

April 16, 1935

G. H. ENGLEHART

1,997,901

WATER METER

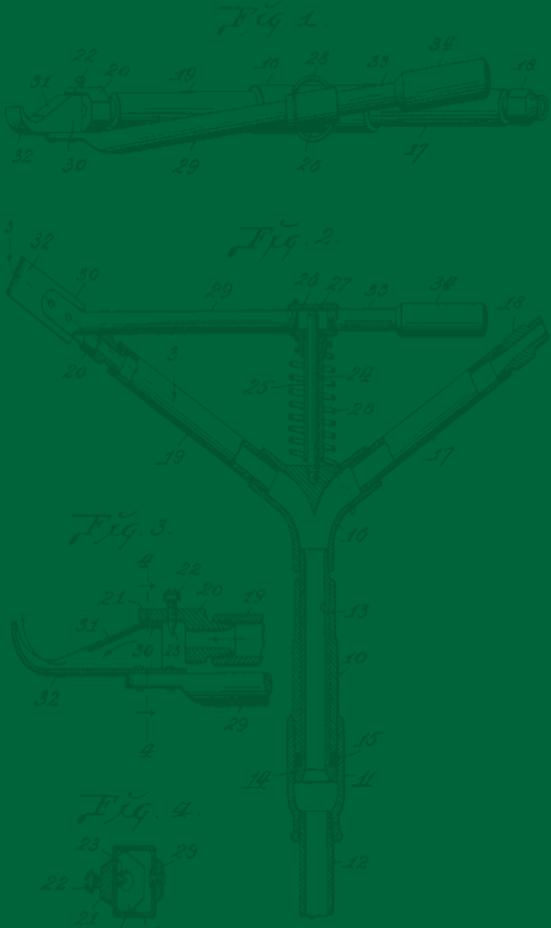
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Fig. 1

Fig. 2

Fig. 3

Fig. 4



INVENTOR:
GEO. H. ENGLEHART
BY: [Signature]

RAIN  BIRD®

iQ4

Flow Sensing

The Intelligent Use of Water™

Leadership · Education · Partnerships ·
Products

Flow Sensing

3 areas to setup in IQ4

- Flow sensors
- FloManager™
- FloWatch™

Flow Monitoring

- If a flow sensor has been installed, real-time flow showing expected flow and actual flow can be displayed

Flow Sensing

FloManager™

- FloManager™ adds basic hydraulic management features to your system to ensure that sufficient water pressure and volume is available to operate all stations. Although it is helpful, flow sensing hardware is not required to use FloManager™. You can manually enter estimated flow rates even if flow sensing hardware is not installed.

Flow Sensing

FloManager™

- FloManager™ works with SimulStations (multi-station operation settings) by adding another layer of station or FloZone prioritization based on available water resources. For example, if FloZone1 has 20 GPM available flow and two stations each consuming 6 GPM are currently in operation for a total of 12 GPM, FloManager™ will not allow an additional station to start unless it consumes 8 GPM or less. This helps ensure that your system's hydraulic resources are not overtaxed and that sufficient water is available to every sprinkler in every station.

Flow Sensing

FloWatch™

- FloWatch™ allows you to use any or all of the FloManager™ features and add additional functionality such as alarms for high flow (SEEF) and low flow (SELF) situations based on parameters you set and control
- Note: Flow sensing hardware is required to use FloWatch™

The screenshot displays the IQ4 software interface for configuring sensors on an ESP LXME Server. The 'Sensors' tab is active, showing a table with the following data:

Name	Type	Model	Settling Time	FloZone™
Local Sensor	Local Sensor	No Sensor Installed	00:30	-
Flow Sensor 1	Flow	FS200P	-	FloWatch™

The 'Flow Sensor 1' row is highlighted with a green box. A green arrow points from this box to a detailed configuration modal for 'FLOW SENSOR 1'. The modal shows the following fields:

- Name: Flow Sensor 1
- Model: FS350B
- Pipe Diameter: 3.0 Inch

A 'Save' button is highlighted with a green box at the bottom right of the modal.

▪ Flow sensor setup – ESP LXMEF

- Select Sensors -> Flow Sensor 1
- Enter Flow Sensor name
- Select the model number of the installed flow sensor (enter pipe diameter if required)
- If non-Rain Bird sensor -> enter Custom, Kfactor and Offset
- Click Save

The screenshot displays the 'Sensors' configuration page in the IQNet software. The 'Sensors' tab is highlighted in a green box. A table lists various sensors, with 'Flow Sensor 1' highlighted in a green box. A green arrow points from 'Flow Sensor 1' to a configuration modal for 'FLOW SENSOR 1'. The modal shows fields for Name, Model (FS350B), Address (12345), Pipe Diameter (2.9 Inch), and FloZone (FloZone™ 1). A 'Save' button is highlighted in a green box.

Name	Type	Model	Address	Setting Time	FloZone™
<input type="checkbox"/> Rain Freeze	Local Sensor	Rain/Freeze Sensor Prevent (Alarm)	0	00:30	-
<input type="checkbox"/> Weather 1	Weather	Rain Sensor Prevent (Alarm)	0	00:30	-
<input type="checkbox"/> Weather 2	Weather	Rain Sensor Prevent (Alarm)	0	00:30	-
<input type="checkbox"/> Weather 3	Weather	Rain Sensor Prevent (Alarm)	0	00:30	-
<input type="checkbox"/> Flow Sensor 1	Flow	Disabled			FloZone™ 1
<input type="checkbox"/> Flow Sensor 2	Flow	Disabled			FloZone™ 2
<input type="checkbox"/> Flow Sensor 3	Flow	Disabled			FloZone™ 3
<input type="checkbox"/> Flow Sensor 4	Flow	Disabled			FloZone™ 4
<input type="checkbox"/> Flow Sensor 5	Flow	Disabled			FloZone™ 5

▪ Flow sensor setup – ESP LX D

- Select Sensors -> Flow Sensor X
- Enter Flow Sensor name -> Address -> Model
- Select the model number of the installed flow sensor (enter pipe diameter if required)
- If non-Rain Bird sensor -> enter Custom, Kfactor and Offset
- Click Save



The screenshot displays the iQ4 interface for configuring sensors on an ESP LXIVM Pro controller. The 'Sensors' tab is active, showing a list of sensors. 'Flow Sensor 01' is selected, and its configuration details are shown in a modal window. The configuration form includes the following fields:

- Name: Flow Sensor 1
- Address: 12345
- Model: FS350B
- Pipe Diameter: 2.9 Inch
- FloZone: FloZone™ 1

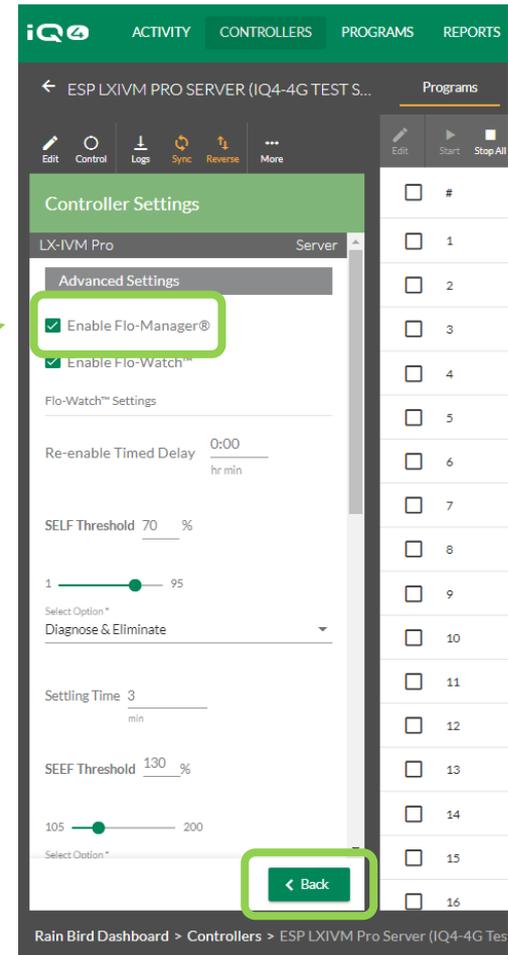
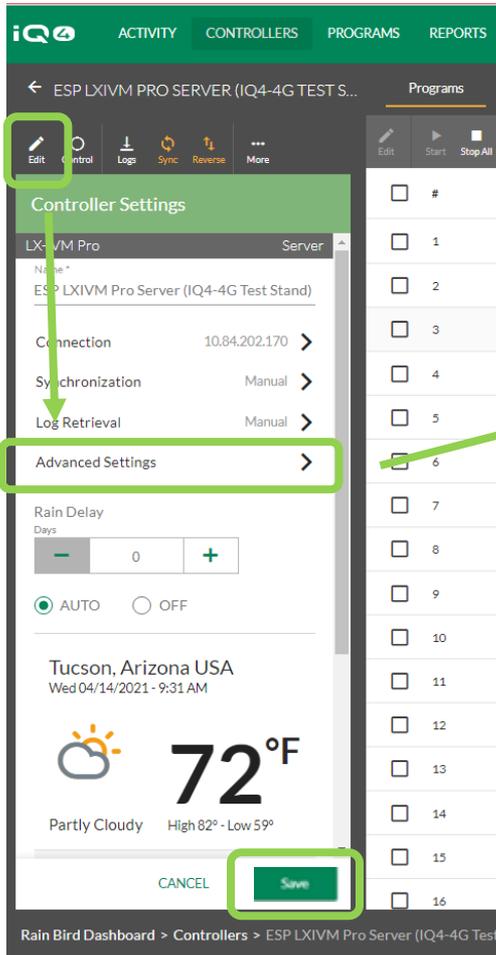
A 'Save' button is highlighted in a green box at the bottom right of the configuration form.

▪ Flow sensor setup – ESP LXIVM / ESP LXIVM Pro

- Select Sensors -> Flow Sensor X
- Enter Flow Sensor name -> Address -> Model
- Select the model number of the installed flow sensor (enter pipe diameter if required)
- If non-Rain Bird sensor -> enter Custom, Kfactor and Offset
- Click Save

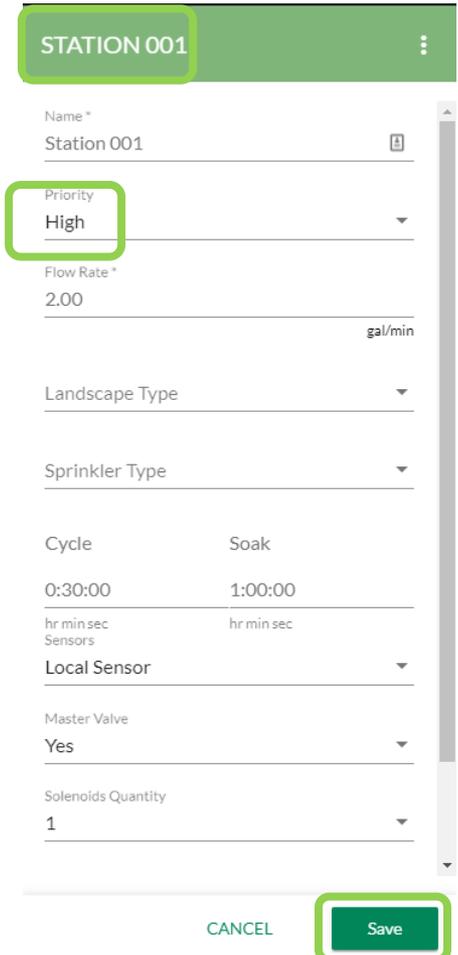
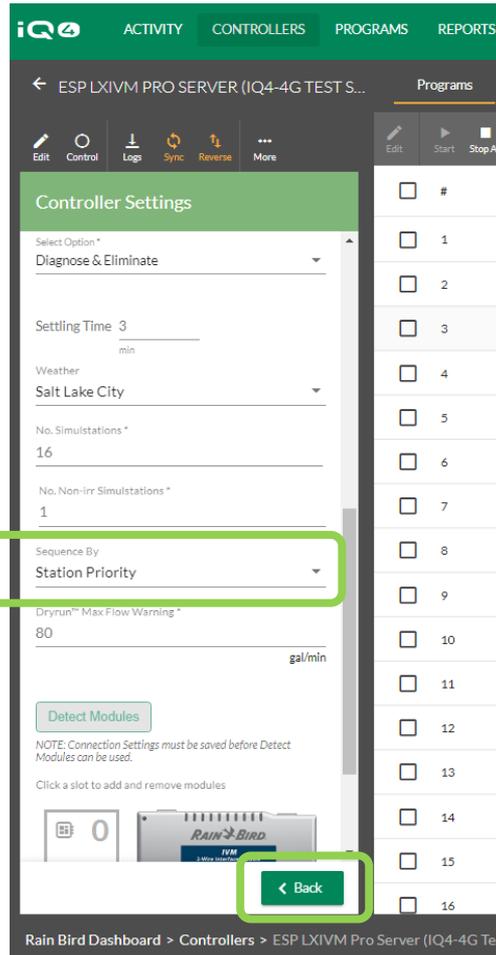
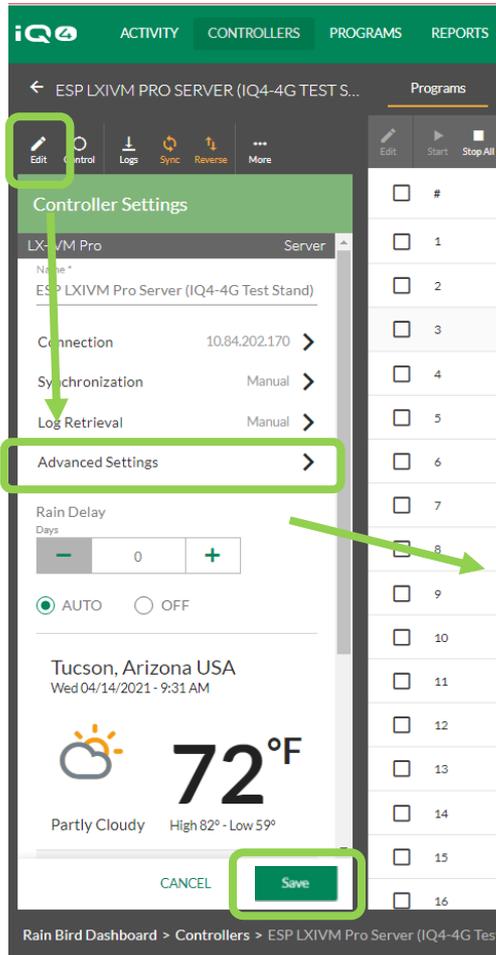
CANCEL

Save



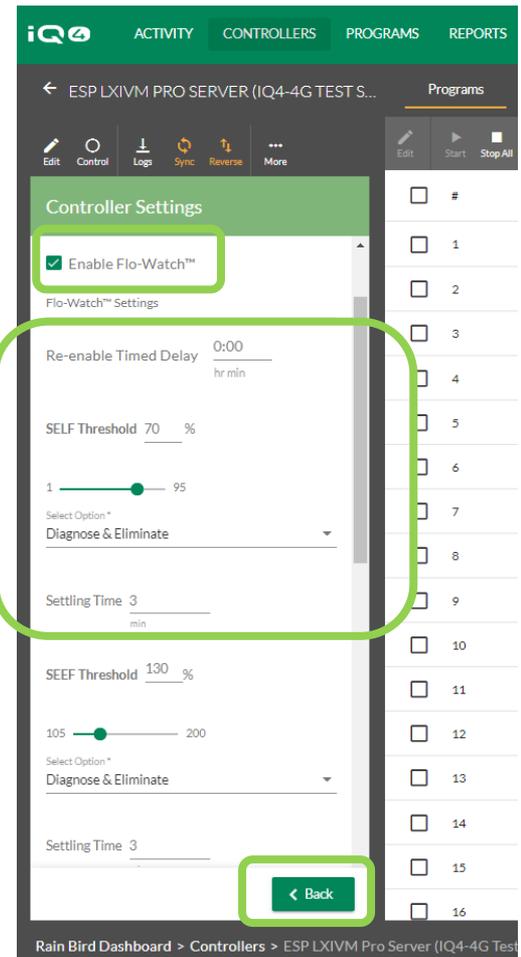
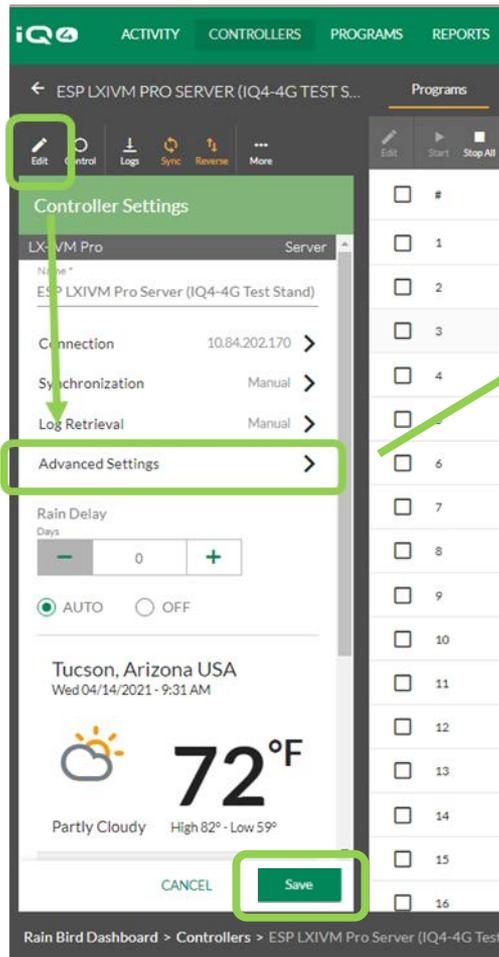
■ Flo-Manager

- Click on desired controller -> Edit
- Click on Advanced Settings
- Select the checkbox for Enable FloManager
- Click Back
- Click Save



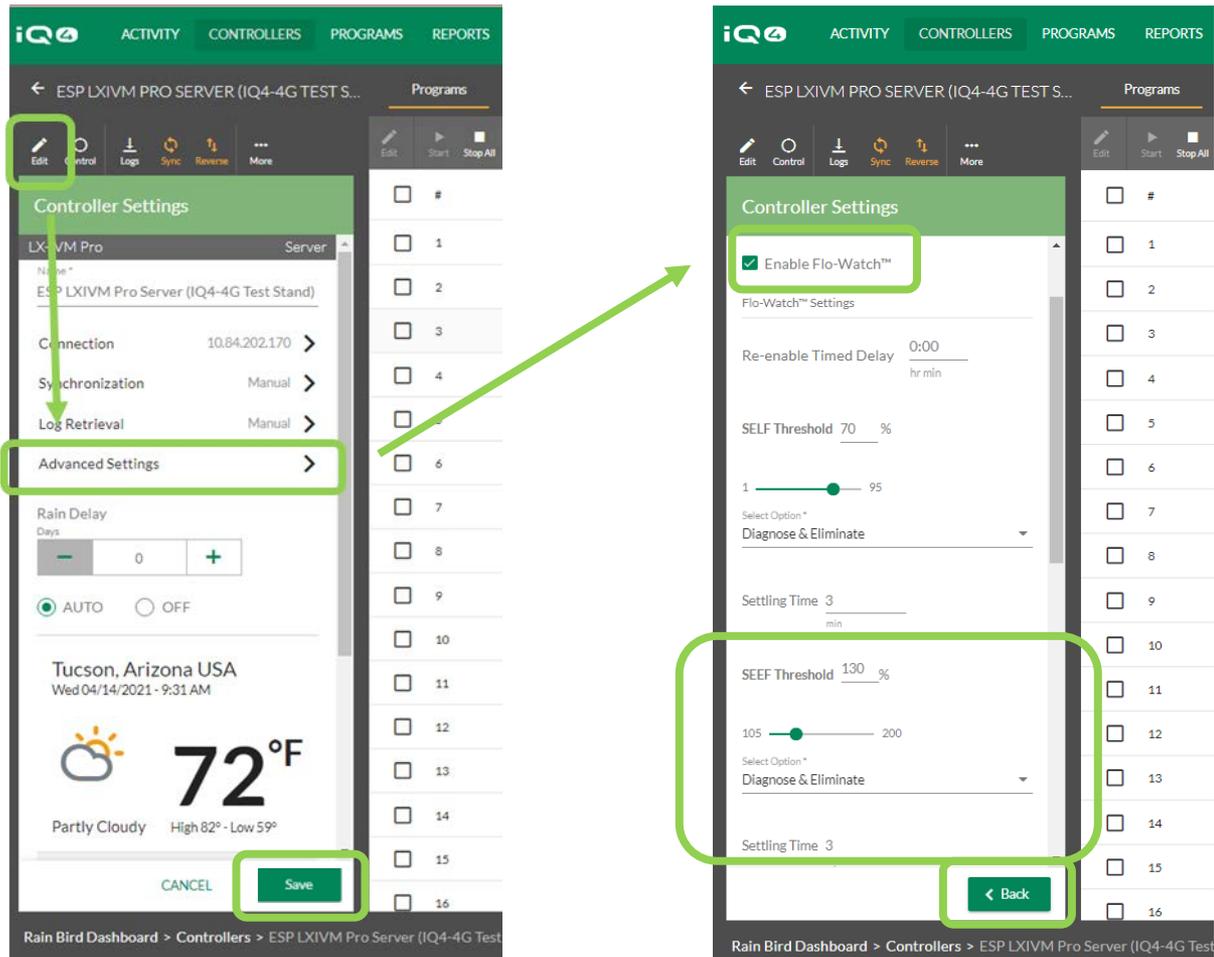
■ Flo-Manager

- The controller Sequence By must be set to Station Priority
- Click Back
- Click Save
- Edit or Batch Edit: All FloManager stations must be set to a priority: High, Medium or Low
- Click Save



■ FloWatch

- Select controller -> Edit
- Click on Advanced Settings
- Scroll down to Enable FloWatch -> Click on checkbox
- Set Timed Delay, SELF Threshold, Response Option, Settling Time
- Click Back
- Click Save



■ FloWatch

- Select controller -> Edit
- Click on Advanced Settings
- Scroll down to Enable FloWatch -> Click on checkbox
- Set Timed Delay, SEEF Threshold, Response Option, Settling Time
- Click Back
- Click Save

FloWatch Settings

FloWatch™ compares the current flow rate (from the flow sensor) to expected learned or user-entered flow rates and takes various actions based on your settings and input. Since current flow conditions are required, FloWatch™ can only be used when flow sensors are present. To use FloWatch™, you must do all of the following:

- Install flow monitoring hardware into the appropriate locations of your irrigation system.
- You should install one flow sensor just downstream of each Master Valve but upstream of any stations.
- To ensure stable readings, flow sensors should be installed at least ten times the distance of the pipe diameter downstream of the Master Valve with an additional five pipe diameter distance between the flow sensor and any additional hardware.
- Use shielded flow sensing cable between flow sensor and the ESP-LXMEF controller

FloWatch Settings

The ESP-LX Satellite Controller enables you to set the flow rates you expect or to automatically Learn Flow rates based on real usage. Once flow is learned or manually entered, the Seek and Eliminate Excessive Flow (SEEF) and Seek and Eliminate Low Flow (SELF) settings let you define the parameters for excessive or low flow and to set the behavior of the satellite controller when these conditions are detected. To most effectively use FloWatch, you will want to first set your SEEF and SELF thresholds and actions.

SEEF stands for Seek and Eliminate Excessive Flow and deals with how you want your controller to respond when excessive flow is occurring, as might be the case with a mainline break.

SELF stands for Seek and Eliminate Low Flow and deals with what the controller should do when low flow is present, as might be the case during a pump failure, municipal water supply issue or when a zone valve fails to open.

FloWatch Settings

FloWatch requires flow rates to be configured to work properly. Flow rates can be entered manually or can be learned automatically through a Learn Flow process at the controller. An automatic Learn Flow operation will Learn Flow for the stations within a FloZone. Ensure you have set up runtimes for all stations included in a Learn Flow exercise prior to setting up a Learn Flow. After flows are learned, they can be Reverse Synced into IQ4 from the controller(s) before the next Sync or Auto Sync

Configuring SEEF

- High Flow Threshold - This is the actual flow rate (between 105-200%) that a station or flow zone must achieve to be considered excessive. Consider using the default setting of 130% (or higher) for SEEF High flow Threshold. Using a lower percentage can result in false alarms due to normal hydraulic variability.
- High Flow Settling Time - This is the time (from 1-10 minutes) that a flow rate must remain at or above the High Flow Threshold before the controller will issue an alarm or take action.

FloWatch Settings

- Action if SEEF Detected - Enables you to set the satellite controller's behavior when a SEEF condition exists. The options are:
 - **Diagnose and Eliminate:** Allows the controller diagnose if the high flow is due to a mainline/FloZone (mainline break, stuck open valve, etc., closing the Master Valve) problem or a station problem (broken lateral, missing sprinklers, etc., closing just the affected valve).
 - **Shut Down and Alarm:** Closes the Master Valve for the FloZone without diagnosing the problem.
 - **Alarm Only:** Issues an alarm condition, but takes no other action (Master Valve is not closed).

Configuring SELF

- Low Flow Threshold - This is the actual flow rate (between 5-95%) that a station or FloZone must achieve to be considered low flow. Consider using the default setting of 70% (or lower) for SELF Low flow Threshold. Using a higher percentage can result in false alarms due to normal hydraulic variability.
- Low Flow Settling Time - This is the time (from 1-10 minutes) that a flow rate must remain at or below the Low Flow Threshold before the controller will issue an alarm or take action.

FloWatch Settings

- Action if SELF Detected - Enables you to set the satellite controller's behavior when a SELF condition exists. The options are:
 - **Diagnose and Eliminate:** Allows the controller diagnose if the low/no flow condition is for all stations or a single station.
 - **Shut Down and Alarm:** Closes the Master Valve for the FloZone without diagnosing the problem.
 - **Alarm Only:** Issues an alarm condition, but takes no other action (Master Valve is not closed).

Frequently Asked Questions

FAQs

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