



**Multi Control
Service Manual**

P/N 1608903 Rev B (ECN 33715)

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Multi-Controller Firmware History

March 6, 2014 Version 1.0.00
First production release

May 2, 2014 Version 1.1.2
Change made to allow Wireless Switch to go in Service Mode
Fixed Low Pressure Warning flagging before Water
High Flow Warning remained after restart
WS Setup looks for WS Radio ID instead of UID
Made Open Circuit Detection Defaulted to Disabled
Fixed bug where low pressure shutdown did not show on LEDs or FieldNET Dashboard

May 25, 2015 Version 1.3.04
Add On-Demand plan that can Span Day boundary and Repeat
Allow Flush Cycle to be triggered by either elapsed time or differential pressure
Fixed the Pause Time feature to resume from where it was paused
Add Normally Closed I/O output controls
Fixed I/O output 1 in Service Mode, allow it to be turned off with button presses

MC Panel

The MC Panel houses the Controller, System I/O Board, a commercial-off-the-shelf transformer, a commercial-off-the-shelf AC/DC power supply, and a FieldNET cellular or radio RTU. The components are mounted on a DIN rail.

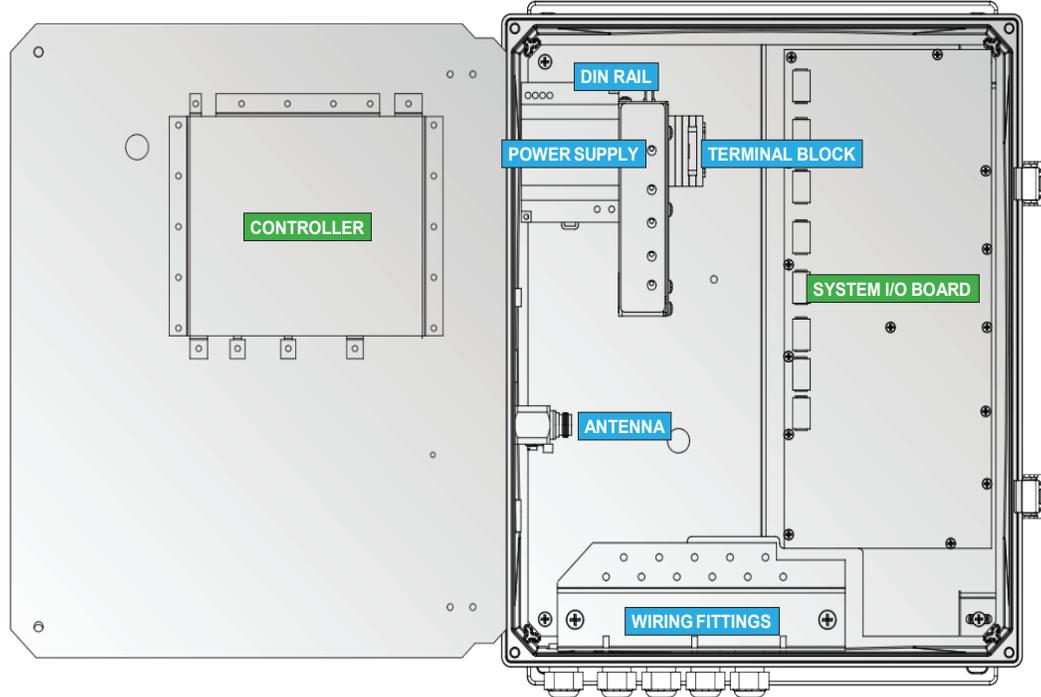
MC Panel Inner Door

The Inner Door is accessed when opening the MC Panel and has the following features:

- Status Center (LEDs)
 - System Status
 - FieldNET Link Status
 - Alert Status
 - Operation Mode Status
- Operation Mode Button
- QR Codes for installing FieldNET Mobile App



MC Panel Enclosure Interior



The MC Panel interior is accessed by opening the MC Panel and unscrewing the knobs located on the right side of the inner door and houses the following components:

- Controller
- System I/O Board
- DIN Rail
 - Transformer
 - Terminal Block
- Antenna Fitting
- Wiring Fittings

All components are designed for rugged environmental use, heat, cold and humidity.

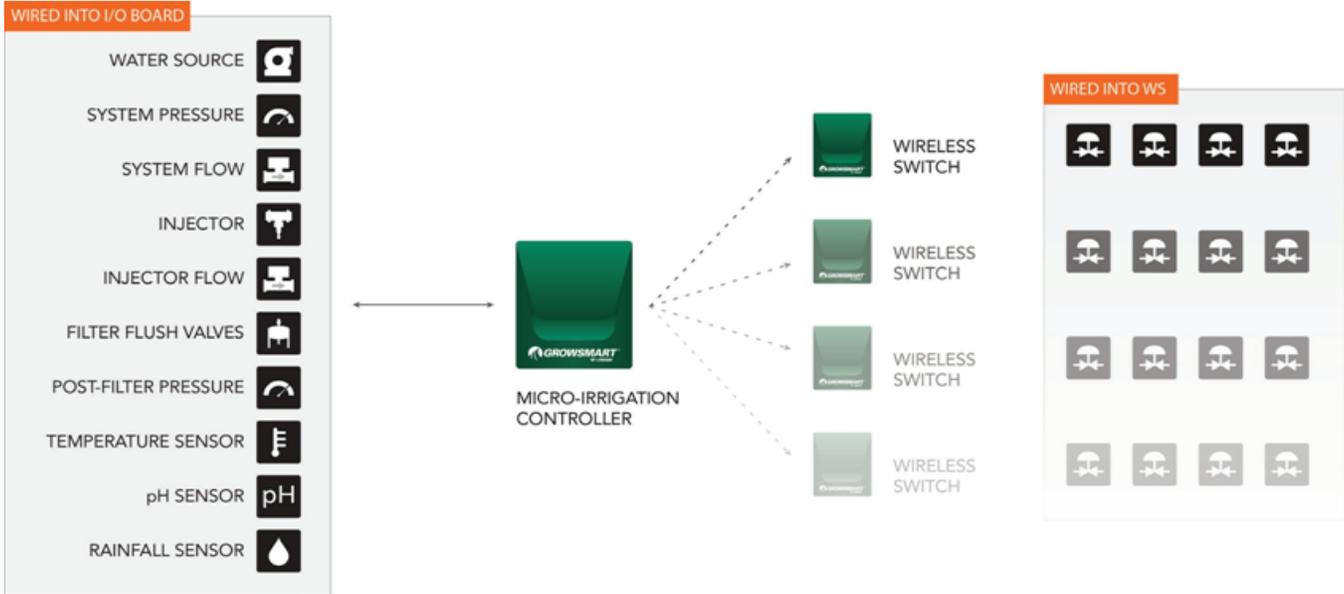
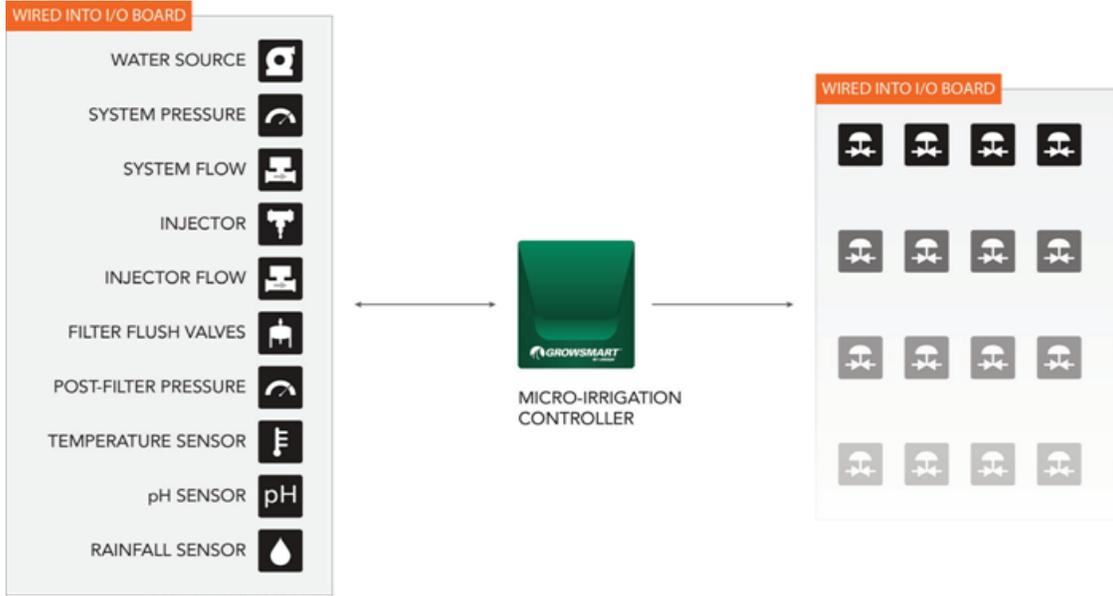
Controller

The Controller is an enclosed subassembly attached to the back of the MC Panel inner door, providing the indicators for the MC Status Center.

The Controller monitors and controls the various components and systems through wired and wireless networks. The Controller manages a wired network for communication with the System I/O Board and Auxiliary I/O Boards. The Controller manages a Point-to-Multipoint wireless radio network for communication with Wireless Switches. As with most radio networks, it is important Wireless Switch are installed with good line-of-sight and clear of heavy vegetation or buildings.

Components are able to be connected to these networks as shown in the table below.

Component	System I/O Board	Auxiliary I/O Board	Wireless Switch
Water Source	•	•	
System Pressure	•		
System Flow	•		
Injector	•	•	
Injector Flow	•		
Filter Flush Valves	•	•	
Post Filter Pressure	•		
Temperature Sensor	•		
pH Sensor	•		
Rainfall Sensor	•		
Zone Valves	•	•	•



When opening the inner door, the side of the Controller has LED indicators to display the current state of the Controller functions and features



NAME	COLOR	DESCRIPTION
POWER	Green	Power is present to Controller
	Yellow	Power is Low or High (Warning)
	Red	Power is Below Operating Range (Shutdown)
FAULT	OFF	No Warning or Fault
	Yellow	Warning Exists
	Yellow	Warning Exists with flashing Warning Code
	Red	Shutdown Exists
I/O BUS LINK	Red	Shutdown Exists with flashing Fault Code
	Green	All Modules on I/O Bus Communicating
	Yellow	One or more Modules on I/O Bus had recent error (Warning)
RADIO LINK	Red	One or more Modules on I/O Bus lost communication (Shutdown)
	Green	All Radio links are good
	Yellow	One or more Radios has poor signal strength (Warning)
NETWORK	Red	One or more Radios has lost communication (Shutdown)
	Green	Radio Network is asleep
	Green	Data Communication on Radio Network
USB	OFF	USB Flash Drive not connected
	Green	Action Complete - USB Flash Drive can be removed
	Green	Action Processing - DO NOT REMOVE USB Flash Drive
	Red	Action Failed - USB Flash Drive can be removed
	Red	Action Invalid - USB Flash Drive can be removed

The USB port is used for upgrading firmware as and manual system configuration with a portable USB Flash Drive. It is recommended to have a designated USB Flash Drive with at least 8 MB available.

If the Controller has detected a Warning or Fault, the Status indicator on the Status Center turns yellow or red and Warning and Fault flash codes are displayed through a series of turning the FAULT indicator on and off. If there are only Warnings, the indicator will flash yellow. If any Faults exist, the indicator will flash red, even for any flash codes that are warnings.

Refer to the “Controller Fault Flash Codes” on page 5-5 for the Warning and Fault flash codes. The start of a flash code is indicated with a solid yellow or red for 10 seconds.

Flash codes are broken down into segments for the number of digits in the number. Segments are separated by a 3 second pause. Each segment will flash the value of each segment digit except for zero, which flashes 10 times (E.g. 1=1 flash, 5=5 flashes, 0=10 flashes).

For example, a flash code of 106 will be broken down into 3 segments with each segment flashing the value of the digit:

- 10 second solid light
- 1 flash
- 3 second pause
- 10 flashes
- 3 second pause
- 6 flashes
- 3 second pause

If other Warnings or Faults exist, a 10 second solid light followed by the next flash code would be displayed and would continue for each additional flash code.

The cycle will continue to repeat until the condition has cleared.

RTU

A Remote Telemetry Unit (RTU) is required for linking the MC Panel to FieldNET for remote monitoring, control, and reporting.

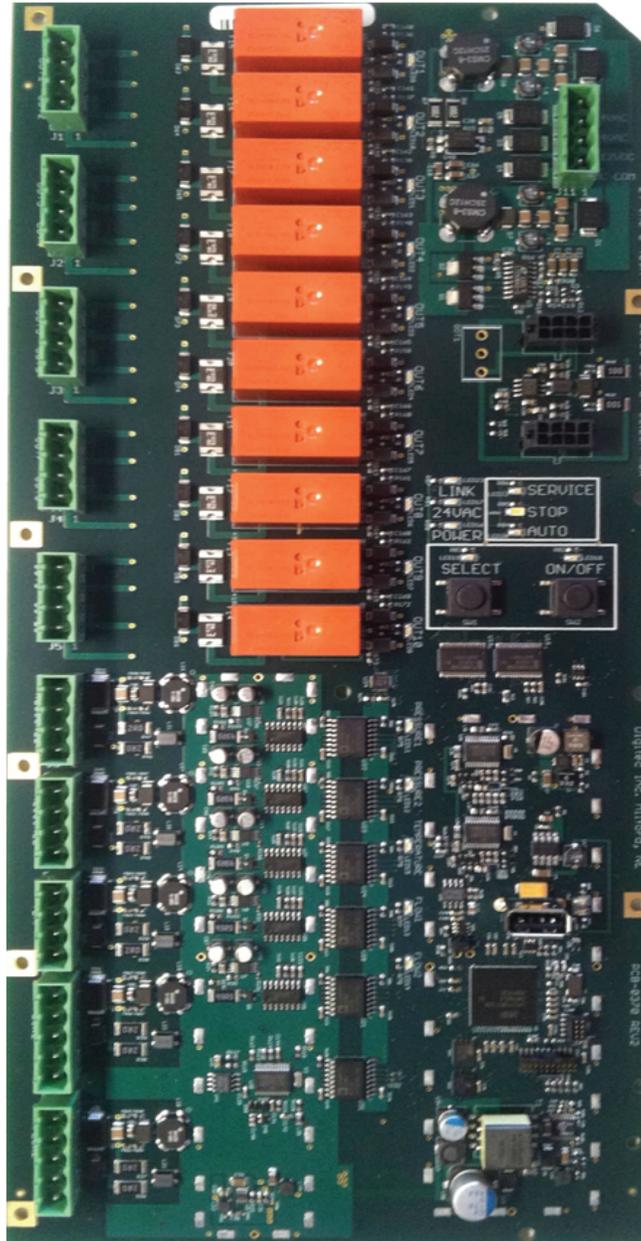
The RTU is connected to the Controller.

Contact Lindsay Sales for purchasing a compatible RTU.

System I/O Board

The System I/O Board provides the connectors for the various Head System and Distribution Network components as well as Service Mode based control.

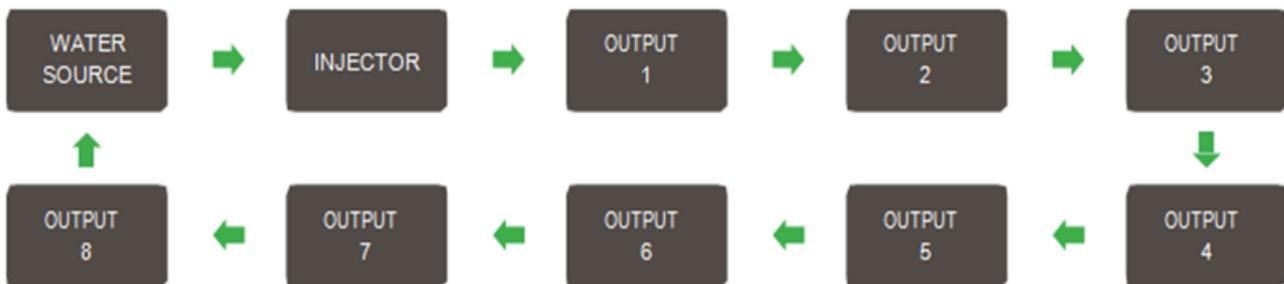
A number of LED indicators display the current state of the System I/O Board functions and features. Please refer to the table on the next page for a description of the indicators.



NAME	COLOR	DESCRIPTION
POWER	 Green	12 VDC power is present to I/O Board
24VAC	 Green	24 VAC is present on the I/O Board
LINK	 Green	Controller BUS link is up
SELECT	 Green	Select button is pressed
ON/OFF	 Green	On/Off button is pressed
SERVICE	 Green	The system is in Service Mode
STOP	 Green	The system is in Stop Mode
AUTO	 Green	The system is in Auto Mode
OUTPUT1 - 10	 Green	Output is On
	 Green	1 flash - Open Circuit detected, 2 flashes - Short Circuit detected
FLOW 1	 Green	System Flow Meter present – 1 flash per Flow Meter pulse
FLOW 2	 Green	Injector Flow Meter present – 1 flash per Flow Meter pulse
PRESSURE 1	 Green	System Pressure sensor present
PRESSURE 2	 Green	Post-Filter Pressure sensor present
TEMP/PH	 Green	Temperature or pH sensor present
USB	 Green	When flashing green, a valid upgrade file on the USB flash drive was found and is updating the I/O Board. DO NOT REMOVE.
	 Red	When flashing red, an invalid upgrade file on the USB flash drive was found. The USB flash drive can be removed.
	 Green	When green and not flashing, the upgrade is complete and the USB flash drive can be removed.
	 Red	When red and not flashing, the upgrade failed and the USB flash drive can be removed
	 OFF	When off, no USB flash drive has been inserted

Service Mode

The System I/O Board illuminates the SERVICE, STOP, and AUTO indicators based on the mode of operation the Low Volume Irrigation Controller is in. Manual operation is possible, when in SERVICE Mode, by pressing the SELECT switch to cycle through the various controls, as shown below, and pressing the ON/OFF switch to toggle the control state. Holding the switch down will select the next option every 3 seconds. When selecting a control the indicator will flash.



If the control is currently Off, the indicator will flash with a short on time and a long off time when selected. If the control is On, the indicator will flash with a long on time and a short off time when selected. The selected indicator will stop flashing and cease to be selected 5 seconds after both buttons have been released.

Test I/O Board 24 ~ Valves

1. Complete FieldNET Initial Startup process.
 - Testing 24 VAC Valves on the System I/O Board and Auxiliary I/O Boards requires configuring through FieldNET prior to testing in order to enable the I/O Channel.
2. Put the system into SERVICE Mode by pressing the Operation Mode button on the Status Center until the LED blinks yellow.
3. Verify the water source is turned OFF at the Control Panel to test the electronic functionality of 24 VAC Valves.
4. Repeat the following process for each 24 VAC Valve:
 - While in SERVICE Mode press the SELECT button momentarily cycle through the valves and press the ON/OFF button to change the valve state.
 - Verify hearing the relay and valve solenoid “click”.
 - The indicator next to the desired valve will blink quickly if the valve is currently OFF.
 - The indicator next to the desired valve will blink slowly if the valve is currently ON.
 - Press the ON/OFF button on the WS to turn the valve OFF.
5. Repeat the above process with the water source turned ON for each 24 VAC Valve to confirm the system hydraulics are plumbed correctly.

Updating Firmware for Drip Controller

Steps to update firmware:

- Create an MC folder on USB drive.
- Inside the MC folder, create a folder named firmware.
- Place firmware files into the created firmware folder in the USB drive.

For the Micro Controller:

1. Power down the unit by disconnecting the green connector in the upper right of the I/O board, until all the lights go out.
2. Place USB in the USB slot on the bottom of the controller (the controller is on the backside of the inner panel door).
3. Power the MC back up by reconnecting the green connector.
4. USB light on the controller will flash green and then go solid once upload is done.

For the I/O in the Micro Controller and/or the Expansion Panels:

1. Power down the unit by disconnecting the green connector in the upper right of the I/O board, until all the lights go out.
2. Place USB in to the slot on the I/O board.
3. Power the I/O board back up.
4. USB light will flash until the upload is complete and the board will then reboot.

For the Wireless Switch:

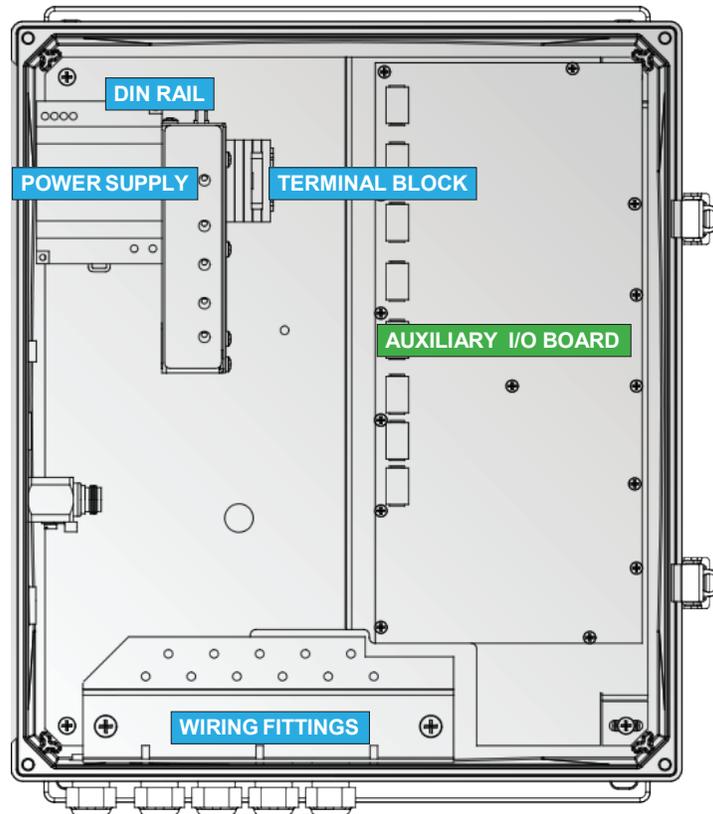
1. Unplug the solar panel connector from Wireless switch board.
2. Turn battery switch off.
3. Place USB with firmware file in the slot.
4. Turn on battery switch.
5. USB light will flash until the upload is complete.
6. Remove USB.
7. Plug solar panel back into Wireless switch board.

Previous settings are retained so if it was configured with the controller previously it should link with the controller without repeating the configuration process.

Expansion Panel

The Expansion Panel houses the Auxiliary I/O Board, a commercial-off-the-shelf transformer, and a commercial-off-the-shelf AC/DC power supply. The components are mounted on a DIN rail.

Expansion Panel Enclosure Interior



The Expansion Panel interior is accessed by opening the Expansion Panel and it houses the following components:

- Auxiliary I/O Board
- DIN Rail
 - Transformer
 - Terminal Block
- Wiring Fittings

All components are designed for rugged environmental use, heat, cold and humidity.

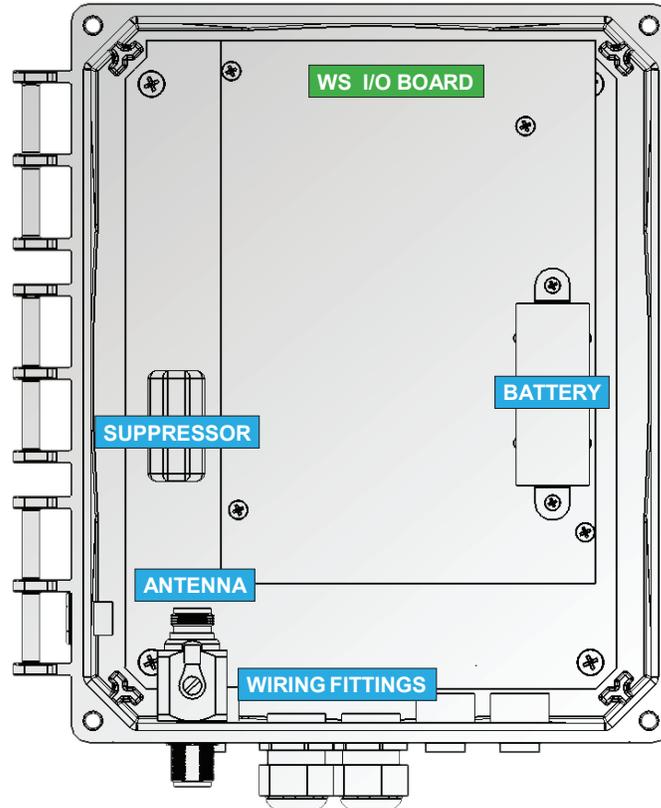
Wireless Switch

The Wireless Switch is a wireless remote microprocessor based irrigation Zone controller, providing ease of installation and low power constraints. Each controller is capable of controlling up to four Zone valves.

Please review “Distribution Network” in the MC Installation instructions for the supported Zone valves and specifications of the Wireless Switch.

The Wireless Switch panel houses the controller and a rechargeable battery, which is charged by an external Solar Panel.

Wireless Switch Enclosure Interior



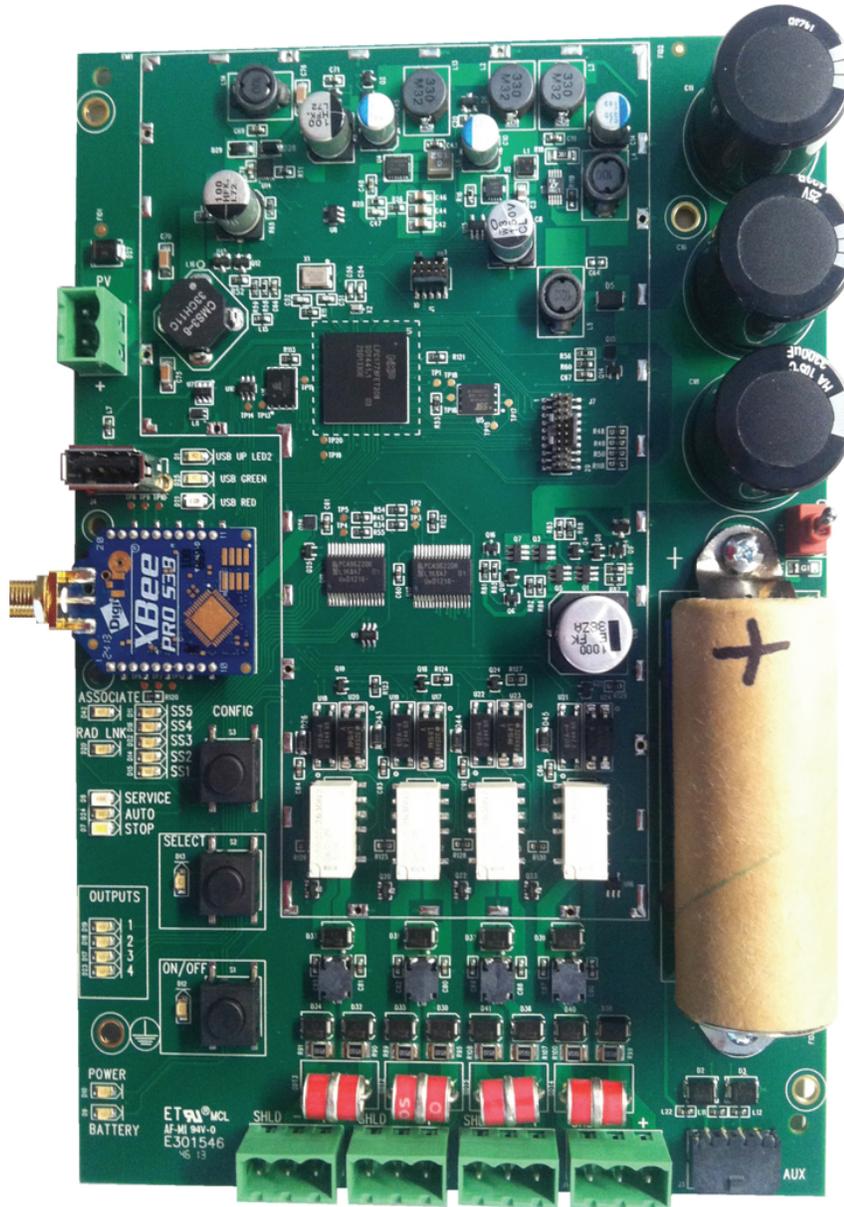
The Wireless Switch interior is accessed by opening the Wireless Switch panel and it houses the following components:

- Wireless Switch Controller
- Wiring Fittings

All components are designed for rugged environmental use, heat, cold and humidity.

Wireless Switch I/O Board

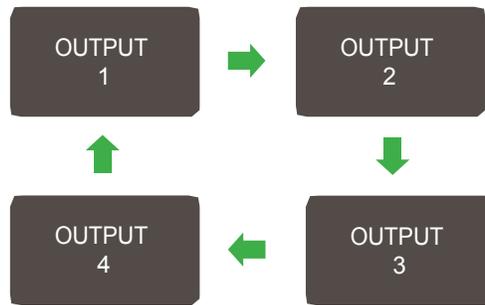
A number of LED indicators display the current state of the Wireless Switch I/O Board functions and features. Please refer to the table on the following page for a description of the indicators.



NAME	COLOR	DESCRIPTION																			
POWER	 Green	Solar power is present																			
BATTERY	 Green	The battery health is good																			
RADIO LINK	 Green	The radio link to Controller is up																			
SELECT	 Green	Select button is pressed																			
ON/OFF	 Green	On/Off button is pressed																			
SERVICE	 Yellow	The system is in Service Mode																			
STOP	 White	The system is in Stop Mode																			
AUTO	 Green	The system is in Auto Mode																			
OUTPUT1-4	 Green	Zone Valve is On																			
	 Green	1 flash - Open Circuit solenoid detected																			
SS1	 Green	<p>The radio Signal Strength is displayed as a meter illuminating LEDs 1-5 with poor signal at 1 LED and all 5 for excellent signal</p> <table border="1"> <thead> <tr> <th></th> <th>POOR</th> <th>AVERAGE</th> <th>EXCELLENT</th> </tr> </thead> <tbody> <tr> <td>SS3</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SS4</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SS5</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		POOR	AVERAGE	EXCELLENT	SS3					SS4					SS5				
	POOR		AVERAGE	EXCELLENT																	
SS3																					
SS4																					
SS5																					
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ASSOCIATE	 Green	When flashing green, the Wireless Swith is synchronizing with Controller																			
USB	 Green	When flashing green, a valid upgrade file on the USB flash drive was found and is updating the I/O Board. DO NOT REMOVE.																			
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	 Green	When green and not flashing, the upgrade is complete and the USB flash drive can be removed																			
	 Red	When red and not flashing, the upgrade failed and the USB flash drive can be removed																			
	 OFF	When off, no USB flash drive has been inserted																			

The Wireless Switch illuminates the SERVICE, STOP, and AUTO indicators based on the mode of operation the Multi-Control is in. Manual operation is possible, when in SERVICE Mode, by pressing the SELECT switch to cycle through the various controls, as shown below, and pressing the ON/OFF switch to toggle the control state. Holding the switch down will select the next option every 3 seconds. When selecting a control the indicator will flash.

While in STOP or AUTO Mode or the Wireless Switch is unable to communicate with the controller, it is possible to temporarily put the Wireless Switch into SERVICE Mode by waking it up (press the SELECT button) and holding the SELECT and ON/OFF buttons for 5 seconds. This will put the Wireless Switch into SERVICE Mode until the next communication with the controller.



If the control is currently Off, the indicator will flash with a short on time and a long off time when selected. If the control is On, the indicator will flash with a long on time and a short off time when selected. The selected indicator will stop flashing and cease to be selected 5 seconds after both buttons have been released.

Wireless Switch Solar Panel



The Wireless Switch battery is charged by 2 Watt Solar Panel.

If the Wireless Switch is put into storage, insulate positive and negative battery terminals to avoid short circuit and ensure sufficient clearance between batteries and other surfaces. Store in a dry, cool (below 30°C and above -10°C) and well ventilated area and avoid fire, heat. Elevated temperatures can result in reduced battery life and venting of flammable liquid and gases. Keep batteries away from strong oxidizers and acids.

Wiring Pressure Sensors

The System Pressure Sensor and optional Post-Filter Pressure Sensor are connected to PRESSURE 1 and PRESSURE 2 respectively on the System I/O Board.

The connector pin out is:

- Pin 4: Sensor Pressure V+
- Pin 3: Sensor Pressure return
- Pin 2: Sensor Pressure signal
- Pin 1: Chassis GND (shield)

Wiring Flow Meters

The System Flow Meter and optional Injector Flow Meter are connected to FLOW 1 and FLOW 2 respectively on the System I/O Board. The Flow Meters use digital pulses to provide the volume of water flowing through the pipeline.

The connector pin out is:

- Pin 5: Sensor V+
- Pin 4: Unassigned
- Pin 3: Unassigned
- Pin 2: Pulse line
- Pin 1: Chassis GND (shield)

Wiring Temperature Sensor

The Controller is capable of monitoring an additional analog Input for temperature. It is connected to the TEMP Input on the System I/O Board, which supports resistive type sensors.

The connector pin out is:

- Pin 4: V+ to Transmitter
- Pin 3: <unused>
- Pin 2: Transmitter Return
- Pin 1: Shield

The Temperature Sensor should be installed in a location that best represents air temperature for the crop and should follow the suggested placement described in the sensor manual. The Temperature Sensor may be used for automatically starting a Temperature Protection Cycle for cooling for freeze protection.

It is generally considered best practice to keep out of direct sunlight and away from asphalt or concrete. Some sensors may come with a radiation shield to provide more accurate readings.

1. Wire the Temperature Sensor to a centralized terminal block.
2. Run cable from the MC Panel through Liquidtight Flexible Metallic Conduit to the terminal block.
3. Connect the cable conductors to the terminal block and label the conductors and cables.
4. Attach the cable conductors to the TEMP Input connector on the System I/O Board.
5. Record sensor details on the appropriate worksheet.

Wiring pH Sensor

The Controller is capable of monitoring an additional analog Input for pH balance. It is connected to the TEMP Input on the System I/O Board, which supports resistive type sensors.

The connector pin out is:

- Pin 4: V+ to Transmitter
- Pin 3: <unused>
- Pin 2: Transmitter Return
- Pin 1: Shield

Wiring Rainfall Sensor

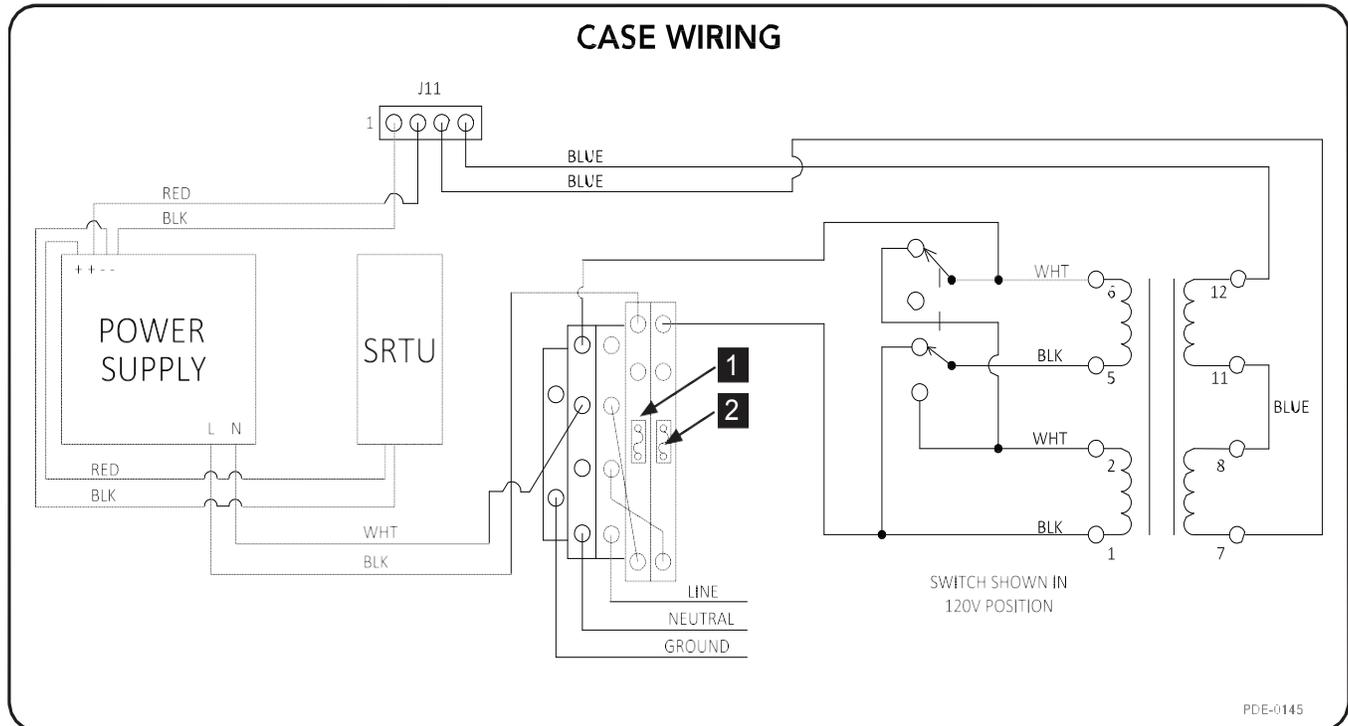
The Controller is capable of monitoring a digital Input for accumulating rainfall using a Rain Bucket. Typical Rainfall Sensors use a tilting bucket to generate a dry contact closure representing rainfall at a preset resolution. The Rainfall Sensor is connected directly to the Controller instead of the System I/O Board.

The connector pin out is:

- Pin 5: PV Cell Input
- Pin 4: PV Cell Input+
- Pin 3: Chassis GND (shield)
- Pin 2: Sensor Return
- Pin 1: Sensor Pulse Line

Connecting Power

The MC Panel and Expansion panels can be run off of 120 VAC 60Hz or 230 VAC 50/60 Hz power. The provided power needs to be properly protected with circuit breakers and proper grounding via a ground rod.



Configure Wireless Switches

1. Insert USB Flash Drive into a computer.
2. Create new folder "MC".
3. Create new folder "Setup" inside the "MC" folder or remove any previous files if folder already exists.
4. Safely eject the USB Flash Drive from computer.
5. Insert USB Flash Drive into the MC Controller.
6. Verify USB LED illuminates flashing green while saving configurations.
7. Verify USB LED illuminates solid green when finishing saving configurations.
8. Remove USB Flash Drive from MC Controller.
9. Repeat the following process for each WS:
 - Insert USB Flash Drive into WS.
 - If the Wireless Switch is sleeping press the SELECT button to wake up the Wireless Switch.
 - Verify USB LEDs illuminate flashing green while saving configurations.
 - USB UP LED2 and USB GREEN indicators will blink while reading and writing configuration.
 - Verify USB LEDs illuminate solid green when finishing saving configurations.
 - USB UP LED2 and USB GREEN indicators will be solid green after configuration is complete.
 - Remove USB Flash Drive from WS.
10. Insert USB Flash Drive into the MC Controller.
11. Verify USB LED illuminates flashing green while saving configurations.
12. Verify USB LED illuminates solid green when finishing saving configurations.
13. Remove USB Flash Drive from MC Controller.
14. Verify each WS links to MC Controller (it may take a while for each WS link to finish communicating).
15. Verify MC Controller Radio Link LED illuminates green solid or flashing.
16. Verify MC Status Center Alert LED illuminates green solid.
17. Remove USB Flash Drive.

Test Wireless Switch

1. Put the system into SERVICE Mode by pressing the Operation Mode button on the Status Center until the LED blinks yellow.
2. Repeat the following process for each WS:
 - Press the SELECT button to activate the WS.
 - Verify the WS is in SERVICE Mode.
 - Verify the ASSOCIATE LED blinks for 3 seconds every 60 seconds.
 - This is the default “wake up” interval for the WS and may change if necessary for installation.

Test Wireless Switch Zone Valves

1. Verify the water source is turned OFF at the Control Panel to test the electronic functionality of Zone Valves.
2. While in SERVICE Mode press the SELECT button on the WS momentarily to choose a Zone Valve.
 - Temporarily put WS into SERVICE Mode by pressing the SELECT and ON/OFF buttons for 3 seconds if in a different mode.
3. Repeat the following process for each Zone Valve:
 - While in SERVICE Mode press the SELECT button momentarily cycle through Zone Valves and press the ON/OFF button to change the valve state.
 - Verify hearing the relay and valve solenoid “click”.
 - The indicator next to the desired Zone Valve will blink quickly if the valve is currently OFF.
 - The indicator next to the desired Zone Valve will blink slowly if the valve is currently ON.
 - Verify the state of the solenoid actuator with the water source turned OFF.
 - The plunger for a latching solenoid will be extended out when the valve is ON to allow for water flow.
 - Remove the coil from the actuator assemble to visually and physically inspect the coil plunger.
 - If the coil plunger is extended, apply a bit of pressure to move it toward the coil.
 - Refer to “Hydraulic Operation of an Open Zone Valve Latching Solenoid” detail in the MC Installation manual for an example.
 - If the coil does not match the extended state, the wires are reversed between the coil and the WS and will need to be reversed at the WS.
 - Reinstall the coil to the actuator.
 - Press the ON/OFF button on the WS to turn the valve OFF.
 - If the coil is not connected back to the actuator, it may not change state as the assembly works with the magnetic field of the coil, spring pressure of the spool and spring pressure of the actuator plate.
4. Repeat the above process with the water source turned ON for each Zone Valve to confirm the system hydraulics are plumbed correctly.
 - Turn several valves on at once and turn one off at a time to prevent pressure spikes on the system.
5. Turn the water source OFF.

Test FieldNET Monitoring and Control

1. Verify the RTU has been properly installed, powered and linked to FieldNET.
 - Follow the installation process provided in the RTU documentation.
2. Follow the Initial Startup process provided in the Multi-Control FieldNET Configuration Manual (P/N PMN-0003) to address the following:
 - Configuring components.
 - Water Source
 - Injector
 - Filter Flush Valves
 - Pressure Sustain Valve
 - Zone Valves
 - Pressure Sensors
 - Flow Meters
 - Temperature / pH Sensor
 - Rainfall Sensor
 - Test individual component control through Service Mode tool.

Test Sensors

1. Complete FieldNET Initial Startup process.
 - Testing the Sensors on the System I/O Board requires configuring through FieldNET prior to testing in order to enable the Sensor and set parameters.
2. Verify Sensor readings against an analog or manual reading:
 - Pressure Transducer: verify with pressure gauge.
 - Flow Meter: verify with a flowmeter with a totalizer display.
 - Temperature Sensor: verify with a thermometer.
 - pH Sensor: verify with pH water sampling kit.
 - Rainfall Sensor: verify by removing the shield of the Rainfall Sensor and toggling the bucket 5 times to force a reading of 0.10 inches or 0.5 millimeters.
 - This assumes the default of 0.02 inches or 0.1 millimeters per toggle.
3. Poll the MC from the Dashboard to get the latest readings and verify against the analog or manual readings.

Service

All service requires a trained Lindsay Dealer.

Controller Factory Reset

The Controller can be reset to the factory defaults with the following process:

1. Cycle the power to the panel.
2. Press and hold the Mode button for 20 seconds while cycling the power.
3. The indicators will turn off briefly and all will turn back on to indicate a reboot has occurred.
4. Configuration and setup must be re-run after reset.

System I/O Board and Auxiliary I/O Board Factory Reset

The System I/O Board and Auxiliary I/O Boards can be reset to the factory defaults with the following process:

1. Cycle the power to the panel.
2. Press and hold the SELECT button for 20 seconds upon power up.
3. The indicators will turn off briefly and all will turn back on to indicate a reboot has occurred.
4. Configuration and setup must be re-run after reset.

Wireless Switch Factory Reset

The Wireless Switch can be reset to the factory defaults with the following process:

1. Press down the CONFIG, SELECT and ON/OFF buttons for 10 seconds.
2. The Wireless Switch will reboot and all indicators will turn back on to indicate a reboot has occurred.
3. Configuration and setup must be re-run after reset.

System Alerts

Alert	Default Level	Description
Filter Hardware Error	2	One of the Filter Flush Valves is reporting a problem which may impact filter flush cycles.
Zone Hardware Error	2	One of the Wireless Switch Zone Valves is reporting a problem which may impact irrigation plans or temperature protection.
Irrigating	3	The Multi-Control is irrigating.
Chemigating	3	The Multi-Control is chemigating.
Plan Paused	3	The current plan is paused.
High System Flow Shutdown	1	Shut down due to high System Flow.
High System Flow Warning	2	System Flow is high.
Low System Flow Shutdown	1	Shut down due to low System Flow.
Low System Flow Warning	2	System Flow is low.
High Flow Disparity Warning	2	System Flow is higher than the total of expected running Zone application rates, which could indicate a leak or a broken pipe.
High Flow Disparity Shutdown	1	Shut down due to the high Flow Disparity.
Low Flow Disparity Warning	2	System Flow is lower than the total of expected running Zone application rates, which could indicate a drip tape is plugged or a stuck valve.
Low Flow Disparity Shutdown	1	Shut down due to the low Flow Disparity.
High System Pressure Shutdown	1	Shut down due to the high System Pressure.
High System Pressure Warning	2	System Pressure is high.
Low System Pressure Shutdown	1	Shut down due to the low System Pressure.
Low System Pressure Warning	2	System Pressure is low.
High Post-Filter Pressure Warning	2	Post-Filter Pressure is high.
Low Post-Filter Pressure Warning	2	Post-Filter Pressure is low.
High Temperature Shutdown	1	Shut down due to the high Temperature.
High Temperature Warning	2	Temperature is high.
Low Temperature Shutdown	1	Shut down due to the low Temperature.
Low Temperature Warning	2	Temperature is low.
High Injector Flow Shutdown	1	Shut down due to high Injector Flow.
High Injector Flow Warning	2	Injector Flow is high.
Low Injector Flow Shutdown	1	Shut down due to low Injector Flow.
Low Injector Flow Warning	2	Injector Flow is low.
High Voltage Shutdown	1	Shut down due to high System Voltage.
High Voltage Warning	2	System Voltage is high.
Low Voltage Shutdown	1	Shut down due to low System Voltage.
Low Voltage Warning	2	System Voltage is low.
Wireless Switch Battery Shutdown	1	One of the Wireless Switches shut down due to an issue with the battery.

Alert	Default Level	Description
Wireless Switch Battery Warning	2	One of the Wireless Switches is reporting an issue with the battery.
Wireless Switch Solar Panel Error	1	One of the Wireless Switches shut down due to an issue with the Solar Panel.
Filter Flush Cycle Running	3	A filter flush cycle is running.
Max Filter Flush Cycles Warning	2	The Multi-Control has attempted the maximum number of contiguous filter flush cycles to reduce Differential Pressure.
Wireless Switch Communication Error	1	One of the Wireless Switches has not communicated after multiple attempts.
Stopped	2	The Multi-Control stopped running.
Powered Off Normal	3	The Multi-Control powered off.
Powered Off While Running Wet	1	The Multi-Control powered off while running.
Temperature Protection Plan Running	3	A temperature protection cycle is running.
Pressure Startup Delay	2	Temporarily disregarding System Pressure alert and shutdown conditions due to system pressurizing.
Flow Delay	2	Temporarily disregarding System Flow alert and shutdown conditions due to changes affecting flow.
Injector Flow Delay	2	Temporarily disregarding Injector Flow alert and shutdown conditions due to changes affecting flow.
Plan Running	3	The current plan is running
Wireless Switch Communication Warning	2	One of the Wireless Switches has low signal strength or data loss.
High Rainfall Shutdown	1	Shut down due to heavy Rainfall.
High Rainfall Warning	2	Rainfall accumulation is high.
Communication Warning	2	FieldNET can communicate with RTU but not the Multi-Control, which could indicate a loose or cut serial connection.
Post-Filter Pressure Delay	3	Temporarily disregarding Post-Filter Pressure alert condition due to system pressurizing.
Injector Off for Filter Flush Delay	3	Temporarily stopping chemigation during filter flush cycle.
Low pH Shutdown	1	Shut down due to low pH.
High pH Shutdown	1	Shut down due to high pH.
Low pH Warning	2	pH is low.
High pH Warning	2	pH is high.
Hardware Shutdown	1	Shut down due to a hardware failure.

Controller Fault Flash Codes

The Controller Fault status LED indicator may display a series of flashes for troubleshooting if the Controller is in a Warning or Shutdown condition. Count the number of flashes and refer to the table below to associate the flash code, cause, and solution.

Code	Warning or Fault	Cause	Solution
10	Max Flush Cycles Warning	The Pressure Differential Filter Flush Cycle has retried the maximum number of cycles without successfully bringing the Pressure Differential back within acceptable range.	<ul style="list-style-type: none"> Verify the Filtration settings in FieldNET are appropriate for this installation (Properties - Filtration). There may be a large obstruction in the filter that is unable to be removed by backwashing. Refer to filter documentation to remove the obstruction. Put system into AUTO Mode by pressing the Operation Mode button or by clicking on the Run button on the Dashboard in FieldNET, which will clear the condition and run the plan as scheduled.
11	Rainfall Shutdown High	The Controller has shut down due to exceeding the allowed accumulation over a period of time.	<ul style="list-style-type: none"> Verify the Rainfall Sensor settings in FieldNET are appropriate for this installation (Properties - System). Put system into AUTO Mode by pressing the Operation Mode button or by clicking on the Run button on the Dashboard in FieldNET, which will clear the condition and run the plan as scheduled.
13	Temperature Shutdown Low	The Controller has shut down due to the Temperature being below the Low Shutdown setting or above the High Shutdown setting.	<ul style="list-style-type: none"> Verify the Temperature Sensor settings in FieldNET are appropriate for this installation (Properties - System). Put system into AUTO Mode by pressing the Operation Mode button or by clicking on the Run button on the Dashboard in FieldNET, which will clear the condition and run the plan as scheduled.
14	Temperature Shutdown High		

Code	Warning or Fault	Cause	Solution
15	Temperature Warning Low	The Temperature is below the Low Alert setting or above the High Alert setting.	<ul style="list-style-type: none"> Verify the Temperature Sensor settings in FieldNET are appropriate for this installation (Properties - System).
16	Temperature Warning High		
18	Water Pressure Shutdown Low	The Controller has shut down due to the System Pressure being below the Low Shutdown setting or above the High Shutdown setting.	<ul style="list-style-type: none"> Verify the System Pressure Sensor settings in FieldNET are appropriate for this installation (Properties - System). Put system into AUTO Mode by pressing the Operation Mode button or by clicking on the Run button on the Dashboard in FieldNET, which will clear the condition and run the plan as scheduled.
19	Water Pressure Shutdown High		
20	Water Pressure Warning Low	The System Pressure is below the Low Alert setting or above the High Alert setting.	<ul style="list-style-type: none"> Verify the System Pressure Sensor settings in FieldNET are appropriate for this installation (Properties - System).
21	Water Pressure Warning High		
23	Water Flow Shutdown Low	The Controller has shut down due to the System Flow being below the Low Shutdown setting or above the High Shutdown setting.	<ul style="list-style-type: none"> Verify the System Flow Meter settings in FieldNET are appropriate for this installation (Properties - System). Put system into AUTO Mode by pressing the Operation Mode button or by clicking on the Run button on the Dashboard in FieldNET, which will clear the condition and run the plan as scheduled.
24	Water Flow Shutdown High		
25	Water Flow Warning Low	The System Flow is below the Low Alert setting or above the High Alert setting.	<ul style="list-style-type: none"> Verify the System Flow Meter settings in FieldNET are appropriate for this installation (Properties - System).
26	Water Flow Warning High		
27	Flow Disparity Shutdown Low	The Controller has shut down due to a Flow Disparity that exceeds the Flow Disparity Shutdown setting. Flow Disparity is calculated by subtracting the Target Flow for the active Zones from the System Flow. Flow Disparity is considered high if the difference is negative and low if positive.	<ul style="list-style-type: none"> Verify the System Flow Meter settings in FieldNET are appropriate for this installation (Properties - System). Put system into AUTO Mode by pressing the Operation Mode button or by clicking on the Run button on the Dashboard in FieldNET, which will clear the condition and run the plan as scheduled.
28	Flow Disparity Shutdown High		

Code	Warning or Fault	Cause	Solution
29	Flow Disparity Warning Low	Flow Disparity is below the Low Alert setting or above the High Alert setting.	<ul style="list-style-type: none"> Verify the System Flow Meter settings in FieldNET are appropriate for this installation (Properties - System).
30	Flow Disparity Warning High		

Troubleshooting

This section addresses frequently asked questions and work-arounds.

Controller

How do I clear my Warnings or Faults?

Warnings and Faults are a results of being triggered due to meeting the conditions of the Warning or Fault.

There are some Warnings and Faults that are based on user-entered parameters. Others are based on hardware reporting a problem.

In order to clear out any active Warnings or Faults, change the Operation Mode. If the condition still exists, the same Warning or Fault will be triggered again.

Wireless Switch

The Wireless Switch does not link to the Controller. What can I do to get it to link?

If a Wireless Switch does not link readily, try resetting the Wireless Switch and the Controller, which should cause the radio to synchronize.

To reset the Wireless Switch, turn it off and then back on using the On/Off switch. Then reset the Controller Panel by disconnecting the power connection and wait until the controller indicator LEDs turn off, which may be up to 2 minutes. Reconnect the power to the Controller Panel, which should cause the Wireless Switches to synchronize.

I keep getting a RED indicator when configuring a Wireless Switch with the USB Flash Drive. What do I need to do to get it configured?

If the Wireless Switch configuration with the USB Flash Drive does not seem to succeed, check if the file “/MC/Setup/setup.rec” file was written after saving the configurations from the Controller.

The Wireless Switch keeps having a Low Battery Warning or Low Battery Shutdown. Does the battery need to be replaced?

Verify the Solar Panel is installed with the optimal angle and is properly connected to the Wireless Switch.

Verify the Battery is properly mounted to the Wireless Switch.

If a Wireless Switch has an alert or a shutdown condition due to low battery voltage a battery replacement may be necessary. Contact Lindsay Sales for replacing the battery.

Revisions				
Date	Revision	ECN	Published ECN	Description
10/24/2014	A	32987	32987	New Manual
10/8/2015	B	33715	33715	Updated page 1

