Remote Control System RC-100

DataMaster Operation Manual

ED-15576   *Rev 4 – 3 May 2016*

DAKTRONICS

DAKTRONICS, INC.

Table of Contents

Section 1: Introduction

This manual is designed to explain the operation of the Daktronics RC-100 Remote Control System for DataMaster® applications. For additional information regarding the safety, installation, operation, or service of this system, refer to the telephone numbers listed in **Section 1.2**.

Important Safeguards

- Read and understand all instructions, both general and for specific applications.

- Do not drop the control console or allow it to get wet.

- Do not disassemble control equipment or electronic controls of the display; failure to follow this safeguard will make the warranty null and void.

- Always turn off and/or unplug the control equipment when it is not in use. Never yank the power cord to pull the plug from the outlet. Grasp the plug and pull to disconnect.

- Do not let any power cord touch hot surfaces or hang over the edge of a table that would damage or cut the cord.

- If an extension cord is necessary, a three-pronged, polarized cord should be used. Arrange the cord with care so that it will not be tripped over or pulled out.

- Inspect console for shipping damage such as rattles and dents, and verify that all equipment is included as itemized on the packing slip. Immediately report any problems to Daktronics; save all packing materials if exchange is necessary.

1.1 Resources

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 C-325405**.

THE CONCEPTS EXPRESSED AND DETAILS SHOWN IN THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY, WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC.   COPYRIGHT 2008 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: **DAKTRONICS UNIVERSITY**

TITLE: **SYSTEM RISER DIAGRAM**

DES. BY: **AORMESH**   DRAWN BY: **AORMESH**   DATE: **15 JAN 08**

REVISION APPR BY-

00   SCALE-   **NONE**   14963-R01 C-325405

Drawing Number

Figure 1: Daktronics Drawing Label

Reference Drawing:
System Riser Diagram ....**Drawing C-325405**

Daktronics identifies manuals by an ED or DD number located on the cover page of each manual. For example, this manual would be referred to as **ED-15576**.

1.2 Daktronics Exchange and Repair & Return Programs

Exchange Program

The Daktronics Exchange Program is a service for quickly 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 decreases equipment downtime. Customers who follow the program guidelines explained below will receive this service.

Before Contacting Daktronics

Identify these important numbers:

Assembly Number: _____

Job/Contract Number: _____

Date Manufactured/Installed: _____

Daktronics Customer ID Number:_____

To participate in the Exchange Program, follow these steps.

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

2. **When the new exchange part is received, mail the old part to Daktronics.**
   If the replacement part fixes the problem, send in the problem part 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. **The defective or unused parts must be returned to Daktronics within 5 weeks of initial order shipment.**

   If any part is not returned within five (5) weeks, a non-refundable invoice will be presented to the customer for the costs of replenishing the exchange parts inventory with a new 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.

Repair & Return Program

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

1. **Call or fax Daktronics Customer Service:**
   Phone: 866-343-3122   Fax: 605-697-4444

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

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

Shipping Address

Daktronics Customer Service
PO Box 5128
201 Daktronics Drive
Brookings, SD 57006

Fax: 605-697-4444

Daktronics Warranty and Limitation of Liability

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

Section 2:   RC-100 System Overview

The RC-100 system allows wireless control of multiple display applications. This system is made up of two distinct hardware components: the RC-100 wireless handheld controller, and the RC-100 wireless Base Station.

The RC-100 wireless handheld controller (**Figure 2**) includes a 4x4 keypad and a 97x32 liquid crystal display (LCD). The RC-100 wireless handheld controller is used to enter information to be displayed on a display. The handheld operates using a 900 MHz radio with internal antenna and comes with a rechargeable Ni-MH (Nickel Metal Hydride) 2000 mAh battery which provides 8-10 hours of operation.

The RC-100 wireless Base Station processes information received from the wireless handheld controllers and sends this information to the display or another external controller. Based on the application, an RC-100 wireless receiver may be mounted outside in an external enclosure *(**Figure 3**)*, or mounted inside in a tabletop enclosure (**Figure 4**).

Figure 2: RC-100 Wireless Handheld Controller

Figure 3: RC-100 Outdoor Enclosure

Figure 4: RC-100 Base Station (Tabletop Enclosure)

Important Installation Range Considerations

The wireless Base Station must be located at least 10' (3 m) from the wireless handheld controller and no more than 500' (152 m) away. If the wireless handheld is used outside this range, the wireless handheld signal may drop out. Ideally, the handheld controller should have a clear line-of-sight to the Base Station antenna. Make sure the Base Station antenna is pointed straight up for best reception (it should look like a capital "L" when viewed from the side).

Section 3: RC-100 Base Station

The RC-100 wireless Base Station is used to communicate with all RC-100 wireless handheld controllers on the same channel setting. The RC-100 wireless Base Station also is used to update connected displays based with information entered on the wireless handheld controller.

The wireless Base Station includes two switches that must be set to specify the function number and channel of operation. Refer to **Section 3.1** and **Section 3.2**, respectively. In addition, the Base Station includes a server/client jumper that must be set to "Client Mode" in some scenarios that feature multiple displays. Refer to **Section 3.4** for more information.

3.1 Function Setting

The desired RC-100 system function must be configured in the wireless Base Station. A list of possible current functions is shown below, along with the corresponding Function Setting.

Function Setting	Function (Base Station Server Mode*)	Function (Base Station Client Mode*)
0	Default Function (last power up function)	All Display Groups
1	CAN Handheld (Judges') Console	Display Group 1
2	GEN I All Sport Scoreboard Controller	Display Group 2
3	**DataTime/DataMaster Display Control**	Display Group 3
4	Reserved	Display Group 4
5	GEN II All Sport Scoreboard Controller	Display Group 2
6	Reserved	
7	Reserved	
8	Reserved	
9	Reserved	
A	Reserved	
B	Reserved	
C	Reserved	
D	Reserved	
E	Reserved	
F	Reset Memory/Test**	Reset Memory/Test**

* The function of the Base Station depends on whether it is in Server or Client mode. For a server Base Station, the Function switch sets up the desired application. For a client Base Station, the Function switch sets up the display group to which this display belongs.

**Function Setting "F" is a special setting which resets all saved memory parameters back to defaults. This can be used for situations such as when a password needs to be reset. To use this function, cycle power to the wireless Base Station with the switch in this position and leave on for 10 seconds. Remove power, change to the desired function and continue. All saved memory parameters will be set back to default.

Selecting Functions

Refer to **Figure 5** for the wireless Base Station circuit board assembly drawing.
To access the circuit board:

- For tabletop Base Station enclosures, remove the two screws securing the top cover, and lift it off.
- For outdoor Base Station enclosures, remove the four screws securing the cover, and lift it off.

After exposing Base Station circuit board, use a small flathead screwdriver to turn the "S2" rotary switch labeled "FUNCTION" to the desired Function Setting.

Figure 5: Function Select Switch (Internal Receiver)

After 5 seconds, the wireless Base Station Server will change its function to match the new switch setting. (Any connected wireless handheld controllers should change as well.)
When the wireless Base Station Server is turned off and back on, it will always default to the function set on the switch.

The function setting may also be set in hardware via the loading of jumpers W1-W4 to select the correct setting value. In this case, switch S2 may not be loaded on the PCB.

DataTime/DataMaster Display Control Function

The DataTime/DataMaster Display Control operates with the Function Setting "3" selected.

3.2 Channel Setting

The wireless Base Station and wireless handheld device use internal radio modules to communicate. The radios on both the wireless handheld and wireless Base Station device can be set to any channel ranging from 1-15. "Channel 1" is the default channel used by Daktronics for single base-station installations.

Refer to **Figure 6** for the wireless Base Station circuit board assembly drawing.
To access the circuit board:

- For tabletop Base Station enclosures, remove the two screws securing the top cover, and lift it off.
- For outdoor Base Station enclosures, remove the four screws securing the cover, and lift it off.

After exposing Base Station circuit board, use a small flathead screwdriver to turn the "S1" rotary switch labeled "CHANNEL" to the desired channel.
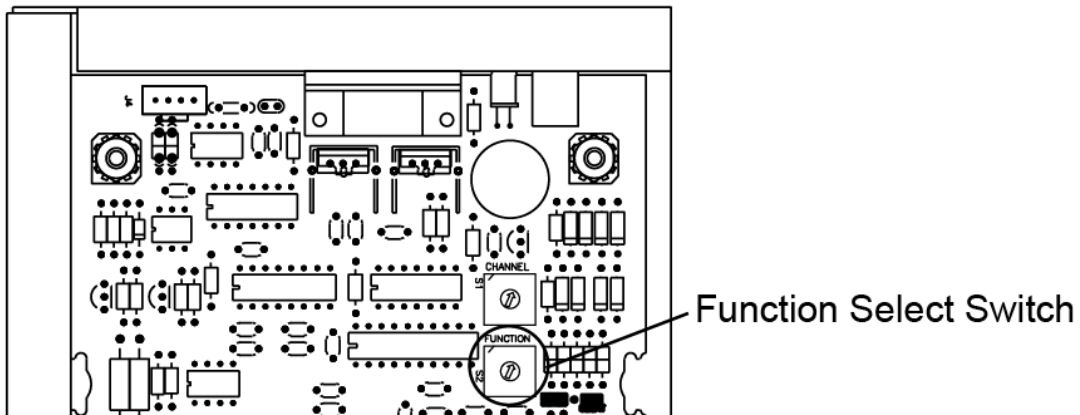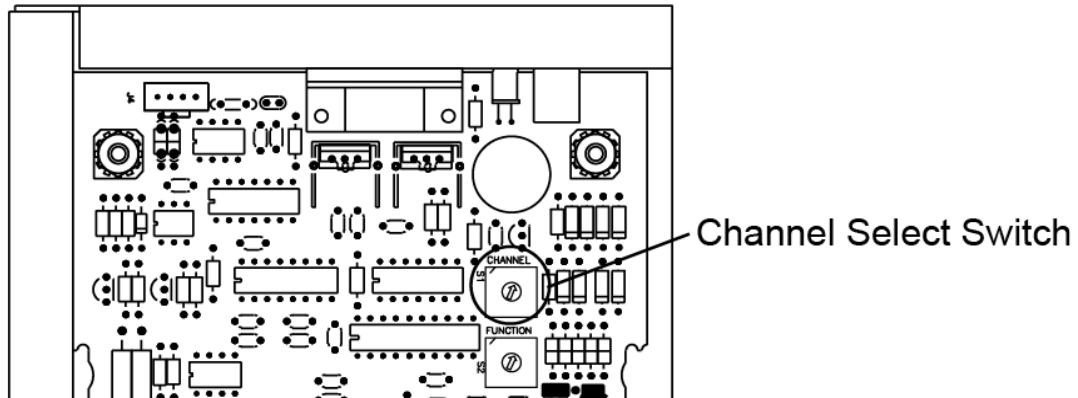

Figure 6: *Channel Select Switch (Internal Receiver)*

Note: The wireless handheld and Base Station must be set to the same channel in order to communicate. To select the channel in the wireless handheld controller, refer to **Section 4.1**.

Two server Base Stations cannot be powered up in the same area with the same channel setting, or they will interfere with each other. To avoid this, on power-up the server Base Station checks to see if there are any other servers located nearby. If another server is detected, the "IN RANGE" LED (**Figure 8**) will flash quickly to indicate interference, and continue to flash until the channel is changed or the conflicting Base Station is turned off.

3.3   Synchronizing Multiple Base Stations and Channel Selection

If two or more server Base Stations need to operate at the same time in the same location, they must each be set to an independent channel and synchronized accordingly.

The RC-100 wireless system uses frequency-hopping technology to maximize range and minimize interference from other systems. When multiple server Base Stations are installed within range of each other (approximately 2000 feet), Base Stations must be able to synchronize with one another to ensure their hop sequences do not interfere with each other.

This is accomplished by the use of sync groups. A list of the sync groups and their corresponding channel numbers and channel groups are shown in the table below.

Sync Group	Channel Number	Primary Channel Group	Extended Channel Group
1	0	All	
2	1	2, 3, 4, 5	7, 8, 9, 10, 12(C), 13(D), 14(E), 15(F)
3	6	7, 8, 9, 10	12(C), 13(D), 14(E), 15(F)
4	11(B)	12(C), 13(D), 14(E), 15(F)	

The "Channel Number," "Primary Channel Group", and "Extended Channel Group" entries correspond to the settings on the CHANNEL rotary switch (**Figure 6)** and handheld settings that pertain to the "Sync Group" shown on the same line. Each "Primary Channel Group" lists the channels that will attempt to synchronize to this sync channel as a first choice. If any Base Stations set to these "Primary Channels" are within range of a Base Station set to the corresponding sync channel number, the two Base Stations will sync.

The "Extended Channel Group" lists channels that attempt to synchronize to the corresponding sync channel as a second or third choice. When these channels are not within range of their primary sync channel, they will attempt to synchronize to the corresponding sync channel.

When a Base Station is synchronized to a Sync Group, the "IN RANGE" LED (**Figure 8**) will flash briefly approximately every 5 seconds with the number of times flashed corresponding to the sync group: 1 = Channel 0, 2= Channel 1, 3=Channel 6, 4= Channel 11 (B).

Any Base Stations set to channels in the "Channel Groups" section will continuously scan for sync Base Stations whenever no handheld controllers are connected. This will allow these boards to be powered up in any sequence and still obtain network synchronization.

If the installation includes a central Base Station located approximately 3000' (914 m) or closer to all other Base Stations, **which will remain on at all times during operation on any Base Station**, a Base Station set on channel 1 may be installed in this location. All other Base Stations may be set to values in the primary and extended channel groups for this channel number to avoid interference within the channels.

3.4   Server/Client Mode Setting

The RC-100 wireless Base Station can operate in either Server Mode or Client Mode, depending on application requirements. For most applications, the wireless Base Station will operate in Server Mode, and no change from the default setting will be necessary.

In **Server Mode**, the wireless Base Station controls all wireless handheld devices, either through an onboard program (i.e. DataMaster®), or by acting as a router to pass data back and forth between wireless handheld devices and an external control system. An RC-100 network (on a single channel) contains **one and only one** server Base Station device.

In **Client Mode**, a wireless Base Station relies on another server Base Station to supply it with data. This client Base Station will typically provide data for a second wireless display. Since the Function Select switch is not needed to select a function when the Base Station is in Client Mode, the function switch selects the display group instead. For more information refer to **Section 3.1**.

Refer to **Figure 7** for the wireless Base Station circuit board assembly drawing.
To access the circuit board:

- For tabletop Base Station enclosures, remove the two screws securing the top cover, and lift it off.
- For outdoor Base Station enclosures, remove the four screws securing the cover, and lift it off.
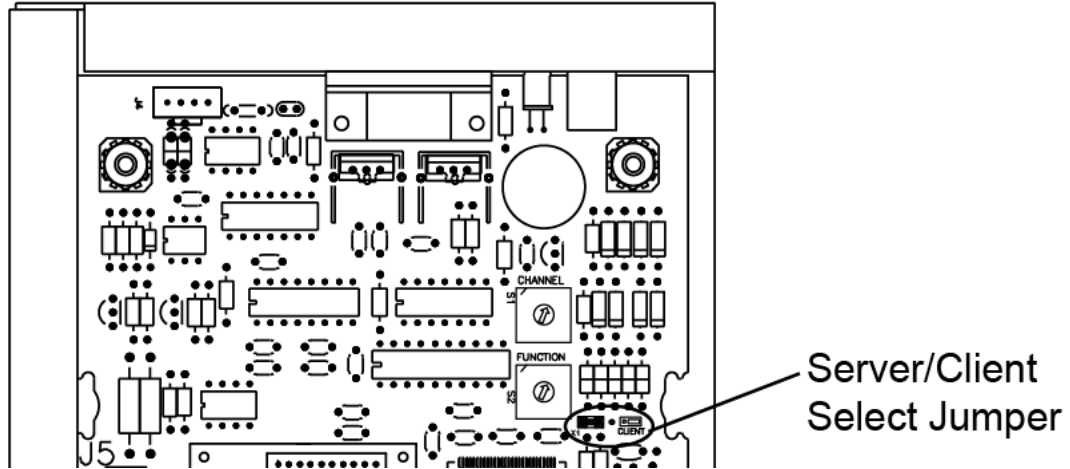
Figure 7: Server/Client Select Jumper (Internal Receiver)

Wireless Base Station Server/Client Mode is selected via the "X1" Server/Client Jumper. Insert the jumper over the top two posts as shown in the "CLIENT" label on the circuit board to put the wireless Base Station in Client Mode. For Server Mode, leave the jumper over the bottom two posts (factory default).

3.5   Wireless Base Station LEDs

The wireless Base Station circuit board includes several light-emitting diodes (LEDs) for diagnostic purposes, as shown in **Figure 8** and described in the table that follows.
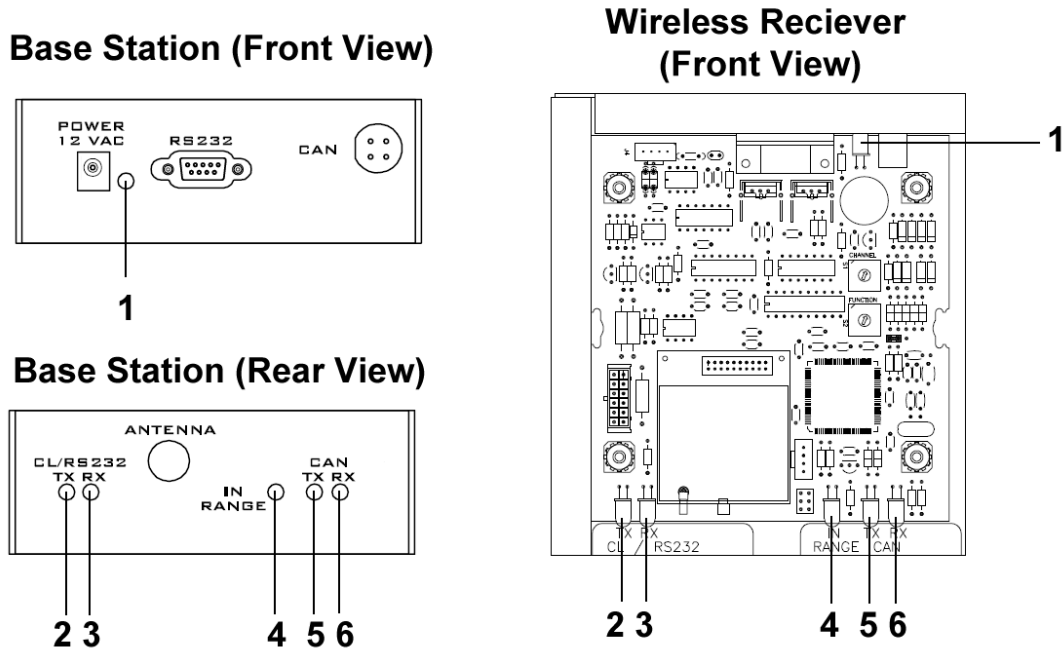
Figure 8: Wireless Base Station LEDs

#	LED	Color	Function
1	POWER	Green	This LED illuminates when the Base Station or receiver is connected to a power source.
2	CL/RS232 TX	Red	This LED flashes when the Base Station transmits Current Loop (CL) or RS-232 data via wire: • Current Loop output is used to control a connected display. • RS-232 output is used to communicate with external devices.
3	CL/RS232 RX	Green	This LED flashes when the Base Station receives Current Loop (CL) or RS-232 data from another device via wire.
4	IN RANGE	Amber	On a server Base Station, this LED flashes several times at start-up to indicate that it is searching for other server Base Stations on the same channel within range. If one is found, this LED flashes continuously to indicate that only one server Base Station is allowed on a given channel. Once in operation mode, this LED will either be on or off to indicate whether or not one or more handheld devices are currently connected to the Base Station. On a client Base Station, this LED is on whenever it is connected to a server Base Station. This LED also shows sync status. Refer to the **Section 3.3**.
5	CAN TX	Green	This LED flashes when Controller Area Network (CAN) data is transmitted to a connected device.
6	CAN RX	Red	This LED flashes when Controller Area Network (CAN) data is received from a connected device.

LED Error Diagnostics

The CL/RS232 TX, CL/RS232 RX, IN RANGE, and CAN TX LEDs are also used to display errors that can occur in wireless Base Station operation. Refer to **Section 9** for more information about these errors.

Section 4: RC-100 Handheld Controller

4.1 Powering the Controller On and Off

Using the Keypad

- Press and hold the **<ON/OFF>** key momentarily to power on the controller. If the LCD does not display text within a few seconds, the internal battery is most likely dead and will need to be recharged (refer to **Section 4.3**).

- Press and hold the **<ON/OFF>** key for 5 seconds to power off the controller. The LCD will display a power down message.

Using External Power

Plugging the wireless handheld controller into an external power source via the power connector on top of the unit will turn it on (and charge its internal batteries). The wireless handheld will not turn off if connected to external power. When connected to external power, the top line of the LCD will show a power plug (**Figure 9**).

Figure 9: External Power Detect Status

When external power is removed and charging is complete, the handheld will power down after a 5 second prompt to conserve battery power. Press any key during the prompt after disconnecting external power to keep the handheld controller powered on.

4.2 Battery Operation

When the controller is powered on, an indicator on the top line of the LCD shows the current battery status (**Figure 10**). The three segments within the battery will gradually disappear as the battery loses its charge.

Figure 10: Battery Status

Idle Time

When using battery power, by default the controller shuts itself off or "sleeps" automatically after 45 minutes of inactivity. The idle time setting may be turned off (refer to **Section 4.4**), but to increase battery life, be sure to manually turn the console off when it will be inactive for a long period of time.

4.3 Battery Recharging

A charger is contained inside the wireless handheld controller for re-charging the batteries. To recharge the batteries when not in use, simply connect an external power source to the power connector on top of the unit. A completely discharged battery will take approximately 1.5 hours of fast charging to recharge. For information on battery replacement, see **Section 9.3**.

A 12 VAC wallpack transformer (Daktronics part number T-1118) is included with the wireless handheld controller for recharging the batteries and providing external power.

4.4 Operation Modes

The RC-100 wireless handheld controller (**Figure 2**) always operates in one of two modes: Config or Connect.

Config Mode

Config ("configuration") mode (**Figure 11**) is used when a wireless server Base Station is not controlling a wireless handheld. Config mode is used to set up operational settings in the wireless handheld controller.

Figure 11: Config Mode LCD Icon

If the wireless handheld has not yet been configured for a specific channel, the Config mode will start automatically when the device is first powered on. If it has been previously configured, the wireless handheld will attempt to connect at the last connected channel.

- Configuration mode may be entered at any time by pressing and holding the **<CONFIG>** key for 5 seconds.

- Use the **<↑>** and **<↓>** arrow keys to move through the possible configuration items.
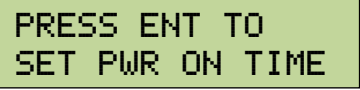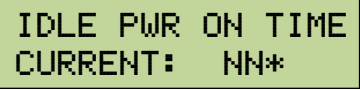
Setting Default Radio Channel Number

Display	Action
PRESS ENT TO SET CHANNEL	Press **<ENTER>** to set the default radio channel number.
RADIO CHANNEL DEFAULT: NN* NN = Current Channel Number (Default: 1)	Use the number keys to enter the desired channel number. Press **<ENTER>** again to save the setting. **Note:** The channel number should match the setting on the desired wireless Base Station to connect to on power-up. Refer to **Section 3.2** for more information on setting the Base Station channel number.

Setting LCD Contrast

Display	Action
PRESS ENT TO SET CONTRAST	Press **<ENTER>** to set the contrast level.
CONTRAST UP – ↑ CONTRAST DN – ↓	Use the up or down arrow keys on the keypad to set the desired contrast. Press **<ENTER>** again to save the setting.

Setting Power Save Mode

Display	Action
PRESS ENT TO SET PWR ON TIME	Press **<ENTER>** to modify the default LCD power on when idle time. This is the amount of time (in minutes) the wireless handheld will remain on when not in use. Decrease this value for longer battery life. Increase this value if the console needs to be inactive for longer periods of time without turning off.
IDLE PWR ON TIME CURRENT: NN* NN = Channel Idle Power On Time in minutes Default: 20 minutes	Use the number keys to edit the idle power on time. Press **<ENTER>** when finished to save the new setting.

Connect Mode
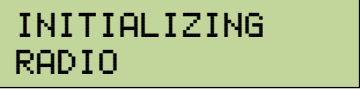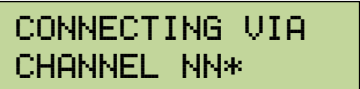
Connect mode (**Figure 12**) is used when the wireless handheld is connected to a wireless server Base Station. In Connect mode, the wireless Base Station determines the operation of the handheld, and all operation is specific to the wireless Base Station Function selected.

CONNECT

Figure 12: Connect Mode LCD Icon

Switching to Connect Mode

After all initialization and configuration is complete, the wireless handheld controller will be ready to connect to a wireless Base Station.

Display	Action
INITIALIZING RADIO CONNECTING VIA CHANNEL NN* NN = Channel Setting	Press **<CONNECT>** to create a connection to an available wireless Base Station on the channel shown. **Note:** The Wireless Base Station must be powered on and must be set to the specified channel. • If a connection was made, the wireless handheld will be operating in Connect mode. Refer to the application-specific sections for operation details. • If a connection could not be made, refer to **Section 9** for information about how to resolve the problem.

Signal Strength Indicator

Once a connection has been made, the top line of the LCD will show the signal strength (**Figure 13**). This indicator shows the approximate signal strength of the network connection. Each successive bar indicates an additional level of signal strength between the handheld and Base Station. When no bars or 1 bar

Figure 13: Signal Strength

is visible, the connection to the wireless network is likely to be limited, and the console may occasionally fail to respond. To improve signal strength, move within range of the Base Station, and remove any obstacles located between the Base Station and handheld controller if possible. For more information refer to **Section 2**.

4.5   Common Keys

Several keys on the default keypad layout are common to multiple wireless handheld applications. These keys are noted in **Figure 14**. For a description of the function of keys for a particular application, refer to the application-specific sections of this manual.
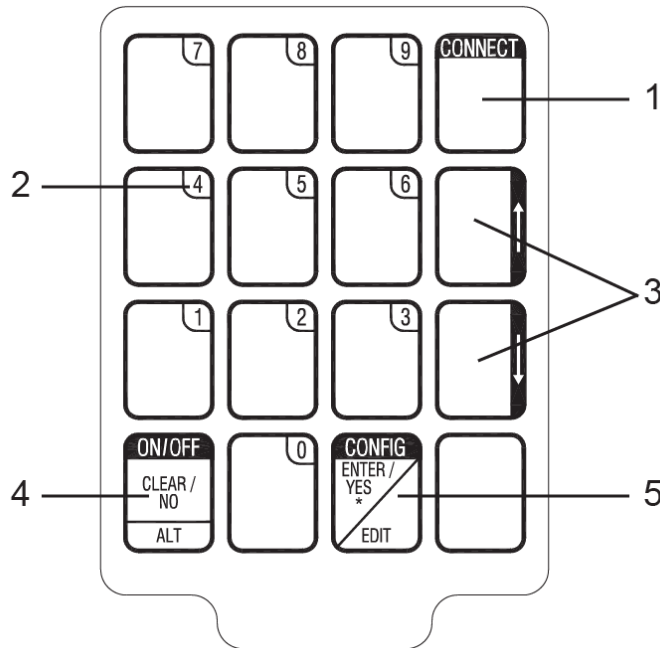
Figure 14: *Common RC-100 Keys*

#	Key	Function
1	CONNECT	This key is used to connect to a wireless Base Station. Refer to **Section 4.4** for more information. Pressing **<ALT>** followed by **<CONNECT>** when a connection is made to a wireless Base Station will show Base Station synchronization and revision information. Refer to **Section 9.2** for more information.
2	Numbers	These keys are used for numeric entry functions. While a particular key may normally be assigned to application-specific functions, in an Edit routine, they are also used to enter the number shown in the corner of the key.

3	Up/Down Arrows	These keys are used to navigate through menu choices and make certain selections. Arrows may also be assigned to application-specific functions.
4	ON/OFF	The **ON/OFF** operation of this key is described in **Section 4.1**.
	CLEAR/NO	The **CLEAR** operation of this key pertains to editing and data entry routines. When editing a value, press **<CLEAR>** to remove that value. The **CLEAR** operation may also be used to escape out of an editing function. If a key was pressed inadvertently, or if the value being edited should not be changed, pressing **<CLEAR>** twice exits the editing routine without modifying the value. The **NO** operation of this key also pertains to editing and data entry routines. When a question prompt is shown on the LCD, press this key to answer the question with a "No."
	ALT	The **ALT** operation of this key selects alternate actions for certain application keys. Press this key before pressing another key to activate a secondary function. Refer to the section following this table for more information.
5	CONFIG	The **CONFIG** operation of this key is described in **Section 4.4**.
	ENTER/YES	The **ENTER** function of this key pertains to editing and data entry routines. After editing a value, press **<ENTER>** to save the change. The **YES** function of this key also pertains to editing and data entry routines. When a question prompt is shown on the LCD, press this key to answer the question with a "Yes."
	EDIT	The **EDIT** function of this key is used to edit the data associated with a particular key. For instance, pressing **<EDIT>** followed by a "**+1**" key will allow the operator to manually type in a new value using the number keys. Refer to the application-specific sections for more information about which keys have EDIT functionality.

Alternate Function Keys

An alternate function of a key, if applicable, will be shown on the bottom the key below a horizontal line. Refer to **Figure 15** for an example.

- Press the key once to run the primary function.

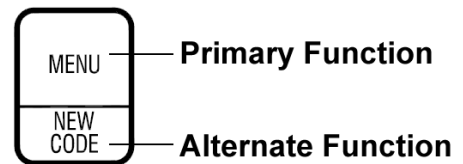- Press **<ALT>** followed by the key to run the alternate function.

Figure 15: Key with ALT Functionality

Section 5:   DataMaster Applications

This section provides information about the "DataMaster" function of the RC-100 wireless Base Station. Refer to the sections following this section for application-specific operation.

5.1   Selecting DataMaster Applications

To select a specific application, the "DataMaster" function must first be set in the wireless Base Station (refer to **Section 3.1**).

Once the DataMaster *function* has been selected, a DataMaster *application* may be selected using the wireless handheld controller.

Display	Action
SELECT FUNCTION (APPLICATION)↑↓	Use the up and down arrow keys <↑↓> to select the desired application from GAS PRICE, RATE DISPLAY, or LOTTERY. Press **<ENTER>** to accept. **Note:** Once the application has been set, the wireless Base Station will continue to use it each time power is reset. To change applications, use the **<NEW CODE>** key on the wireless hand-held. Refer to **Section 5.2** for more information.
INITIALIZING DISPLAY	To accept a new application, the handheld controller will send this information to the display.
SEARCHING FOR DISPLAY	It may take a moment to detect the display, and the message at left will show on the LCD. If the wireless Base Station cannot be found, the controller will not work. This may happen if the controller is out of range or if the wireless Base Station has no power.

5.2 DataMaster Application Keys

All DataMaster applications have keys with the same functionality, as described below.

> **Note:** For other common wireless handheld keys, refer to **Section 4.5**.

New Code (Alternate Function)

The New Code key (**Figure 16**) is used to change the current DataMaster application.

Figure 16: *New Code Key*

Display	Action
PRESS ENT TO SELECT NEW CODE	This key is implemented as an alternate function. Press **<ALT>** followed by **<NEW CODE>**. Press **<ENTER>** to select a new application. Refer to **Section 5.1**. **Note:** All data for the current application will be lost. Press **<CLEAR>** to cancel and resume normal operation.

Dimming

The dimming (brightness) level of the display can be adjusted in two ways. A temperature/light sensor, mounted near the display, can detect the level of ambient light at the display location and dim the sign'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.

Figure 17: *Dimming Key*

To select either of these functions, press the **<DIMMING>** key (**Figure 17**). The current setting is shown on the bottom line of the LCD.

Display	Action
DIMMING AUTOMATIC ↓ **DIMMING MANUAL ↓** **DIMMING BLANK SIGN ↓**	Press the down arrow key **<↓>** to toggle through dim settings: **Automatic** – The display automatically dims based on the light detected at the display* **Manual** – The display dimming level is set manually. Once set, this value remains regardless of the level of light detected at the display. **Blank Sign** – The display can be blanked out without powering down.

Automatic

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

Display	Action
SET AUTO DIMMING MAX INTENSITY?	Press **<ENTER>** to edit the auto dimming max intensity. This is the maximum intensity that the display will use in full-bright modes (during daylight hours.) Press **<CLEAR>** to cancel and keep the current auto dimming maximum setting.
INTENSITY NN ↑↓* **ENTER TO SET** NN = Current intensity (1-16) Max intensity = 16	Press the up or down arrow keys **<↑↓>** to modify the maximum intensity of the display (**Note:** The DataMaster must be connected to the display.) Press **<ENTER>** to accept this intensity.

Manual

If MANUAL dimming is selected, the following will be shown on the LCD:

Display	Action
INTENSITY NN ↑↓* **ENTER TO SET** NN = Current intensity (1-16) Max intensity = 16	Press the up or down arrow keys **<↑↓>** to modify the current intensity of the display (**Note:** The DataMaster must be connected to the display.) Press **<ENTER>** to accept this intensity.

Blank Sign

Display	Action
BLANK THE SIGN? **<ENT> YES**	Press **<ENTER>** to blank the sign or press **<CLEAR>** to resume normal operation.
RESTART SIGN? **<ENT> YES**	To resume normal operation from a blanked sign, press the **<DIMMING>** key again. Press **<ENTER>** to restart or press **<CLEAR>** to return to the menu without restarting the sign.

Display Sequence

As values are edited, they do not instantly appear on the display. To send a new sequence to the display, press the **<DISPLAY SEQUENCE>** key (**Figure 18**).

Figure 18: *Display Sequence Key*

Menu

Press the **<MENU>** key (**Figure 19**) to access settings related to program operation. Note that several settings are applicable to all modes, while certain settings are only available for the specified applications.
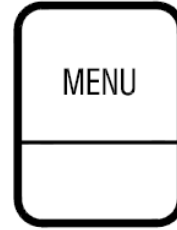

Figure 19: *Menu Key*

Edit Price Line 1-5 (Gas & Rate Displays Only)

Display	Action
PRICE LINE L ENTER TO EDIT EDIT LINE L $DD.CC* L = current line DD = current dollar value CC = current cent value	Press the up or down arrow keys **<↑↓>** to move to the previous or next item in the list. Press **<ENTER>** to edit the item shown on the LCD. Press the **<MENU>** key a second time or press the **<CLEAR>** key (press twice if editing) to exit the menu.

Edit Lottery 1-5 (Lottery Displays Only)

Display	Action
LOTTERY L ENTER TO EDIT EDIT LOTTERY L $DDD* L = current line DDD = current dollar value	Press the up or down arrow keys **<↑↓>** to move to the previous or next item in the list. Press **<ENTER>** to edit the item shown on the LCD. Press the **<MENU>** key a second time or press the **<CLEAR>** key (press twice if editing) to exit the menu.

LED Test

Select LED TEST to test the LED digits on the display.

Display	Action
LED TEST? ENTER TO TEST	Press **<ENTER>** to cycle the display digits between all LEDs on and all LEDs off.
ENTER TO TEST CLEAR TO EXIT	Press **<ENTER>** send the test command to the display. Press **<CLEAR>** to exit the test mode.

Display Option (Rate Displays Only)

Select DISPLAY OPTION to set the position of the decimal for the price display.

Display	Action
DISPLAY OPTION ENTER TO EDIT	Press **<ENTER>** to set the display option or press **<CLEAR>** to exit the menu.
DISPLAY OPTION $00.00 ↓	The current configuration is shown on the bottom line of the LCD. Press the down arrow key **<↓>** to select one of the following values: $00.00 (default) $0.000 $.0000 $0000.00 $000.00 $00 $000.0 **Note:** If the wrong configuration is selected for the display being used, the price may not be displayed correctly. Press **<ENTER>** when finished.
DISPLAY $00.00 ENTER TO UPDATE	A screen will appear asking to confirm the selection. Press **<ENTER>** again to update the display option.

Display Option 1-5 (Lottery Displays Only)

Select a DISPLAY OPTION to set the position of the decimal for each lottery display line.

Display	Action
```DISPLAY OPTION L``` ```ENTER TO EDIT``` L = current line	Press **\<ENTER\>** to set the display option or press **\<CLEAR\>** to exit the menu.
```DISPLAY OPTION L``` ```$000 ↓``` L = current line	The current configuration is shown on the bottom line of the LCD. Press the down arrow key **\<↓\>** to select one of the following values: $000 (default) $00.0 $0.00 **Note:** If the wrong configuration is selected for the display being used, the value may not be displayed correctly. Press **\<ENTER\>** when finished.
```DISPLAY $000``` ```ENTER TO UPDATE```	A screen will appear asking to confirm the selection. Press **\<ENTER\>** again to update the display option.

Display Status

Select DISPLAY STATUS to view information about the display.

Display	Action

```DISPLAY STATUS``` ```ENT TO SELECT```
 	
```DISPLAY STATUS``` ```GET STATUS?```
	Press **\<ENTER\>** to get the display status or press **\<CLEAR\>** to exit the menu.
	
	Press **\<ENTER\>** again and the LCD will show the following display status items:
	• Driver Firmware Version • Dimming Mode
	• Current Day/Time • Temp Sensor Status
	• Last Reset Time • Light Sensor Status
	• Current Temp • COM1 Device
	• Temp Sensor Offset • Timing Reference
	• Dimming Level
	
	Press **\<CLEAR\>** to return to normal operation, or press **\<ENTER\>** to access two additional display settings: Display Passcode and Detect Clients.

Display Passcode

This setting is only available after entering the Display Status menu option.

Display	Action
DISPLAY PASSCODE ENT TO EDIT	While the Display Status information is cycling, press **<ENTER>** to bring up the DISPLAY PASSCODE option. Press **<ENTER>** to edit the passcode.
DISPLAY PASSCODE NEW CODE ····* DISPLAY PASSCODE PASSCODE SET	Enter a four-digit passcode using the number pad, and then press **<ENTER>**. To cancel creating a passcode, press **<CLEAR>** followed by **<ENTER>**.
DISPLAY PASSCODE OLD CODE ····*	If there was an old passcode, it must be entered first before a new code may be entered. To remove a passcode option entirely, first enter the old passcode, and then press **<ENTER>**.
ENTER PASSCODE TO ACCESS ····* ERROR – CODE DOES NOT MATCH	Power off the RC-100 to activate the passcode. The next time the RC-100 is powered on, the passcode must be entered before it will operate. The passcode is also required when switching display functions. If an incorrect passcode is entered, the error message at left will display.

Detect Clients

This setting is only available after entering the Display Status menu option.

Display	Action
DETECT CLIENTS ENT TO EDIT	While the Display Status information is cycling, press **<ENTER>**. Press the down arrow **<↓>** to select the DETECT CLIENTS option. Press **<ENTER>** to detect the number of client Base Stations on the system. This is used so the **<DISPLAY SEQUENCE>** key knows how many clients there are for showing error messages.

Display	Action
| ```
CLIENTS FOUND  N
IS THIS CORRECT?
```<br><br>N= number of clients | The LCD will show how many clients are found. If the **<YES>** key is pressed, this is the number that the console will use for showing error messages if all expected clients did not respond. |
| ```
CHECK POWER ON
CLIENT AND RETRY
```<br><br>```
ENTER TO RETRY
CLEAR TO EXIT
``` | If the **<NO>** key is pressed, the LCD will toggle between the two screens shown at left. The detect client function can be retried by pressing **<ENTER>** or canceled by pressing **<CLEAR>**. |

Set Time 12HR

Select SET TIME 12HR to set the time as well as the date.

Display	Action
| ```
SET TIME 12HR
ENTER TO EDIT
``` | Press **<ENTER>** to set the time of day or press **<CLEAR>** to exit the menu. |
| ```
SET TIME 12HR
12:00*   PM ↓
``` | Use the number pad to edit the time.<br><br>Press the down arrow key **<↓>** to set AM or PM.<br><br>Press **<ENTER>** when finished. |
| ```
SET TODAYS DATE
MM*/DD /YY
```<br><br>MM = current month value<br>DD = current day value<br>YY = current year value | Use the number pad to edit the month, day, and year values; press **<ENTER>** to accept each value. |
| ```
 5/03/16
ENTER TO SEND
```<br><br>```
TIME- 11:35 AM
ENTER TO SEND
``` | Before the time and date are sent to the display, the LCD will toggle between the two screens shown at left. If the values are correct, press **<ENTER>** to confirm. |

Section 6:   Gas Price Operation

Insert: LL-2617

The insert drawing is located in **Appendix A**. If an insert is lost or damaged, a copy of the insert drawing can be used until a replacement arrives. Refer **Section 4.1** for information on starting up the handheld controller and **Section 5.2** for additional DataMaster application keys.

6.1   Gas Price Controller Operation

Display	Action
``` LINE PRICE 1 ↓ $0.00 9/10 ``` ``` <EDIT> TO MODIFY 1 ↓ $0.00 9/10 ```	After entering the Gas Price mode, the LCD will toggle between the two screens shown at left. Press the up or down arrow keys **<↑↓>** to scroll through the current setting for any of the lines on the display. Press **<ENTER>** to modify any of the line settings.
``` EDIT LINE L $D.CC* 9/10 ↓ ``` L = current line D = current dollar value CC = current cent value	Use the number pad to edit the price value for the line. Press **<ENTER>** to accept the new value or press **<CLEAR>** to cancel the changes.
``` SEQUENCE SENT DISPLAY RESPONSE ```	To send the updated values to the display, press **<DISPLAY SEQUENCE>**. Refer to **Section 5.2**.

6.2   International Gas Price Display Operation

International gas price displays must be operated in Rate Display mode. To switch to Rate Display mode:

1. Press **<ALT>** followed by **<NEW CODE>**.

2. Press **<ENTER>**.

3. Use the arrow keys **<↑↓>** to select RATE DISPLAY and then press **<ENTER>**.

Now a four-digit price can be entered. The fourth number represents the digit in the 1/10 of a cent position.

If the decimal point appears in the wrong spot on the LCD:

1. Press **<MENU>**.

2. Use the arrow keys **<↑↓>** to select DISPLAY OPTION and then press **<ENTER>**.

3. Use the down arrow **<↓>** to move the decimal point to the desired position.

4. Press **<ENTER>** twice.

The display should now show the decimal in the desired place.

Refer to **Section 7.1** for additional Rate Display operation.

Section 7: Rate Display Operation

Insert: LL-2617

The insert drawing is located in **Appendix A**. If an insert is lost or damaged, a copy of the insert drawing can be used until a replacement arrives. Refer **Section 4.1** for information on starting up the handheld controller and **Section 5.2** for additional DataMaster application keys.
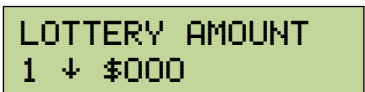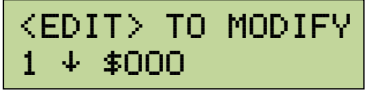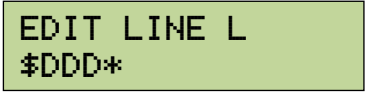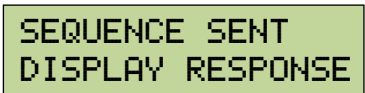
7.1 Rate Display Controller Operation

Display	Action
LINE PRICE **1 ↓ $ 0.00** **<EDIT> TO MODIFY** **1 ↓ $ 0.00**	After entering the Rate Display mode, the LCD will toggle between the two screens shown at left. Press the up or down arrow keys **<↑↓>** to scroll through the current setting for any of the lines on the display. Press **<ENTER>** to modify any of the line settings.
EDIT LINE L **$DD.CC*** L = current line DD = current dollar value CC = current cent value	Use the number pad to edit the price value for the line. Press **<ENTER>** to accept the new value or press **<CLEAR>** to cancel the changes.
SEQUENCE SENT **DISPLAY RESPONSE**	To send the updated values to the display, press **<DISPLAY SEQUENCE>**. Refer to **Section 5.2**.

Section 8:   Lottery Display Operation

Insert: LL-2617

The insert drawing is located in **Appendix A**. If an insert is lost or damaged, a copy of the insert drawing can be used until a replacement arrives. Refer **Section 4.1** for information on starting up the handheld controller and **Section 5.2** for additional DataMaster application keys.
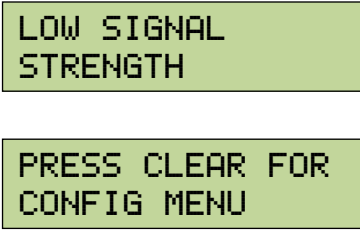
8.1   Lottery Display Controller Operation

Display	Action

`LOTTERY AMOUNT`
`1 ↓ $000`
 	
`<EDIT> TO MODIFY`
`1 ↓ $000`
	After entering the Lottery Display mode, the LCD will toggle between the two screens shown at left.
	
	Press the up or down arrow keys **<↑↓>** to scroll through the current setting for any of the lines on the display.
	
	Press **<ENTER>** to modify any of the line settings.

`EDIT LINE L`
`$DDD*`
 	
L = current line
DDD = current dollar value
	Use the number pad to edit the value for the line.
	
	Press **<ENTER>** to accept the new value or press **<CLEAR>** to cancel the changes.

`SEQUENCE SENT` `DISPLAY RESPONSE`	To send the updated values to the display, press **<DISPLAY SEQUENCE>**. Refer to **Section 5.2**.

Section 9: Troubleshooting

9.1 Handheld Controller Error Messages

Display	Cause/Solution
NO SERVER FOUND ON CHANNEL NN NN = current setting **ENT TO RETRY CLEAR SETS CHAN**	The wireless handheld could not find a server on the specified channel. • Make sure the wireless Base Station is powered on, and is set for the specified channel. • Make sure the handheld is within minimum and maximum range limits (refer to **Section 2**). • Press **<ENTER>** to retry the connection (if the handheld was just moved in range or the wireless Base Station has been correctly configured). • Press **<CLEAR>** to set the channel number to a different channel and retry.
NO RESPONSE ON CHANNEL NN NN = current setting **ENT TO RETRY CLEAR SETS CHAN**	The wireless handheld *did* find a server on the specified channel, but the server did not respond. • Make sure the handheld is within minimum and maximum range limits (refer to **Section 2**). • Cycle power to the wireless Base Station and retry the connection. • Make sure that there are no other wireless Base Stations within range on the same channel. Try a different channel if necessary. • Press **<ENTER>** to retry the connection (if the handheld was just moved in range or the wireless Base Station has been correctly configured). • Press **<CLEAR>** to set the channel number to a different channel and retry.
ERROR - THIS CHANNEL IN USE	The message at left is displayed if another wireless handheld controller is currently connected to the Base Station. No DataMaster application supports multiple handheld controllers at this time. Power off any other unused handheld units on the same channel in the area (refer to **Section 4.1**).

Display	Cause/Solution
| ```
LOW SIGNAL
STRENGTH


PRESS CLEAR FOR
CONFIG MENU
``` | The Base Station has stopped responding to the wireless handheld. This could mean any of the following scenarios are true:<br>• The Base Station was turned off or has lost power.<br>• The Base Station was changed to a different channel.<br>• The Base Station and handheld are too far away or too close (refer to **Section 2**).<br><br>If all of these problems have been checked and the handheld still shows Low Signal Strength, cycle power on both the handheld and Base Station. |

9.2 Base Station Errors

IN RANGE LED On Start-up

The IN RANGE LED (**Figure 8**) flashes several times at start-up while the server Base Station searches for other Base Stations on the same channel within range. If another server Base Station is found, this LED will flash continuously, indicating that only one server Base Station is allowed on a given channel.

General Base Station Failures

The wireless Base Station uses the on-board LEDs (**Figure 8**) to indicate failure status. When a failure occurs, the CL/RS232 TX, CL/RS232 RX, IN RANGE, and CAN TX LEDs all flash in a repetitive pattern to indicate the failure type. The LEDs will flash on for a long period of time, followed by a series of short flashes that give the error type. This sequence will repeat 5 times, after which the Base Station will reset.

If an error sequence is being displayed on the LEDs, first cycle power to the wireless Base Station by disconnecting power for several seconds and then reconnecting. If the problem persists, please contact Daktronics Customer Service (refer to **Section 1.2**).

Obtaining Base Station Status Information

When connected to a wireless Base Station in any DataMaster function, the wireless handheld can obtain status information about the Base Station. This information includes the Base Station channel, firmware revision number and date, and whether or not the Base Station is synchronized to another Base Station in the area.

Display	Action
| ```
VN.N MMM DD YYYY
NoSync Chan:CC
```<br><br>N.N = firmware revision<br>MMM = month<br>DD = date<br>YYYY = year<br>CC = channel number | Press **<ALT>** followed by **<CONNECT>** to display Base Station status information.<br><br>Press any key to return to normal operation.<br><br>    **Note:** If the Base Station is synchronized to another Base Station via a sync group, the bottom left corner of the LCD will display "Sync:" followed by the sync group number. Refer to **Section 3.3**. |
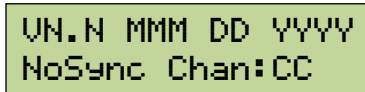
9.3 Replacing Handheld Battery

To verify the battery is replaceable, look at the assembly number (ASSY NO.) and revision number (REV) on the back of the unit (**Figure 20**).

- If the assembly number is **0A-1110-0033** and the revision number is **REV 7** or higher (after August 30, 2007), the battery may be replaced in the field. Units built before this date must be sent to Daktronics to install a new battery.
- If the assembly number is **0A-1110-0053**, the battery may be replaced in the field regardless of revision number.

Figure 20: *Manufacturing Date & Revision Number*

After verifying the correct numbers, follow the steps below to replace the battery.

1. Remove the two Philips screws (one on the top and one on the bottom) to separate the bottom half of the case from the top half.
2. Disconnect the 2-pin battery power cable from the main circuit board, and remove the battery from the retaining clips (**Figure 21**).
3. Install new battery (Daktronics part # BT-1032) into the retaining clips and connect the 2-pin cable.
4. Close the case, and tighten the screws.
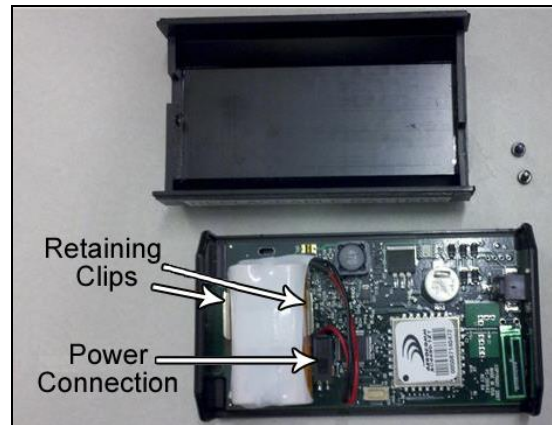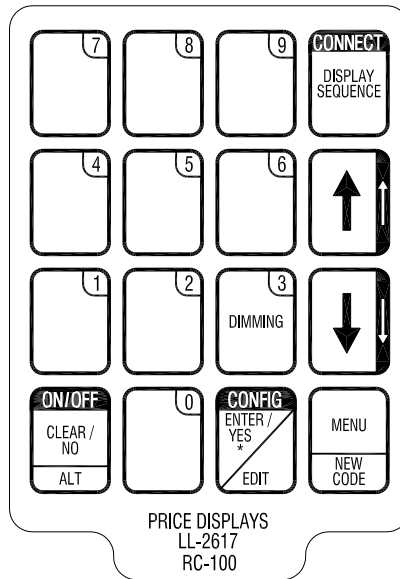5. Charge the battery as needed before first use.

Figure 21: *Handheld Unit, Cover Removed*

Note: Please return used batteries to a battery recycling center or retailer for disposal.

Appendix A: Reference Drawings

PRICE DISPLAYS
LL-2617
RC-100

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

TITLE: INSERT; LL-2617 RC-100 PRICE DISPLAYS

DES. BY: DRAWN BY: GWITCHE DATE: 06 JUN 05

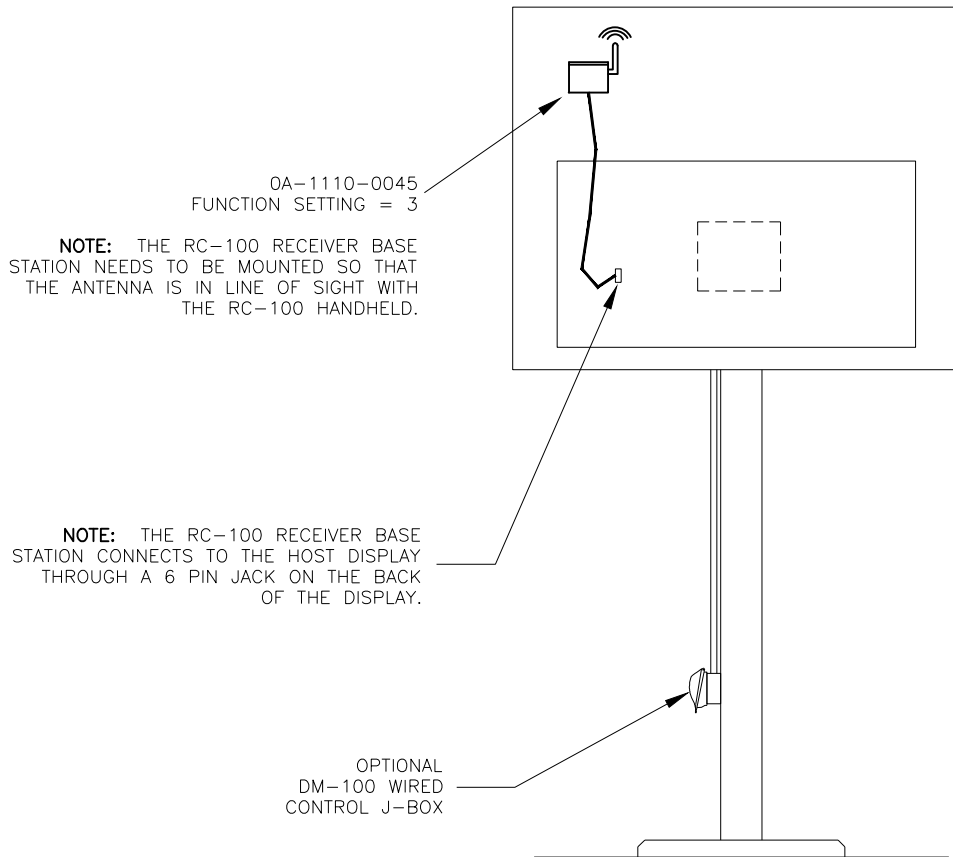| REV.	DATE	DESCRIPTION	BY	APPR.	REVISION	APPR. BY:	1110-V07A-244374
					00	SCALE: 1=1	

NOTE: THIS DETAIL SHOWS A GENERIC PRICE DISPLAY. ACTUAL
DISPLAY MAY BE DIFFERENT FROM DRAWING.

FRONT VIEW

0A-1110-0045
FUNCTION SETTING = 3

NOTE: THE RC-100 RECEIVER BASE
STATION NEEDS TO BE MOUNTED SO THAT
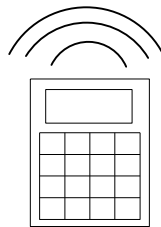THE ANTENNA IS IN LINE OF SIGHT WITH
THE RC-100 HANDHELD.

NOTE: THE RC-100 RECEIVER BASE
STATION CONNECTS TO THE HOST DISPLAY
THROUGH A 6 PIN JACK ON THE BACK
OF THE DISPLAY.

OPTIONAL
DM-100 WIRED
CONTROL J-BOX

NOTE:
THE WIRELESS BASE STATION COMES
PRE-SET TO CHANNEL 1. HOWEVER,
CHANNELS 1-15 CAN BE USED.

FUNCTION TABLE

FUNCTION NUMBER	DESCRIPTION
0	DEFAULT FUNCTION (LAST POWER UP FUNCTION)
1	CAN HAND HELD (JUDGES) CONSOLE
2	BASEBALL/TENNIS SCOREBOARD CONTROLLER (ALLSPORT)
3	DATATIME/DATAMASTER DISPLAY CONTROL

0A-1110-0053
INSERT: LL-2617
(GAS PRICE DISPLAY)

DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

PROJ: DATAMASTER LED DISPLAYS
TITLE: SYSTEM RISER DIAGRAM: DATAMASTER- RC-100
DESIGN: KBIERBA
DRAWN: KBIERBA
DATE: 9 JUN 05
SCALE: NONE

REV	DATE		BY
02	27 APR 12	UPDATED RC-100 HANDHELD PART NUMBER	JFL
01	01 AUG 05	REVISED TEXT	CMG

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	02	P 1279	R - 01 - A	244838

TOP VIEW

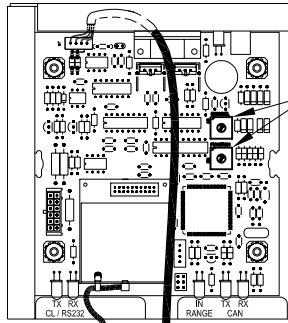### BASE STATION VIEW WITH FUNCTION SETTINGS CHART

STEP 1.1
USING A NUT DRIVER, REMOVE THE TWO NUTS ON THE TOP OF
THE RADIO ENCLOSURE. REMOVE THE COVER FROM THE
ENCLOSURE.

STEP 1.2
USING A SMALL FLAT HEAD SCREW DRIVER OR YOUR FINGERS
CHANGE THE SWITCHES TO THE DESIRED CHANNEL AND FUNCTION
NUMBER. (REFER TO STEP 1.2 VIEW AND CHART FOR CHANNEL
SELECTION.)

STEP 1.3
NOTE THE CHANNEL NUMBER YOU HAVE SET AND REATTACH THE
COVER ON THE ENCLOSURE USING THE NUTS REMOVED IN STEP
1.1. BE SURE TO REINSTALL THE ANTENNA CABLE AND COVER AS
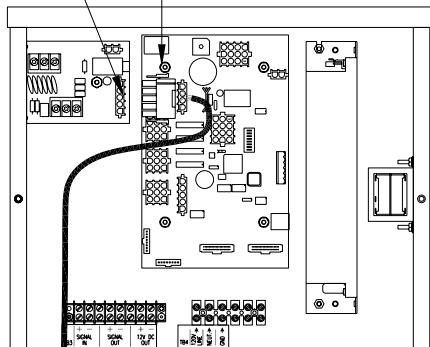THEY WHERE.

STEP 1.2 VIEW

STEP 1.2 CHART

FUNCTION SETTING	FUNCTION (SERVER MODE)
0	DEFAULT FUNCTION (LAST POWER UP FUNCTION)
1	CAN HANDHELD JUDGES CONSOLE
2	ALL SPORT SCOREBOARD CONTROLLER
3	DATA TIME MASTER DISPLAY CONTROLLER
4−E	RESERVED
F	RESET MEMORY/TEST

CONNECTING THE BASE STATION WIRE HARNESS
FRONT VIEW OF DRIVER ENCLOSURE; LID REMOVED

STEP 2.6
PLUG P1 FROM **RADIO** BASE STATION INTO
THE J2, RADIO 5 PIN JACK ON THE
SIGNAL INPUT CARD, LOCATED INSIDE OF
DRIVER ENCLOSURE. THIS IS THE ONLY
CONNECTION THAT NEEDS TO BE MADE
FOR THE RADIO RECEIVER.

J2 ON SIGNAL
INPUT CARD

WIRE FROM RADIO
RECEIVER

STEP 2.1
FIND A LOCATION ON THE INSIDE OF THE POWER/SIGNAL
ACCESS DOOR WHERE THE BASE STATION ENCLOSURE,
ONCE MOUNTED, WILL NOT INTERFERE WITH CLOSING THE
DOOR. (REFER TO YOUR SCOREBOARDS INSTALLATION
MANUAL TO DETERMINE THE LOCATION OF THE
POWER/SIGNAL ACCESS DOOR.)

STEP 2.2
CHECK FOR A PRE−DRILLED 9/32" HOLE IN THE
ACCESS DOOR. IF THERE IS NO HOLE, DRILL A 9/32"
HOLE THROUGH THE FACE OF THE DOOR AS SHOWN
BELOW.

STEP 2.3
BASE STATION ENCLOSURE INCLUDES FOUR 5" VELCRO
STRIPS. INSTALL BY REMOVING THE BACKING FROM THE
VELCRO TO EXPOSE THE ADHESIVE. ATTACH TO THE
SCOREBOARD ACCESS DOOR DIRECTLY ABOVE THE HOLE
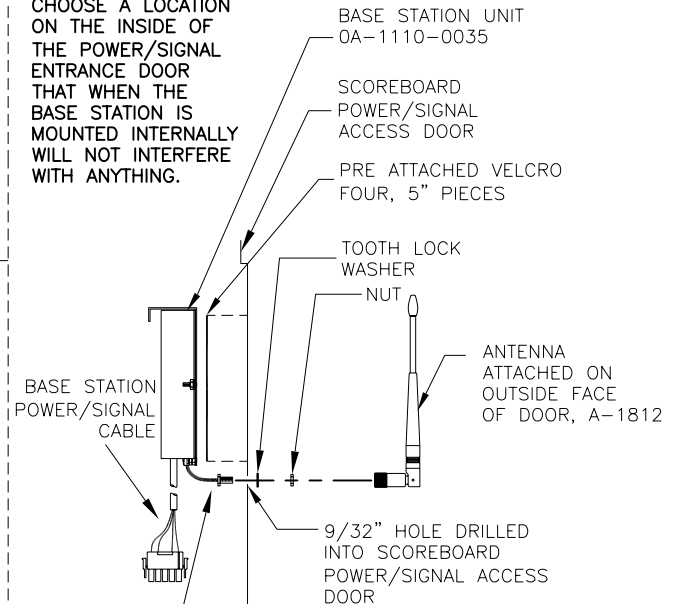YOU DRILLED EARLIER.

STEP 2.4
FEED THE ANTENNA CABLE FROM THE BASE STATION
THROUGH THE 9/32" HOLE. ATTACH THE ANTENNA
CABLE TO THE FACE OF THE SCOREBOARD WITH THE
SUPPLIED LOCK WASHER AND NUT.

STEP 2.5
ATTACH THE PROVIDED ANTENNA TO THE PREVIOUSLY
MOUNTED ANTENNA CABLE AND TIGHTEN. BE SURE TO
HAVE THE ANTENNA POINTING UP AS SHOWN BELOW.

NOTE:
BE SURE TO
CHOOSE A LOCATION
ON THE INSIDE OF
THE POWER/SIGNAL
ENTRANCE DOOR
THAT WHEN THE
BASE STATION IS
MOUNTED INTERNALLY
WILL NOT INTERFERE
WITH ANYTHING.

BASE STATION UNIT
0A−1110−0035

SCOREBOARD
POWER/SIGNAL
ACCESS DOOR

PRE ATTACHED VELCRO
FOUR, 5" PIECES

TOOTH LOCK
WASHER

NUT

ANTENNA
ATTACHED ON
OUTSIDE FACE
OF DOOR, A−1812

BASE STATION
POWER/SIGNAL
CABLE

9/32" HOLE DRILLED
INTO SCOREBOARD
POWER/SIGNAL ACCESS
DOOR

MAKE SURE THAT THE ANTENNA
CABLE IS COMING FROM THE
BOTTOM OF THE BASE STATION,
TO PREVENT WATER DAMAGE,
AS SHOWN ABOVE.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:	DATAMASTER LED DISPLAYS WITH RC−100
TITLE:	BASE STATION; INSIDE INSTALLATION

DES. BY: KBIERBA	DRAWN BY: KBIERBA	DATE: 21 JUN 05

REVISION	APPR. BY: MMILLER	
00	SCALE: NONE	1279−E07A−245626

REV.	DATE	DESCRIPTION	BY	APPR.

SIGN 1

0A-1110-0046
RC-100

0A-1110-0045
BASE STATION

0A-1279-0201
(6')

6-PIN RJ14
TERMINATED
CABLE
(25 FT)

RADIO (J12)
INPUT
OUTPUT

INPUT
OUTPUT

INPUT
OUTPUT

INPUT
OUTPUT

INPUT
OUTPUT

INPUT
OUTPUT

UNL	DM-100 LINE 1
UNL+	DM-100 LINE 2
PREM	DM-100 LINE 3
E-85	DM-100 LINE 4
DIES	DM-100 LINE 5

SIGNAL CAN BE WIRED IN ANY ORDER
AS LONG AS OUTPUT CONNECTS TO INPUT

SIGN 2

INPUT
OUTPUT

INPUT
OUTPUT

INPUT
OUTPUT

INPUT
OUTPUT

INPUT
OUTPUT

UNL	DM-100 LINE 1
UNL+	DM-100 LINE 2
PREM	DM-100 LINE 3
E-85	DM-100 LINE 4
DIES	DM-100 LINE 5

LINE NUMBER

SET LINE NUMBER USING ONE-OFFSET BINARY NOTATION.

LINE 1 — OFF LINE_BIT0 / OFF LINE_BIT1 / OFF LINE_BIT2

LINE 2 — ON LINE_BIT0 / OFF LINE_BIT1 / OFF LINE_BIT2

LINE 3 — OFF LINE_BIT0 / ON LINE_BIT1 / OFF LINE_BIT2

LINE 4 — ON LINE_BIT0 / ON LINE_BIT1 / OFF LINE_BIT2

LINE 5 — OFF LINE_BIT0 / OFF LINE_BIT1 / ON LINE_BIT2

LINE 6 — ON LINE_BIT0 / OFF LINE_BIT1 / ON LINE_BIT2

LINE 7 — OFF LINE_BIT0 / ON LINE_BIT1 / ON LINE_BIT2

LINE 8 — ON LINE_BIT0 / ON LINE_BIT1 / ON LINE_BIT2

SIGN NUMBER

SET SIGN NUMBER USING ONE-OFFSET BINARY NOTATION.

SIGN 1 — OFF SIGN_BIT0 / OFF SIGN_BIT1 / OFF SIGN_BIT2

SIGN 2 — ON SIGN_BIT0 / OFF SIGN_BIT1 / OFF SIGN_BIT2

SIGN 3 — OFF SIGN_BIT0 / ON SIGN_BIT1 / OFF SIGN_BIT2

SIGN 4 — ON SIGN_BIT0 / ON SIGN_BIT1 / OFF SIGN_BIT2

SIGN 5 — OFF SIGN_BIT0 / OFF SIGN_BIT1 / ON SIGN_BIT2

SIGN 6 — ON SIGN_BIT0 / OFF SIGN_BIT1 / ON SIGN_BIT2

SIGN 7 — OFF SIGN_BIT0 / ON SIGN_BIT1 / ON SIGN_BIT2

SIGN 8 — ON SIGN_BIT0 / ON SIGN_BIT1 / ON SIGN_BIT2

RESERVED

OFF RESERVED
OFF RESERVED

LEAVE RESERVED SWITCHES "OFF"

ALL SWITCHES IN THE OFF POSITION

OFF
1 2 3 4 5 6 7 8

NOTES:

EVERY DRIVER MUST HAVE A UNIQUE ADDRESS

BASE STATION MUST BE SET TO FUNCTION 3

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: THIN GAS PRICE DISPLAYS

TITLE: DIPSWITCH SETTINGS; RC-100

DES. BY: THENDRI   DRAWN BY: KBIERBA   DATE: 27 SEP 05

REVISION	APPR. BY:	
00	SCALE: NONE	1356-E10B-258289

REV.	DATE	DESCRIPTION	BY	APPR.

Appendix B: Daktronics Warranty and Limitation of Liability

DAKTRONICS WARRANTY & LIMITATION OF LIABILITY

This Warranty and Limitation of Liability (the "Warranty") sets forth the warranty provided by Daktronics with respect to the Equipment. By accepting delivery of the Equipment, Purchaser and End User agree to be bound by and accept these terms and conditions. Unless otherwise defined herein, all terms within the Warranty shall have the same meaning and definition as provided elsewhere in the Agreement.

DAKTRONICS WILL ONLY BE OBLIGATED TO HONOR THE WARRANTY SET FORTH IN THESE TERMS AND CONDITIONS UPON RECEIPT OF FULL PAYMENT FOR THE EQUIPMENT.

1. **Warranty Coverage**

    A. Daktronics warrants to the original end user (the "End User") that the Equipment will be free from Defects (as defined below) in materials and workmanship for a period of one (1) year (the "Warranty Period"). The Warranty Period shall commence on the earlier of: (i) four weeks from the date that the Equipment leaves Daktronics' facility; or (ii) Substantial Completion as defined herein. The Warranty Period shall expire on the first anniversary of the commencement date.

    "Substantial Completion" means the operational availability of the Equipment to the End User in accordance with the Equipment's specifications, without regard to punch-list items, or other non-substantial items which do not affect the operation of the Equipment.

    B. Daktronics' obligation under this Warranty is limited to, at Daktronics' option, replacing or repairing, any Equipment or part thereof that is found by Daktronics not to conform to the Equipment's specifications. Unless otherwise directed by Daktronics, any defective part or component shall be returned to Daktronics for repair or replacement. This Warranty does not include on-site labor charges to remove or install these components. Daktronics may, at its option, provide on-site warranty service. Daktronics shall have a reasonable period of time to make such replacements or repairs and all labor associated therewith shall be performed during regular working hours. Regular working hours are Monday through Friday between 8:00 a.m. and 5:00 p.m. at the location where labor is performed, excluding any holidays observed by Daktronics.

    C. Daktronics shall pay ground transportation charges for the return of any defective component of the Equipment. All such items shall be shipped by End User DDP Daktronics designated facility. If returned Equipment is repaired or replaced under the terms of this Warranty, Daktronics will prepay ground transportation charges back to End USer and shall ship such items DDP End User's designated facility; otherwise, End User shall pay transportation charges to return the Equipment back to the End User and such Equipment shall be shipped Ex Works Daktronics designated facility. All returns must be pre-approved by Daktronics before shipment. Daktronics shall not be obligated to pay freight for any unapproved return. End User shall pay any upgraded or expedited transportation charges.

    D. Any replacement parts or Equipment will be new or serviceably used, comparable in function and performance to the original part or Equipment, and warranted for the remainder of the Warranty Period. Purchasing additional parts or Equipment from the Seller does not extend the Warranty Period.

    E. Defects shall be defined as follows. With regard to the Equipment (excepting LEDs), a "Defect" shall refer to a material variance from the design specifications that prohibit the Equipment from operating for its intended use. With respect to LEDs, "Defects" are defined as LED pixels that cease to emit light. Unless otherwise expressly provided, this Warranty does not impose any duty or liability upon Daktronics for partial LED pixel degradation. Notwithstanding the foregoing, in no event does this Warranty include LED pixel degradation caused by UV light. This Warranty does not provide for the replacement or installation of communication methods including but not limited to, wire, fiber optic cable, conduit, trenching, or for the purpose of overcoming local site interference radio equipment substitutions.

    EXCEPT AS OTHERWISE EXPRESSLY SET FORTH IN THIS WARRANTY, TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, DAKTRONICS DISCLAIMS ANY AND ALL OTHER PROMISES, REPRESENTATIONS AND WARRANTIES APPLICABLE TO THE EQUIPMENT AND REPLACES ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ACCURACY OR QUALITY OF DATA. OTHER ORAL OR WRITTEN INFORMATION OR ADVICE GIVEN BY DAKTRONICS, ITS AGENTS OR EMPLOYEES, SHALL NOT CREATE A WARRANTY OR IN ANY WAY INCREASE THE SCOPE OF THIS LIMITED WARRANTY.

    THIS LIMITED WARRANTY IS NOT TRANSFERABLE.

2. **Exclusion from Warranty Coverage**

    This Warranty does not impose any duty or liability upon Daktronics for any:

    A. damage occurring at any time, during shipment of Equipment unless otherwise provided for in the Agreement. When returning Equipment to Daktronics for repair or replacement, End User assumes all risk of loss or damage, agrees to use any shipping containers that might be provided by Daktronics, and to ship the Equipment in the manner prescribed by Daktronics;

    B. damage caused by: (i)the improper handling, installation, adjustment, use, repair, or service of the Equipment,or (ii) any physical damage which includes, but is not limited to, missing, broken, or cracked components resulting from non-electrical causes; altered, scratched, or fractured electronic traces; missing or gauged solder pads; cuts or clipped wires; crushed, cracked, punctured, or bent circuit boards; or tampering with any electronic connections, provided that such damage is not caused by personnel of Daktronics or its authorized repair agents;

    C. damage caused by the failure to provide a continuously suitable environment, including, but not limited to: (i) neglect or misuse; (ii) improper power including, without limitation, a failure or sudden surge of electrical power; (iii) improper air conditioning, humidity control, or other environmental conditions outside of the Equipment's technical specifications such as extreme temperatures, corrosives and metallic pollutants; or (iv) any other cause other than ordinary use;

D. damage caused by fire, flood, earthquake, water, wind, lightning or other natural disaster, strike, inability to obtain materials or utilities, war, terrorism, civil disturbance, or any other cause beyond Daktronics' reasonable control;

E. failure to adjust, repair or replace any item of Equipment if it would be impractical for Daktronics personnel to do so because of connection of the Equipment by mechanical or electrical means to another device not supplied by Daktronics, or the existence of general environmental conditions at the site that pose a danger to Daktronics personnel;

F. statements made about the product by any salesperson, dealer, distributor or agent, unless such statements are in a written document signed by an officer of Daktronics. Such statements as are not included in a signed writing do not constitute warranties, shall not be relied upon by End User and are not part of the contract of sale;

G. damage arising from the use of Daktronics products in any application other than the commercial and industrial applications for which they are intended, unless, upon request, such use is specifically approved in writing by Daktronics;

H. replenishment of spare parts. In the event the Equipement was purchased with a spare parts package, the parties acknowledge and agree that the spare parts package is designed to exhaust over the life of the Equipment, and as such, the replenishment of the spare parts package is not included in the scope of this Warranty;

I. security or functionality of the End User's network or systems, or anti-virus software updates;

J. performance of preventive maintenance;

K. third-party systems and other ancillary equipment, including without limitation front-end video control systems, audio systems, video processors and players, HVAC equipment, batteries and LCD screens;

L. incorporation of accessories, attachments, software or other devices not furnished by Daktronics; or

M. paint or refinishing the Equipment or furnishing material for this purpose.

3.   **Limitation of Liability**

Daktronics shall be under no obligation to furnish continued service under this Warranty if alterations are made to the Equipment without the prior written approval of Daktronics.

It is specifically agreed that the price of the Equipment is based upon the following limitation of liability. In no event shall Daktronics (including its subsidiaries, affiliates, officers, directors, employees, or agents) be liable for any claims asserting or based on (a) loss of use of the facility or equipment; lost business, revenues, or profits; loss of goodwill; failure or increased cost of operations; loss, damage or corruption of data; loss resulting from system or service failure, malfunction, incompatibility, or breaches in system security; or (b) any special, consequential, incidental or exemplary damages arising out of or in any way connected with the Equipment or otherwise, including but not limited to damages for lost profits, cost of substitute or replacement equipment, down time, injury to property or any damages or sums paid to third parties, even if Daktronics has been advised of the possibility of such damages. The foregoing limitation of liability shall apply whether any claim is based upon principles of contract, tort or statutory duty, principles of indemnity or contribution, or otherwise.

In no event shall Daktronics be liable for loss, damage, or injury of any kind or nature arising out of or in connection with this Warranty in excess of the Purchase Price of the Equipment. The End User's remedy in any dispute under this Warranty shall be ultimately limited to the Purchase Price of the Equipment to the extent the Purchase Price has been paid.

4.   **Assignment of Rights**

The Warranty contained herein extends only to the End User (which may be the Purchaser) of the Equipment and no attempt to extend the Warranty to any subsequent user-transferee of the Equipment shall be valid or enforceable without the express written consent of Daktronics.

5.   **Governing Law**

The rights and obligations of the parties under this Warranty shall not be governed by the provisions of the United Nations Convention on Contracts for the International Sales of Goods of 1980. The parties consent to the application of the laws of the State of South Dakota to govern, interpret, and enforce each of the parties' rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Warranty, without regard to conflict of law principles.

6.   **Availability of Extended Service Agreement**

For End User's protection, in addition to that afforded by the warranties set forth herein, End User may purchase extended warranty services to cover the Equipment. The Extended Service Agreement, available from Daktronics, provides for electronic parts repair and/or on-site labor for an extended period from the date of expiration of this warranty. Alternatively, an Extended Service Agreement may be purchased in conjunction with this Warranty for extended additional services. For further information, contact Daktronics Customer Service at 1-800-DAKTRONics (1-800-325-8766).