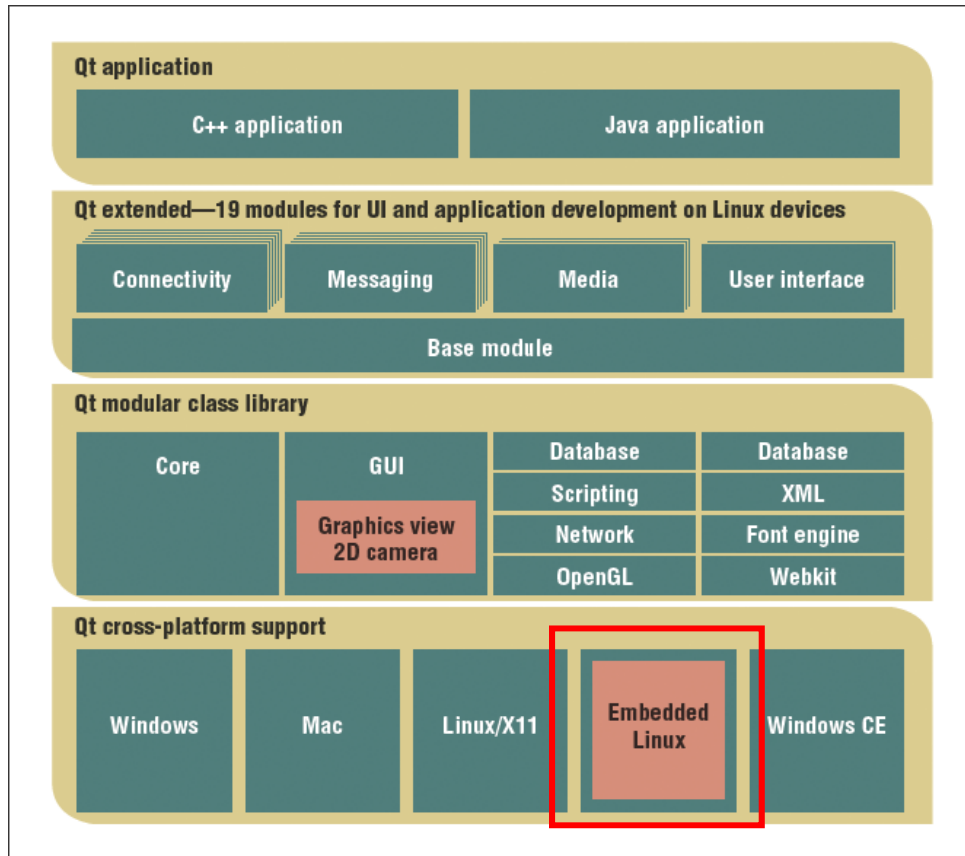# 1. HMI Linux – QT Version

**QT Architecture Diagram**

QT supports multiple platforms, so it only provides minimal library support. The HMI LINUX is an embedded Linux category.

**Development Notice**

(1) Applications compiled directly from the QT IDE development environment cannot be executed directly on HMI LINUX. Applications on the ARM platform must be cross-compiled before they be executed.
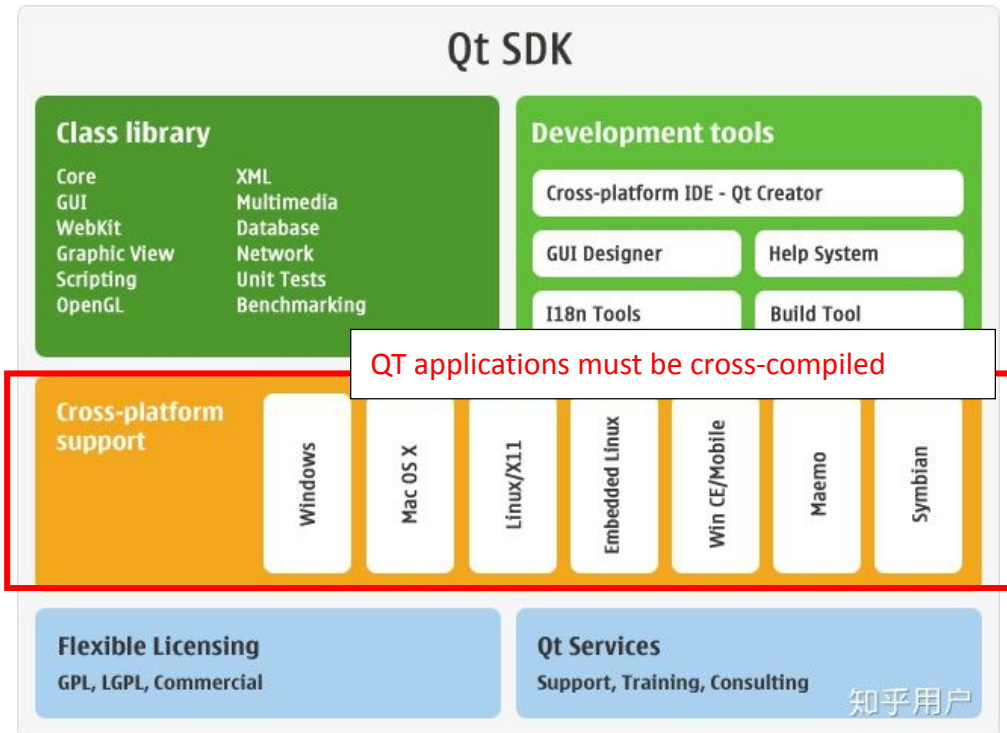

(2) According to the type of ARM, the supported functions are also different. The HMI of the DMATEK uses ArmV7, and the ARMv7 supports 32-bit space and 32-bit operations. Support for 64-bit computing is only available on Amv8 and above.
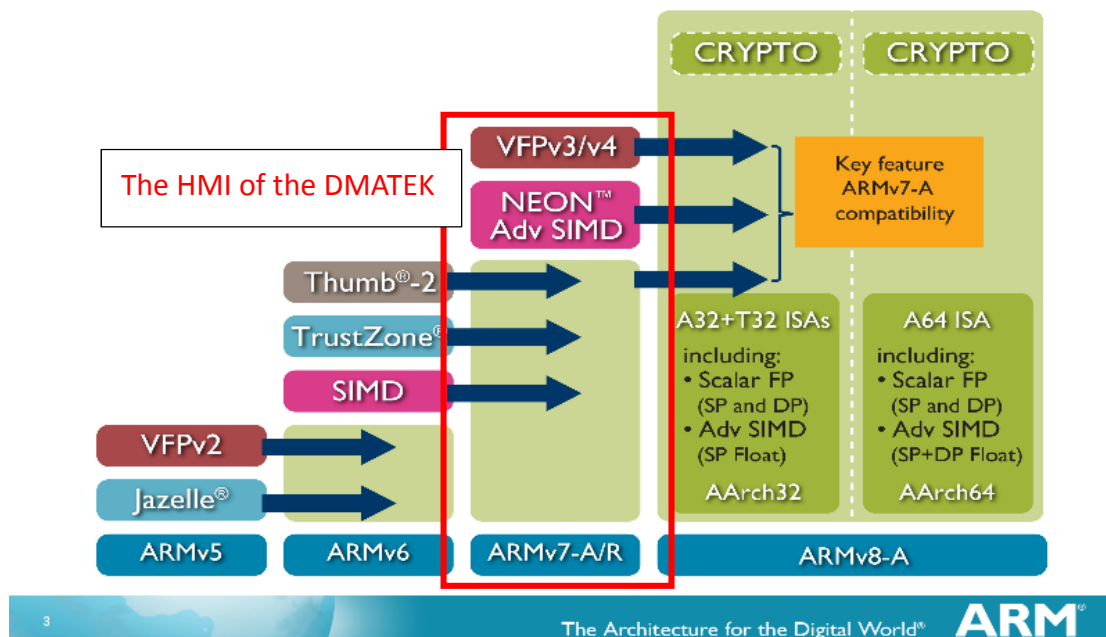
(3) The HMI of the DMATEK currently offers a QT 5.4 environment with minimal library support. Any required development libraries such as nodejs, php, etc., developers must cross-compile to transplant

QT 5.4 itself has no interface and application, so any required library must be transplanted by the developer.
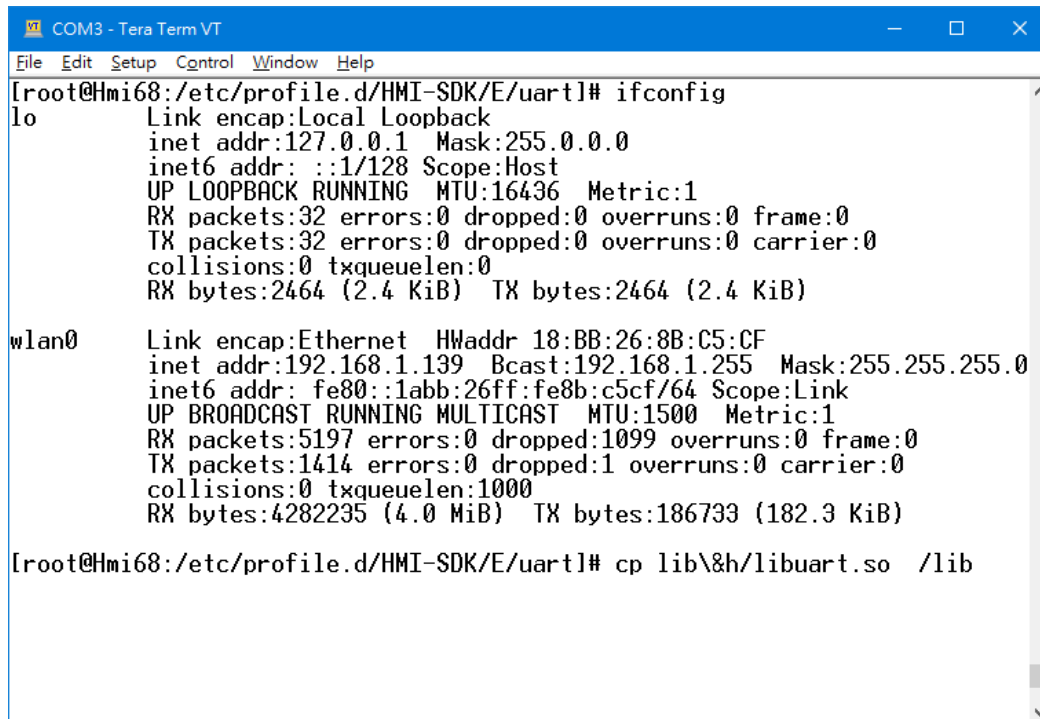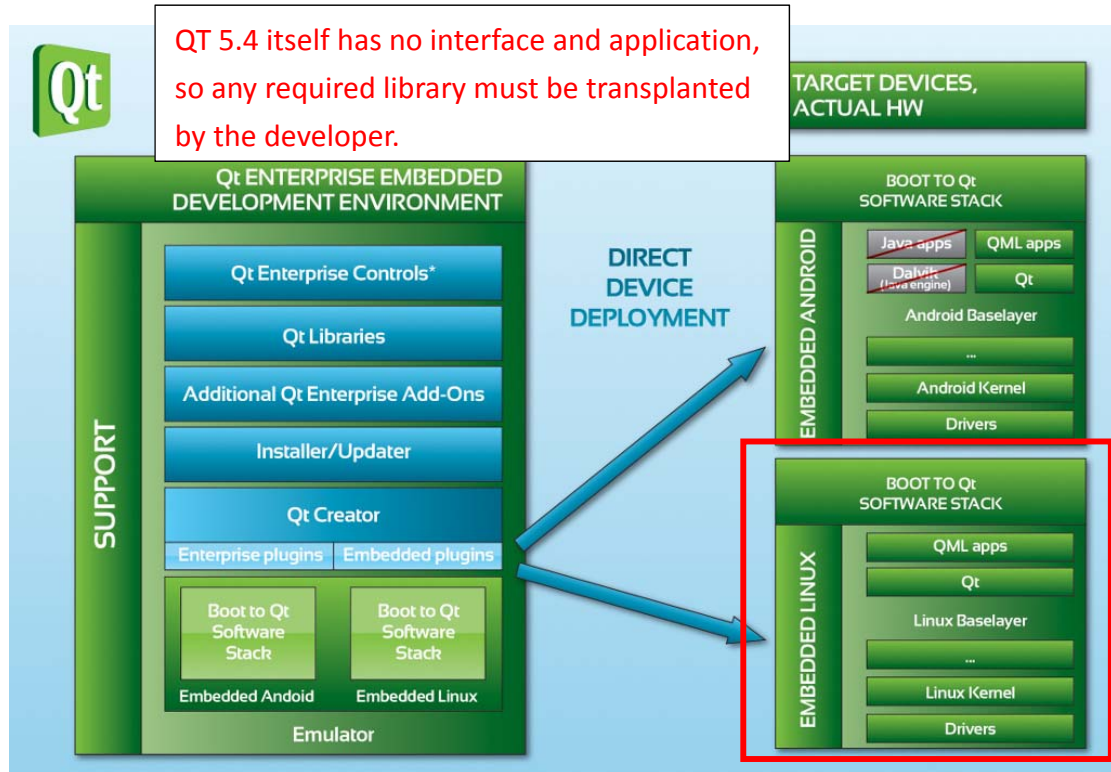
(4) The development environment provided by the HMI of the DMATEK is as follows
   a. **Ubuntu.iso** with development tools such as cross compilers
   b. Development documents
   c. Cross compiler

Cross compiler
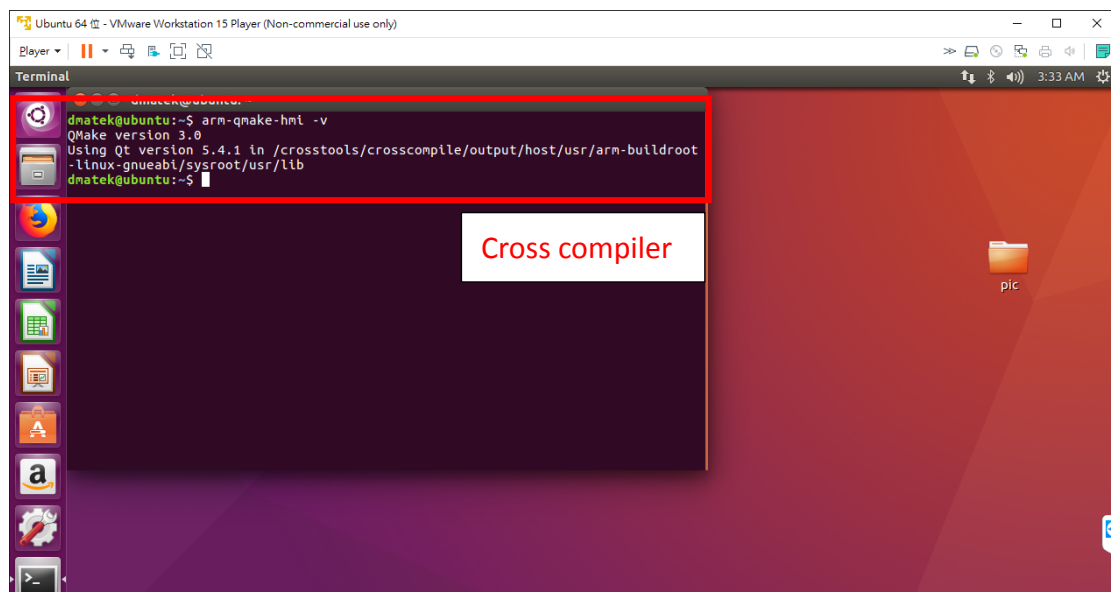
(5) The HMI of the DMATEK only provides a simple demo interface and SDK .

Command interface

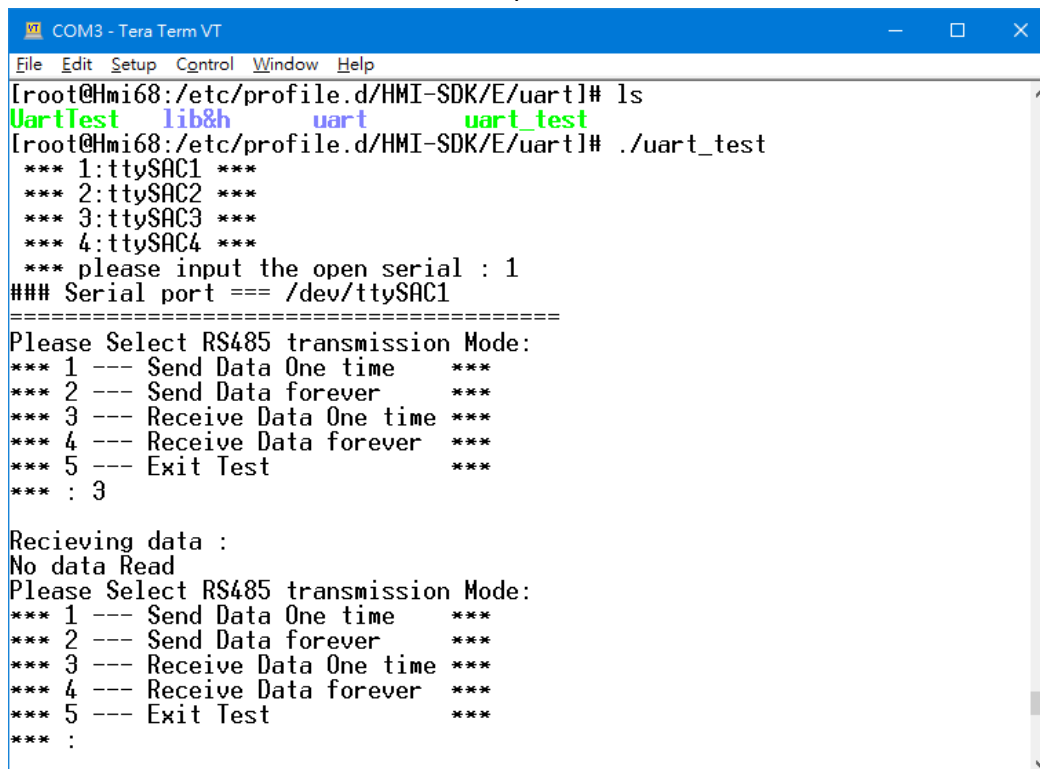   a.   Command interface - general linux command

```
COM3 - Tera Term VT                                          —    □    ×
File  Edit  Setup  Control  Window  Help
[root@Hmi68:/etc/profile.d/HMI-SDK/E/uart]# ifconfig
lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:32 errors:0 dropped:0 overruns:0 frame:0
          TX packets:32 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:2464 (2.4 KiB)  TX bytes:2464 (2.4 KiB)

wlan0     Link encap:Ethernet  HWaddr 18:BB:26:8B:C5:CF
          inet addr:192.168.1.139  Bcast:192.168.1.255  Mask:255.255.255.0
          inet6 addr: fe80::1abb:26ff:fe8b:c5cf/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:5197 errors:0 dropped:1099 overruns:0 frame:0
          TX packets:1414 errors:0 dropped:1 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:4282235 (4.0 MiB)  TX bytes:186733 (182.3 KiB)

[root@Hmi68:/etc/profile.d/HMI-SDK/E/uart]# cp lib\&h/libuart.so  /lib
```

    b.   Command interface - SDK example, UART demo

```
COM3 - Tera Term VT                                          —    □    ×
File  Edit  Setup  Control  Window  Help
[root@Hmi68:/etc/profile.d/HMI-SDK/E/uart]# ls
UartTest    lib&h       uart        uart_test
[root@Hmi68:/etc/profile.d/HMI-SDK/E/uart]# ./uart_test
 *** 1:ttySAC1 ***
 *** 2:ttySAC2 ***
 *** 3:ttySAC3 ***
 *** 4:ttySAC4 ***
 *** please input the open serial : 1
### Serial port === /dev/ttySAC1
========================================
Please Select RS485 transmission Mode:
*** 1 --- Send Data One time      ***
*** 2 --- Send Data forever       ***
*** 3 --- Receive Data One time ***
*** 4 --- Receive Data forever    ***
*** 5 --- Exit Test               ***
*** : 3

Recieving data :
No data Read
Please Select RS485 transmission Mode:
*** 1 --- Send Data One time      ***
*** 2 --- Send Data forever       ***
*** 3 --- Receive Data One time ***
*** 4 --- Receive Data forever    ***
*** 5 --- Exit Test               ***
*** :
```

Graphical interface

※The test application on the interface is as follows

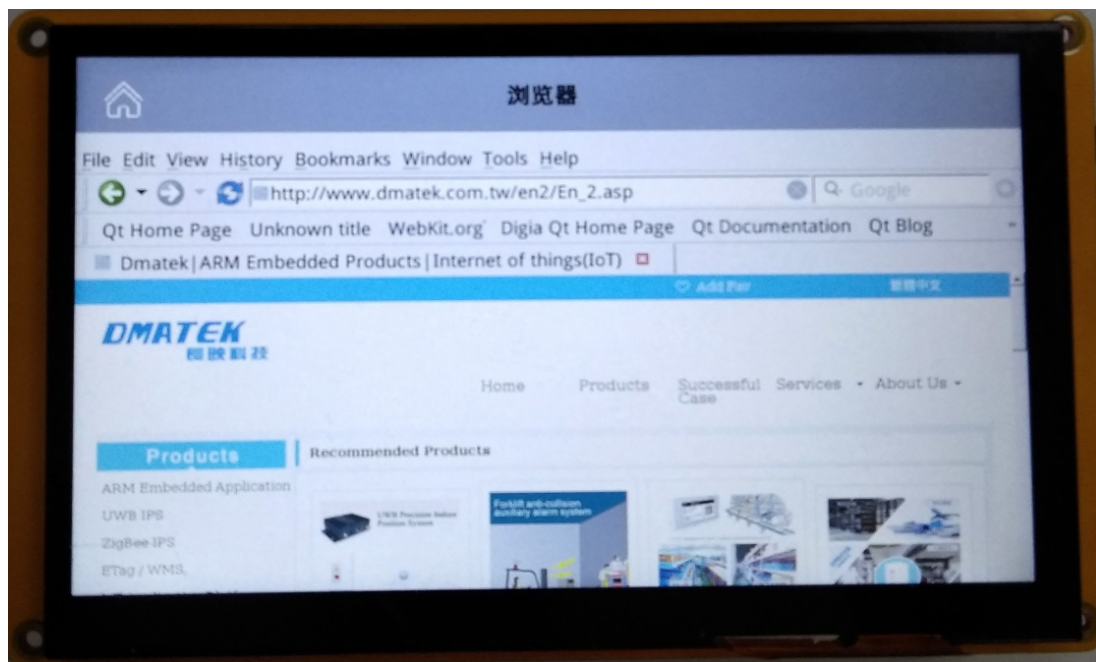| Application	Application function
Uart	1. RS232/RS485-serial port on/off 2. COM1 / COM2 / COM3 - 3-channel serial port selection 3. 9600/19200/57600/115200 - 4 baud rate selection 4. Data transmission and reception
GPIO	1. 8-channel input detection 2. 8-channel output potential setting and reading
Buzzer	1. Buzzer function test - on/off
Backlight	1. Backlight function test - The value is adjustable from 10 to 255. The bigger the number, the brighter it is.
WIFI	1. WIFI function test - open / search / connect / close
LCD	1. LCD colors - click on the screen to change color
Touch	1. Four-point touch point track display
Ethernet	1. DHCP function test 2. Static IP function test
Browser	1. Internet web page test - test network connection
Language	1. Three language changes - Traditional/Simplified/English

a. User interface - OT test application

b. User interface - WIFI connection test picture
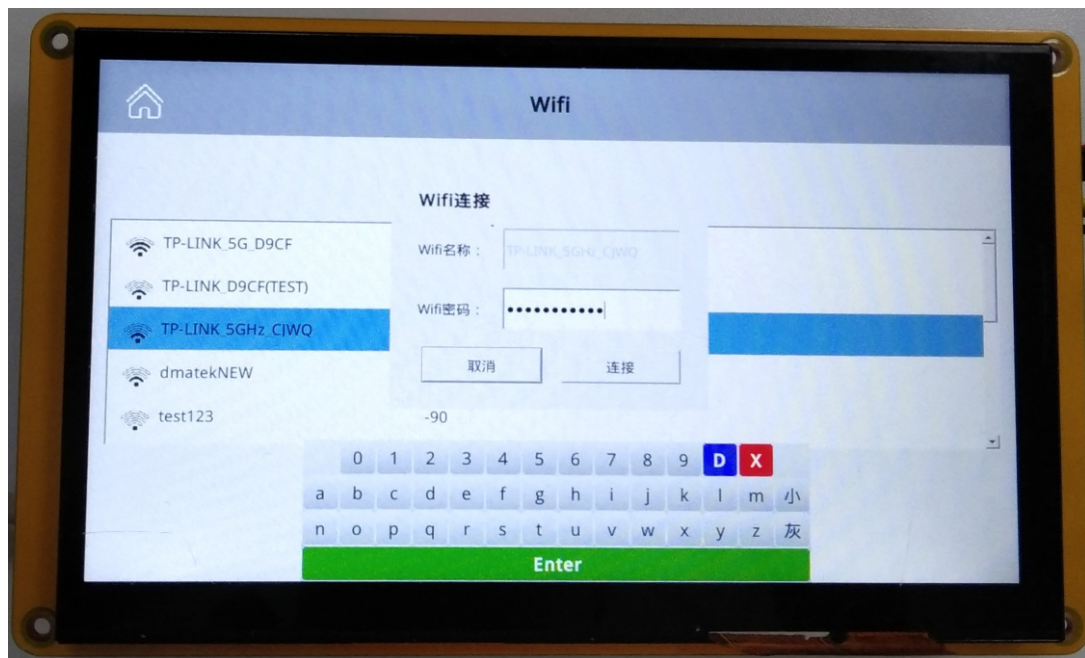
c. User interface - QT browser test picture

(6) Hardware development
  a. If the application involves controlling the underlying hardware, such as UART, reboot, and so on. Developers need to call the SO file provided by DMATK (providing a function interface to control the hardware)
  b. If the developer wants to add equipment such as sensors. Unless DMATEK already provides control methods (such as uart, gpio, etc. already provided in the SDK), please contact DMATEK when ordering.
  c. GPIO is a fixed 8-channel output and 8-channel input. For other GPIO function requirements, please submit it at the time of ordering. GPIO output voltage is 3.3V
  d. RS232 and RS485 functions are only potential conversion after UART output. Currently, HMI does not provide upper layer communication protocol such as Modbus.

SDK Content

Item	SDK	Demo Function
Backlight	libbacklight.so	1. Backlight brightness adjustment 2. Command interface example 3. QT interface example
Buzzer	libbuzzer.so	1. Turn on the buzzer 2. Turn off the buzzer 3. Get the buzzer status 4. Command interface example 5. QT interface example
front	Nono	1. Install display font 2. Call display font 3. QT interface display example
GPIO	libgpio.so (Single GPIO control)	1. Set a single output to high potential 2. Set a single ouput to low potential 3. Read the output potential state 4. Detecting the input potential state 5. Command interface example 6. QT interface example
	libgpio.so (8-channel control)	1. This feature requires updating imag 2. Simultaneously set the 8-channel output potential 3. Simultaneously read the 8-channel input

		potential state
		4. Command interface example
UART	libuart.so	1. Turn on the UART and receive messages
		2. Send hex message
		3. Send string message
		4. Command interface example
		5. QT interface example
USB Update	Nono	1. Update installed apps with USB
		2. QT interface update apps example
WIFI	libWifiLib.so libWifiLib.so.1 libWifiLib.so.1.0 libWifiLib.so.1.0.0	1. Turn on WIFI function
		2. Search WIFI
		3. Get WIFI strength, SSID and other information
		4. Connect to WIFI
		5. Turn off WIFI function
		6. QT interface example