The DSC series
Dynamic Sequencing Controller
(for Aquatic Playgrounds)

Water Odyssey

by Fountain People, Inc.

Water Odyssey™
Dynamic Sequencing Controller

This manual is intended to acquaint the user with both installation of the DSC and the procedures for modifying the various settings responsible for the behavior of the aquatic playground.

Aquatic Playgrounds create a stimulating interactive play environment for children. The operational control of these play areas has evolved.

Prior to the introduction of the DSC Series Controller an aquatic playground's control system was commonly comprised of time clocks, timers, Programmable Logic Controllers (PLCs), sequencers and a lot of wire.

This equipment was wired together according to the individual aquatic playground's design requirements. For example, if an aquatic playground required two time clocks and three sequencers, the control panel would consist of two time clocks and three sequencers. Not only is this design limited in its ability to add interactivity to an aquatic playground, it is difficult to modify the programming and often requires assistance from the manufacturer.

Advantages

The DSC controller was designed specifically for aquatic play applications. It is reliable, flexible, and easy to reprogram in the field or in the comfort of your office on a PC.

With the DSC base module you have the equivalent of 60 time clocks, 60 timers, 60 cycle timers, 30 sequencers, and logic control all in one easy to program package! The "wiring" of these components is performed by selecting and setting event properties in the DSC.

Events are the programming equivalent of wiring equipment together. Basically, an event is a list of options that determine what will start a water feature, how a water feature will behave, how long a water feature will run and lastly what wire terminal will power the water feature. The following table lists a few the available choices for every event.

Inputs (select one or many)

- ✓ **8 Additional Terminals per Module**
- ✓ **32 Wireless Activators**
- ✓ **7 Different Time Clocks**

Outputs (select one or many)

- ✓ **8 Additional Terminals per Module**

Functions (select one)

- ✓ **Duration Timer**
- ✓ **Cycled On/Off Timer**
- ✓ **Defined Sequence**
- ✓ **Random Output**
- ✓ **Event Cue**

The DSC allows up to 60 user changeable events. The options for each event are accessible through the DSC by using the integral keypad and LCD display.

With the DSC, you can easily upgrade your aquatic playground, add new features, add new activators, or just change the Play Scenario™ of the aquatic playground anytime you want. No more waiting on the manufacturer to return your call.

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The DSC controller is highly versatile and has a wide range of capabilities. Becoming familiar with these capabilities will help you to understand how to apply them to your aquatic play area.

Interface Control Module
- Each system is shipped with a detailed drawing set unique to the project.
- Built in operating hours that you can set for each weekday. (in 15 minute increments)
- A Play Scenario™ is preprogrammed, essentially making your aquatic playground ready for operation once installation is complete.
- Input and output terminal blocks are removable, allowing for easy wiring.
- Terminal blocks are spring loaded and include a wire installation tool.
- The output voltage is 24VAC.
- WaterScript™ is a Microsoft® Windows® based program that makes programming the DSC even easier with its simple to use drag and drop interface.

Activators
- Eight wired inputs per module.
- Integral support for up to 32 Wireless Activators.
- Wireless activator addresses are field adjustable.
- Seven types of time clock activators ranging from hourly to specific time and weekday.

Event Functions
- Duration: Turn on water features for a set period of time.
- Cycled: Cycle water features on and off for a set period of time.
- Random: Cycle random water features on and off at random rate.
- Defined: Turn water features on based on a user defined pattern.
- Event Cue: Cycle through multiple events with one activator.

Built in Diagnostic Tests
- Test wired inputs to ensure they are wired to the correct activator
- Test wireless inputs to confirm their addresses and check for low batteries.
- Test outputs to ensure they are wired to the correct water feature.
- Test individual events to ensure that they behave the way you expect.

Panel Components

**The image below illustrates the basic components found in a DSC panel.
Use this as a reference for information discussed later in the manual**

Wireless Receiver

A wireless receiver and 150' of shielded cable are supplied if your system uses wireless activators. The receiver will need to be installed and the cable must be connected to the a port on the Communication Bus inside the DSC panel. Reference the electrical drawings included with your system.

IMPORTANT: *The receiver should be installed at least 10 feet above grade, no more than 150 feet from the furthest activator, and within line of sight of all the activators. (See wireless installation parameters drawing)*

DSC Components

The image below identifies the basic components found on the Main Module of a DSC panel. Use this as a reference for information discussed later in the manual.

DSC Display

Navigation Keys

Ethernet Port

SD Card

DC Wired Input Indicators

(Wireless Systems do not require DC Input modules)

AC Wired Output Indicators

DC Inputs

AC Outputs
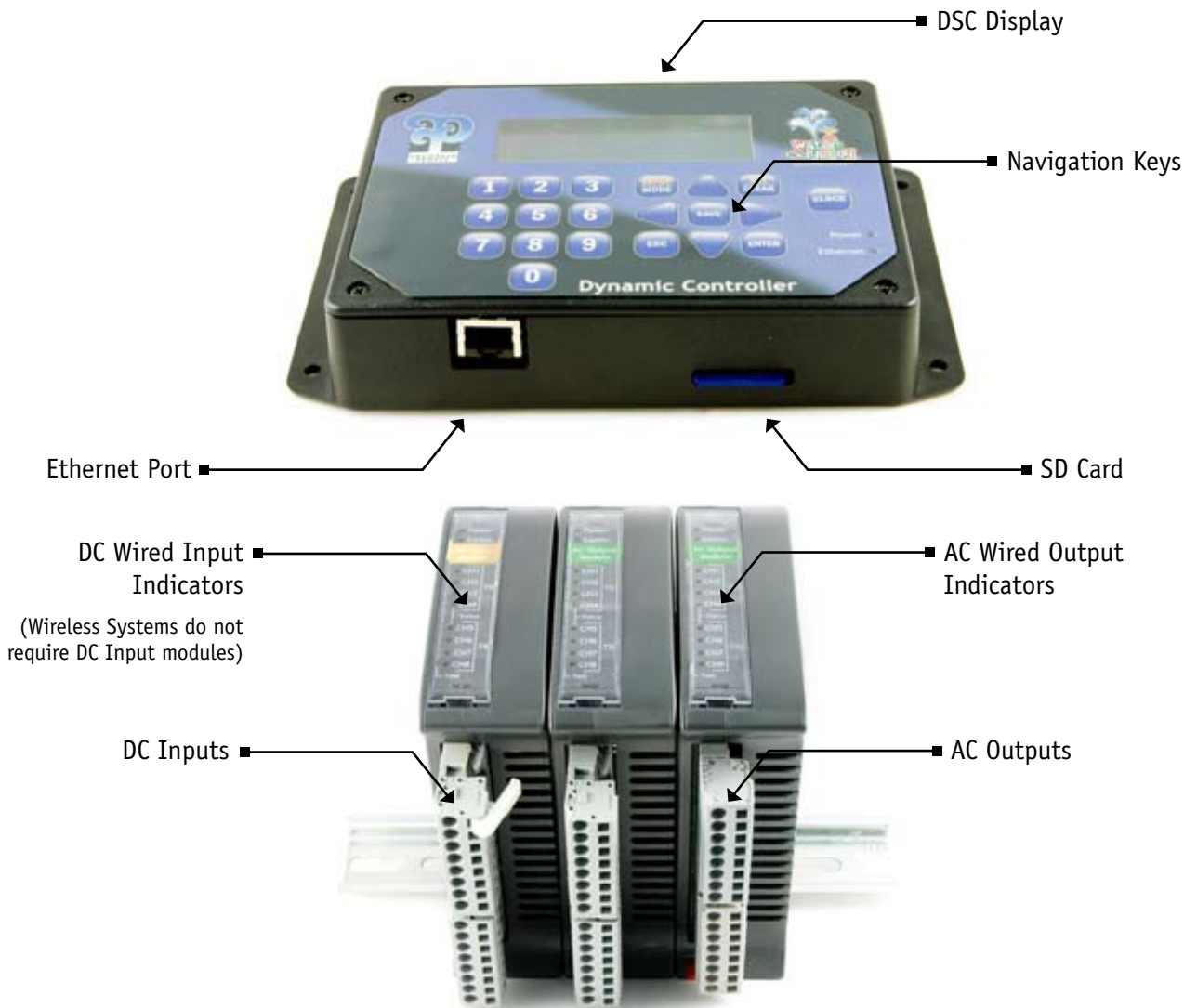
Wire Installation Tool

There are two tools attached to the terminal blocks. These tools can be removed and placed over the terminal you are wiring. After removing the terminal plug, snap the installation tool on the desired terminal and press down on the tool while supporting the terminal plug. The spring terminal will open allowing easy connection of each wire. When the wiring is complete, plug the terminal block into the DSC.

version 1.2

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Quick Start

This section contains information to assist in understanding your project's installation documents, basic operation of the DSC, and system testing.

Unique to each job is a documentation set placed inside the control panel. This package contains an event table, electrical diagrams, site plan, and manifold drawing.

Event Table

Before the DSC panel ships it is setup to perform a Play Scenario™ (see page 22) developed by a factory designer. The Play Scenario consists of one or more events that determine how the water features will behave. These events are documented on an event table.

The event table assigns the water features to their event numbers, activators, and the outputs assigned to their solenoid valves. Secondly, it describes the events' function which determines how the water features will behave when they are activated.

Project	W5115 Fantasy Island Park
Entered Project	
Entered Time	
Entered Date	1/29/2008
Programmer	Mr. Rourke
Play Senaro	

Element	Event	Activation Type (Input)			Output	Operation Time	Event Type	Seq No.	Time On	Cycle On	Cycle Off
		Wired	Wireless	Other							
Weeping Water	1	011			021	Park Hours	Duration		4min		
Roll-A-Rail	1	011			022	Park Hours	Duration		4min		
Water Web	2	011			023	Park Hours	Cycled	1	3min	15 sec	4 sec
Water Cage	2	011			024	Park Hours	Cycled	1	3min	5 sec	5 sec
Aqua Arch	3		A1		025	Park Hours	Random	2	2min		
Aqua Arch	3		A1		026	Park Hours	Random	2	2min		
Aqua Arch	3		A1		027	Park Hours	Random	2	2min		
Aqua Arch	3		A1		028	Park Hours	Random	2	2min		
Aqua Arch	3		A1		031	Park Hours	Random	2	2min		
Aqua Arch	3		A1		032	Park Hours	Random	2	2min		
Pop Drops	4		A1		033	Park Hours	Defined	3	1min		
Pop Drops	4		A1		034	Park Hours	Defined	3	1min		
Pop Drops	4		A1		035	Park Hours	Defined	3	1min		
Pop Drops	4		A1		036	Park Hours	Defined	3	1min		
Pop Drops	4		A1		037	Park Hours	Defined	3	1min		
Pop Drops	4		A1		038	Park Hours	Defined	3	1min		
Morning Prime	5			Park Hours	021-038	Park Hours	Defined	4	3min		

Electrical Drawings

These drawings illustrate how the DSC is wired in the panel as well as how to connect the wired activators and solenoid valves to the terminal blocks.

Note: *It is very important to terminate the field wiring (indicated by dashed lines) correctly in order for the aquatic playground to function in the manner described in the Play Scenario™.*
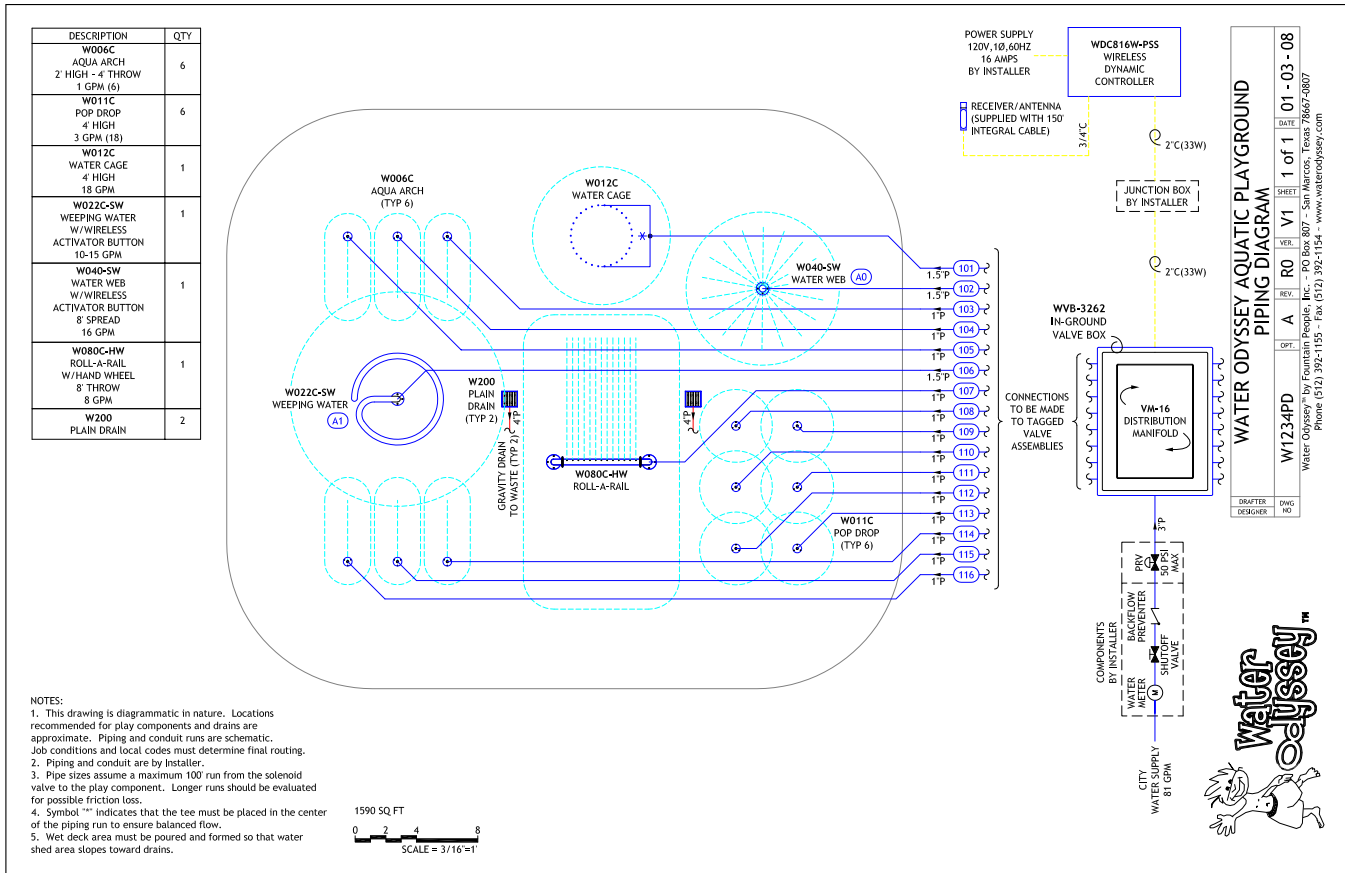
It may be necessary to test the outputs (see page 18) to ensure that the water features' solenoid valves are controlled be the outputs shown in the provided electrical drawing.
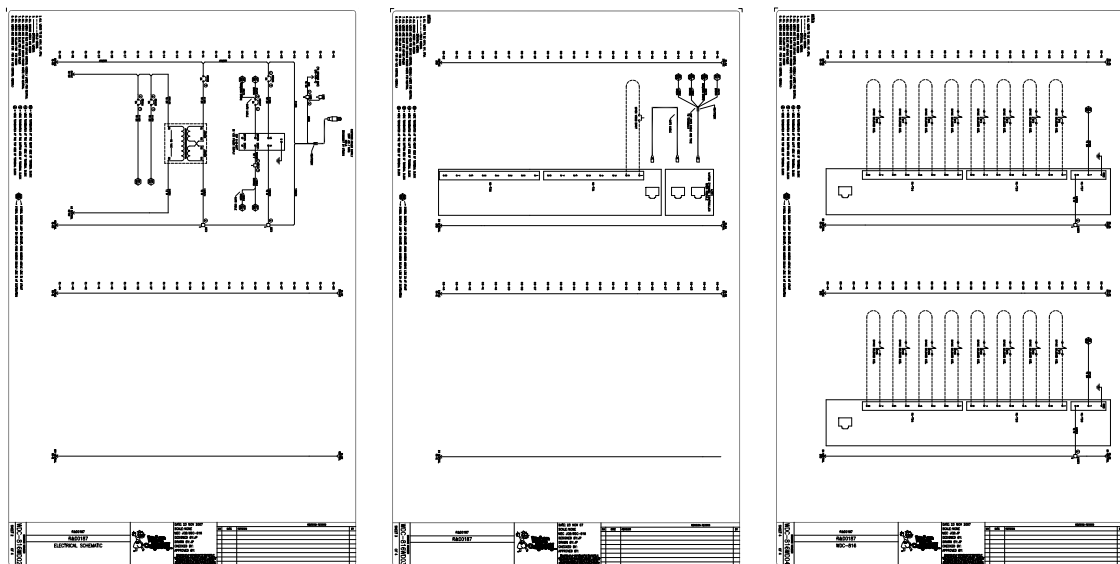
Included Documentation

Site Plan Drawing

This drawing shows your aquatic playground layout and illustrates how the play elements and other components are interrelated. Each discharge line is labeled and corresponds to the electrical drawing. Example, the valve labeled 102 connects to wired Output 2 on the on module 1.

DESCRIPTION	QTY
W006C AQUA ARCH 2' HIGH - 4' THROW 1 GPM (6)	6
W011C POP DROP 4' HIGH 3 GPM (18)	6
W012C WATER CAGE 4' HIGH 18 GPM	1
W022C-SW WEEPING WATER W/WIRELESS ACTIVATOR BUTTON 10-15 GPM	1
W040-SW WATER WEB W/WIRELESS ACTIVATOR BUTTON 8' SPREAD 16 GPM	1
W080C-HW ROLL-A-RAIL W/HAND WHEEL 8' THROW 8 GPM	1
W200 PLAIN DRAIN	2

NOTES:
1. This drawing is diagrammatic in nature. Locations recommended for play components and drains are approximate. Piping and conduit runs are schematic. Job conditions and local codes must determine final routing.
2. Piping and conduit are by Installer.
3. Pipe sizes assume a maximum 100' run from the solenoid valve to the play component. Longer runs should be evaluated for possible friction loss.
4. Symbol "*" indicates that the tee must be placed in the center of the piping run to ensure balanced flow.
5. Wet deck area must be poured and formed so that water shed area slopes toward drains.

1590 SQ FT

SCALE = 3/16'=1'

POWER SUPPLY 120V,1Ø,60HZ 16 AMPS BY INSTALLER

WDC816W-PSS WIRELESS DYNAMIC CONTROLLER

RECEIVER/ANTENNA (SUPPLIED WITH 150' INTEGRAL CABLE)

2"C(33W)

JUNCTION BOX BY INSTALLER

2"C(33W)

WVB-3262 IN-GROUND VALVE BOX

VM-16 DISTRIBUTION MANIFOLD

CONNECTIONS TO BE MADE TO TAGGED VALVE ASSEMBLIES

W006C AQUA ARCH (TYP 6)

W012C WATER CAGE

W040-SW WATER WEB (A0)

W022C-SW WEEPING WATER (A1)

W200 PLAIN DRAIN (TYP 2)

GRAVITY DRAIN TO WASTE (TYP 2)

W080C-HW ROLL-A-RAIL

W011C POP DROP (TYP 6)

1.5"P 101
1.5"P 102
1"P 103
1"P 104
1"P 105
1.5"P 106
1"P 107
1"P 108
1"P 109
1"P 110
1"P 111
1"P 112
1"P 113
1"P 114
1"P 115
1"P 116

COMPONENTS BY INSTALLER

WATER METER
BACKFLOW PREVENTER
SHUTOFF VALVE
PRV
50 PSI MAX

3"P

CITY WATER SUPPLY 81 GPM

WATER ODYSSEY AQUATIC PLAYGROUND PIPING DIAGRAM

W1234PD

A R0 V1 1 of 1 01-03-08

OPT. REV. VER. SHEET DATE

DRAFTER DESIGNER DWG NO

Water Odyssey™ by Fountain People, Inc. - PO Box 807 - San Marcos, Texas 78667-0807 Phone (512) 392-1155 - Fax (512) 392-1154 - www.waterodyssey.com

Use your Water Odyssey™ Field Connections Drawing to determine how to plumb each aquatic play element to the appropriate solenoid valve.

As a precaution it is recommended that you verify the water features in your play area are plumbed to the appropriate solenoid valve. Here are a few items to check:

- Cloud 9™ elements should be plumbed to 1″ solenoid valves grouped on a manifold with a pressure reducing valve set to a maximum of 20 psi.
- The larger above ground water features such as a Saguaro Soaker™ should be plumbed to 2″ solenoid valves grouped with the 1″ solenoid valves on a manifold with a maximum of 20 psi.

Important Note: Your manifold will have tags on the solenoid valves marked to coordinate with the Piping Diagram and Electrical drawings. The Contractor is required to do the following:

- Plumb water features to the appropriate solenoid valves.
- Run independent valve cables from each solenoid to the Water Odyssey Dynamic Sequencing Controller. **DO NOT SHARE COMMONS.** Check label on each wire to assure proper connection.
- Connect the solenoid wires to the appropriate terminals according to the electrical drawings.

Note: *If solenoid valves are supplied by others, 24VAC solenoid valves must be used and must **not** exceed 18 watts per valve. A pressure regulating valve is necessary to maintain appropriate pressure. Maximum pressure to the manifold must not exceed 35psi.*

Main Screen & Keypad

Main Screen

This screen is displayed after the DSC has powered up. This screen displays the Water Odyssey™ project number, the current state of the operating hours, system messages including when a wireless activator requires a new battery, and the current date and time.

```
W6874 Control System
      Push Setup
Operating Hours:    On
Thr, Jan 01 11:23 AM
```
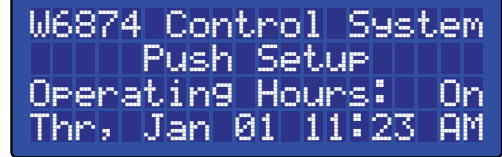
Keypad

The keypad consists of 20 keys used to navigate and modify all the settings in the DSC. This list describes their most common function.

Clock

Press this key at any time to cycle through operating modes.
• Auto   DSC will run according to the operating hours.
• On   DSC will force operating hours on.
• Off   DSC will force operating hours off.

Setup | Mode

Press this key to access event settings, operating hours, system tests, and system setup. When a Password is set you are required to enter the password before gaining access to the controller settings.

Enter

Used for navigation and selection of properties.

ESC | Back

Used for navigation, pressing the [ESC | BACK] key will return you to the previous screen.

Save

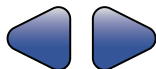Press this key at anytime to permanently store any changes that you have made.

Set | Clear

Used to modify event properties, operating hours, and defined sequences.

Left and Right Arrows

Used to modify event properties and for navigating operating hours and defined sequences.
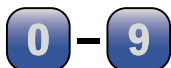
Up and Down Arrows

Used for navigation throughout the menus and settings.

Numbers

Used to enter numeric values and for navigation shortcuts.

Menu Navigation

The [UP ARROW] and [DOWN ARROW] keys are used to navigate through menu options. Note that not all menu items are displayed on the screen at once. This is illustrated by the two options System Status and System Setup shown below the screen to the left.
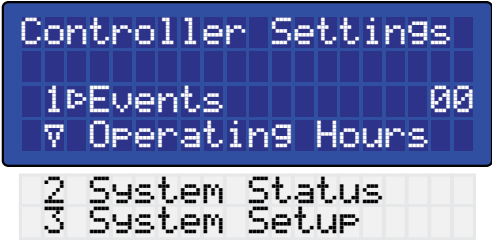
To display these options on the screen scroll down using the [DOWN ARROW] key. The numbers to the left of the menu items are shortcut keys. These can be used instead of the arrows. For example pressing the [4] key will go directly to System Setup. Examples in this manual are shown using shortcut keys whenever possible.

```
Controller Settings

1▷Events           00
▽ Operating Hours
2 System Status
3 System Setup
```

```
Controller Settings

1▷Events           00
▽ Operating Hours
```
➡
```
Events

1▷Add New
▽ Edit
```

Note: At anytime press the [ESC | Back] key to return to the previous screen.

The screen above shows an arrow (▷) pointing to the Events menu item. This arrow indicates the current item for selection. To select this item press the [ENTER] or [RIGHT ARROW] key. Doing so will display the Events screen. You can also press the shortcut key, [1].

```
Controller Settings
△ Events           00
1▷Operating Hours
▽ System Tests
```
➡
```
Move:15min  10:45 AM
Sun |  ▶————————————◀
Mon |       ▶—————————◀
Tue |       ▶—————————◀
```

To access Operating Hours, scroll down using the [DOWN ARROW] key until the arrow points to the Operating Hours menu item and press the [ENTER] or [RIGHT ARROW] key. You can also press the shortcut key, [2].

```
Controller Settings
△ Operating Hours
1▷System Status
▽ System Tests
```
➡
```
System Status

1▷Event            6
▽ Module           3
```

To access System Tests, scroll down using the [DOWN ARROW] key until the arrow points to the System Tests menu item and press the [ENTER] or [RIGHT ARROW] key. You can also press the shortcut key, [3].

```
Controller Settings
△ System Status
4▷System Setup
```
➡
```
System Setup

1▷Set Password
▽ Date: 01/01/2008
```

To access System Setup, scroll down using the [DOWN ARROW] key until the arrow points to the System Setup menu item and press the [ENTER] or [RIGHT ARROW] key. You can also press the shortcut key, [4].

Adjust Date & Time

The DSC has a built-in time clock with calendar that will maintain proper time and date even when the unit is not powered. This gives the DSC the capability of controlling events based on the time of day and the day of the week.

Adjust the System Time

The DSC is set to your aquatic playground's time zone before leaving the factory. The time can be adjusted using the following procedure.

```
System Setup
 ▲ Date:  01/01/2008
 3▷Time:     11:23 AM
 ▽ Disable Outputs
```
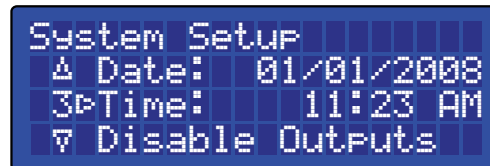
Starting on the Main Screen, press [SETUP] [4] [3]. This will display the System Settings screen and place the cursor on the Time item. Next press the [RIGHT ARROW] to place the cursor in the Time field. Using the numeric keys enter the current time. To change between AM and PM position the cursor on the AM/PM using the [RIGHT ARROW] key and press the [SET|CLEAR] key.
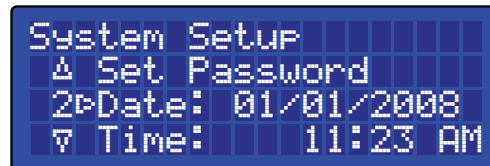
Example: How to change the time from 11:23 AM to 2:45 PM.
Starting on the Main Screen, press the following keys:
[SETUP] [4] [3] [RIGHT ARROW] [0] [2] [4] [5] [SET|CLEAR] [RIGHT ARROW]

Adjust the System Date

The Date is preset before leaving the factory. The date can be adjusted using the following procedure.

```
System Setup
 ▲ Set Password
 2▷Date: 01/01/2008
 ▽ Time:     11:23 AM
```

Starting on the Main Screen, press [SETUP] [4] [2]. This will display the System Settings screen and place the cursor on the Date item. If you are already on the System Setup screen use the [UP ARROW] and/or [DOWN ARROW] keys to scroll to the Date item. Next press the [RIGHT ARROW] to place the cursor in the Date field. Using the numeric keys enter the current date. Note that the DSC will support dates up to the year 2047.

Example: How to change the date from 01/01/2008 to 08/11/2008
Starting on the Main Screen, press the following keys:
[SETUP] [4] [2] [RIGHT ARROW] [8] [1] [1] [0] [8]

Adjust the Operating Hours

Your aquatic playground operating hours can be uniquely set in 15 minute increments for each day of the week.

The DSC is shipped with operating hours preset to open at 10:00 AM and close at 6:00 PM for your time zone. These hours can be modified to suit the requirements of the aquatic playground. Each day can have multiple open and close times and each day of the week can have its' own unique operating hours.

Access the Operating Hours

Starting on the Main Screen, press [SETUP] [2]. This will display the Operating Hours screen and place the cursor on Monday at 10:00 AM.

The top row displays the cursor move and the cursor location. The cursor move determines how many spaces the cursor will move when the [LEFT ARROW] and [RIGHT ARROW] keys are pressed. The move value can be adjusted by pressing the [SETUP|MODE] key. The possible values are 15 minutes and 2 hours.
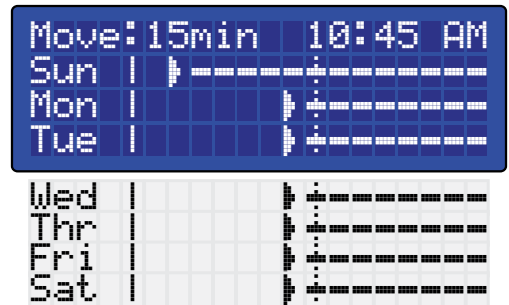
The cursor location is shown in the upper right corner, 10:45 AM on the screen above. This value will change when the [LEFT ARROW] or [RIGHT ARROW] key is pressed to reflect the current cursor location.

Use the [UP ARROW] and [DOWN ARROW] keys to scroll through the days of the week. Use the [LEFT ARROW] and [RIGHT ARROW] keys to scroll through the times of the day. Press the [SET|CLEAR] key to set and clear the open and close times on the display.

Example: Setting open and close times

Use the [LEFT ARROW] and [RIGHT ARROW] keys to scroll to the time you want the aquatic playground to open. Press the [SET|CLEAR] key, the screen should be similar to the following. The DSC automatically fills in the time to the right with dashed lines

Using the [LEFT ARROW] and [RIGHT ARROW] keys scroll to the time you want the aquatic playground to close. Press the [SET|CLEAR] key, the screen should be similar to the following:

If you insert a time in-between the open and close times all the open and close times to the right will be inverted. The screen should be similar to the following:

Add a Password

To prevent unauthorized personnel from modifying settings, the DSC can be password protected. Once enabled, a password is required every time the [SETUP] key is pressed to allow access to the controller's settings.

The DSC is shipped with password protection enabled. The default password is 1155. To modify password protection and set a new system password perform the following steps.

Starting at the Main screen, press [SETUP] enter the password [1] [1] [5] [5] navigate to the password settings [4] [1]. This will display the Password screen and wait for you to enter a four digit password.

```
Enter Password
    ....
```

Next press the four desired keys to set the password. A password can only consist of numeric values. After the four keys have been pressed a second password screen will be displayed requiring that the four keys are reentered for confirmation.

```
Confirm Password
    ....
```
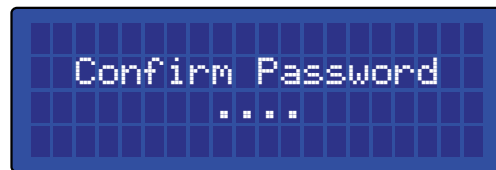
After the password is reentered you are returned to the System Setup screen and password protection is now enabled. Once set, you will be asked to enter the password to gain access to the DSC's settings.

Example: How to enable password protection and set the password to 3194.
Starting on the Main Screen, press the following keys:
[SETUP] [1] [1] [5] [5] [4] [1] [3] [1] [9] [4] [3] [1] [9] [4]

To disable password protection go to the set password screen and enter 0000 for the password. This instructs the DSC to disable password protection.

Example: How to disable password protection.
Starting on the Main Screen, press the following keys:
[SETUP] [Enter Password] [4] [1] [0] [0] [0] [0] [0] [0] [0] [0]

The operating hours can be overridden simply by pressing the clock override button. This will allow you to operate the aquatic playground while operating hours are off, and shut it down while the operating hours are on.
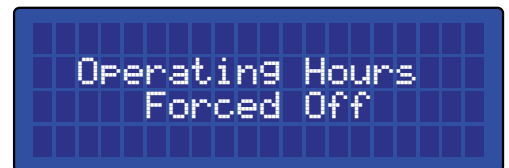
Force Operating Hours On

Press the [CLOCK] key until you see the Operating Hours Forced On screen. While the DSC display is on the main screen the Forced On screen will periodically flash as a reminder that the operating hours are not in their normal automatic mode.
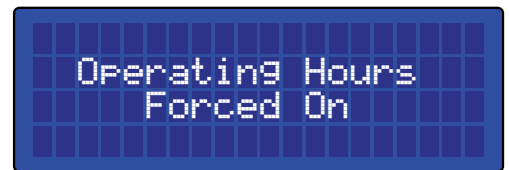
All Events set to run while operating hours are on will be enabled. Events requiring an activator in order to operate will need to be activated as they would normally.

```
Operating Hours
   Forced On
```

Force Operating Hours Off

Press the [CLOCK] key until you see the Operating Hours Forced Off screen. While the DSC display is on the main screen the Forced Off screen will periodically flash as a reminder that the operating hours are not in their normal automatic mode.

All events that require operating hours on in order to operate will be disabled.

```
Operating Hours
   Forced Off
```

Set Operating Hours to Automatic

Press the [CLOCK] key until you see the Operating Hours Auto screen. The aquatic playground will start and stop according to the Operating Hours settings.

```
Operating Hours
     Auto
```