Wiring the Probes:

This was probably the hardest part to do. Be very careful not to cut or break the probe wires, as you will then need to buy new ones…

It required a lot of elbow grease and spit, yes spit. A little bit in the rubber boot helped lube it up to slide down the wire…

The pH probe has a rubber boot on it up near the bayonet connector. Peel it back and slide it a foot or so down the probe wire towards the sensor. I peeled it back so it was 'inside out' to allow the TDS wiring to go up through the boot to keep everything clean when its pulled up to the outlet box.

Take the TDS probe wires and tightly wrap the ends and cover with a bit of electrical tape to keep them together and from getting damaged.

I used needle nose pliers to expand the smallest part of the boot and opened the pliers wide enough to shove a pump body between the handles to hold it open. I was then able to work the TDS probe wires up through the boot.

Pull the boot to ‘flip it’ around the right way, leaving a foot or so from the boot to the probe ends.

Slide the probe wires up through your outlet box. Leave the boot on the outside.

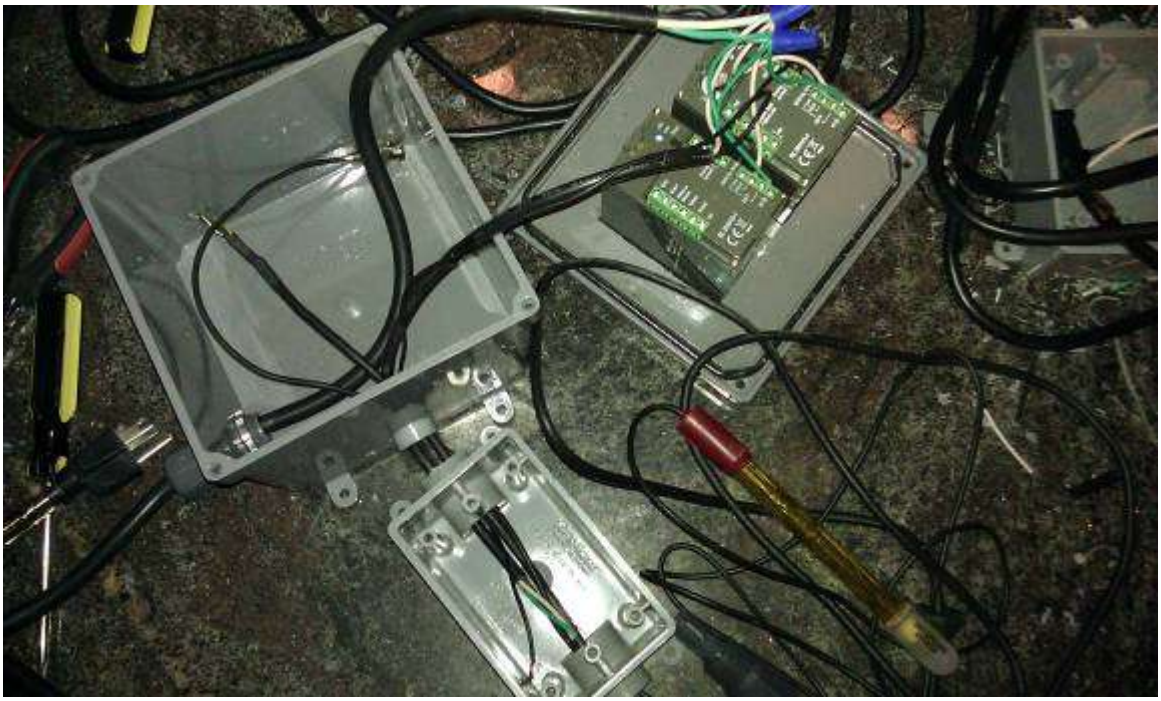
Insert the conduit connector (tophat) into the controller box.

Run the probe wires up into the controller box.

(Ignore the ‘missing tophat’ in the following pictures, I was trying something else and didn’t get a good picture of the proper connector)

Pull the probe wires up and out of the box to allow slack for wiring.
They will get pulled back down once we button it up.

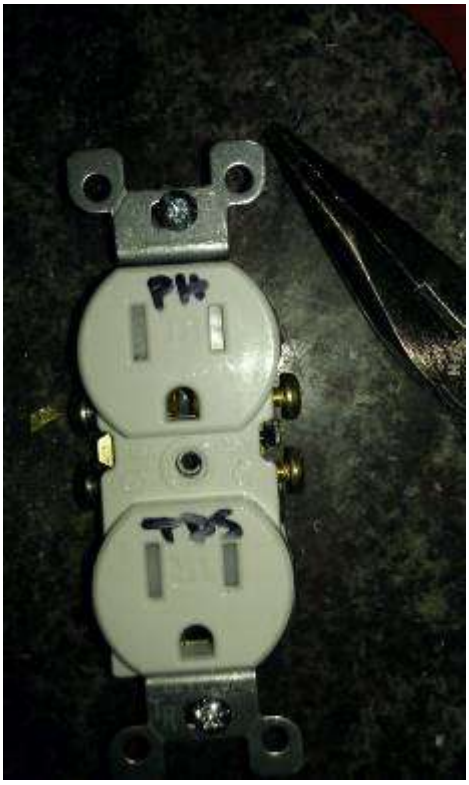
Run the outlet wire bundle back through the ‘tophat’ and down into the outlet box.



Prepare the outlet for a ‘split’ circuit:

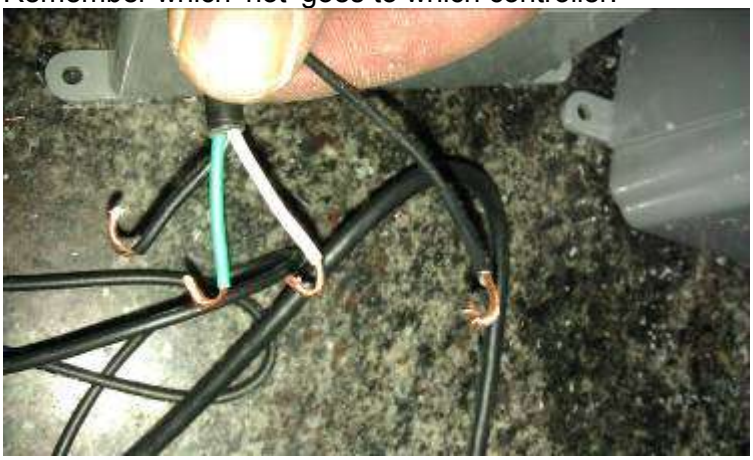
The brass connectors indicate the ‘hot’ side. There is a tab that connects the terminals/outlets together. We need to separate them for our use, so grab the tab with needlenose pliers and bend up and down. It will break off in two or three bends.

Now that each outlet is controlled separately, I've labeled them for my use.



Wire up the outlet:

Put a semicircle bend in the wires. 2 hots, shared neutral and ground.
Remember which ‘hot’ goes to which controller!



Put the wire to the left side, so when you tighten, it pulls the wire in to the screw/terminal.

My loose/taped wire goes to my pH controller.

Button up the outlet box by screwing it in to the box, then installing the faceplate.


PW

Hook up the probes:

Simple bayonet connector for the pH probe. Insert and twist to lock.

If you want to dose pH up, now is the time to insert the jumper that you made earlier.

Open/No Jumper = pH Down
Shorted/Jumper = pH Up

(Jumper was inserted for this picture only, it was removed for my application)

TDS Probe:
Color coded = Idiot proof!


Grey
Green
White or Brown
Yellow
Shield
NU
Dosing contact
115 V
230 V
BL 983319-1


Grey
Green
White or Brown
Yellow
Shield
BL 983319-1

Decision time…

On the backs of the controllers, there is a trimmer pot (min/max) and a jumper marked 'Time'.

This is your 'overtime' control to stop your controller from dosing endlessly (if feed hoses get pulled from tank, stock tank out of nutrients, controller malfunction, pump failure, etc.) It could also save your plants by NOT overdosing them or it could cause your doser to NOT work as it will 'trip' too often and go in to 'timeout' mode where it requires manual intervention by you to reset it.

The Min is ~5 minutes, the Max is ~30 minutes. Based on YOUR setup, your pumps, what you are dosing, etc. YOU need to determine what the best setting is for you and your setup.

For my setup, I set the pH to MIN (turn the trimmer). Based on my DIY pH doser experience, right after a full res change, as long as I hit my target pH and ppm levels **before** turning on the dosing unit, I see the controller kicking on and kicking off frequently, doing 'micro' corrections off of that, not straight dosing for a minute or two on end. I don't want it EVER to dump 30ml – 100ml of 30:1 – 20:1 acid into my tank. Again, this unit is for monitoring and maintenance of your solution, not for a fully automated reservoir change. This setting is very dependent on which vendor/acid you are using. GenHydro is weak compared to Advanced Nutrients 'concentrate'. I 'water down' the AN and it is still very strong. Once your fresh reservoir is stable pH-wise, the doser will maintain it to your setpoint. If your setup has WILD pH swings (2+ points) in either direction over 24 hours, I am not sure you would want your doser 'chasing its tail' so shutting off/timing out would be the right thing to do.

I set the TDS controller to half of MIN/MAX. While I do not see the potential need for my pumps to run for 15 minutes straight, it ~may~ be possible. I feel safe with the potential for ~100ml of A/B being dumped in and not being too hot (enough to kill) in my systems. Again, each micro correction on/off of a few seconds to a minute or two will 'reset' your 'overtime' clock.

If you are running drain to waste, using larger pumps, using these for 'fertigation' controllers vs dosing controllers, etc. you may want to remove the jumper all together and it will never time out and require a reset. You need to understand your system to dial this in for you.

Mounting the controllers:

The controllers come with mounting bracket ‘wings’. These will hold the controller tight to the faceplate from behind.

Before we close the controller box up, let’s test to make sure that our circuits/connections are good.

Plug it in, make sure your controllers light up.

Now we need to button the whole thing up.

You set your MIN/MAX Time settings right?
pH up or down set properly (open or shorted)?

Ok good.

Get your PVC cement and run it around the ‘TopHat’. Don’t get it on your probe wires.

Let it set up and dry. Put something under the outlet box to keep it level, as there is a ¼" offset between the bottoms of the controller box and the outlet box.

Ideally I would have used ¾" tophat and ¾" conduit holes in the outlet boxes, maybe even an extension pipe between them, but I liked that the rubber boot of the probe fit nicely into the ½" hole. Whatever you choose, make sure that the pH probe 'bayonet' can slide through easily!

Carefully pull the probe wires down through the outlet box, removing slack from the controller box. Do the same with the power cord.

Move the controller/faceplate in to position over the box and continue removing slack. Be VERY careful with pH probe. The bayonet connecter makes a very tight fit at the back of the box, bending the probe wire down. Do NOT over tighten the faceplate as you will pinch off the pH probe wire.

Once all slack has been removed, tighten up the power cord connector snugly and slide the rubber boot up into the ½” conduit hole.

Testing:

Once the PVC cement is dry, lets verify the outlets operate as they should.
I used a rechargeable LED flashlight, but a lamp, radio, whatever will work.

TDS controller set to ‘On’, orange light means its dosing.
Power to the outlet (flashlight is charging):

TDS controller set to ‘off’, Green light = No power to circuit = NO Dosing
(Flashlight is not charging)

pH controller set to On/Auto, Orange light = Power to outlet = DOSING
(flashlight is charging)

pH Controller set to Off, Green Light = NO Dosing = No power to outlet.
(Flashlight is not charging)

All good. Time to wire up the pumps!