HCA Tech Note

Integrating an Automatic Water Shutoff Valve with HCA using UPB

If you have ever had a flood in your house due to a broken pipe, leaking dishwasher, or overflowing washing machine, you can understand the usefulness of an automatic water shutoff valve. Such a device can automatically turn off your main water line in response to signals from wireless water sensors around your house in bathrooms, basements, kitchens, etc. The valve described in this technical note (the WaterCop by DynaQuip Controls, www.watercop.com) can operate independently of any home automation system. However, integrating it with HCA adds functionality.

The WaterCop has buttons on the face of it that allow you to open and close the valve manually. In addition, the device has an RJ-45 jack that allows the device to interface with a remote switch, or an automation system that can provide momentary contact closures to open or close the valve. The interface also provides confirmation that the valve has opened or closed. The valve is powered by plugging it into an ordinary outlet.

An experienced plumber should do the installation of the WaterCop. The device installs downstream of the water meter and any exterior manual shutoff valve, and is available with a valve to fit 1/2",¾", 1", and 1 ¼" pipes. The device should be installed indoors, such as in a crawlspace, or basement. The photo to the left shows the water line before the installation of the valve.

Here is a picture after the valve was installed. Note the cable that comes out of it. This will be connected to a UPB module to sense the valve actions and also to control it.
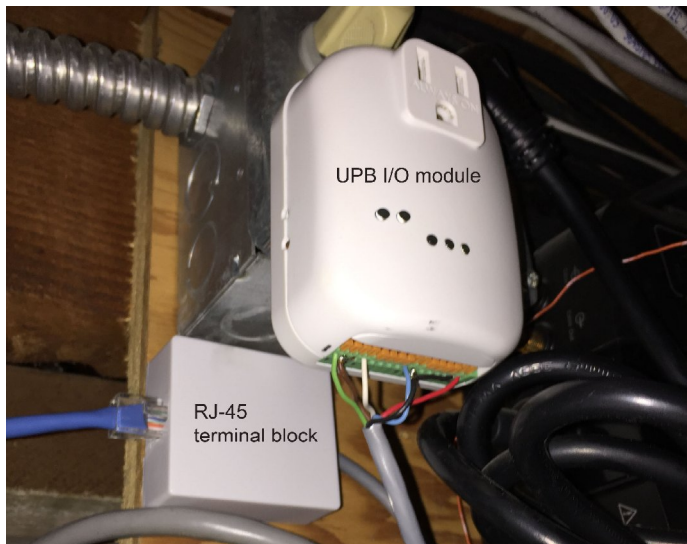
Integrating with HCA using UPB

After installation of the valve and the wireless sensors that are part of the WaterCop product, the system is fully functional. What follows is a discussion of how to integrate it with HCA to provide a way to remotely close and open the valve and also to provide a mechanism to alert you when a leak is detected.

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It is important to note that the leak detection and the valve closing has nothing to do with HCA. All that is part of the WaterCop product. Once a leak is detected the WaterCop handles all valve actions. Integration with HCA provides a way for you to be told that it happened. HCA is not involved in controlling the valve in response to a water detection event.

WaterCop can be integrated with HCA using a Simply Automated UPB I/O module. This module provides two momentary contact closures to open and close the valve, as well as providing two inputs that can be used to *confirm* valve opening and closing.
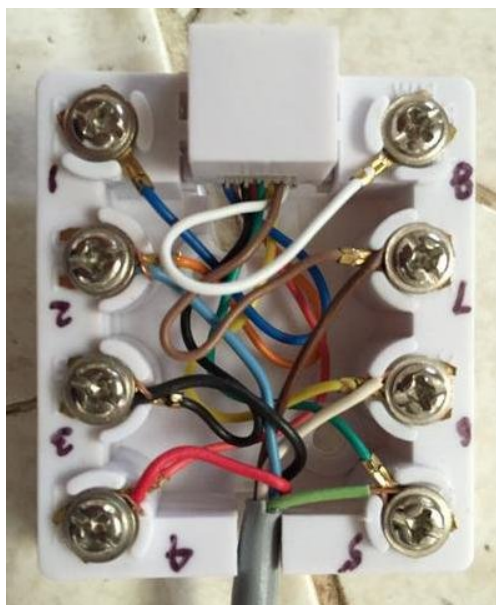
A terminal block with an RJ-45 jack provides a convenient way to connect the UPB module terminals to the RJ-45 connector on the WaterCop using an ordinary Ethernet cable as shown in this photo.

The connections between the UPB module and valve are as follows:

UPB Module	Pin	Valve RJ45	Pin
Input 2	9	Normally Closed	2
Common	10,15	Common	3
Input 3	16	Normally Open	4
Output 1	1	Close Valve	5
Common	2,3	Common	7
Output 2	4	Open Valve	6

Configuring with UPStart

Once the UPB module is added to your UPB network, it is configured using the UPStart UPB configuration program as shown below.

The first step is to assign a scene to the first receive channel. This can be activated to close the valve.

A second scene is then created and assigned to the second channel. This can be activated to open the valve.
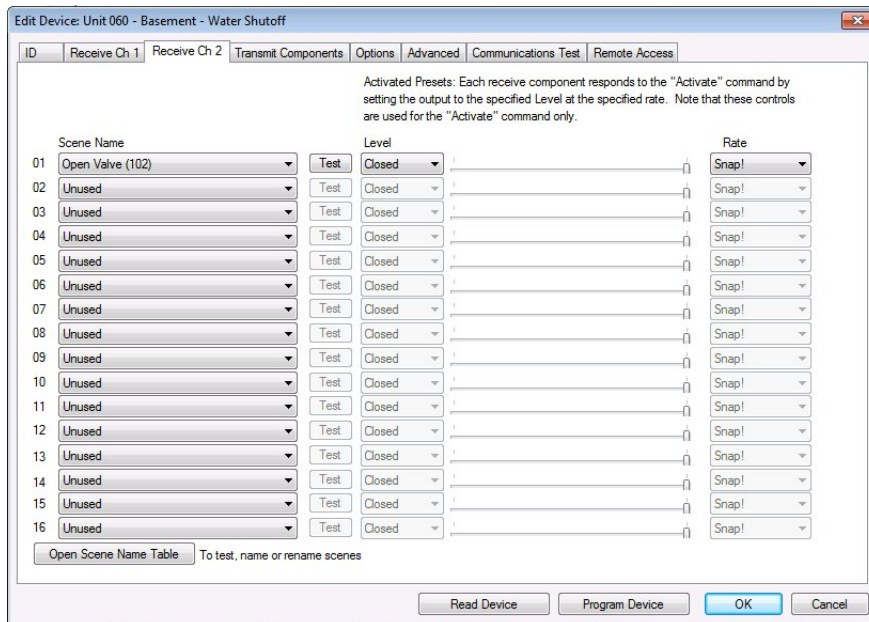
Once the two receive channels are configured then scenes are created to report when the valve opens and closes. These are assigned to inputs 2 and 3 on the module. The Simply Automated input module has documentation on how to connect wires to pins. Just use the "pin to pin" table given above to make the correct connections to what the WaterCop provides.
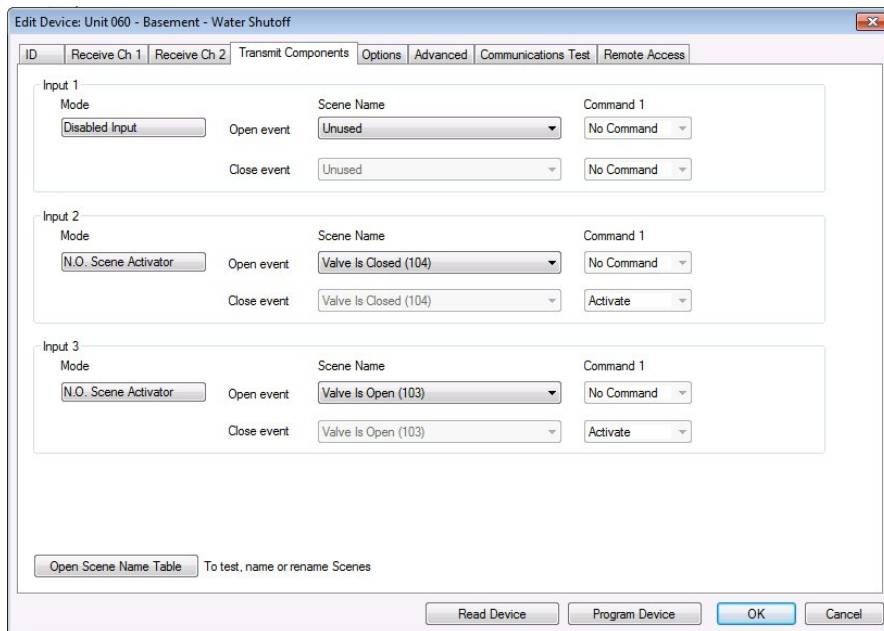
The final configuration of the module is setting the channel options for "Momentary action".
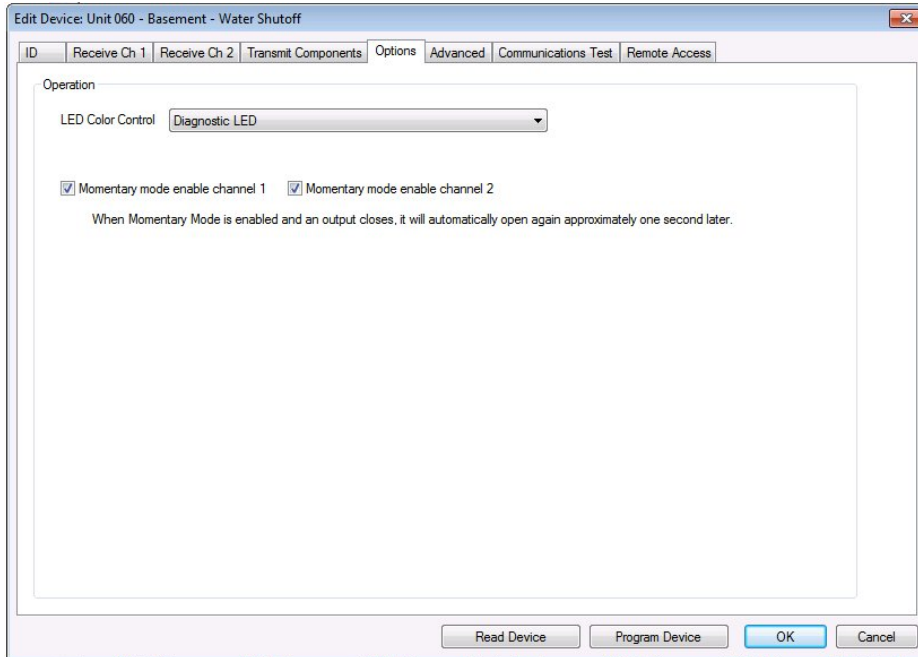
When HCA imports the UPB Network it creates devices for each of the inputs and outputs that the module has. On the "Remote Access" tab are where you choose which of the inputs and outputs you want HCA to create devices for, what they should be called, and what icons are used.

| Show Icon	Icon Label	Icon Name	
☑ Channel 1	Close Value	Appliance	Change
☑ Channel 2	Open Value	Appliance	Change
☐ Input 1	Water Shutoff	Water Heater	Change
☑ Input 2	Value Is Closed	Pool Filter	Change
☑ Input 3	Valve Is Open	Pool Heater	Change

With all this configuration in place, here is a summary of the receptions and transmissions:

- From HCA send an ON to channel 1 – in HCA the device created for channel 1 is called "Close Valve" and the house water will be on.

- From HCA Send an ON to channel 2 – in HCA the device created for channel 2 is called "Open Valve" and the house water will go off

- When WaterCop closes the valve it transmits a scene activate of the "Valve is closed" scene. This can be used as a trigger to a program.

- When WaterCop opens the valve it transmits a scene activate of the "Valve is open" scene. This can be used as a trigger to a program

A few programs provide control of the valve and show the state of it.
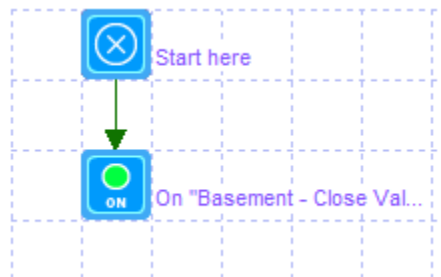
Program *Basement – Turn Water Off*
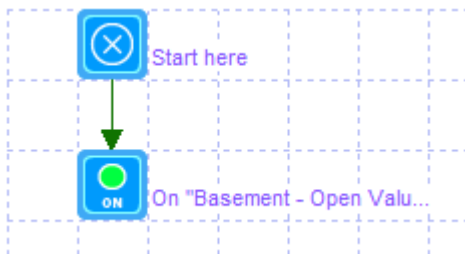

Program *Basement – Turn Water On*

Program *Basement – Respond to Water Cop*

This program triggers on the scene activation messages when the valve opens or closes.

Start the program on any of these triggers:

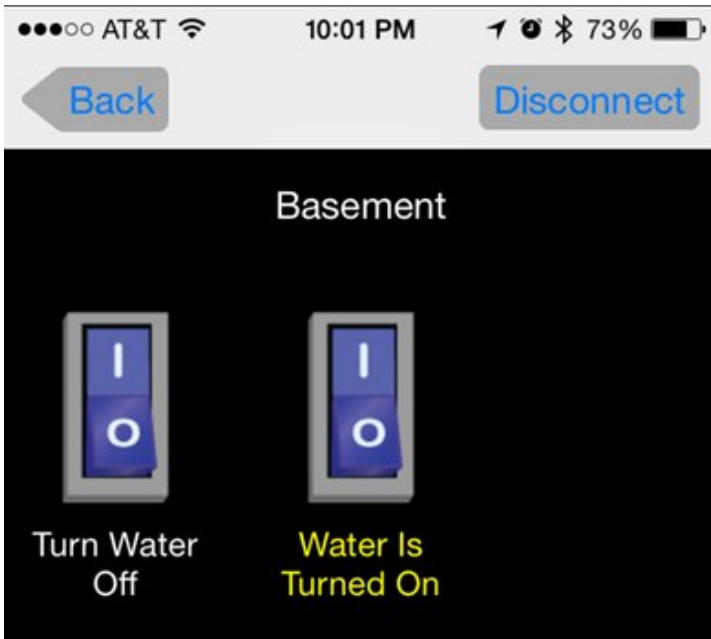| Trigger	Edit	Delete
When "Basement - Close Value" Input 2 Close (Activate Valve Is Closed (104))	Edit	Delete
When "Basement - Close Value" Input 3 Close (Activate Valve Is Open (103))	Edit	Delete
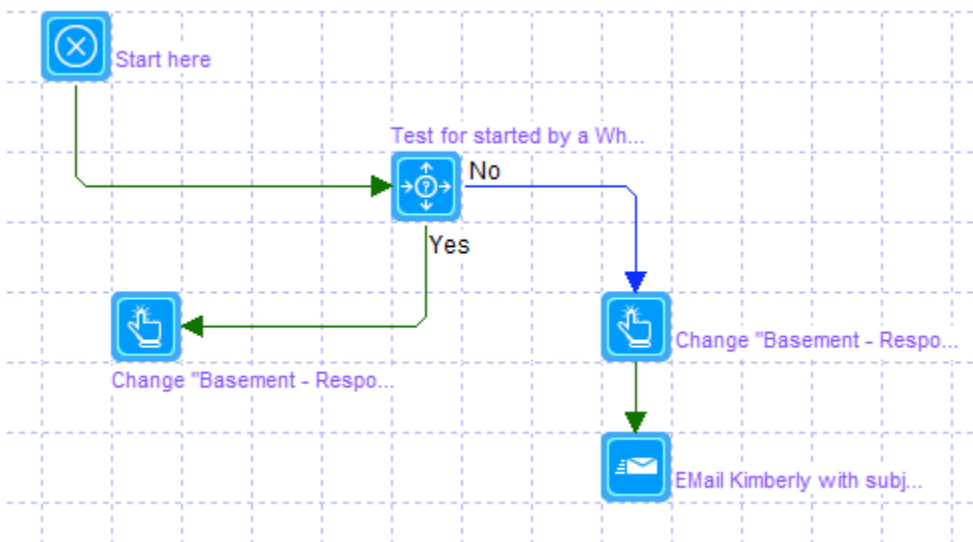
The actions of the program are to check the starting trigger and then change the program icon and its label to show if the water is ON or OFF.

Once all the programs are created, when viewed on a mobile application the state of the water cop can be easily seen as well as provide a quick way to turn the water off.

##end##