



SAMSUNG
ARTIK™ Modules

**Lab 1: Getting Started with the
ARTIK Development Board**

Samsung Training Lab

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VERSION HISTORY

Revision	Date	Description	Maturity
V1.0	January 22, 2017	First release	Released
V1.0.1	February 10, 2017	File name change	Release Update

OBJECTIVE

This lab will setup the ARTIK Development Board for this and other ARTIK Labs.

POWERING UP THE BOARD

This section sets the ARTIK Development Board up with power, Wi-Fi, and serial connection. The following illustration indicates the pertinent connections and switches.

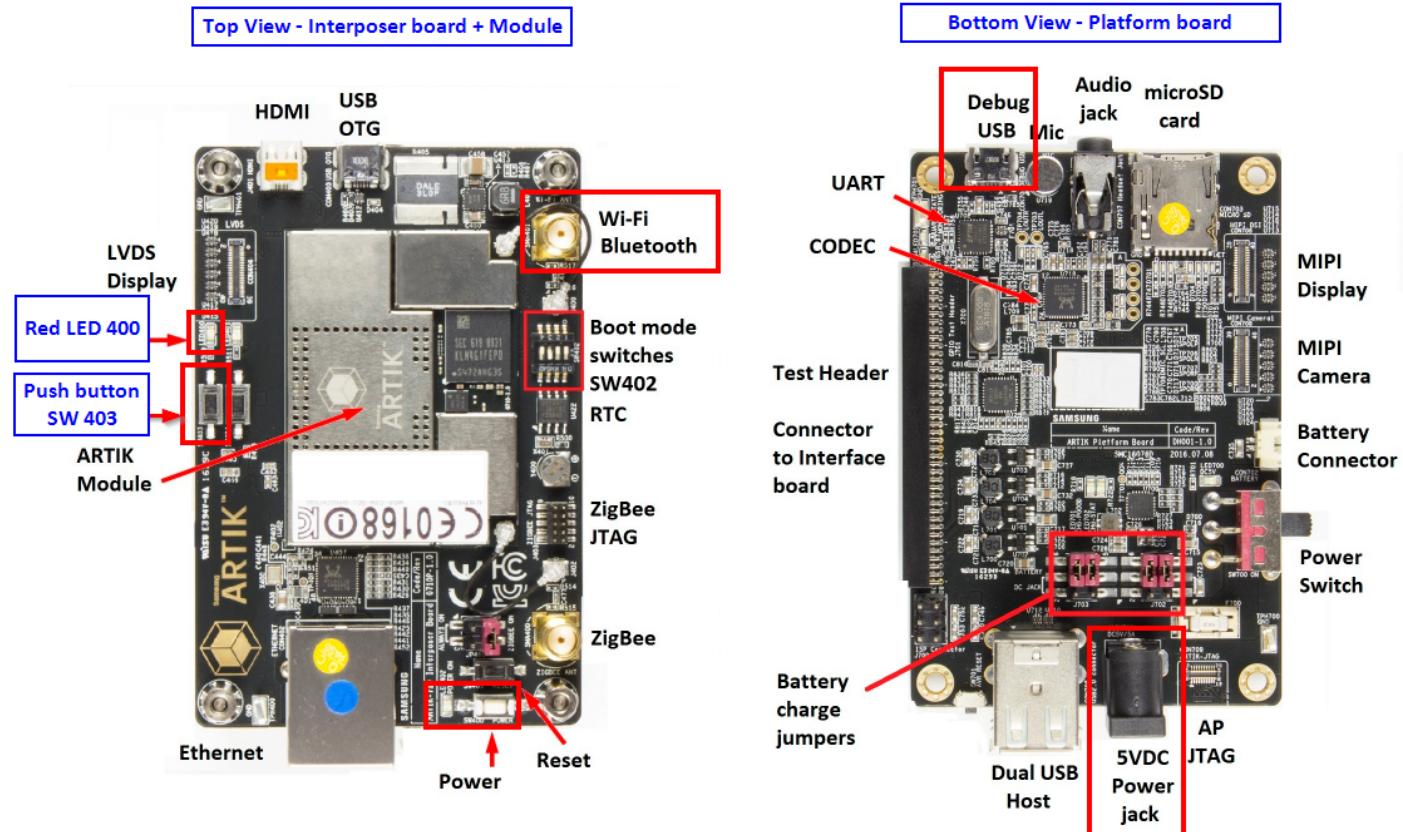
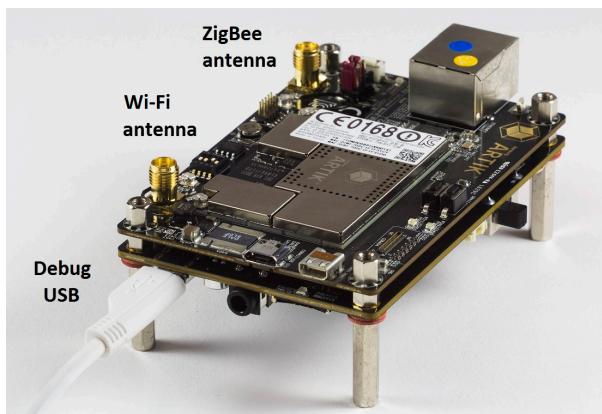
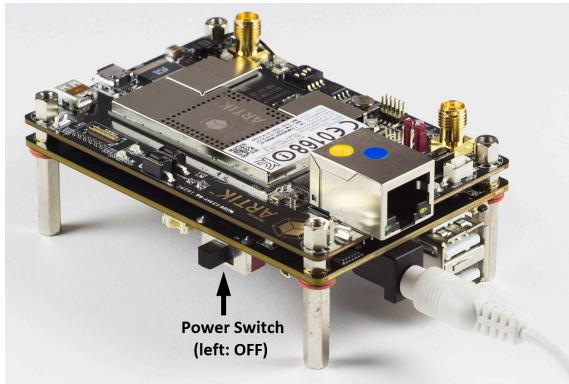


Figure 1. ARTIK Development Board

1. Connect the wireless antenna to the Wi-Fi connector on the ARTIK Development Board.
2. Connect the serial USB to the micro-USB cable to your computer with the debug board. The micro-USB connector on the platform board (located on the bottom level of the kit) near the Wi-Fi antenna.



- Set the **Power** switch on the board to the OFF position. Refer to figure below for the position of power switch.



- Plug the AC power supply and the 5V connector into the board.
- Set the **Power** switch on the board to the ON position. A green and red LED will illuminate on the bottom of the board. The green LEDs will fast-blink.
- Press and hold the 'white colored Power switch' for 3 seconds, until the red LED next to it glows indicating the board boot up



ARTIK SERIAL PORT SETUP

Please refer to one of the following sections, based on the OS of your PC:

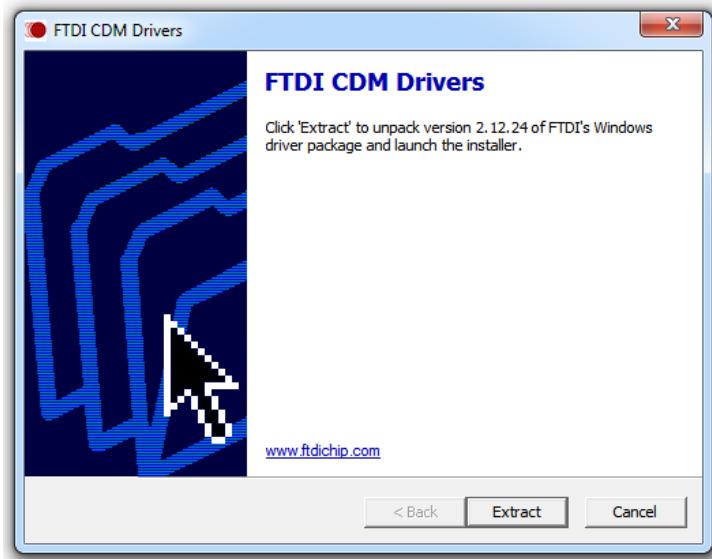
Windows: [Windows Serial Port Setup](#)

Macintosh: [Macintosh Serial Port Setup](#)

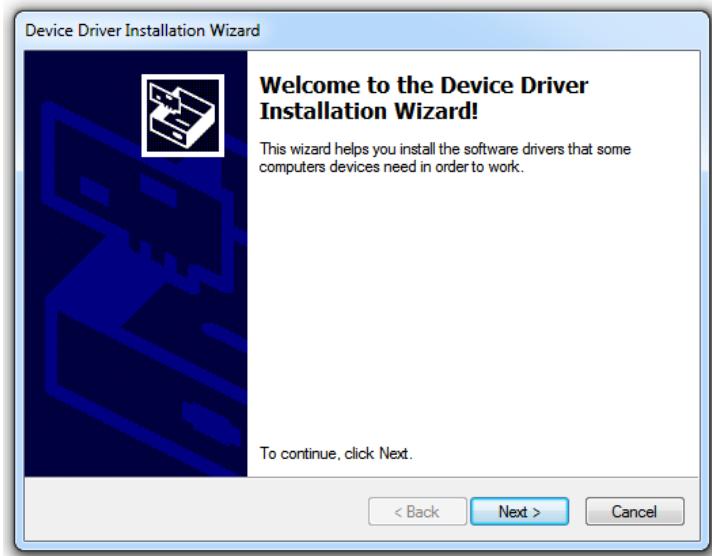
WINDOWS SERIAL PORT SETUP

1. Drivers are required for the USB serial ports. To obtain them, click on the following link:
http://www.ftdichip.com/Drivers/CDM/CDM21224_Setup.zip

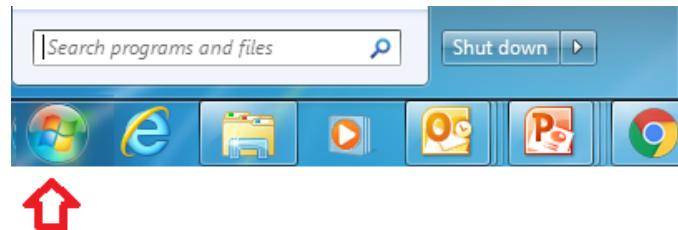
Answer **OK** then **Open** to open the **.zip** setup file. Once opened, **Run** the setup program **.exe** file to extract the installer.



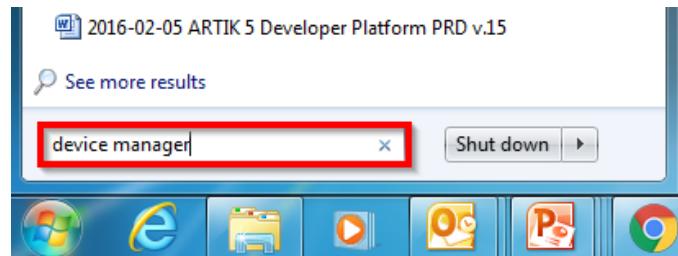
2. Follow the installer instructions.



3. Click the Windows **Start** icon.

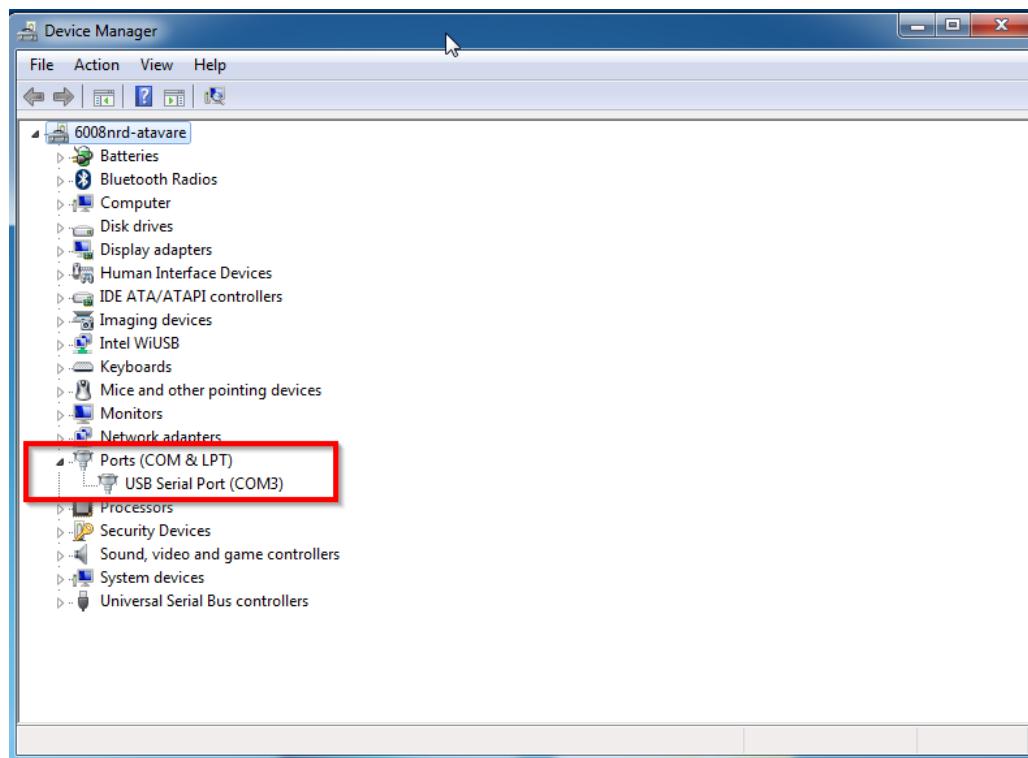


4. In **Search programs and files** type "**device manager**".



5. Get the COM port number when you connect a USB serial cable to the PC (in this example the COM port number is "COM3"). This COM port number will be used to connect to the ARTIK Development Board.

Note: If the COM port connection is not detected, temporarily power ON the board (see [step 5](#) in the section [Powering up the Board](#) on [page 3](#) above).

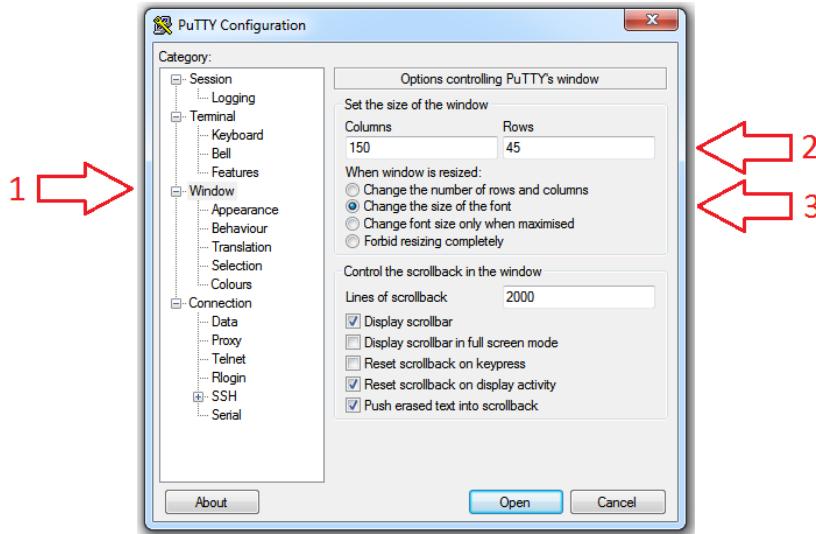


6. It is recommended that Windows users install PuTTY, a free serial console program, found at: <http://www.putty.org>

Follow the download links to “**putty.exe**”. Click on the “**putty.exe**” link to save it to your PC. Run putty.exe and pin it in your Task Bar for quicker future access.

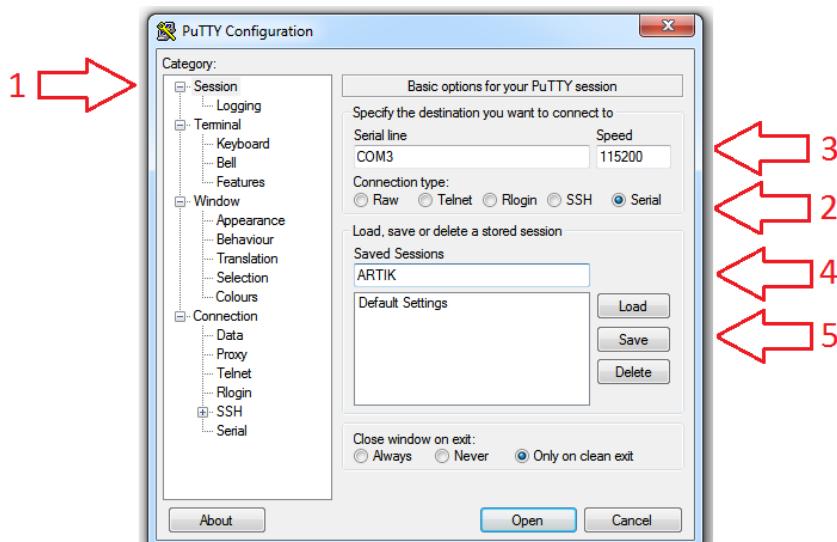
7. With PuTTY opened, set up an ARTIK configuration:

- Select the **Window** section of settings.
- Set the window **Columns** to **150** and **Rows** to **45**.
- Select **Change the size of font** when the window is resized.



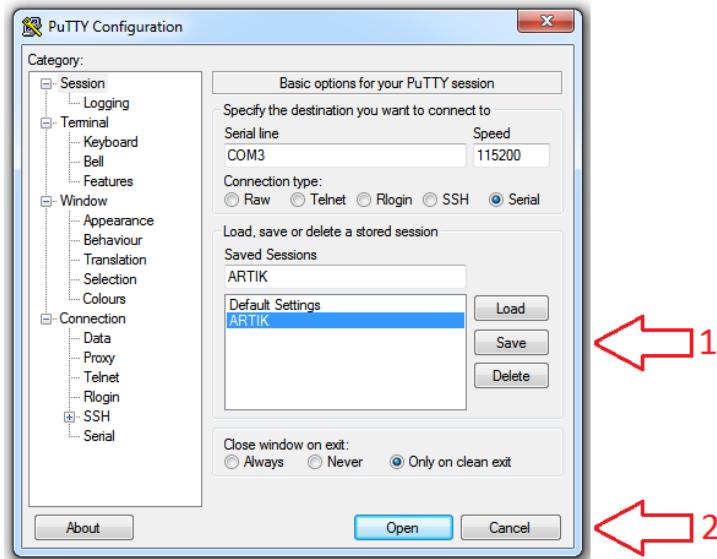
8. Set the PuTTY configuration as follows:

- Select the **Session** section of settings.
- Set **Connection type** to “**Serial**”.
- Set **Serial line** to the COM port number found in **step 5** on **page 6** above. Set **Speed** to “**115200**”.
- Enter the name “**ARTIK**” as a saved configuration set.
- Click **Save** to save the configuration. “**ARTIK**” will show up in the configurations list.



9. Connect to the ARTIK Development Board:

- a. Select the “**ARTIK**” configuration from the configuration list.
- b. Click **Open** to connect to ARTIK.



10. The resulting screen output will be blank. Resize the screen as desired.
11. Proceed to the **ARTIK Boot-up And Login** section on [page 9](#) below.

MACINTOSH SERIAL PORT SETUP

The instructions below are for Macintosh users.

1. Make sure you have completed the **Powering up the Board** section, starting on [page 3](#).
2. Go to the Finder **Go** menu and open the **Utilities** folder. Double-click and run the **Terminal** program.
3. Configure the terminal for **150** columns and **45** rows.
4. In **Terminal**, execute the following command:

```
ls /dev/tty.*
```

This will list all of the currently connected USB serial ports. Look for an entry such as "**tty.usbserial-XXXXXXX**", where "XXXXXXX" is a unique identifier (e.g. **tty.usbserial-AI02ZWTO**). This is the ARTIK Development Board's serial connection.

5. Connect to ARTIK by using the following command in the terminal (substitute "**XXXXXXX**" for the correct ID).

```
screen /dev/tty.usbserial-XXXXXXX 115200
```

6. The resulting terminal output will be blank. Resize the terminal window as desired.
7. Proceed to the section **ARTIK Boot-up And Login** beginning on the following page.

ARTIK BOOT-UP AND LOGIN

1. Press the **Power** button (see the illustration in the [Powering up the Board](#) section, starting on [page 3](#)) until the red LED next to the button lights up.
2. The output will look similar to this example:

```
[ OK ] Started Bluetooth service.  
bluetooth.service  
[ OK ] Started Network Name Resolution.  
systemd-resolved.service  
[ OK ] Reached target Network is Online.  
      Starting LSB: Advanced IEEE 802.11 management daemon...  
[ OK ] Started ArtikOnBoarding.  
ws-client.service  
      Starting /etc/rc.local Compatibility...  
[ OK ] Reached target Bluetooth.  
[ OK ] Started LSB: Advanced IEEE 802.11 management daemon.  
hostapd.service  
[ OK ] Started /etc/rc.local Compatibility.  
rc-local.service  
      Starting Hold until boot process finishes up...  
      Starting Terminate Plymouth Boot Screen...  
opt-user-apps-data.mount  
[ Booting Done ]  
  
Ubuntu 16.04.4 LTS artik ttyAMA3  
  
artik login: |
```

3. At the login prompt, use:
login = "**root**"
password = "**root**" (you will not see the character when you type)
4. The resulting login output will look similar to this example:

```
artik login: root  
Password:  
Last login: Wed Jan 18 15:47:53 on ttyAMA3  
[root@artik ~] # █
```

5. Execute the following command to match the terminal output to the terminal program:

```
echo "stty cols 150 rows 45" >> .bashrc
```

EXERCISE GPIO SIGNALS

One of the basic operations on an ARTIK is to control the GPIO signals. This can be done using various different programming methods. But for simplicity of demonstration, the following SYFS commands will perform this using simple terminal commands.

There are four simple commands to control or monitor a GPIO signal. This example uses the GPIO signals connected to **LED401** and **SW403** on the top of the ARTIK Development Board (refer to [Figure 1. ARTIK Development Board](#) on [page 3](#) in the section [Powering up the Board](#)).

The following commands illustrate controlling **LED401** connected to GPIO 38:

1. Execute these commands to prepare GPIO 38 for use and to set GPIO 38 as an output signal:

```
echo 38 > /sys/class/gpio/export  
echo out > /sys/class/gpio/gpio38/direction
```

2. Execute this command to turn **LED401** on (blue):

```
echo 1 > /sys/class/gpio/gpio38/value
```

3. Execute this command to turn **LED401** off:

```
echo 0 > /sys/class/gpio/gpio38/value
```

4. Execute this command to release GPIO 38:

```
echo 38 > /sys/class/gpio/unexport
```

You have now completed Lab 1

APPENDIX

The following commands illustrate monitoring **SW403** connected to GPIO 30.

1. Execute these commands to prepare GPIO 30 for use and to set GPIO 30 as an input signal:

```
echo 30 > /sys/class/gpio/export  
echo in > /sys/class/gpio/gpio30/direction
```

2. Execute this command to read the state of **SW403**. You should get a “**1**”.

```
cat /sys/class/gpio/gpio30/value
```

3. Press **SW403** while executing this command to read the state of **SW403**.
You should get a “**0**”.

```
cat /sys/class/gpio/gpio30/value
```

4. Execute this command to release GPIO 30:

```
echo 30 > /sys/class/gpio/unexport
```

Additional pictorial references for debug USB location

