Instructions for Installing the SIS Firmware

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Purpose

This document will guide the maker of a Standalone Intelligent Sensor System (SIS) to install the SIS firmware into the SIS Hub.

Overview

The SIS is fully documented on Git Hub at https://github.com/SISProject

The SIS Hub uses a processor from *particle.io* as the local compute resource. The SIS currently uses the Photon, but is intended to be compatible with the future Electron. This document will refer to the Photon but should be the same process for the other processors.

You can install the SIS firmware into your Photon at any point in the development process. This document will assume that you have completed the build of your SIS printed circuit board and installed the Photon into that board. Instructions for doing so can be found at:

https://github.com/SISProject/SISDocs/blob/master/SIS_Hub_PCB_Assembly_Instructions.pdf

Many steps of the process involve services from *particle.io* and Git Hub. These instructions were accurate at the time they were created, but we have no control over these other providers; the reader may need to adjust to new realities.

The process consists of several steps.

1. Power up the Photon and connect it to the internet
2. Verify the Photon
3. Install the Firmware
4. Verify the SIS

1.Power up the Photon and connect to the internet

Before starting this step, open a browser window and bring up the *particle.io* dashboard:

https://dashboard.particle.io/user/logs
If you don't have a *particle.io* user account, you will have to create one. Once you are at the actual dashboard it should say something about "waiting for events." Leave the browser window open.

Connect one end of a USB cable to the large connector on the SIS PCB and the other end to a reliable power supply (USB power; +5 volts DC regulated). Wait 30 seconds and look at the dashboard. If it shows that your "device came online" then you can move on to step 2 - you've obviously worked with this Photon before.

What is the Photon Telling You Now?

Note the multi-color LED on the Photon board.

Breathing Cyan: If the Photon is "breathing cyan" then it is connected to the internet and you can move on to step 2.

Blinking Blue: If this is the first time you've used your Photon it should be blinking blue; this means it is ready for WiFi configuration.

Blinking Green: If you have already used your Photon, then it will probably be blinking green. If the Photon is blinking green then hold down the mode button on the Photon board until the LED starts blinking blue.

The Photon is Blinking Blue

It is ready for WiFi configuration.

Install the *particle.io* app on your smart phone and follow its directions to configure your Photon with your local WiFi credentials. When you are done, the Photon should be breathing cyan. If not, go to www.particle.io and troubleshoot the situation.

2. Verify the Photon

There are a number of ways to get your SIS firmware into your Photon. We are going to use the simplest way.

Open a new web browser tab (don't close the dashboard tab from step 1) and navigate to the *particle.io* build site:

https://build.particle.io

Verify Photon

On the far left of the build site is a vertical menu with several icons. Hover over the icons until you find the one that is "devices"; it should be a round icon similar to a reticule. Click the icon and a list of devices that are registered to your Particle.io account is displayed. Find the Photon you are using for your SIS Hub. If your Photon is breathing cyan, then it should have a little cyan dot next to its name to show that it is on-line. If your device has stopped breathing cyan, or the little cyan dot is not displayed, then work with the *particle.io* community to figure out what's wrong.

If your Photon has a little cyan dot next to it, then select it. A gold star should show up next to the name or your Photon.

Blink an LED

Go to the left hand vertical menu again. Hover over icons until you find one named “code”. It should be this symbol: < >. Click it and a list of programs is displayed. Click on the sample app “blink an LED”. Now on the left hand menu click the lightning bolt to push this application to your Photon. Watch your Photon. It should blink magenta a few times. If this is the first time you’ve connected your Photon to *particle.io* then it may get a firmware update and it might blink magenta for a while and reset itself several times. Go have coffee and come back in 10 minutes. At this time you want to wait until your Photon is once again breathing cyan. It should also be blinking the blue D7 LED that is on the Photon board. You have now verified your Photon is working correctly.

3. Install the Firmware

Create a Web Based Project

In the *particle.io* build site click the button “create new app”. Give it the name SIS. In the right hand pane where you see a few lines of sample code, delete all of it.

Download the SIS Firmware

The latest SISFirmware is stored on the public site Git Hub. There are many ways to use Git Hub. We will use the most simple way possible.

In any browser on any system, go to

https://github.com/SISProject/SISSoftware

On the right hand side of the screen should be a button labeled “download”. Click it to download the latest version of the SIS Project files.

Once the download is complete, unzip the file and navigate to the Firmware folder. Open the file named SaratogaSIS.ino in a text editor.

Add the Firmware to Your Web Project

Copy all the text from the SaratogaSIS.ino file into your clipboard. Make sure that you copy *everything.*

Now paste the text into the code editor on the *particle.io* build site where you previously erased all the code.

Verify the SIS Firmware

On the left hand vertical menu find the “compile” icon; it should be a checkmark in a circle. Click it and make sure the SIS firmware compiles without error.

Flash the Firmware

On the left hand vertical menu find the “flash” icon; it should be a lightning bolt. Click it.

Now watch your Photon. It should blink magenta a few times (perhaps so fast you’ve missed it?) and then restart including flashing green as it connects to your WiFi network again.

Once the Photon begins to breath cyan you should see the D7 LED blink six times and then go dark. This is the SIS firmware telling you that it is alive! If the D7 LED remains solid blue, then the SIS firmware encountered some problem during start up.

4. Verify the SIS

To verify that the SIS firmware is working correctly you should try to read its configuration. The SIS is managed through a Javascript client that runs in your browser. The files for this client are included in the SIS Project files in the “website” folder.

We currently maintain a web site that hosts these files so you can test your SIS right away. Navigate your web browser to

http://www.shrimpware.com/SIS

Once there click on the link for Standard Configuration. On that page you can log in to your *particle.io* account and then select your Photon. The web page will attempt to read your SIS configuration through the *particle.io* cloud. If the section “Configuration Report From Selected Device” shows you information, then your SIS is working! See the SIS User Manual for additional instructions on using the SIS Client app:

https://github.com/SISProject/SISDocs/blob/master/SIS_User_Manual.pdf

At this point you should have a working SIS running for you! Congratulations. Your next step is to configure the SIS with sensors for your particular installation. You should now read the SIS Theory of Operation and Installation Manual:.

https://github.com/SISProject/SISDocs/blob/master/SIS_Theory_of_Operation_and_Installation.pdf

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