QuickFeather Alexa Close-Talk, Voice-Initiated Dev Kit Quick Start Guide (Rev 1.0)

This document serves as a guide for the user to getting started with the QuickFeather Dev Kit + Amazon Alexa.

QuickFeather Alexa Close-Talk, Voice-Initiated Dev Kit Overview

The dev kit includes:

- QuickLogic QuickFeather module
- Espressif ESP32 DEVKITC VE module
- Adafruit UDA1334 (audio output) module
- QuickLogic multi-microphones module
- QuickLogic AVS Cradle

Applications

- Voice initiated, Close-Talk Voice solution using Amazon Wake Word Engine

Getting Started

What you will need

- QuickFeather Alexa Close-Talk, Voice-Initiated Dev Kit
    - QuickLogic's QuickFeather AVS Cradle
    - QuickLogic's QuickFeather board: this board is modified to use with external PDM microphone(s); the on-board PDM microphone is disabled
    - QuickLogic's PDM Microphone board
    - Espressif ESP32 DEVKITC-VE
    - Adafruit UDA1334 I2S audio board

You will need to provide the following: (not included in the shipment)

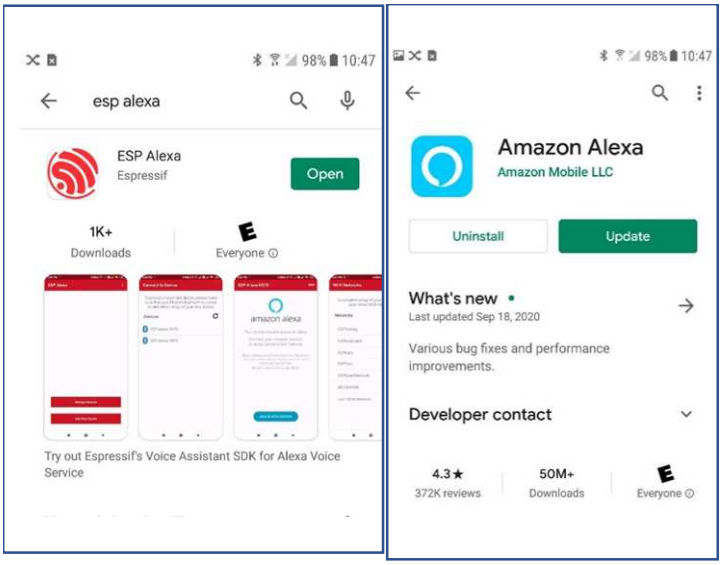
- MicroUSB cables: 2x
- USB power source such as PC USB ports or USB Power Hub connected to PC
- Android phone with Alexa application and ESP Alexa application installed
- Wired Earbud or power speaker with audio cable

Set up and test the QuickFeather Alexa Close-Talk, Voice-Initiated Dev Kit:

Prerequisite

The QuickFeather Alexa Close-Talk, Voice-Initiated Dev Kit comes with the default Software configuration that is ready for user to setup connection to Amazon Cloud Service. Prior to doing the QuickFeather Alexa Close-Talk, Voice-Initiated Dev Kit connection setup, user needs to:

- Download and install Amazon Alexa Android application on an Android phone
- upon completion of installing the application, register for an account with Amazon Alexa service
- Download and install ESP Alexa Android application on an Android phone



Setup QuickFeather Alexa Close-Talk, Voice-Initiated Dev Kit connection to Amazon Voice Service for the first time

Important: the system is shipped with the EPS32 firmware that is used for Amazon qualification testing. It is ready for "Provision" setup (connection to WIFI and Amazon Cloud account)

Important: once the provide setup is completed, changing WIFI setup or register a different Amazon Voice account requires reprogramming of the ESP32 DEVKITC VE; see "programming ESP32 DEVKITC VE binaries" section.

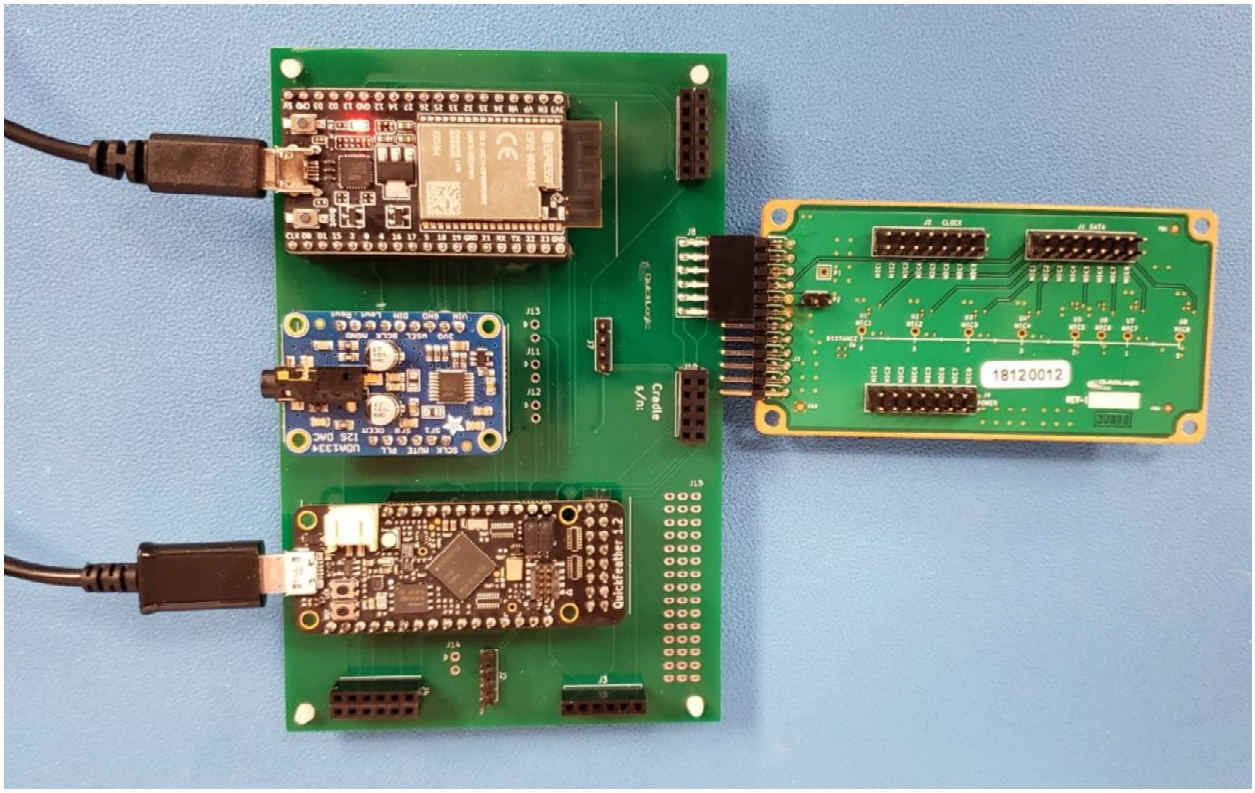
Summary of Steps: detail instructions for each step is provided after the summary

1. Connect microUSB cable to QuickFeather and power source
2. Connect microUSB cable to DEVKITC VE and PC
3. On Android phone launch ESP Alexa application
4. Select Add New Device
5. If no ESP-Alexa-ZZZZ (where ZZZZ is the system assign #), exit the ESP Alexa app and repeat step (2) to step (4). Once ESP-Alexa-ZZZZ appears, go to next step.
6. Select the ESP-Alexa-ZZZZ device
7. The application will Invike the Amazon Alexa application and request log in; select "SIGN IN WITH AMAZON"

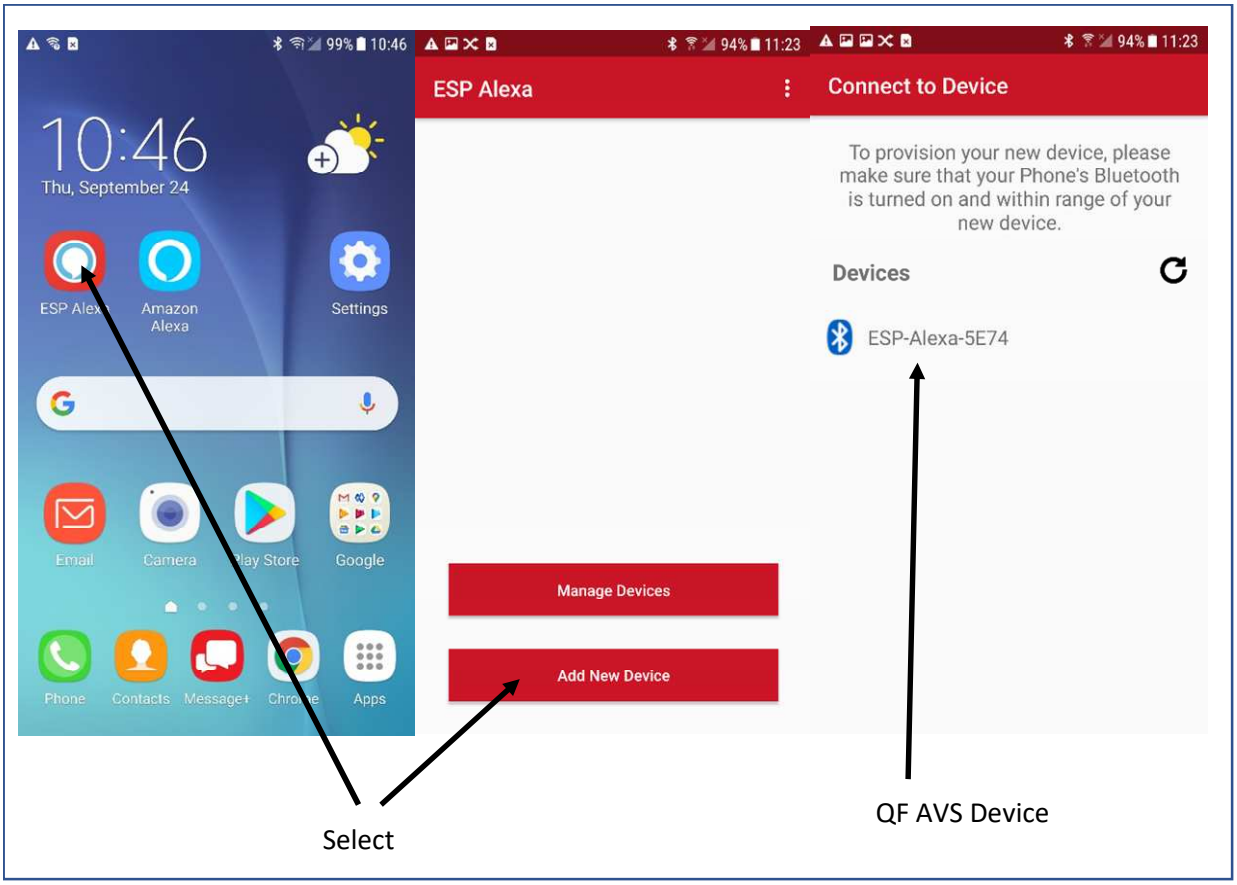
8. When sign-in is completed, the ESP Alexa application requests for WIFI connection
9. Select the WIFI network and enter passcode; select Provision; if connection to WIFI is successful, the system is ready to accept “Alexa” wake word and send command to AVS.
10. Test the setup

Details:

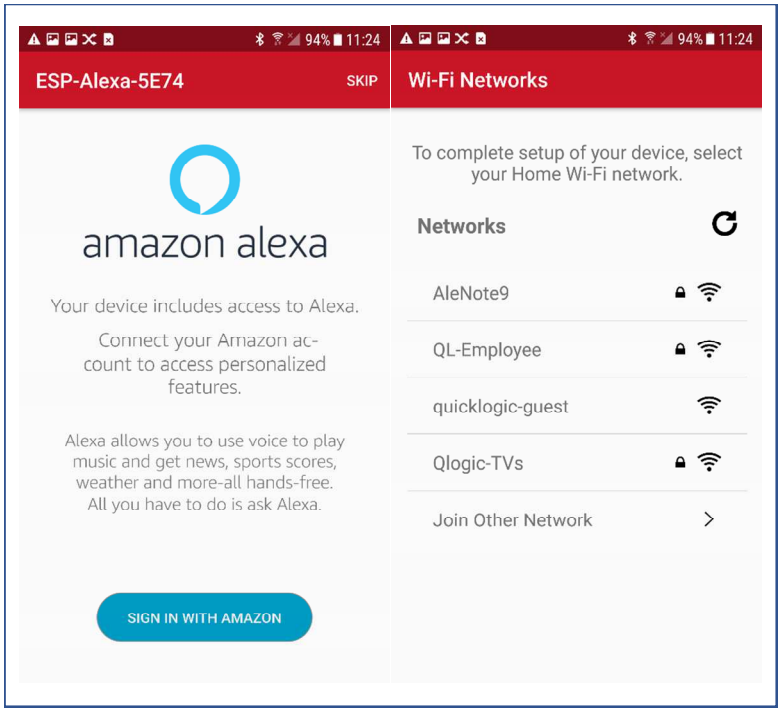
Connect microUSB cables to QuickFeather and power source; connect microUSB cable to DEVKITC VE and PC USB port



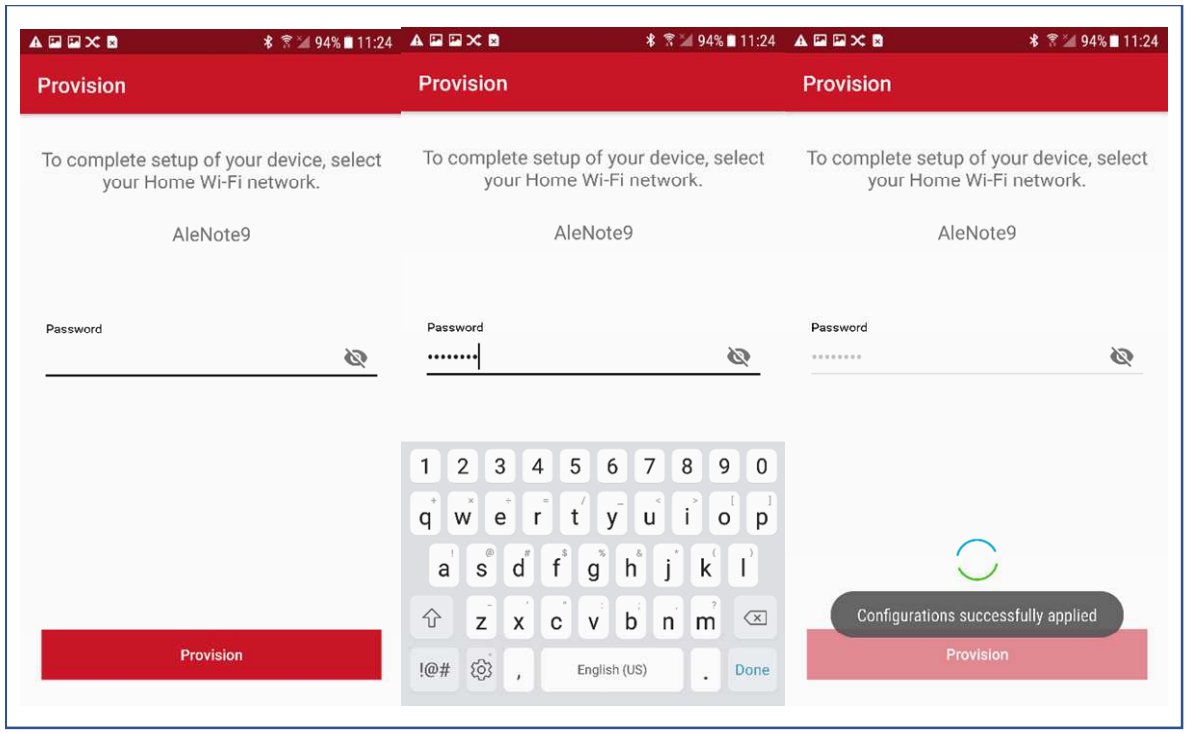
Launch ESP Alexa application on Android phone and Select new device; if the ESP-Alexa-ZZZZ does not show in the list of recognized devices, reset the ESP DEVKITC-VE module and restart this step.



Log into Amazon Alexa account; upon completion of logging in, the ESP Alexa application shows available WIFI network for connection



Setup WIFI connection and update QuickFeather Alexa Close-Talk, Voice-Initiated Dev Kit with setup information



NOTE: Need to Split PICTURES

Test the QuickFeather Alexa Close-Talk, Voice-Initiated Dev Kit setup:

a) Press ESP32 DEVKITC VE reset button and wait for 30 seconds for the ESP32 to establish connection to cloud
b) Connect earbud to UDA1334 earbud audio jack
c) Speak “Alexa, what time is it?”
d) There is a respond audio “ping” and Alexa Voice service responds with the time of the registered account location.

Note: if the system does not respond, see debug session for additional steps.

System Firmware Update

Tool required: flash_download_tool_3.8.5

Link to tool: https://www.espressif.com/en/support/download/other-tools

Erasing existing Firmware

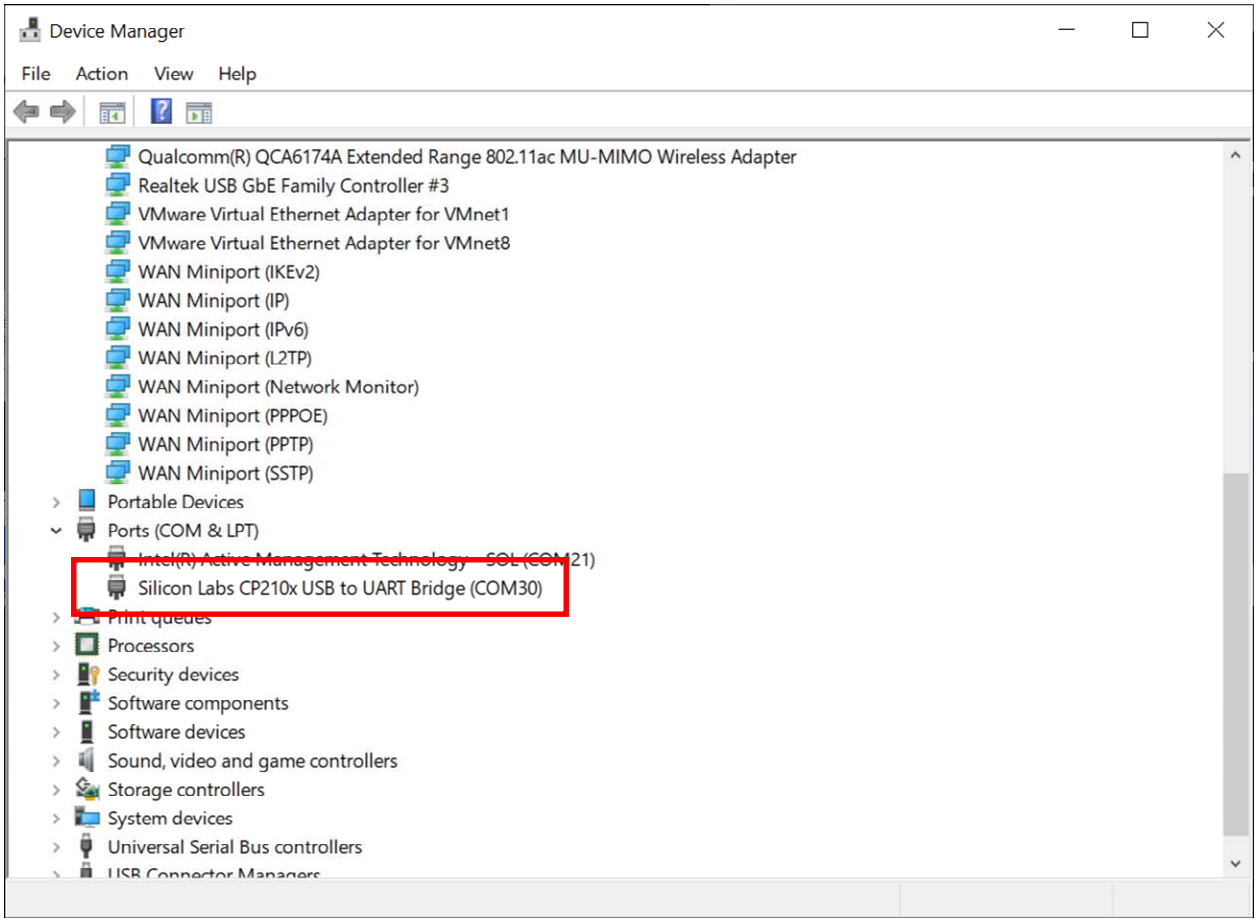
NOTE: before executing this procedure, make sure you have all of the default binaries or new update binaries to program the HDK.

Execute this procedure to:

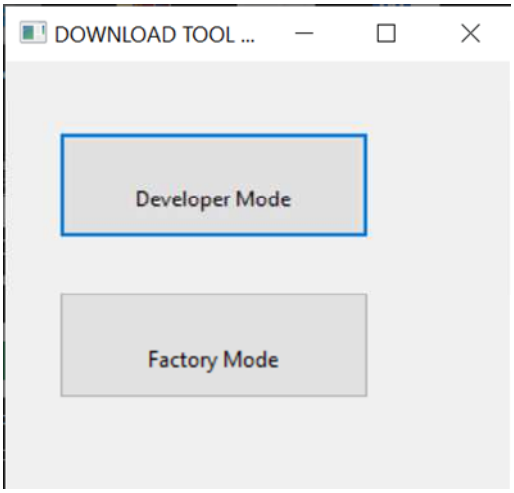
- Setup with new WIFI connection
- Switch to a different Alexa Amazon account

Steps:

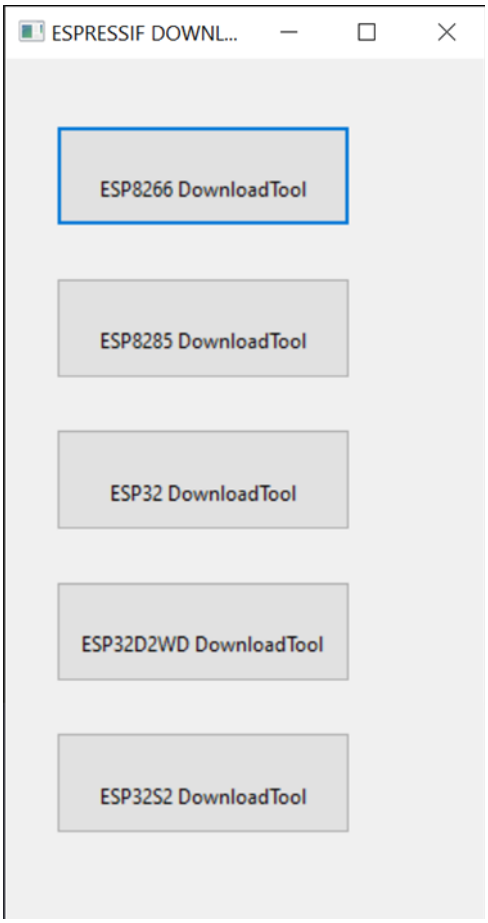
1. Connect microUSB cable to QuickFeather and power source; apply USB power
2. Connect microUSB cable to DEVKITC VE and laptop/PC USB port
3. Determine COM port# for the DEVKITC VE; on Windows PC, use device manager to look for the assigned port #



4. Launch “flash_download_tool_3.8.5.exe” application:
   Select **Developer Mode**
   Select **ESP32 DownloadTool**

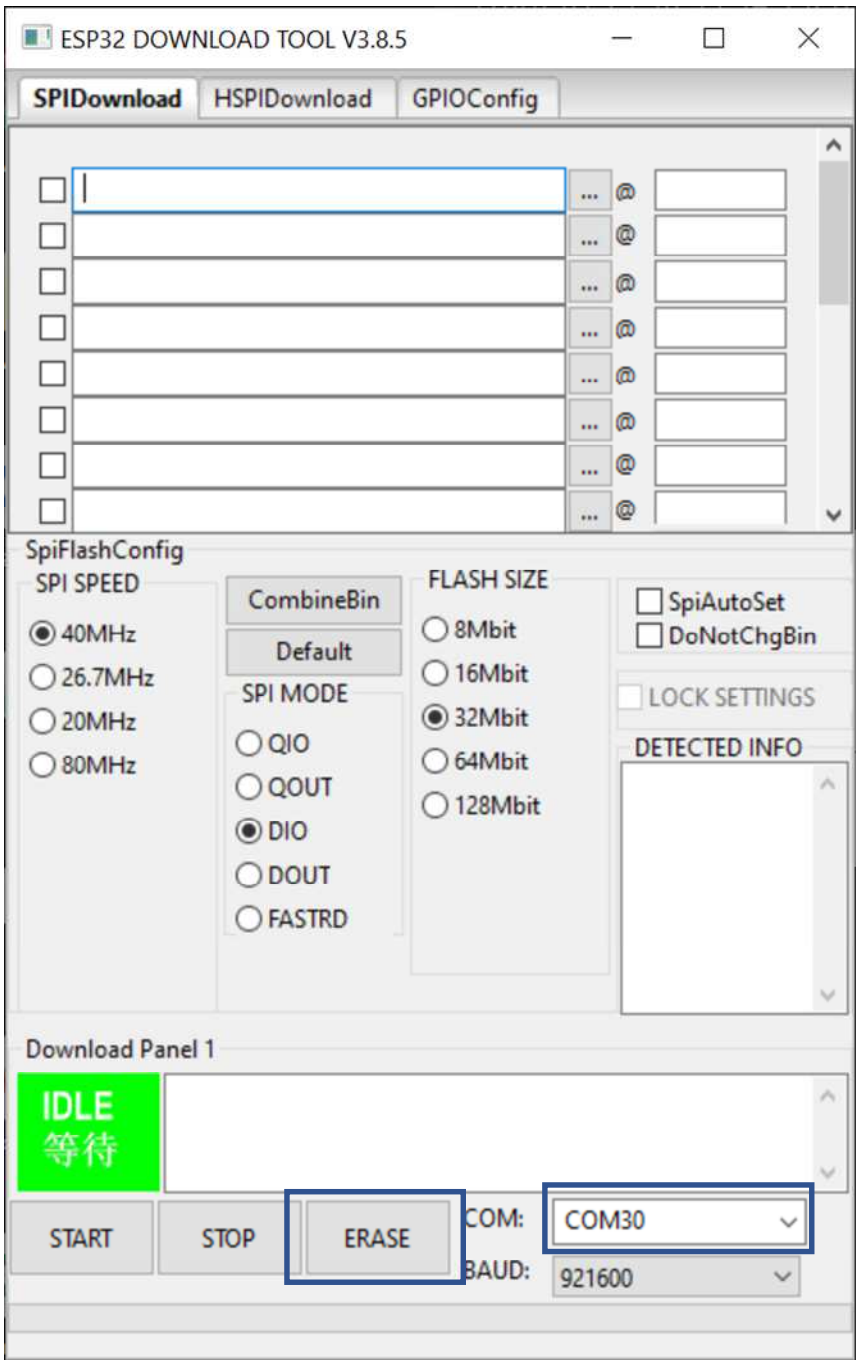


select **“Developer Mode”**



Select **“ESP32 DownloadTool”**

5. Select the assigned COM port from step (3)



6. Select Erase to erase the current Firmware from the module

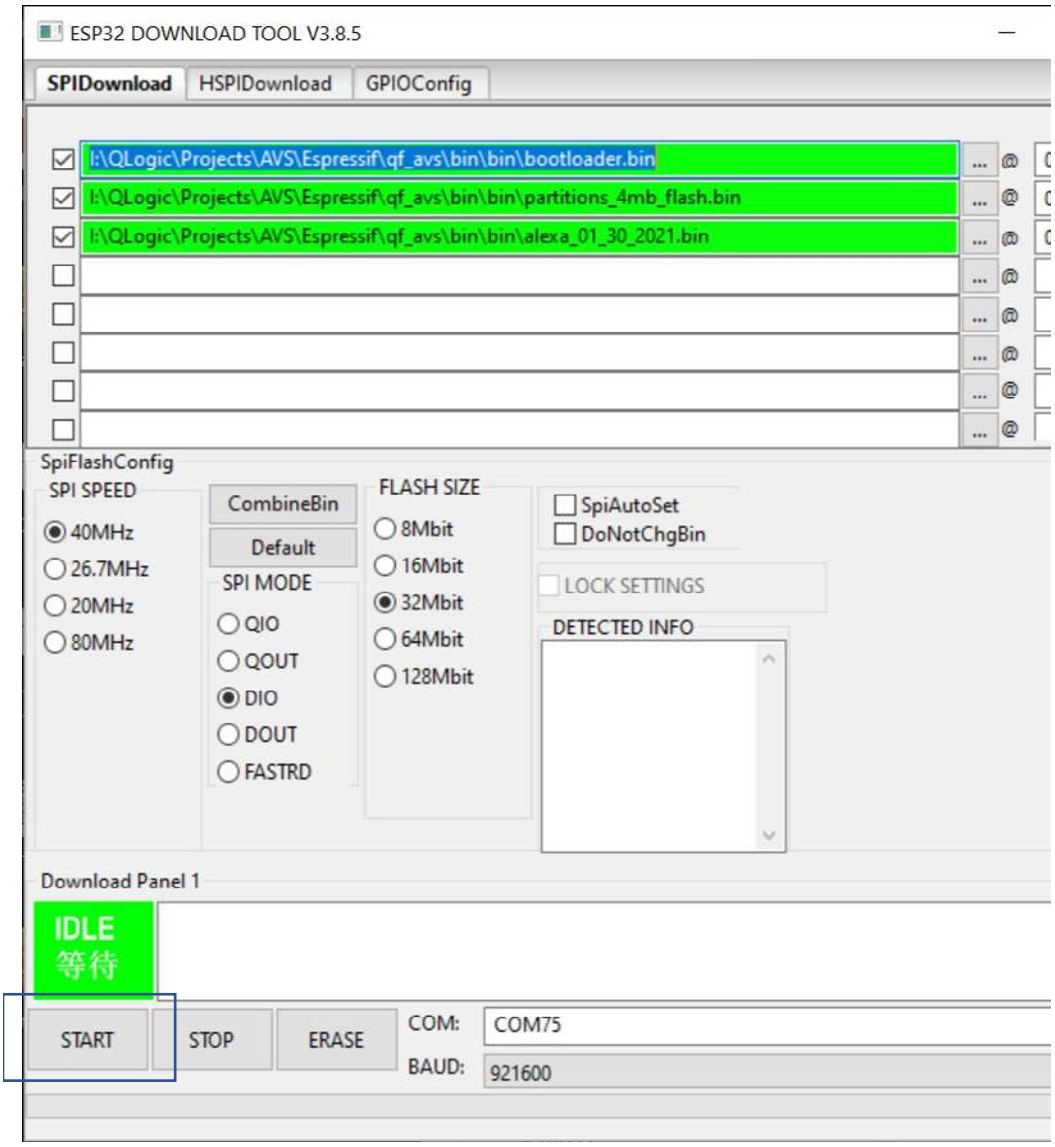
Note: to see DEVKITC VE message when the flash is erased, see debug session for additional information.

Download QuickFeather Alexa Close-Talk, Voice-Initiated Dev Kit firmware

IMPORTANT: the binaries files are available at https://github.com/QuickLogic-Corp/qorc-companion/tree/main/ESP32/AVS/qf_amazon_alexa/Binfiles

Steps:

1. Connect microUSB cable to QuickFeather and to power source; apply USB power
2. Connect microUSB cable to DEVKITC VE and laptop/PC USB port
3. Determine COM port# for the DEVKITC VE; on Windows PC, use device manager to look for the assigned port #
4. Launch “flash_download_tool_3.8.5.exe” application:
   Select **Developer Mode**
   Select **ESP32 DownloadTool**
5. Select the proper binaries to load: make sure to check the boxes
   a. “bootloader.bin” @ 0x1000
   b. “partitions_4mb_flash.bin” @ 0x8000
   c. “alexa_01_30_2021.bin” @ 0x10000
6. Select START



7. Exit the “flash_download_tool_3.8.5.exe” application
8. If downloading firmware after erase procedure, follow the steps in section “Setup and Test the QF AVS Kit” before using the system. If downloading firmware without erasing procedure, the system is ready to use.

Note: To confirm the QuickFeather Alexa Close-Talk, Voice-Initiated Dev Kit system is ready for use, see debug session for additional information

System Debug

In this chapter, common debug steps are provided to confirm the system operations. All of the steps require a Terminal application (Tera Term or Putty) to monitor the output messages from the DEVKITC VE and the QuickFeather. Use “Tera Term” application if auto COM Port disconnect recovery is needed when power to the DEVKITC VE is required.

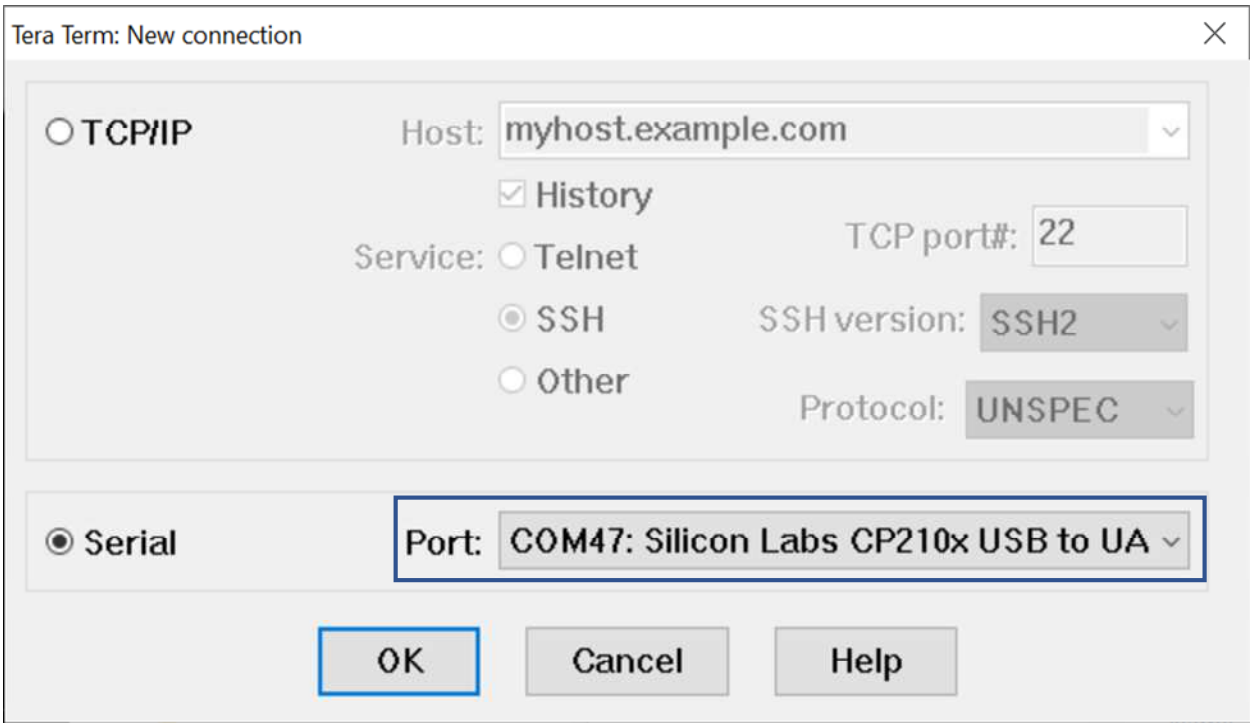
TeraTerm: https://ttssh2.osdn.jp/index.html.en

PuTTY: https://www.putty.org/

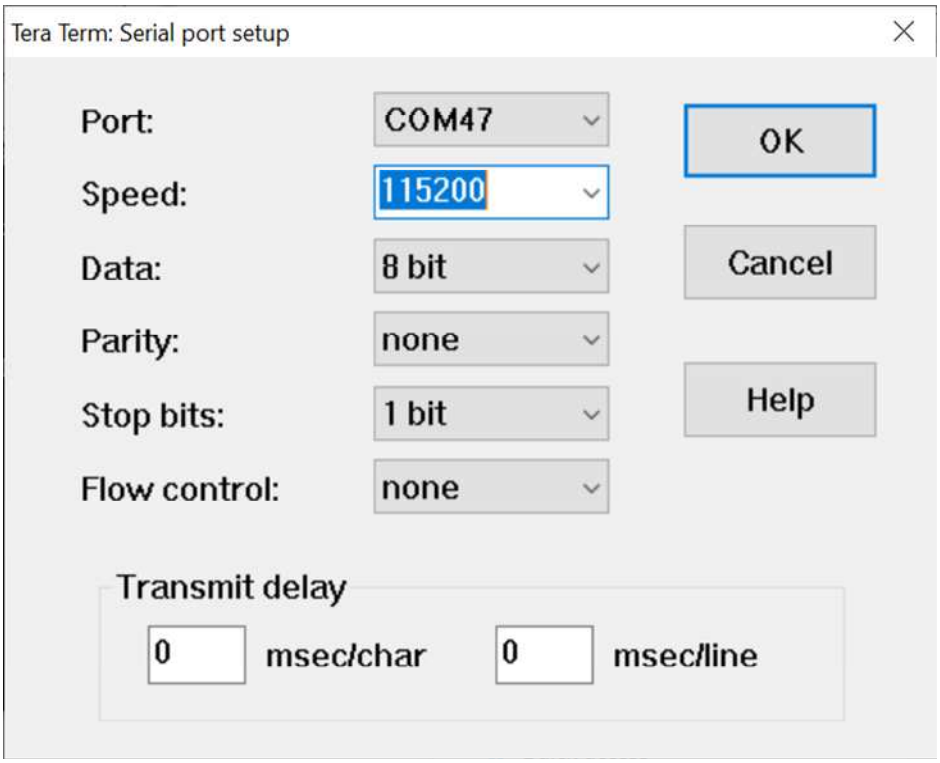
NOTE: make sure only one application is connected the assigned COM PORT; when open an already connected COM PORT, connection error is shown.

For all debug steps, the following common steps are required:

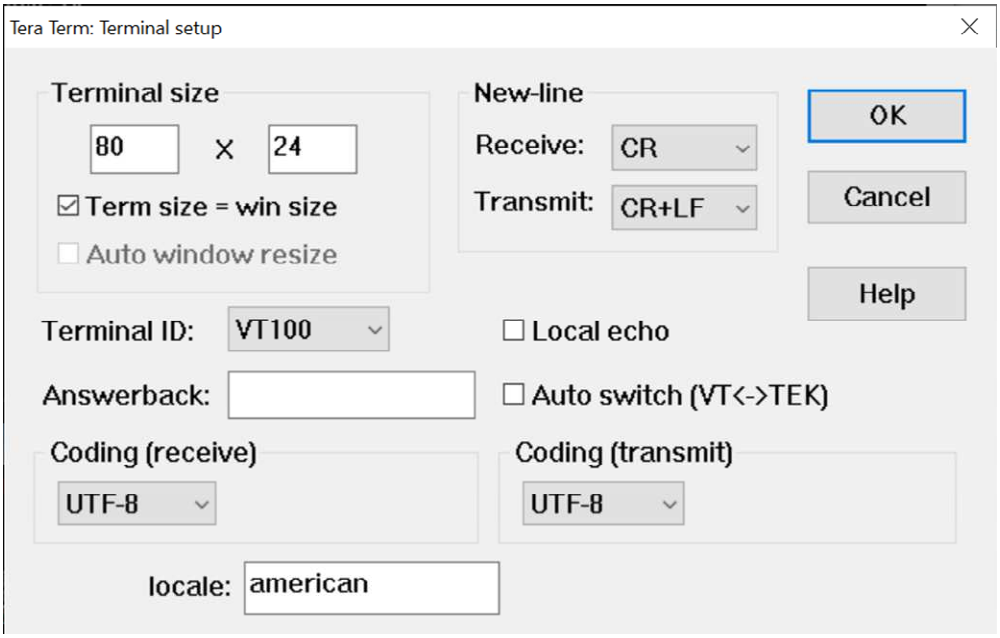
1. Confirm microUSB cables are connected to DEVKITC VE and QuickFeather; power is applied.
2. Determine COM port# for the DEVKITC VE; on Windows PC, use device manager to look for the assigned port#
3. Launch TeraTerm and select assigned COM PORT



4. Configure TeraTerm Serial connection; setup -> Serial port ….



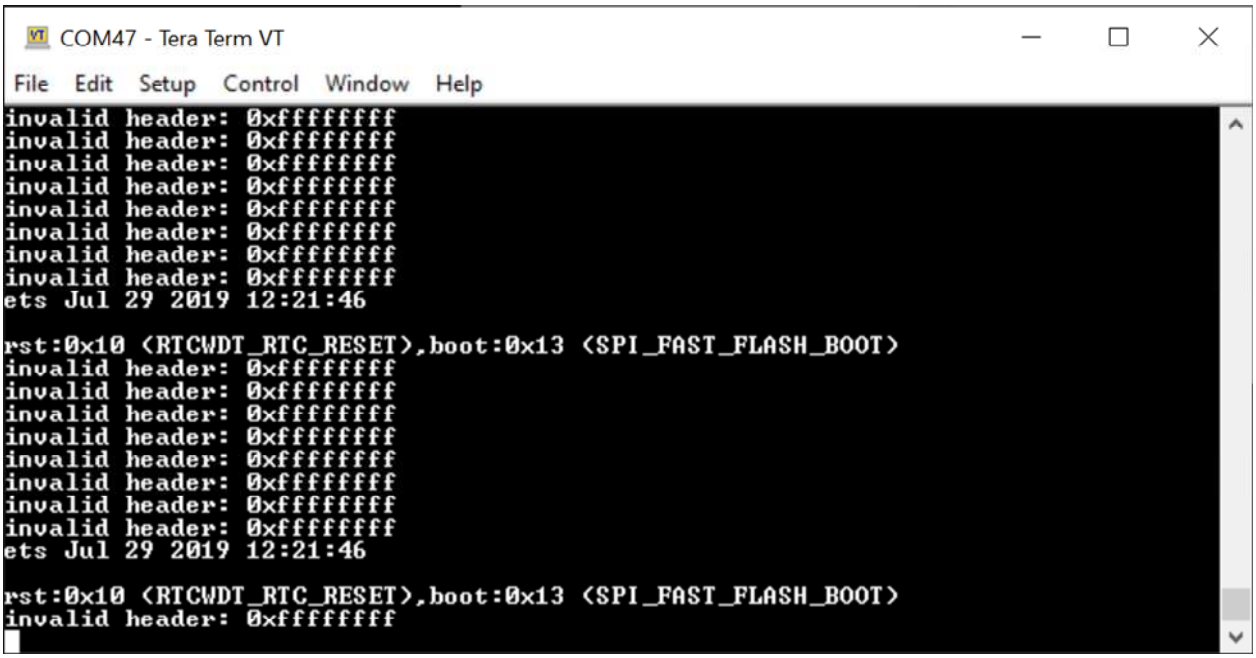
5. Configure TeraTerm transmit and receive setup: setup -> Terminal …



Confirming DEVKITC VE FW is erased

Steps:

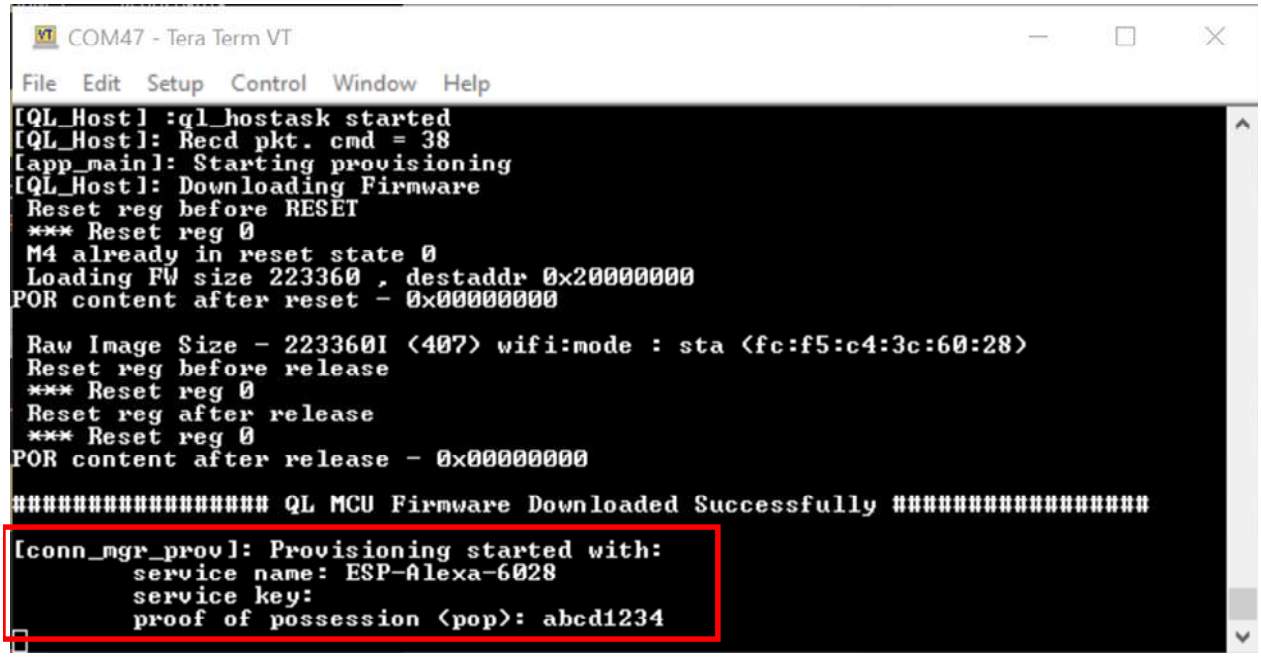
1. Press DEVKITC VE reset button
2. Check terminal output



Confirming DEVKITC VE FW is ready for Amazon Cloud Configuration

Steps:

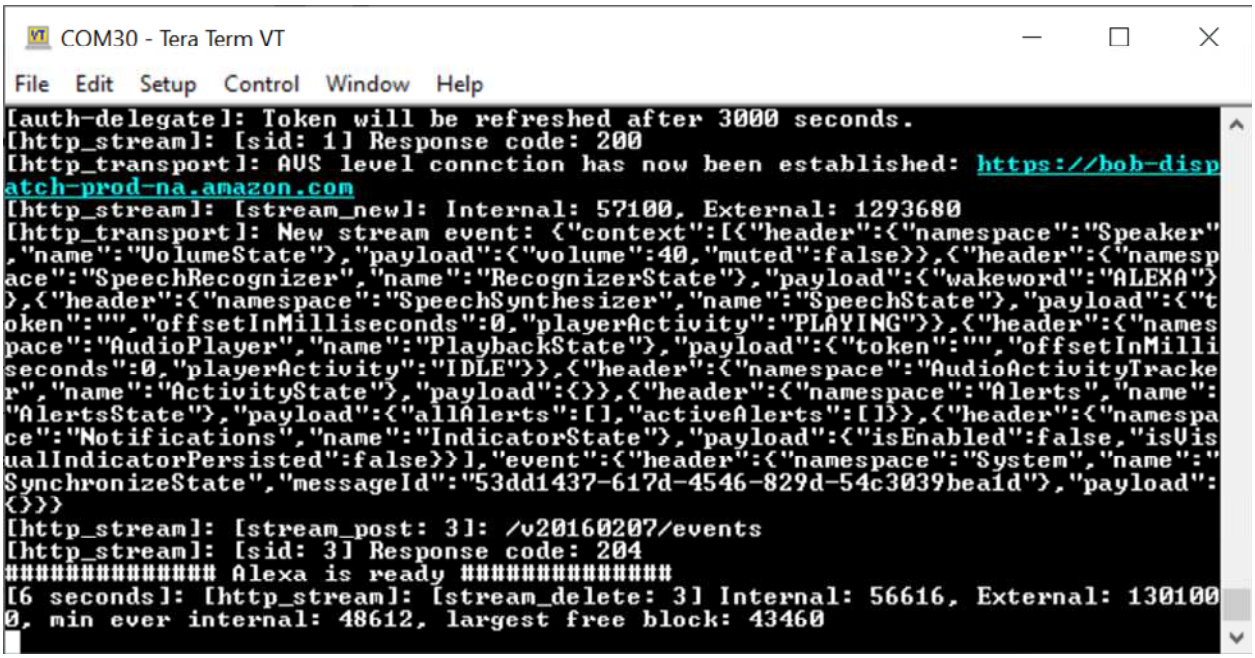
1. Press DEVKITC VE reset button
2. Check terminal output



Confirming DEVKITC VE FW is configured and connected Amazon Cloud

Steps:

1. Press DEVKITC VE reset button
2. Check terminal output



Additional resources

- QuickLogic Expansion Board: https://github.com/QuickLogic-Corp/quickfeather-expansion-board
- QuickFeather: https://github.com/QuickLogic-Corp/quick-feather-dev-board
- Source code for ESP32 application: https://github.com/QuickLogic-Corp/qorc-companion/tree/main/ESP32/AVS/qf_amazon_alexa
- ESP32 binaries for programming: https://github.com/QuickLogic-Corp/qorc-companion/tree/main/ESP32/AVS/qf_amazon_alexa/Binfiles

Revision

Version	Date	Revision
1.0	February 2021	First Release