

This manual is suitable for TT\_M3HQ and TT\_M4G9 development boards designed and manufactured by Thunder Software Technology Co., Ltd.  
 In this paper, TT\_M3HQ and TT\_M4G9 development boards are referred to as development boards. For TT\_M3HQ and TT\_M4G9, please refer to the following links for details.

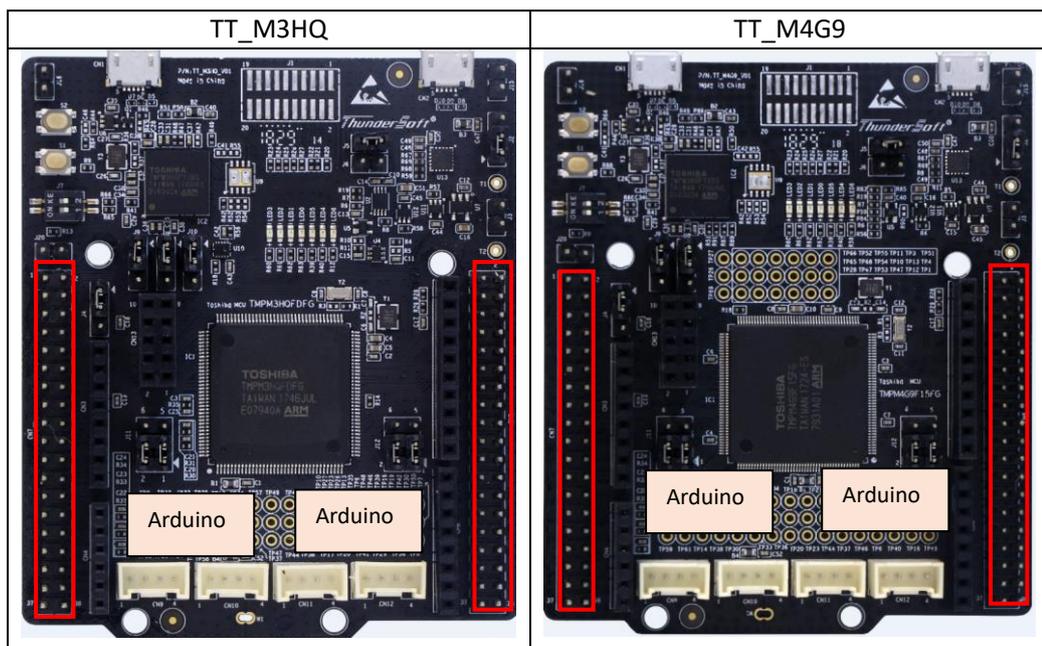
Official	TT_M3HQ	<a href="https://www.thundersoft.com/index.php/iot/kit/m3hq/3-126">https://www.thundersoft.com/index.php/iot/kit/m3hq/3-126</a>
	TT_M4G9	<a href="https://www.thundersoft.com/index.php/iot/kit/m4g9/3-127">https://www.thundersoft.com/index.php/iot/kit/m4g9/3-127</a>
mbed	TT_M3HQ	<a href="https://os.mbed.com/platforms/TT-M3HQ/">https://os.mbed.com/platforms/TT-M3HQ/</a>
	TT_M4G9	<a href="https://os.mbed.com/platforms/TT-M4G9/">https://os.mbed.com/platforms/TT-M4G9/</a>

For the Shield Board X-NUCLEO-6180XA1 used in this manual, please refer to the following links, referred to as the Shield Board in this article.

ST Official	<a href="https://www.st.com/content/st_com/en/products/imaging-and-photonics-solutions/proximity-sensors/vl6180x.html">https://www.st.com/content/st_com/en/products/imaging-and-photonics-solutions/proximity-sensors/vl6180x.html</a>
mbed	<a href="https://os.mbed.com/components/X-NUCLEO-6180XA1-Proximity-and-ambient-l/">https://os.mbed.com/components/X-NUCLEO-6180XA1-Proximity-and-ambient-l/</a>

**Precautions No.1:**

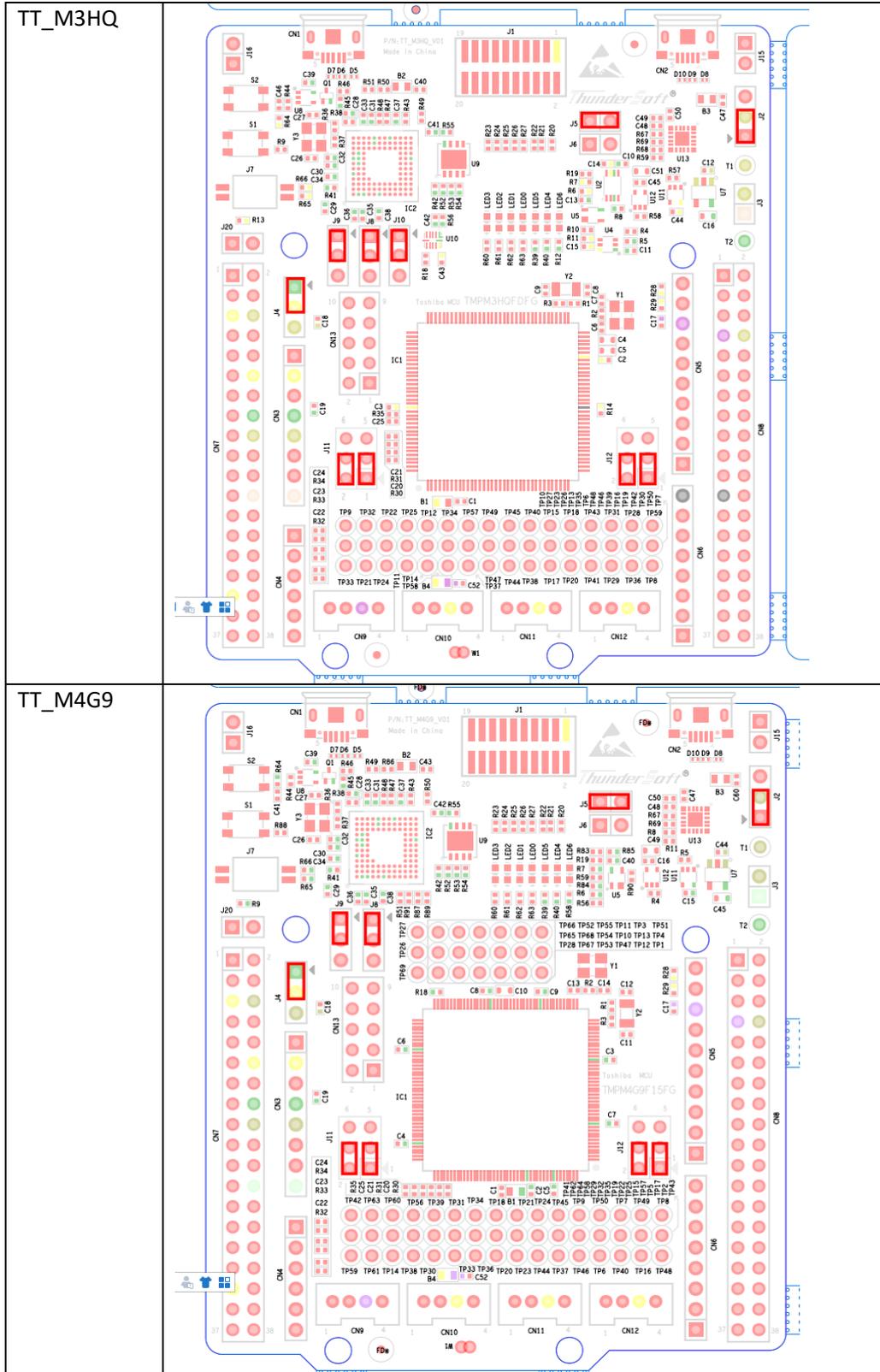
The final version of the development board is not equipped with the following extension connectors. If you need to use them, please solder the extension connectors or jump wire by yourself.



Precautions No.2:

Please confirm that the jumper caps are installed correctly as below before use.

(The jumper caps are installed according to the default state in factory. However, the jumper caps may fall off during use, which may cause the board to fail to start.)



Operation steps:

Step1: Download the corresponding test code from the official website or mbed website, as shown below.

 A8491	2018/8/24 18:00
 BH1790GLC	2018/9/7 10:58
 DoorStatus	2018/8/6 15:16
 FRDM_FXS_MULTI_B	2018/9/5 10:22
 HTU21D	2018/8/6 15:16
 IKS01A2	2018/8/20 17:58
 LCD	2018/9/11 16:24
 MPU6050	2018/8/6 15:16
 PirSensor	2018/8/6 15:16
 VL6180XA1	2018/8/24 17:58
 main.cpp	2018/9/25 15:43
 readme.txt	2018/9/11 16:21

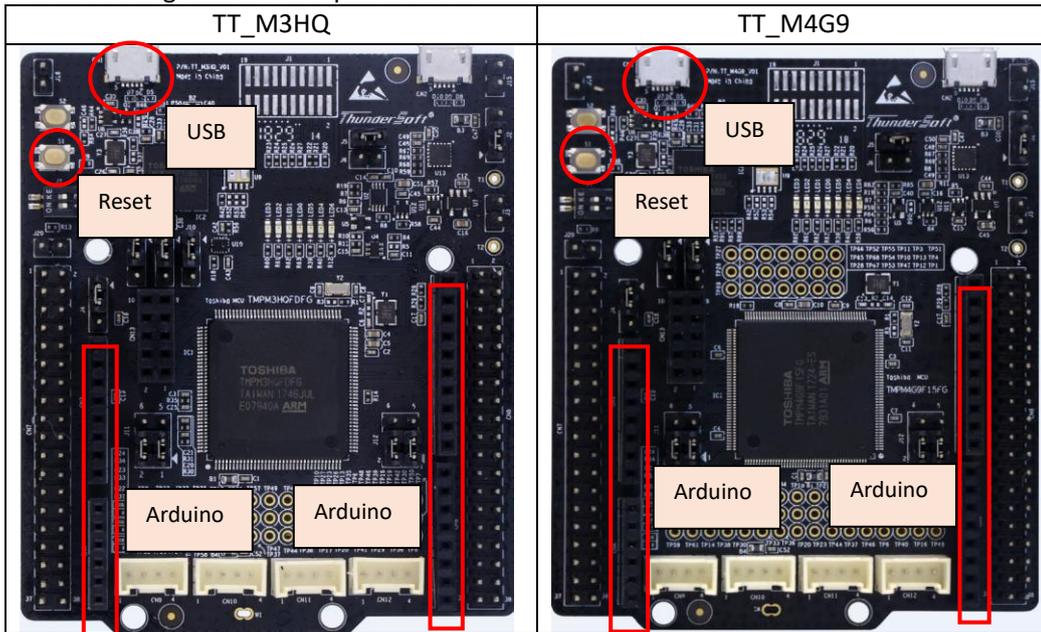
Step2: Compile source code

Developers can compile code in command line tools with the following commands.

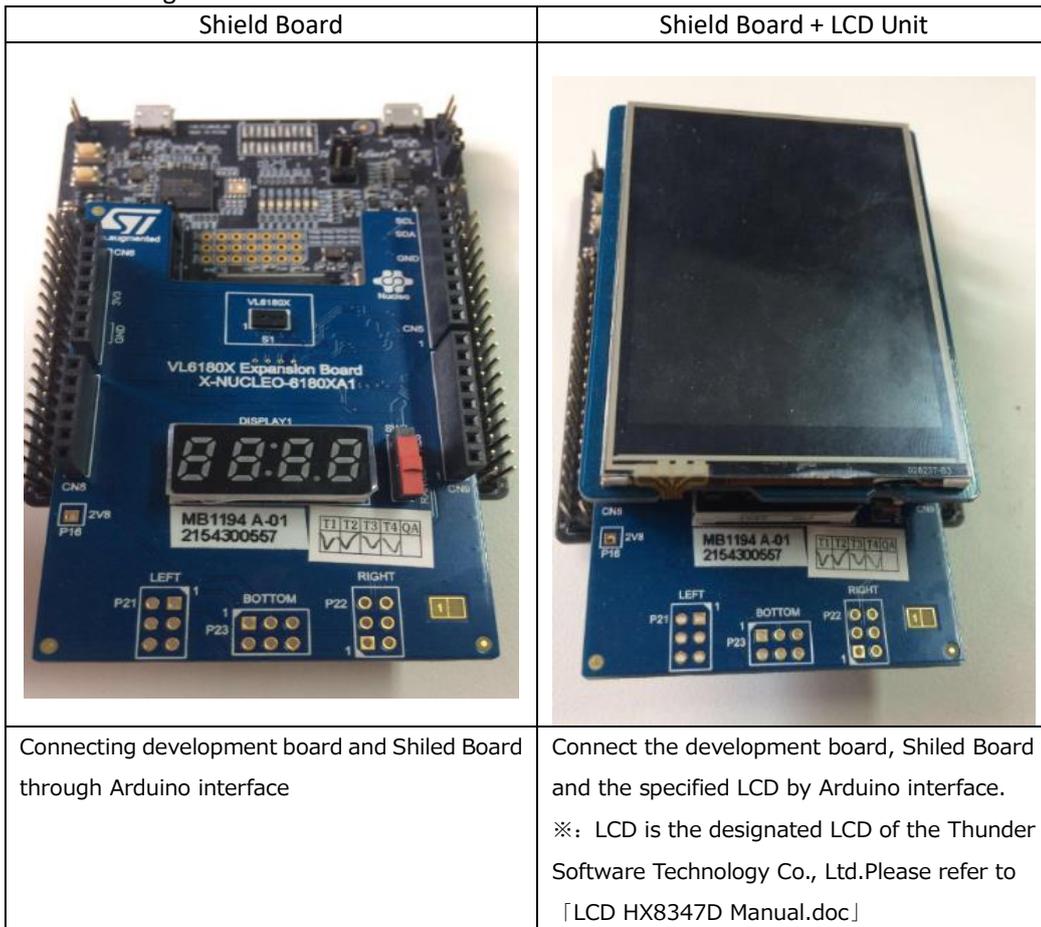
TT_M3HQ	<code>mbed compile -t GCC_ARM -m TT_M3HQ -D TEST_VL6180</code>
TT_M4G9	<code>mbed compile -t GCC_ARM -m TT_M4G9 -D TEST_VL6180</code>

Step3: Connect development board, Shield Board (and LCD screen).

Schematic diagram of development board:

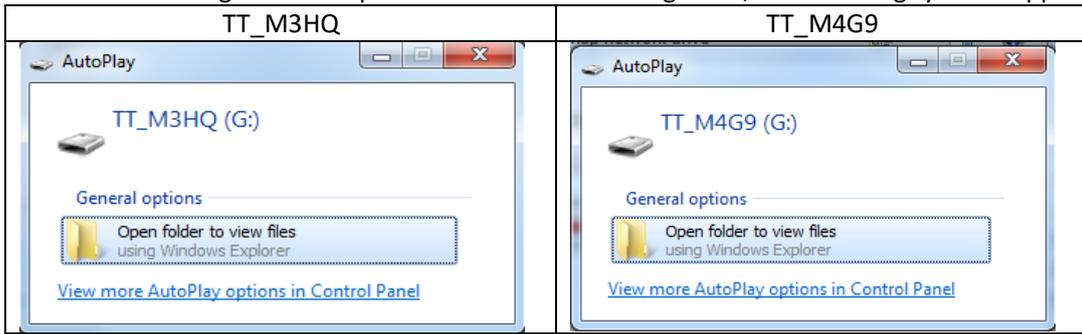


Schematic diagram of connection:



Step4:Burn .bin file:

After connecting the development board and PC through USB, the following symbols appear.



Then drag and drop (or copy) the .bin file compiled in Step2 to the corresponding symbols. After the drag and drop (copy) is completed, press the reset key, and the following output will appear.

	Serial port Log output	LCD output
Output format	<pre> Welcome to Thundersoft TT_M3HQ sensor1 id = 0xxx sensor2 id = 0xxx sensor3 id = 0xxx sensor1 data = sensor2 data = sensor3 data =           </pre>	<pre> Welcome to Thundersoft TT_M3HQ sensor1 id = 0xxx sensor2 id = 0xxx sensor3 id = 0xxx sensor1: data sensor2: data sensor3: data           </pre>
Output example	<pre> Welcome to Thundersoft TT_M4G9 VL6180X ID = 0xb4 STMPE1600 ID = 0x1 Range = 8 ALS = 256 Range = 8 ALS = 256 Range = 8 ALS = 256 Range = 9 ALS = 256 Range = 9 ALS = 256 Range = 9 ALS = 256 Range = 5 ALS = 256 Range = 4           </pre>	<p>The image shows a photograph of an LCD screen displaying the following text in red and black: 'Welcome to Thundersoft TT_M4G9', 'VL6180 ID:0xB4', 'STMPE ID: 0x01', 'VL6180X RANG:', '6', 'VL6180X ALS:', '512'. The screen is mounted on a board with some components visible at the bottom.</p>

The developer can compile and write the program to the development board through IAR / KEIL after getting the code. This article will not introduce the use of IAR and KEIL, so the developer can debug it by himself.