GENERIC GALAXY®
AF-6200/6300 SERIES

DISPLAY MANUAL

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DAKTRONICS

Table of Contents

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1 Introduction

This manual provides installation, maintenance, and troubleshooting information for the Daktronics AF-6200/6300 displays. For information regarding the safety, installation, operation, or service of this system, please refer to the telephone numbers listed on the cover page of this manual.

Daktronics AF-6200/6300 displays meet the NEMA® 4X standard—any customer installed mounting hardware, power/signal entrances, and/or penetrations of any sort must maintain the NEMA® 4X standard.

The manual is divided into the following sections:

- **Introduction** provides the information needed to use this manual. Take time to read the introduction as it defines terms and explains concepts used throughout the manual.

- **Mechanical Installation** contains mechanical installation information for the display.

- **Electrical Installation** contains electrical installation information for the display.

- **Maintenance and Troubleshooting** provides maintenance and general troubleshooting information for the Daktronics AF-6200/6300 displays.

- **Exchange and Repair** offers information regarding the Daktronics exchange and repair program.

- **Glossary** contains definitions for the terms and phrases commonly used throughout this manual and with the Galaxy® product.

Daktronics identifies manuals by the ED or DD number located on the cover page of each manual. For example, this manual would be referred to as **DD3894570**.

Refer to the **Daktronics Exchange and Repair & Return Programs (p.20)** if any component needs replacement or repair.

Display Overview

Daktronics outdoor Galaxy® LED displays are designed and manufactured for performance, reliability, ease of maintenance, and long life. The displays consist of an array of LED pixels. The configuration of the LED pixels depends on the model of LED displays.

A typical system consists of a Windows®-based personal computer (PC) that runs Venus® 1500 software and of one or more displays. Daktronics Venus® 1500 software package operates with Windows® XP, Windows Vista®, Windows® 7, and Windows® 8 systems on an IBM®-compatible computer. Refer to the **Venus® 1500 Controller Manual** for installation and maintenance information about the Venus® 1500 editing station.

Network Concepts

Daktronics offers four network systems: RS232, RS422, Ethernet, fiber-optic Ethernet, and cellular modem to interconnect and control displays. One display network can comprise up to 240 displays. Each Daktronics system is capable of performing multiple functions, including:

- Transferring messages.

- Programming messages to play on a display or group of displays in a network.

- Determining display statuses on a network.

The Daktronics AF-6200/6300 displays use one of the following communication methods. Refer to the **Signal Termination from Computer to Display (p.7)** section for more detailed information.

RS232

RS232 (EIA/TIA-232-E) is a standard communication interface that employs a single-ended serial transmission scheme using a maximum cable length of 25' (7.62 m). This interface is designed for computer communication at short distances. Most computers have an RS232 communications port.

RS422

RS422 (EIA/TIA-422-B) is a standard communication interface that uses a differential balanced transmission scheme typically using a maximum cable length of approximately 4,000' (1.2 km). The main advantage of RS422 over RS232 is a longer cable length. A signal converter is needed to convert the computer's RS232 signal to RS422.

Ethernet

An Ethernet network is a standard communication method that allows one computer, or a number of computers, to connect to displays. Each primary display is identified by a unique address. This address allows the computer to communicate directly with each primary display.

Fiber-optic Ethernet

A fiber-optic network is a standard communication method transmitting light (signal) through glass fibers. Fiber-optic cable has a maximum length of 2,000' (0.6 km). A signal converter is required to convert the computer's Ethernet interface to a light signal, and another to convert the light signal to Ethernet within the display.

Cellular Modem

A cellular IP modem provides a wireless communication network between the display controller and the remote central software. It can send and receive data using cellular technologies provided by the cellular carrier.

2   Mechanical Installation

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

Daktronics is not responsible for the integrity of the mounting structure or any mounting hardware not provided by Daktronics. It is the customer's responsibility to ensure a qualified structural engineer has approved the structure and any additional hardware.

Daktronics AF-6200/AF-6300 displays meet the NEMA® 4X standard—any customer installed mounting hardware, power/signal entrances, and/or penetrations of any sort must maintain the NEMA® 4X standard.

Support Structure Design

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

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

Display Mounting

It is the customer's responsibility to ensure the installation will meet local standards and to determine the proper mounting method and location. The mounting hardware must be capable of supporting all components to be mounted. The mounting hardware and method are the responsibility of the customer. The number of attachment points needed and the structure must be reviewed by a qualified structural engineer and meet all national and local codes.

> **Note:** The display has a hinged face panel. Take care to ensure the door opens properly.

Rear Mounting (Single Face Only)
After determining the type of mounting members, attach the mounting members to the back of the display. Place sealing washers or waterproof sealant between the display and the mounting member to prevent water leaking into the display. Use all four, six, or eight attachment points, depending on the size of the display.

Top/Bottom Mounting (Single Face or Double Face)
After determining the proper mounting method, top or bottom, and the type of mounting members, attach the mounting members to the display. Place sealing washers or waterproof sealant between the display and the mounting member to prevent water leaking into the display. Use all eight attachment points on the display.

Side Mounting (Single Face or Double Face)
After determining the type of mounting members, attach the mounting members to both sides of the display. Place sealing washers or waterproof sealant between the display and the mounting member to prevent water leaking into the display. Use all eight attachment points (four per side) on the display.

Shoe Mounting (Single Face or Double Face)

A bracket may be designed to suspend the display from a support structure with the use of two shoes. The shoe-mount method uses a shoe, or a metal base plate with a support tube extending from its center.

Power and Signal

For all methods:

This display has many potential entrances for power or signal cables. Possible signal and power entrances are marked with small indentations on the cabinet. After determining a power and signal entrance, punch the appropriate size hole and refer to the **Electrical Installation (p.5)** section for electrical installation. Waterproof any hole punched or drilled in the display with either a watertight plug or with conduit to prevent water from entering the display.

Drill from the inside of the display to ensure the components within the display are not damaged. After drilling, remove any metal filings that might interfere with the operation of the components within the display.

For Shoe-Mounting Method

The electrical connections can also route to the sign through the support tubes of the shoes. If using this method, drill a hole in the display at one of the center punches designated for power or signal. Align this hole with the support tube. Use watertight sealant between the display and the shoe to prevent water from entering the sign.

> **Note:** If using this method, conduit must be used—the support tubes are not a viable raceway.

3 Electrical Installation

Getting Started

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

Only qualified individuals should terminate power and signal cable within this Daktronics display.

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

Daktronics AF-6200/6300 displays meet the NEMA® 4X standard—any customer installed mounting hardware, power/signal entrances, and/or penetrations of any sort must maintain the NEMA® 4X standard.

Conduit

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

- Power

- Signal IN wires

- Signal OUT wires (if signal is required for another display)

To prepare for power and signal entrance:

1. Release the face panel latches using a tubular key provided by Daktronics.

2. Open the face panel.

3. Clear the area for drilling.

Punch or drill out the desired area for power and signal entrance. Verify the internal components are undamaged and free of debris. Attach the conduit and route the power and signal cables. Use watertight connections where the conduit enters the display cabinet.

Power Requirements

Proper power installation is imperative for display operation. For more information on power specifications refer to the power specification data label in the display located near the power termination panel.

Grounding

All components of a display system—including but not limited to displays, control equipment, and connected peripheral equipment—must be electrically grounded. Only qualified individuals may perform electrical work, including verification of ground resistance. Daktronics is not responsible for improper grounding or damage incurred as a result of improper grounding.

Grounding methods must meet the provisions of all applicable local and national codes. Inspect and verify all grounding methods meet the provisions of all applicable local and national codes.

Proper grounding is necessary for reliable equipment operation and general electrical safety. Failure to properly ground the display system may void the warranty, disrupt operation, damage equipment, and cause bodily harm or death.

Local and national codes require the use of a power disconnect near the display. If disconnect is not within direct line of sight of the display, provide a lockable disconnect switch (knife switch) at the display location so all power lines can be completely disconnected. Use a two-conductor disconnect so the hot line and the neutral can be disconnected.

There are two considerations for power installation: new power installation and existing power installation. These two power installations differ slightly, as described in the following paragraphs. Refer to **Figure 1**.
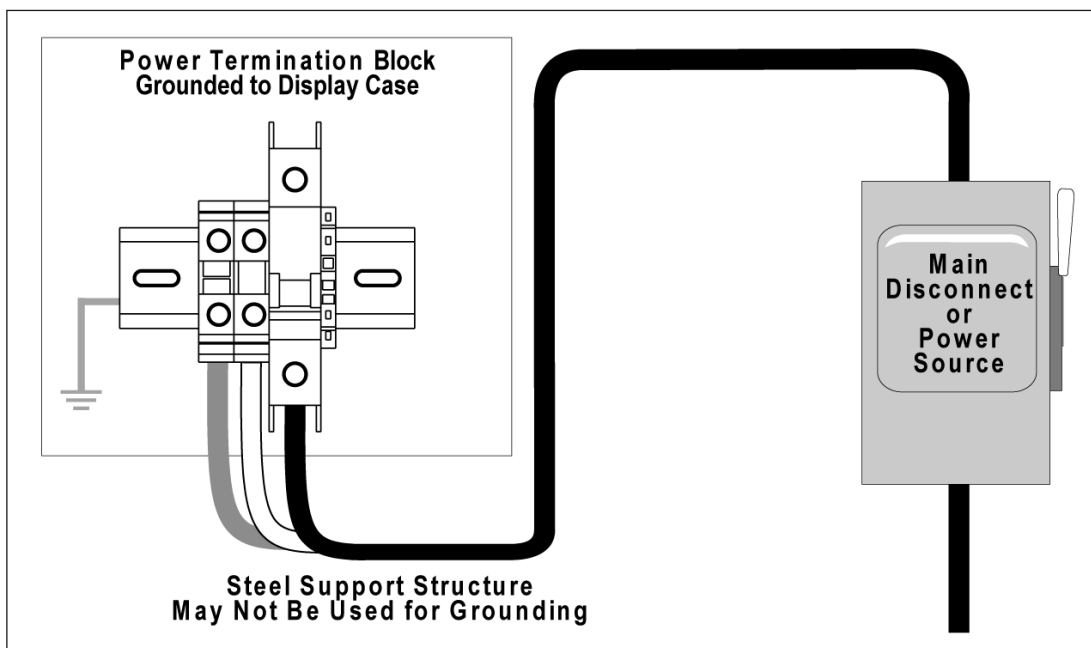
Figure 1: *Power Installation*

New Power Installation
The power cable must contain a separate earth-ground conductor. When using a separate ground conductor, do not connect neutral to ground at the disconnect or at the display. This would violate electrical codes and void the warranty.

Existing Power Installation
When a separate ground conductor is not available, connect the neutral to the earth-ground at the disconnect, never at the display.

Signal Termination from Computer to Display

The following communication options are available for the AF-6200/6300 series.

RS232

An RS232 network requires a 2-conductor shielded cable to transmit RS232 signal. Do not subject this shielded cable to mechanical flexing after installation. This cable is not for direct burial. Route RS232 cable in a dedicated, grounded metallic conduit at the base of the display structure. This cable has a maximum length of 25' (7.62 m).

The signal cable terminates within the display in the J3 jack on the display controller.

RS422

An RS422 network requires a 6-conductor shielded cable to transmit RS422 signal. This cable consists of unpaired wires that should not be subjected to mechanical flexing after installation. This cable is not for direct burial. Route RS422 cable either in dedicated metallic conduit or inside buildings; if not in conduit, keep away from interference signals. With interference signals, a 2' (0.6 m) separation is typically required.

The signal cable terminates within the display to the terminal block labeled "IN RS422" on the display controller. The opposite end terminates at the surge card.

Surge Card (Out RS422)	Field Cabling	Terminal Block (In RS422)
Pin 1 (N.C.)	—	Pin 1 (N.C.)
Pin 2 (In-P)	Red	Pin 2 (Out-P)
Pin 3 (In-N)	Black	Pin 3 (Out-N)
Pin 4 (Out-P)	Green	Pin 4 (In-P)
Pin 5 (Out-N)	White	Pin 5 (In-N)
Pin 6 (Ground)	Shield/Ground	Pin 6 (Ground)

Ethernet

An Ethernet network system requires a Cat-5 cable. Signal travels from the Local Area Network (LAN) to the Ethernet In jack (J4) on the controller.

The signal cable terminates within the display at the controller. The opposite end terminates at the control computer.

Ethernet Surge Card (J2)	Ethernet In (J4)
Pin 1 (TX-P)	Pin 1 (TX+)
Pin 2 (TX-N)	Pin 2 (TX-)
Pin 3 (RX-P)	Pin 3 (RX+)
Pin 4 (N.C.)	Pin 4 (CHGND)
Pin 5 (N.C.)	Pin 5 (CHGND)
Pin 6 (RX-N)	Pin 6 (RX-)
Pin 7 (N.C.)	Pin 7 (CHGND)
Pin 8 (N.C.)	Pin 8 (CHGND)

Fiber-Optic Ethernet

A fiber-optic network requires a 4-fiber, multi-mode cable with ST connectors. Two fibers are used, leaving the other two as spares. Either use direct burial or route the cable in conduit. Do not subject fiber-optic cable to mechanical flexing.

The signal cable terminates within the display at the fiber card in the display at the fiber signal converter.

> **Note:** A small power supply will be installed with the fiber Ethernet options.

4   Maintenance and Troubleshooting

Getting Started

1. Turn off the breaker before performing any repair or maintenance work on the displays. Disconnect power to the display if performing repair or maintenance.

2. Only qualified service personnel should access internal display electronics.

3. Daktronics engineering staff must approve any changes to the displays. If making modifications to the displays, submit detailed drawings to the Daktronics engineering staff for evaluation and approval or the warranty will be void.

4. Take care when handling the display's door to prevent injuries or damage, especially in windy conditions.

Weather Stripping

To ensure a watertight display, Daktronics installed weather stripping around the face panel. When replacing weather stripping, check for proper installation or water may leak into the display and damage the components.

Accessing the Internal Components

To access the internal components of the display, a tubular key is needed (provided by Daktronics).

To open the door and access the internal components:

1. Release the door by turning the captive latches on the door using the tubular key provided by Daktronics.

2. Carefully lower the door. Linkages installed at each end will support the door when in the open position.

> **Note:** Do not lean on or place extra weight on the open door.

Module Removal and Replacement

To remove and replace a module:

1. Access the display interior using the steps outlined in **Accessing the Internal Components**.

2. Release the power cable to the module by squeezing the locking tab of the black 12-pin locking connector while pulling the plug free.

3. Release the signal cable to the module by grasping the sides of the white 15-pin connector while pulling the plug free.

4. Using a $^5/_{16}$" nut driver, release the nuts securing the module panel to the door. Lift the module panel away from the door.

5. Using a $^1/_4$" nut driver, release the nuts securing the module to the module panel.

6. Carefully lift the module out of the face panel.

Follow the previous steps in reverse order to attach a new module.

Power Supply Replacement

Each sign uses 5 volt power supplies. One power supply can run multiple modules. The power supplies attach to a support bracket, which secures to a mounting panel in the rear of the display.

To replace a failed power supply:

1. Access the internal components following the procedure outlined in the **Accessing the Internal Components (p.9)** section.

2. Turn off power to the display by flipping the switch on the power termination panel.

3. Using a $^5/_{16}$" nut driver or wrench, remove the two nuts securing the power supply and support bracket to the cabinet; refer to **Figure 2**.

Figure 2: *Power Supply*

4. Carefully lift the power supply from the display.

5. Disconnect and label all power cables from the power supply.

6. Turn the mounting plate over to access the two mounting screws. Using a Phillips screwdriver, remove the screws to release the power supply from the plate.

7. Position the new power supply on the mounting plate and secure it using the screws.

8. Reconnect the power cables.

9. Attach the plate to the cabinet using the two nuts.

10. Reapply power to the display.

11. If necessary, adjust the voltage to match the voltage setting of the existing power supplies.

12. Close the sign door.
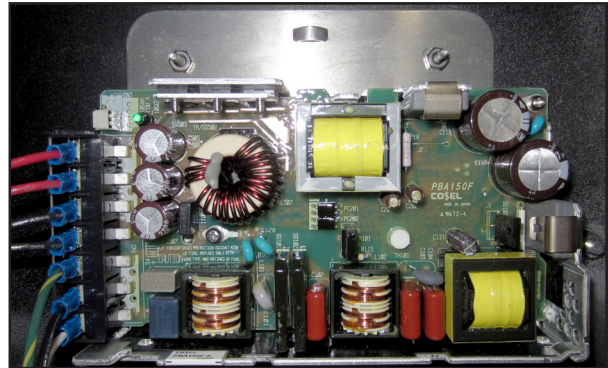
Controller Board

The controller is the component that sends data to the modules. **Figure 3** illustrates a typical controller.

To remove and replace the controller:

1. Open the face panel following the steps outlined in the **Accessing the Internal Components (p.9)** section.

2. Turn off power to the display by flipping the breaker.

3. Remove all power and signal connections from the controller. Label each cable to ensure proper installation after installing the new controller.

4. Using a $^5/_{16}$" nut driver, remove the nuts holding the controller in place.

5. Note the address of the rotary switches and ensure the address on the replacement controller is the same.

6. Follow the previous steps in reverse order to install a new controller. Then reset the display address on the controller to match the address on the removed controller.

Controller Address Setting

The rotary switches set the hardware address, which the software uses to identify the particular display. When replacing a controller board, set the rotary switches on the new controller to the same address configuration as the defective controller. Each controller in a network needs a unique address. Refer to **Figure 3**.
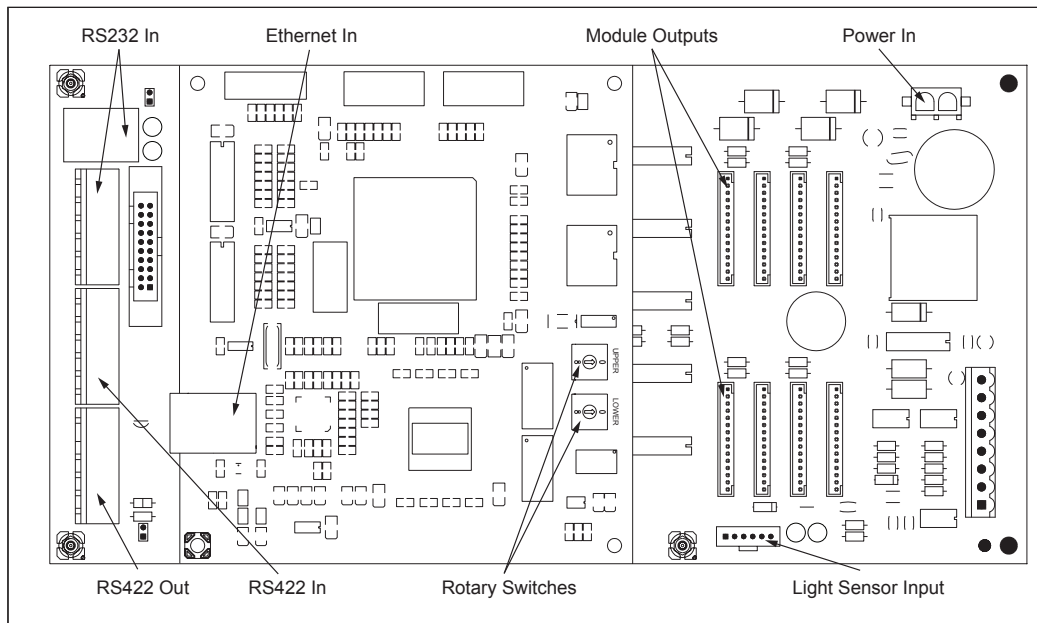
Figure 3: *Controller*

Set the switches by rotating them counter-clockwise until the arrow points to the desired number; refer to **Figure 4**. Turn off the display's power and then turn it back on to activate the test mode or to change the address.

> **Note:** Setting both rotary switches to address "0" activates a test mode. Turn off the display's power and turn it back on to activate testing. Refer to **Figure 5**.
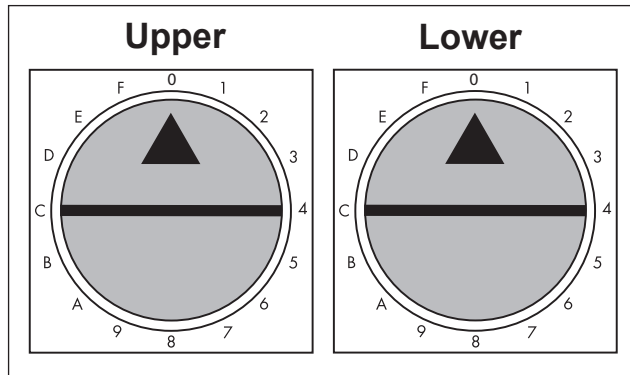
Figure 4: Rotary Switches

Figure 5: Rotary Address Examples

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

Controller Diagnostics

The following chart details the information that each diagnostic LED provides. The chart describes normal functioning of the LEDs, whether always on or flashing at a certain rate.

> **Note:** Some LEDS, such as Run and Receive signal, are both labeled with the same number. This occurs because the controller includes two layers of circuit board. In **Figure 3,** the CPU is the raised board on the controller.

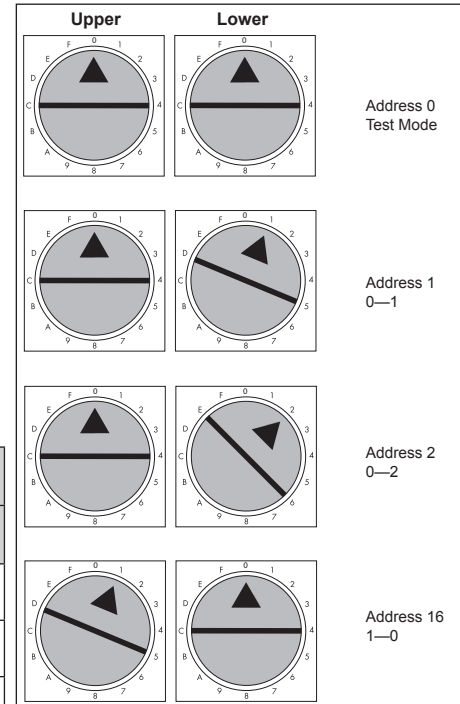| CPU			
LED	**Color**	**Label (Function)**	**Operation**
DS1	Red	TXD (CAN)	Flashes when controller is transmitting CAN information.
DS2	Red	RXD (CAN)	Flashes when controller is receiving CAN information.
DS3	Red	RST (System Restart)	Off when controller is functioning properly. Flashes at 1.5-second rate if controller is not resetting the watchdog timer.
DS4	Red	RUN (Run)	A steady flash indicates the controller is running properly. Normal flash rate is about once per second.
DS5	Red	PRG—(U15 Programmed)	On when U15 contains a valid logic problem.
DS7	Red	Link (Link)	On when Ethernet interface is in the link up condition. Flashes when the Ethernet chip detects, transmits, or receives activity.
DS8	Red	SPD (Speed)	On when Ethernet interface is at 100Mbps. Off when the Ethernet interface is at 10Mbps.
DS9	Red	DUP (Duplex)	On when the Ethernet interface is at full duplex. Off when the Ethernet interface is at half duplex.
DS10	Red	COL (Collision)	Flashes when the Ethernet interface detects a collision in half duplex.
DS12	Red	2.5 V	On when 2.5 V power supply is functioning.
DS13	Red	3.3 V	On when 3.3 V power supply is functioning.

Product Board			
LED	**Color**	**Function**	**Operation**
DS1	Green	5 V	On when 5 V power supply is functioning.
DS2	Green	3.3 V	On when 3.3 V power supply is functioning.
DS3	Yellow	TX1 (COM1)	Flashes when transmitting serial information.
DS4	Yellow	RX1 (COM1)	Flashes when receiving serial information.
DS5	Yellow	LGHT) Light	Flashes when receiving signal from light sensor.

Light Sensor

The light sensor assembly is mounted on the inside of the door in the top-left of the cabinet. The entire assembly fits over two pressed-in studs. If the light sensor should fail, only the circuit board needs to be replaced.

To replace a failed light sensor:

1. Disconnect the electrical connections to the light sensor.

2. Remove the nuts behind the circuit board plate and remove the plate and circuit board from the assembly.

3. Remove the nuts securing the circuit board to the plate.

4. Remove the standoffs, plastic washers, and attachment screws from the board.

5. Remove all wiring from the defective sensor.

6. Reattach the new circuit board using the nuts removed in **Step 2**. Note the orientation of the new circuit board. The photocell must line up with the circular opening in the bottom of the display when the assembly is in place.

Communication Accessories (Optional)

RS422 Surge Suppressor

The surge suppressor is an inline device that filters the RS422 data line. It suppresses surges to a low voltage in order to protect the display controller's RS422 input. The surge suppressor must firmly connect to the display to be effective. The mounting hardware used to secure the surge suppressor is sufficient if it is fastened properly. Refer to **Figure 6**.
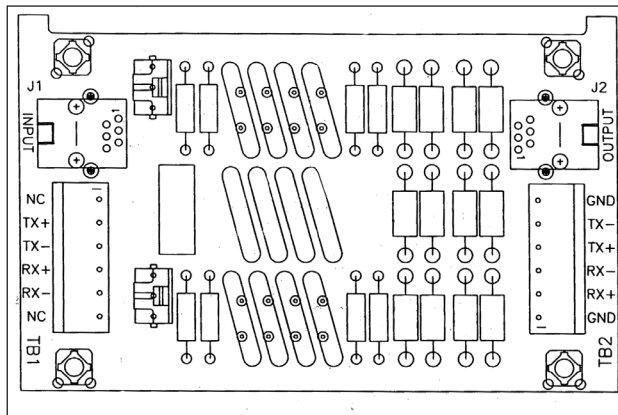

Figure 6: *RS422 Surge Suppressor*

To remove the surge suppressor:

1. Disconnect the signal connections.

2. Using a $^5/_{16}$" nut driver, remove the four nuts holding the surge suppressor in place.

3. Install the new surge suppressor and replace the nuts.

4. Reconnect power and signal cables.

Signal Converter

The following tables list the jack pin-outs for a wire signal converter. Refer to **Figure 7**.

J1—25 Pin DB-F	
Pin	**Operation**
2	TX-P (out)
3	RX-P (in)
7	GND

J2 and J3—RJ45	
Pin	**Operation**
1	(not used)
2	GND
3	TX-N (out)
4	TX-P (out)
5	RX-N (in)
6	RX-P (in)
7	GND
8	(not used)

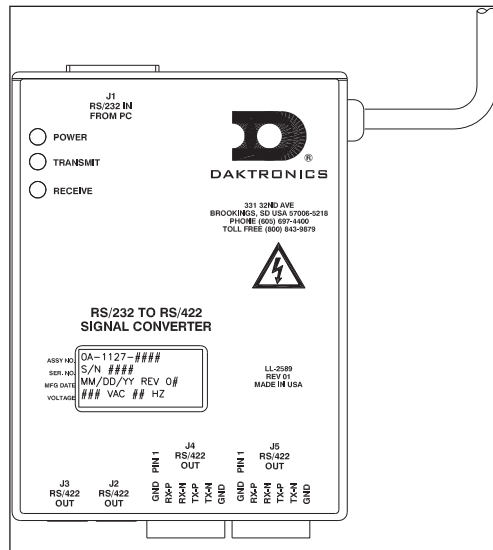| J4 and J5—Phoenix	
Pin	**Operation**
1	GND
2	RX-P (in)
3	RX-N (in)
4	TX-P (out)
5	TX-N (out)
6	GND

Figure 7: RS232/RS422 Signal Converter

The following table details information that each LED provides. Refer to **Figure 7** for an illustration of the signal converter.

LED Indicator	Typical States		Troubleshooting
Power	On	Signal Converter (SC) is receiving power.	
	Off	SC is not receiving power.	
		Internal 1 AMP fuse is bad.	Replace SC.
TX	On Steady	SC is not connected to a serial port.	Connect to open computer serial port.
		1. Serial Port or serial cable is bad. 2. Computer serial port in sleep mode.	1. Try another port or replace serial cable. 2. Communicate to display.
	Off Steady	Normal state; SC is not transmitting data.	
	Brief Flicker	SC is transmitting data.	
RX	On Steady	1. Field cable between SC and display is bad. 2. Connected to display output jack or terminated incorrectly. 3. Bad serial port on display controller.	1. Eliminate cabling by disconnecting wire/cable from SC to display controller. 2. Check connections and terminations. 3. Eliminate by disconnecting wire/cable to display controller.
	Off Steady	Normal state; SC is not receiving data.	
	Brief Flicker	SC is receiving data.	
TX/RX	On Steady	(If serial cable is connected) Bad SC.	Replace SC.

Ethernet Surge Card

An Ethernet surge card is an inline device that filters the Ethernet data line. It suppresses surges down to a low voltage in order to protect the display controller's Ethernet input. If a surge card is included with the display, it is located in the interior of the display. Refer to **Figure 8**.

To replace a surge card:

1. Disconnect the input and output signal connections.

2. Carefully remove the four nuts holding the surge card in place using a $^5/_{16}$" nut driver.

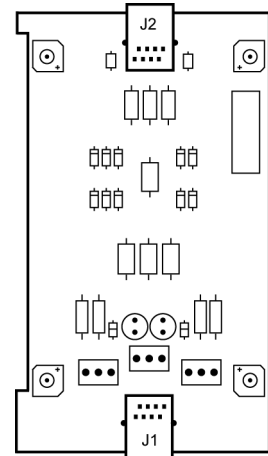3. Install the new surge card and reconnect the signal cables.

Figure 8: Ethernet Surge Card

Fiber Media Converter

The fiber media converter, if included, is located in the interior of the display. Complete the following steps to replace a media converter:

1. Disconnect the power and signal connections, referring to **Figure 9** for connector locations.

2. Remove the three corner nuts holding the fiber media converter.

3. Install the new fiber media converter.

4. Reconnect power and signal cables.

The fiber media converter contains the following input and output jacks:

- The fiber transmit and receive jacks are marked by arrows showing their function and are labeled "100BASE-FX". The fiber cable from the first media converter connects to these jacks.

Figure 9: *Fiber Media Converter*

- The input/output Ethernet signal to/from the display routes through the breakout board to an RJ45 jack, labeled "100BASE-TX".

- The DC power input from the display to the media converter routes through the breakout board and into the power jack labeled "12 VDC Input".
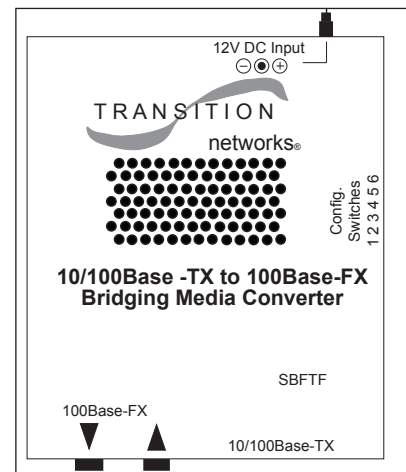
Troubleshooting

This section lists some problems that may be encountered while operating the display. Next to each problem are troubleshooting steps that may help resolve it. While this list does not cover all possible problems that may occur, it does cover those that occur most often. Contact Daktronics Customer Service if problems continue with the display; refer to the **Daktronics Exchange and Repair & Return Programs (p.20)** section.

Problem Observed	Possible Corrective Action
One or more individual LED pixels does not light.	Replace module.
A column of LED pixels does not light.	Replace the first module from the left that does not work.
A row of pixels does not light.	Replace the first module from the left that does not work.
A section of the display does not work. Section extends all the way to the right side of the display.	Replace the first module from the left that does not work.
	Replace the following module that does not work.
	Replace the power supply on the first module to the left of the module that does not work.
	Replace the ribbon cable.
Entire display is distorted.	Verify configuration is correct.
	Replace the controller board.
A single line is garbled.	Replace the first module on the left end of the bad line.
	Replace the ribbon cable.
	Replace the controller board.
Two or more modules (which share a power supply) do not light.	Replace the power supply.
Entire display does not work.	Check breaker in power termination panel.
	Check 120 VAC to the display.
	Check 5 VDC to the controller board.
Display is stuck on bright or dim.	Check for obstructions.
	Check manual / auto dimming.
	Check light sensor cable / wiring.
	Replace light sensor.
	Replace controller board.

Initialization Sequence

When first powered up, the display runs an initialization sequence that displays the following information:

1. Product Name (Galaxy)

2. Display Size (Row x Column)

3. Shading (Mono)

4. Bootloader Version (OS X.XX)

5. Firmware Number (ED-XXXXX)

6. Firmware Revision (Rev X.XX)

7. Hardware Address (HW: XX)

8. Software Address (SW: XX)

9. IP Address [(varies per controller) IP: 172.16.192.2X]

10. Subnet Msk: [(default) Msk: 255.255.0.0]

11. COM1 Configuration (C1:15) [(Modem C1:V15) if a modem is present]

12. COM2 Configuration (C2:RTD)

13. Socket 3001: (IP 3001:V15)

14. Socket 3002: (IP 3002: RTD)

15. Line Frequency [CLK: AUTO (60)]

16. Display Name Description (Galaxy Row x Column)

5   Exchange and Repair

All parts in Daktronics displays are assigned a part number. Daktronics part numbers are commonly found on drawings. Those part numbers can be used when requesting replacement parts from Daktronics Customer Service. Take note of the following part number formats. (Not all possible formats are listed here.)

- "0P-_ _ _ _-_ _ _ _" denotes an individual circuit board.

- "0A-_ _ _ _-_ _ _ _" denotes an assembly. An assembly can be a single circuit board or a collection of components that function together, usually mounted on a single plate or in a single enclosure.

- "0Z-_ _ _ _-_ _ _ _" denotes an assembly.

- "PR-_ _ _ _ _ _-_ _" denotes a specially ordered part.

Most circuit boards and components within this display carry a label that lists the part number of the unit. If a circuit board or assembly is not listed in the replacement parts list, use the label to order a replacement. A typical label is shown in **Figure 10**. The part number is in bold.
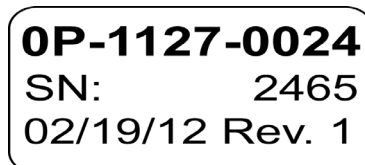
0P-1127-0024
SN: 2465
02/19/12 Rev. 1

Figure 10: *Typical Label*

Daktronics Exchange and Repair & Return Programs

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

Exchange Program

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

Before Contacting Daktronics

Identify these important part numbers:

Display Serial Number:
Display Model Number:
Contract Number:
Date Installed:
Location of Display (Mile Marker Number):
Daktronics Customer ID Number:

To participate in the Exchange Program, follow these steps.

1. **Call Daktronics Customer Service:**

Market Description	Customer Service Number
Department of Transportation, mass transits, airports, parking facilities	**800-833-3157**

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 is made for the replacement part immediately, unless a qualifying service agreement is in place**.
   In most circumstances, the replacement parts are invoiced at the time they are shipped.

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

Repair & Return Program

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

1. **Call or fax Daktronics Customer Service:**
   Refer to the appropriate market number in the chart listed on the previous page.
   Fax: 605-692-0145

2. **Receive a case number before shipping.**
   To receive a case number, contact a services coordinator via phone, email, or by creating a MySupport account on the Daktronics website. This expedites repair of the part.

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

4. **Enclose:**

   • your name

   • address

   • phone number

   • the case number

   • a clear description of symptoms

Shipping Address

Daktronics Customer Service
331 32nd Ave
Case#_____
Brookings, SD 57006

Email

transportationhelp@daktronics.com

Glossary

Controller: A system that can remotely control displays. This system contains a message studio, a schedule studio, a display manager, and other tools and options that configure displays and networks.

Column: Vertical line of pixels.

Controller Board: Controls data for the entire display.

Display Address: Identification number assigned to each display in a network. It is set using the front panel interface. The controller uses the address to differentiate between displays connected on the same network. Displays on the same network cannot have the same address.

Display Configuration: A display's model number, address, etc. This information automatically displays when operating the display.

Ethernet: A local area network (LAN) protocol using a bus topology. The Ethernet network card uses the TCP/IP interface to communicate with the server via the LAN.

Ethernet Surge Card: An inline device that filters the Ethernet data line. It suppresses surges to a safe voltage to protect the display controller's Ethernet input.

Face Panel: A latching, hinged door that hinges downward. The modules mount to the face panel.

Fiber Optics: Technology that uses light energy to transmit signal to displays via hair-thin optical fibers.

LED (Light Emitting Diode): Low-energy, high-intensity lighting units. LED displays offer high resolution for distinct text. A cluster of LEDs form a pixel on the display.

Matrix: Area on a display that plays content, measured in rows and columns of pixels.

Module: A unit of the display that contains LEDs, a display board, and a driver board. Modules are placed next to each other to form the matrix of the display. One driver board is located on the back of each module.

Network: Multiple displays connected to each other. Up to 240 Venus® 1500-controlled displays can exist on one network.

PCB: Printed Circuit Board.

Pixel: An LED that powers on and off to form character and graphic content.

Power Supply: Components used inside a display that convert incoming alternating current (AC) power to direct current (DC) power, as required by several components within the display.

Row: Horizontal line of pixels.

RS232: Standard PC communication type with a maximum cable length of 25 feet (7.62 meters).

RS422: Standard differential communication type with a maximum cable length of 4,000 feet (1.2 kilometers).

RX LED: An LED on the signal converter that indicates the display is sending data back to the signal converter.

Serial Port: Connector on the back of the control computer. The serial port controls the display network through either a 9- or 25-pin serial connector.

Signal Converter: Component that converts data from RS232 to RS422 (wire converter) or from RS232 to light signals (fiber converter). The signal converter is used in RS422 systems or fiber systems, respectively.

Surge Suppressor (Surge Protector): A device inserted in the signal line and/or telephone line to prevent damage to electronic equipment caused by voltage transients or spikes.

TX LED: An LED on the signal converter that indicates the control computer is sending data to the display.

Venus® 1500 Software: Daktronics-designed, Windows®-based software that creates and edits messages on displays.