

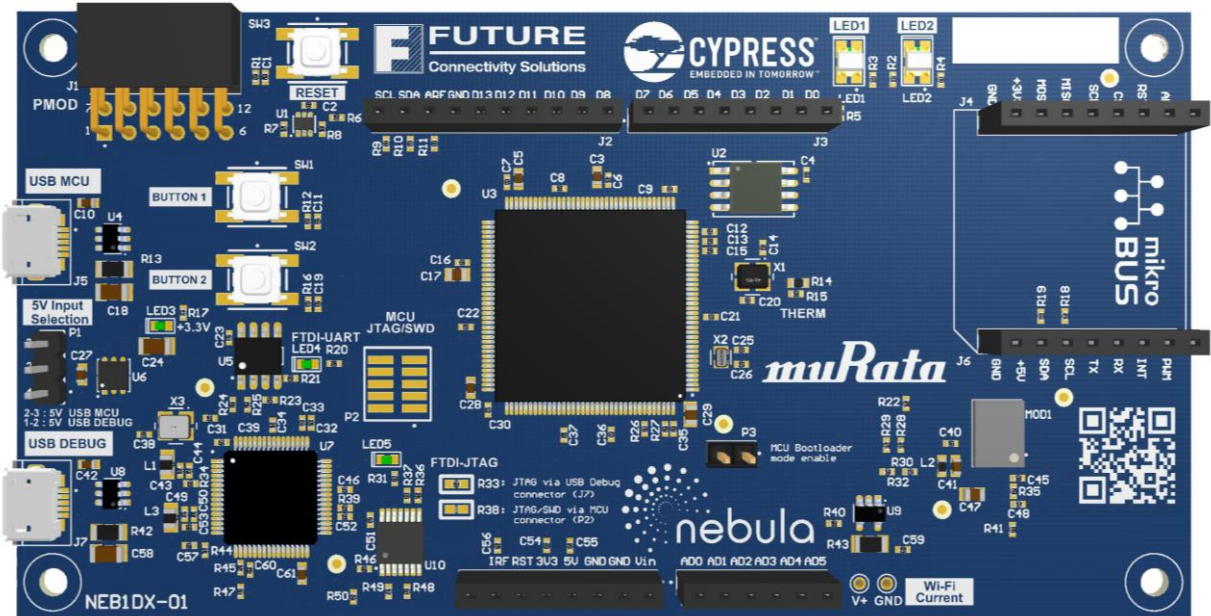
SENSE • CONNECT • CONTROL



Nebula IoT Reference Design Board

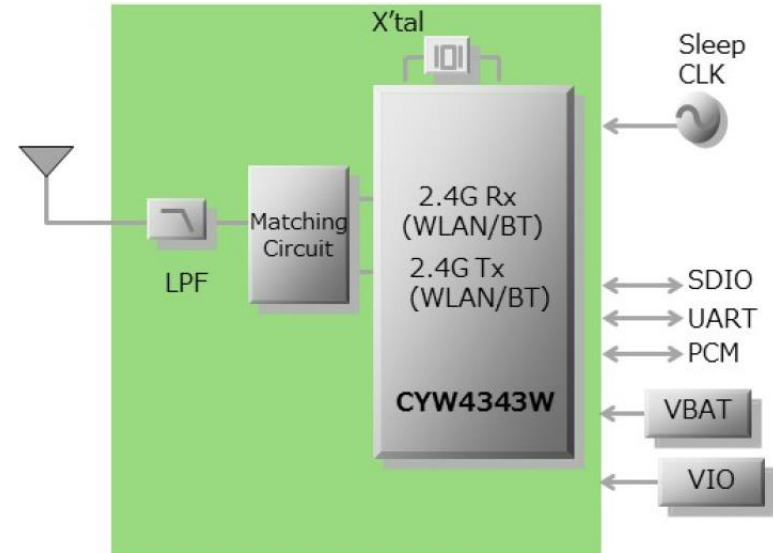
The possibilities are endless!

- Use the different interfaces to add on development boards from our growing list of Future IoT ready boards
- Application Examples:
 - Sensors
 - Proximity
 - Ambient light
 - Motion
 - Temperature
 - Humidity
 - Pressure
 - Gesture Recognition
 - UVA/UVB
 - Motor Control



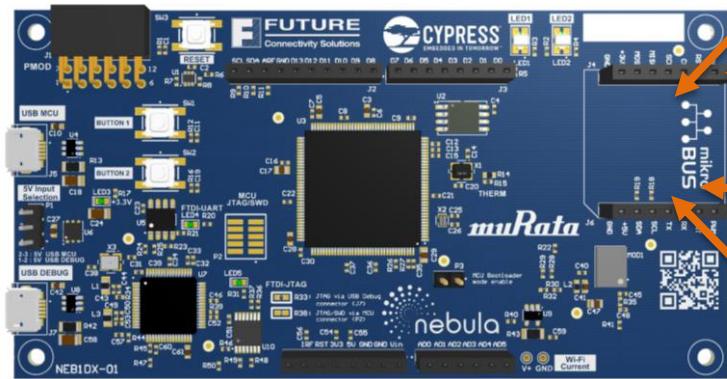
Cypress Murata Certified WiFi + Bluetooth Combo Module

- Murata 1DX certified module - Part Number LBEE5KL1DX-883
- Inside is a Cypress CYW4343W Wi-Fi and Bluetooth chipset radio
- Single Band 2.4GHz 802.11 b/g/n
 - Over SDIO Interface
- Dual Mode (Classic BT + BLE) Bluetooth v4.1 + EDR Radio
 - Over UART Interface
- Single ended RF port using single antenna
- Radio Regulatory Certifications
 - USA/Canada FCC ID : VPYLB1DX IC : 772C-LB1DX
 - Europe EN300328 v1.9.1
 - 4.2. Bluetooth® Qualification QDID: 7306
- Size: 6.95 x 5.15 x 1.1 mm

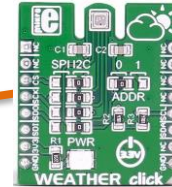


Sensor add-on Shields-MikroBUS™ boards

MikroBUS™ Sensor Shield Example



Proximity Sensor Shield
MIKROE-1897



Weather Click
MIKROE-1978



Magneto 2 Click
MIKROE-1938



SHT Click Sensor Shield
MIKROE-2101

Sensor add-on Shields-MikroBUS™ boards

- Shield based on ST Microelectronics' proximity sensor VL6180X
- Sensor consists of:
 - IR Emitter
 - Ambient light sensor
 - Range sensor
- Calculates distance by measuring the time it takes for a photon to travel to the nearest object and back
- Communicates with the Nebula board through mikroBUS I²C pins
- Size: 28.6 x 25.4 mm



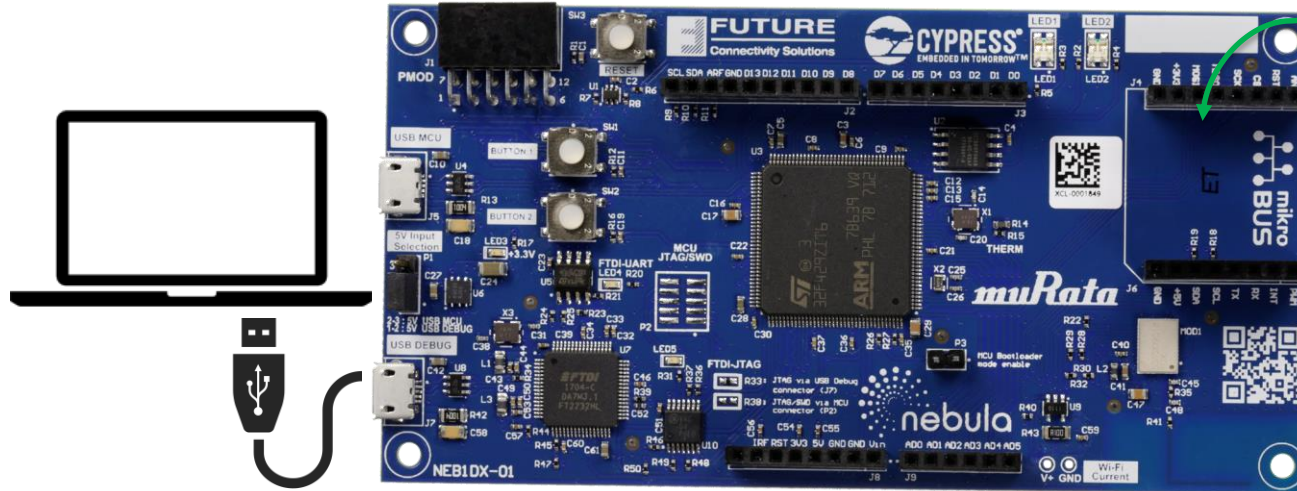
Proximity Sensor Shield
MIKROE-1897



How to use the LightRanger Click board with the Nebula IoT Board

Hardware Prerequisites

- 1 x Nebula IoT development kit (NEB1DX-01)
- 1x USB cable
- 1 PC
- 1 x LightRanger Click board (MIKROE-1897)



Nebula IoT Development kit



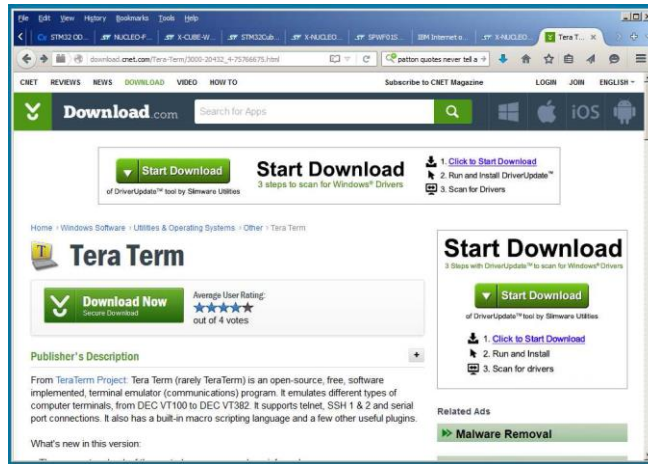
LightRanger Click board

Software Prerequisites

- Example code “ vl6180x_test” make target built in WICED
- WICED Studio 5.2 (and later)

Download Terminal Emulator (if you don't have one)

- TeraTerm Pro is available (for free) at:
 - http://download.cnet.com/Tera-Term/3000-20432_4-75766675.html
 - Download “teraterm-4.89.exe” (or later). Run it.
 - (The current installer is in the “Tools” subdirectory of the memory stick.)





WICED Walkthrough

WICED Studio SDK: Download

Download **WICED Studio 5.2 or later:**

Windows:

<https://community.cypress.com/docs/DOC-13651>

Linux or OS X:

<https://community.cypress.com/community/wiced-wifi/wiced-wifi-documentation>

The screenshot shows a forum post on the Cypress Developer Community website. The post is titled "WICED-Studio 5.2.0 Installer (Windows)" and is marked as "OFFICIAL". It was created by user "mifo" on Sep 5, 2017, 2:09 PM. The post contains instructions for installing and uninstalling WICED Studio 5.2.0 on Windows. A download link for "WICED-Studio-5.2.0-IDE-Installer.zip (555.1 MB)" is highlighted with a green box. The post also includes a user rating section with 0 ratings.

WICED-Studio 5.2.0 Installer (Windows)
Created by mifo on Sep 5, 2017 2:09 PM. Last modified by mifo on Sep 5, 2017 2:09 PM.

Release Notes: WICED Studio 5.2.0

Windows Install:

- Download the attached .zip file
- Extract the installer.exe and config.xml file from the zip file to temp folder on your computer; do not execute the installer from the zip file
- Double click the installer.exe to install WICED Studio
- After installation is completed, launch WICED Studio IDE from shortcut on desktop

Windows Uninstall:

- Uninstall "WICED Studio" from Control Panel -> Programs and Features OR (in Win 10)
- Start Menu -> Settings -> System -> Apps & features -> WICED-Studio -> Uninstall
- To clean up all WICED components manually, delete files and folders for the IDE and SDK, typically in "C:\Users\<name>\Documents\WICED" and "C:\Users\<name>\AppData\Local\WICED"

WICED-Studio-5.2.0-IDE-Installer.zip (555.1 MB)
Download

876 Views | Categories: CYN43302, CYN42340, CYN4343W, CYN43304, CYN4343B, CYN43907, WICED Studio 5.x
Tags: wiced studio 5.2, windows installer

Average User Rating: (0 ratings) | Your Rating: (0 ratings)

WICED Studio: IDE Overview

Device Selector

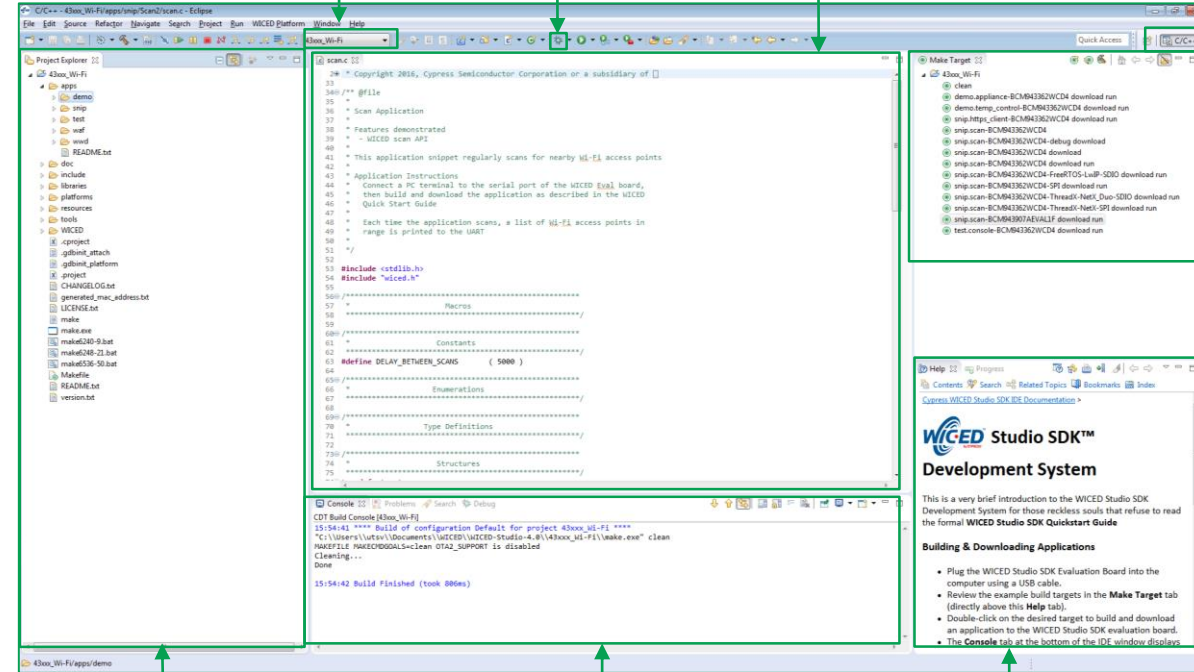
Choose your device

Debug Icon

Launch debugger

Editor

Edit the firmware



Project Explorer

Explore the SDK

Console Window

View the build output

Help

Learn how to build/run an application

Workspace Perspective

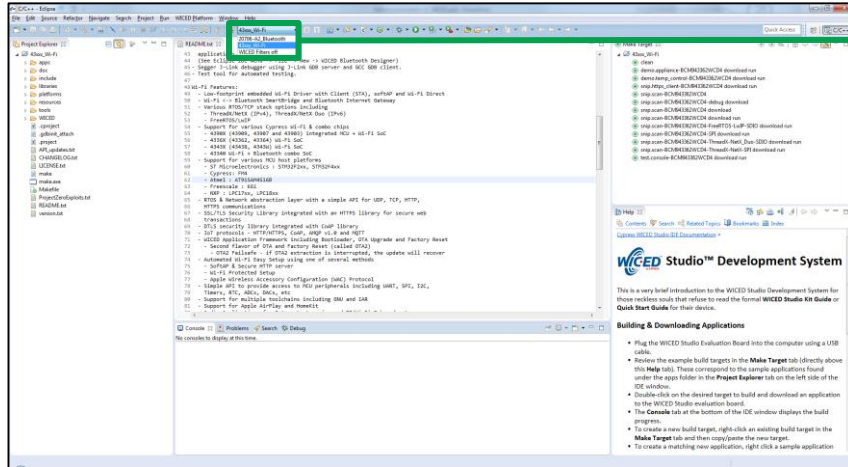
Switch between editor and debug views

Make Target

Build your application

WICED Studio SDK: Device Selection

Use the pull-down menu to change the device



Pull-down menu options:

20706-A2_Bluetooth – Bluetooth (BR/EDR/BLE) SoC with ARM® Cortex® -M3

43xxx_Wi-Fi – Wi-Fi + Bluetooth Combo SoCs, Wi-Fi SoCs with integrated MCU, and Wi-Fi-only SoCs

WICED Filters off – Show all available devices

WICED Studio SDK: Example Applications

Choose the relevant sub-folder from the **43xxx_Wi-Fi -> Apps** folder in the **Project Explorer**

Demo – Advanced applications that combine multiple WICED features

Snip – Application snippets that use various WICED APIs

Test – Manufacturing/certification-related test applications and utilities

WAF – Applications that are part of the WICED Application Framework (WAF) like bootloaders

WWD – Applications that use low-level APIs provided by the WICED Wi-Fi Driver (WWD) and do not use the WICED APIs provided by the WICED Application Framework

Read the **README.txt** files to learn about the contents of the respective folder

The image shows three screenshots of the Project Explorer in WICED Studio, illustrating the folder structure for example applications.

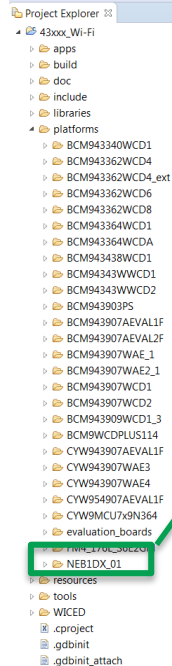
- Apps folder:** Shows the hierarchy starting from the `43xxx_Wi-Fi` project, navigating to the `apps` sub-folder. The `apps` folder contains sub-folders for `demo`, `snip`, `test`, `waf`, and `wwd`, along with a `README.txt` file.
- Demo folder:** Shows the contents of the `demo` sub-folder, listing various application examples such as `apollo`, `appliance`, `audio_loopback`, `audio_player`, `avs`, `avs_app`, `aws_iot`, `azure_iot_hub`, `ble_wifi_introducer`, `bt_internet_gateway`, `bt_smartbridge`, `coap_exosite`, `dual_hf_a2dp`, `headset`, and `temp_control`. A `README.txt` file is also present at the bottom.
- Snip folder:** Shows the contents of the `snip` sub-folder, listing application snippets categorized by API type, such as `amtp`, `ap_clients_rssi`, `apsta`, `avs_authorization`, `bluetooth`, `bluetooth_audio`, `coap_app`, `config_mode`, `crypto`, `custom_ie`, `dct_read_write`, `email`, `flac`, `gpio`, `graphics`, `gspi_slave`, `http_server_sent_events`, `httpbin_org`, `https_client`, `https_server`, `keep_alive`, `led_example`, `link_status`, `multi_image_0`, `multi_image_1`, `ota_fr`, `ota_fr_no_buttons`, `ota2_example`, `ota2_extract`, `packet_filter`, `ping_deepsleep`, `ping_ethernet`, `ping_powersave`, `ping_webserver`, `pno`, `power_management`, `powercycle`, `rfmon`, `rsa_pkcs1`, `scan`, `sd_filesystem`, `secure_mqtt`, `security_types`, `service_discovery`, `sntp_get_time`, `spi_slave`, `ssdp`, `stack_overflow`, `stdio`, `tcp_client`, `tcp_client_powersave`, `tcp_server`, `tcp_server_async`, `tftp`, `thread_monitor`, `uart`, `udp_receive`, `udp_transmit`, `websocket_client`, `websocket_server`, `wifi_connection_manager`, `wps_enrollee`, and `wps_reistrar`. A `README.txt` file is located at the bottom right.

WICED Studio SDK: Platform Selection

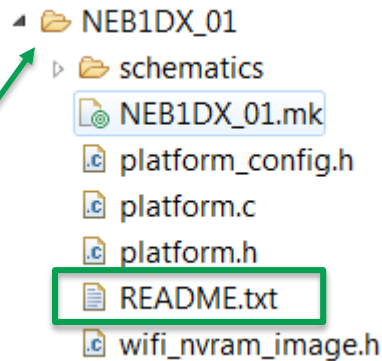
Browse the **43xxx_Wi-Fi** device folder to the **Platforms** folder in your **Project Explorer** to view the hardware platforms available for your device.

Read the README.txt file located within the folder for every platform for details about each hardware platform.

Wi-Fi/Wi-Fi + BT Platforms



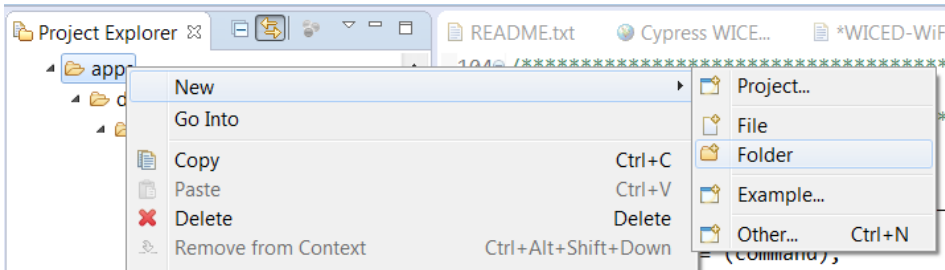
Nebula Platform Folder with README.txt file



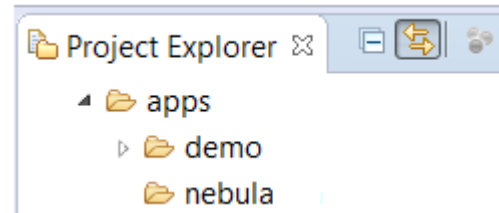
WICED Studio SDK: Create and Build your Own Application

1 Create a new Folder in the **apps** folder called **nebula**.

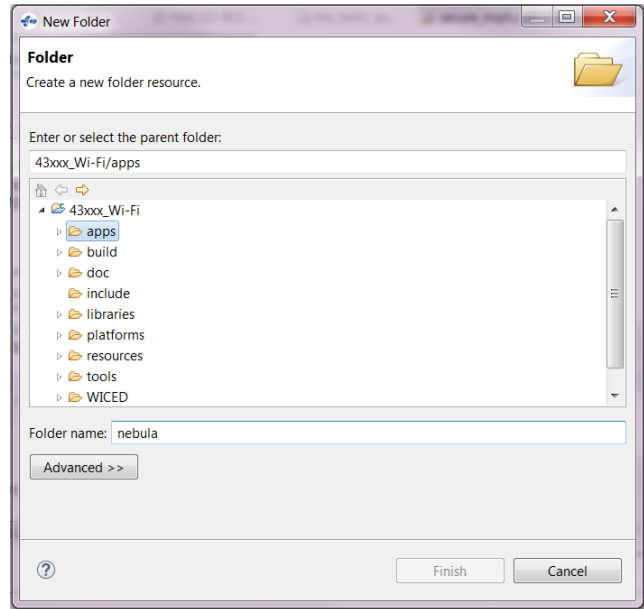
Creating a new folder in the *apps* directory



Expected result:



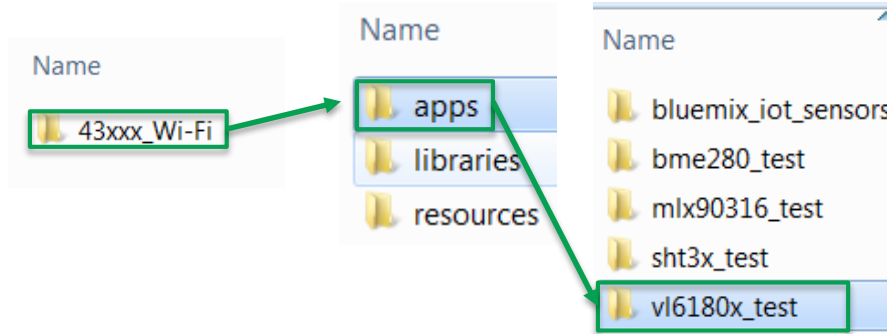
Creating a new folder in the *apps* directory



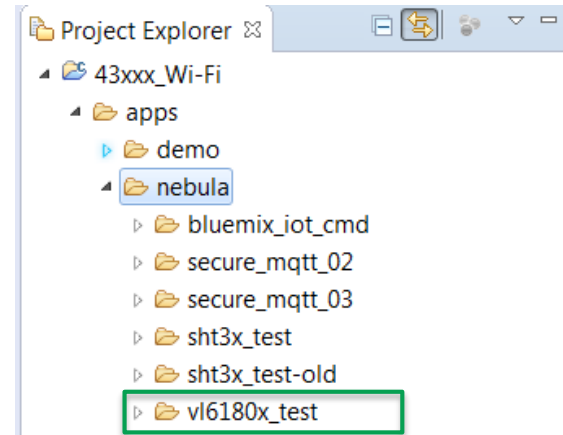
WICED Studio SDK: Create and Build your Own Application

2 Copy the example “vl6180x_test” code into the nebula folder.

VL6180x application code



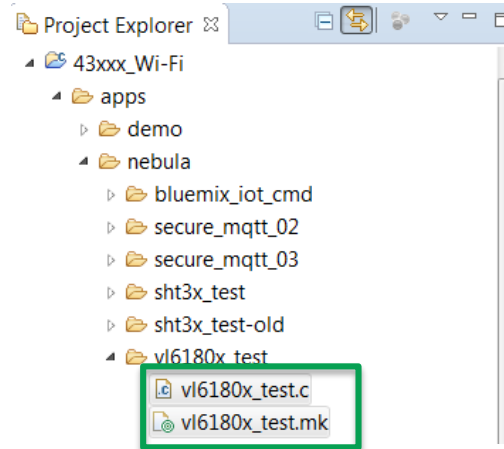
VL6180x application is copied and pasted under 43xxx_Wi-Fi → Apps → nebula



WICED Studio SDK: Create and Build your Own Application

3 Ensure the .c and .mk files are in the directory

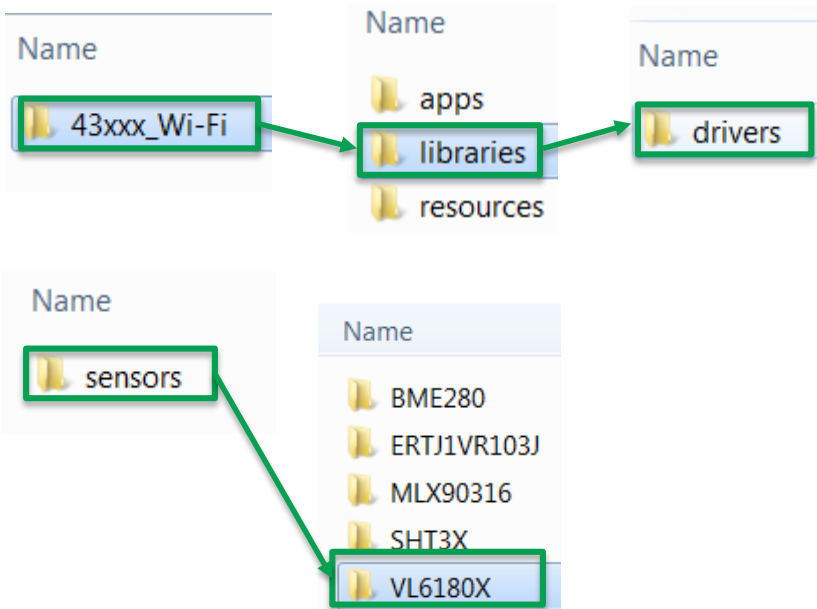
vl6180x_Test.c and vl6180x_test.mk



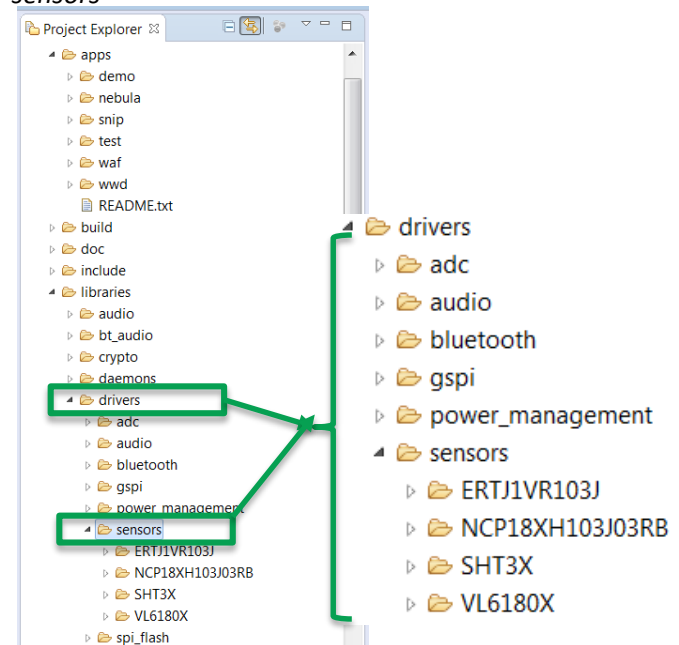
WICED Studio SDK: Create and Build your Own Application

4 Copy the VL6180X drivers into the WICED directory

Driver code is located under *sensor_code>libraries>drivers>sensors>VL6180X*



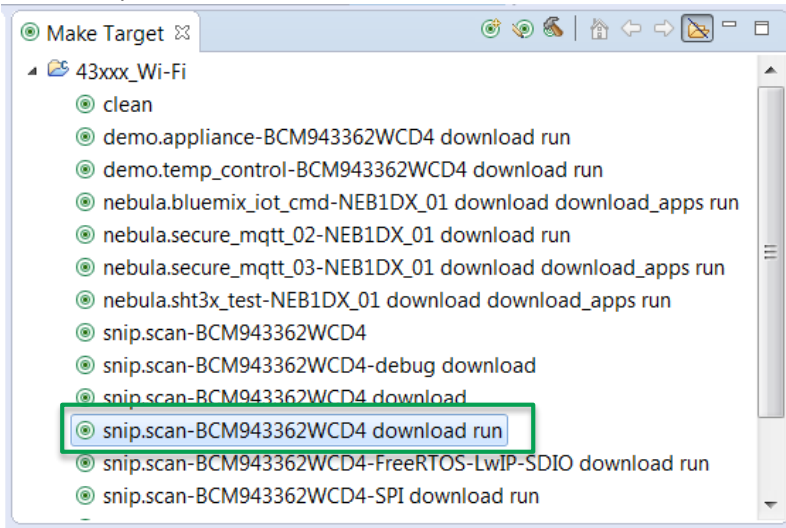
Paste it in WICED under *libraries > drivers > sensors*



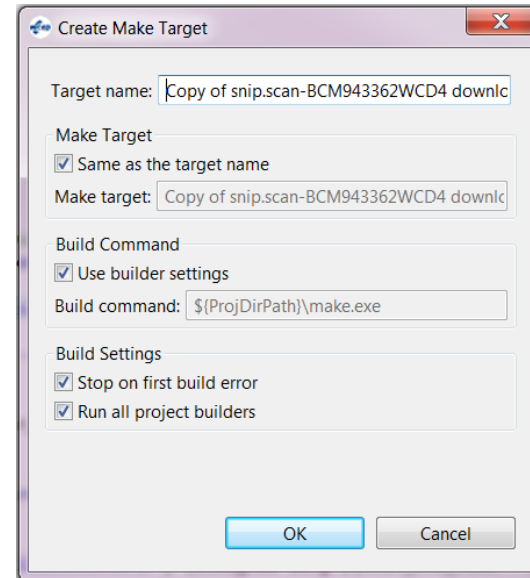
WICED Studio SDK: Create and Build your Own Application

- 5 In the **Make Target** window right-click and copy an example build target that ends with **download run**.

Select *snip.scan-BCM943362WCD4 download run*



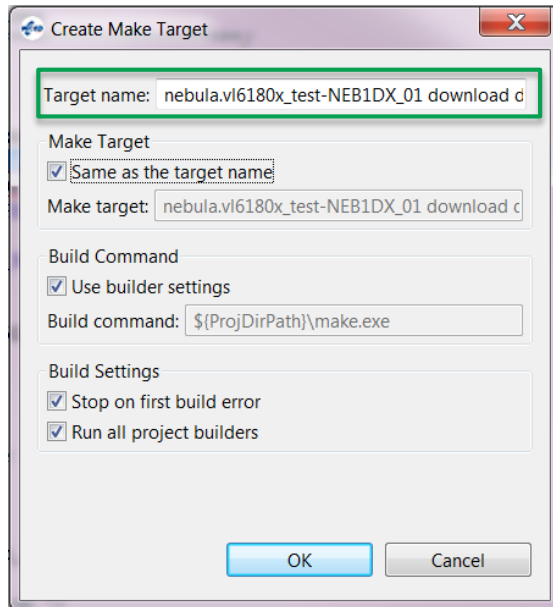
- 6 Paste the example build target in the **Make Target** window. The **Create Make Target** window opens automatically to enable you to edit build options.



WICED Studio SDK: Create and Build your Own Application

- 7 Modify the **Target name** to match the following format:
`<application.folder.path>-<target platform> download download_apps run` and press *OK*.

The target name is modified to *nebula.vl6180x_test-NEB1DX_01 download download_apps run*

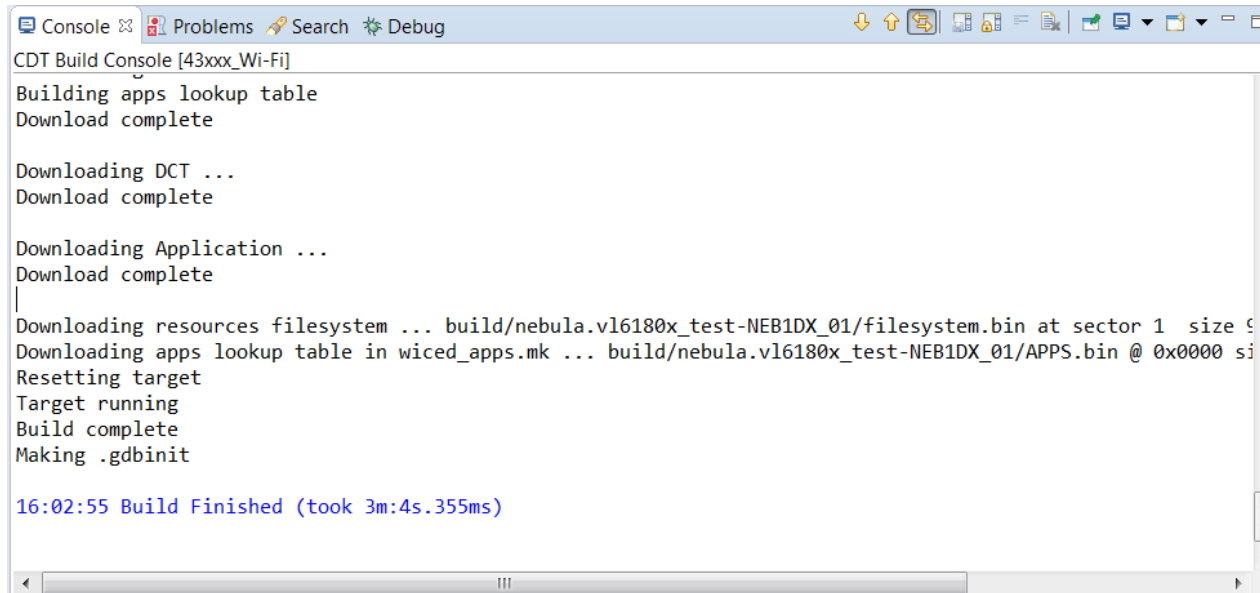


You only need to include the **download_apps** option if you expect that the external flash needs to be updated. Since this is our first build and the Wi-Fi module firmware is a resource stored in the external flash, we need to include this to make sure it is properly programmed.

WICED Studio SDK: Create and Build your Own Application

- 8 Double-click the newly created make target *nebula.vl6180x_test-NEB1DX_01* **download download_apps run** to build, download, and run your application.

Console window showing build output



```
CDT Build Console [43xxx_Wi-Fi]
Building apps lookup table
Download complete

Downloading DCT ...
Download complete

Downloading Application ...
Download complete

Downloading resources filesystem ... build/nebula.vl6180x_test-NEB1DX_01/filesystem.bin at sector 1 size 9
Downloading apps lookup table in wiced_apps.mk ... build/nebula.vl6180x_test-NEB1DX_01/APPS.bin @ 0x0000 s
Resetting target
Target running
Build complete
Making .gdbinit

16:02:55 Build Finished (took 3m:4s.355ms)
```

WICED Studio SDK: Create and Build your Own Application

9 Open a terminal program, observe output.

Expected result

```

COM94 - Tera Term VT
File Edit Setup Control Window Help
Ambient Light = 36 lux
Nothing within detectable range.

Starting WICED vWiced_006.000.000.0043
Platform NEBIDX_01 initialised
Started ThreadX v5.6
Initialising NetX_Duo v5.7_sp2
Creating Packet pools
WLAN MAC Address : DG:EF:CA:00:71:4C
WLAN Firmware   : w10: Oct 23 2017 03:54:15 version 7.45.98.38 (r674442 CY) FWID 01-acea29d1
WLAN CLM        : API: 12.2 Data: 9.10.39 Compiler: 1.29.4 ClmImport: 1.36.3 Creation: 2017-10-23 03:45:22
--- U16180X Proximity and Ambient Light Sensor Snippet ---
Ambient Light = 45 lux
Nothing within detectable range.
Ambient Light = 39 lux
Nothing within detectable range.
Ambient Light = 407 lux
Nothing within detectable range.
Error reading ambient light! Err = 1
Range = 102 mm
Error reading ambient light! Err = 1
Range = 100 mm
Ambient Light = 1477 lux
Range = 142 mm
Ambient Light = 1415 lux
Range = 159 mm
Ambient Light = 1336 lux
Range = 176 mm
Ambient Light = 1285 lux
Range = 166 mm
Ambient Light = 1358 lux
Range = 160 mm
Ambient Light = 1432 lux
Range = 142 mm
  
```



Baud rate: 115200
Data: 8 bit
Parity: none
Stop: 1 bit
Flow control: none

Shine a flashlight near the proximity sensor on the click board and observe the ambient light reading.

THANK YOU!