



# FLOW AND LINE PRESSURE MONITORING

Monitors the status of an irrigation zone or system to confirm proper operation and predict potential problems or required maintenance. Measurements from pressure gauges, flow meters and other devices are recorded, showing trends and alerting the user when high or low values indicate problems.

Automated text-message alerts draw immediate attention to equipment failures and other status changes. Flow and Line Pressure Monitoring can be combined with other Observant solutions for comprehensive farm water management.

## Applications

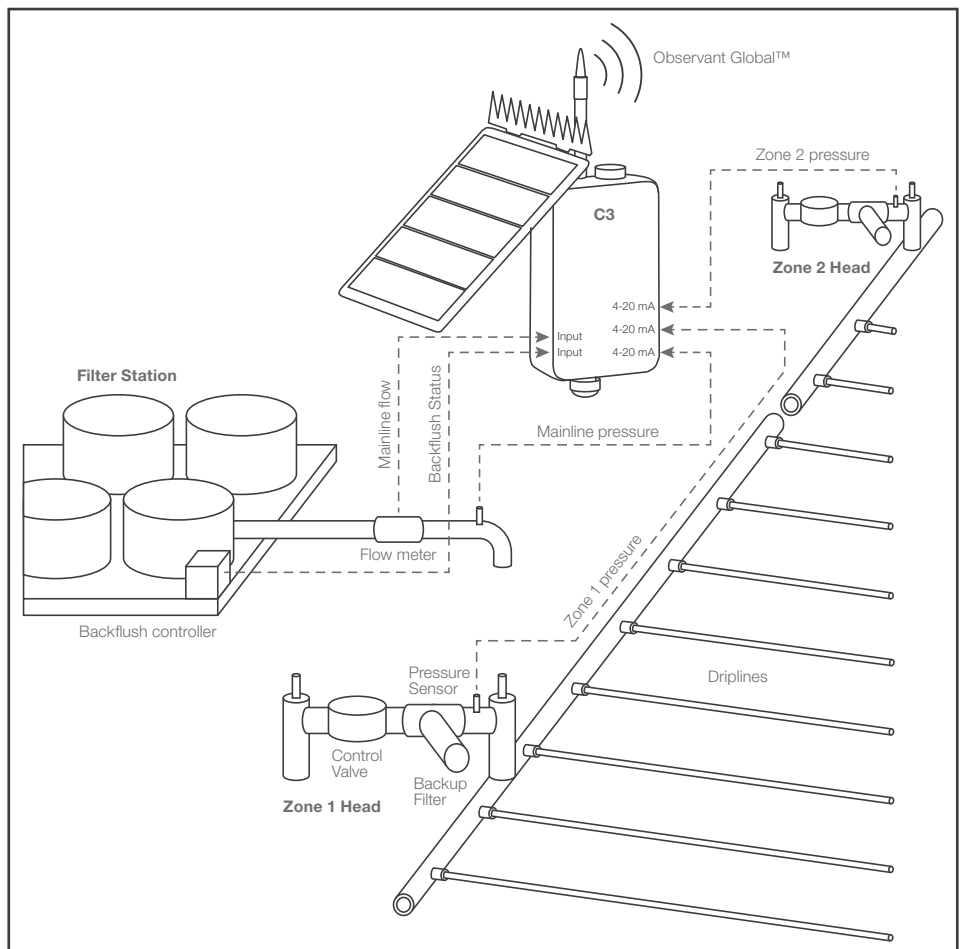
- Drip irrigation.
- Mechanized (Pivot) Irrigation.
- Solid Set Sprinkler Irrigation.
- Microspray/Microsprinkler Irrigation.
- Furrow Irrigation.

## Related Solutions

- Pump Management.
- Irrigation Scheduling.
- Soil Moisture Monitoring.
- Weather & Environmental Monitoring.

## Observant Platforms

- C3 Gateway.
- C3 Cell.
- C3 Node.
- Solo.





# Capability: Flow Rate and Totalized Flow Monitoring

## I/O Type and Connection

Digital Input, pulse train. Connect to C3™ or Solo™ Dual Purpose Digital/Analog Inputs (Inputs 1–4). See the Observant Technical Note: Pulse Flow Meters and Pulse Energy Meters.

## Physical Interpretation

Each digital pulse represents one unit of volume passing through the device, calibrated per device. Flow rate is proportional to pulse frequency. Totalized flow over time is proportional to the number of pulses counted over time. Raw pulses are converted and displayed in engineering units (gallons, gallons per minute, liters or liters per minute as appropriate) by the Observant Global™ software.

## Input Source

- Flow meter at head of irrigation system, such as pump or filter station output.
- Flow meter at head of individual irrigation zone.

## Uses of Information

Changes in flow rate can indicate a number of problems in an irrigation zone. Examples include:

Flow Measurement	Possible Indications
Sudden increase	<ul style="list-style-type: none"> <li>• Line break downstream of meter.</li> <li>• Failure of sprinkler head(s).</li> </ul>
Gradual increase	<ul style="list-style-type: none"> <li>• Damage to drip laterals from pests or field operations.</li> </ul>
Sudden decrease	<ul style="list-style-type: none"> <li>• Line break upstream of meter.</li> <li>• Clogged manifold, valve or other line downstream of meter.</li> </ul>
Gradual decrease	<ul style="list-style-type: none"> <li>• Drip emitter plugging.</li> <li>• Filter clogging.</li> <li>• Pump wear.</li> <li>• Water supply depletion.</li> </ul>

Totalized flow can be used to track the amount of water that is applied during a single irrigation event or during a larger period of time such as a crop season.

## Alerts

The system can be configured to alert on either a high or low flow rate, but not on a zero flow rate, thus avoiding an alert when the system or zone is deliberately shut down. Alternatively, if Flow and Line Pressure Monitoring is used in conjunction with Irrigation Scheduling, alerts can be configured to only be active when a schedule is active.

## Supported Flow Monitoring Devices

Pulse output flow meters, including McCrometer and SeaMetrics.



# Capability: Pressure Monitoring

## I/O Type and Connections:

Analog Input, 4–20 mA. Connect to Dual Purpose Switched Outputs (with C3 Telemetry Units) or to the Sensor Input using an appropriate connector (with Solo Telemetry Units).

## Physical Interpretation:

Analog signal is proportional to water pressure at the measurement point. Supported devices are automatically calibrated to provide measurements in engineering units (PSI or Bar).

## Input Source(s):

- Pressure sensor at entrance to irrigation zone.
- Pressure sensor immediately downstream of filter or filter station.
- Pressure sensor immediately upstream of filter or filter station.
- Pressure sensors at other critical points.

## Uses of Information

Pressure Measurement	Location	Possible Indications
Increase	Head of zone	<ul style="list-style-type: none"> <li>• Drip emitter plugging if zone is not pressure regulated.</li> </ul>
Decrease	Head of zone	<ul style="list-style-type: none"> <li>• Line break downstream of sensor.</li> <li>• Damage to sprinkler head(s).</li> <li>• Damage to drip laterals by pests or field operations.</li> </ul>
Increase	Tail of drip zone (flush manifold)	<ul style="list-style-type: none"> <li>• Drip emitter plugging.</li> </ul>
Decrease	Filter output	<ul style="list-style-type: none"> <li>• Filter clogging, backflush required*.</li> </ul>
Sudden increase	Filter output	<ul style="list-style-type: none"> <li>• Filter element failure*.</li> </ul>

\* Use this measurement for small supplemental or backup filters. The main filter station should use a dedicated, backflush controller.

## Alerts

The system can be configured to alert on either a high or low pressure, but not on a zero pressure, thus avoiding an alert when the system or zone is deliberately shut down. Alternatively, when Flow and Line Pressure Monitoring is used in conjunction with the Irrigation Scheduling solution, low pressure alerts can be configured to only be active when the schedule is running.

## Supported Pressure Monitoring Device

Schneider OsiSense P/N XMLK100P2D23 Pressure Sensor, 420 mA output, 100 PSI



# Capability: Backflush Monitoring

## I/O Type and Connections:

Normally Open relay output of backflush controller indicating backflush status. Connect to C3 or Solo Dual Purpose Digital/Analog Inputs (Inputs 1–4). See Observant Health Desk article, “Switched Input to Monitor Equipment State.”

## Physical Interpretation:

A digital input is connected to a backflush controller status output or to a pressure switch mounted on a filter-station, backflush line. An “active” value indicates the filter is being backflushed. An “inactive” value indicates the filter is in normal operating mode.

## Input Sources:

- Status output of backflush controller, relay, or digital output.
- Pressure switch on backflush line of filter station’s relay output.

## Uses of Information:

Filter stations under independent backflush control will typically backflush when the pressure drop across the station reaches a preset value. In normal operation, a filter station will backflush at regular intervals, which depend on flow rate, water quality, and media type. An increase in backflush frequency can indicate a problem with the water source, which must be addressed before it causes problems with the filters or the irrigation system. Algae or bacterial blooms in surface water or an increase in scale or sand in well water are two of the many water supply problems that can be detected by monitoring backflush frequency. A sudden drop in backflush frequency can also indicate problems such as filter-media failure.

## Alerts

The system can be programmed to provide alerts when the time interval between two successive backflushes falls below a specified value.

## Supported Pressure Monitoring Device

Normally Open electrical contact (relay) devices.