

Understanding Points of Connection and Mainlines

Every irrigation system has two basic elements: the transport of water from its source to the landscape, and the distribution of transported water to the plant material in the landscape. Certainly this description makes irrigation system design seem simple enough – connect the water source to the water delivery pipes, program the controller, and then monitor the landscaping and adjust the system as necessary.

These days, there can be tremendous variation in the way that irrigation systems are connected to water sources and in the way that water flows through the system itself. Systems might be required to take different quantities of water from several different water sources. Combine those requirements with the types of devices that are available to manage water connections and flow, and the capability of modern irrigation controllers to manage all these factors at various levels, and systems get incrementally more complex.

Another layer of complexity in irrigation system design is that the terminology used to describe the components differs depending on the resource or irrigation controller you're using. For example, is a point of connection the same as a water source? What is a mainline and how do I know how many are in my system? Is a flow sensor different from a flow meter?

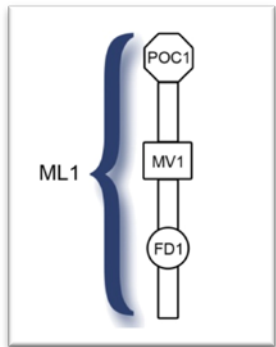
Baseline's Terminology

flow device (FD)	A device that is capable of measuring water flow and water used, includes flow sensors and flow meters
mainline	A pressurized pipe that supplies water from the point of connection (water source) to the valves
master valve (MV)	A valve used to control when water is allowed to flow through that point of connection. Often used to protect the landscape from flooding in case of a ruptured main or malfunctioning downstream valve
normally closed master valve (NCMV)	An automatic valve through which no water will flow unless external influences are applied to cause the valve to open
normally open master valve (NOMV)	An automatic valve through which water will flow unless external influences are applied to close the valve
point of connection (POC)	Also known as a water source . This term can refer to the place where the irrigation system is connected to a water supply. In the case of a system that has access to water from multiple supplies, such as harvested rainwater, reclaimed water, and potable water, this term is also used to distinguish one water supply from another

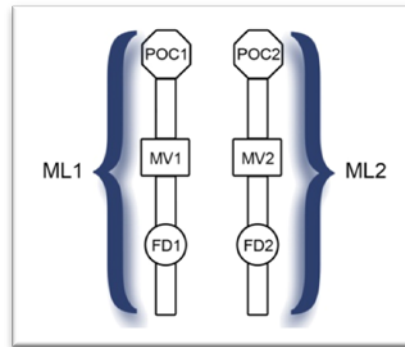
Design Scenarios

Baseline understands the variation in system design, and our BaseStation 3200 irrigation controller is capable of managing any design scenario, including the following examples:

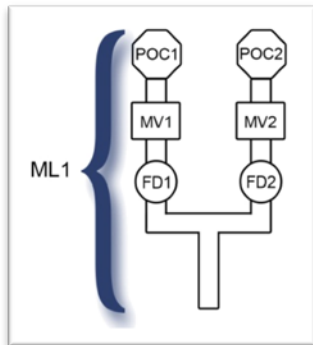
One water source, one mainline, one master valve, and one flow device



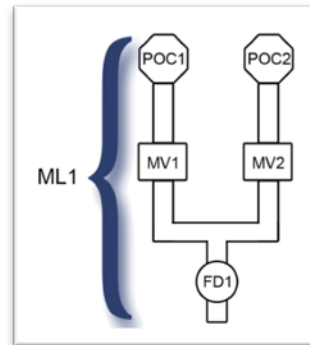
Multiple water sources, multiple mainlines, each with their own master valves and flow devices



Multiple water sources, multiple master valves and flow devices, and one mainline



Multiple water sources, multiple master valves, and one mainline with a flow device



You can program Baseline irrigation controllers to communicate with devices, such as

- Master valves, including normally open and normally closed devices
- Flow devices, such as flow sensors and flow meters
- Pumps or pump start devices

And you can associate those devices at various levels within the controller to manage different levels of your irrigation system, such as

- Points of connection (water sources)
- Mainlines
- Programs

Baseline's BaseStation 3200 irrigation controller

- Supports up to 8 independent mainlines for control and management of separate water delivery systems
- Supports independent operation of each mainline
- Supports up to 8 flow sensors or meters, which manage and monitor flow across a site as independent or connected hydraulic systems organized into mainline groupings
- Supports up to 8 normally open and/or normally closed master valves and/or pump starts for the entire system
- Supports water source prioritization to control which water sources are used first
- Supports automatic switching between prioritized water sources when empty conditions for each source are configured
- Supports prioritized daily water rationing across multiple water sources

Programming Examples for Various Designs

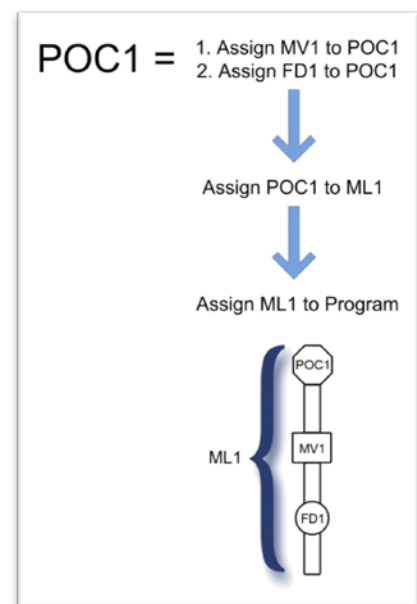
As the complexity of your system design increases, programming the controller to take precise control over the water at your site requires some specific steps. In this section, we describe the steps required to program the BaseStation 3200 controller for the design scenarios shown earlier.

One Water Source

In a simple system design where you have one water source, one mainline, one master valve and one flow device, you would perform the following steps to program the controller:

1. Turn the dial to the **Water Sources** position, and then use the **Assign Devices to Water Sources** option to assign the master valve and the flow device to POC 1.
2. Turn the dial to the **Flow** position and use the **Assign Water Sources to Mainlines** option to assign POC 1 to Mainline 1.
3. Turn the dial to the **Flow** position and use the **Assign Programs to Mainlines** option in to associate the mainline with the programs that will use this water source.

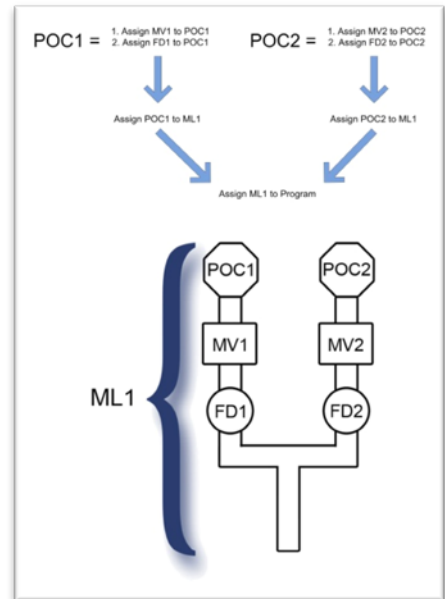
If you have multiple independent mainlines each with independent water sources, use the procedure described above, to set up POC 1, and then repeat the steps to set up POC 2, and so on.



Multiple Water Sources, Multiple Devices

When you are combining multiple water sources into one mainline, but the water sources must be controlled and managed separately with their own master valves and flow devices, you would perform the following steps to program the controller:

1. Turn the dial to the **Water Sources** position, and then use the **Assign Devices to Water Sources** option to assign master valve 1 and flow device 1 to POC 1. Then assign the other master valve and flow device to POC 2.
2. Turn the dial to the **Flow** position and use the **Assign Water Sources to Mainlines** option to assign POC 1 and POC 2 to Mainline 1.
3. Turn the dial to the **Flow** position and use the **Assign Programs to Mainlines** option in to associate the mainline with the programs that will use these water sources.



Multiple Water Sources, Single Flow Device

In a scenario where you are combining multiple water sources into one mainline, and the water sources are controlled separately with their own master valves, you would perform the following steps to program the controller:

1. Turn the dial to the **Water Sources** position, and then use the **Assign Devices to Water Sources** option to assign master valve 1 to POC 1. Then assign the other master valve to POC 2. Assign flow device 1 to both POC 1 and POC 2.
2. Turn the dial to the **Flow** position and use the **Assign Water Sources to Mainlines** option to assign both POC 1 and POC 2 to Mainline 1.
3. Turn the dial to the **Flow** position and use the **Assign Programs to Mainlines** option in to associate the mainline with the programs that will use these water sources.

Note: In this scenario, the flow device is “downstream” from both POCs. For that reason, you can’t use this design to manage the number of gallons used from one of the POCs because the flow device doesn’t know which POC the water is coming from. If you need to budget or ration the water from each POC, you will need to have a flow device associated with each POC.

