



## The Easy Way to Automate Your Irrigation and Fertilization with AI

- ❁ Oro Gem range of controllers allow you to automate the control and regulation of your pumps, valves, and other hydraulic components in your drip or sprinkler system remotely from anywhere.
- ❁ Our industry leading controllers are suitable for open fields, orchards and greenhouses, and delivering excellent crop performance and resource efficiency.



## OroGEM Much More than a Controller. It's a Whole Operating System for Your Irrigation.

All our controllers are connected to the Orogem OS, an intuitive visual work tool that makes it easier to plan, monitor and execute your irrigation with greater transparency and reliability. So you can minimize your operating costs while improving your yields with a lot less effort.

### Irrigation Controller

- ✦ A wide range of flexible and modular controllers, suitable for almost any type of application like filter back flushing and fertigation
- ✦ All irrigation controllers are modular and allows expanding the system
- ✦ All irrigation controllers can upgrade the software through Bluetooth device.
- ✦ Lora based RTU – Up to 2 km line of sight
- ✦ Weather station – Supplying Weather data for irrigation and shutdown the system during rain
- ✦ Analog inputs available locally near the controller or remotely through the RTU (Both Lora and RS485)

### Fertigation

- ✦ Allows both Local and central fertilization sites, Up to 8 fertilizers channel per site
- ✦ **Fertilizer dosage modes:**
  - Continuous - Time (hh:mm:ss)
  - Volume - Liters Concentration ( L/m<sup>3</sup> )
  - Proportional - proportion calculated from given amount of water and fertilizer
- ✦ Fertilizer dosage procedure: Pre-watering, Fertilizer injection, Post-watering

### Irrigation Program

- ✦ Hundreds of irrigation programs to Control irrigation line / head units and valves can be defined
- ✦ Water dosing by Time, Volume and moisture possible.
- ✦ **Irrigation scheduling features:**
  - No Schedule - Manual on/off
  - Day count RTC with numbers of cycles
  - Run list for a given number of days and repeat till end date
  - Run and Skip days
- ✦ Single cycle or pulse irrigation
- ✦ Start: by time, by condition, manually
- ✦ Each program allows irrigating single or multiple valves or sequence of valves or group of valves
- ✦ Main valve operation delayed, advanced or together with the irrigation valves possible.

## Backflush

- Allows both Local and central filter sites
- Flushing by time, by differential pressure or by both
- Definable parameters:**  
Flushing interval, Pre dwell time, Dwell time, Flushing time, PD delay
- Endless looping detection and prevention
- Accumulation of flushing cycles by time and by PD

## General

- ORO Site configurator allows tailor fitting for each irrigation controller to site-specific irrigation needs
- Flexible condition systems allow starting, waiting, stopping and continuing of irrigation programs
- Detailed event log for all irrigation system available
- Controller configuration and irrigation programs are saved in non-volatile memory and backed up on cloud

## Alarm

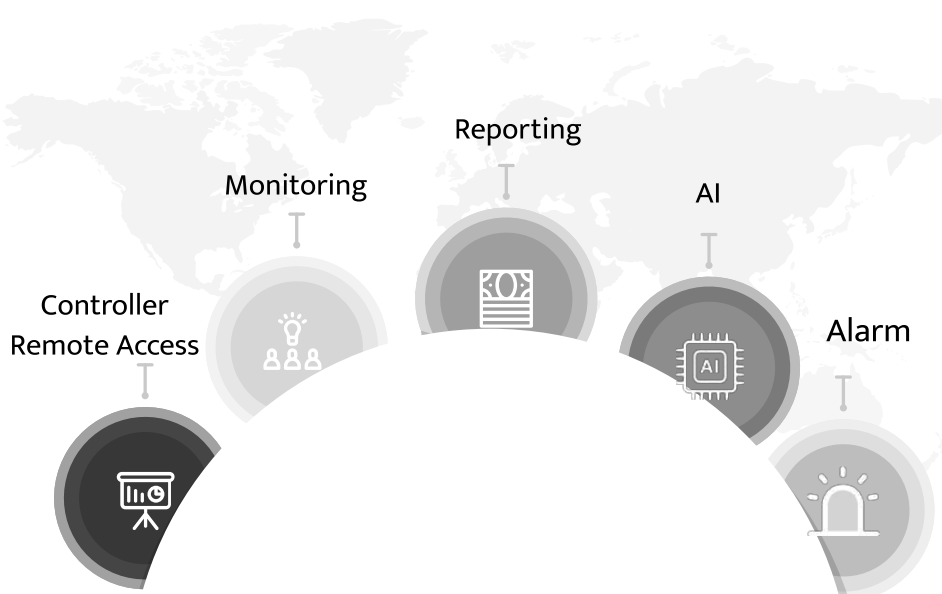
- High flow, Low flow, Water leakage, Low pressure
- Fertilizer leakage, No pulses from fertilizer injector
- PD sensor failure
- Low battery, No Power Supply

## Communication

- The ORO Gem+ OS seamlessly connects your controller your sensors, to the cloud and accessible with your mobile device.
- Oro App - For **Web, Android** and **iOS**
- Possible communication channels: GSM, WIFI, Ethernet cable

## Power

- 12V DC from a solar panel and a rechargeable battery
- 220V AC with a rechargeable battery power backup





## ORO GEM

High performance automation that doesn't compromise on flexibility. Acts as a Master Device for **Small Farms**.

ORO Smart

Communication  
RS485

ORO Smart+



## ORO GEM+

High performance automation that doesn't compromise on flexibility. Acts as a Master Device for **Medium and Large Farms**.

Communication  
Lora/GPRS

Communication  
RS485

ORO PUMP

ORO RTU

ORO PUMP+

ORO RTU+

ORO SENSE

ORO WEATHER

ORO LEVEL

ORO EXTEND

ORO Smart

ORO Smart+

### Ordering Information

Model Number	Communication
ORGEM	RS485
ORGEM+	Lora /RS485



## oro Smart

The simple and flexible solution for automating your irrigation pump and valves, also functions as a slave device.



Output : 8 Nos  
Valves/Pumps



Input ADC : 4Nos  
Pressure / Level Sensor

(optional)



Input ADC : 2Nos  
PH Sensor

(optional)



Communication  
RS485

### Ordering Information

Model Number	Communication	Description
OS4R	RS485	4 Relay
OS8R	RS485	8 Relay
OS4RADC	RS485	4 Relay with 4 to 20 mA
OS8RADC	RS485	8 Relay with 4 to 20 mA
OS4RPH	RS485	4 Relay with PH



## oro Smart+

The simple and flexible way to automate your irrigation pump, valve, filtration and fertigation. Acts as a slave device.



Output : 16 Nos  
Valves/Pumps



Input ADC : 4Nos  
Pressure / Level Sensor



Digital Input : 2Nos  
Pulse Flow Meter  
Pressure Switch



Input ADC : 2Nos  
EC Sensor

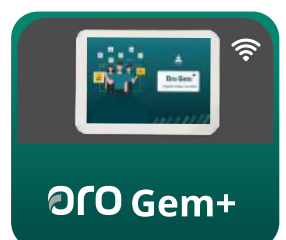
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Communication  
RS485  
WIFI/GPRS

### Ordering Information

Model Number	Communication	Description
OSP8R	RS485	8 Relay with 4 to 20mA Digital Input
OSP16R	RS485	16 Relay with 4 to 20mA Digital Input
OSP16RADC	RS485	16 Relay with 4 to 20mA Digital Input, EC





## oRO RTU

The simple and flexible way to automate your irrigation valves. Acts as a slave device.



Communication  
Lora-RF



(optional)

### Ordering Information

Model Number	Communication	Description
ORTU4L	Lora	4 Latch
ORTU4LADC	Lora	4 Latch with 4 to 20mA
ORTU8L	Lora	8 Latch
ORTU8LADC	Lora	8 Latch with 4 to 20mA



oRO Gem+



## oRO RTU+

The simple and flexible way to automate your irrigation valves with soil moisture data. Acts as a slave device.



Communication  
Lora-RF



(Optional)

### Ordering Information

Model Number	Communication	Description
ORTUP4LSMST	Lora	4 Latch, 4 Soil Moisture With Soil Temperature
ORTUP4LSMSTADC	Lora	4 Latch, 4 Soil Moisture With Soil Temperature, 4 to 20mA

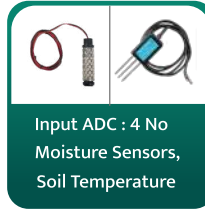


oRO Gem+

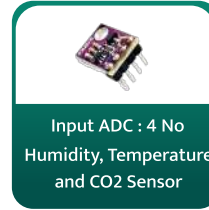


## DroSense

The simple and flexible way to get soil moisture and temperature data and automate your irrigation. Acts as slave device.



Input ADC : 4 No  
Moisture Sensors,  
Soil Temperature



Input ADC : 4 No  
Humidity, Temperature  
and CO2 Sensor

(Optional)



Communication  
Lora-RF



### Ordering Information

Model Number	Communication	Description
OSMST	Lora	4 Soil Moisture with 1 Soil Temperature
OHT-CO2	Lora	Humidity Temperature, CO2

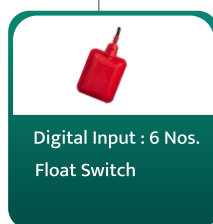


## DroLevel

The simple and flexible way to get water level data and automate your irrigation. Acts as slave device.



Output : 4 Latch



Digital Input : 6 Nos.  
Float Switch



ADC Input: 4 No.  
Pressure/ Level  
4/20mA

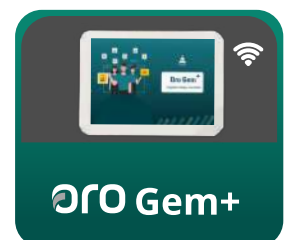


Communication  
Lora-RF



### Ordering Information

Model Number	Communication	Description
OLEVELDADC	Lora	Level/Pressure, Float
OLEVEL4LDADC	Lora	4 Latch, Level/Pressure, Float





## oro Pump

The simple and flexible way to automate your irrigation pump. Acts as standalone or slave device.



Communication  
GPRS/Lora-RF



Output: 5 Relay  
control up to 3 pumps



Voltage Protection  
3 Current Sensing



### Ordering Information

Model Number	Communication	Description
OPUMPGSM	GSM	Pump Controller with GSM
OPUMLORA	Lora	Pump Controller with Lora



oro Gem+



## oro Pump+

The simple and flexible way to automate your irrigation pump. Acts as standalone or slave device.



Communication  
GPRS/Lora-RF



Output: 5 Relay  
control up to 3 pumps



Digital Input : 6 Nos  
Float Switch/  
Pulse Flow Meter



ADC Input: 1 No. each  
1 Pressure/ 1 Level  
4/20mA

(Optional)



Voltage Protection  
3 Current Sensing



### Ordering Information

Model Number	Communication	Description
OPUMPGSMADC	GSM	GSM Pump Controller with ADC
OPUMLORAADC	Lora	Lora Pump Controller with ADC



oro Gem+





## Oro Extend

The simple and flexible way to boost Lora RF signal and extend the range of the device. Acts as slave device.

### Ordering Information

Model Number	Communication	Description
OEXTEND	Lora	Lora Repeater



Communication  
Lora-RF

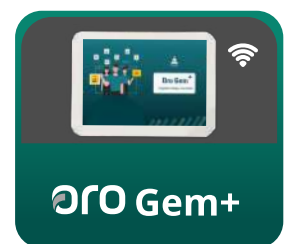
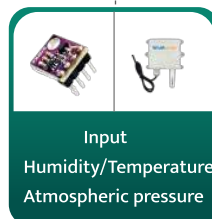


## Oro Weather

The simple and flexible way to get weather data and automate your irrigation. Acts as a standalone and slave device.



Communication  
RS485/GPRS /  
Lora-RF



### Ordering Information

Model Number	Communication	Description
OWSGSM	GSM	Weather Station using GSM
OWSLORA	Lora	Weather Station using Lora



## Niagara 100 Series

Plastic hydraulic/Electric Control Valves for residential, commercial and agricultural irrigation systems. The Niagara 100 Series plastic control valves are globe pattern 2". These control valves provide superior hydraulic high flow performance, demonstrating state-of-the-art technology.

### Ordering Information

Model Number	Description
NVDN50	Niagara Oro valve 100 series 2" Threaded



## Niagara 200 Series

A unitized flexible super-travel diaphragm & guided plug provide a signification 'look through' passage resulting in accurate & stable regulation and ultra-high flow capacity. The Valve unique body design allows on-site adaptation. Its articulated flange connections isolate the valve from pipeline bending & pressure stresses.

### Ordering Information

Model Number	Description
NVDN80T	Niagara Oro valve 200 series 3" Threaded
NVDN100F	Niagara Oro valve 200 series 4" Flanged



## Niagara Pressure Sustaining Valve

The Niagara PSV is a Hydraulically operated, diaphragm actuated control valve that sustains minimum present upstream (back) pressure and opens fully when line pressure is in excess of setting.

### Ordering Information

Model Number	Description
NPSVDN50T	Niagara Pressure sustaining valve 2" Threaded
NPSVDN80T	Niagara Pressure sustaining valve 3" Threaded
NPSVDN100F	Niagara Pressure sustaining valve 4" Flanged



## Niagara Quick Pressure Relief Valve

Niagara PRV is a hydraulically operated, diaphragm actuated control valve designed to relief excessive line pressure when it rises above the preset maximum. It responds to rises in system pressure immediately, accurately and with high repeatability, by opening fully. The Niagara PRV Provides smooth drip tight closing.

### Ordering Information

Model Number	Description
NPRVDN50T	Pressure relief valve 2" Threaded
NPRVDN80T	Pressure relief valve 3" Threaded
NPRVDN100F	Pressure relief valve 4" Flange



## Niagara Pressure relief-Sustaining Pilot

This is a 2-way direct acting pilot valve, actuated by a pressure responsive diaphragm, which seeks to reach equilibrium between hydraulic and set spring forces. When used in a pressure relief/sustaining circuit, the pilot opens at upstream pressure rises above set point.

### Ordering Information

Model Number	Description
NPSP 1 - 6	Niagara Pressure Sustaining Pilot Valve, 1-6 bar



## 3 Way Solenoid with Hydraulic Base

The 3 way solenoid with hydraulic base is a compact 3 Way Solenoid Pilot Valve that can control valves independently or in combination with other control circuit accessories. It excels in its low power consumption and low sensitivity to dirt and voltage variations. The hydraulic base features a manual override and consists of a bracket for attaching to the valve or to a solenoid manifold.

### Ordering Information

Model Number	Description
O3WS24VDC	3 way solenoid, 24 VDC
O3WS24VAC	3 way solenoid, 24 VAC
OSW9VDC-L	Magnetic, Latch solenoid 9-20VDC



## Oro Pressure Transmitter

The Oro pressure Transmitter is a high stable and reliable pressure sensor and used for measuring water pressure in the irrigation line and water Distribution systems.

### Ordering Information

Model Number	Description
OROPS10	Oro Pressure transmitter, Range 0-10 bar, Output signal 4 - 20 mA



## Oro Level Transmitter

The Oro Level transmitter is used to determine the level of a tank, cistern or cavity, to accurately monitor variations in the level of the liquid.

### Ordering Information

Model Number	Description
OROLPS015	Oro Level transmitter, Range 0-15 mtr, Output signal 4 - 20 mA
OROLPS035	Oro Level transmitter, Range 0-35 mtr, Output signal 4 - 20 mA
OROLPS100	Oro Level transmitter, Range 0-100 mtr, Output signal 4 - 20 mA



## Float Switch

The OroFloat, a liquid or water level float switch is suitable for level switching of various liquids, sewage in shafts, tanks, basins or cisterns. The switching differential of the level switch is adjustable by the position of the included counterweight on the cable. It is a simple to use water level float switch.

### Ordering Information

Model Number	Description
OROFLS102	Niagara float switch with 2m cable
OROFLS104	Niagara float switch with 4m cable
OROFLS108	Niagara float switch with 8m cable



## Oro Soil Moisture Sensor

The Oro granular matrix soil moisture sensor is suitable for soil moisture sensing of various soil types for agricultural needs. Oro soil moisture sensor is designed to be placed in the various soil types for monitoring soil conditions.

### Ordering Information

Model Number	Description
OROSMS105	Oro Soil Moisture Sensor with 5 Metre Cable



## Oro Electrical Conductivity Sensor

Oro Electrical conductivity sensors are ideal for measuring the concentration of dissolved solid in water. They are provided with an accurate predetermined factory calibration constant for agricultural needs. Conductivity is measured by applying an alternating current to a measuring cell. This cell comprises a glass body supporting two to four platinum plates (also called poles) immersed in a solution.

### Ordering Information

Model Number	Description
OROECS100	Oro Electrical conductivity sensor, 0 to 10000 $\mu\text{S}/\text{cm}$



## Oro PH Sensor

Oro PH sensor model Oro PH IS designed for various Industrial Applications. Four ceramic junction reference aids in the sensor's Resistance to harsh Environments and helps prolong sensor life for agricultural needs. The robust sensor design makes the Oro PH reliable in a wide range of aqueous solution found in pipelines, open tanks or ponds.

### Ordering Information

Model Number	Description
OROPHS100	Oro PH Sensor, 0 to 14 PH



## oro Fertigem 2ch

The FertiGem-2ch is a plug-and-play, fully configurable, simple-to-operate two channel fertilizer/acid dosing unit offering a perfect Fertigation solution for Agriculture. Fitted with electricity where injection of up to two fertilizer solutions is needed. It ensures the highest efficiency with minimum investment - a highly cost-effective solution for Fertigation.

### Ordering Information

Model Number	Description
FERTIGEM200	Double channel fertilizer Dosing Unit



## oro Fertigem 5ch

Fully configurable and highly cost-effective fertilizer/acid dosing unit, which includes the new intuitive and simple-to-use ORO Gem+ controller, is designed for precise fertigation for agriculture. Fertigem- 5G maximizes the usage of available water flow rates and pressures on the main irrigation line, ensuring the highest efficiency, while managing local and remote devices. It provides the crops with the optimal amount of water and fertilizers.

### Ordering Information

Model Number	Description
FERTIGEM500	Five Channel Fertilizer Dosing Unit

### Spares Ordering Information

Model Number	Description
OROVENTURI600	Venturi
OROVENTURI1000	Venturi
OROROTA400	Rotameter
OROROTA1000	Rotameter
OROSOLENOID10W	Solenoid Coil 10W AC
ORONEEDLEVALVE	Needle Valve



## Pulse Flow Meter

It uses a multi-blade plastic paddle mounted at the top of the water passage, where disturbance from solid suspended in the water is minimal, providing accurate meter containing solid debris, low head loss, magnetic drive.

### Ordering Information

Model Number	Description
PFM2	Pulse Flow Meter, 2", Max 24 V AC/DC
PFM3	Pulse Flow Meter, 3", Max 24 V AC/DC
PFM4	Pulse Flow Meter, 4", Max 24 V AC/DC



## Electromagnetic Flow Meter

Electromagnetic flow meters do not have any moving parts, allowing for the measurement of flow without any physical obstruction, thereby eliminating potential pressure drops or blockages. Electromagnetic flow meters are renowned for their accuracy.

### Ordering Information

Model Number	Description
EMFM2	ElectroMagnetic Flow Meter, 2", Max 230V AC/ 24V DC, RS485, 4-20mA
EMFM3	ElectroMagnetic Flow Meter, 3", Max 230V AC/ 24V DC, RS485, 4-20mA
EMFM4	ElectroMagnetic Flow Meter, 4", Max 230V AC/ 24V DC, RS485, 4-20mA

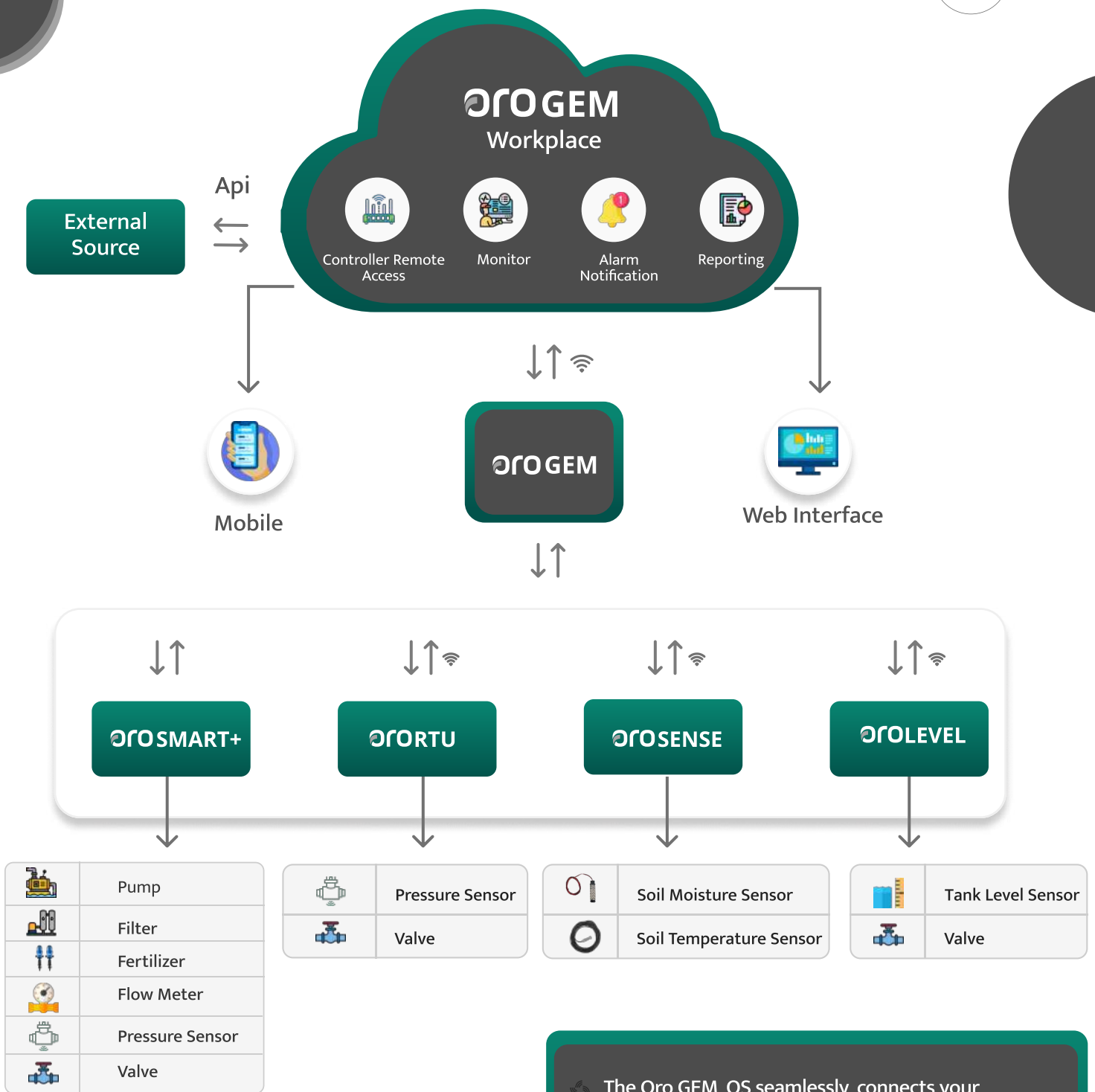


## BackFlush Valves

Backflush Valves are designed for automatic backflushing of filters. We offer plastic and iron hydraulically operated backflush valves to fit both disc and sand media filters.

### Ordering Information

Model Number	Description
BFV2	Backflush Valve, 2", Bermad/Automat
BFV3	Backflush Valve, 3", Bermad/Automat
BFV4	Backflush Valve, 4", Bermad/Automat



- ✦ The Oro GEM OS seamlessly connects your controller, to your sensors, to the cloud and accessible with your mobile device.
- ✦ Offering a seamless way to manage your irrigation.



Manufactured By :

**Niagara Automations**

295, Niagara Road ,near M.G.R Nagar,  
Athipalayam,Coimbatore - 641 110  
Tamil Nadu, India



For More Information Visit

[www.niagaraautomation.com](http://www.niagaraautomation.com)