

**DataTime® Outdoor LED  
Time & Temperature Displays**

Installation and Operation Manual

*ED-13752*

*Rev 10 – 4 June 2014*

**DAKTRONICS**

**ED-13752**  
**Product 1279**  
**Rev 10 – 4 June 2014**

## **DAKTRONICS, INC.**

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# Section 1: Introduction

This manual explains the installation, maintenance and troubleshooting of Daktronics DataTime® DF-1010 (full cabinet) or DF-1011 (drop-in cabinet) light emitting diode (LED) time and temperature displays. For questions regarding the safety, installation, operation, or service of this system, please refer to the telephone numbers listed on the cover page of this manual.

## Safety Precautions

- Read and understand these instructions before installing the display.
- Do not drop the controller or allow it to get wet.
- Properly ground the display with a ground rod at the sign location.
- **Disconnect power when the display is not in use.**
- **Disconnect power when servicing the display.**
- Do not modify the display structure or attach any panels or coverings without the express written consent of Daktronics.

**Figure 1** illustrates a Daktronics drawing label. The drawing number is located in the lower-right corner of a drawing. This manual refers to drawings by listing the last set of digits and the letter preceding them. In the example, the drawing would be referred to as **Drawing A-181218**. Reference drawings are inserted in **Appendix A**.

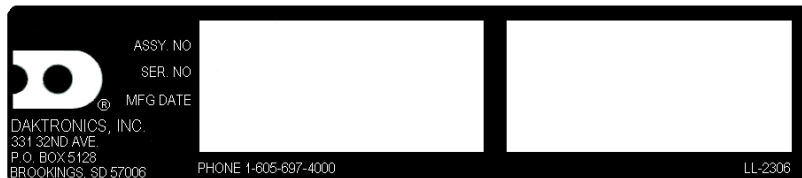
THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2002 DAKTRONICS, INC.			
DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: DATA TIME LED DISPLAYS			
TITLE: MECHANICAL SPECS, DF-1010-24, G3			
DES. BY: AVB		DRAWN BY: AGIBSON	DATE: 09 JAN 03
REVISION	APPR. BY:	1279-R04A-181218	
02	SCALE: 1=16		

**Figure 1:** Daktronics Drawing Label

The model numbers of a Daktronics display can be found on the ID label inside the display. The label will be similar to the one shown in **Figure 2**. When calling Daktronics Customer Service, please have this information available to ensure that a request is serviced as quickly as possible.

Daktronics displays are built for long life and require little maintenance. However, occasionally, display components may need to be replaced. The **Replacement Parts List** in **Section 5.1** provides the names and part numbers of these components.

Following the Replacement Parts List is the Daktronics Exchange and Repair and Return Programs in **Section Error! Reference source not found.** Refer to these instructions if any display component needs repair or replacement.



**Figure 2:** Display Identification Label

## 1.1 Product Overview

DataTime is part of a family of Daktronics digit products designed for easy installation, readability, and reliability. The DataTime series name is used only for time and temperature displays.

The DataTime Series includes:

- **Time & Temperature Displays:** Automatic time and temperature displays that show temperatures in Fahrenheit or Celsius (three digits, degree symbol, and F or C character) and 12- or 24-hour time.

These displays have the following features:

- LEDs are used to illuminate numeric digits.
- Maximum power usage is 150 W using a 120 V power input.
- Cabinets are constructed of heavy-gauge aluminum.
- Digit faceplates are black and set directly into the surface of the display.
- Mounting weights and dimensions for each model are listed in **Section 2.1** of this manual.
- DataTime outdoor LED displays use a DataMaster 100 hand-held controller. The device uses a keyboard insert for display control. **Section 6:** of this manual provides operating instructions.

DataTime model numbers are formatted as follows:

<b>DF-101X</b>	=	Outdoor Digit Display (1010 full cabinet or 1011 drop-in cabinet)
<b>HH</b>	=	Digit height in inches (10, 13, 18, 24)
<b>C</b>	=	LED Color- R (Red) or A (Amber)

## Section 2: Mechanical Installation

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Daktronics does not guarantee the warranty when the display is not constantly in a stable environment.

Daktronics' engineering staff must approve any changes that may affect the display's weather-tightness. 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 the installation or the structural integrity of support structures done by others.** It is the customer's responsibility to ensure that a qualified structural engineer approves the structure and any additional hardware.

### 2.1 Mechanical Installation Overview

Mechanical installation typically consists of mounting the display and any accompanying panels to the support structure.

The table below shows the weights and dimensions for each model in this series.

Model	Dimensions (H x W x D)	Weight Uncrated	Digit Size
DF-1010-10	1'-3" x 3'-0" x 6" (380 mm, 910 mm, 152 mm)	30 lb 14 kg	10" (254 mm)
DF-1010-13	1'-6" x 4'-0" x 6" (457 mm, 1,219 mm, 152 mm)	35 lb 16 kg	13" (330 mm)
DF-1010-18	2'-0" x 5'-0" x 6" (610 mm, 1,524 mm, 152 mm)	60 lb 27 kg	18" (457 mm)
DF-1010-24	2'-6" x 6'-0" x 6" (762 mm, 1,829 mm, 152 mm)	90 lb 41 kg	24" (610 mm)
DF-1011-10	1'-3" x 3'-0" x 6 1/8" (381 mm, 914mm, 155 mm)	25 lb 12 kg	10" (254 mm)
DF-1011-13	1'-6" x 4'-0" x 6 1/8" (457 mm, 1,219 mm, 155 mm)	35 lb 16 kg	13" (330 mm)
DF-1011-18	2'-0" x 5'-0" x 6 1/8" (610 mm, 1,524 mm, 155 mm)	60 lb 27 kg	18" (457 mm)
DF-1011-24	2'-6" x 6'-6" x 6 1/8" (762 mm, 1,981 mm, 155 mm)	90 lb 41 kg	24" (610 mm)

## 2.2 Support Structure Design

### Reference Drawings:

Mounting Method, Flag Style, One Pole.....	<b>Drawing A-166139</b>
Mounting Method, Single Line on One Pole.....	<b>Drawing A-166142</b>

While DataTime displays are designed for wall or pole mounting, every installation will be different. Actual site demands dictate the appropriate mounting method. Most DataTime models have fully finished exteriors, but other models (DF-1011) are designed to be inserted into an existing sign cabinet and require a custom installation.

**Drawings A-166139** and **A-166142** detail the mounting method for a single display on a single column support to multiple displays stacked above one another in a single-pole installation. The drawings include welding and hardware notes applicable for most installations.

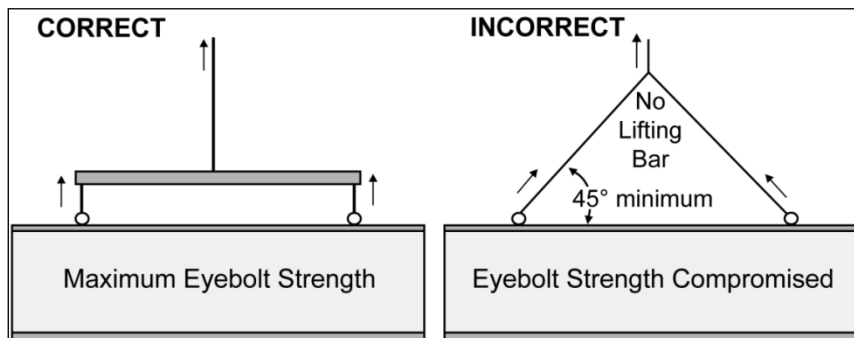
**Note:** The drawings suggest mounting methods and should not be considered as specifications for construction. **It is the installer's responsibility to ensure the mounting structure and hardware are capable of supporting the display, and comply with local codes.**

## 2.3 Lifting the Display

DF-1010 models are shipped equipped with  $\frac{3}{8}$ " eyebolts used for lifting and positioning the display. Eyebolts are located along the top outer edges of the cabinet. Daktronics strongly recommends using a spreader bar, or lifting bar, to lift the display, ensuring the force on the eyebolts is straight up, which minimizes lifting stress.

**Figure 3** illustrates both the correct and the incorrect methods of lifting a display. Lift the display as shown on the left, with a lifting bar. Be sure to use every lifting point provided.

**Daktronics assumes no liability for display damage resulting from incorrect setup or lifting methods.**



**Figure 3:** Correct and Incorrect Lifting

Eyebolts are intended for lifting during installation only. **Do not attempt to permanently support the display by the eyebolts.**



## 2.4 Temperature and Light Sensor

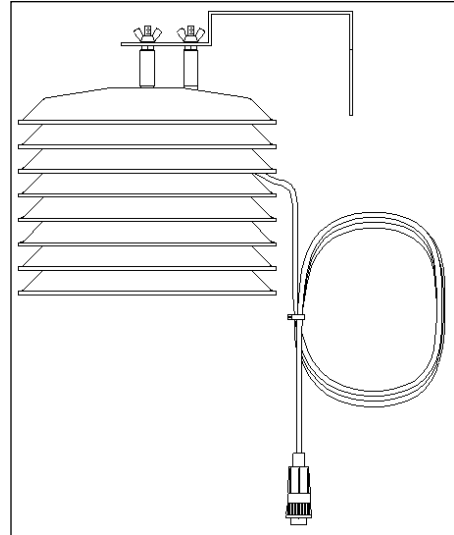
### Reference Drawings:

Time & Temp Power/Signal Hookup.....	<b>Drawing A-938369</b>
Installation, Temp Sensor, G3 .....	<b>Drawing A-184840</b>
Shop Drawings.....	<b>Refer to Appendix A</b>

All displays in the DataTime series use a light sensor to regulate dimming functions, but time and temperature models employ a remotely located sensor to collect and display temperature information as well. Both temperature and light-monitoring electronics are located in the sensor housing.

(Dimming involves decreasing overall display intensity, both for better display viewing and to prolong LED life. The brightness level should be highest during the day to compete with daylight, and lower at night.)

The Daktronics Controller Area Network (CAN) Temperature/Light Sensor is pre-installed in a protective housing, as shown in **Figure 4**. The assembly includes the sensor, mounting bracket, and cabling with a quick-connect plug. Instructions in the following subsections describe the placement and connection of the device. Review the wiring diagram and connection illustration in **Drawing A-184840** before beginning.



**Figure 4:** Temperature Sensor Housing and Cabling

## Locating the Temperature Sensor

Refer to Figure 5 for recommendations.

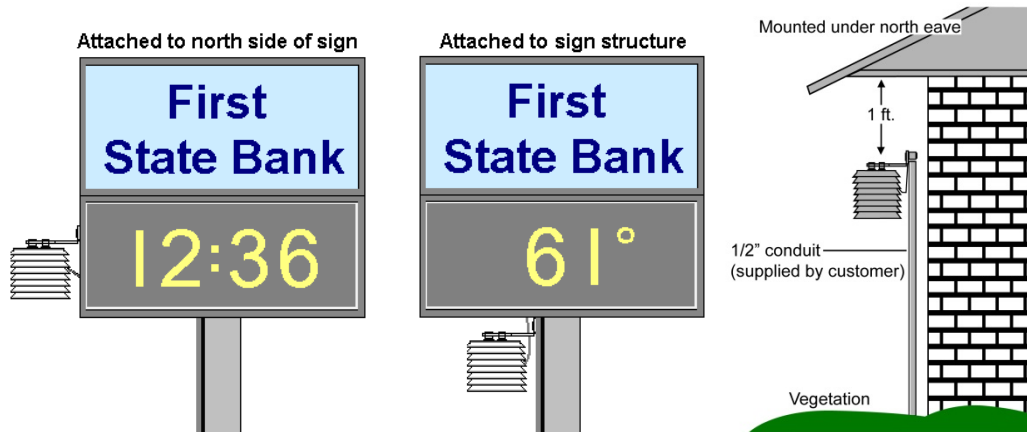


Figure 5: Appropriate Locations for Temperature Sensor

### Recommendations and Requirements:

- First choice for the sensor location is a north eave or northern exposure, away from direct sunlight and above grass. This location gives extra stability and accuracy to the sensor because of the additional shade usually provided by a northern exposure.
- Second choice for locating the sensor is on the display itself, or somewhere on the display structure. (This works best with light-colored displays.) Location of the sensor should be above, below, or on the northern edge of the display to keep the sensor shaded as much as possible. Sensor readings will be more accurate if there is grass below the sign, rather than concrete or asphalt.

### Things to Avoid:

- The sensor requires a location away from chimneys, air conditioners, vents, tar roofs, concrete, and parking lots, all of which can cause abnormal temperature fluctuations and incorrect sensor readings. For accurate readings under these conditions, keep a separation of at least 20-30 feet horizontally and 8 feet vertically between the sensor and the influential element.
- Locations that restrict air movement are also unsatisfactory.
- When a display has two faces, do not mount the sensor between the faces.

## Connecting the Temperature Sensor

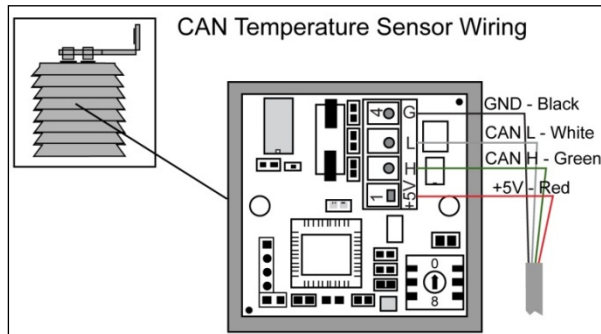
After properly locating the sensing device, follow these steps to connect it with the display:

1. The temperature sensor is equipped with outdoor-rated cable that has a four-pin quick-connect plug on the end. Route the cable from the sensor to the back of display.
2. A four-pin quick-connect jack located on the back panel of the display connects the sensor cable to the display. Refer to the **Shop Drawing** for the exact location of the jack on a particular model. Simply plug in the sensor cable and tighten the connector collar to the display. An internal cable, factory-installed, runs from the sensor jack to the TB1 connector on the driver inside the housing.
3. Secure any additional cable to prevent the quick connect plug from being pulled out of the display and to protect it from weather or vandalism.

**Note:** The temperature sensor is equipped with 25 feet (7.6 m) of cable. If necessary, the cable can be cut to shorten and re-terminated. In addition, the cable can be extended by using a four-conductor shielded cable to a distance of 750 feet (230 m). When not using the provided weather-resistant cable, the cable from the sensor to the display needs to be in conduit.

### Connection to the Sensor

If it is necessary to reconnect the wires to the temperature sensor terminal block, refer to **Figure 6** and the table for the correct connections.



**Figure 6:** Temperature Sensor Connection

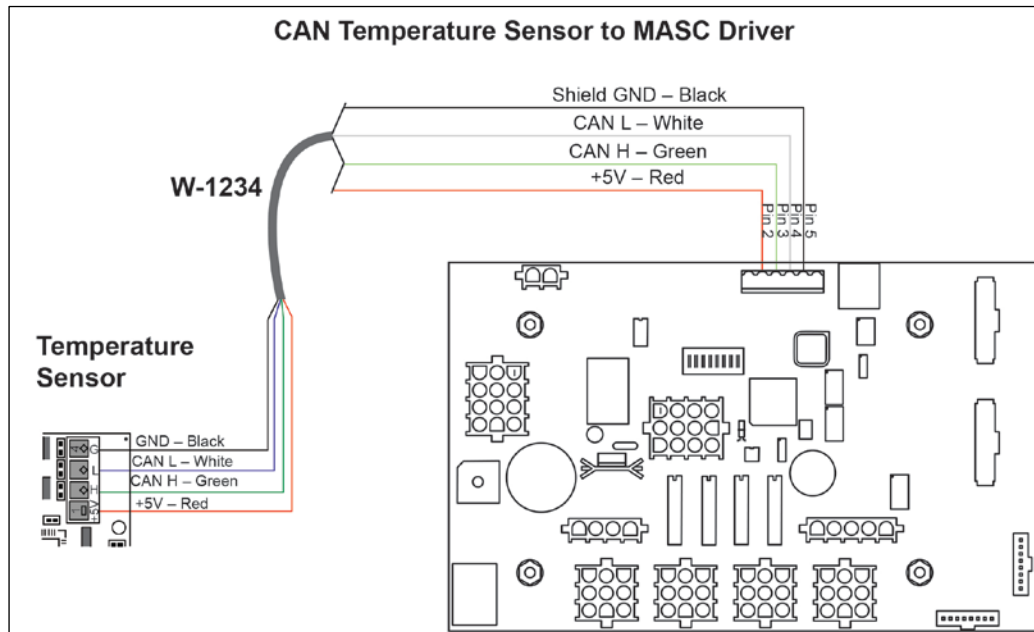
**Note:** Make sure the power is off before making any connections.

Wiring to Temperature Sensor		
Wire Color	Terminal Block Pin No.	Function
Red	Pin 1	5 V
Green	Pin 2	CAN H
White	Pin 3	CAN L
Black	Pin 4	GND

## Connection from Sensor to the Display Driver

If the distance from the temperature sensor to the display is greater than the provided 25 foot (7.6 m) cable, a 4-conductor shielded cable can be connected from the sensor to TB1 on the display driver board.

1. The display's power must be OFF when attaching the internal sensor cable to the host driver.
2. Connect the temperature sensor to the terminal block (TB1) on the host driver. Refer to **Figure 7** and the table below for the correct connections.



**Figure 7:** Temperature Sensor to Display Driver Connections

CAN Temperature Sensor (TB1)	Field Cabling	MASC Driver to CAN
Pin 1 (+5V CAN)	Red	Pin 2 (+5V CAN)
Pin 2 (CAN H)	Green	Pin 4 (CAN H)
Pin 3 (CAN L)	White	Pin 5 (CAN L)
Pin 4 (GND CAN)	Black	Pin 3 (GND CAN)
	Shield	Pin 3 (Shield)

## Section 3: Electrical Installation

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Daktronics outdoor displays are ETL and UL listed and tested to CSA standards for outdoor use. Contact Daktronics with questions regarding the testing procedures.

Only qualified individuals should perform power routing and termination to the display. It is the responsibility of the electrical contractor to ensure that all electrical work meets or exceeds local and national codes.

### 3.1 Preparing for Power/Signal Connection

**Reference Drawing:**

Time & Temp Power/Signal Hookup..... **Drawing A-938369**

Electrical installation consists of the following process:

- Providing power and ground to a disconnect near the display.
- Routing power and ground from the main disconnect to the display driver/power enclosure.
- Connecting the display ground to a grounding electrode at the display location.
- Routing the control signal cable from the control location to the display location.

**Drawing A-938369** provides detailed instructions for power and signal connections for time and temperature displays, including connection of the temperature sensor and connections between host and client displays. Refer to this drawing before completing any part of the electrical installation.

### 3.2 Power and Grounding Connections

**Power**

Correct power installation is imperative for proper display operation. The following subsections detail display power installation. Only qualified individuals should complete electrical installation. Improper installation could result in serious damage to the equipment and be hazardous to personnel.

Daktronics DataTime displays have removable or hinged front panels that allow access to the digits, cabling, and other electronic components. Power and control signal hookup has been simplified.

DataTime outdoor displays require a dedicated, 120 V circuit for incoming power. The display itself has no breakers or fuses.

**WARNING: The display circuit must be fused at 15 A, and all conductors must be designed to pass a 15 A current in normal operation. Failure to meet wiring and over current protection device requirements is a violation of the National Electrical Code and will void the display's warranty.**

The table below shows the circuit specifications and maximum power requirements for each model.

<b>DataTime Time and Temperature Displays</b>			
<b>Model</b>	<b>Digit Size</b>	<b>Maximum Power</b>	<b>Circuit Requirements</b>
DF-1010-10	10" (254 mm)	150 W	120 VAC – 15 A
DF-1010-13	13" (330 mm)	150 W	120 VAC – 15 A
DF-1010-18	18" (457 mm)	150 W	120 VAC – 15 A
DF-1010-24	24" (610 mm)	150 W	120 VAC – 15 A
DF-1011-10	10" (254mm)	150 W	120 VAC – 15 A
DF-1011-13	13" (330 mm)	150 W	120 VAC – 15 A
DF-1011-18	18" (457 mm)	150 W	120 VAC – 15 A
DF-1011-24	24" (610 mm)	150 W	120 VAC – 15 A

## **Grounding**

### **Reference Drawing:**

Enclosed Driver, 4 Column Reference ..... **Drawing A-938300**

Displays **MUST** be grounded according to Article 250 of the National Electrical Code and according to Daktronics specifications. Daktronics requires a resistance-to-ground of 10 ohms or less.

The contractor performing the electrical installation must verify ground resistance. Technicians from Daktronics Sales and Service offices can also provide this service.

The display system **must** be connected to an earth electrode installed at the display. Proper grounding is necessary for reliable equipment operation. It also protects the equipment from damaging electrical disturbances and lightning. The display **must** be properly grounded, or the warranty will be void. Refer to **Drawing A-938300**, for information on where to connect the grounding wire. Connection at the driver enclosure terminal block is illustrated at the bottom of the drawing.

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

### **Power Installation**

There are two considerations for power installation: installation with ground and neutral conductors provided, and installation with only a neutral conductor provided. These two power installations differ slightly, as described in the following paragraphs:

**Installation with Ground and Neutral Conductors Provided.** For this type of installation, the power circuit must contain an isolated earth-ground conductor. Under this circumstance, do not connect neutral to ground at the disconnect or at the display. This would violate electrical codes and void the warranty. Use a disconnect so that all hot lines and neutral can be disconnected. The National Electrical Code requires the use of a lockable power disconnect within sight of or at the display.

**Installation with Only a Neutral Conductor Provided.** Installations where no grounding conductor is provided must comply with Article 250-32 of the National Electrical Code. If the installation in question meets all of the requirements of Article 250-32, the following guidelines must be observed:

- Connect the grounding electrode cable at the local disconnect, never at the display driver/power enclosure.
- Use a disconnect that opens all of the ungrounded phase conductors.

### 3.3 Lightning Protection

Using a disconnect near the display to completely cut all current-carrying lines significantly protects the circuits against lightning damage. This is also a National Electrical Code requirement. For the disconnect to provide protection, the power **must** be disconnected when the display is not in use. The DM-100 control console should also be disconnected from power and from the signal J-box when the system is not being used. The same surges that may damage the display's driver can also damage the DM-100 console's circuit.

### 3.4 Signal Connection

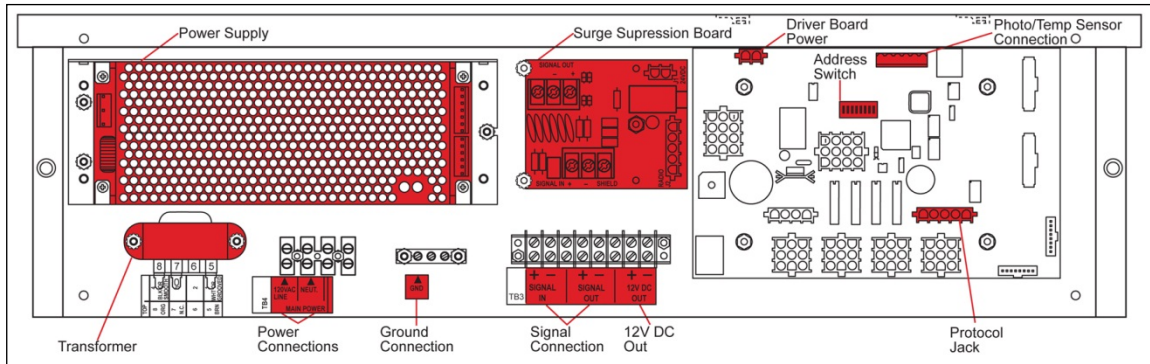
#### Reference Drawings

4 Column MASC Specifications .....	<b>Drawing A-166216</b>
Time & Temp Power/Signal Hookup.....	<b>Drawing A-938369</b>
Enclosed Driver, 4 Column Reference.....	<b>Drawing A-938300</b>

Route power and signal cables into the display from the side or rear. There are  $\frac{7}{8}$ " knockouts for  $\frac{1}{2}$ " conduit fittings on the sides of all DataTime cabinets and on the back panels. All power and signal wiring terminates at the driver enclosure.

To access the driver enclosure, open the access door and remove the cover. Refer to the **Shop Drawings** for the access location for the display. For displays with 10", 13", 18" and 24" digits, access to interior components is gained by turning the latches on the hinged doors.

Refer to **Drawing A-938300** for a complete review of power and signal connections for direct connection to the displays. **Drawing A-166216** provides connection specifications for the four-column drivers used in all DataTime time and temperature displays. Power and signal connections, illustrated in **Figure 8**, are similar for both drivers.



**Figure 8:** DataTime Driver Enclosure with 4-Column Driver

## Host/Client Definitions

### Reference Drawings:

Multipurpose 4 Column LED Driver II Specifications.....	<b>Drawing A-166216</b>
Host/Client Definitions .....	<b>Drawing A-185236</b>

One driver at each display installation is designated as the “host driver.” This driver receives its signal directly from the DataMaster controller on its “Signal IN” terminals, and it is the only driver that is connected to the photo/temperature sensor. The “Signal OUT” terminals on the host are used to connect to the “client driver.”

Select the host driver by inserting the Protocol-4 plug into the five-pin protocol jack (J20). Refer to **Figure 8** or **Drawing A-166216** for location of the protocol jack.

With a time and temperature display there is usually only one host and one client. The client driver receives signal from the host driver, and the client can re-drive this signal to other drivers.

## Direct – Outdoor Connection

### Reference Drawings:

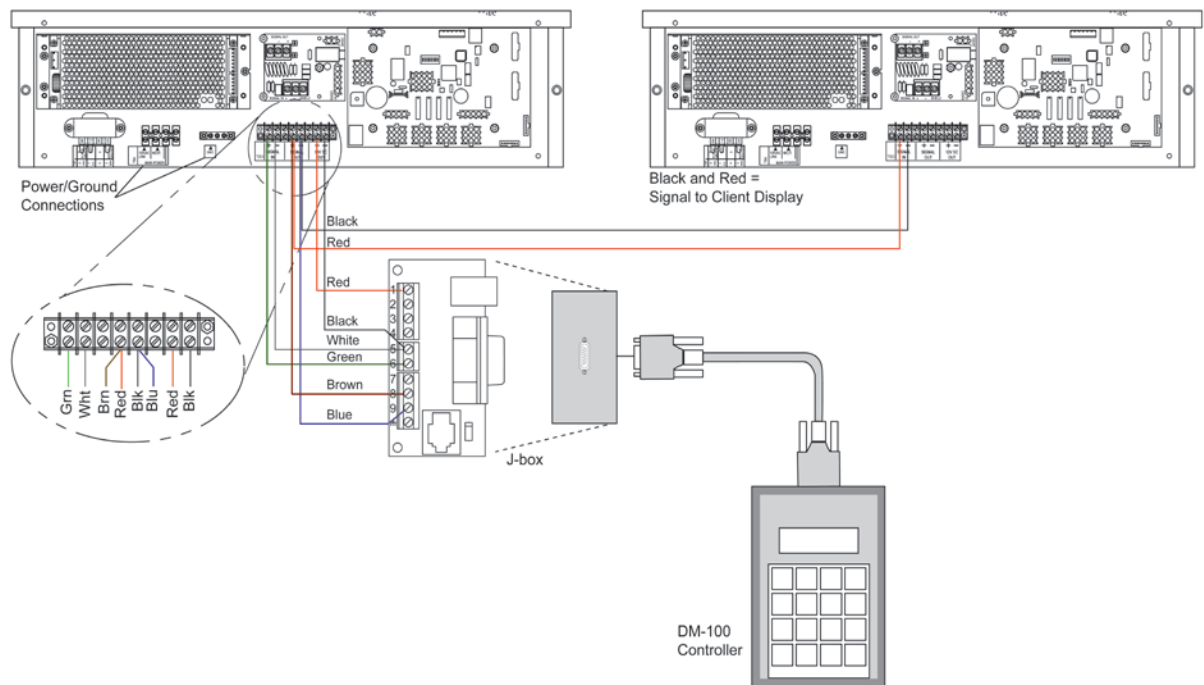
Riser Diagram, Outdoor Wire Control .....	<b>Drawing A-164988</b>
Time & Temp Power/Signal Hookup .....	<b>Drawing A-938369</b>
Enclosed Driver, 4 Column.....	<b>Drawing A-938300</b>

A direct-controlled display uses a current loop connection from the J-box at the base of the display to the driver enclosure in the display. All the power and signal wiring terminates at the driver enclosure. The DataMaster controller receives its power from the display. The display layout is shown in **Drawing A-164988**.

**Note:** The cable from the J-box to the display needs to be routed through conduit or the display pole to protect it from weather and vandalism.



1. Mount the J-box at the display.
2. Select the host driver by inserting the Protocol-4 plug into the five-pin protocol jack (J20).
3. Route a six-conductor, 18 AWG, shielded signal cable through conduit from the J-box to the driver enclosure in the host display. Fifty feet (15.2 m) of signal wire is provided.
4. Connect the signal wire from the J-box to the driver enclosure as shown in **Figure 9** and listed in the table. Refer to **Drawings A-938369** and **A-938300** for additional information.



**Figure 9:** Direct Connection from Outdoor Location

Wiring from J-Box to Host Driver Enclosure		
J-Box Pin Number	Cable Color	Enclosure Terminal Block
Pin 1	Red	12 V DC Out (+)
Pin 5	Black	12 V DC Out (-)
Pin 5	White	Signal IN (-)
Pin 6	Green	Signal IN (+)
Pin 8	Brown	Signal OUT (+)
Pin 9	Blue	Signal OUT (-)

5. Mount the temperature sensor as described in **Section 2.4**, and connect the quick connect cable to the four-pin quick connect on the back of the display.
6. The DataMaster controller plugs into the J-box using a DB9M to DB9F serial cable.

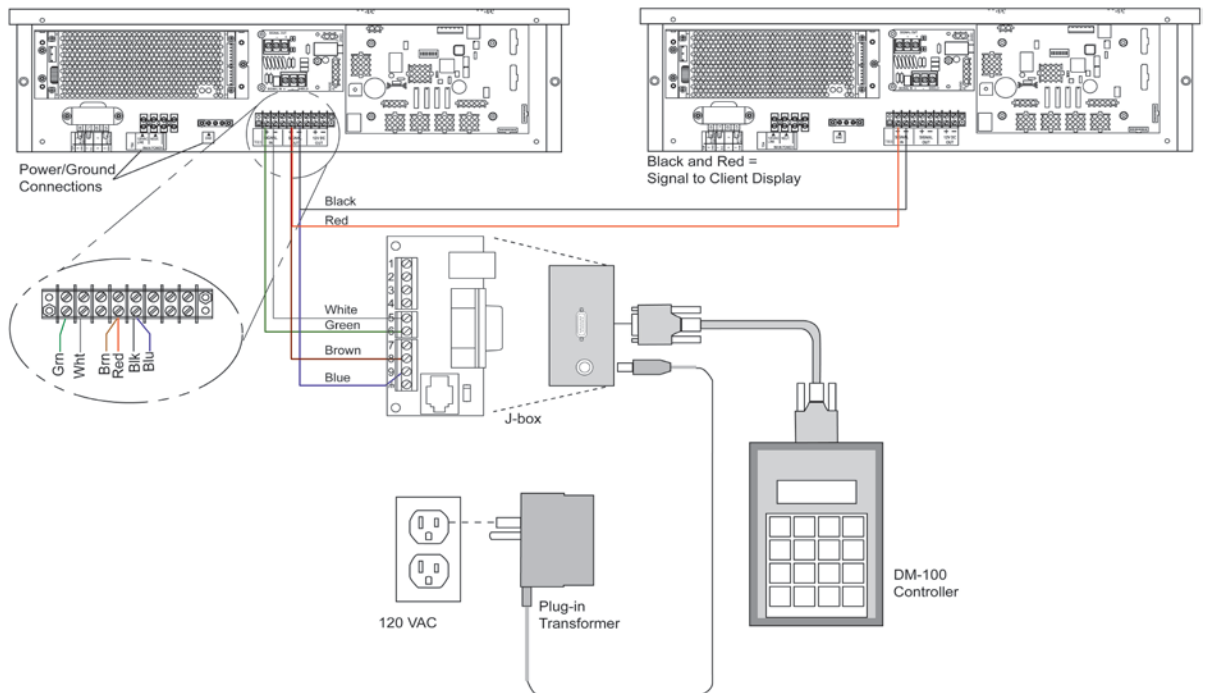
## Direct – Indoor Connection

### Reference Drawings:

Riser Diagram, Indoor Wire Control .....	<b>Drawing A-175342</b>
Time & Temp Power/Signal Hookup .....	<b>Drawing A-938369</b>
Enclosed Driver, 4 Column.....	<b>Drawing A-938300</b>

A direct-controlled display can also be used from a J-box at an indoor location. In that case, only two, 22 AWG, signal wires will need to be connected to the J-box and a wall pack transformer will be used for power to the DataMaster controller. The distance from the indoor J-box to the host driver can be up to 2,000 ft (600 m). Refer to **Figure 10** and **Drawing A-175342** for system layout and signal connections.

1. Mount the J-box at an indoor location.
2. Select the host driver by inserting the Protocol-4 plug into the five-pin protocol jack (J20).
3. Route a four-conductor, 18 AWG, shielded signal cable through conduit from the J-box to the driver enclosure in the host display.
4. Connect the signal wire, through conduit, from the J-box to the driver enclosure as shown in **Figure 10** and listed in the table. Refer to **Drawings A-938369** and **A-938300** for additional information.



**Figure 10:** Direct Connection from Indoor Location

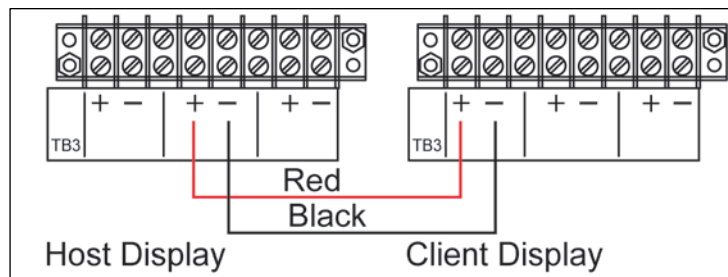
Wiring from Indoor J-Box to Host Driver Enclosure		
J-Box Pin Number	Cable Color	Enclosure Terminal Block
Pin 5	White	Signal IN (-)
Pin 6	Green	Signal IN (+)
Pin 8	Brown	Signal OUT (+)
Pin 9	Blue	Signal OUT (-)

- Mount the temperature sensor as described in **Section 2.4**, and connect the quick connect cable to the four-pin quick connect on the back of the display.
- The DataMaster controller plugs into the J-box using a DB9M to DB9F serial cable.
- Plug the wall pack transformer into a wall socket and the other end into the DM-100 controller.
- Client Definitions and Address Settings

**Reference Drawings:**

- Multipurpose 4 Column LED Driver II Specifications ..... **Drawing A-166216**
- Host/Client Definitions..... **Drawing A-185236**

One driver at each display installation is designated as the “host driver,” and all other displays are “clients.” The “Signal OUT” terminals on the host are used to connect to the “client drivers.” Refer to **Figure 11** and **Drawing A-185236** for an illustration of the client/host display connection.



**Figure 11:** Host, Signal Out to Client, Signal In

Client drivers receive signal from the host driver on the “Signal IN” terminals and can re-drive this signal to other “client drivers” on the “Signal OUT” terminals.

The maximum wire distance between the host driver and client driver is 2000 feet.

Some multiple-module DataTime displays use “host/client” displays, which do not contain a driver and may use either client or host digit outputs. The DF-1011 model uses the host/client configuration.

### Address Settings

The address of each driver is set using an eight-position DIP-switch (S1), and the address is based on that driver’s position in the display system. If a single-line display is used, the address will typically be Address “01.” This means that switch 1 is turned “ON” and the remaining 7 switches are in the “OFF” position. This is the default address set when each display is shipped. In multiple-product displays, the address determines which line of information is shown on the driver’s digits. The switch is set using a binary address. Use the table and the examples in **Figure 12** for setting the address.

**Note:** Some older drivers set the address of each driver using an address plug (Daktronics part # 0A-1150-0122) in J19. The address, either using a switch or a plug, needs to be set for each driver.



**Figure 12:** Common Address Settings

Binary Address Settings								
Address	Switch Number							
	1	2	3	4	5	6	7	8
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF	OFF	OFF

# Section 4: Maintenance and Troubleshooting

## Important Notes

- Disconnect power before doing any repair or maintenance work on the display.
- Allow only qualified service personnel access to internal display electronics.
- Disconnect power when not using the display.

## 4.1 Component Location and Access

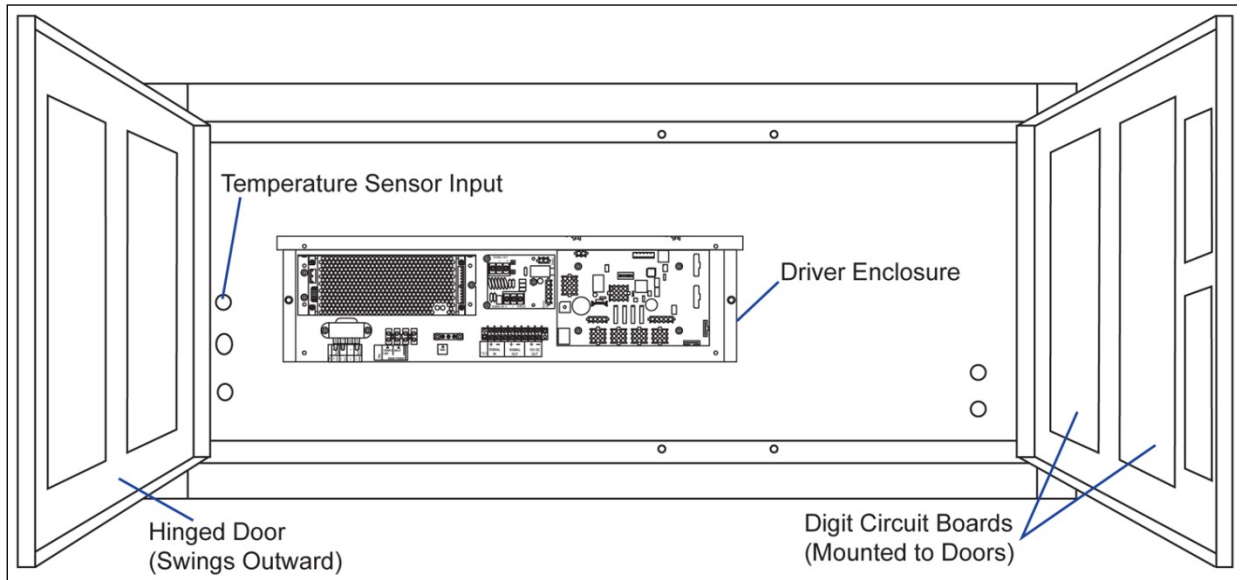
### Reference Drawings:

Shop Drawings.....Refer to Appendix A

Each display contains an enclosure that includes the following devices:

- Display Driver
- 24V DC Power Supply
- 10V AC Transformer
- Signal Surge Board
- Signal/Power Input Termination Jacks

On the 10" display, all the components are behind one door. For 13", 18", and 24" displays, the hinged doors swing outward when the two latches on the front display face panel are turned, as shown in **Figure 13**. For larger displays, 36", 48", and 60", access the enclosure by turning the latches and opening one of the digits in the face of the display. Since component placement varies slightly with each DataTime model; consult the specific model's **Shop Drawings**.



**Figure 13:** Time and Temp Display with Door Panels Open

## 4.2 Troubleshooting

This section lists potential problems with the display, indicates possible causes, and suggests corrective actions. This list does not include every possible problem, but it does represent some of the more common situations that may occur. (Refer to the appropriate manual for a list of potential problems with an add-on or separately mounted Galaxy<sup>®</sup> display.)

Symptom/Condition	Possible Cause
Entire display fails to work	<ul style="list-style-type: none"> <li>• Check for proper line voltage at power termination panel.</li> <li>• Check connections from power supply to driver.</li> <li>• Check power LED on driver.</li> </ul>
Cannot communicate with display	<ul style="list-style-type: none"> <li>• Check connections at J-box and display.</li> <li>• Make sure DataMaster controller is receiving power.</li> <li>• Check serial wires from J-box to host driver.</li> </ul>
No display on client sign	<ul style="list-style-type: none"> <li>• Check for power on client.</li> <li>• Check signal wires from host to client.</li> <li>• Make sure protocol plug is not connected. (Protocol plug for host driver only.)</li> <li>• Check addressing of client display.</li> </ul>
Client drivers will continually cycle through the power-on self-test	<ul style="list-style-type: none"> <li>• Make sure address is set on the host driver.</li> </ul>
Garbled display	<ul style="list-style-type: none"> <li>• Power down and power display back up.</li> <li>• Check connections from driver to digits.</li> <li>• Re-send message from DM-100.</li> </ul>
Digit will not light	<ul style="list-style-type: none"> <li>• Test using different digit board in display.</li> <li>• Test using a different output from the driver.</li> <li>• Black wire to digit broken.</li> <li>• Poor contact at driver connection.</li> <li>• Driver malfunction.</li> </ul>
Segment will not light	<ul style="list-style-type: none"> <li>• Test using output to different segment.</li> <li>• Check for broken LED or connection.</li> <li>• Check wires between driver and digit.</li> <li>• Poor contact at driver connector.</li> <li>• Driver shift register failure.</li> </ul>
Segment stays lit	<ul style="list-style-type: none"> <li>• Test using output to different segment.</li> <li>• Check for shorts on wires.</li> <li>• Driver shift register failure.</li> </ul>
Data appears in the wrong place on the display, wrong data on a particular line of the display	<ul style="list-style-type: none"> <li>• Incorrect address settings on drivers. (Refer to "Power-On Self-Test" in the following section.)</li> <li>• Incorrect connection from driver to digits.</li> </ul>

## Error Codes

Some DataTime displays have their own built-in troubleshooting mechanism. Failures that may occur in the display driver are described using codes. In the event a display malfunctions, a failure code registers by showing an “Ex” value on the first two digits of the display. “E” simply indicates an error, and the letter “x” represents the actual code number. Refer to the following table for a description of each failure code and for possible solutions.

**Note:** The LCD screen on the DataMaster 100 controller will not show the failure codes described in the table below. Failure codes will only be shown on the DataTime display.

Failure Code	Description	Possible Solution
<b>E1</b>	<b>Protocol Setting Error:</b> There is an unsupported driver protocol setting.	Check the value set in the protocol plug of the driver (J20).
<b>E2</b>	<b>Time Error:</b> No valid time is stored in the driver; it may be a failure of the real-time clock on board or other timekeeping device.	Set the time in the display using the Set Time menu option on the DataMaster 100 controller.
<b>E3</b>	<b>Temperature Error:</b> No response coming from the temperature sensor, or general temperature sensor failure.	<p>Check the temperature sensor location and verify all connections. Refer to <b>Section 2:</b> for wiring information.</p> <p><b>Note:</b> The temperature sensor takes approximately 10 seconds to initialize on power-up. The display will show this error until initialization is complete.</p> <p>If a temperature sensor is not used, set the hold time to zero.</p>
<b>E4</b>	<b>No Message Error:</b> This code is shown when no messages are downloaded to the display	Download a new message to the display using the < <b>DISPLAY SEQUENCE</b> > key on the DataMaster 100 controller.
<b>E5</b>	<b>No Line Number Selected Error:</b> The driver for this line has a Protocol-4 plug installed in J20, but the address is not set on the address switch.	Set the line number by setting the address using the address switch. The Protocol-4 plug designates this driver as the “host.” If this is not the host, remove the Protocol-4 plug from J20.

## Power On Self-Test

A useful troubleshooting tool is the power on self-test the host driver performs every time it powers up:

1. Driver Firmware version (r:XX)
2. Address (Ad:XX)
3. Line number (L:X)
4. Columns (1234)
  - If the signal wiring between each controller is correct, the first two digits of each driver will display “Ad” momentarily, and the first digit will then flash three numbers indicating the decimal address that is set with the address switch. (If a client driver displays “A <number>,” followed by “P <number>,” it is not receiving “signal in,” and is performing its own self-test.)
  - The first two digits of each line will display “Lx”, where “x” is the line number that the driver is set to control using the address switch (set with address plug on older drivers).
  - Each line will display “1234...” according to the column number of each of its digits. Every line should show “1” on the left-most digit, and all digits should be numbered consecutively from left to right. If this is not the case, either the wrong address is set, or the driver or digit harness is connected incorrectly.

If no address is set on the host driver, it will display “E5,” and all client drivers will continually cycle through the power on self-test.



# Section 5: Parts Replacement

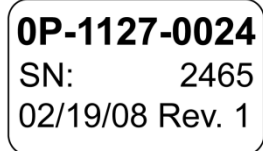
This section provides the necessary information to obtain new parts from Daktronics and how to install those parts in the display. Refer to **Section 5.2** for instructions on Daktronics Exchange and Repair & Return Programs.

## 5.1 Replacement Parts List

The following formats may be found on various Daktronics drawings. These part numbers can be used when requesting replacement parts from Daktronics Customer Service.

- "TB \_\_" denotes a termination block for power or signal cable.
- "E \_\_" denotes a grounding point.
- "J \_\_" denotes a power or signal jack.
- "P \_\_" denotes a power or signal plug for the opposite jack.
- "0P- \_\_\_\_\_" denotes an individual circuit board, such as a driver board.
- "0A- \_\_\_\_\_" denotes an assembly, such as a circuit board and the plate or bracket to which it is mounted. A collection of circuit boards working as a single unit may also carry an assembly label.
- "W- \_\_\_\_\_" denotes a wire or cable. Cables may also carry the assembly number format in certain circumstances. This is especially true for ribbon cables.

Most circuit boards and components within this display carry a label that lists the part number of the unit. If a circuit board or assembly is not listed in the **Replacement Parts List**, use the label to order a replacement. A typical label is shown in **Figure 14** with the part number in bold.



*Figure 14: Typical Label*

The following tables contain some of the items that may need to be replaced in these displays over time. Many of the parts also have the part numbers on labels affixed to them.

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

Description	Daktronics Part No.
Temp sensor housing, assembly	0A-1151-0005
Light and temp sensor (only), CAN, coated, w/bus terminator	0P-1247-0008
Temp and Humidity Sensor, assembly	0A-1151-0006
Protocol plug (Protocol-4)	0A-1279-0089
Transformer, Pri. 115; Sec. 10VCT@1.2A	T-1072
Power supply, 24 V DC, 150 W	A-1720
Signal surge suppression board	0P-1110-0011

<b>Description</b>	<b>Daktronics Part No.</b>
Driver, 4-column	0P-1192-0068
<b>DataMaster 100 Controller parts</b>	
DataMaster 100 hand-held controller	0A-1196-0088
Junction box, outdoor, 9-pin D-male	0A-1196-0093
Junction box, indoor, 9-pin D, male	0A-1196-0099
DM-100 Insert Time & Temp/Gas Price	0G-164998
DataMaster 100 outdoor wired installation kit	0A-1279-0087
DataMaster 100 indoor wired installation kit	0A-1279-0103
Transformer, wall pack (for DataMaster 100)	T-1118
Cable, serial, DB9 male to DB9 female	W-1267
<b>Digits and Accessories</b>	
Digit, 10" red, 7-segment digit board	0P-1192-0255
Digit, 10" amber, 7-segment digit board	0P-1192-0256
Colon, 10", red	0P-1192-0278
Colon, 10", amber	0P-1192-0279
Digit, 13" red, 7-segment digit board	0P-1192-0200
Digit, 13" amber, 7-segment digit board	0P-1192-0214
Colon, 13" red	0P-1192-0236
Colon, 13" amber	0P-1192-0237
Digit, 18", red, 7-segment digit board	0P-1192-0202
Digit, 18", amber, 7-segment, digit board	0P-1192-0216
Digit segment, 24" red, vertical	0P-1192-0204
Digit segment, 24" red horizontal	0P-1192-0205
Digit segment, 24" amber, vertical	0P-1192-0218
Digit segment, 24" amber horizontal	0P-1192-0219
Indicator, 2" red, circuit board (18" and 24" displays)	0P-1192-0228
Indicator, 2" amber, circuit board (18" and 24" displays)	0P-1192-0229

## 5.2 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:

**Call Daktronics Customer Service:** 800-325-8766 to order the exchange part.

**1. When the new exchange part is received, mail the old part to Daktronics.**

If the replacement part fixes the problem, send in the failed part within 3 weeks of the ship date.

- a. Package the old part in the same shipping materials in which the replacement part arrived.
- b. Fill out and attach the enclosed UPS shipping document.
- c. Ship the part to Daktronics.

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

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

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

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

## 5.3 Repair & Return Program

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

1. **Call or fax Daktronics Customer Service:**  
Phone: 800-325-8766 Fax: 605-697-4444
2. **Receive a Return Materials Authorization (RMA) number before shipping.**  
This expedites repair of the part.
3. **Package and pad the item carefully to prevent damage during shipment.**  
Electronic components, such as printed circuit boards, should be placed in an antistatic bag before boxing. Daktronics does not recommend using packing peanuts.
4. **Enclose:**
  - your name
  - address
  - phone number
  - the RMA number
  - a clear description of symptoms

### Shipping Address

Daktronics Customer Service  
PO Box 5128  
201 Daktronics Dr.  
Brookings, SD 57006  
Attn: RMA#\_\_\_\_\_

## 5.4 Daktronics Warranty and Limitation of Liability

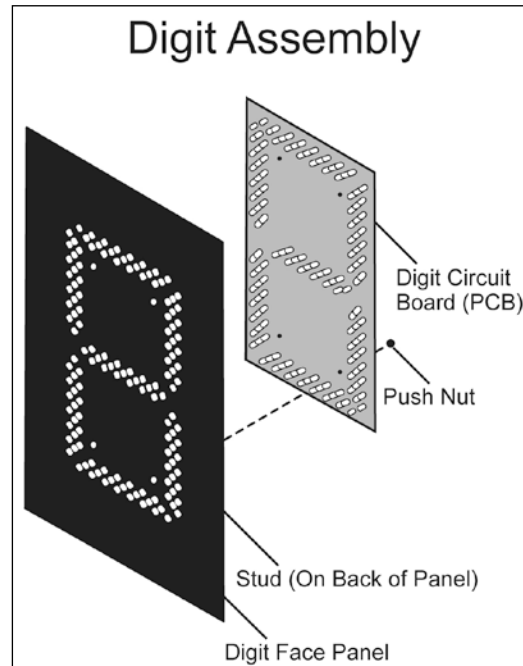
The Daktronics Warranty and Limitation of Liability is located in Error! Reference source not found.. The Warranty is independent of Extended Service agreements and is the authority in matters of service, repair, and display operation.

## 5.5 Instructions for Replacing Parts

### Replacing a Digit

On displays with 10", 13", and 18" digits, a digit circuit board is mounted to the back of the digit panel. Do not attempt to remove individual LEDs, but rather replace the entire digit panel. Refer to **Figure 15**. To remove a display digit, follow these steps:

1. Open the digit panel as described in **Section 4.1**.
2. Disconnect the power connector from the back of the digit. Release the connector by squeezing together the locking tabs and pull the connector free.
3. Digits are secured to the inside of the panel with fixed machine screws, and push nuts. Remove the nuts and lift the digit off the standoff screws. (Push nuts can be removed in several ways, but Daktronics recommends using a  $9/32$ " nut driver.)
4. Position a new digit over the screws and tighten the nuts.
5. Reconnect the power connector. **Note:** This is a keyed connector - it will attach in one way only. **Do not attempt to force the connection.**
6. Close and secure the digit panel and test the display.

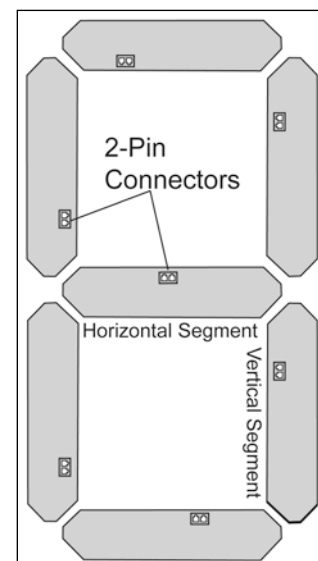


**Figure 15:** Digit Assembly

### Replacing a Digit Segment

The larger digits (24") are constructed in segments, as shown in **Figure 16**. In this case, make repairs by removing only the defective segment. **Do not** attempt to remove individual LEDs. To remove a digit segment, follow these steps:

1. Open the digit panel as described in **Section 4.1**.
2. Disconnect the two-pin power connector from the back of the individual segment. Release the connector by squeezing together the locking tabs and pull the connector free.



**Figure 16:** Digit Segments

3. Individual segments are secured to the inside of the panel with fixed machine screws, spacers, and push nuts. Remove the nuts and lift the segment off the standoff screws.
4. Position the new segment over the screws and tighten the nuts.
5. Reconnect the power connector. **Note:** This is a keyed connector - it will attach in one way only. **Do not attempt to force the connection.**
6. Close and secure the digit panel and test the display.

Replace a malfunctioning colon, decimal, or indicator assembly in the same manner.

## Segmentation and Digit Designation

### Reference Drawing:

Segmentation, 7 Segment Bar Digit .....	<b>Drawing A-38532</b>
Shop Drawings .....	<b>Refer to Appendix A</b>

In each digit, certain LEDs always go on and off together. These groupings of LEDs are referred to as “segments.” **Drawing A-38532** illustrates digit segmentation. It also details which connector pin is wired to each digit segment and the wiring color code used throughout the display.

The **Shop Drawings** identify the driver connectors controlling the digits. The number displayed in the hexagons in the upper half of each digit, indicate which connector is wired to that digit.

## Replacing an LED Driver

### Reference Drawing:

4 Column MASC LED Driver Specifications .....	<b>Drawing A-166216</b>
Shop Drawings .....	<b>Refer to Appendix A</b>

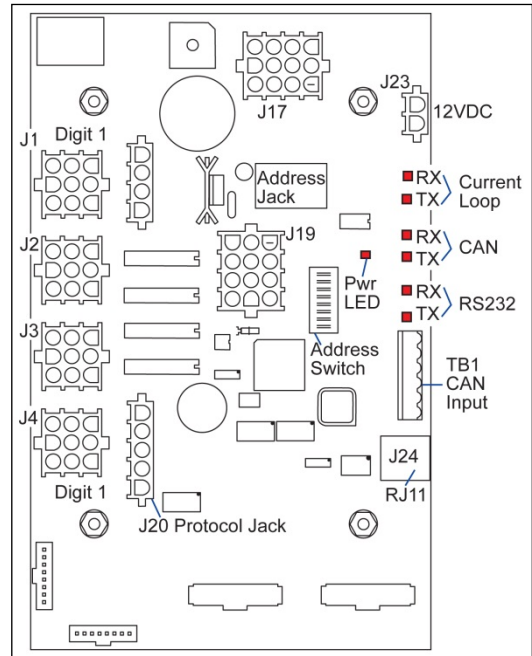
Drivers are mounted inside the display enclosure and typically behind a digit, but location and mounting varies by model. Refer to the **Shop Drawings** for the location of the driver. All DataTime displays are front-accessible.

1. Open the digit panel or display face panel as described in **Section 4.1**.
2. Remove the cover from the driver enclosure.
3. Label all cables before removing them.
4. Disconnect all connectors from the driver. Release each connector by squeezing together the locking tabs and pull the connector free.

**Note:** When reconnecting, remember these are keyed connectors and will attach only one way. **Do not** attempt to force the connections.

5. Remove the screws, nuts, or wing nuts securing the driver to the inside of the enclosure.
6. Carefully lift the driver from the display and place it on a clean, flat surface.
7. Follow the steps in reverse order to attach a new driver.

In the display, the LED drivers perform the task of switching digits on and off. Refer to **Drawings A-166216** for a complete listing of driver connector functions and wiring pin numbers.



**Figure 17:** Four-Column Digit Driver

DataTime Time & Temp displays use four-column drivers which have four outputs to digits.

**Figure 17** identifies the connector functions for a four-column driver. (Major functions are the same on 16-column drivers.) The table lists the functions of the various jacks, including which ones are not used in this application.

The display line controlled by the driver is set with an eight-position DIP-switch that is set before shipping. (**Note:** Some older drivers use a 12-position address plug inserted in J19). All DataTime displays ship with a “Line 1” address already set.

LED Driver Jack Functions	
Jack Number	Function
J1-J4 (4-column)	Digit Output
J17	Signal/Power Input
J20	Protocol-4 Location
J23	12V DC Power Out
J19	Address Plug (older drivers only)
J18, J21, J22, J24, J25, J26, J27, J28	Jacks <b>Not Used</b> in this application

## Replacing a Signal Surge Board

### Reference Drawings:

Enclosed Driver, 4 Column Reference..... **Drawing A-938300**  
 Shop Drawings..... **Refer to Appendix A**

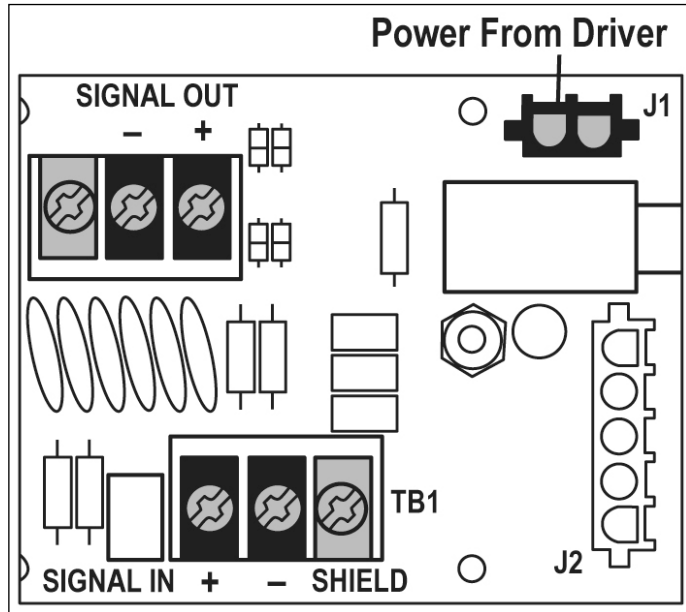
Surge boards are mounted inside the upper left-hand corner of the driver enclosure inside the display and typically behind a digit, but location and mounting varies by model. Refer to the **Shop Drawings** for the location of the surge board. All DataTime displays are front-accessible.

1. Open the digit panel or display face panel as described in **Section 4.1**.

2. Remove the cover from the driver enclosure.
3. Disconnect the power connector from the surge board. Release it by squeezing together the locking tabs and pull the connector free.

**Note:** When reconnecting, remember it is a keyed connector and will attach in only one way. **Do not** attempt to force the connection.

4. Remove the screws securing the surge board to the inside of the enclosure.
5. Carefully lift the surge board, as shown in **Figure 18**, from the display and place it on a clean, flat surface.



**Figure 18:** Signal Surge Suppression Board

6. Follow the steps in reverse order to attach a surge board.

In the display, the signal surge suppression board is an inline device used to filter the current loop data line. It suppresses surges down to a low voltage to protect the display's controller. Refer to **Drawings A-938300** for the location of the surge board inside the driver enclosure.

The surge board is pre-wired before the display is shipped.

**Note:** The surge suppressor must be firmly connected to the driver enclosure, and the display must be properly grounded in order to be effective.



# Section 6: DataMaster 100 Controller

These sections describe the DataMaster 100 controller including the insert and the operation to set the time and date on the display.

## 6.1 DataMaster 100 Overview

**Reference Drawing:**

System Riser Diagram, Control Combinations ..... **Drawing A-164988**

The DataMaster 100 Series controller, shown in **Figure 19**, is a hand-held controller designed to operate Daktronics LED DataTime and DataMaster displays. See **Section 1.1** for the list of displays the DM-100 can control. The console's liquid crystal display (LCD) guides the user through the operation of the system.

Time and temperature displays use a junction box at the base of the display or an indoor wire system. Refer to **Section 3** for information and possible connection types.

**Note:** You **must** be connected to the display in order to modify the time, temperature, hold time, etc. The following sections will explain this process in greater detail.



**Figure 19: DataMaster 100**

## 6.2 DataMaster Insert

**Reference Drawing:**

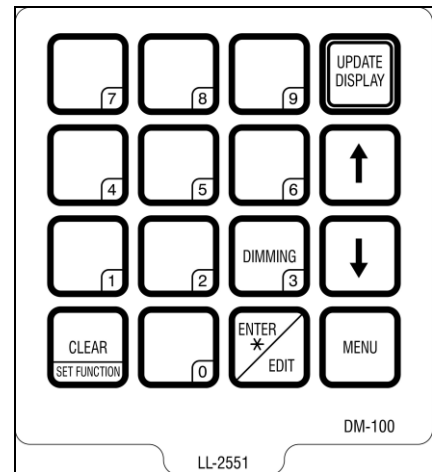
Insert, LL-2551 Price/T&T Display ..... **Drawing A-164998**

The DataMaster 100 controller uses a keypad insert to program time and temperature information for the displays.

**Figure 20** illustrates the DM-100 insert used to control the displays. For more details on the insert, refer to the DataMaster 100 insert drawing, **A-164998**. If an insert is lost or damaged, a copy of the insert drawing can be used until a replacement is ordered.

To start the controller and use the insert, read the section carefully to fully understand the operating instructions.

**Note:** Depending on the version of the DM-100 controller and the revision on the display, some of the following items may not be used on the display, or will not be shown on the DM-100 controller.



**Figure 20: DataMaster 100 Insert  
LL-2551**

## 6.3 Time & Temperature Display Operation

The DataMaster 100 controller can be configured to program time and temperature information displayed on the LED DataTime Time & Temp display. The instructions provided in this section discuss the functions the operator uses to control the display. In the unlikely event that the Time & Temp display malfunctions, refer to **Section 4.2** for troubleshooting actions that may be taken.

Connect to the display through either the indoor or outdoor J-box, set the time and date and send changes to the display.

**Note:** You will need to do this infrequently, since the display will automatically keep track of time. The time on the display should be accurate (even through a loss of power for several days). Use this function when a s has just been installed or to correct time due to long power outages.

There is more than one way to get to certain LCD screens on the DM-100. One way is by using the menu and then using the arrows to reach the desired location, and the other is to set the time, date, and then continuing to enter through to the additional screens.

### Time & Temperature Display Setup

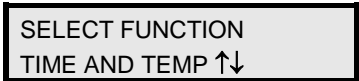
To configure the DataMaster 100 controller for use with Time & Temp displays, use the <CLEAR/SET FUNCTION> key on start-up. The following text will be displayed on the LCD during start-up:

Daktronics, Inc.  
Brookings, SD

DataMaster 100  
ED-13374 VX.X

The controller will then list the "Current Function." If it is Time and Temp you can continue, otherwise at the next frame: "Current Function? Press Set Function" you need to press <Clear/Set Function> and use the <↑↓> to select Time and Temp.

**Note:** Press the <Clear/Set Function> key quickly to enter the Function mode. If you miss this step, unplug the power to the DataMaster controller and start again.

	Press the arrow up or down key <↑↓> until the Time and Temp option is shown. Press the <ENTER> key to accept.
---	---

**Note:** The actual Time & Temperature values will not be displayed on the DataMaster 100 LCD because these values are kept in the display itself.

LCD Screen	Action
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>CURRENT FUNCTION TIME AND TEMP</p> </div>	<p>Power is provided to the DM-100 controller through the serial cable on an outdoor display and by a wall pack transformer for an indoor display.</p> <p>This display appears briefly.</p>
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>CHANGE FUNCTION? PRESS SET FUNCTION</p> </div>	<p>This message appears next on the screen.</p> <p>If "TIME and TEMP" was shown on the bottom line of the LCD during start-up, do nothing. The controller will automatically default to previous Time and Temp settings. (The controller will remember the last function used, so you should only have to do this with a new controller or switching between DataTime and other DataMaster displays.)</p> <p>If a function other than "TIME AND TEMP" was shown on the bottom line of the LCD during start-up, press the &lt;<b>SET FUNCTION</b>&gt; key while the second LCD prompt is displayed.</p> <p>You only have 1 or 2 seconds to push it. If you miss it you have to unplug power and try again.</p>

## Menu Items

Pressing the <MENU> key accesses the settings listed below:

On power-up, the DataMaster 100 LCD display will default to showing the current display settings. The sequence preview will show the sequence order and display formats currently selected. The following menu items text will be shown on the LCD (the <↑↓> to select):

1. Daylight Savings Setting
2. Set Time (12hr/24hr)
3. Temp °F Offset
4. Temp °C Offset
5. Time Format/Hold Time
6. Temp °F Format/Hold Time
7. Temp °C Format/ Hold Time
8. %RH - format
9. Sequence Order
10. LED Test?
11. Modem Settings
12. Display Status

- 13. Diagnostics
- 14. About

### Daylight Savings Setting

Use the Daylight Savings Select menu to set the sign to automatically correct for daylight savings.

LCD Screen	Action
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">           DAYLIGHT SAVINGS ENTER TO EDIT         </div> <div style="border: 1px solid black; padding: 5px;">           DAYLIGHT SAVINGS ENABLE? ↓         </div>	<p>Press the &lt;ENTER&gt; key to accept.</p> <p>Press the down arrow key &lt;↓&gt; to select the Enable or Disable daylight savings time correction.</p> <p>If enabled, the display time will automatically be corrected for daylight savings time. The default setting is Daylight Savings Time Enabled.</p> <p><b>Note:</b> In order for any changes to take effect, the time must be updated on the display. Use the Set Time menu function.</p>

### Set Time

Use the Set Time menu to set the time on the display.

LCD Screen	Action
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">           SET TIME - 12HR ENTER TO EDIT         </div> <div style="border: 1px solid black; padding: 5px;">           SET TIME 12HR 12:00* PM↓         </div>	<p>The LCD screen will go to the Set Time screen directly from changing the Daylight Saving Time screen, or can be selected using the menu.</p> <p>Press &lt;ENTER/EDIT&gt; to modify the time listed on the screen.</p> <p><b>Note:</b> The flashing asterisk shows current data being edited.</p> <p>The LCD screen will display the time followed by a blinking asterisk (*). Change the time as needed and use the &lt;↓&gt; to switch between AM and PM. The AM/PM setting is not shown when 24-hour time is selected.</p> <p>To save changes, press &lt;ENTER&gt; when finished editing.</p> <p>Press the &lt;CLEAR&gt; key to cancel changes</p>

The above example is for use with a 12-hour format, the same process will be used for the 24-hour format, and time will be entered in military time.

After setting the time you will need to set the date. If the date is already correct, enter through the date and press <ENTER> to send the time to the display. If the date is not correct, follow the steps below.

## Set Date

Use the set date menu to enter the date in the display.

LCD Screen	Action
<div style="border: 1px solid black; padding: 5px; margin-bottom: 20px;">           SET TODAYS DATE MM/DD/YY         </div> <div style="border: 1px solid black; padding: 5px;">           MM/DD/YY ENTER TO SEND         </div>	<p>MM – Current month DD – Current day YY – Current year (last two digits)</p> <p>Input the month (MM) using the number keys.</p> <p>Press &lt;ENTER&gt; to move to DD. Enter the day.</p> <p><b>Press &lt;ENTER&gt; to move to YY. Enter the appropriate year.</b></p> <p><b>Note:</b> The flashing asterisk on the LCD shows the current data being edited.</p> <p>When finished inputting today's date, press &lt;ENTER&gt; to send to the display and continue to the next screen.</p>

## Degrees F Temperature Offset

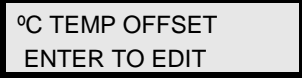
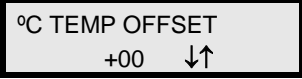
Use the Set °F Temperature Offset menu to set the degrees Fahrenheit offset temperature. This is the value (in degrees) that the display will automatically increment or decrement the Fahrenheit temperature value read from the temperature sensor.

LCD Screen	Action
<div style="border: 1px solid black; padding: 5px; margin-bottom: 20px;">           °F TEMP OFFSET ENTER TO EDIT         </div> <div style="border: 1px solid black; padding: 5px;">           °F TEMP OFFSET +00    ↑↓         </div>	<p>+00 shows the current °F temp offset. Press the up or down arrow keys &lt;↑↓&gt; to modify the temperature offset.</p> <p>Only values between -16 and +16 are allowed.</p> <p>Press the &lt;ENTER&gt; key when finished editing to save changes.</p> <p>Press the &lt;CLEAR&gt; key to cancel changes</p>

**Note:** The temperature offset may be set in either Celsius or Fahrenheit. A conversion will be used to determine the correct offset of the modified temperature.

## Set Degrees C Temperature Offset

Use the Set °C Temperature offset menu to set the degrees Celsius offset temperature. This is the value (in degrees) that the display will automatically increment or decrement the Celsius temperature value.

LCD Screen	Action
	+00 shows the current °C temp offset. Press the up or down arrow keys<↑↓> to modify the temperature offset.
	Values between -9 and +9 are allowed. Press the <ENTER> key when finished editing to save changes. Press the <CLEAR> key to cancel changes. Press <CLEAR> twice to exit the menu. Press <ENTER/EDIT> to modify the current attribute listed on the screen.

**Note:** The temperature offset may be set in either Celsius or Fahrenheit. A conversion will be used to determine the correct offset of the modified temperature.

## Time & Temperature Format/Hold Settings

A hold time can be modified for time and temperature (both °F and °C) by pressing the <EDIT/ENTER> key during operation (when the current item to edit is shown) or using the <MENU> key.

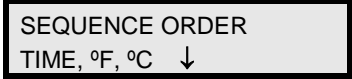
LCD Screen	Action
<div style="border: 1px solid black; padding: 5px; width: fit-content;">                     TIME- 12HR 6COL ↑                      HOLD 00.0 SEC                 </div>	<p>Select the hold time in seconds, and the selection of 12-hr or 24-hr time is also be adjusted here.</p> <p>For temp you can choose: XX°, XXF, XX (blank) for Fahrenheit temps and XX°, XXC, XXc and XX (blank) for Celsius temps [XX° is the default for °F, and XXc is the default for °C]</p>
<div style="border: 1px solid black; padding: 5px; width: fit-content;">                     °F – FORMAT XX° ↑                      HOLD SS.T SEC                 </div>	<p>For humidity you can choose: XXh or Xrh [XXh is the default setting]</p>
<div style="border: 1px solid black; padding: 5px; width: fit-content;">                     °C – FORMAT XXc ↑                      HOLD SS.T sec                 </div>	<p>Hold Time 00.0 shows the current hold time in seconds. The default is 5 seconds (05.0).</p> <p>Press the number keys to change this value.</p>
<div style="border: 1px solid black; padding: 5px; width: fit-content;">                     %RH – FORMAT XXc ↑                      HOLD SS.T sec                 </div>	<p>To save changes, press the &lt;ENTER&gt; key when finished editing.</p> <p>Press the &lt;CLEAR&gt; key to cancel changes.</p>

**Note:** Setting the hold time to 00.0 seconds for any of the above hold times will disable that function of the display. This is useful at times when only one temperature format will be used.

An option to set relative humidity (RH) is available on the DM-100 controller, but cannot be read using the standard temp/light sensor.

## Sequence Order

Use the Set Sequence Order menu option to set the order that information is shown on the display.

LCD Screen	Action
	<p>The current order is displayed on the bottom line of the LCD.</p> <p>Press the down arrow key &lt;↓&gt; to select the alternate sequence.</p> <p>Possible sequence options are:</p> <ul style="list-style-type: none"> <li>Time, °F, °C (default)</li> <li>Time, °C, °F</li> <li>Time, °C, Time, °F</li> <li>Time, °F</li> <li>Time, °C</li> <li>Time</li> <li>°F</li> <li>°C</li> <li>°F, °C</li> <li>Time, °F, °C, %RH</li> <li>Time, °C, °F, %RH</li> </ul> <p>To save changes, press the &lt;ENTER&gt; key when finished editing.</p>

**Note:** The new sequence will be saved when the hand-held controller is powered down.

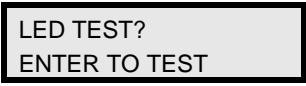
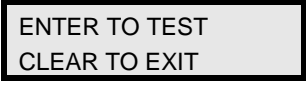
Using the hold time parameter (see the °C FORMAT, °F FORMAT, and TIME FORMAT functions), these sequences can be modified to disable one or more of the selected display items. For example, to disable temperature in °C from a sequence, select the Temp °C Format/Hold menu and enter a "0" hold time.

An option to set relative humidity (RH) is available on the DM-100 controller, but cannot be read using the current temp/light sensor.



## LED Test

Use the LED Test menu item to test the LED digits on the display. The following LCD screen will be displayed:

LCD Screen	Action
	Press the <ENTER> key to cycle the display digits between all LEDs on and all LEDs off.
	Press <ENTER> to send the test command to the sign. Press <CLEAR> to exit the test mode.

## Modem Settings

The DM-100 controller has an option to set modem settings, but this method of communication is not used with standard Time & Temp Displays. If a modem was used, the next screen would require the user to enter up to 20 phone numbers to call, followed by the dial-out prefix, the disconnect time in seconds, and if the controller should allow multiple dialing of displays.

## Display Status

The DM-100 controller will also query the display and will respond if it finds the bi-directional link.

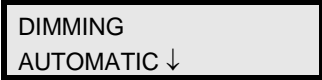
## Diagnostics

The DM-100 controller can also do an RS232 Com test and a Loopback test.

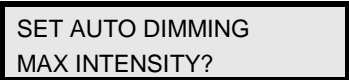
## Dimming

Adjust the dimming level of the Time & Temp display in two ways. A temperature/light sensor, mounted near the display, detects the level of ambient light at the display location and dims the display's LEDs accordingly. This function is known as automatic dimming. When the manual dimming function is selected, the LEDs remain at the same level of brightness, regardless of the level of light detected at the display.

To select either of these functions, press <DIMMING>. The current setting is shown on the bottom line of the LCD.

LCD Screen	Action
	<p>Press the down arrow key &lt;↓&gt; to toggle through dim settings:</p> <p><b>Automatic:</b> The display automatically dims based on the light detected at the display</p> <p><b>Manual:</b> The dimming level is set manually. Once set, this value remains regardless of the light level detected at display. Use the down arrow key &lt;↓&gt; to adjust the dimming to one of 16 levels.</p> <p><b>Blank Sign:</b> Will blank the display of all items.</p>

If AUTOMATIC dimming is selected, the following LCD prompt will be shown:

LCD Screen	Action
	<p>Press the &lt;ENTER/EDIT&gt; key to edit the auto dimming max intensity. This is the maximum intensity that the display will use in full-bright modes (during daylight hours).</p> <p>Press &lt;CLEAR&gt; to keep the current auto dimming maximum setting</p>

The following LCD prompt is shown for either Manual or Automatic dimming selections:

LCD Screen	Action
<div data-bbox="370 346 678 426" style="border: 1px solid black; padding: 5px; text-align: center;">INTENSITY XX↓↑ ENTER TO SET</div> <p data-bbox="345 468 651 569">XX – Current intensity (1-16) Max Intensity – 16 (Default is 16)</p>	<p data-bbox="727 352 1357 420">Press the up or down arrow key &lt;↑↓&gt; to modify the current intensity of the display</p> <p data-bbox="727 457 1403 621">Press &lt;ENTER&gt; to accept this intensity. If the manual dimming mode is selected, this will be the new intensity for the display at all times. However, if the automatic dimming mode is selected, the display will dim between the dim mode and the maximum intensity level you have set.</p>



# Glossary

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The following list includes some of the more commonly used terms when referring to these displays. Because Daktronics occasionally alters standard design to meet customer needs, the actual display design may vary slightly from the illustrations. This is only a brief overview. Refer to **Section 4:** for additional information on maintaining the various display components.

**Client:** Receives signal from the host driver on the Signal IN terminals. These drivers can re-drive signal to other client drivers.

**DataMaster Controller (DM-100):** The hand-held keypad device used to set the time, date, hold times, dimming etc. on the DataTime display. Refer to **Section 6:** for more information on the DataMaster controller.

**Display Address:** An identification number assigned to each driver in a network. The address is set using an 8-position binary switch. For single-line signs such as a Time & Temp display, the address will typically be "1." The address will be displayed each time the display powers up.

**Digit Circuit Board:** The board mounted to the back of a digit panel and containing the LEDs. It can be made up of an entire digit or as individual segments of a digit.

**Host:** Contains the driver which relays signal directly from the DataMaster controller on its Signal IN terminals. It is the only driver connected to the temperature/photo sensor. The Signal OUT terminals are used to connect to client driver. The host driver is selected by inserting the Protocol 4 plug into the protocol jack.

**Light emitting diode (LED):** High-intensity, low-energy lighting units.

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

**Protocol plug:** A plug inserted in the 5-pin protocol jack to select the host driver for a set of host-client displays.



# Appendix A: Reference Drawings

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Drawings in this manual are referenced by their last set of digits and the letter preceding them. Drawings in this appendix are first listed in alphanumeric order.

## **General Drawings**

Segmentation, 7 Segment Bar Digit .....	<a href="#">Drawing A-038532</a>
Riser Diagram; Outdoor Wire Control.....	<a href="#">Drawing A-164988</a>
Insert, 0G-164988 Price/ T&T Display .....	<a href="#">Drawing A-164998</a>
Mounting Method, Flag Style, One Pole.....	<a href="#">Drawing A-166139</a>
Mounting Method, Single Line on One Pole.....	<a href="#">Drawing A-166142</a>
4 Column MASC Driver Specifications .....	<a href="#">Drawing A-166216</a>
Riser Diagram, Indoor Wire Control .....	<a href="#">Drawing A-175342</a>
Time & Temp Power/Signal Hookup .....	<a href="#">Drawing A-938369</a>
Installation, Temp Sensor, G3 .....	<a href="#">Drawing A-184840</a>
Enclosed Driver, 4 Column Reference .....	<a href="#">Drawing A-938300</a>
Host/Client Definitions .....	<a href="#">Drawing A-185236</a>

## **Shop Drawings**

Shop Drawing, DF-1010-10-R/A.....	<a href="#">Drawing A-919879</a>
Shop Drawing, DF-1010-13-R/A.....	<a href="#">Drawing A-919882</a>
Shop Drawing, DF-1010-18-R/A.....	<a href="#">Drawing A-919889</a>
Shop Drawing, DF-1010-24-R/A.....	<a href="#">Drawing A-919891</a>
Shop Drawing, DF-1011-10-R/A.....	<a href="#">Drawing A-919896</a>
Shop Drawing, DF-1011-13-R/A.....	<a href="#">Drawing A-919901</a>
Shop Drawing, DF-1011-18-R/A.....	<a href="#">Drawing A-919906</a>
Shop Drawing, DF-1011-24-R/A.....	<a href="#">Drawing A-919945</a>





# Appendix B: Temperature Sensor Mounting

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Temperature Sensor Mounting ..... ED-18601



# **Appendix C: DataTime Quick Installation Guide**

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Installation Quick Reference, DF-1010 Time & Temp.....[Drawing A-176249](#)



# **Appendix D:      DataTime Quick Start Reference**

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DataTime Time & Temperature Quick Start Reference ..... **ED-13950**