DFXE-SM001-DT0R

mbed Kit User Guide of NNN50 daughter board

Index:

Revision History

Version	Date	Reason of change	Maker
0.1	2017/3/17	First release	Tsungta Wu

Wireless Bluetooth Low Energy Module
MBED Kit Getting Start

1. Introduction

• The DELTA DFXE-SM001 development kit provides cost effective, low power, and flexible platform to rapid prototype of Delta module design (Wi-Fi® connectivity, Bluetooth Low Energy and Combo). Kit has sensor connection IO on board, it is convenient to set up example application and develop the relative prototype. The DELTA DFXE-SM001 is compatible with Delta brand module (NQ62x, NNN50, TT21x and MAMJ1)

1.1 Minimum Requirements

- Computer (supported OS; Window 7 and above, Ubuntu Linux 12.04 and above, MAC OS 9/10 and above) with a USB port
- Micro USB cable

2. Kit Content

2.1 DELTA DFXE-SM001 mbed kit hardware content

- DELTA DFXE-SM001 mbed kit board x 1

2.2 DELTA DFXE-SM001 mbed kit hardware figure

DELTA-DFCM-NNN50
Arduino Headers

NC	1	2	NC
NC	3	4	NC
NC	5	6	p0
NC	7	8	NC
NC	9	10	NC
NC	11	12	NC
NC	13	14	NC
NC	15	16	NC
Reserved	17	18	Reserved
Reserved	19	20	Reserved
GND	21	22	GND
GND	23	24	GND
5V	25	26	3V3

CN10
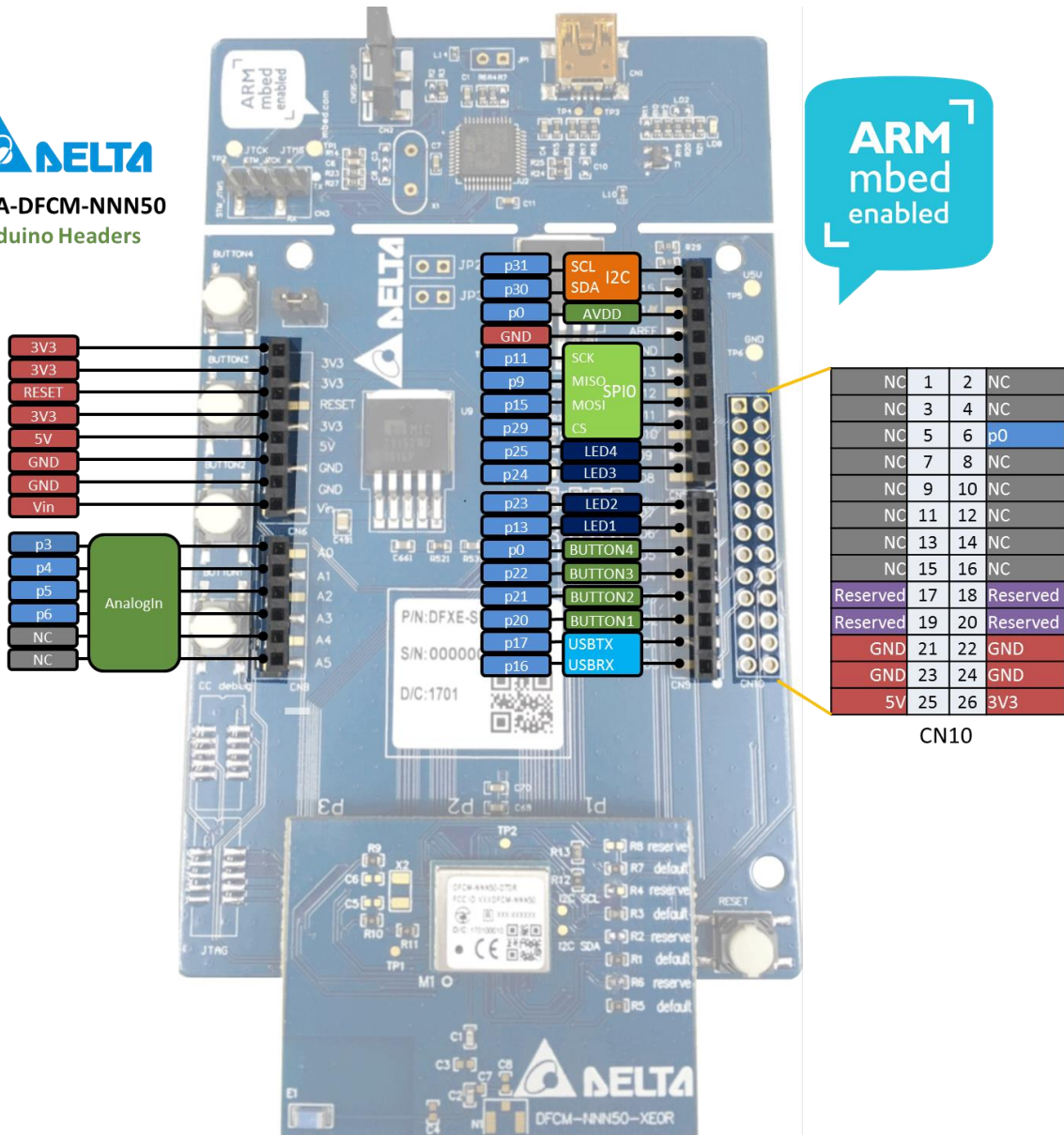
WARNING: Note that AnalogIn A4, A5 must remain not connected since those two pins are currently used for 32.768kHz RTC

2.3 Downloadable Content

2.3.1 nRF51822 documentation

- ■ nRF51 Series Reference Manual
- ■ nRF51822 Product Specification
- ■ S130 nRF51822SoftDevice Specification
- ■ nRF51822 Product Anomaly Notification
- ■ All documents can be found from the link below

    http://www.nordicsemi.com/eng/Products/Bluetooth-Smart-Bluetooth-low-energy

2.3.2 Hardware related files

- ■ Schematics
- ■ Placement
- ■ All documents can be found from DELTA DFXE-SM001 and NNN50 daughter board platform page

   https://developer.mbed.org/platforms/Delta-DFCM-NNN50/

3. Getting started

This section contains the procedure from login in mbed page to load application to DELTA DFXE-SM001 and NNN50 daughter board.

3.1 Connect your Delta DFXE-SM001 mbed kit to a computer

(1) Connect your mbed kit to a computer with a USB cable.

(2) The status light (LD3) turn on, indicating the kit is powered on.

(3) After a few seconds, the computer will recognize the mbed microcontroller as a standard USB drive named as DELTA.
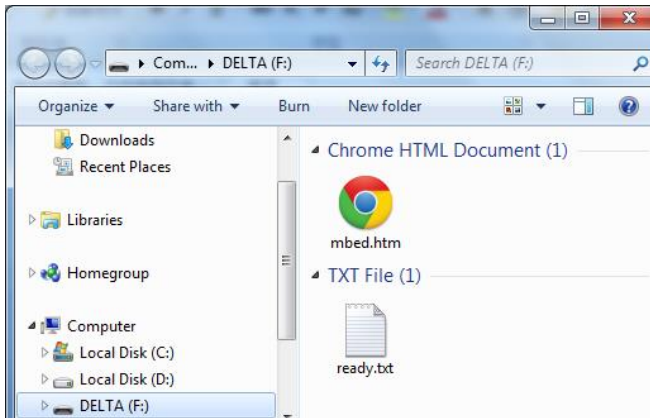
Windows Example

3.2 Click the MBED.HTM file to log in

(1) Go to the new USB Drive and click MBED.HTM to open it in a web browser.

(2) If you do not have an mbed account, click Signup to create your mbed account. Otherwise, log in with your normal username and password. This will give you access to the website, tools, libraries, and documentation.

3.3 Windows serial configuration

The mbed serial port works by default on Mac and Linux, but Windows needs a driver. These instructions explain how to setup the mbed Microcontroller to use the USB serial port on Windows.

(1) Download the mbed Windows serial port driver

Download the installer to your PC, e.g. your desktop.   Download latest driver

(2) Run the installer

With your mbed plugged in, and no explorer drive windows open, run the installer:

It will take some time (especially on Vista), and pop up a few 'unsigned driver' warnings, but after a while you should have a Serial port.

(3) Where Next- Any Detail needs to refer below website

https://developer.mbed.org/handbook/Windows-serial-configuration

3.4 Build up the first program on DELTA DFXE-SM001

(1) After you login the mbed, click the new program button. Then choice one of the example program, the project will be generated from mbed.

(2) Click the compile button directly; the image file will be generated from mbed

(3) The image file can be saved to USB drive of DELTA DFXE-SM001 directly. Or download to your local storage and use drag-n-drop to USB drive to load firmware.

(4) During the image uploading, the (LD8) should blink to indicate the uploading state.

(5) When the uploading is completed, the succ.txt should be appeared in USB drive. Then the uploaded application starts running on DELTA DFXE-SM001.

4. Kit Description.

4.1 Kit Feature – NNN50 Daughter board

4.1.1 General

■ Integrates wireless LAN chip and BLE chip

■ Built in RF switch for BLE and WLAN using a single antenna

■ Integrate a 32 bit ARM® Cortex M0 CPU,256KB flash memory and 32KB RAM

■ Extra 256KB flash memory for user data storage.

■ 8/9/10 bit ADC - 5 configurable channels

■ 14 General Purpose I/O Pins

■ Two-wire Master (I2C compatible) support 100K bps and 400K bps

■ UART baud rate up to 921600 bps

■ SPI bit rate up to 4M bps

■ Quadrature Decoder (QDEC)

■ Temperature sensor

■ LGA42 pin package

■ Dimension 12.4mm(L) x 10.9mm(W) x 1.8mm(H)

■ RoHS compliant

4.1.2   Wi-Fi

- IEEE 802.11 b/g/n (1x1) for up to 65 Mbps
- Superior Sensitivity and Range via advanced PHY signal processing
- Advanced Equalization and Channel Estimation
- Advanced Carrier and Timing Synchronization
- Soft-AP support
- Supports IEEE 802.11 WEP, WPA, WPA2 Security
- SSL Security
- On-Chip network stack offload MCU
- Integrated Network IP stack to minimize high speed mode host CPU requirements (4KB flash - less than 1KB RAM, for Wi-Fi drivers)
- Network features TCP, UDP, DHCP, ARP, HTTP, SSL, and DNS
- Support SPI host interface

4.1.3   Bluetooth

- Bluetooth 4.1 specification compliant
- AES HW encryption

4.2   HDK – DFXE-SM001-DT0R

- USB drag and drop programming
- USB Virtual COM port for serial terminal
- CMSIS-DAP interface for programming and debugging
- Accepts power through USB or external source (7V-12V)
- Pin header for current measurement

5. HDK Reset

DELTA DFXE-SM001 performs reset and run for the whole kit when the firmware is programmed. The user will observe the DELTA USB drive is then closed and remounted due to the reset. The RESET button can be used to HW reset module manually and it is working no matter the power supply is from USB or external power.

6. Power Supply

- USB
- External power supply from VIN (7V~12V)

7. Button and LED

There are four user buttons and four LEDs on this mbed kit board, in which those are connected to dedicate I/Os on the DFCM-NNN50-DT0R. The connections are shown in the table below.

Part	GPIO	Short
BUTTON1	P0.20	NA
BUTTON2	P0.21	NA
BUTTON3	P0.22	NA
BUTTON4	P0.00	NA
LED1	P0.13	SB_4
LED2	P0.23	SB_3
LED3	P0.24	SB_2
LED4	P0.25	SB_1

8. UART Configuration

Below table shows an overview of the UART connections on DELTA DFXE-SM001, refer to section 3.3 to setup the Virtual Com Port on your PC

nRF51822	
Default GPIO	UART
P0.17	TXD
P0.16	RXD

9. Measuring Current

The current drawn by the DFCM-NNN50-DT0R module can be monitored on the DELTA DFXE-SM001 mbed kit via JP5 (open and hook to the current meter). If no current measurement is needed, please make sure JP5 is shorted at all times.

10. Learning Video

https://developer.mbed.org/getting-started/