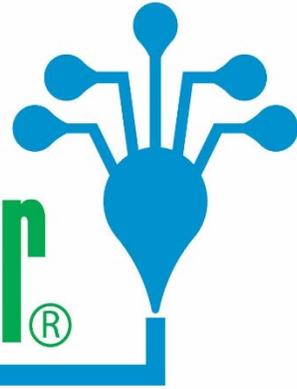
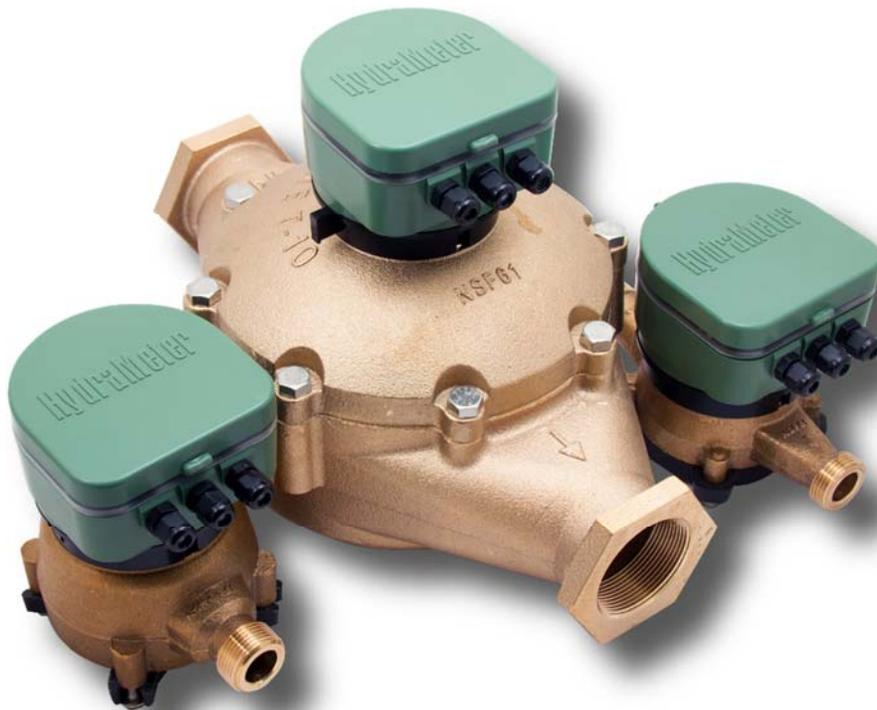


patent pending

HydraMeter®



Guide for Manual Set-Up



4/20/2015

Introduction

Congratulations... You have selected the most advanced and diverse water management device available. With engineering inspiration, Seco Sys has designed and developed the HydraMeter to be the first fully comprehensive water management device ever conceived. The HydraMeter is an ultra-intelligent water meter controller that mounts atop many common water meters. In its application, users can have visibility and control of water consumption in a way never obtained before. Like Hydra, the powerful multi-headed water serpent of Greek mythology, Seco Sys' HydraMeter has several metering personalities and modes of operation. This unique ability makes it possible for the HydraMeter to tackle nearly any water management task, setting it apart from other available water management devices.

Key features are as follows:

- Advanced flow measurement and processing for flow-rate, flow-time and flow-volume.
- Independent control of master valves and pumps.
- Configurable water budget management with automatic alarm response.
- Direct interface with flow sensor compatible control systems.
- Internet communication capable.

The HydraMeter facilitates a single solution for all water management requirements. The HydraMeter controller is completely scalable and mounts to nearly any AWWA approved water meter, allowing it to easily integrate and manage water for small or large water delivery systems. To take full advantage of the many personalities and features of your HydraMeter, please take the time to review the user manuals.



As explained above, the HydraMeter has many personalities. This manual details the stand-alone operation of a HydraMeter with an attached valve. In this application or "Personality," all alarms receive a single response: Water is shut off. While this "all or nothing" approach has its uses, when a HydraMeter is used in conjunction with a HydraConnect or HydraPod-C its features multiply. The HydraConnect provides local audible alarms and push button valve control, as well as internet connectivity. The HydraPod also provides remote data access (along with other features).

This access to our WaterUseOnline.com site provides flexible online programming of the HydraMeter from a cloud-based dashboard. From there, text message, email or voice message alerts (with or without valve shut off) can be triggered in response to alarms. Water budgets can be generated and tracked in real time, along with a host of other conservation and water smart features. A list of features can be found on our website at www.secosys.us or you can contact your dealer for more information about this low cost, feature-packed subscription service.

HydraMeter Installation

HydraMeter installation is covered in a separate document that can be found under the Support tab of our www.secosys.us website. It is important that you read that document prior to installation or programming. As noted there, please make sure that if you are not experienced in water meter installation, or have any doubts as to your abilities, seek out a qualified installer. If you choose to do your own installation, be aware that you are doing so at your own risk and Seco Sys will not be held liable for failures due to improper installation procedures.



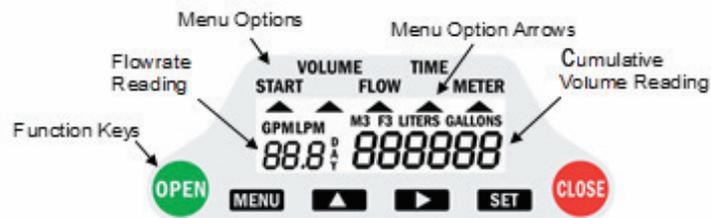
Clear top with 4 captive screws.

The HydraMeter Display and Keypad

To access the keypad, simply unscrew the clear top of the HydraMeter. When you are done programming, **it is important that you replace the clear top and tighten it appropriately to ensure that the unit remains water tight.**

The HydraMeter display provides:

- Real-time flow rate readings
- Accumulated water volume
- Alarms status
- Valve status
- Menu arrow indicators



The keypad is used to navigate the menu options for configuration settings and programming the HydraMeter. All black keys are only accessible with the protective clear cover removed. The green and red colored keys labeled “Open” and “Close” are also accessible with the protective clear cover in place. This permits either manual opening and closing of the connected control valve, initiation of preset schedules or clearing an active alarm.

Selecting the Use Type: What am I?

Configurations of the HydraMeter (USE Types) can be used to perform a number of unique water management tasks. Once the “USE” type is selected, the associated menus define how the HydraMeter will manage water. This Manual only covers USE Types 1 and 2. For more information on Type 3 contact Seco Sys.

USE 1 - Manage Water. This is the Default Use Type where the HydraMeter is to be used to manage water around defined limits such as flow rate, daily volume and run-time duration. Typical applications include: in-building water management; leak detection, flood prevention, real time water consumption reporting, residential monitoring and budgeting, water cooling towers, water treatment systems, pump control and irrigation systems.

USE 2 – Manually Initiated Water Delivery. This is where the HydraMeter will deliver a programmed amount of water each time the external green “Water On” key is pressed (up to four preset limits can be programmed). Typical applications include water dispensing for outdoor water spigots, pool refill systems, grove irrigation or industrial chemical mixing applications.

USE 3 – This is where the HydraMeter is to be used to deliver a defined volume of water based on a set schedule. Typical applications include irrigation of landscape or agriculture of farm or crop lands.

This manual does not cover USE 3 set-up.

Initializing USE Configuration

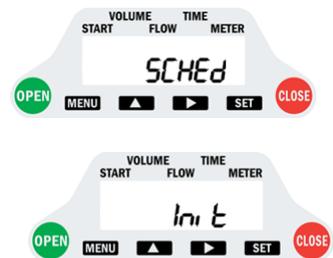
Now you are ready to initialize the HydraMeter's USE configuration, or tell the HydraMeter what it is. This includes setting variables like the clock time, day of the week, units of measure and other variables that characterize the HydraMeter for its intended USE. Since these variables are a one-time setup, access is protected from normal programming menus and key functions. Hydrameters are shipped in USE 1 by default, and the steps below list initialization variables in the order they will appear on the HydraMeter display for USE 1. For convenience, a form is provided in Appendix B to acknowledge and document all required variables prior performing initialization. It is a good idea to note your variables for future reference.

Listing of Initialization Variables:

- Day Number (1 - 7 with 1 representing Sunday)
- Clock Time (set in 24 hour format)
- Unit of Measure (Liters or Gallons)
- USE Type
 - 1 = Manage Water
 - 2 = Scheduled Water Delivery
 - 3 = Initiated Water Delivery
- Pulses per unit of measure for the selected water meter (see Appendix A for this data)
- Volume Metering Option
 - (Off or On) **Default 50 Gallons**
- Flow Time Metering Option
 - (Off or On) **Default 2 Minutes**
- High Flow Limit Metering Option
 - (Off or On) **Default 10 Gallons/Minute**
- Low Flow Limit Metering Option
 - (Off or On) **Default .8 Gallons/Minute**
- Leak Rate Metering Option
 - (Off or On) **Default .3 Gallons/Minute**
- HydraMeter Number (1 - 19)

For the Metering Options listed here, if you leave them off now and change your mind later you will have to go through the initialization process again to turn them on. If you think you might want to use them it is a good idea to turn them on during initialization. Their Default limits are here in read and can be customized to your needs later.

To access the Initialization Menu press the Up and Right Arrow keys simultaneously until the display reads the "SCHED", then press the [MENU] key once to advance the screen to read "Init". To enter the initialization menu option, press the [SET] key and begin setting each variable as prompted. Use the black menu keys to perform the following functions:



Use the MENU key to advance to the next screen without changing the displayed value.



Use the Up Arrow key to change the value where the cursor is flashing.



Use the Right Arrow key to advance the cursor to the next segment or variable.

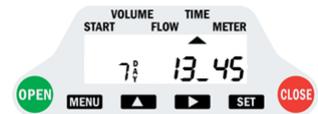


Use the SET key to accept and save the value that was just entered or changed.

Setting Weekday and Clock Time:

This menu screen is for setting the weekday and clock time. Refer to day 1 as Sunday. Note that the clock time must be entered in 24 hour format.

- Set the weekday using the Up Arrow key first then advance the cursor using the Right Arrow key to set the clock time.
- Press the SET key to accept the changes and advance to the next screen.



Units of Measure:

This menu screen is for setting the unit of measure for metered calculations. The option permits selecting either Liters or Gallons. The default value is gallons.

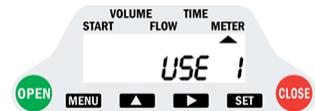
- Use the Up Arrow key to change the value accordingly.
- Press the SET key to accept the changes and advance to the next screen.



USE Type:

This menu screen is for setting the USE type which defines how the HydraMeter will manage water. As discussed earlier, the default is USE Type 1.

- Don't change it from USE Type 1.
- Press the SET key to advance to the next screen.



Identifying the Water Meter:

This screen tells your HydraMeter how to read the water meter it is sitting on. Our preferred meter is a Neptune meter, but others may be used. You will input the number of pulses per unit of measure for your water meter (see Appendix A to get this number). The example to the right shows a value of 33.3 pulses per unit of measure.

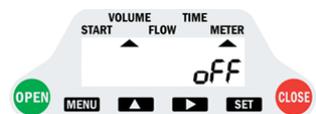
- Use the Up and Right Arrow keys to change each digit of the selected value.
- Press the SET key to accept the changes and advance to the next screen.



Volume Metering Option

Enable this option to permit management of water delivery by volume of unit measure for any single event. This will meter and control flow in cases like a ruptured washer hose. (*Remember, if you are setting up Use Type 2 or 3 you will not see this option.*) The default option is Off.

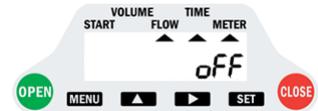
- Use the Up Arrow key to change this option between Off or On.
- Press the SET key to accept the changes and advance to the next screen.



Flow Time Metering Option

Enable this option to permit management of water delivery by flow time or duration for any flow event. This will meter and control flow in cases like a forgotten hose in your garden. (*Remember, if you are setting up Use Type 2 or 3 you will not see this option.*) The default option is Off.

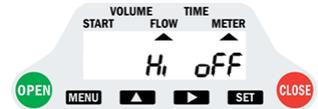
- Use the Up Arrow key to change this option between Off or On.
- Press the SET key to accept the changes and advance to the next screen.



High Flow Limit Metering Option

Enable this option to alert for water delivery that exceed a defined high flow rate during any event. This will monitor and control water in cases like a broken sprinkler head. The default option is Off.

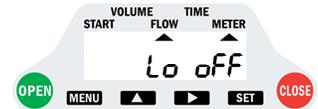
- Use the Up Arrow key to change this option between Off or On.
- Press the SET key to accept the changes and advance to the next screen.



Low Flow Limit Metering Option

Enable this option to alert for water delivery that falls below a defined flow rate during any event. This will monitor and control water in cases like an obstructed irrigation valve. This may not be widely applicable to residential monitoring. The default option is Off.

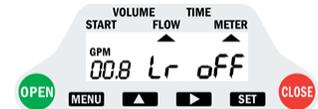
- Use the Up Arrow key to change this option between Off or On.
- Press the SET key to accept the changes and advance to the next screen.



Leak Rate Metering Option

Enable this option to alert for water leaks with flow rates that fall below a defined flow rate. This will monitor and control water in cases like a slab leak. The default option is Off.

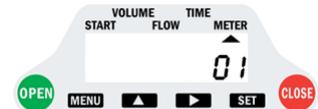
- Use the Up Arrow key to change this option between Off or On.
- Press the SET key to accept the changes and advance to the next screen.



Meter Number

This Menu Option is used to set the meter address so that other equipment can communicate with it. Is this the first, second or nineteenth HydraMeter in a chain of networked Hydrameters?

- Use the Up Arrow key to change the address number from 1 to 19.
- Press the SET key to accept the changes and advance to the next screen.



Congratulations! You have initialized your HydraMeter and it is ready to go. If you want to add flow limits specific to your particular water management needs, rather than defer to the default limits, the next section will explain how to do that.

Programming Menu Options

Once it has been initialized you can use your HydraMeter for very precise measurement of all water going through it (down to 4/100 gallon a minute). If you want more control however, you will need to tell it what you want it to do for you. The good news is that the HydraMeter is ready to help you understand what “normal water use” is for your application. Turn things being monitored on one at a time: for landscape run sprinklers through their cycle, for homes turn each fixture and appliance on one at a time write down how much water they use. Turn everything on all at once to see what the maximum use could be. Write down the flow numbers as you go and you’ll have the information you need to define and program limits for your HydraMeter.

To begin programming the HydraMeter, the Menu key is pressed. Each press of the Menu key will advance through the HydraMeter program menu options. The Use Type you’ve selected along with the options that were enabled in the initialization process will determine what program menu items will appear. For Use Type 1, if all options were enabled then the following menu options will be visible:

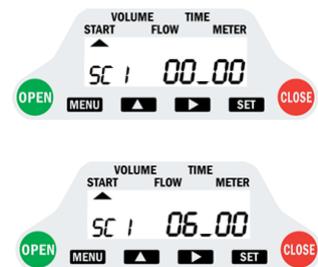
- **Scheduled Start** - The scheduled start defines the time periods for which control limits will be honored. Different limits can be applied for different time periods (up to 4 different schedules).
- **High Flow** - Define the upper flow-rate limit
- **Low Flow** - Define the lower flow-rate limits
- **Flow Time** - Define the duration that any flow-rate can occur (N/A Use Types 2 & 3)
- **Volume** - Define the maximum volume of water that can flow continuously without interruption. (N/A Use Types 2 & 3)

Programming for USE 1: Manage Water

Schedules

Setting schedules allows users to define different water flow and usage limits for different time periods in a day. For example, you may have high water use in the morning when everyone is home, but little to no water use in the middle of the day. In manual mode there is only one schedule allowed. Through the enhanced features available on our WaterUseOnline web services, there are four start schedules available. For these purposes, you will need to set the Schedule number to 1.

- Press Menu until the Menu arrow is position below START.
- The cursor will be flashing the schedule number. To advance through the schedule numbers (1-4) press the Up arrow key. Stop at 1.
- Once the schedule number 1 is selected, advance to the Start Time entry using the Right Arrow Key.
- Leave the Start Time at **00_00** so that it knows this is a 24 hour schedule.
- Press SET to save the schedule.
- Press MENU to go to the next menu item.

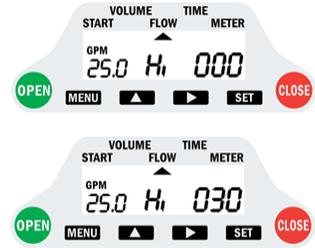


Below you will learn how to set the limits specific to your needs.

High Flow Rates

High flow rates are set to define the maximum flow rates allowed any time during a water flow schedule. This menu screen will only appear if it was enabled during initialization.

- Press Menu until the Menu Arrow is positioned below Flow.
- Enter a value for the high flow rate limit at the left portion of the display. This is the value above which would indicate a problem in the water delivery system (example to the right shows 25 gallons per minute).
- Press the right arrow key to advance to the delay time that must pass before water shut-off will occur. The delay value is entered in seconds (example to the right shows 30 seconds).
- Press SET to save and exit or press MENU to go to the next menu item.



Low Flow Rates

Low flow rates are set to define the minimum flow rates allowed any time during water flow schedule. This menu screen will only appear if it was enabled during initialization.

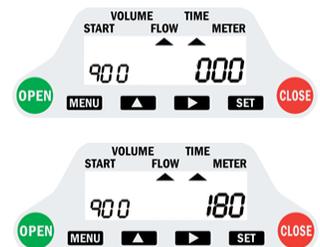
- Press Menu until the Menu Arrow is positioned below Flow.
- Enter a value for the low flow rate limit at the left portion of the display. This is the value below which would indicate a problem in the water delivery system (example to the right shows 0.8 gallons per minute).
- Press the right arrow key to advance to the delay time that must pass before water shuts off will occur. The delay value is entered in seconds (example to the right shows 60 seconds)
- Press SET to save and exit or press MENU to go to the next menu item.



Flow Times

Flow Time is used to define the maximum length of time that water is allowed to flow continuously during a schedule before the water is shut off. The maximum you can program is about 16.5 minutes (999 seconds), with a 16.5 minute (999 second) delay before shut-off (about 33 minutes total). If you need water for longer than the time you set, simply turn the water off mid-cycle for a few seconds and then on again to restart the clock. (For example turn the hose off and then on again.) This menu screen will only appear if it was enabled during initialization.

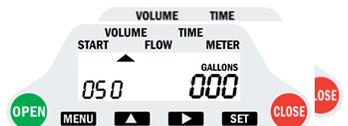
- Press Menu until Menu Arrows appear below Flow and Time
- Using the Up and Right Arrow Keys enter a time in seconds at the left portion of the display (the example to the right shows 900 seconds or 15 minutes).
- Press the right arrow key to advance to the delay time that must pass before water shuts off will occur. The delay value is also entered in seconds (example to the right shows 180 seconds or 3 minutes)
- Press SET to save and exit or press MENU to go to the next menu item.



Volume

Volume is used for setting the maximum amount of water allowed to flow continuously during a schedule before water is shutoff.

- Press Menu until the Menu Arrow appears below Volume.
- Using the Up and Right Arrow Keys enter a volume at the left portion of the display (example to the right shows 50 gallons).



- Press the right arrow key to advance to the delay time that must pass before water shut-off will occur. The delay value is also entered in seconds (*example to the right shows 60 seconds*)
- Press SET to save and exit or press MENU to go to the next menu item.

You have now set all of your limits, and the HydraMeter is on duty. Below you will learn what to expect if the HydraMeter detects that your limits have been exceeded.

HydraMeter Alarm Screens

The following screens display when the HydraMeter is in an alarm state. Remember, in Manual mode the only answer to an alarm is valve closure. If you program the HydraMeter through our WaterUseOnline web services, you will be able to send emails, voice messages or texts to designated people in response to alarms, as well as choose whether you want to shut the water off or not.

Flow Volume Limits

When a continuous flow delivers a volume that exceeds the Volume Delivery Limit the Volume Alarm screen will display. The Menu Arrow will flash below the Volume label. The Volume Limit value will display to the right and the number of delay seconds before the valve closes will display to the left. The delay value will count down to indicate the number of seconds left before valve closure.

When the delay time expires and the valve closes the display will flash **oFF** to the left and the Menu Arrow will continue to flash below the Volume label.

Flow Rate Limits

When a flow-rate exceeds the set Flow-Rate Limit the Flow-Rate Alarm screen will display. The Menu Arrow will flash below the Flow label. The Flow-Rate Limit value will display to the left and the number of delay seconds before the valve closes will display to the right. The type of flow limit reached will display to the right: **H** for a high flow-rate limit, **LD** for a low flow-rate limit, and **Lr** for a leak rate limit.

The delay value will count down to indicate the number of seconds left before valve closure.

When the delay time expires and the valve closes the display will flash **oFF** to the left and the Menu Arrow will continue to flash below the Flow label.

Flow Time Limits

When continuous flow time exceeds the set Flow Time Limit, the Flow Time Alarm screen will display. The Menu Arrow will flash below the Flow and Time labels. The Flow Time Limit value will display to the right and the number of delay seconds before the valve closes will display to the left.

The delay value will count down to indicate the number of seconds left before valve closure. When the delay time expires and the valve closes the display will flash **oFF** to the left and the Menu Arrow will continue to flash below the Flow and Time label.

Congratulations.

Your HydraMeter is ready to conserve water and protect your property!

Programming for USE 2: *Manually Initiated Water Delivery*

What is USE 2?

When you choose Use Type 2, the HydraMeter is capable of delivering a target volume of water when the green Water On button is pressed. There are four preset target volume delivery values available to choose from. You can toggle through these by pressing the green Water On button on the HydraMeter. As you toggle the Water On button, the left side of HydraMeter display will show **dL 1** (Delivery Value 1). On the right side of the display will show the set volume to be delivered. As you toggle the Water On button you will see the set volumes for **dL 2**, **dL 3**, and **dL 4** in sequence. After toggling through the four set volume entries the display will return to the normal display mode. If you pause for several seconds on any of the four set volume values the HydraMeter valve will open and water will flow. Once the set volume of water has passed through the HydraMeter the valve will close.



Programming the Target Delivery Volumes

Once you decide how much water should be delivered for each Target Delivery Value, press the **[MENU]** key.

- **dL 1** will show on the left of the display and the first digit of the target volume to be delivered will be flashing. Adjust the flashing digit value with the Up Arrow Key. Move to the next digit with the Right Arrow Key. Once the target value has been set press the **[SET]** key.
- **dL 2** will show on the left of the display and the first digit of the target volume to be delivered will be flashing. Repeat the same sequence used for **dL 1** above for **dL 2**, **dL 3**, and **dL 4**. Once all values have been entered the display will turn to its normal mode.

Flow Limits

If Flow Limits were enabled in Initialization menu you will be able to set the maximum and minimum flow-rates allowed when water is being delivered and set the delay times from the **[MENU]** key.

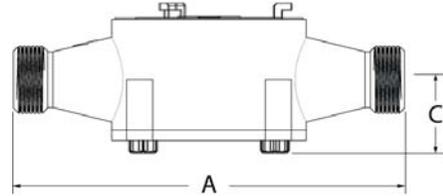
Toggle the **[MENU]** key though the four volume delivery settings. After passing through all four values, the Menu Arrow will positioned below the Flow label at the top of the Keypad.

- If a High Flow limit was enabled the current High Flow limit value will display with the first digit flashing. Use the Up Arrow Key to enter each digit of the High Flow limit using Right Arrow Key to advance after each digit is entered.
- On the right of the display is shown the Delay Time for shutting of the valve after the Hi Flow limit is reached. Press the right arrow key to advance to the delay time that must pass before water shut-off will occur. The delay value is also entered in seconds.
- Press **[SET]** to save and exit or press **[MENU]** to go to the next menu item.
- If a Low Flow limit was enabled the current Low Flow limit value will display with the first digit flashing. Use the Up Arrow Key to enter each digit of the Low Flow limit using Right Arrow Key to advance after each digit is entered.
- On the right of the display is shown the Delay Time for shutting of the valve after the Low Flow limit is reached. Press the Right Arrow key to advance to the delay time that must pass before water shut-off will occur. The delay value is also entered in seconds.
- Press **[SET]** to save and exit.

Appendix A: Water Meter Information

Meter Size (inches)	Dimension A	Dimension C
5/8" x 1/2"	7 1/2"	1 1/2"
5/8" x 3/4"	7 1/2"	1 1/2"
3/4" x 3/4"	9	2 1/16"
3/4 x 1	9	2 1/16"
1 x 1	10 3/4	2 1/8"
1 1/2	13	2 1/8"
2	17	1 3/4"

Table 1 AWWA Meter Dimensions



Meter Size (inches)	Pulses Per Gallon
5/8 x 3/4	56.7
3/4 x 3/4	33.3
3/4 x 1	15
1 x 1	5.6
1 1/2	25
2	4

Table 2: Elster Meter Pulse Count

Meter Size (inches)	Pulses Per Gallon
5/8"	57.8
3/4 "	32.3
1"	15
1 1/2"	6.7
2"	3.7

Table 3: Neptune T-10 Meter Pulse Count

Meter Size (inches)	Pulses Per Gallon
1 1/2"	0.15
2"	0.15
3"	0.28

Table 4: Neptune HP/T Meter Pulse Count

NOTE:
For sizes larger than shown
Please call Seco Sys
(760) 297-3004

Appendix B: Check List of Initialization Variables

Day Number (1 - 7 with 1 representing Sunday)

Clock Time (set in 24 hour format)

Unit of Measure Liters Gallons

USE Task Type

1 = Manage Water

2 = Scheduled Water Delivery

3 = Manually Initiated Water Delivery

#_____ Pulses per unit of measure for the selected meter (see Appendix A for this data)

Off On Volume Metering Option

Off On Flow Time Metering Option

Off On High Flow Limit Metering Option

Off On Low Flow Limit Metering Option

Off On Leak Rate Metering Option

Meter Number (1 - 19)

#_____