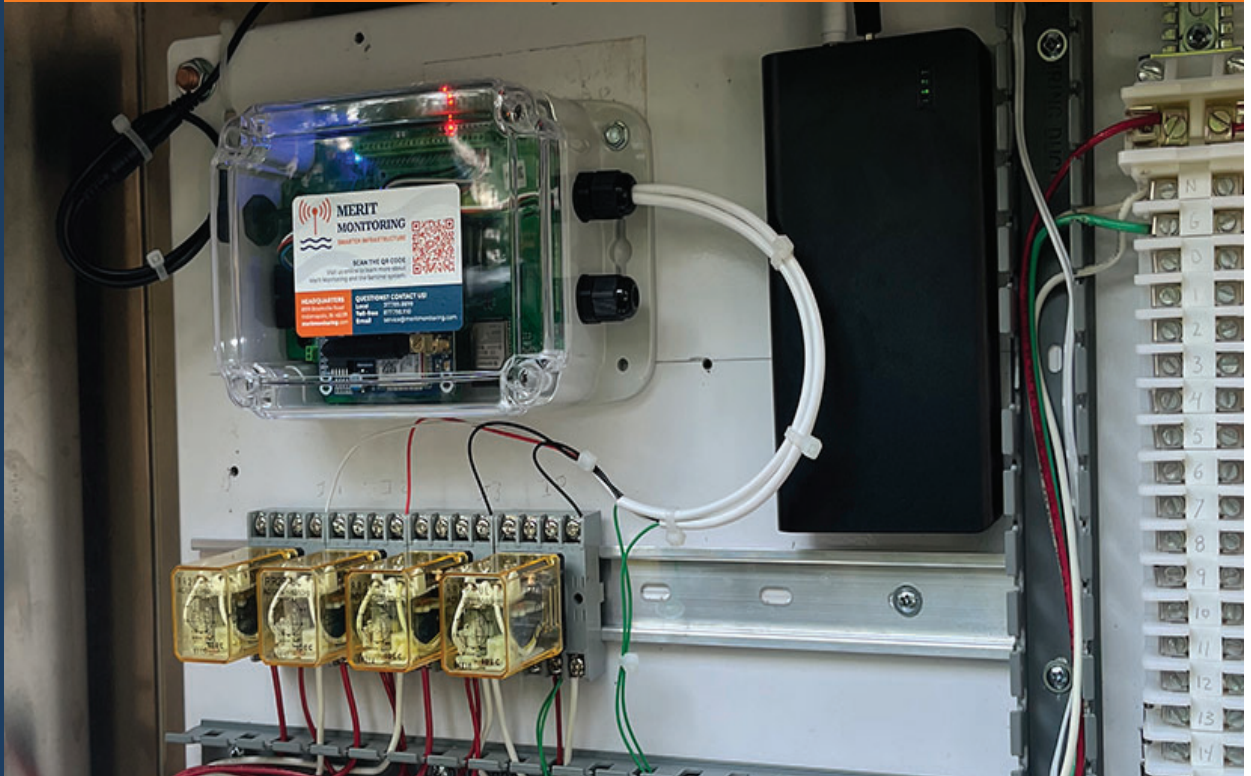


SENTINEL SENTINEL+ SCOUT

Installation & Owner's Guide



TOLL-FREE 877.798.1110
EMAIL service@covalen.com
WEB meritmonitoring.com

SENTINEL

Real-time alerts and alarms for power, pump failure, pump status, and abnormal level conditions.

SENTINEL+

Includes all Sentinel features plus real-time pump management functionality and more user-defined inputs.

SCOUT

Builds on the Sentinel+ with signal isolation, expanded terminal strip, mapping, GPS tracking, predictive maintenance, and customizations.

FEATURES	SENTINEL	SENTINEL+	SCOUT
Digital inputs	4	7	7
Analog inputs		4	4
Digital outputs		2	2
Dedicated power fail	1	1	1
Industrial-grade enclosures	Poly-carbonate 4.5 (H) x 7.7 (W) x 2.4 (D) inches	Poly-carbonate 7.5 (H) x 11.5 (W) x 5.5 (D) inches	Poly-carbonate 15.25 (H) x 9.5 (W) x 6.25 (D) inches
NEMA 4X	✓	✓	✓
Preconfigured with plug-and-play installation	✓	✓	✓
User-friendly dashboards with current real-time and historical overviews of trending data	✓	✓	✓
Alarms and notifications: SMS, email, and voice with customizable settings	✓	✓	✓
Dual cellular and WiFi connectivity with multi-carrier redundancy and global SIM	✓	✓	✓
Limited warranty and technical support	✓	✓	✓
Monitor both fixed and movable assets		✓	✓
Signal isolator/splitter to reduce interference			✓
Terminal strip	Standard	Standard	Expanded
Optional MODBUS RS485 boards for added I/O and controls			✓
Back-up emergency lift station control			✓

Sentinel



Sentinel+



Scout



TABLE OF CONTENTS

➔ Installation

Mounting.....	4
Sentinel and Sentinel+ Wiring Diagram for Analog and Digital Inputs/Outputs.....	5
Scout Wiring Diagram for Analog and Digital Inputs.....	6
Scout Wiring Diagram for Analog Isolator.....	7
Downloading the Merit Monitoring App.....	8

➔ System Set Up

Local Access User Interface	9
Connecting to the Server.....	10
Main User Dashboard.....	11
Manage Profile and User Information.....	12
Manage Sites	13
Manage Users and Notifications.....	14
Manage User Roles and Access.....	15

➔ User Interface

Logs & Datapoints.....	16
Events & Runtime Reports.....	17
Controller List	18
Main Controller Screen	18
Quick View Dashboard.....	19
Controller Configuration.....	19

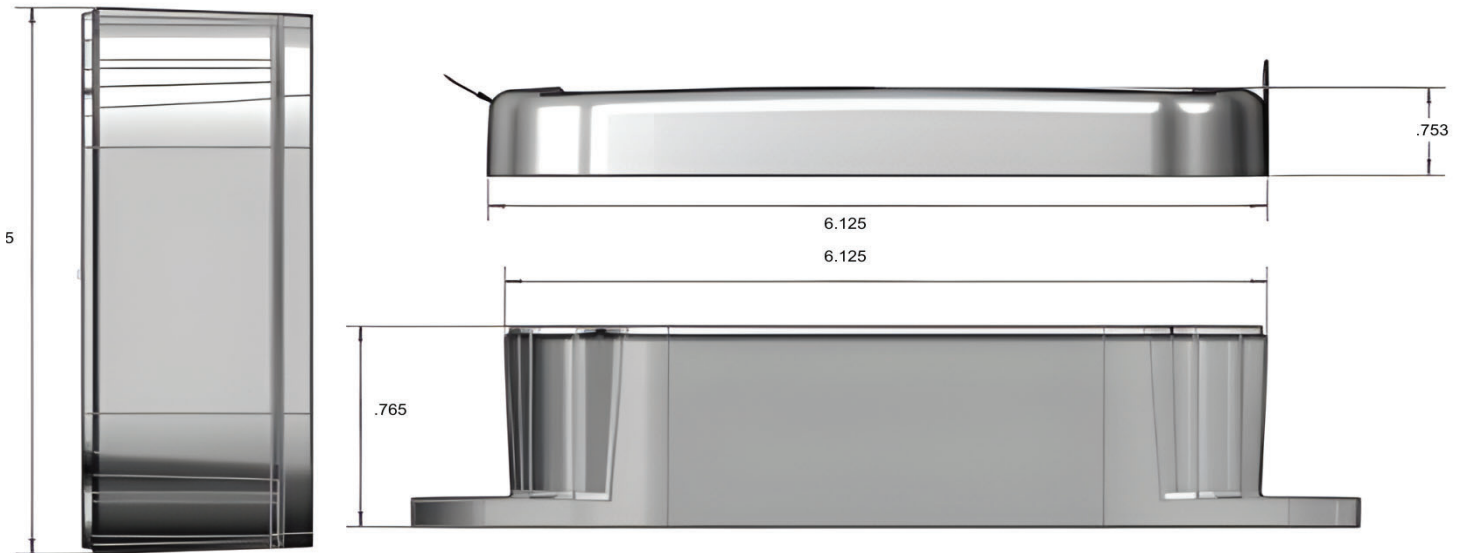
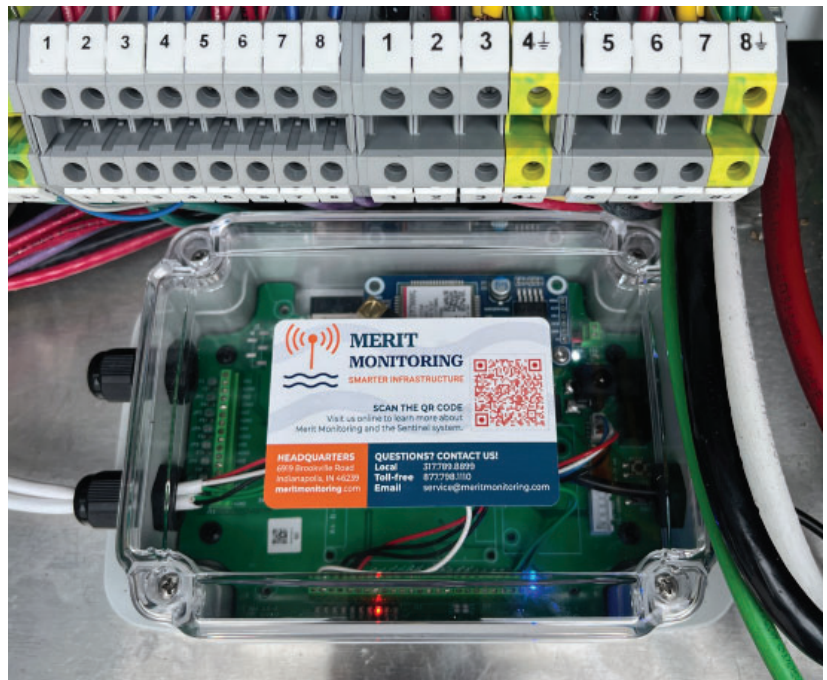
➔ Device Set Up

Analog Input (Sensor) Configuration.....	20
Digital Input Configuration	21
Digital Output Configuration.....	22

Installation

➔ Mounting

- Select a location close to the control panel or location of the digital and analog I/O points.
- Mount the weather-proof controller using the pre-drilled four screw holes in each corner.
- **The controller can be mounted inside of an existing panel, outside on the side of the panel, or any available mounting space.**

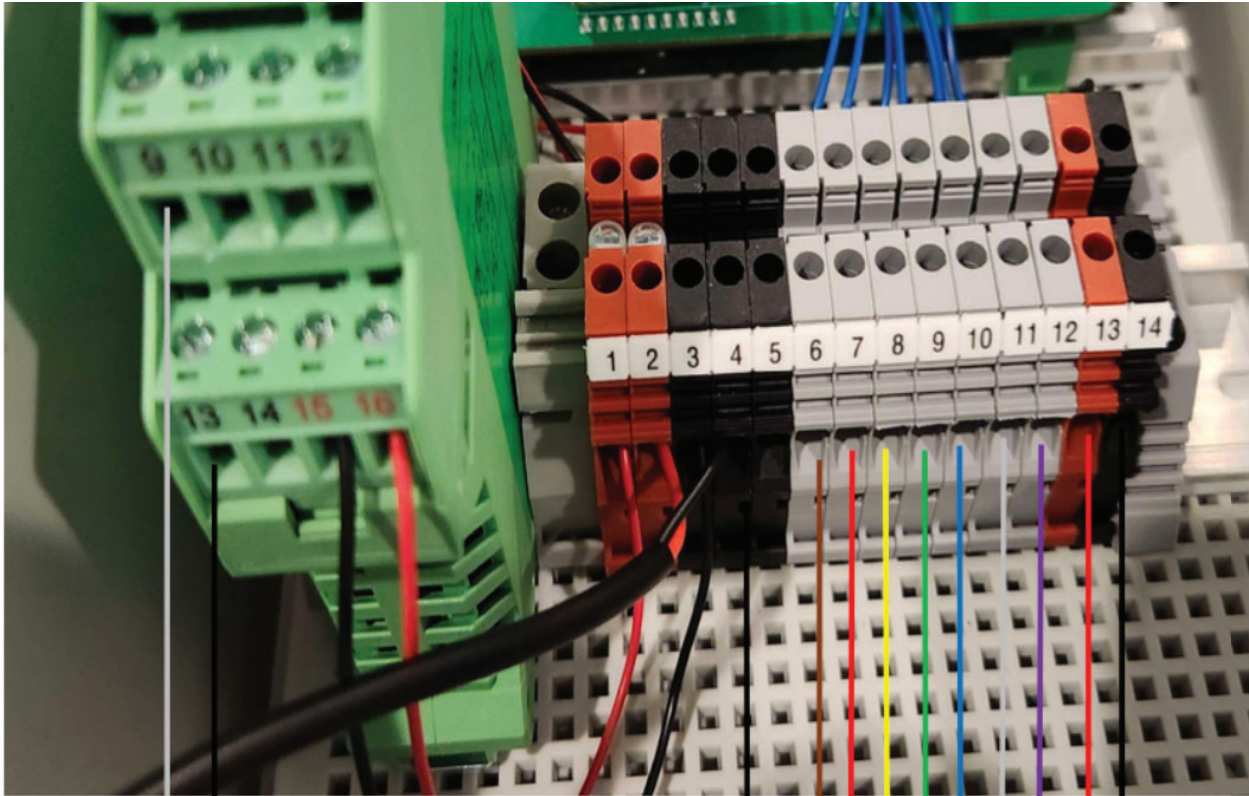




FROM POWER SUPPLY OR PROVIDED POWER ADAPTER

Cables





Sensor
Analog 1
Pin 13 +
Pin 9 --
White and Black

Digital Inputs
Ground
Pin 5 Black

Wet Well pump 1
running feedback
Pin 6 Brown

Wet Well pump 2
running feedback
Pin 7 Red

High Float
Pin 8 Yellow

Digital 4
Pin 9 Green

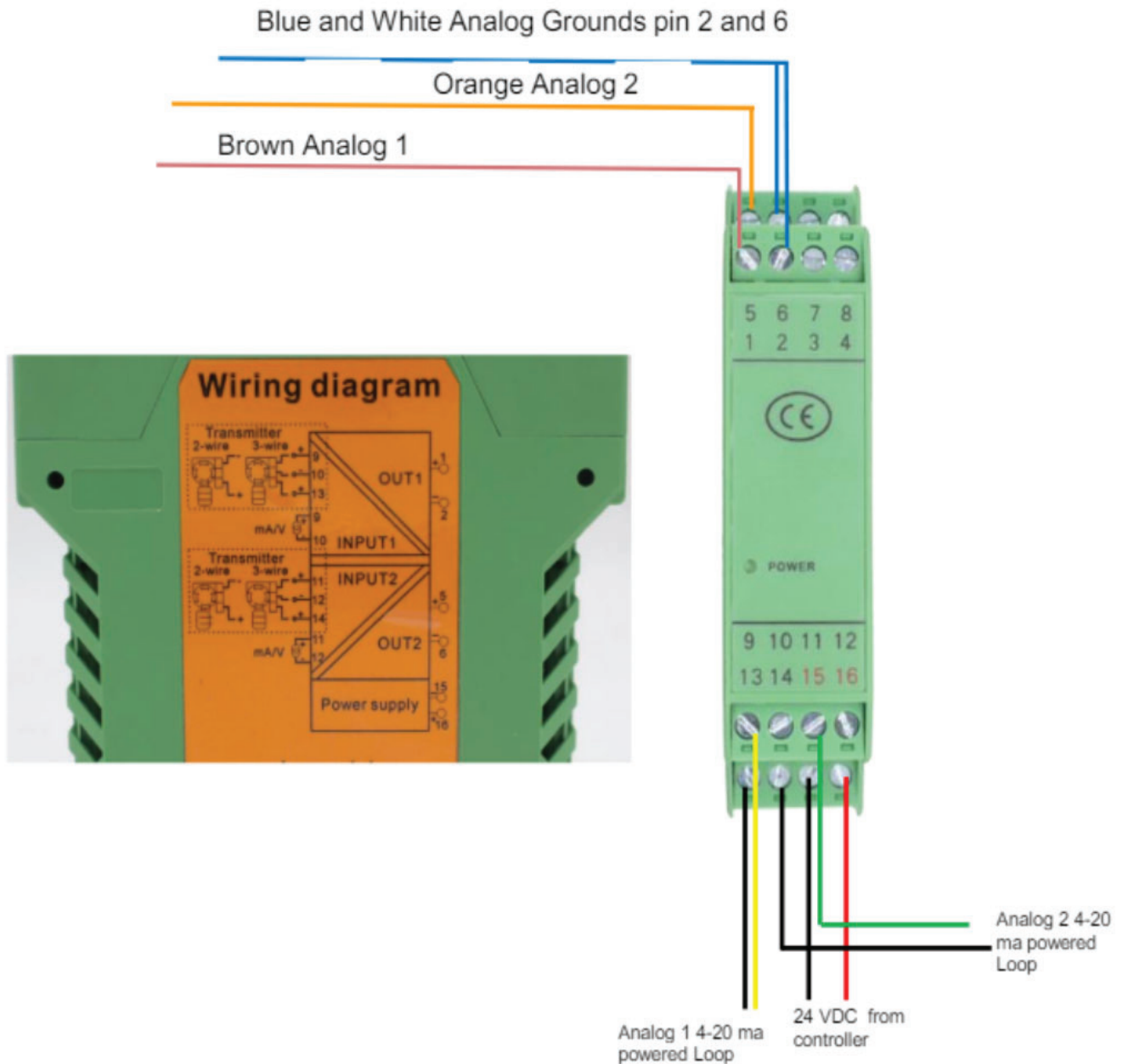
Digital 5
Pin 10 Blue

Digital 6
Pin 11 White

Digital 7
Pin 12 Violet

Level Sensor
Analog 1
Pin 13 +
Pin 14 --
Analog to others device

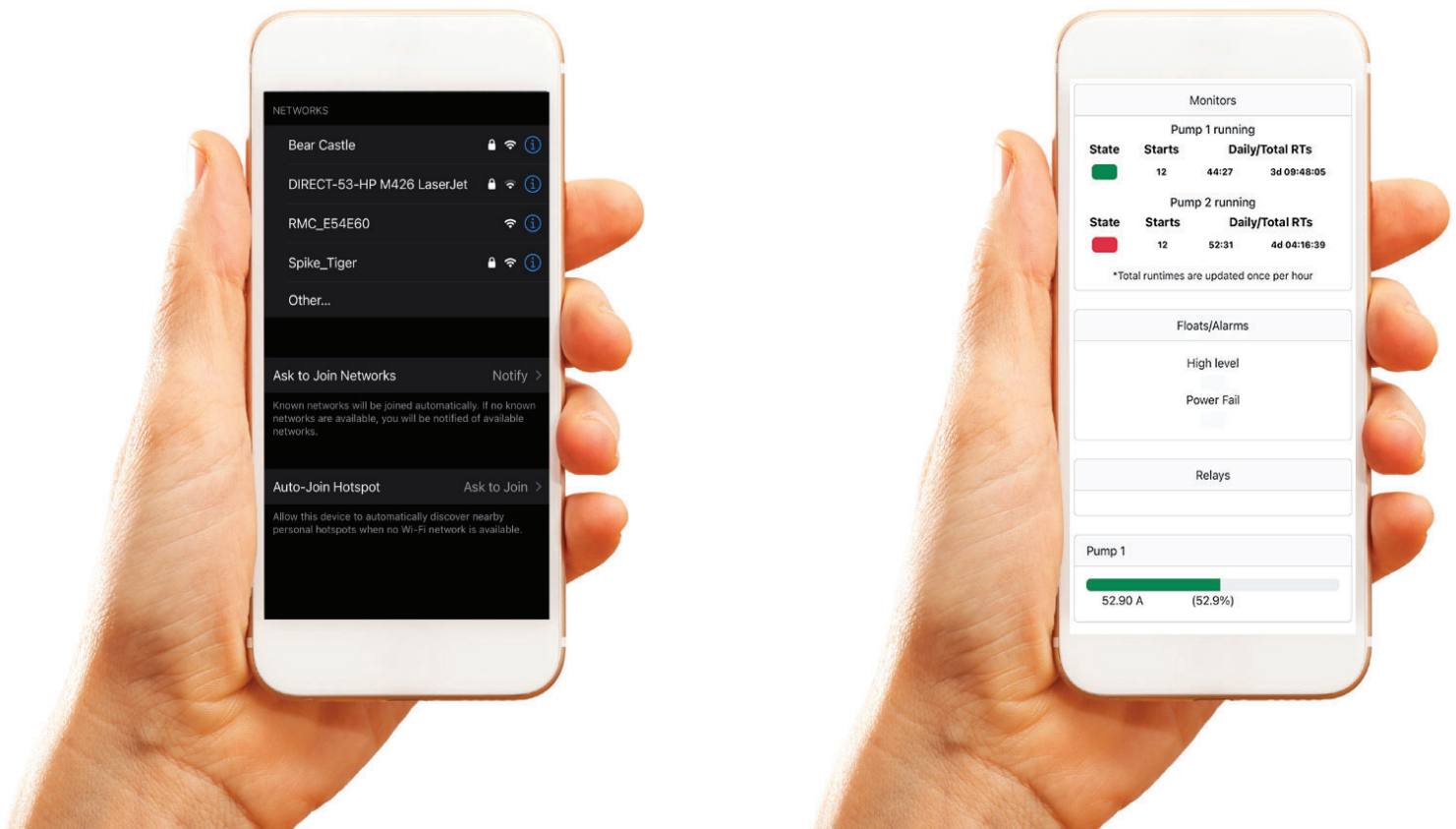
Wiring Diagram for Analog and Digital Inputs



Merit Monitoring App

Downloading and Setting up the App on Your Smart Phone or Mobile Device

- **DOWNLOAD:** Download the Merit Monitoring app from meritmonitoring.com.
- **CHOOSE YOUR NETWORK:** Connect to your local WiFi network from the list that appears on your phone (left below).
- **SELECT:** Select the Merit Monitoring icon. The app will open and you will see two elections available. The “connect” button will directly connect you to the server and cloud-based user interface.
- **SETUP:** The Setup button will connect you directly to the local user interface (right below).
- **NOTE:** Your smart device must be connected to the MAC address as shown on your unit in the selection of WiFi networks to connect directly to a local access point.



System Set Up

➔ Local Access User Interface

Accessing and Setting up Your Local User Interface

- **MAC ADDRESS:** The electronic serial number of your device.
- **CONNECT TO WiFi:** Check the box shown below to connect your device to a local WiFi network.
- **ENABLE CELLULAR MODEM:** Check this box to connect device to a cellular network.
- **APN:** Address of the cellular carrier.
- **SIGNAL STRENGTH:** The signal strength of the cellular connection to the cell tower.
- **SAVE NETWORK CONFIG AND REBOOT:** Save revised settings.

Network **Device**

Network Setup

Mac Address: 94:3C:C6:46:0C:F0

☐ Connect to Wifi

☒ Enable Cellular Modem

APN

hologram

Signal Strength

-69

Update

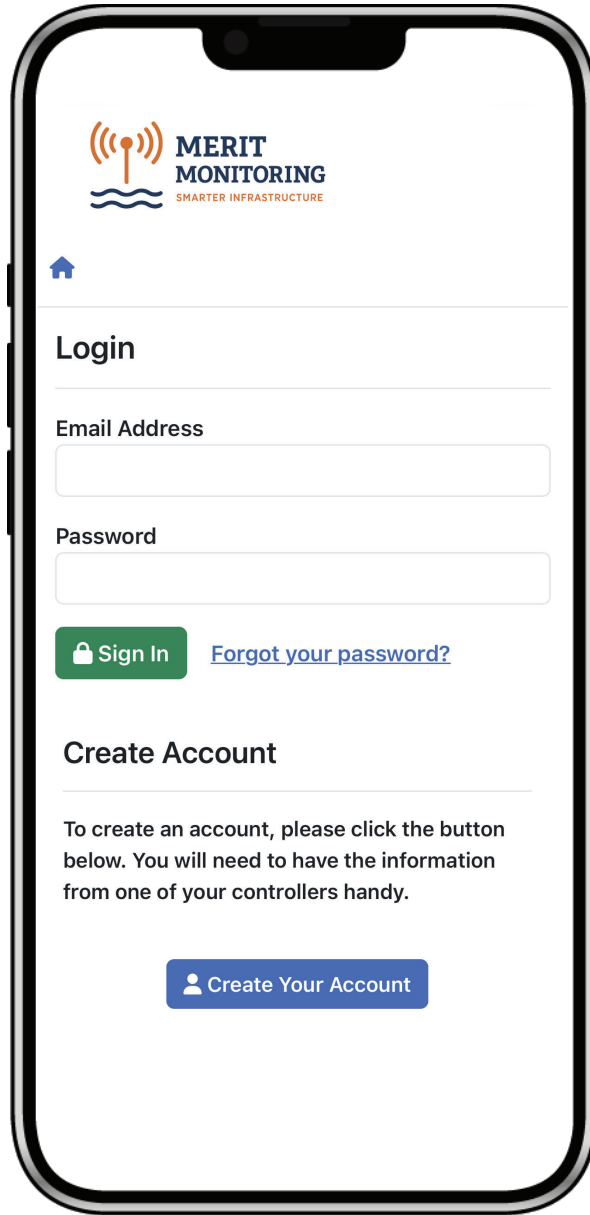
(Device will disconnect from cellular network while updating the cell signal)

Save Network Config and Reboot

Connecting to the Server

Connecting Your Device to Merit Monitoring's Server

- **DOWNLOAD THE APP:** Download the Merit Monitoring app from the Apple or Google App Store and meritmonitoring.com/resources.
- **LOG-IN SCREEN:** The server sign-up screen will appear.
- **ENTER CREDENTIALS:** Enter the email address and password supplied with the unit.
- **SIGN IN:** After entering the credentials, click the green "Sign In" button.



The image shows a smartphone screen displaying the Merit Monitoring app's login interface. At the top is the Merit Monitoring logo, which consists of an orange antenna icon with signal waves, the text "MERIT MONITORING" in blue, and "SMARTER INFRASTRUCTURE" in orange below it. A blue home icon is positioned below the logo. The main heading is "Login" in bold black text. Below this are two input fields: "Email Address" and "Password". Under the password field is a green "Sign In" button with a white lock icon, and a blue link that says "Forgot your password?". Below the login section is a "Create Account" heading. A paragraph of text follows: "To create an account, please click the button below. You will need to have the information from one of your controllers handy." At the bottom is a blue button with a white person icon and the text "Create Your Account".

Main User Dashboard

Overview & Setting Up Your Profile

- **MY ACCOUNT:** Set up your individual profile. See page 12.
- **SITES:** View and edit the list of your sites. See page 13.
- **USERS:** Add and edit users, user roles, and set notifications. See pages 14 and 15.
- **CONTROLLERS:** View and edit the controllers. See pages 18 and 19.
- **LOGS & REPORTS:** Click tabs in the Logs menu to access each report types. See page 16.
- **DATAPPOINTS:** View and download the analog and digital data. See page 16.
- **EVENTS:** View and download current and historical events. See page 17.
- **RUN TIMERS:** View and download historical run times. See page 17.

My Account

Welcome to your dashboard. Here you can manage all your controller information and programming.

Sites

1

[View List](#)

Controllers

1

[View List](#)
[Quick View](#)

Logs

 Datapoints

 Events

 Run Timers

Users

3

[View List](#)

Notifications

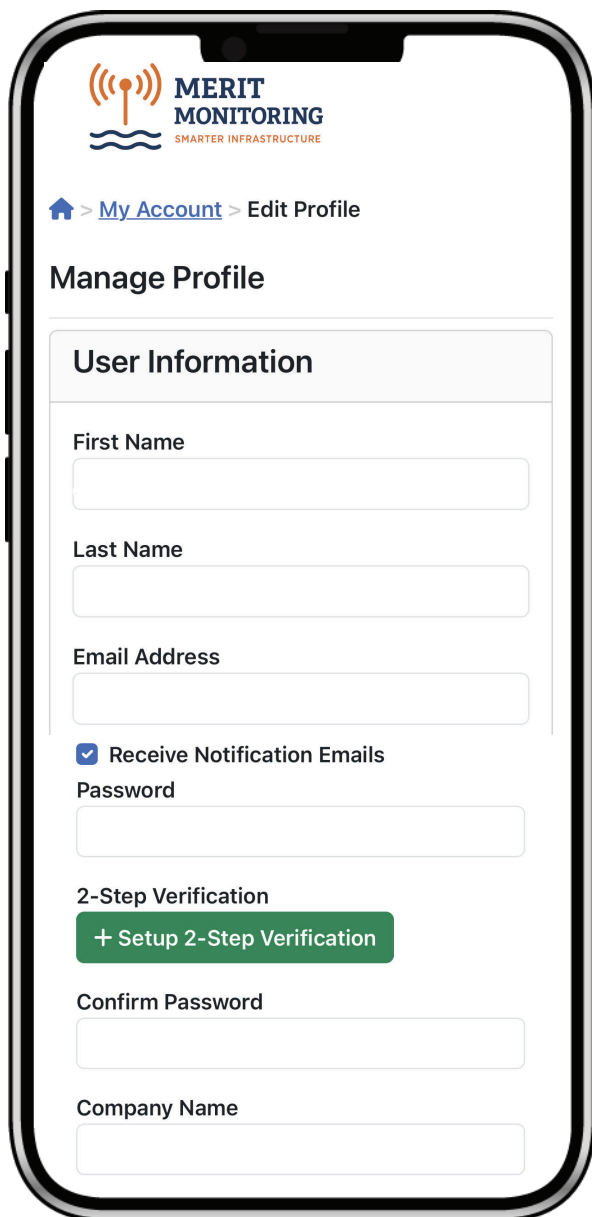
Claude Jones

[Re-assign](#)

Manage Profile & User Information

Creating profile and user information

- **FIRST NAME:** Enter the user's first name.
- **LAST NAME:** Enter the user's last name.
- **EMAIL:** Enter the user's email address.
- **PASSWORD:** Enter the assigned password.
- **COMPANY NAME:** Enter the organization's name.
- **TIME ZONE:** Choose the time zone where your system is located.
- **MOBILE NUMBER:** Enter the user's mobile phone number for texts and emails.
- **MOBILE CARRIER:** Choose the name of the user's cell phone cellular carrier.



 **MERIT MONITORING**
SMARTER INFRASTRUCTURE

[Home](#) > [My Account](#) > Edit Profile

Manage Profile

User Information

First Name

Last Name

Email Address

☒ Receive Notification Emails

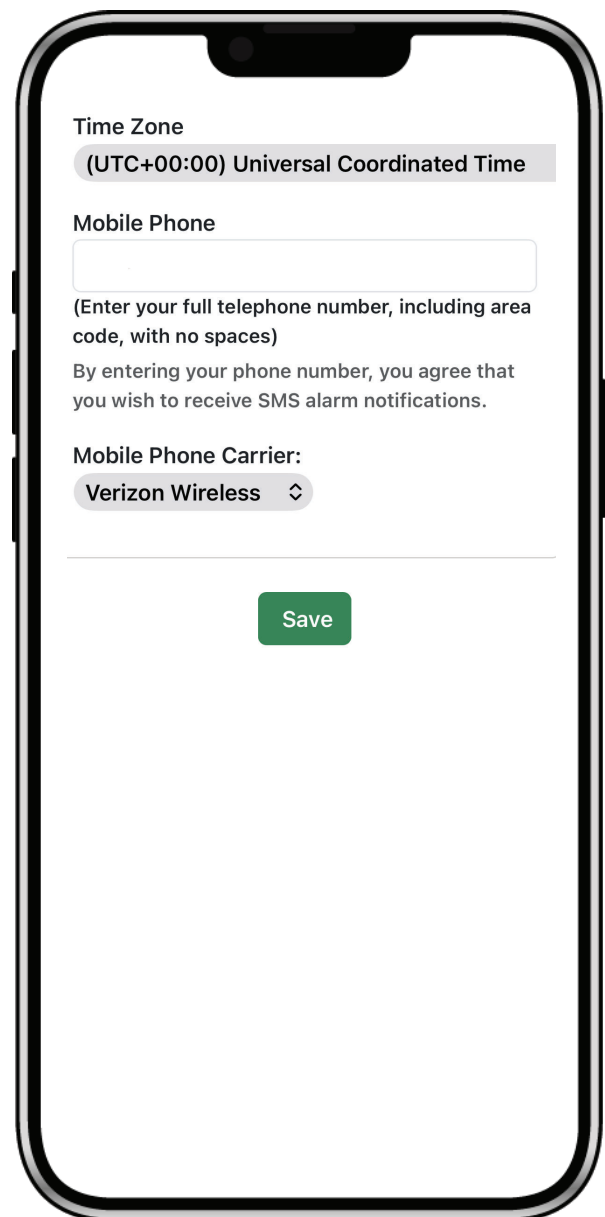
Password

2-Step Verification

[+ Setup 2-Step Verification](#)

Confirm Password

Company Name



Time Zone

(UTC+00:00) Universal Coordinated Time

Mobile Phone

(Enter your full telephone number, including area code, with no spaces)

By entering your phone number, you agree that you wish to receive SMS alarm notifications.

Mobile Phone Carrier:

Verizon Wireless ▾

[Save](#)



Manage Sites

Manage Your Sites & Controllers

- **SITE LIST:** Manage your sites, controller, and add a new site by clicking the “Add New Site” button.

Site List

[Add New Site](#)

Site Name	Address	Country	
Middletown	1234 Maple Leaf Drive	United States	Manage Controllers Edit

New Site

Site Information

Site Name

Address

Address 2

Country

United States

▼

City

State

[Save](#)



Manage Users and Notifications

Adding and Editing Users & Selecting Users for Notifications

- **USER LIST:** All users can be changed, edited, and deleted. New users can be added by clicking the blue button.
- **NOTIFICATIONS:** Select users to be notified.

User List

[Add New User](#)

Name	Email	
Andrew Albertson	andrew@cityofmiddletown.com	<button>Edit</button> <button>Delete</button>
John Jones	john@cityofmiddletown.com	<button>Edit</button> <button>Delete</button>
Thomas Tucker	thomas@cityofmiddletown.com	<button>Edit</button> <button>Delete</button>

Notifications

This page allows you to select who will receive all the selected notifications in your account. A user must be given the manager role to show up here, which you can do by editing their account.

Select which users you would like to receive all controller notifications under this account.

- ☐ Andrew Albertson
☒ Thomas Tucker

Save

Manage User Access

User Roles & Selecting Users for Notifications

User Information

First Name

Thomas

Last Name

Tucker

Email Address

thomas@cityofmiddletown.com

☒ Receive Notification Emails

Password

(8 characters minimum)

Confirm Password

Role

Manager

▼

Time Zone

(UTC-05:00) Indiana (East)

▼

Mobile Phone

1234567890

(Enter your full telephone number, including area code, with no spaces)

By entering your phone number, you agree that you wish to receive SMS alarm notifications.

Mobile Phone Carrier:

Verizon Wireless

▼

Sites

☐ All Sites

☒ Tank

Save

- **ROLES:** Below are the roles to which a user can be assigned.

Role

Manager

Manager

User

View-Only User

- **MANAGERS:** Have access to all sites and receive all notifications.
- **USERS:** Have the same access as managers, but do not receive notifications.
- **VIEW-ONLY USERS:** Can view sites and configuration settings but can not make updates or changes.
- **SITES:** These are the sites that managers can access from the server. Managers can select all sites or check specific sites.



Logs & Datapoints

Viewing and Downloading

- **DOWNLOADS:** All report logs can be downloaded as .csv (Excel) or PDF files.
- **DATAPPOINTS:** Click the Datapoints tab to view analog and digital historical data.

Datapoints

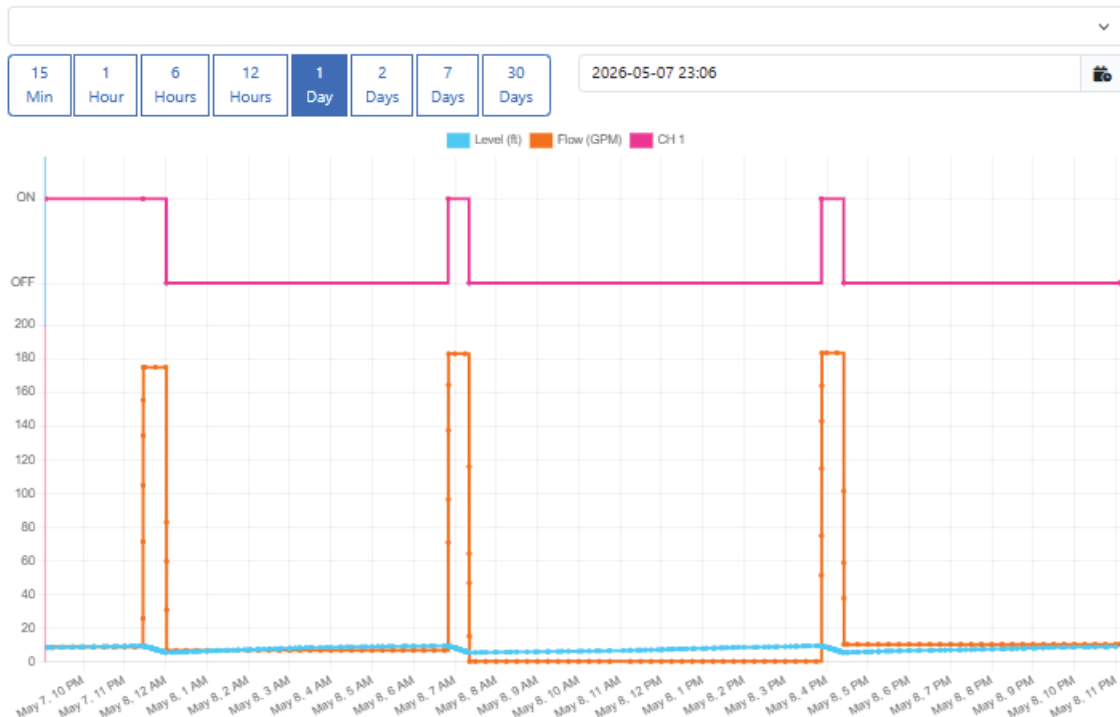
Events

Run Timers

Click the Logs tabs above to access site data and reports.

Data Logging Report

Choose a device from the dropdown to update the graph. Click on any of the sensors in the legend to toggle their visibility. If the times seem off, check the time zone you have set in your [profile settings](#).



Daily Statistics

[CSV Export](#)

Controller Name	Variable	Info	Date	
	Runtimes		From	To
			2026-05-06	2026-05-08
Middletown	Pump 1	Starts: 1	2026-05-08 04:25:18 pm	
Middletown	Pump 1	Runtime: 00:33:44	2026-05-08 04:25:18 pm	
Middletown	Pump 2	Starts: 1	2026-05-08 04:25:18 pm	
Middletown	Pump 2	Runtime: 00:30:14	2026-05-08 04:25:18 pm	
Middletown	Pump 1	Starts: 2	2026-05-07 11:27:19 pm	
Middletown	Pump 1	Runtime: 01:04:45	2026-05-07 11:27:19 pm	
Middletown	Pump 2	Starts: 1	2026-05-07 11:27:19 pm	
Middletown	Pump 2	Runtime: 01:00:27	2026-05-07 11:27:19 pm	
Middletown	Pump 1	Starts: 1	2026-05-06 11:57:50 pm	

Events & Run Times

Accessing, Viewing, and Downloading

- **EVENTS:** All analog and digital historical events can be viewed and data downloaded.
- **RUN TIMES:** All historical run times can be viewed and data downloaded.
- **DOWNLOADS:** Chose from Excel .csv or PDF files.

Logs

 Datapoints

 Events

 Run Timers

Event Logs

[CSV](#) [PDF](#)

Controller Name	Date	Action	Info
<div><div>From:</div><div>2026-05-07</div><div>To:</div><div><input type="text"/></div><div>2026-05-08</div><div>--All Events--</div><div>Search</div></div>			
Middletown	2026-05-08 16:25:18	Pump changed	Pump 1 off
Middletown	2026-05-08 15:52:55	Pump changed	Pump 1 on
Middletown	2026-05-08 07:21:00	Pump changed	Pump 2 off
Middletown	2026-05-08 06:50:46	Pump changed	Pump 2 on
Middletown	2026-05-08 00:01:21	Pump changed	Pump 1 off
Middletown	2026-05-07 23:27:19	Pump changed	Pump 1 on
Middletown	2026-05-07 16:48:21	Pump changed	Pump 2 off
Middletown	2026-05-07 16:16:39	Pump changed	Pump 2 on
Middletown	2026-05-07 10:02:21	Pump changed	Pump 1 off

Runtime Report for May 10, 2026

[CSV](#) [PDF](#)

Date

Controller Name	Input	Starts	Runtime
Middletown	P1 run	1	00:33:12
Middletown	P2 run	2	01:02:27



Controller List

Controller and Site Names

- **CONTROLLERS:** This screen is where you access, view, manage, and edit controllers. New controllers can be added. The map overview shows all controller locations.

Controller List

[Map Overview](#) [Add New Controller](#)

Filters

Name/MAC

Controller Name	Site Name	MAC	FW Version	
Middletown	1234 Maple Leaf Drive	64D558	0.4.2-0	View Stats Edit

25 per page << Viewing Page 1 of 1 >> 1 results found



Main Controller Screen

Monitors, Floats/Alarms, Relays, Levels, and Flow

- **SITE NAME:** Name or location of site.
- **LOCAL UNIT TIME:** Local internet time at controller location.
- **CONNECTED:** Displays the status of the connection between local controller and the cloud-based server and the time zone where the server is located.
- **MONITORS:** Shows the current state of each pump, number of pump starts, and actual pump run times.
- **FLOATS/ALARMS:** Displays status of high levels in wet well and power failure.
- **MOBILE PHONE:** Displays the user's mobile phone for texts and emails.

CONNECTED

Setup

Local Unit Time
05/11/2026
9:58 AM
EDT

Connected

Last Data Update
05/11/2026, 9:59 AM EDT

Level

5.87 ft

(48.9%)

352 gal

Monitors

P1 run

State	Starts	Daily/Total RTs
<div></div>	0	0:00 5d 00:49:34

P2 run

State	Starts	Daily/Total RTs
<div></div>	1	32:30 5d 00:30:57

*Total runtimes are updated once per hour

Floats/Alarms

P1 fault

P2 fault

High Level

Power Fail

Relays

Flow

15.00 GPM

(3%)

 **MERIT**
MONITORING
SMARTER INFRASTRUCTURE

Page 18

Quick View Dashboard

See & Review Status of All Sites

Quickview

1234 Maple Leaf

P1 fault

OK

P2 fault

OK

High Level

OK

Power Fail

OK

P1 run

OFF

P2 run

OFF

Level

7.2 ft

Flow

15 GPM

Controller Configuration

Configure Site Controllers

- **NAME:** Name your controller location.
- **TIME ZONE:** Choose your local time zone.
- **ANALOG SENSOR CONFIG:** Click the Show/Hide button.
- **DIGITAL SENSOR CONFIG:** Click the Show/Hide button.
- **OUTPUT CONFIG:** Click the Show/Hide button.
- **MODBUS CONFIG:** Click the Show/Hide button.

Application

1234 Maple Leaf

Device Setup

Name

1234 Maple Leaf

Time Zone

(UTC-05:00) Eastern Time (US & Canada)

Latitude

34.81414

Longitude

85.14203

Reset Totals

Analog Sensor Config

Show/Hide

Digital Sensor Config

Show/Hide

Output Config

Show/Hide

MODBUS Config

Show/Hide

Save Device Config

Device Set Up



Analog Input (Sensor) Configuration

Configure Your Analog Inputs

- **TYPE:** Use the drop-down menu to select the type of analog input being monitored, i.e., wet well tank, flow, etc.
- **NAME:** Name of the analog, i.e., level, flow, etc.
- **MODE:** Use the drop-down menu to select the type of electrical input.
- **SENSITIVITY:** How often the analog input will report to server based on percentage of change.
- **UNITS:** Use the drop-down menu to choose the engineering units of measurement, i.e., feet, gallons, etc.
- **GALLONS/INCH:** The value entered represents the number of gallons in one inch or one foot of liquid in the well or tank, respectively.
- **LOW:** Enter a set point for low alarm trigger.
- **HIGH:** Enter a set point for high alarm trigger.
- **MAX:** Engineering units at 20mA.
- **ALARM DELAY:** Enter the number of seconds the alarm must be active to trigger.

Analog Sensor Config

Show/Hide

Analog Offset

0

<div>Analog 1 Type</div> <div>Wet Well Tank</div> <div>Name</div> <div>Level</div> <div>Mode</div> <div>4 20mA Low >High</div> <div>Sensitivity 1</div> <div>%</div> <div>Units</div> <div>Feet</div> <div>Gallons/Inch</div> <div>5</div> <div>Min</div> <div>0</div> <div>Low</div> <div>1</div> <div>High</div> <div>12</div> <div>Max</div> <div>12</div> <div>Alarm Delay (sec)</div> <div>0</div>	<div>Analog 2 Type</div> <div>Flow Sensor</div> <div>Name</div> <div>Flow</div> <div>Mode</div> <div>4 20mA Low >High</div> <div>Sensitivity 3</div> <div>%</div> <div>Min</div> <div>0</div> <div>Low</div> <div>0</div> <div>High</div> <div>500</div> <div>Max</div> <div>500</div> <div>Alarm Delay (sec)</div> <div>1000</div>
<div>Analog 3 Type</div> <div>Disabled</div>	<div>Analog 4 Type</div> <div>Disabled</div>
<div>Analog 5 Type</div> <div>Disabled</div>	<div>Analog 6 Type</div> <div>Disabled</div>
<div>Analog 7 Type</div> <div>Disabled</div>	<div>Analog 8 Type</div> <div>Disabled</div>

Device Set Up



Digital Input Configuration

Configure Your Pump Alarm

- **TYPE:** Use the drop-down menu to select the type of digital input being monitored, i.e., wet well tank, float sensor, alarm, etc.
- **NAME:** Name of the digital input.
- **INPUT STATE:** Select whether the digital input is active, open, or closed.
- **START COUNT ALARM:** Enter the number of pump starts to be exceeded in 24 hours to trigger an alarm.
- **RUNTIME ALARM:** Enter the number of runtime minutes to be exceeded in 24 hours to trigger an alarm.

Digital Sensor Config		Show/Hide
<div>Digital 1 Type</div> <div>Wetwell Pump State</div> <div>Name</div> <div>P1 run</div> <div>Input State</div> <div>Active When Closed</div> <div>Start Count Alarm: 0 Runtime Alarm (min): 0 Gallons Per Cycle: 1000</div>	<div>Digital 2 Type</div> <div>Wetwell Pump State</div> <div>Name</div> <div>P2 run</div> <div>Input State</div> <div>Active When Closed</div> <div>Start Count Alarm: 0 Runtime Alarm (min): 0 Gallons Per Cycle: 1000</div>	
<div>Digital 3 Type</div> <div>Alarm</div> <div>Name</div> <div>P1 fault</div> <div>Input State</div> <div>Active When Closed</div>	<div>Digital 4 Type</div> <div>Alarm</div> <div>Name</div> <div>P2 fault</div> <div>Input State</div> <div>Active When Closed</div>	
<div>Digital 5 Type</div> <div>Alarm</div> <div>Name</div> <div>High Level</div> <div>Input State</div> <div>Active When Closed</div>	<div>Digital 6 Type</div> <div>Disabled</div>	
<div>Digital 7 Type</div> <div>Disabled</div>	<div>Digital 8 Type</div> <div>Alarm</div> <div>Name</div> <div>Power Fail</div> <div>Input State</div> <div>Active When Open</div>	



Digital Output Configuration

Configure Your Digital Outputs

- **TYPE:** There are two digital output types, (1) dosing pump and (2) manual.
- **DOSING PUMP:** This selection allows you to control a digital output based on a choice of settings.
- **PUMP STATE:** This selection controls the output based on wet well pump conditions.
- **MANUAL:** This selection allows you to turn the digital output manually on and off with a button.
- **NAME:** Name of the digital output.
- **WET WELL PUMPS:** Turn on.
- **WET WELL LEVEL-TIMED:** Based on level set points, the output will turn on for the amount of time set in the Dose Runtime box.
- **WET WELL HIGH ON/LOW OFF:** This selection will control the output based on the high and low set points. The output will come on when the high set point is reached and turns off with the low set point is reached.
- **WET WELL LOW ON/HIGH OFF:** This selection will control the output based on the high and low set points. The output will turn on when the low set point is reached and off when the high set point is reached.

Output Config Show/Hide

☐ Relays are in a Lead/Lag configuration

Relay 1	Relay 2
Type: Dosing Pump	Type: Manual
Name: Pump1 on/off	Name: Relay 2
Dosing Mode: Pump State	

Relays Config Show/Hide

Output Config Show/Hide

☐ Relays are in a Lead/Lag configuration

Relay 1	Relay 2
Type: Dosing Pump	Type: Manual
Name: Pump1 on/off	Name: Relay 2
Dosing Mode: Pump State	
Pump State: Wetwell Pump Running	