (EXCEPT WHERE NOTED).

POWER SPECIFICATION LABEL INSTRUCTIONS:

- 1) REFER TO CHARTS FOR POWER SPECIFICATION INFORMATION.
- 2) LOCATE THE DISPLAY SIZE (MATRIX SIZE).
- 3) IDENTIFY VOLTAGE TYPE:
 - A) FOR 120VAC, 1PH, 60HZ, LIST AMPS GIVEN.
 - B) FOR 240VAC, 1PH, 50HZ, LIST AMPS GIVEN.

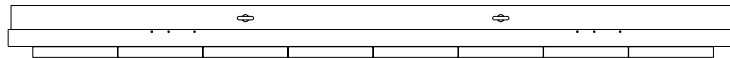
EXAMPLE PRODUCT IDENTIFICATION LABEL

 <p>DAKTRONICS, INC. 331 32ND AVE. P.O. BOX 5128 BROOKINGS, SD 57006</p>	ASSY NO. 0A-1301-****	AF-3200-16X80-34-RED 120VAC, 1PH, 60HZ AMPS PER LINE = 3.33 MAX WATTS = 400
	SER. NO. (NEXT ASSIGNED #)	
MFG DATE (TODAY'S DATE MM/DD/YY) REV XX	WORK ORDER NUMBER	LL-2306

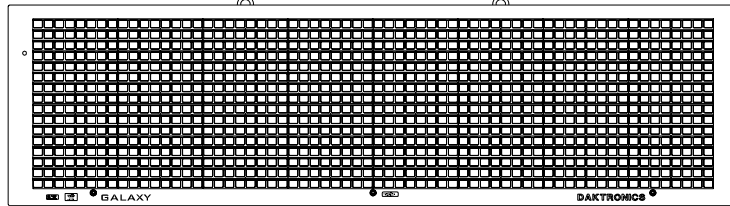
REV.	DATE	DESCRIPTION	BY	APPR.
04	03 MAY 07	REMOVED SIZES NOT IN STANDARDIZATION. UPDATED POWER SPECS FOR -06 DESIGN.	LLK	LLK
03	29 MAR 07	ADDED IDENTIFICATION LABEL	LLK	LLK
02	24 MAY 05	REMOVED 32 HIGH MATRIX SIZES AND ALL 112 LONG MATRIX SIZES. UPDATED POWER SPECS.	WRS	LLK
01	01 MAR 04	REVISED POWER SPECS FOR DRIVER WATTAGE	LLK	

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 2005 DAKTRONICS, INC.			
DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GALAXY, LOUVERED, VENUS 1500, 34MM, AF-3200			
TITLE: POWER SPECS, AF-3200-(16-24X64-96)-34-RED-*			
DES. BY: LKERR		DRAWN BY: DMATHER	
		DATE: 18 NOV 03	
REVISION	APPR. BY:	1301-R10A-200045	
04	SCALE: 1=1		

REV.	DATE	DESCRIPTION	BY	APPR.
02	19JUL05	CORRECTED X1 DIMENSIONS IN TABLE	SMM	DUD
01	18MAY05	UPDATED HORIZ. DIMS PER DESIGN CHANGES. ADDED INFORMATION FOR **X96 DISPLAYS.	SMM	DUD

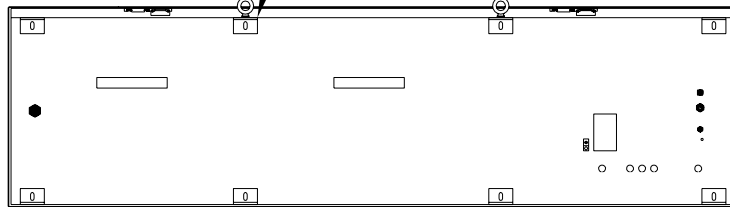


TOP VIEW



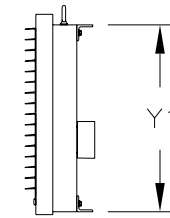
FRONT VIEW

L2 X 2 X 1/4 X 3 WIDE STEEL CLIP ANGLE FOR MOUNTING, ATTACHED TO DISPLAY BY 3/8" BOLT AND NUT INSERT. ALSO SEE NOTE 3.

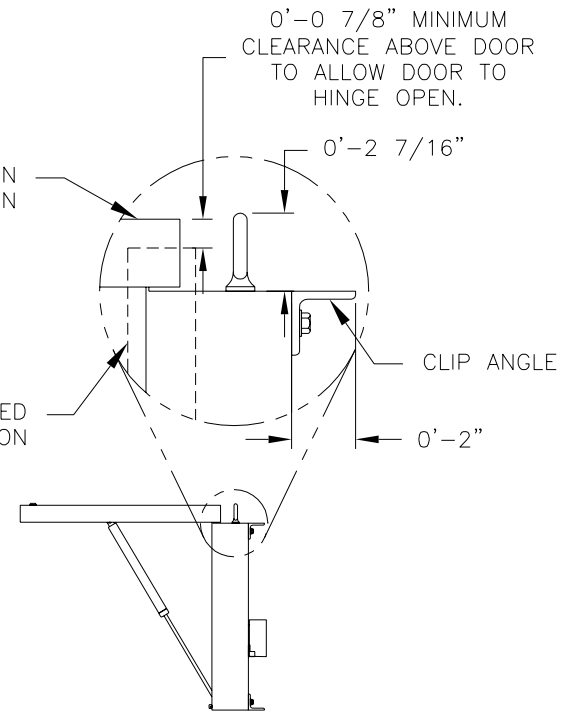


REAR VIEW

2'-2 5/8" x1 2'-2 5/8" 0'-3" TYPICAL



RIGHT SIDE



RIGHT SIDE
SHOWN WITH DOOR HINGED OPEN.

DISPLAY SIZE	DIMENSIONS AS LISTED ABOVE (FEET AND INCHES)		ESTIMATED WEIGHT
	X1	Y1	
16X64	2'-7 15/16"	1'-11 3/8"	110 LBS
16X80	4'-5 3/16"	1'-11 3/8"	130 LBS
16X96	2 X 3'-1 1/4"	1'-11 3/8"	150 LBS
24X64	2'-7 15/16"	2'-10"	150 LBS
24X80	4'-5 3/16"	2'-10"	175 LBS
24X96	2 X 3'-1 1/4"	2'-10"	200 LBS

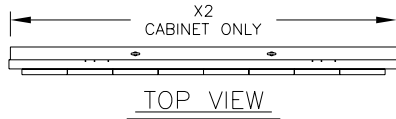
NOTES:

- 1) FOR DISPLAY SPECIFICATIONS SEE DAKTRONICS DRAWING A-205736.
- 2) EYEBOLTS MAY NOT BE USED FOR PERMANENT INSTALLATION.
- 3) ALL CLIP ANGLES (OR THEIR LOCATIONS) MUST BE USED FOR DISPLAY INSTALLATION.
- 4) **X96 DISPLAYS HAVE AN EXTRA PAIR OF MOUNTING ANGLES LOCATED AT HALF OF THE DISPLAY'S LENGTH (SEE X1).

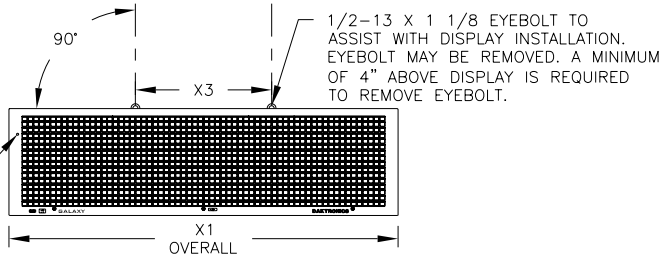
PROJ: OUTDOOR GALAXY DISPLAYS
 TITLE: SHOP DRAWING, MOUNTING, AF-3200-**-X**-34-*, *
 DES. BY: DDAGGIT DRAWN BY: DDAGGIT DATE: 19MAR04
 REVISION APPR. BY: SCALE: 1=24 1301E10A-202043

DAKTRONICS, INC. BROOKINGS, SD 57006

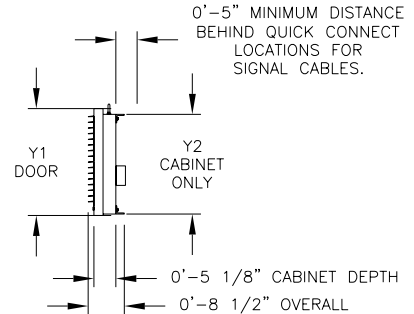
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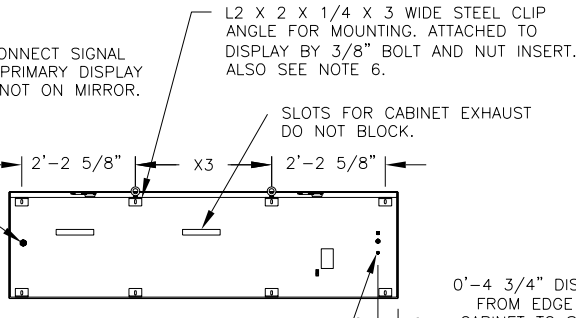
IN ORDER TO MAINTAIN THE STRUCTURAL INTEGRITY OF THE DISPLAY CABINET, THE 90° ANGLE BETWEEN THE CABINET AND THE LIFTING METHOD MUST BE MAINTAINED.



1/2" DIAMETER HOLE WITH CLEAR POLYCARBONATE LENS FOR AUTOMATIC LIGHT LEVEL SENSOR. DO NOT BLOCK.



SLOTS FOR VENTILATION INLET. DO NOT BLOCK.



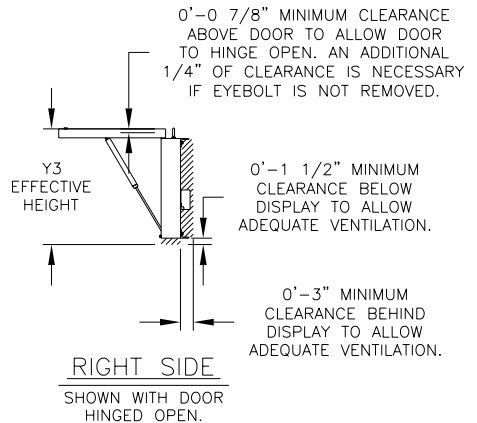
QUICK CONNECT SIGNAL OUTLET. PRIMARY DISPLAY SHOWN, NOT ON MIRROR.

L2 X 2 X 1/4 X 3 WIDE STEEL CLIP ANGLE FOR MOUNTING. ATTACHED TO DISPLAY BY 3/8" BOLT AND NUT INSERT. ALSO SEE NOTE 6.

SLOTS FOR CABINET EXHAUST DO NOT BLOCK.

0'-4 3/4" DISTANCE FROM EDGE OF CABINET TO SIGNAL JACK LOCATION. TYPICAL EACH END.

QUICK CONNECT SIGNAL INPUT. PRIMARY DISPLAY SHOWN. ONLY ONE JACK ON MIRROR DISPLAY. ALSO SEE CLEARANCE DIMENSION ON RIGHT SIDE VIEW.



NOTES:

- 1) DISPLAY IS ALL ALUMINUM CONSTRUCTION.
- 2) FACE PANEL IS 1/8" NOMINAL (0.118" ACTUAL) THICK OUTDOOR GRADE CLEAR POLYCARBONATE.
- 3) DISPLAY CABINET COLOR IS FLAT BLACK.
- 4) DISPLAY L.E.D. COLOR IS MONOCHROME RED OR AMBER.
- 5) EYEBOLTS MAY NOT BE USED FOR PERMANENT INSTALLATION.
- 6) ALL CLIP ANGLES (OR THEIR LOCATIONS) MUST BE USED FOR DISPLAY INSTALLATION. FOR ADDITIONAL MOUNTING DETAILS SEE DAKTRONICS DRAWING A-202043.
- 7) FRONT ACCESS FOR SERVICE BY OPENING THE DOOR AS SHOWN BY USING A 5/32" ALLEN (HEX) WRENCH. WRENCH IS NOT PROVIDED.
- 8) VENTILATION INLET AND EXHAUST SLOTS MUST NOT BE BLOCKED OR DISPLAY WARRANTY WILL BE VOID.
- 9) IF DISPLAY IS TO BE ENCLOSED INTO A SURROUNDING STRUCTURE, FOR ADEQUATE VENTILATION A MINIMUM OPENING AREA OF 200 SQ. INCHES (250 SQ. INCHES FOR **X96 DISPLAYS) IS REQUIRED FOR BOTH INLET AND EXHAUST.
- 10) Y3 EFFECTIVE HEIGHT INCLUDES ALLOWANCES FOR DOOR TO OPEN AND FOR BOTTOM VENTILATION.
- 11) **X96 DISPLAYS HAVE AN EXTRA MOUNTING ANGLE LOCATED HALF WAY BETWEEN DISTANCE X3.

DISPLAY SIZE	DIMENSIONS AS LISTED ABOVE (FEET AND INCHES)						POWER REQUIREMENTS (120 VAC)		ESTIMATED WEIGHT
	X1	X2	X3	Y1	Y2	Y3	RED DISPLAY	AMBER	
16X64	7'-7 1/4"	7'-6 1/2"	2'-7 15/16"	2'-1 1/4"	1'-11 3/8"	2'-3 3/8"	2.27 AMPS, 272 WATTS	3.14 AMPS, 376 WATTS	110 LBS
16X80	9'-4 1/2"	9'-3 13/16"	4'-5 3/16"	2'-1 1/4"	1'-11 3/8"	2'-3 3/8"	2.70 AMPS, 324 WATTS	3.79 AMPS, 455 WATTS	130 LBS
16X96	11'-1 3/4"	9'-3 13/16"	6'-2 1/2"	2'-1 1/4"	1'-11 3/8"	2'-3 3/8"	3.34 AMPS, 400 WATTS	4.64 AMPS, 557 WATTS	150 LBS
24X64	7'-7 1/4"	7'-6 1/2"	2'-7 15/16"	3'-0"	2'-10"	3'-2 1/16"	3.34 AMPS, 400 WATTS	4.64 AMPS, 557 WATTS	150 LBS
24X80	9'-4 1/2"	9'-3 13/16"	4'-5 3/16"	3'-0"	2'-10"	3'-2 1/16"	3.99 AMPS, 478 WATTS	5.62 AMPS, 674 WATTS	175 LBS
24X96	11'-1 3/4"	9'-3 13/16"	6'-2 1/2"	3'-0"	2'-10"	3'-2 1/16"	4.84 AMPS, 581 WATTS	6.80 AMPS, 816 WATTS	200 LBS

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR GALAXY DISPLAYS

TITLE: SHOP DRAWING, AF-3200-***X**-34-*-* , 120

DES. BY: DDAGGIT

DRAWN BY: DDAGGIT

DATE: 9MAR04

REVISION

APPR. BY:

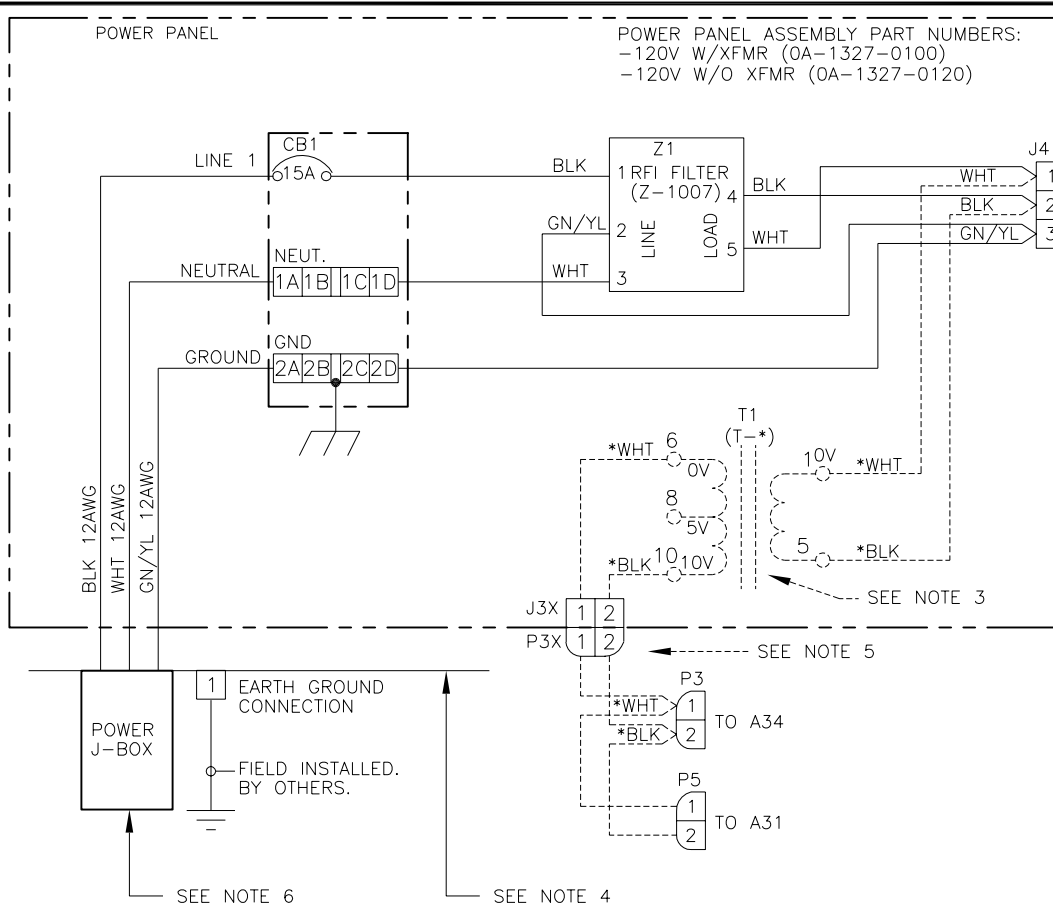
02

SCALE: 1=45

1301-E10A-205736

REV.	DATE	DESCRIPTION	BY	APPR.
02	16MAY05	UPDATED DWG AND ADDED INFORMATION FOR **X96 DISPLAYS.	SWM	DJD
01	27AUG04	CHANGED Y1 FROM 2'-1 1/16" FOR 16X64 AND 16X80. CHANGED Y1 FROM 2'-11 1/16" FOR 24X64 AND 24X80.	DJD	

REV.	DATE	DESCRIPTION	BY	APPR.
03	14JUL08	ADDED PART NUMBER 0A-1327-0120	JMG	DJM
02	19OCT04	REMOVED MIRROR ASSEMBLY MOVED FROM P1 1321 TO P1 1322 CORRECTED THE PART NUMBER OF THE 240V PANEL W/O XFMR: 0A-1327-0122	WPS	DJM
01	29JUL04		DJM	



- 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)

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DAKTRONICS, INC. BROOKINGS, SD 57006

Proj: BUSINESS PRODUCTS DISPLAY COMPONENTS

TITLE: SCHEMATIC- POWER TERM PANEL- 1 CIRCUIT

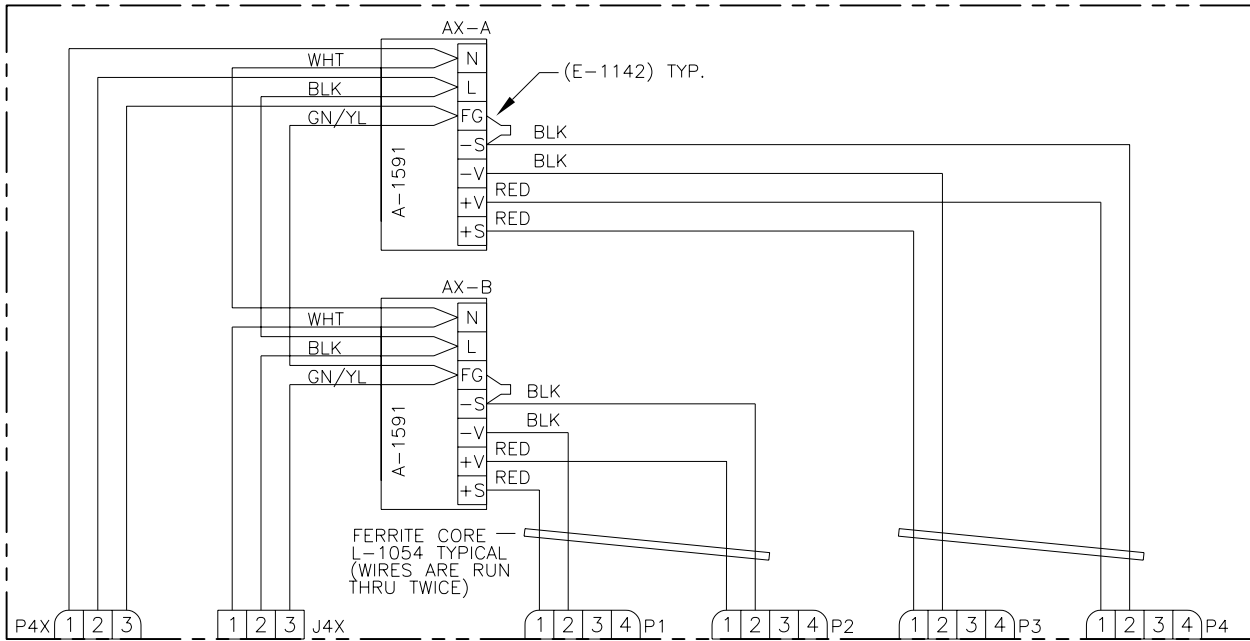
DES. BY: DMATHER DRAWN BY: DMATHER DATE: 14 MAY 04

REVISION 03

APPR. BY: 1327-R01A-211950

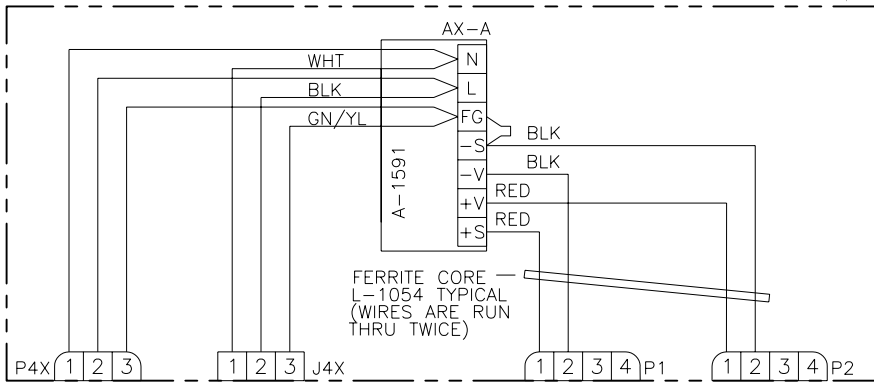
SCALE: 1=1

DUAL 6.5VDC VERSION (RED)
 0A-1327-0004
 (SET POWER SUPPLIES TO 6.5VDC)



BE CERTAIN ALL TERMINALS ON
 POWER SUPPLY ARE TIGHTENED.

SINGLE 6.5VDC VERSION (RED)
 0A-1327-0003
 (SET POWER SUPPLY TO 6.5VDC)



NOTES

- 1) ALL WIRE IS 14 AWG EXCEPT * IS 18 AWG UNLESS OTHERWISE NOTED.
- 2) REFER TO ASSEMBLY PACKET FOR WIRE ROUTING COMING OFF OF POWER SUPPLIES.

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: BUSINESS PRODUCTS DISPLAY COMPONENTS

TITLE: SCHEM., POWER SUPPLY CONFIGURATIONS, (A-1591)

DES. BY: DMATHER

DRAWN BY: LKERR

DATE: 09 JUN 04

REVISION

APPR. BY:

00

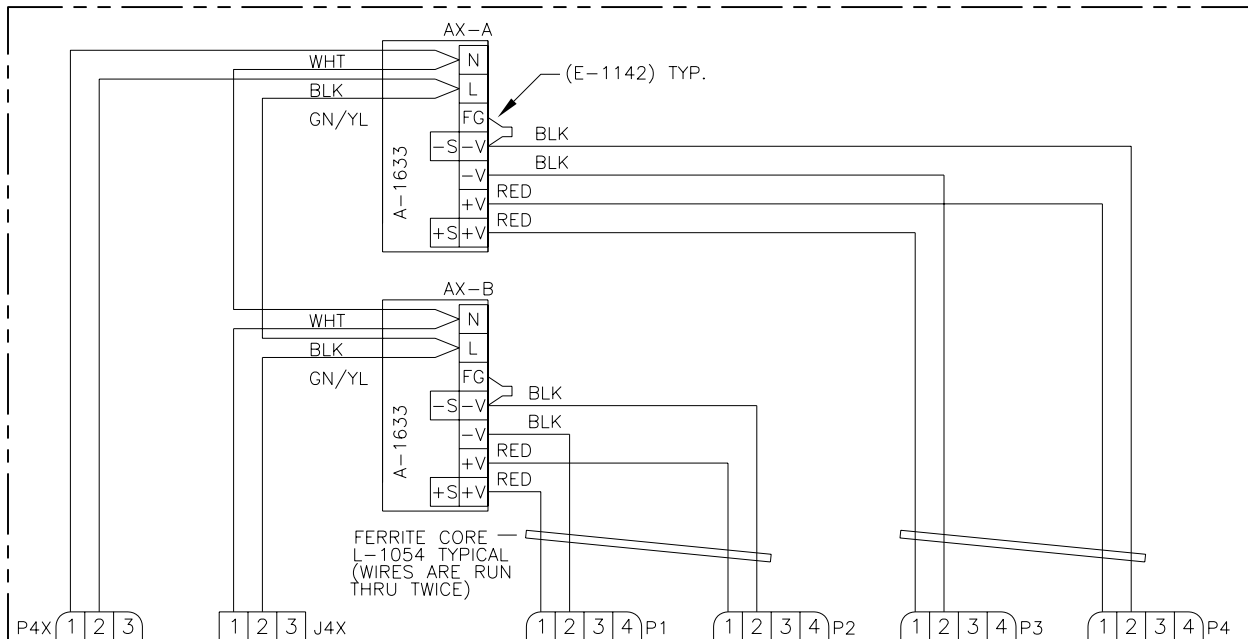
SCALE: 1=1

1327-R03A-215014

REV.	DATE	DESCRIPTION	BY	APPR.

DUAL 9.5VDC VERSION
 0A-1327-0008
 (SET POWER SUPPLIES TO 9.5VDC)

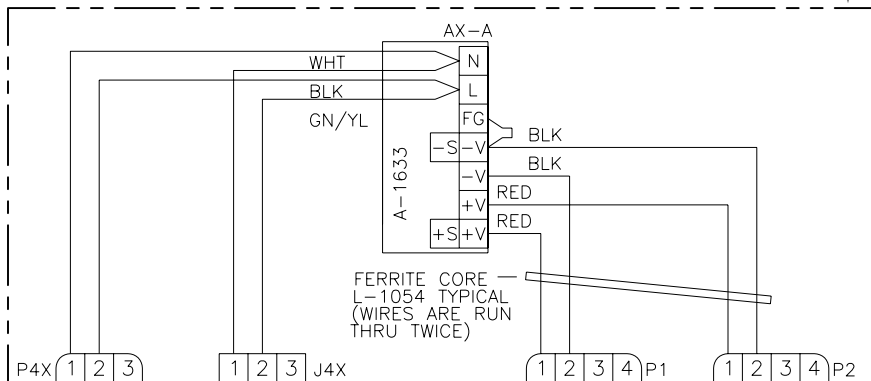
-OR- DUAL 9.0VDC VERSION
 0A-1327-0010
 (SET POWER SUPPLIES TO 9.0VDC)



BE CERTAIN ALL TERMINALS ON
 POWER SUPPLY ARE TIGHTENED.

SINGLE 9.5VDC VERSION
 0A-1327-0007
 (SET POWER SUPPLY TO 9.5VDC)

-OR- SINGLE 9.0VDC VERSION
 0A-1327-0009
 (SET POWER SUPPLY TO 9.0VDC)



NOTES

- 1) ALL WIRE IS 14 AWG EXCEPT * IS 18 AWG UNLESS OTHERWISE NOTED.
- 2) REFER TO ASSEMBLY PACKET FOR WIRE ROUTING COMING OFF OF POWER SUPPLIES.

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: BUSINESS PRODUCTS DISPLAY COMPONENTS

TITLE: SCHEM., POWER SUPPLY CONFIGURATIONS, (A-1633)

DES. BY: DMATHER

DRAWN BY: LKERR

DATE: 09 JUN 04

REVISION

APPR. BY:

02

SCALE: 1=1

1327-R03A-215015

REV.	DATE	DESCRIPTION	BY	APPR.
02	01NOV04	DELETED RGB AND AMBER FROM CONFIGURATION DESCRIPTION FOR 0A-1327-0007, 0A-1327-0008, 0A-1327-0009, AND 0A-1327-0010	WRS	DJM
01	22OCT04	ADDED POWER SUPPLY ASSEMBLIES 0A-1327-0009 AND 0A-1327-0010.	DJM	

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.
HAULT	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

FIRMWARE REVISION DATE

EPLD PROGRAM REVISION DATE

UPPER / LOWER ADDRESS SWITCHES

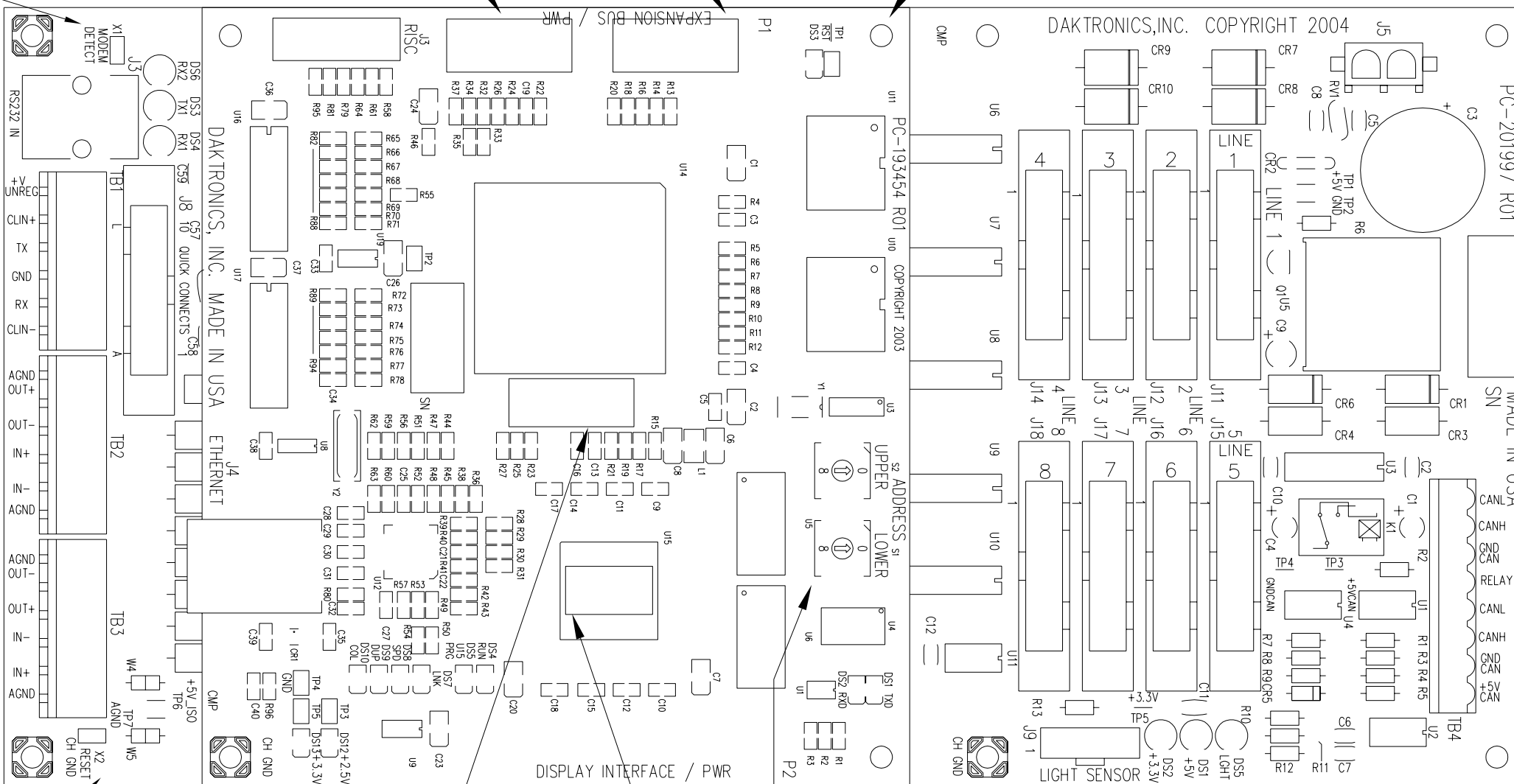
PIN	FUNCTION
1	LIGHT-P
2	LIGHT-N
3	+5V-P
4	GND-N
5	SHIELD-N
6	N.C.

PRODUCT BOARD

PRODUCT BOARD

M2 CNTRLR COATED

SCREW STANDOFF SCREW
TYPICALLY @4 PLACES



PIN	FUNCTION
2	10VAC
1	10VAC

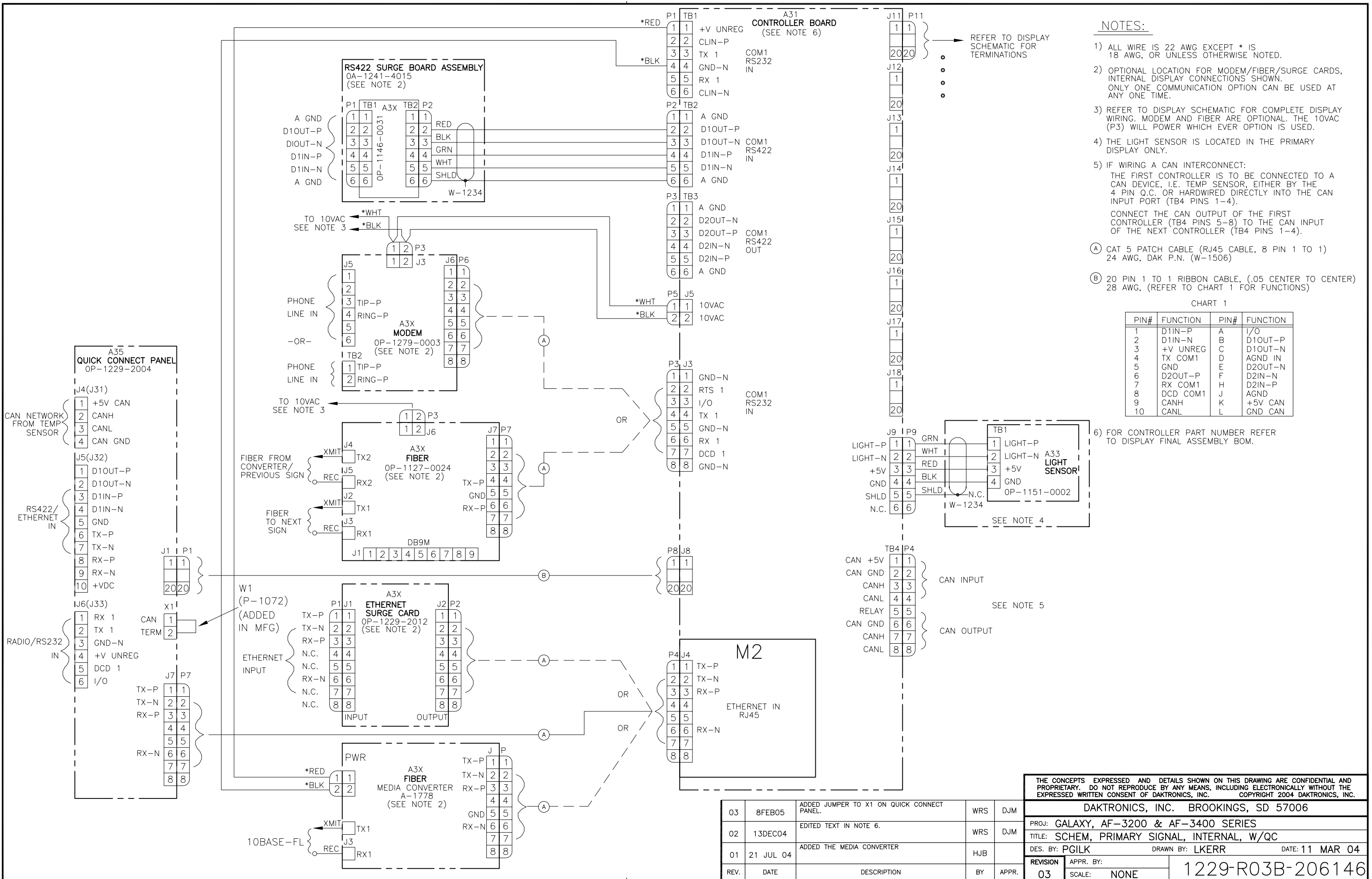
PIN	FUNCTION
8	CANL
7	CANH
6	CAN_GND
5	RELAY
4	CANL
3	CANH
2	CAN_GND
1	CAN_+5V

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DAKTRONICS, INC. BROOKINGS, SD 57006

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	

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	



- 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

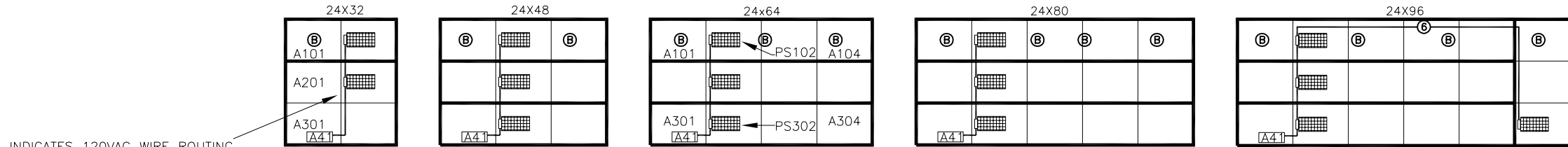
PIN#	FUNCTION	PIN#	FUNCTION
1	D1IN-P	A	I/O
2	D1IN-N	B	D1OUT-P
3	+V UNREG	C	D1OUT-N
4	TX COM1	D	AGND IN
5	GND	E	D2OUT-N
6	D2OUT-P	F	D2IN-N
7	RX COM1	H	D2IN-P
8	DCD COM1	J	AGND
9	CANH	K	+5V CAN
10	CANL	L	GND CAN

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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	APPR. BY:	1229-R03B-206146			
03	SCALE: NONE				

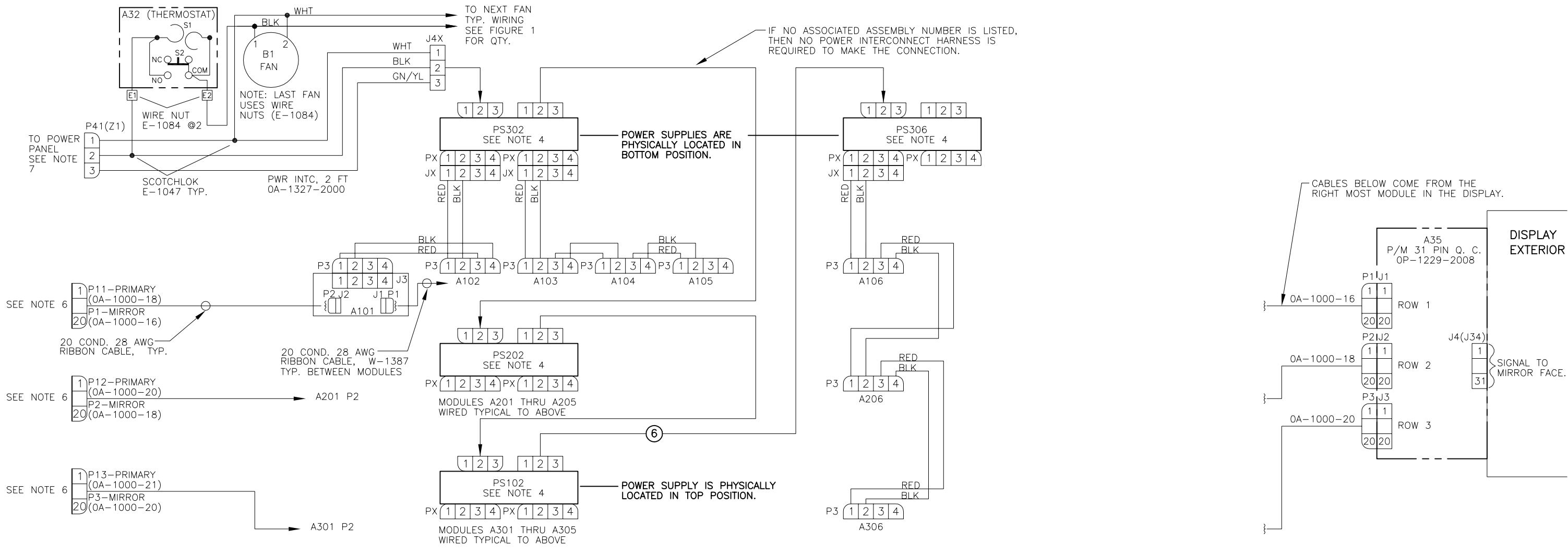
REV.	DATE	DESCRIPTION	BY	APPR.
03	8FEB05	ADDED JUMPER TO X1 ON QUICK CONNECT PANEL.	WRS	DJM
02	13DEC04	EDITED TEXT IN NOTE 6.	WRS	DJM
01	21 JUL 04	ADDED THE MEDIA CONVERTER	HJB	

FIGURE 1: DEPICTS LARGEST 24 ROW BY 96 COLUMNS. SELECT CORRESPONDING DISPLAY SIZE.

- (NO SCALE)
- 1 POWER SUPPLY (PS) ASSEMBLY
 - Ⓟ FAN
 - MODULE POWERED BY Z1 (J41)
 - MODULES WITHIN BOLD AREA ARE POWERED BY A SINGLE POWER SUPPLY. THE POWER SUPPLY WITHIN THE BOLD AREA GENERALLY DOES NOT POWER THESE MODULES. IE. ON A 24X64 DISPLAY PS102 POWERS MODULES A301 THRU A304 AND PS302 POWERS MODULES A101 THRU A104.



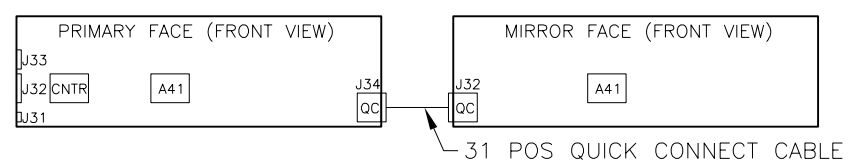
INDICATES 120VAC WIRE ROUTING



NOTES:

- 1) ALL WIRE IS 14 AWG EXCEPT * IS 18 AWG UNLESS OTHERWISE NOTED.
- 2) EACH LED MODULE IS A 8X16 MATRIX.
- 3) THE FRAME IS TO BE CONNECTED TO EARTH GROUND AT INSTALLATION TIME.
- 4) REFER TO DWG. A-215014(2 LED, RED PIXEL) & DWG. A-215015(3 LED, AMB PIXEL) FOR POWER SUPPLY CONFIGURATIONS.
- 5) REFER TO DWG. A-200045(2 LED, RED PIXEL) & DWG. A-200044(3 LED, AMB PIXEL) FOR POWER REQUIREMENTS.
- 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.
- 7) P41 CONNECTS TO J41 OF POWER PANEL (A41) REFER TO DWG-211950 FOR 120VAC. REFER TO DWG-220287 FOR 240VAC.
- 8) SCHEMATIC SHOWN DEPICTS THE LARGEST LENGTH 24 HIGH DISPLAY (24X96). REFER TO FIGURE 1 FOR DETAILS ON ALL LENGTH DISPLAYS.
- 9) POWER SUPPLY/MODULE CONFIGURATION IS CONCEPTUAL REFER TO FIGURE 1 FOR THE PARTICULAR SIZE LAYOUT. MODULES WITHIN EACH BOLD AREA IN FIGURE 1 ARE POWERED BY ONE POWER SUPPLY ASSEMBLY.
- ⑥ HARN, PWR INTC, 3 PIN J TO 3 PIN P, 6 FT(14AWG) OA-1327-2002

FIGURE 2:

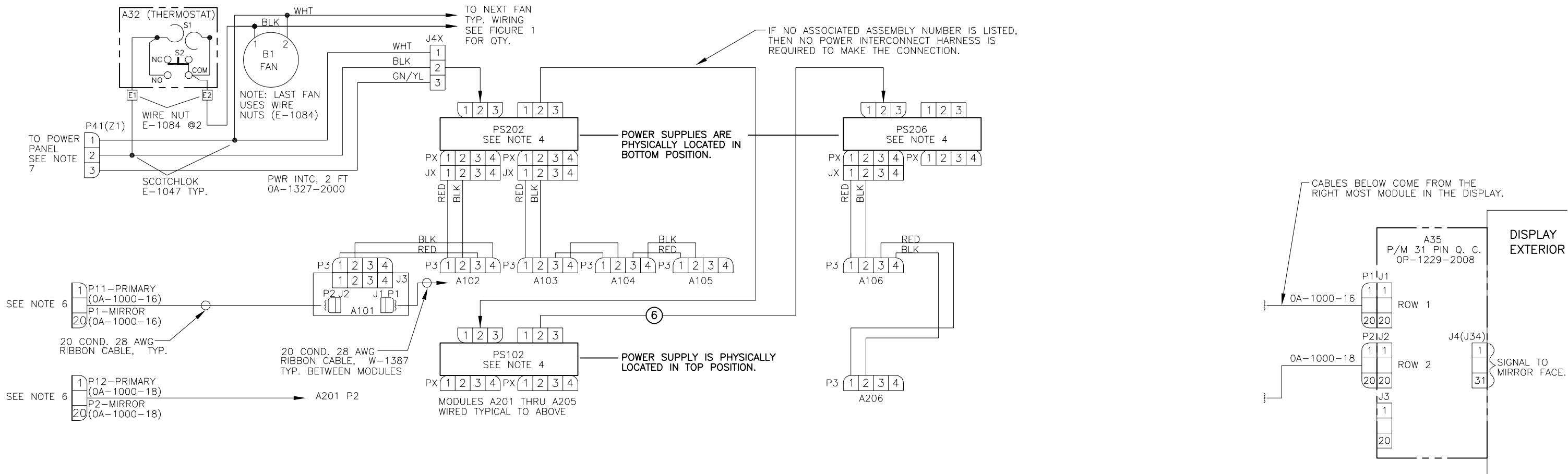
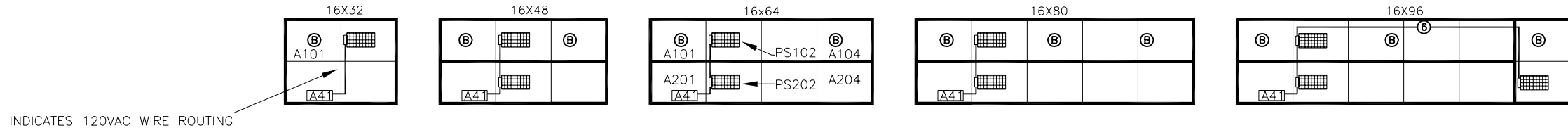


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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GALAXY; AF-3400-32-MONOCROME SERIES (-05)			
TITLE: SCHEMATIC, AF-3200-24X(32-96)-34-MONO- P/M- *			
DES. BY: LKERR	DRAWN BY: LKERR	DATE: 02 FEB 05	
REVISION	APPR. BY:	1301-R03B-233115	
01	SCALE: 1=1		

REV.	DATE	DESCRIPTION	BY	APPR.
01	20JUL05	CHANGED OA-1000-16 ON P11 TO OA-1000-18, OA-1000-18 ON P12 TO OA-1000-20, AND OA-1000-20 ON P13 TO OA-1000-21.	RBN	

FIGURE 1: DEPICTS LARGEST 16 ROW BY 96 COLUMNS. SELECT CORRESPONDING DISPLAY SIZE.

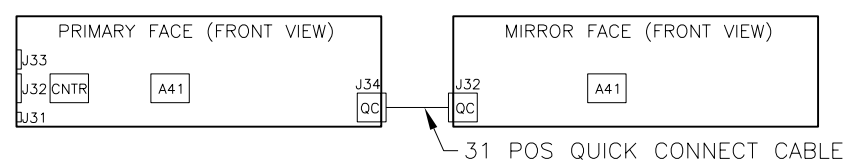
- (NO SCALE)
- 1 POWER SUPPLY(PS) ASSEMBLY
- Ⓟ FAN
- MODULE POWERED BY Z1 (J41)
- MODULES WITHIN BOLD AREA ARE POWERED BY A SINGLE POWER SUPPLY. THE POWER SUPPLY WITHIN THE BOLD AREA GENERALLY DOES NOT POWER THESE MODULES. IE. ON A 16X64 DISPLAY PS102 POWERS MODULES A201 THRU A204 AND PS202 POWERS MODULES A101 THRU A104.



NOTES:

- 1) ALL WIRE IS 14 AWG EXCEPT * IS 18 AWG UNLESS OTHERWISE NOTED.
- 2) EACH LED MODULE IS A 8X16 MATRIX.
- 3) THE FRAME IS TO BE CONNECTED TO EARTH GROUND AT INSTALLATION TIME.
- 4) REFER TO DWG. A-215014(2 LED, RED PIXEL) & DWG. A-215015(3 LED, AMB PIXEL) FOR POWER SUPPLY CONFIGURATIONS.
- 5) REFER TO DWG. A-200045(2 LED, RED PIXEL) & DWG. A-200044(3 LED, AMB PIXEL) FOR POWER REQUIREMENTS.
- 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.
- 7) P41 CONNECTS TO J41 OF POWER PANEL (A41) REFER TO DWG-211950 FOR 120VAC. REFER TO DWG-220287 FOR 240VAC.
- 8) SCHEMATIC SHOWN DEPICTS THE LARGEST LENGTH 16 HIGH DISPLAY (16X96). REFER TO FIGURE 1 FOR DETAILS ON ALL LENGTH DISPLAYS.
- 9) POWER SUPPLY/MODULE CONFIGURATION IS CONCEPTUAL REFER TO FIGURE 1 FOR THE PARTICULAR SIZE LAYOUT. MODULES WITHIN EACH BOLD AREA IN FIGURE 1 ARE POWERED BY ONE POWER SUPPLY ASSEMBLY.
- ⑥ HARN, PWR INTC, 3 PIN J TO 3 PIN P, 6 FT(14AWG) 0A-1327-2002

FIGURE 2:



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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GALAXY; AF-3400-32-MONOCROME SERIES (-05)			
TITLE: SCHEMATIC, AF-3200-16X(32-96)-34-MONO- P/M- *			
DES. BY: LKERR		DRAWN BY: LKERR	
DATE: 01 MAR 05		REVISION	
00		APPR. BY: SCALE: 1=1	
1301-R03B-235484			

REV.	DATE	DESCRIPTION	BY	APPR.

Appendix B: Temperature Sensor Installation

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.

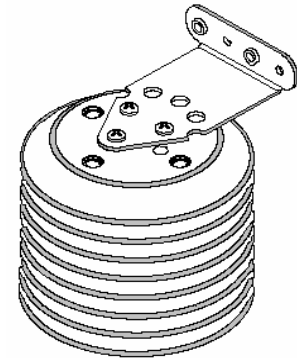


Figure 1: Temperature Sensor

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.

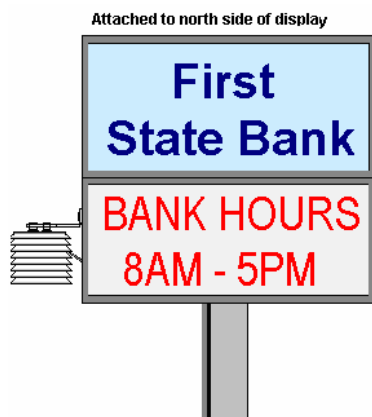


Figure 2: Located on the Display

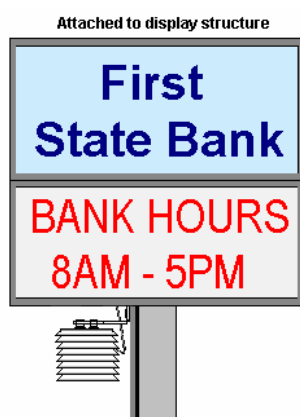


Figure 3: Located on Structure

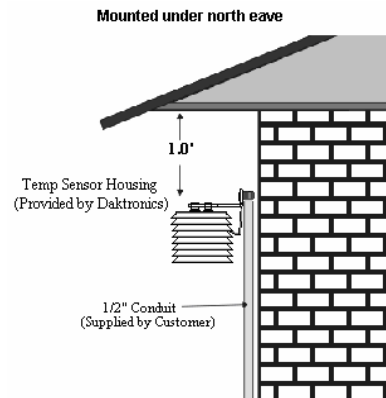


Figure 4: Located on the North Eave

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.

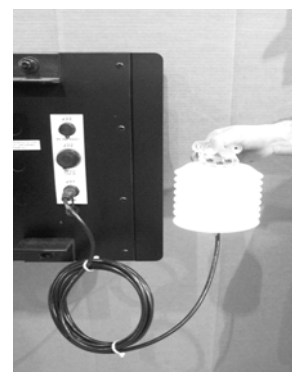


Figure 5: Quick-connect Cable

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.

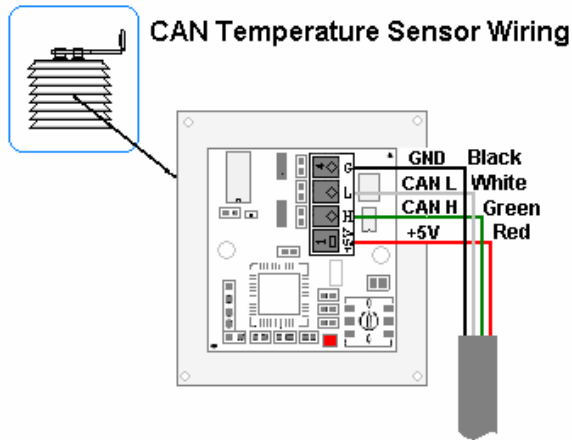


Figure 6: CAN Temperature Sensor Wiring

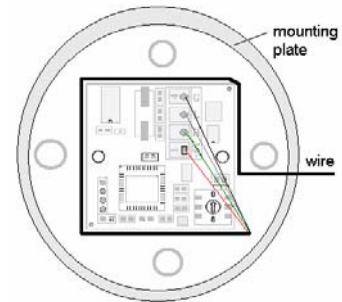


Figure 7: Wiring Around Sensor

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.

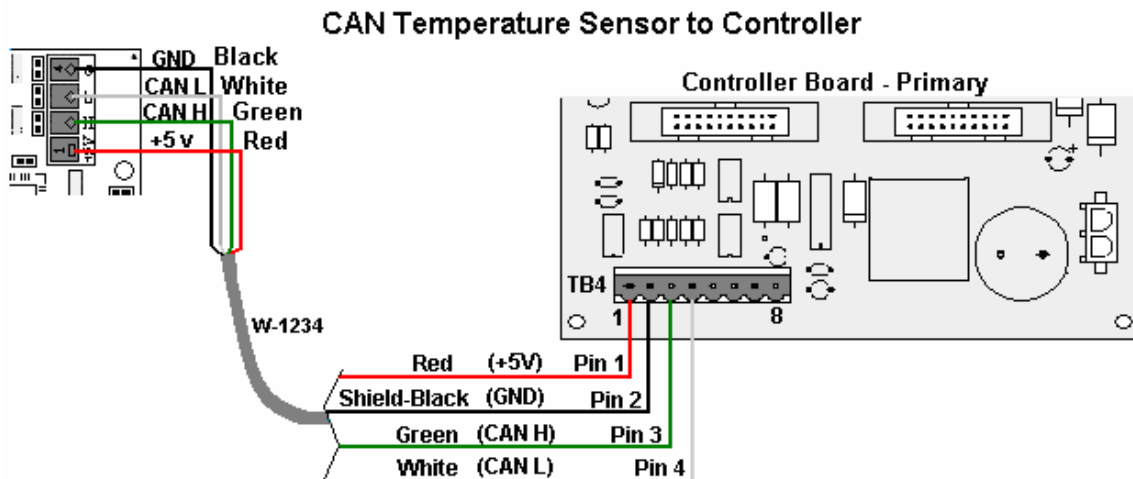


Figure 8: CAN Temperature Sensor Connection

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.

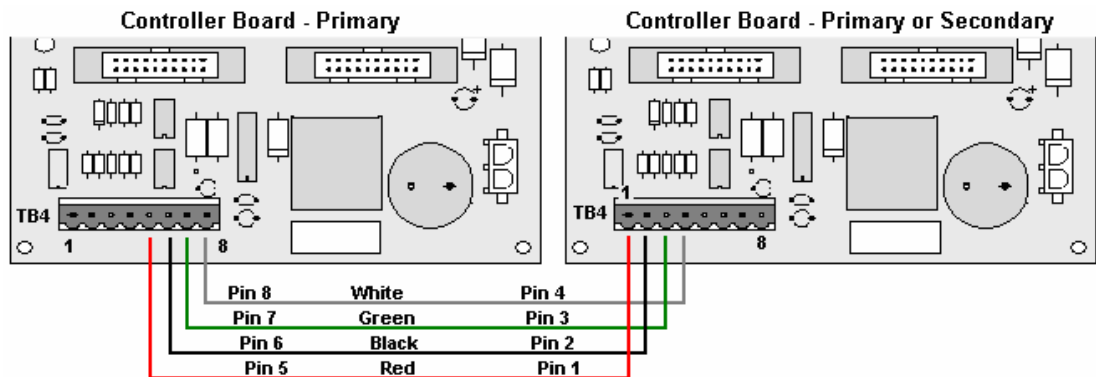


Figure 9: CAN Controller Interconnect

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.

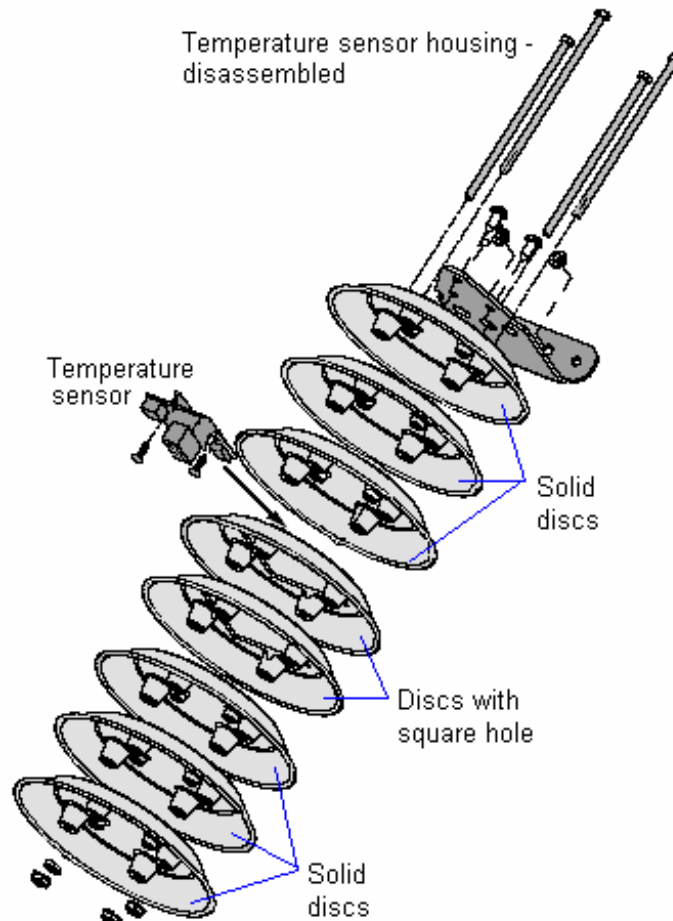
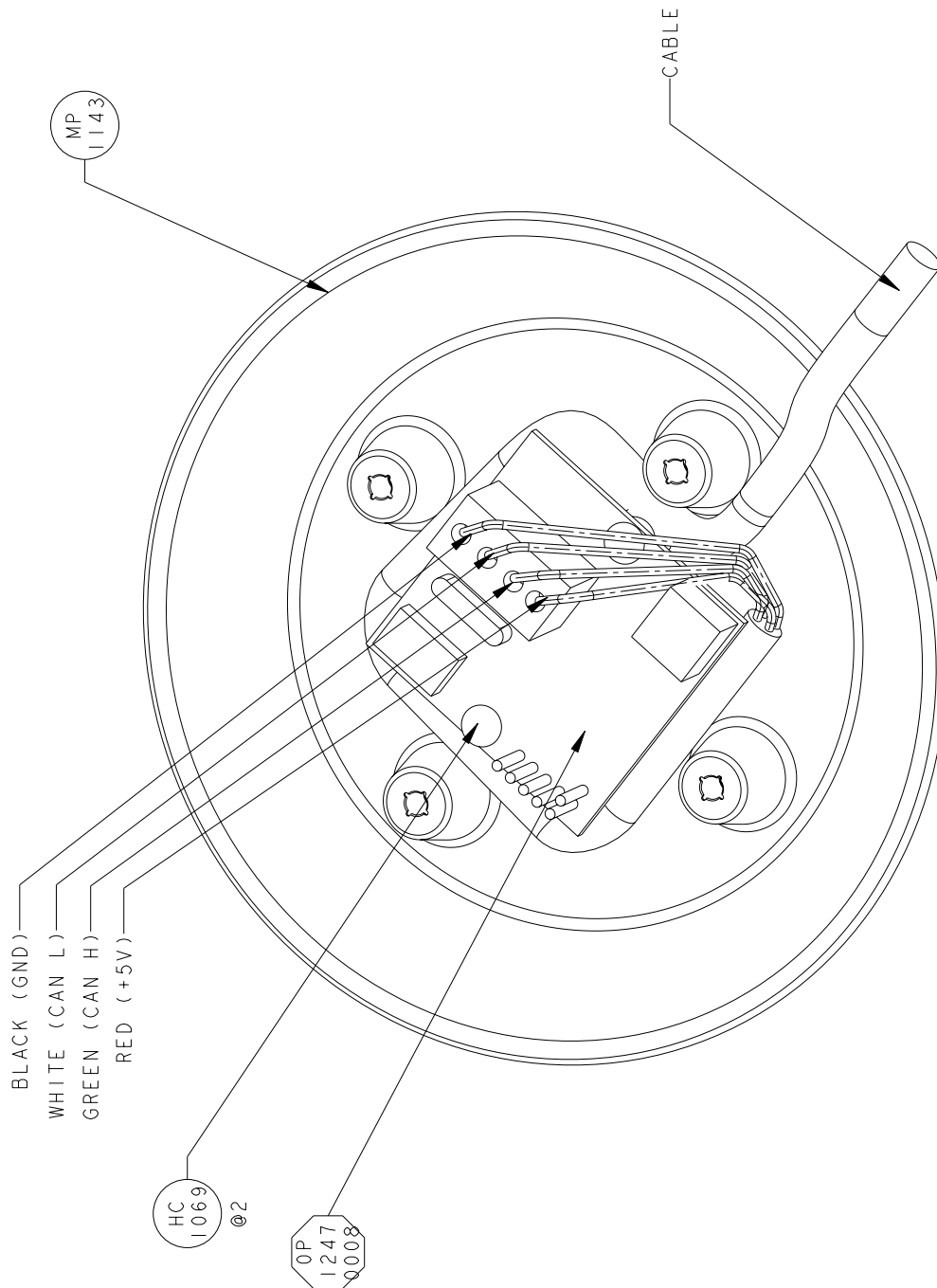


Figure 10: *Temperature Sensor Housing Disassembled*



ASSEMBLY INSTRUCTIONS:
 ATTACH PCB 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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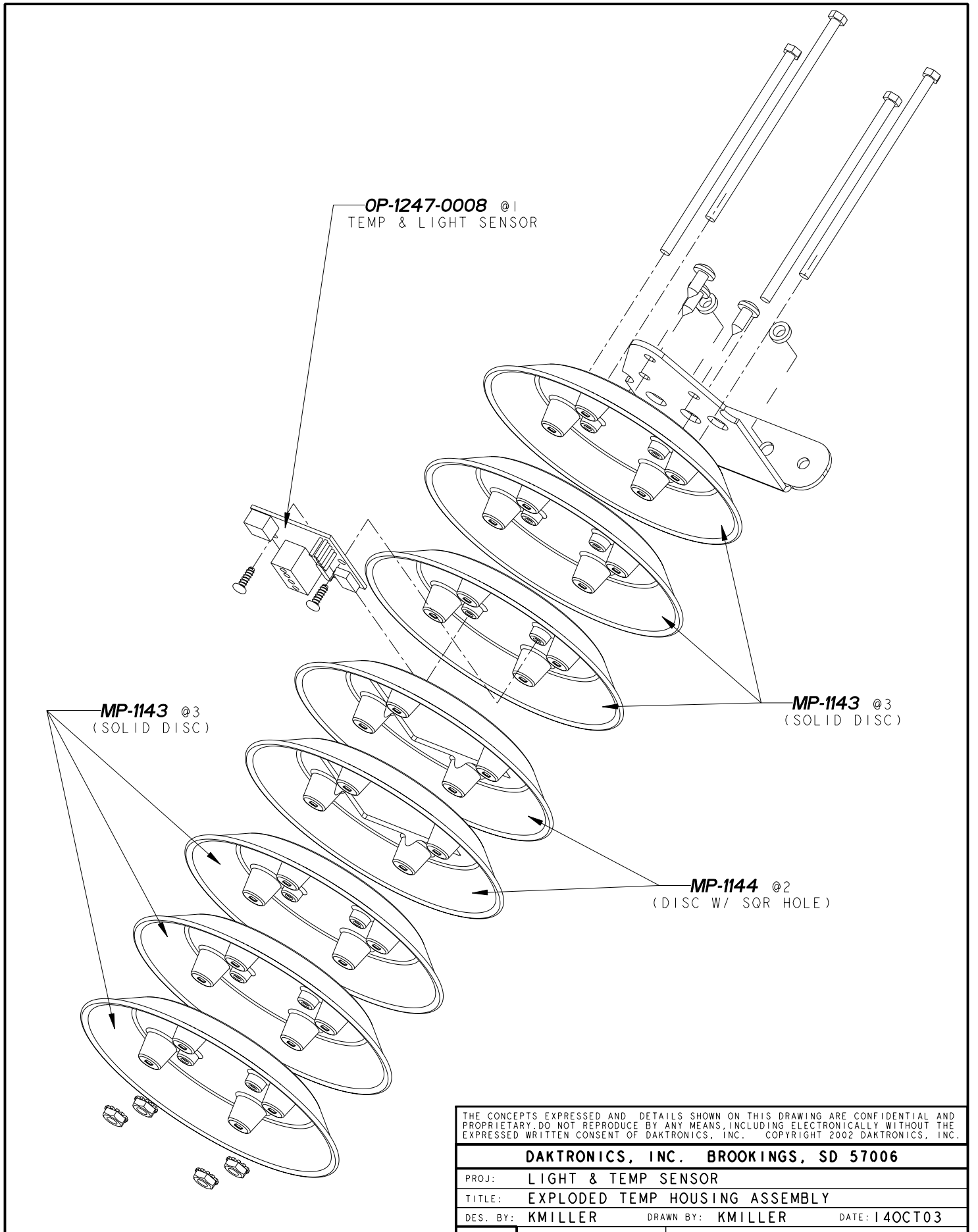
PROJ: LIGHT & TEMP SENSORS

TITLE: TEMP SENSOR CABLE ROUTING SCHEMATIC

DES. BY: K MILLER DRAWN BY: K MILLER DATE: 03OCT03

REVISION SHEET 1 OF DWG 197884 1151-E10A-197884
 SCALE: 1 = 1

REV.	DATE	DESCRIPTION	BY	APPR.



OP-1247-0008 @1
TEMP & LIGHT SENSOR

MP-1143 @3
(SOLID DISC)

MP-1143 @3
(SOLID DISC)

MP-1144 @2
(DISC W/ SQR HOLE)

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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	1151-E10A-198371
	SCALE: 1=3	

REV.	DATE	DESCRIPTION	BY	APPR.

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