Procedure Title:	Document Number:
Work instructions **AKS Plus and AKS Field Update Procedure**	**522.0006.001.0E**

1. PURPOSE

Details equipment and assembly operation steps for: AKS Plus and AKS.

2. SCOPE

1. Process for installing new Firmware on AKS and AKS Plus
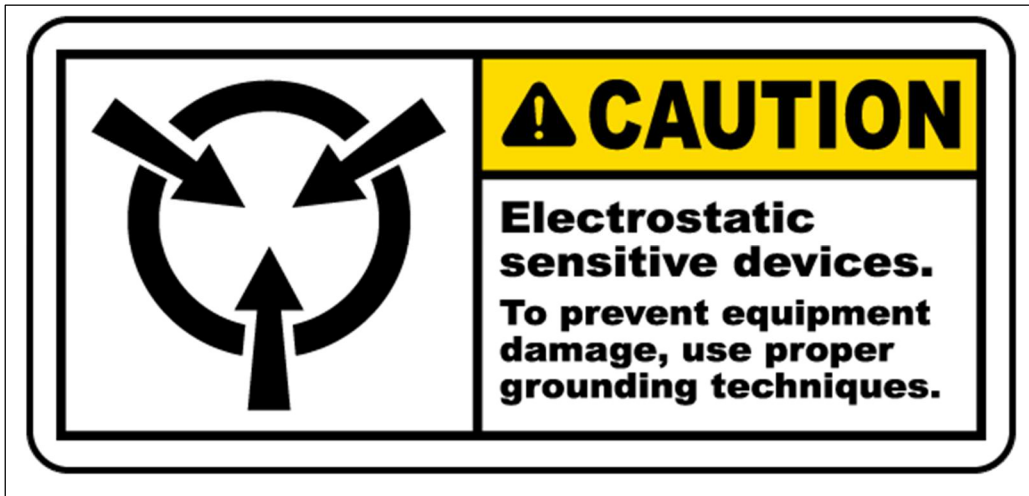
2. Test process and validation

3. ASSOCIATED DOCUMENTS

Document Title	Document Number

Qty	Description	PN
1	AKS PLUS, AKS	045.0016.002.0C

Equipment List

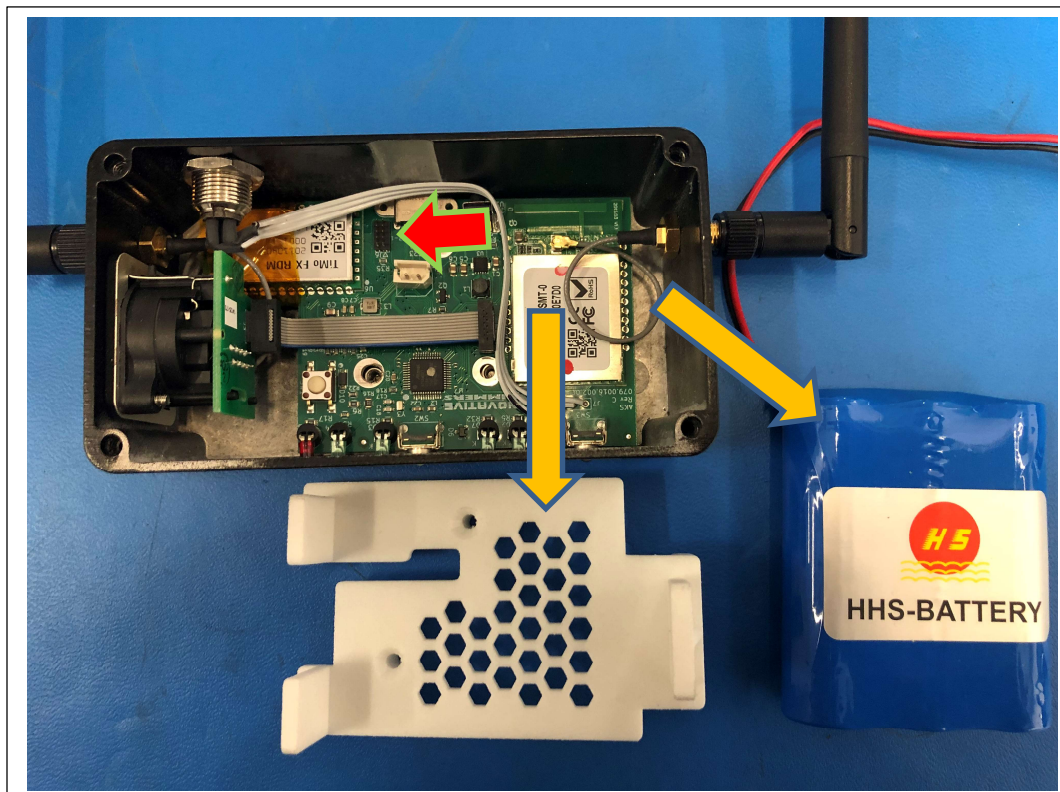| AKS PCBA	Atmel Ice	Computer
Micro USB Cable	**IDC Ribbon Cable**	**RJ45**
AC to DC adapter with 5v USB port	**#1 and #2 Screwdriver**	

1	Procedure for AKS Plus, AKS

1. Remove all four Screws.

2. Remove battery and battery connector. Remove the two screws holding the battery bracket and remove bracket. Red arrow points to the SAMD programming pins. All Firmware updates can be performed without removing the PCBA from the enclosure. All Pictures of PCBA outside of the enclosure are for reference only.
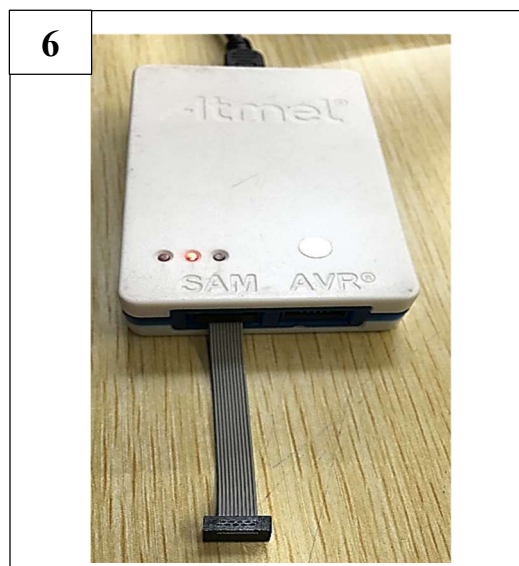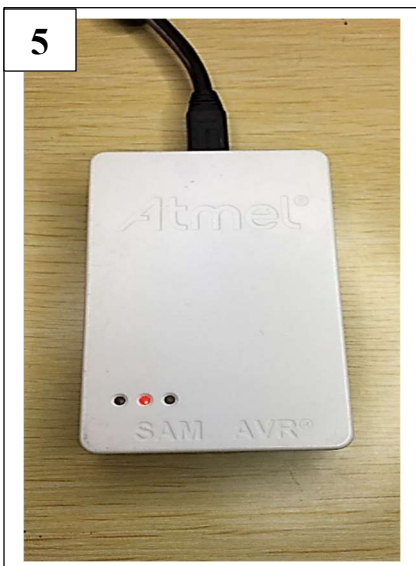
1	Procedure for AKS Plus, AKS and Satellite

Programming Setup:

1. Plug a 5VDC USB power adapter into a 120VAC outlet.
2. Plug the male USB end of (1) micro USB cable into the AC adapter.
3. Plug the micro USB end of the same cable to USB1 on the AKS-Plus or AKS PCBA.
4. Plug the male USB end of (1) micro USB cable to a female USB port on a computer.
5. Plug the micro USB end of the cable connected to the computer to the Atmel Ice as shown (#5).
6. Plug an IDC Cable into the SAM slot of the Atmel Ice. The blue side of the cable should line up with the pin 1 triangle indicator on the Atmel Ice (#6).
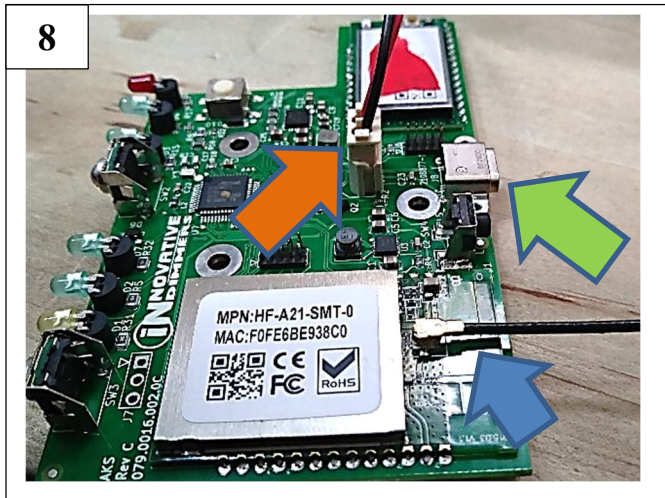

7. Plug the other end of the IDC Cable into J6 on the AKS-Plus or AKS PCBA. The pin 1 triangle indicator should line up with the blue side of the cable (Red Arrow) All Pictures of PCBA outside of the enclosure are for reference only.
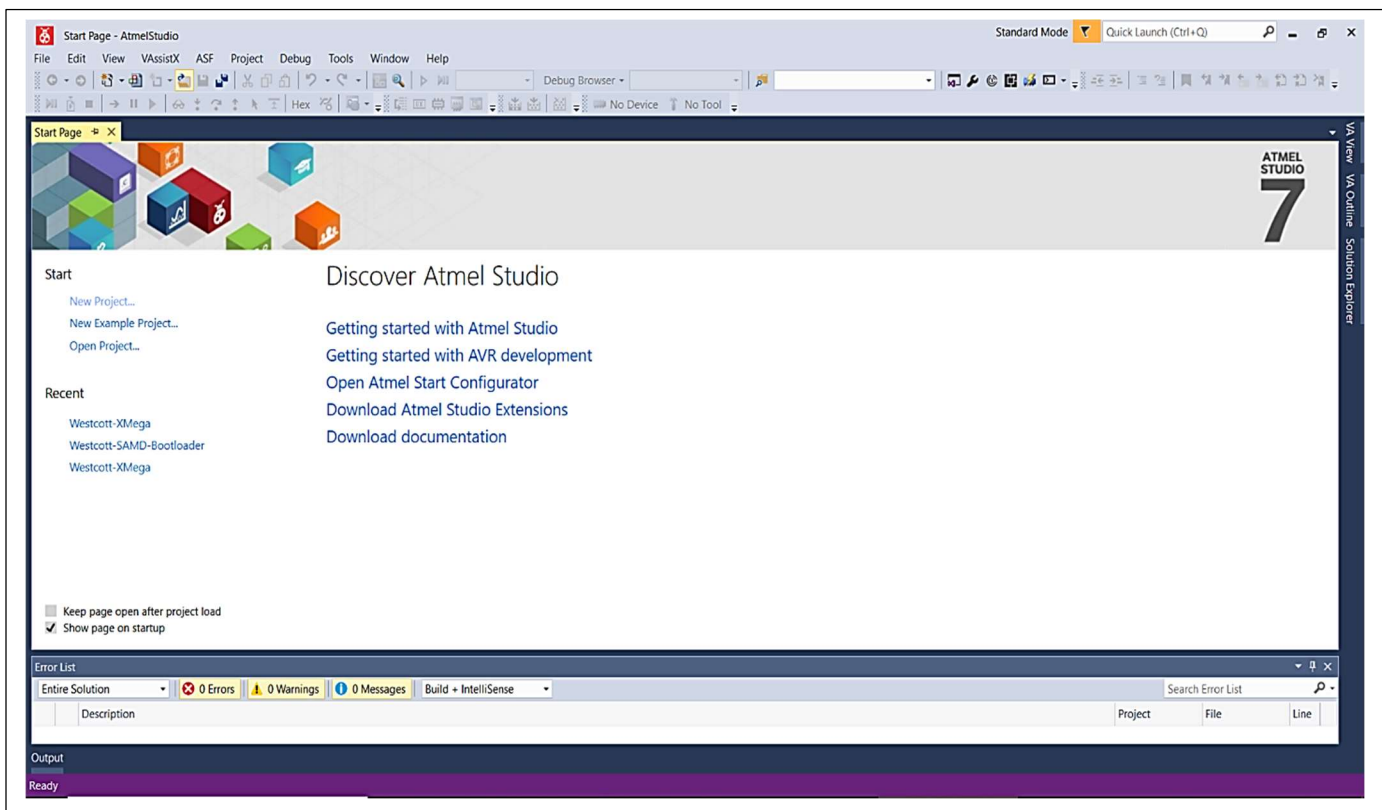
8. Plug a battery into the AKS-Plus PCBA 2-pin header (Orange) or Plug in the micro-USB(Green). Ensure that HF-A21 antenna cable is connected (Blue arrow). All Pictures of PCBA outside of the enclosure are for reference only.
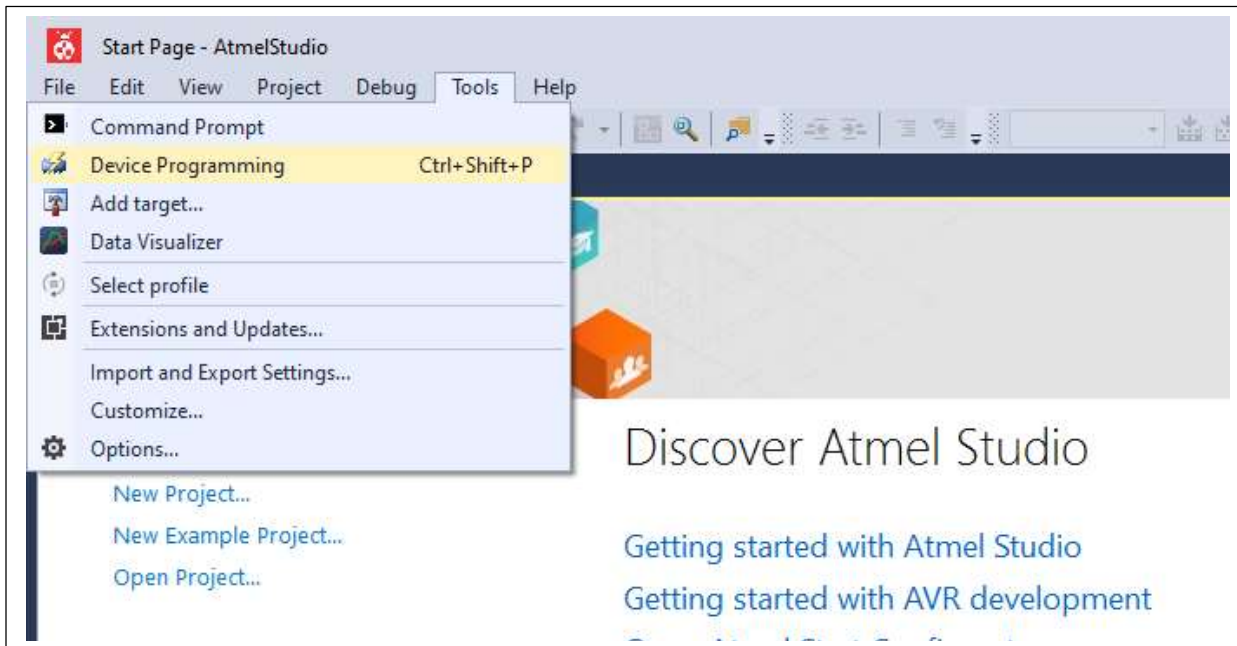

SAMD Programming Procedure

Open Atmel Studio on the computer:

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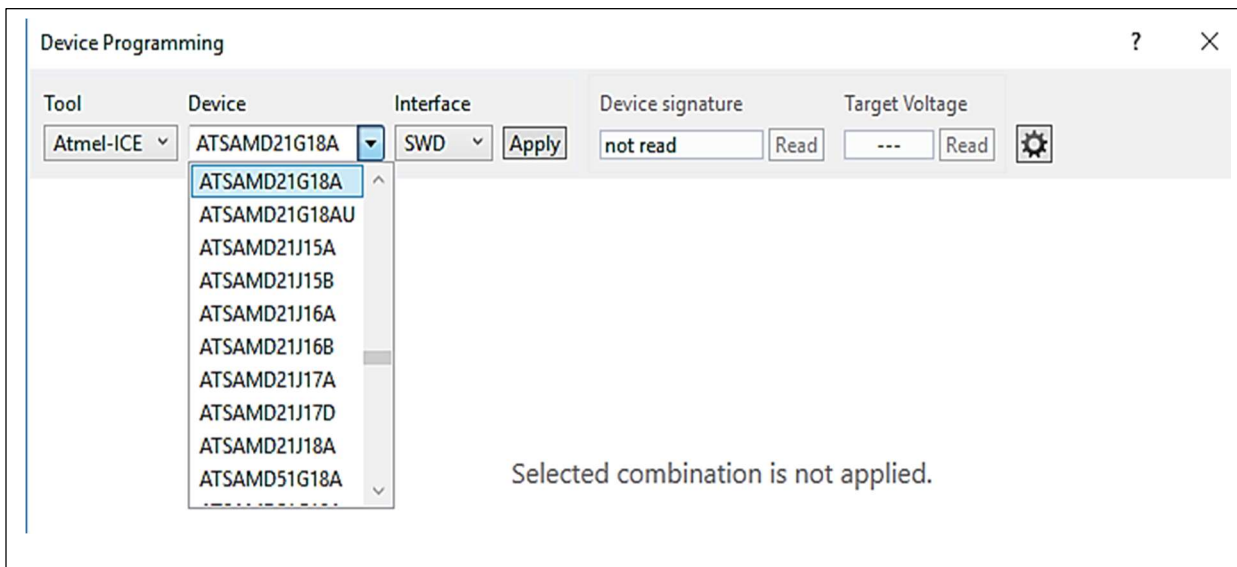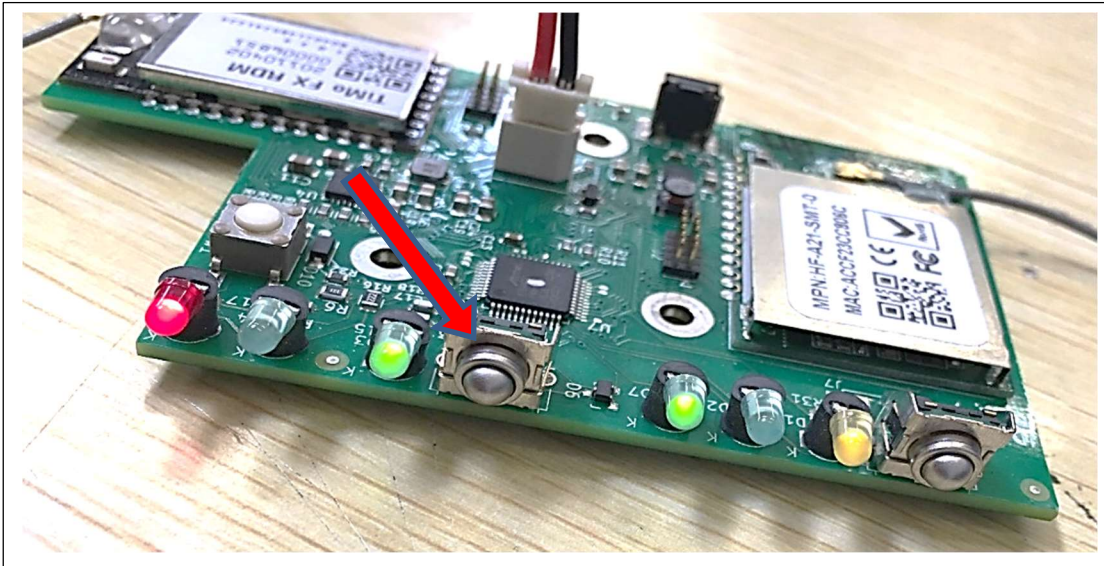
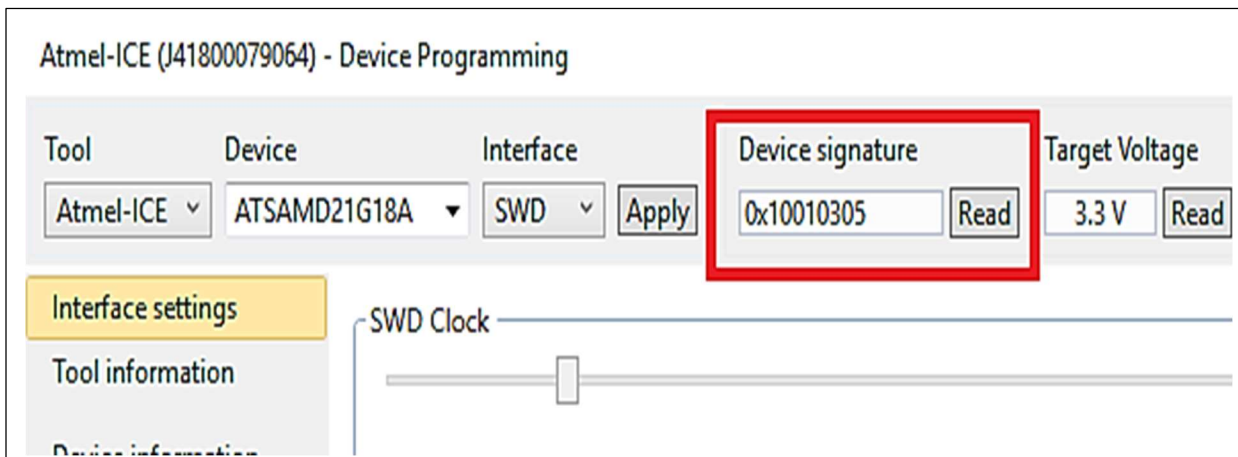1. In the Tools tab, open **Device Programming**:

2. Select **Atmel-ICE** under the Tool tab and **ATSAMD21G18A** under the Device tab:

3. Proceed to the next step by holding down **SW2** on the AKS board. (SW2 must be held down during the entire ATMEL programming process):
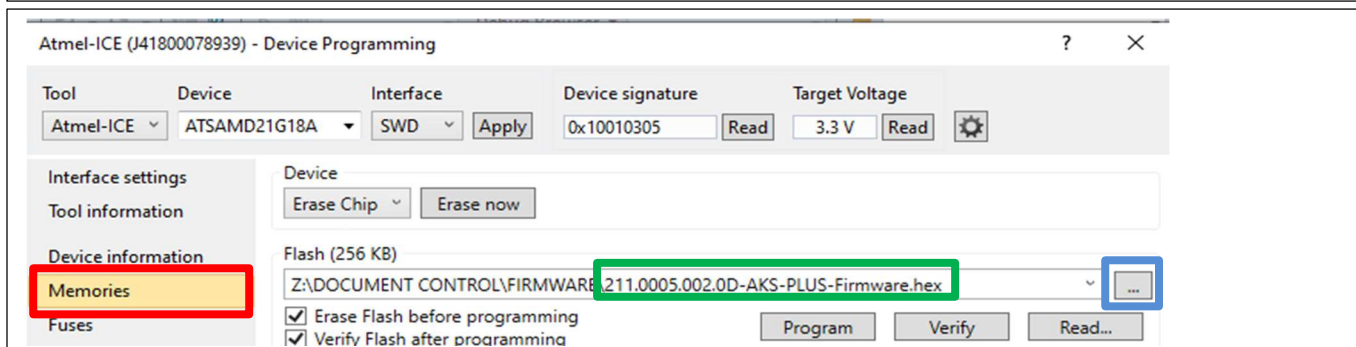

4. Within the Device Programming window, navigate to the **Interface** sub-section and Click **Apply**. Next, navigate to the **Device signature** sub-section and click **Read**. "0x10010305" should then display in the **Device Signature** bar if everything is working correctly.

5. Navigate to the **Memories** tab on the left of the window, click it. Under the **Flash** subsection, click the icon with three periods and select the firmware **211.0005.002.0D-AKS_PLUS-FIRMWARE.hex**, then click **Program**.

Path to firmware may be different base on users folder path and how firmware was distributed

6. The Atmel microcontroller is now programmed. **SW2** can now be released and the IDC Cable may be removed from Header J6.

7. Hold **SW2** until LED3 begins to flash green. This turns AKS-Plus or AKS PCBA unit off.

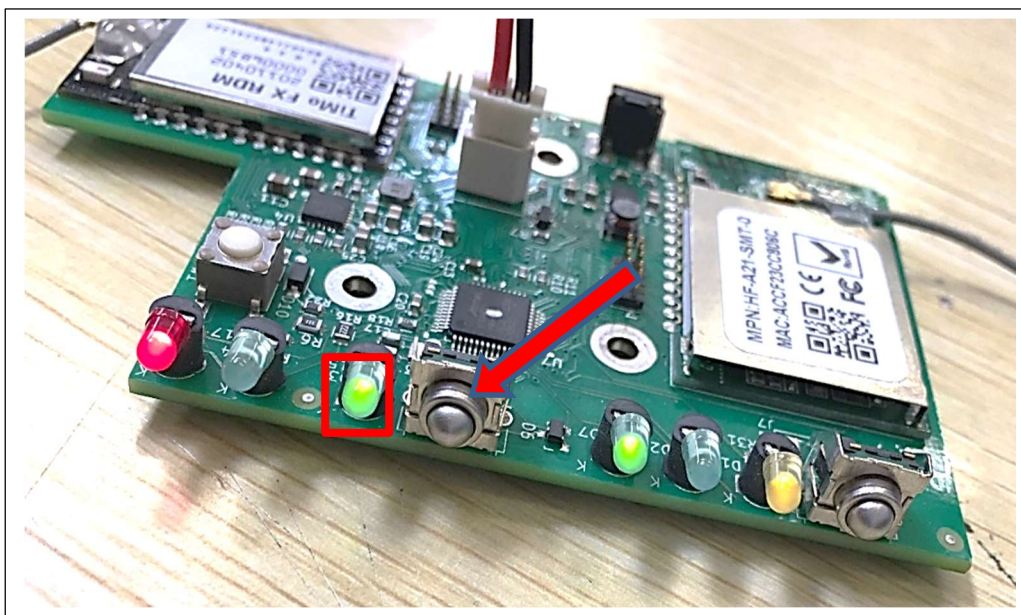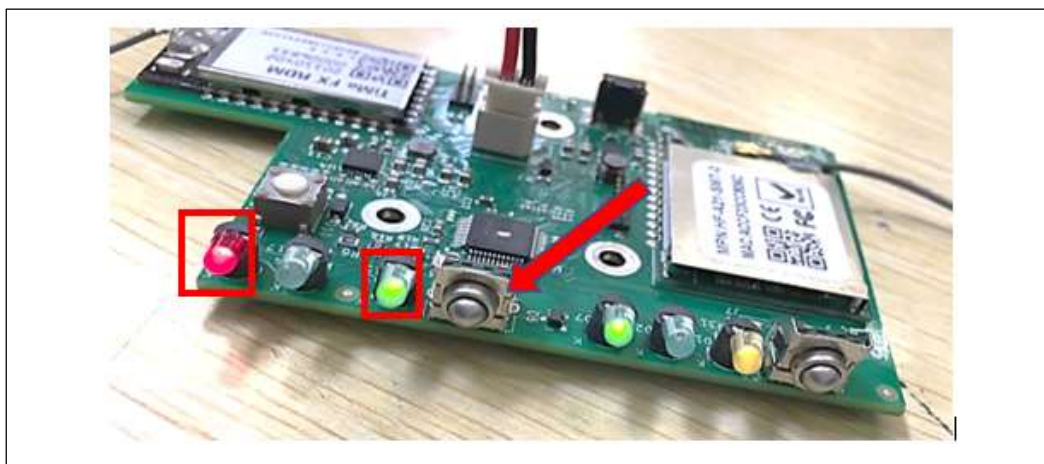## HF-A21 Re-programming Procedure:

1. Hold **SW2** until Red LED5 flashes once and LED3 goes solid green. This turns on the AKS-Plus or AKS PCBA.

2. Go to your computer and select the Wi-Fi icon.

Wifi Icon may be different based on Computer Operating system

3. Search for the SSID: **Ratpac AKS or HF-A21x_AP** and click it.

4. Click on the **Connect** icon to connect to the **Ratpac AKS** or **HF-A21** access point. The password for Ratpac AKS is **quietonset**

5. Open a browser, Chrome works well, and type in the URL address bar **10.10.100.254** and hit enter.

6. A pop-up will prompt for a username and password. For user type: **admin** and for password type: **admin**

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7. Check the menu to the left of the screen and check to see which menu is present

1
- Main Settings
- AP Interface Setting
- STA Interface Setting
- Instructions and Help
- Device Management
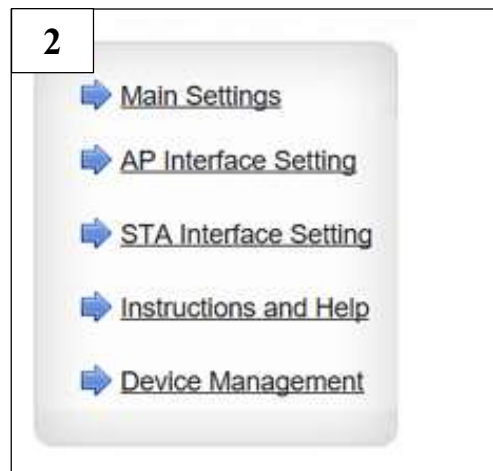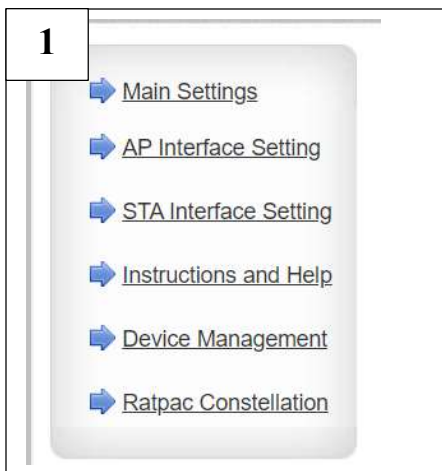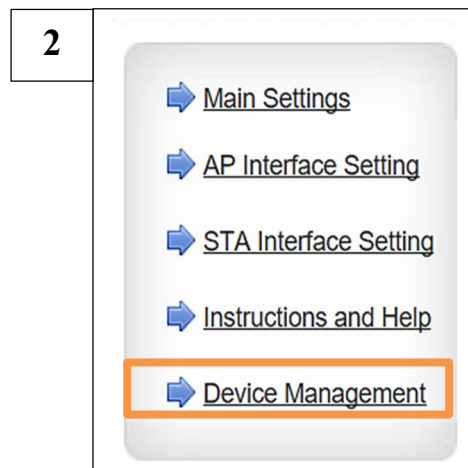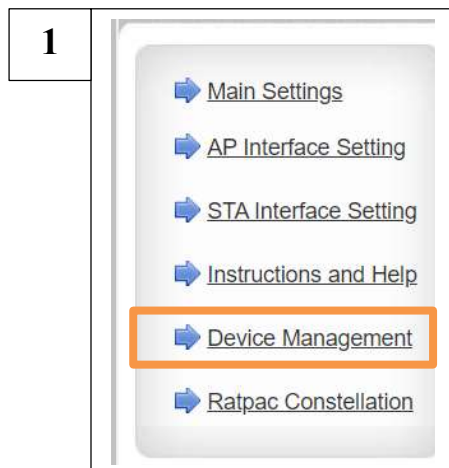- Ratpac Constellation

2
- Main Settings
- AP Interface Setting
- STA Interface Setting
- Instructions and Help
- Device Management

8. If you have menu 1 proceed to step J. If you have menu 2 follow steps (a) through (o) described below:

   a. Connect to the SSID: **Ratpac AKS** or **HF-A21x_AP**

   b. Open a browser and enter **10.10.100.254** in the URL address bar. If that IP address doesn't work check that the AKS and AKS Plus is not set on STA mode. Click the Power button 3 times to change Mode. STA Mode IP: **10.10.99.254**

   c. Enter **admin** for user and enter **admin** for password

   d. Click **Device Management** in the menu located in the left side of the page

1
- Main Settings
- AP Interface Setting
- STA Interface Setting
- Instructions and Help
- Device Management
- Ratpac Constellation

2
- Main Settings
- AP Interface Setting
- STA Interface Setting
- Instructions and Help
- Device Management

e. Click on (**1**) **Choose File on Newer Firmware and (2) Browse on default Firmware** under the **(1) Update Module Firmware and (2) Update Firmware** subsection

1	**Update Module Firmware**
	Location: [Choose File] No file chosen
	[Apply]

2	**Update Firmware**
	Location: [ ] [Browse...]
	[Apply]

f. Locate the firmware **211.0007.001.0G-AKS Plus HF-A21 (3.68)**

Path to firmware may be different based on users folder path and how firmware was distributed

- 211.0007.001.0D-AKS_HFA-21-FIRMWARE
- 211.0008.001.0A-24_CH-DMX IO-FIRMWARE.hex
- 211.0009.001.0A-Cintenna_2-Firmware.bin
- 211.0011.001.0C-Satellite_HFA-21-FIRMWARE

EXAMPLE ONLY REVISION AND NAME COULD CHANGE

g. Next click **Apply**

h. Wait for the page to display the following.

➡ Main Settings   **Update Firmware Successfully,Rebooting......**

Update Firmware Successfully,Rebooting......

i. Refresh the webpage and reconnect to the **Ratpac AKS** SSID if necessary.

j. Click **Device Management** in the side menu.
k. Verify the correct Firmware and Version are displayed at **Release date.**

!!Picture is reference only Ver: 3.63 SAMD: 1.C and up are ready for Over the air Update!!

SAMD Programming Procedure Over the Air:

Will only work with compatible HFA-21 V3.01 and SamD V1.C or later. To find the Version follow Step below A-D and K to get to the menu that will show the current Version. If Firmware is not compatible follow **SAMD Programming Procedure and HFA-21 Programing procedure**.

1. Check that all Firmware is compatible. Connect either by RJ45 or WiFi.

   a. Connect to the SSID: **Ratpac AKS** or **HF-A21x_AP**

   b. Open a browser and enter **10.10.100.254** in the URL address bar. If that IP address doesn't work check that the AKS and AKS Plus is not set on STA mode. Click the Power button 3 times to change Mode. STA Mode IP: **10.10.99.254**

   c. Enter **admin** for user and enter **admin** for password

   d. Click **Device Management** in the menu located in the left side of the page

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Main Settings

AP Interface Setting

STA Interface Setting

Instructions and Help

Device Management

Ratpac Constellation

e. Click on **Choose File** are under the **Update SAMD Firmware** subsection

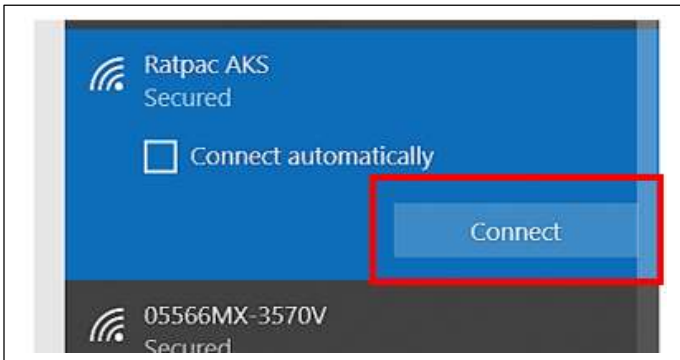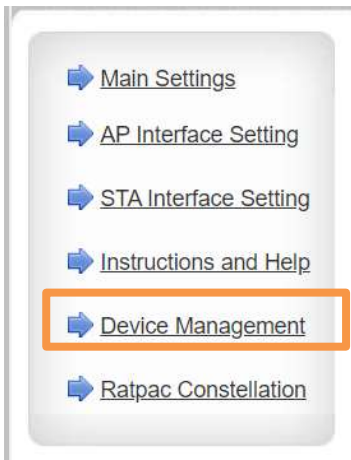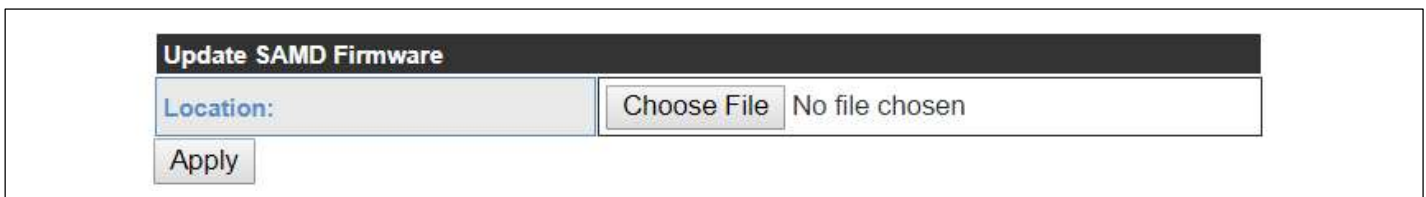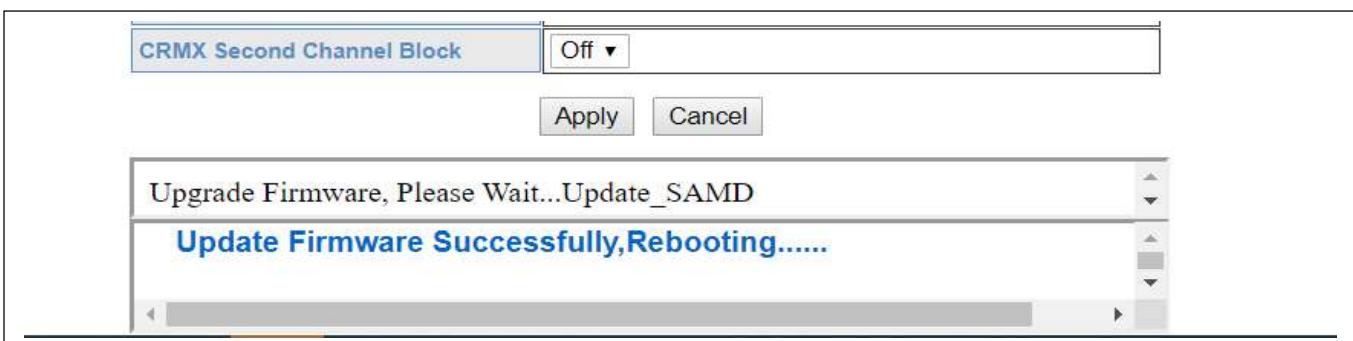| Update SAMD Firmware	
Location:	Choose File No file chosen
Apply	

f. Locate the firmware **211.0005.002.0H-AKS Plus-Satellite SAMD21.bin** this is a .BIN file

Path to firmware may be different based on users folder path and how firmware was distributed

g. Next click **Apply**

h. Wait for the page to display the following. Also, in the AKS and AKS Plus the Power LED and the Battery LED will Blink together once it stop update is complete.

CRMX Second Channel Block	Off ▾
	Apply Cancel

Upgrade Firmware, Please Wait...Update_SAMD

Update Firmware Successfully,Rebooting......

i. Refresh the webpage and reconnect to the **Ratpac AKS** SSID if necessary.

j. Click **Device Management** in the side menu.

k. Check that Firmware was successfully installed and Current. This is under **Release date.**

l. Perform a Factory Default procedure.

1. Turn off AKS or AKS Plus
2. Hold the link buttons, then holding the power button until power LED start blinking
3. Let go of the power button but continue to hold the link button
4. While holding the link button approximately 4 seconds the Power LED will start blinking at this moment the let go of the Link button.
5. Once the power LED stops blinking wait until WiFi LED starts blinking.
6. Turn off the AKS
7. Start normal function test