Water Leak Detector
Frequently Asked Questions

By: Jim Schrempp and Bob Glicksman; updated 12/23/22

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1. General Questions.

1.1. What is the Water Leak Detector?

The Water Leak Detector (WLD) is an electronic device designed to alert you in the event that you have a water leak in the vicinity of one of the WLD's water level sensors. The WLD supports two such sensors. In addition, the WLD measures and displays ambient temperature and humidity, and can generate alarms if the temperature is too low or too high.

The WLD is connected to the Internet via WiFi and the project can provide you with SMS text messages about new temperature and water leak alarm conditions. A smartphone App allows you to view the current temperature, humidity, and alarms status, and set new temperature alarm limits, anywhere over the Internet.

The WLD also has audible and visual alarm indicators and a local "servo meter" indication of temperature and humidity. The local alarm and indicator functions will alert you to leak conditions when you are at home, even if you are not near your mobile phone.

Further information about the Water leak detector can be found in the document "Water_Leak_Detector_Concept_V2" that is in the *Documentation* folder of this repository.

1.2. How do I obtain a Water Leak Detector?

The Water Leak Detector is a project that you build yourself, using parts that you purchase yourself from the included parts list and that you assemble using the included documentation.

1.3. Who is Team Practical Projects?

Team Practical Projects is a collaboration between Jim Schrempp and Bob Glicksman. Jim and Bob are both retired after long careers in technology development. We enjoy developing useful and practical devices for ourselves and for others and we are happy to share what we develop with people who might find our projects interesting and/or useful.

1.4. I like the Water Leak Detector project. Has Team Practical Projects published other projects that I might be interested in?

Yes. We post all of our projects on Github, at https://github.com/teampracticalprojects.

1.5. I have ideas/suggestions for improving the Water Leak Detector. How do I communicate these with Team Practical Projects?

Send us an email at TeamPProjects@gmail.com or open an issue in GitHub.

1.6. I have ideas/suggestions for projects that Team Practical Projects might be interested in. How do I communicate these to you?

Send us an email at TeamPProjects@gmail.com or open an issue in GitHub.

2. Licensing Questions.

2.1. Do I need to obtain a license/permission to build a Water Leak Detector for myself?

We offer the Water Leak Detector, and all of our projects, free of royalties to everyone, under a Creative Commons license Attribution-Non-Commercial 4.0. You can view the details of this license at: http://creativecommons.org/licenses/by-nc/4.0/ or send a letter to Creative Commons, 444 Castro Street, Suite 900, Mountain View, California, 94041, USA. In short, you may build Water Leak Detectors under this license, royalty free, for your own use. You may also expand or extend or otherwise incorporate part or all of our technology in your own projects, as long as you publish such projects under the same open source, non-commercial license and acknowledge the use of our technology.

2.2. Do I need to obtain a license/permission to build a Water Leak Detector for someone else?

You may build as many Water Leak Detectors as you wish, royalty free, under the terms of the Creative Commons license Attribution-Non-Commercial 4.0. Under this license, you may charge others up to the cost of the parts, materials, and labor that you use to build the Water Leak Detectors. You may not, however, charge others for the use of our technology nor can you sell Water Leak Detectors in any way commercially (either as assembled and tested units or as kits).

2.3. Do I need to obtain a license/permission to manufacture Water Leak Detectors for sale?

Yes. We are willing to discuss commercial licensing with people/companies who are genuinely interested in making Water Leak Detectors for sale (as kits or as finished products) or in using our WLD technology inside of your own product(s). Please e-mail us with your interest: TeamPProjects@gmail.com.

2.4. Do I need to obtain a license/permission to sell kits for people to build Water Leak Detectors?

Yes. We are willing to discuss commercial licensing with people/companies who are genuinely interested in making Water Leak Detectors for sale (as kits or as finished products) or in using our WLD technology inside of your own product(s). Please e-mail us with your interest: TeamPProjects@gmail.com.

2.5. How do I obtain a commercial license to sell assembled Water Leak Detectors or Water leak Detector kits?

We are willing to discuss commercial licensing with people/companies who are genuinely interested in making Water Leak Detectors for sale (as kits or as finished products) or in using our WLD technology inside of your own product(s). Please e-mail us with your interest: TeamPProjects@gmail.com.

2.6. I made some changes/modifications to the Water Leak Detector (hardware, firmware, app or documentation). Do I need to inform someone about these changes, and how do I do this?

We love collaborators! The best way to do this is to engage with us on GitHub or email (TeamPProjects@gmail.com). Let's talk about the changes you're making. If your changes are in-line with our objectives for the project, we'd like to add them. The best way to do this is to fork our repository on GitHub, do your work, and submit a pull request to our development branch. If you're not a GitHub user, email us and we can work something out.

3. Building/Installing Questions.

3.1. What tools do I need in order to build a Water Leak Detector from your documentation?

You will need basic hand tools and through hole soldering tools. Here is a suggested list:

- Small, straight screwdriver.
- Needle nose pliers.
- Diagonal cutter.
- Wire stripper (#16 awg - #26 awg stripping dies).
- Fine tip soldering iron.
- Electrical solder.
- Electrical tape or painters tape (for holding things in place while soldering).
- Sturdy double sided tape for mounting things.
- Solder wick or solder pullit (for when you make a mistake).
- "3rd hand" support stand to hold a printed circuit board while soldering.
- Magnifying glass (for inspecting your work).
- Electrical multimeter (with VDC and ohms settings).
- Electric drill and ¼" general purpose drill bit set.
- Shop knife (if cutting a plastic box for your enclosure).
- Plastic glue (hot glue gun is recommended).

3.2. What skills do I need in order to build a Water Leak Detector from your documentation?

You will need basic through hole soldering skills to assemble the WLD printed circuit board and the RJ11 boards. Minimum pin spacing is 0.1”; we do not use small outline devices or surface mount devices because of the extra skills and tools needed.

You will need to drill and cut a plastic box to use as an enclosure, unless you select some other enclosure option (such as 3D printed parts).

You will need to glue plastic parts together; a hot glue gun is recommended.

You don’t need to be a super programmer (or even a beginner programmer), but you have to be willing to follow our instructions on how to install the firmware, webhooks, scripts, and the smartphone app.

3.3. Where do I install the Water Leak Detector electronics?

You will want to install the WLD electronic enclosure somewhere where you can see the faceplate, access AC power, and at a location where you can run the cables to the sensor(s). We have tested sensor cable lengths up to 10 feet, but longer cables should work (in theory).

3.4. Where do I install the Water Level Sensors?

The water level sensors should be placed along a wall so that the bottom tip of the sensor contacts the ground. The location should be at a low point in the floor where leaked water is likely to pool first. If such a location is not available, you might want to consider placing a rectangular pan directly below the likely leak location and mount a sensor vertically along one side of the pan.

4. Operating Questions (local).

4.1. What does a steady green light on the pushbutton switch mean?

A steady green light means that the Water Leak Detector is powered, armed and ready to detect leaks, but that no leak is currently being detected. It also means that it is measuring temperature and pressure and that it is connected to the Particle cloud via the Internet. Under rare circumstances, the Photon might crash but leave the LED on solid.

4.2. What does a flashing green light on the pushbutton switch mean?

A flashing green light means that a water leak has been detected or that a sensor has become disconnected. The light will continue to flash as long as either of the sensors is wet. After the leak is cleaned up and both sensors are dried off (with a dry cloth), the light will go back to solid green (armed and ready).

4.3. What if there is no light on the pushbutton switch?

If the pushbutton switch does not display a solid or flashing green light, it means that the Water Leak Detector is not armed and ready. There are many reasons for this, including but not limited to:

- No power to the WLD electronics.
- The WLD electronics (Photon) is not connected to the Particle cloud via the Internet.
- The WLD electronics (Photon) has not exited setup, perhaps because of a problem with the electronics (such as with communicating with the DHT11 temperature/pressure sensor).
- A wire has come loose between the WLD printed circuit board and the LED terminals on the pushbutton switch.
- A bad LED inside the pushbutton switch.

You can find further information about troubleshooting your WLD in the “WLD troubleshooting” document in the *Documentation* folder of this repository.

4.4. How do I mute the audible alarm?

Pressing the pushbutton switch will mute the audible alarm. The green LED will continue to flash until the sensors are dry and the device rearms.

4.5. How do I re-arm the Water Leak Detector after muting an audible alarm?

The WLD will automatically re-arm after the water leak has been cleaned up and the sensors have been dried off. This will be indicated by the backlight LED returning to a constant on state.

4.6. How do I read temperature or humidity off of the face of the Water Leak Detector?

Once you have calibrated the servo as described in our documentation, the pointer on the servo will indicate the temperature or humidity. You change from one to the other by throwing the toggle switch on the faceplate.

4.7. How do I switch the “servo meter” on the Water Leak Detector from temperature to humidity or visa versa?

Change position of the toggle switch.

4.8. How do I read temperature in Fahrenheit (Centigrade)?

Both scales are available on the front panel “servo meter”. You can read whichever scale that you choose. The App that we supply with this project displays temperature in Fahrenheit. You can change the WLD firmware to report in Centigrade yourself if you wish.

4.9. My servo meter is not displaying the correct temperature or humidity. What do I do to correct this?

First, repeat the calibration step from the documentation. Second, consider the environment of the WLD. If the detector is installed in a cabinet with a water heater, then the temperature and humidity may be different from the ambient environment outside the cabinet. Check the temperature and humidity that is reported on the App or via the Particle Console. If the servo

meter readings are the same as those reported to the cloud, then these are the values that the DHT11 temperature/humidity sensor is reporting. Replace the DHT11 sensor if it is not reading correctly. If the reading on the app are correct but the servo indicator is off, try re-aligning the pointer horn on the servo to the correct value. Re-run the servo calibration routine if this is necessary:
https://github.com/TeamPracticalProjects/WaterLeakSensor/blob/master/Documentation/Servo_Meter_Calibration.pdf

4.10. Will my Water Leak Detector provide me with local only operation in the event that my Internet connection is down?

No. When the internet is down the Photon is unable to connect to the Particle Cloud. This can prevent the Photon from executing the WLD firmware.

5. Operating Questions (Remote - app).

5.1. Where do leak detection notifications show up on my smartphone?

Leak detection alarms show up in two places: (1) when any alarm is generated, an SMS text is sent to the user's mobile phone. The mobile phone need not be a smartphone; any mobile phone that supports SMS texts will suffice. (2) the current status of all three alarms are displayed on the smartphone App that is part of this project. See section 5.2 of the "WLD_Installation_and_User_Manual_V2" in the *Documentation* folder of this repository for details. Active alarms are backgrounded in red; no alarms are backgrounded in green. Note the distinction between alarm texts and the Alarm status shown on the App. The alarm texts occur when the alarm condition is first detected, and are timestamped as such. The App shows the state of the alarms when the App is opened or the REFRESH DATA button is tapped. This may occur some time after the alarm was detected and the alarm status may have changed in the interim (e.g. someone repaired and cleaned up the water leak prior to the App being used).

5.2. How can I tell if the Water Leak Detector is currently detecting a leak alarm or not?

Open the App on your smartphone. If any of the three alarms are backgrounded in red, then that alarm is still active. If the alarm is backgrounded in green, then the alarm condition is no longer present.

5.3. What messages are displayed on the “Current WLD Status” line of the App and what do these messages mean?

This message contains two items relating to the current (as of opening the App or tapping REFRESH DATA) status of the WLD hardware: (1) the version of the firmware that is installed on the Photon device, and (2) the date and time of the last reset of the Photon (in UTC - not converted to local time). This information may be helpful in troubleshooting.

5.4. How do I convert the time displayed on the “Current WLD Status” line of the App into the local time where I am (local time where the Water leak Detector is)?

The time in these messages is UTC (Coordinated Universal Time). You can convert this time to your local time via one of the many on-line time zone converters that you can find on the Internet.