BaseStation 1000
Configuration & Specification Guide
The BaseStation 1000™ is built with the smart contractor in mind. Each feature was carefully designed to balance ease-of-use with powerful irrigation functionality. The BaseStation 1000 features include two-wire and conventional wire compatibility, flow management tools, and a built-in Ethernet port for Internet connectivity.

**Part Number: BL-1000 Base Model**
- Supports up to 50 zones
- Supports up to 10 biSensors
- Supports up to 20 programs
- Supports 1 complete water source (flow sensor, MV, & pump)
- Built-in Ethernet port
- Flow monitoring and flow management

**Two-Wire & Conventional Wire**
Each BaseStation 1000 has the flexibility to support both two-wire and conventional wire. A controller could be strictly two-wire or completely conventional wire. Or, combine the two! The BaseStation 1000 is a great solution for retrofitting existing sites where two-wire will be added in the future.

**Expandability**
Every BaseStation 1000 has two expansion slots which allow you to increase the controller’s functionality. Each controller can be expanded to support up to 100 zones, 20 biSensors, 40 programs, and 3 complete water sources, in addition to full BaseManager functionality.

**Central Control & Remote Access**
Every BaseStation 1000 includes a built-in Ethernet port so they are Internet-ready out-of-the-box. Using the built-in Ethernet port or adding one of the other available communication options allows for real-time access and remote connectivity through BaseManager central control and LiveView™. Remotely control any BaseStation 1000 with Mobile Access™, which turns any mobile smart phone into the ultimate irrigation remote. The BaseStation 1000 can also be seamlessly integrated into a building management system with BACnet Manager™.
BaseManager

BaseManager™ is Baseline’s new cloud-based central control technology. It features an incredibly easy to use map-based interface and programming tools that allow for complete, real-time access to any BaseStation 1000. In addition, BaseManager features comprehensive reports, graphs and diagnostic features. BaseManager also features LiveView™. LiveView provides access from any web-enable device to a BaseStation 1000 just like standing in front of the controller.

Baseline’s Mobile Access is a mobile web application that turns any web-enabled cell phone or other mobile device into the ultimate remote control. Mobile Access gives users full control of their BaseStation 1000 irrigation systems. Mobile Access Advanced offers advanced features like real-time device testing, device geo-location and more.

BaseManager is also compatible with BACnet Manager™. Baseline’s BACnet Manager for BaseManager is the industry’s first solution for integrating your irrigation system with a building management system.

BaseManager Web Service is available in two ways:
- BaseManager: Includes BaseManager Service and Mobile Access
- BaseManager Plus: Includes BaseManager Service and Mobile Access Advanced

Cloud-based BaseManager Options

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL-BMW2-LITE (INCLUDED!)</td>
<td>LiveView only and Mobile Access Lite - Included with every BaseStation 1000</td>
</tr>
<tr>
<td>BL-BMW2-1</td>
<td>1 year of BaseManager service and Mobile Access for 1 controller</td>
</tr>
<tr>
<td>BL-BMW2-PLUS</td>
<td>1 year of BaseManager service and Mobile Access Advanced for 1 controller</td>
</tr>
</tbody>
</table>

Self-hosted BaseManager Server Options

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL-BM2-SW</td>
<td>BaseManager Server Software for self-hosted server applications</td>
</tr>
<tr>
<td>BL-BM2-COM</td>
<td>BaseManager Server Software for self-hosted server pre-installed on a server</td>
</tr>
<tr>
<td>BL-BM2-MAA</td>
<td>Mobile Access Advanced Plug-in for self-hosted BaseManager Server</td>
</tr>
</tbody>
</table>

Building Management System Options

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL-BM2-BACNET-SW</td>
<td>BACnet Manager Software for BaseManager</td>
</tr>
<tr>
<td>BL-BM2-BACNET-VM</td>
<td>BACnet Manager Virtual Machine Image for BaseManager</td>
</tr>
<tr>
<td>BL-BMW-BACNET-COM</td>
<td>BACnet Manager pre-installed on a server</td>
</tr>
</tbody>
</table>

Program & Memory Expansion Module for BaseManager

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL-1000MEXP-BM</td>
<td>Adds full functionality support for BaseManager - Includes 6 months of free BaseManager Plus</td>
</tr>
</tbody>
</table>

**NOTES:** The BL-1000MEXP-BM is required in order to use all BaseManager features, Mobile Access, Mobile Access Advanced, & BACnet Manager. The Expansion module is not required for LiveView or Mobile Access Lite.
**“X” Series Cabinets**

**Large Metal Wall Mount Enclosure**
- 15.50" W x 12.38" H x 6.40" D
- Available in 16-gauge steel & powder coated (X) & 16-gauge 304 grade stainless steel (XS)
- Interior/exterior mount
- Compatible with R-Series Powered biCoders - Can hold up to 48 conventionally wired zones
- Compatible with any communication module

**How to Specify:**
BL-1000X

**Pedestal Base for “X” Series Cabinets**
- 15.50" W x 23.00" H x 6.40" D
- Available in 16-gauge steel & powder coated (XP) & 16-gauge 304 grade stainless steel (XSP)

**How to Specify:**
BL-XP

**“P” Series Pedestals**

**Stainless Steel Pedestal Enclosure**
- 17.38" W x 36.25" H x 12.63" D
- 16-gauge, 304 grade stainless steel
- Interior/exterior mount
- Compatible with R-Series Powered biCoders - Can hold up to 48 conventionally wired zones
- Compatible with any communication module

**How to Specify:**
BL-1000P
Communication Options

BaseStations in the “X”, “XS”, and “P” enclosures are large enough to hold the controller, up to 48 conventionally wired stations, AND a communication module. The communication module will be built into the enclosure by the factory when ordered together. Baseline recommends that “X” or “XS” enclosures be specified when a wall-mount enclosure and communication module is required.

“WL” Ethernet
Every BaseStation 1000 has a built-in Ethernet port. No additional hardware is required for Ethernet-based communication.

“WF” Wi-Fi Communication Modules
Part Numbers: BL-1000WF-X
BL-1000WF-P

“CM” Cell Modem Communication Modules
Part Numbers: BL-CM-X
BL-CM-P

“ER” Ethernet Radio (Spread Spectrum) Communication Modules
Part Numbers: BL-ER-C
BL-ER-X
BL-ER-P

Every Ethernet Radio configuration requires at least one radio that is configured as a gateway. The BL-ER-C is an Ethernet radio in a “C” series enclosure with factory default settings as a gateway. It can also be configured as a repeater. One repeater may be inserted between a gateway and endpoint if required.

Cell Modem Gateway
Connect up to 20 controllers to the Internet through a Cell Modem Gateway. Connect the controllers to the Cell Modem Gateway with an Ethernet Radio Network.
Part Numbers: BL-CM3G-GW

Cell Modem Gateways require a larger cellular data plan. Use BL-CM-SVC1-EXT5 for up to 5 controllers and BL-CM-SVC1-EXT20 for up to 20 controllers. For BaseStations in “X” series enclosures, the Cell Modem Gateway is a standalone unit in its own enclosure and will require its own power source. For BaseStations in “P” series pedestals, the Cell Modem Gateway can be installed inside the unit.

NOTES: Cell modems operate on the AT&T network and require a yearly data fee. Ethernet and Wi-Fi modems may require some network/IT setup. Ethernet connections require a physical connection to the local network, so an Ethernet drop should also be specified. An Ethernet Radio is a spread spectrum radio that operates between 902 MHz and 928 MHz. Ethernet radios require line-of-sight communications and can typically communicate up to 1 mile when properly configured with appropriate radio locations and antennas.
**Conventional Wire**

Add up to 48 conventionally wired terminal stations to any BaseStation 1000. Baseline BL-5200 Series Powered biCoders are available in 12 and 24 station configurations. Specify the conventional wire station count by adding “-R12”, “-R24”, “-R36”, or “-R48” to any BaseStation 1000 part number.

Example: BL-1000X-R48

![Baseline Powered biCoder Conventional Wire Module](image)

**Powerful Retrofit Solutions**

Every BaseStation 1000 is capable of controlling up to 100 zones in any combination of two-wire and conventional wire. Combine multiple existing small-station-count controllers into one controller by replacing one of the old controllers with a BaseStation 1000, and one or more old controllers with Powered biCoders in their own enclosure.

Example: BL-5200X-R36

“X” Series Enclosure Part Numbers:
- BL-5200X-R12
- BL-5200X-R24
- BL-5200X-R36
- BL-5200X-R48

“P” Series Enclosure Part Numbers:
- BL-5200P-R12
- BL-5200P-R24
- BL-5200P-R36
- BL-5200P-R48

**NOTES:** Each BL-5200 Series Powered biCoder must be connected to a BaseStation 1000 with a two-wire path. Please see the Two-Wire Specifications document for information on wire specifications.
Two-Wire Devices

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL-5201</td>
<td>1 valve direct burial biCoder</td>
</tr>
<tr>
<td>BL-5202</td>
<td>2 valve direct burial biCoder</td>
</tr>
<tr>
<td>BL-5204</td>
<td>4 valve direct burial biCoder</td>
</tr>
<tr>
<td>BL-5201MV</td>
<td>Master valve direct burial biCoder</td>
</tr>
<tr>
<td>BL-5201PR</td>
<td>Direct burial pump start/stop relay switching biCoder</td>
</tr>
<tr>
<td>BL-5303</td>
<td>External air temperature sensor</td>
</tr>
<tr>
<td>BL-5308</td>
<td>Direct burial standard flow biCoder</td>
</tr>
<tr>
<td>BL-5309</td>
<td>Direct burial flow biCoder for use with low power flow meters such as mag meters</td>
</tr>
<tr>
<td>BL-5315B</td>
<td>1.5’ direct burial biSensor soil moisture sensor. Includes 50’ of wire.</td>
</tr>
<tr>
<td>BL-5401</td>
<td>Outside operation button in plastic wall mount enclosure. “Coach’s Button”</td>
</tr>
<tr>
<td>BL-5402</td>
<td>Direct burial event biCoder</td>
</tr>
<tr>
<td>BL-LA01</td>
<td>Direct burial lightning arrestor</td>
</tr>
</tbody>
</table>

Program & Memory Expansion Modules

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL-1000EXP-25</td>
<td>Increases capacity to 75 zones, 30 programs, 15 moisture sensors, &amp; 2 complete water sources</td>
</tr>
<tr>
<td>BL-1000EXP-50</td>
<td>Increases capacity to 100 zones, 40 programs, 20 moisture sensors, &amp; 3 complete water sources</td>
</tr>
</tbody>
</table>

NOTES: Maximum functionality for a BaseStation is 100 zones, 40 programs, 20 moisture sensors & 3 water sources. Adding more expansion modules will not exceed these maximums.
When a flow meter is added to a BaseStation 1000 system, the controller can do more to manage the water for a site. The controller can learn the flow for each zone and maximize the number of zones it turns on at once to help shorten water windows. The controller can help to protect the site from mainline breaks with configurable high flow and unexpected flow shutdown settings. The controller will also automatically shut down a zone which has higher than expected flow during an irrigation cycle.

Baseline offers several two-wire-ready flow sensor and biCoder combinations. The BaseStation 1000 is also compatible with most third-party flow meters when used with a flow biCoder.

### Baseline Flow Sensor Options

#### PFS Series Flow Sensors

The PFS Series Flow Sensor is a PVC T-type sensor. Every Baseline PFS Series Flow Sensor is two-wire ready with a flow biCoder built into the tee insert. Each sensor is pre-configured with the correct K and offset values. The PFS Series Flow Sensors are available in 1” to 4” sizes.

<table>
<thead>
<tr>
<th>Part #</th>
<th>Size</th>
<th>Max Pressure</th>
<th>Operating Range (GPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL-PFS100</td>
<td>1&quot;</td>
<td>240</td>
<td>.75 to 40</td>
</tr>
<tr>
<td>BL-PFS150</td>
<td>1.5&quot;</td>
<td>240</td>
<td>1.5 to 100</td>
</tr>
<tr>
<td>BL-PFS200</td>
<td>2&quot;</td>
<td>240</td>
<td>3 to 150</td>
</tr>
<tr>
<td>BL-PFS300</td>
<td>3&quot;</td>
<td>150</td>
<td>6 to 300</td>
</tr>
<tr>
<td>BL-PFS400</td>
<td>4&quot;</td>
<td>150</td>
<td>10 to 480</td>
</tr>
</tbody>
</table>

#### BHM Series Hydrometer & Master Valve Combination

The BHM Series Hydrometer is a flow meter and master valve combination available in normally open and normally closed configurations. The Hydrometer is available in 1½” to 4” pipe sizes and every Hydrometer is two-wire ready with a built-in flow biCoder and pre-configured K and offset values.

<table>
<thead>
<tr>
<th>Part #</th>
<th>Size</th>
<th>Max Pressure</th>
<th>Operating Range (GPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL-BHM150</td>
<td>1.5&quot;</td>
<td>230</td>
<td>1.8 to 55</td>
</tr>
<tr>
<td>BL-BHM200</td>
<td>2&quot;</td>
<td>230</td>
<td>5.3 to 95</td>
</tr>
<tr>
<td>BL-BHM300</td>
<td>3&quot;</td>
<td>230</td>
<td>14 to 220</td>
</tr>
<tr>
<td>BL-BHM400</td>
<td>4&quot;</td>
<td>230</td>
<td>21 to 380</td>
</tr>
</tbody>
</table>

For normally open configurations, add “-NO” to the end of the part number.

### Baseline Flow biCoder Options

The BL-5308 and BL-5309 Flow biCoders make most third-party flow sensors compatible with a BaseStation 1000.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL-5308</td>
<td>For use with most flow sensors (such as Data Industrial and Netafim type sensors). The BL-5308 accepts a 5 millisecond low pulse at 200 hertz and a maximum of 200 pulses per second.</td>
</tr>
<tr>
<td>BL-5309</td>
<td>For use with mag type meters, or when a second system (such as a pump station) needs to share a connection to the flow meter. The BL-5309 accepts a 5 millisecond low pulse at 200 hertz and a maximum of 200 pulses per second.</td>
</tr>
</tbody>
</table>
A properly configured soil moisture sensor can reduce outdoor water use by up to 62 percent or more over traditional irrigation methods. By watering your plants when needed, you can increase landscape health, promote deeper root growth, and make your plants more disease resistant.

A biSensor should be placed in the effective root zone of the plant it is monitoring. Usually the sensor will be making the irrigation decision for a group of zones (hydrozone) made up of plants with similar water needs, so it should be placed in the effective root zone of a representative plant.

For most sites, place one sensor in the lawn, one in the shrubs, and one in the trees if these plant types are in separate zones. Bury the sensor in the zone that needs to be watered the most frequently (the one that dries out the quickest). Place the sensor in an average to slightly dry area (a spot that receives an average amount of water for that zone). Bury the sensor in the top third of the root zone, usually 2 - 3 inches deep for turf. biSensors are compatible with two-wire and conventional wire applications.

In addition to traditional landscape applications, biSensors can also be used to manage cisterns, ponds, and water features. biSensors are also exceptional tools for green walls and green roofs.

Watering with Soil Moisture Sensors
Available for download from www.baselinesystems.com

Moisture Sensor CAD Details
Available for download from www.baselinesystems.com
Two-Wire BaseStation 1000

How to Specify:

**BL-1000** - BaseStation 1000 controller  
Designate enclosure by adding X, XS, or P  
Example: BL-1000X  
Two-wire biCoders, Soil Moisture Sensors, Flow biCoders, etc.  
**BL-1000MEXP-25** or **BL-1000MEXP-50** Expansion Module - (if required)

Conventional Wire BaseStation 1000

How to Specify:

**BL-1000** - BaseStation 1000 controller  
Designate enclosure by adding X, XS, or P  
Add conventional wire stations with -R12, -R24, -R36, -R48  
Example: BL-1000X-R24  
Soil Moisture Sensors, Flow biCoders, etc.  
**BL-1000MEXP-25** or **BL-1000MEXP-50** Expansion Module - (if required)
Combining Multiple Conventional Wire Systems into one BaseStation 1000

How to Specify:

**BL-1000** - BaseStation 1000 controller
- Designate enclosure by adding X, XS, or P
- Add conventional wire stations with -R12, -R24, -R36, -R48
  Example: BL-1000X-R48

**BL-5200** Series Powered biCoders
- Designate enclosure by adding X, XS, or P
- Add conventional wire stations with -R12, -R24, -R36, -R48
  Example: BL-5200X-R48

**BL-1000MEXP-25 or BL-1000MEXP-50** Expansion Module - (if required)

Soil Moisture Sensors, Flow biCoders, etc.

Two-wire path connects the controller to each Powered biCoder set

Combining Multiple Conventional Wire Systems and Two-wire Devices into one BaseStation 1000

How to Specify:

**BL-1000** - BaseStation 1000 controller
- Designate enclosure by adding X, XS, or P
- Add conventional wire stations with -R12, -R24, -R36, -R48
  Example: BL-1000X-R48

**BL-5200** Series Powered biCoders
- Designate enclosure by adding X, XS, or P
- Add conventional wire stations with -R12, -R24, -R36, -R48
  Example: BL-5200X-R48

Soil Moisture Sensors, Flow biCoders, etc.

**BL-1000MEXP-25 or BL-1000MEXP-50** Expansion Module - (if required)
Connecting a BaseStation 1000 to BaseManager with the Built-in Ethernet Port

How to Specify:
- **BL-BMW2-1** - BaseManager Web Service
- **BL-1000** - BaseStation 1000 controller
  - Designate enclosure by adding X, XS, or P
  - Add conventional wire stations with -R12, -R24, -R36, -R48
  - Example: BL-1000X-R48
- Soil Moisture Sensors, Flow biCoders, etc.
- **BL-1000MEXP-BM** - Expansion Module for full BaseManager compatibility
- **BL-1000MEXP-25** or **BL-1000MEXP-50** Expansion Module - (if required)

Connecting a BaseStation 1000 to BaseManager with a Wi-Fi Module

How to Specify:
- **BL-BMW2-1** - BaseManager Web Service
- **BL-1000** - BaseStation 1000 controller
  - Designate enclosure by adding X, XS, or P
  - Add conventional wire stations with -R12, -R24, -R36, -R48
  - Example: BL-1000X-R48
- **BL-1000WF-X** - Wi-Fi Module for BaseStation 1000
  - Designate a different enclosure type by substituting a XS, or P
  - Soil Moisture Sensors, Flow biCoders, etc.
- **BL-1000MEXP-BM** - Expansion Module for full BaseManager compatibility
- **BL-1000MEXP-25** or **BL-1000MEXP-50** Expansion Module - (if required)
Connecting a BaseStation 1000 to BaseManager with a Cell Modem

How to Specify:

- **BL-BMW2-1** - BaseManager Web Service
- **BL-1000** - BaseStation 1000 controller
  - Designate enclosure by adding X, XS, or P
  - Add conventional wire stations with -R12, -R24, -R36, -R48
  - Example: BL-1000X-R48
- **BL-CM-X** - Cell Modem Module for BaseStation 1000
  - Designate a different enclosure type by substituting a XS, or P
  - Soil Moisture Sensors, Flow biCoders, etc.
- **BL-1000MEXP-BM** - Expansion Module for full BaseManager compatibility
- **BL-1000MEXP-25 or BL-1000MEXP-50** - (if required)
Connecting a BaseStation 1000 to BaseManager with Ethernet Radios

How to Specify:

**BL-BMW2-1** - BaseManager Web Service
**BL-1000** - BaseStation 1000 controller
- Designate enclosure by adding X, XS, or P
- Add conventional wire stations with -R12, -R24, -R36, -R48
- Example: BL-1000X-R48

**BL-ER-X** - Ethernet Radio Module for BaseStation 1000
- Designate a different enclosure type by substituting a X or P

**BL-ER-C** - Ethernet Radio Gateway
- Soil Moisture Sensors, Flow biCoders, etc.

**BL-1000MEXP-BM** - Expansion Module for BaseManager compatibility

**BL-1000MEXP-25 or BL-1000MEXP-50** - Expansion Module - (if required)
Connecting a BaseStation 1000 to BaseManager with a Cell Modem Gateway & Ethernet Radios

How to Specify:

**BL-BMW2-1** - BaseManager Web Service
**BL-1000** - BaseStation 1000 controller
   - Designate enclosure by adding X, XS, or P
   - Add conventional wire stations with -R12, -R24, -R36, -R48
   - Example: BL-1000X-R48

**BL-CM3G-GW** - Cell Modem Gateway
   - Designate a different enclosure type by substituting a X or P

**BL-ER-X** - Ethernet Radio Module for BaseStation 1000
   - Designate a different enclosure type by substituting P for X

**BL-ER-C** - Ethernet Radio Gateway
   - Soil Moisture Sensors, Flow biCoders, etc.

**BL-1000MEXP-BM** - Expansion Module for BaseManager compatibility
**BL-1000MEXP-25** or **BL-1000MEXP-50** - Expansion Module - (if required)