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Development manual ITM-1261

2021. v1

Requirements

Hardware

- An ACK module board (USI MT7697H development kit)
- A Nuvoton debug board and UART to USB module
- An internet-accessible 2.4G Wi-Fi router
- A mobile phone with Amazon Alexa APP
- Some Dupont lines, module USB to TTL and an USB Mini line

Software/Drivers

- Keil MDK 5.26
- Latest Nu-Link Keil drivers
- Python-3.8 environment, see Python download
- Java SE 8 or later. For Java installation instructions, see <u>Java SE Downloads</u>

Prepare Amazon account

- Register for an Amazon developer account.
 - Get an Amazon developer account
 - Mobile device download APP : Amazon Alexa APP
- The Amazon account must be the same as the APP.



Hardware Connect

- Connect to console(USB)
- Connect to WiFi debug port: following below picture TX to RX, TX to RX, GND to GND, 3V3 to VDD





Hardware Connect

- Connect to console(USB)
- Connect to MCU debug port: following below picture TX to RX, TX to RX, GND to GND, 3V3 to VDD





Hardware Connect

- Connect to Nuvoton debug board
- Connect to the pins to load firmware into MCU : VCC/DAT/CLK/RST/GND/TX to RX/RX to TX

ACK module



Nuvoton debug board



USB to PC



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Software Preparation

- Download python and java
 - Python download
 - Java download
 - Remember to add python and java execution to **PATH** variable.
- Ready to develop software
 - Download <u>ACK Device SDK 4</u>.
 - Download <u>Githob code</u>
 - Put the Github file under the path of <u><ACK_Device_SDK_4>\user\platform</u>

Driver Installation

- Install "Nu-Link Driver for Keil" on Window platform
 - Download Nu-Link Driver for Keil
 - Nuvoton provides installshield wizard to help user to install these utilities for keil.
 - It also includes a Nu-Link USB Driver. Please install it for MDK-ARM debugger and Nuvoton virtual COM(VCOM) function.



Build Steps

- Open ack.uvmpw Keil multiple project file using MDK 5.26.
 Path: <Path-to-ACK_Device_SDK>\user\platform\numicro_nuc1261\nutinynuc1261s\ack.uvmpw
- Press "Batch rebuild" to build all examples.
- Finally, execute "ack_hmcu_fw_merge.bat" to merge customer_loader and example into a hex file.



ACK HMCU Firmware Installation

Nuvoton NuMicro ICP Programming Tool 3.03	X Nuvoton NuMicro ICP Programming Tool 3.03 - NUC126 Series - X	Chip Settings ×
Select Language:	Project Chips Tool Language Help Status Disconnect: Chip Connected with Nu-Link (ID: 18000142) Part No. NUC1261SG4AE LDROM:4K, APROM:256K, Data:0K, SPROM:2K, RAM:20K	Brown-out Voltage Options
English ~ Select Target Chip:	Load File LDROM File Name: C:\LDROM.hex File not load. File not load. File Name: Z:\ACK_Device_SDK_4.0.202101122015\user\platform\numicro_nuc1261\nutiny-nuc1261s\Merged_Smz	Boot Options O LDR0M O LDR0M with IAP O LDR0M with IAP
Quit Continue >>	size: 58.9K Bytes, checksum: 6872 Offset: 0x 0 Data Flash File Name: C:\Data hex File not load. SPROM File Name: C:\SPROM.hex	PF[4:3] Multi-function Options Work as GPI0 Image: Work as External 4~24MHz Crystal Pin I/O Initial State Options Image: Work as External 4~24MHz Crystal Pin
Support Forum EN: http://forum.nuvoton.com SC: http://www.nuvoton-mcu.co	File not load. Last Byte: 0x FF Config Bits Setting Config 0: 0xFFFFFBF Config 1: 0x000FFFFF <update history=""></update>	O Input Tri-state Mode O Quasi-bidirectional Mode Data Flash Options Data Flash Base Address: 0x FFFFF
	LDROM APROM Data Flash SPROM LDROM APROM Data Flash SPROM LDROM APROM Data Flash SPROM Info	Data Flash Size: 0.00K Watchdog Watchdog Clock Power-down Security Lock ICE Lock
	Programming LDROM APROM Data Flash SPROM Config Options Start	Config Value Config 0: 0xFFFFFBF Config 1: 0x000FFFFF OK Cancel
	Build: 7091r	

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ack_hmcu_fw_merge.bat

- This is batch script for window platform. Help user to get all merged firmwares for programming, just a double-click step.
- It invokes some python utilities Amazon provided
 - For producing a merged firmware for NuMicro MCU.
 - Connect to Nuvoton debug board.
 - For OTA upgrading file for publishing on Amazon Cloud.
 - Please remember to modify the device type for yours.

Name	Date modified	Туре	Size	
not applications		File folder		
J common	2021/10/6 下午 05:49	File folder		
🌄 customloader	2021/10/6 下午 05:49	File folder		
🕅 ack.uvmpw	2021/10/18上午 10:58	猩ision4 Multi-Pr 2		
🔊 ack_hmcu_fw_merge.bat	2021/4/22 上午 11:43	Windows Batch File 1 KB		

	Merged_DashReplenishment.hex	2021/4/26 下午 07:28	HEX File	112 KB
	Merged_HelloWorld.hex	2021/4/26 下午 07:28	HEX File	127 KB
_	Merged_Microwave.hex	2021/4/26 下午 07:28	HEX File	156 KB
	Merged_SmartLight.hex	2021/4/26 下午 07:28	HEX File	157 KB

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Product registration(WiFi debug console)

- Generate QR codes for new products
 - Refer to Alexa to create a new virtual product and download your configuration file.
 - Connect to WiFi debug console.
 - Download the <u>ACK Module Utility</u> and execute the following java command.
 - Import virtual products : java -jar <path>\ackmoduleutility.jar provision -p <port> -provisionconfigfile ProvisioningInfo_[devicetypeid].conf
 - Generate QR code : java –jar <path>\ackmoduleutility.jar barcode --port <port> --upc ./

		■ Windows 命令處理程式
🮽 → 電腦 → 本機磁碟 (C:) → ModuleUtility_5.0.67.0 → ESP		C:\ModuleUtility_5.0.67.0>java -jar ackmoduleutility.jar provision -p COM3pro visionconfigfile ProvisioningInfo_A5U77T00FOGRN.conf Device provisioning beginning for device type A5U77T00FOGRN Setting device information
加入至媒體櫃 🔻 共用對象 🔻 投影片放映 新增資料夾		Authorization is required. Your web browser should open the "Login with Amazon" page to the following link, please login with your Amazon developer credentials
DVC_GB21JU041 405001S.png DVC_GB21JU041 405001S_barcode_ PKG_GB21JU0414 05001S.png	PKG_GB21JU0414 05001S_barcode_c	associated with device type A5U77T00F0GRN. https://devicesigner.amazon.com/v1/au thn?state=XW5gT1REgDW6D4KdDJnYjw-bbmPqzbBf-Y1W5XnKFQc9KQAyJ8i8Jek8BRHqj9aTEY&typ e=online_signing Waiting for you to login using "Login with Amazon" ! Login detected, sending request for device certificate to the ACK service Device certificate request was successful and device certificate has been provid ed to ACK module utility. Device provisioning continuing Device provisioning successful C:\ModuleUtility_5.0.67.0>java -jar ackmoduleutility.jar barcode -p COM3upc .
content.txt	ontent.txt	/ Barcode files successfully created in ./ directory.

Test product action

- App operation
 - Check development board power on.
 - On the mobile device App, select devices, and add new devices as shown on the right.
 - Choose Development Device and ack. Then scan the QR code.
 - After the mobile device is successfully connected, the status light can be operated.



THANK YOU

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About

- Amazon ACK HMCU On NuTiny-NUC1261S
 - <u>https://raw.githubusercontent.com/OpenNuvoton/ACK-</u> <u>HMCU/master/numicro_nuc1261/docs/Amazon%20ACK%20HMCU%20on%20NuTiny-</u> <u>NUC1261S.pdf</u>
- Prototype Your Product
 - https://developer.amazon.com/en-US/docs/alexa/ack/steps-to-prototype-a-product.html

Download

- Amazon Developer Account
 - https://developer.amazon.com/en-US/docs/alexa/ack/developer-account.html
 - https://developer.amazon.com/alexa/console/ack/
- Python
 - https://www.python.org/ftp/python/3.8.6/python-3.8.6-amd64.exe
- ACK Device
 - https://developer.amazon.com/alexa/console/ack/resources
- Github
 - <u>https://github.com/Brickcom/ACK-HMCU</u>
- Java
 - https://www.oracle.com/java/technologies/downloads/

Note:

- <path>:File placement. Ex: <u>C:\ModuleUtilit5.0.67.0</u>
- ort>: Com port Name. Ex: <u>COM3</u>
- [devicetypeid]: Virtual product device type ID. Ex: <u>A5V77T00FOGRN</u>

