SFM6000 Series

The new Suprema SFM6000 Series represents a great leap forward in biometrics.
SFM6000 Series offers unrivaled matching performance, higher level of security, rich communication interfaces, improved durability and easier integration tools. Powered by the world's best, multi-award winning Suprema fingerprint algorithm, SFM6000 Series provides unrivaled matching speed(5,000 match/sec), enhanced security(30% lower FRR) larger user capacity(up to 25,000) and improved sensor durability and precision.
By providing loads of integration-oriented features and 100% backwards compatibility to existing SFM5000 Series modules, SFM6000 Series offers refined fingerprint security solution to developers and manufacturers for integration with various applications including access control, time & attendance, mobile, kiosks, safes, door locks and so on.

USER MANUAL– QUCICK START

High-performance Embedded Fingerprint Modules

1 | DOCUMENT INFO

This article is user manual for SFM60X0 Module. Click the following links to learn about the SFM Modules.
https://www.supremainc.com/en/Embedded-Modules

Specification

- Hardware

Models	SFM6020-OP6	SFM6030-OC6	SFM6050-TC1	SFM6050-TC2
Sensor				
Sensor Model	OP6	OP6	TC1R	TC2R
Sensor Type	Optical (Superior Quality/ Waterproof)	Optical (Waterproof)	Capacive (Anti-latent fingerprint coated)	
Resolution (dpi)	500		508	
Sensing Area (mm)	16.0 x 19.0	16.0 x 18.0	12.8 x 18.0	10.4 x 14.4
Image Size (pixel)	272 x 320	288 x 288	256 x 360	208 x 288
Finger Rotation (°)	- 90° ~ + 90°			
Sensor Dimension (LxWxH) (mm)	20.5 x 25 x 52	21 x 23 x 54	20.4 x 27 x 3.5	
General				
CPU	1.0GHz (MIPs)			
Flash Memory	8MB (NOR Flash/16MB option available)			
Biometrics				
EER	< 0.1%			
Enrollment Time	< 330ms			
1:1 Verification Time	< 330ms			
1:1000 Identification Time*	< 400ms			
Template Type	Suprema, ISO19794-2, ANSI-378			
Template Size	Default: 384 Bytes, 256 - 384 Bytes (Configurable)			
Template Capacity	5,000 @ 8MB Flash / 25,000 @ 16MB Flash			
Encryption (Fingerprint Data)	256-bit AES			
Interfaces				
Host Communication	Asynchronous serial: CMOS level (3.3V), up to 115200 bps & USB (ADB)			
External I/O	8x Digital I/O			
Hardware				
Operating Temperature Range (°C)	-15 to 60 °C			
Supply Voltage	2..5 ~ 5.5 VDC Regulated			
Board Size (L x W x H) (mm)	55 x 40 x 8			

* Average 1:1000 genuine identification time including feature extraction

- Software
  - Linux 3.10.14 (gcc version 4.7.2)

Document Version: 1.10.00

Development Environment:

- Compiler: gcc version 4.7.

Table of Contents

There are two ways to use SFM6000 is.

- Using EVK2.0 Board

- Using UnifingerUI application

2.1 USING EVK2.0 BOARD

2.1.1 Mounting

Fig1) EVK2.0 board with SFM60x0 module

2.1.2 Connection sensors

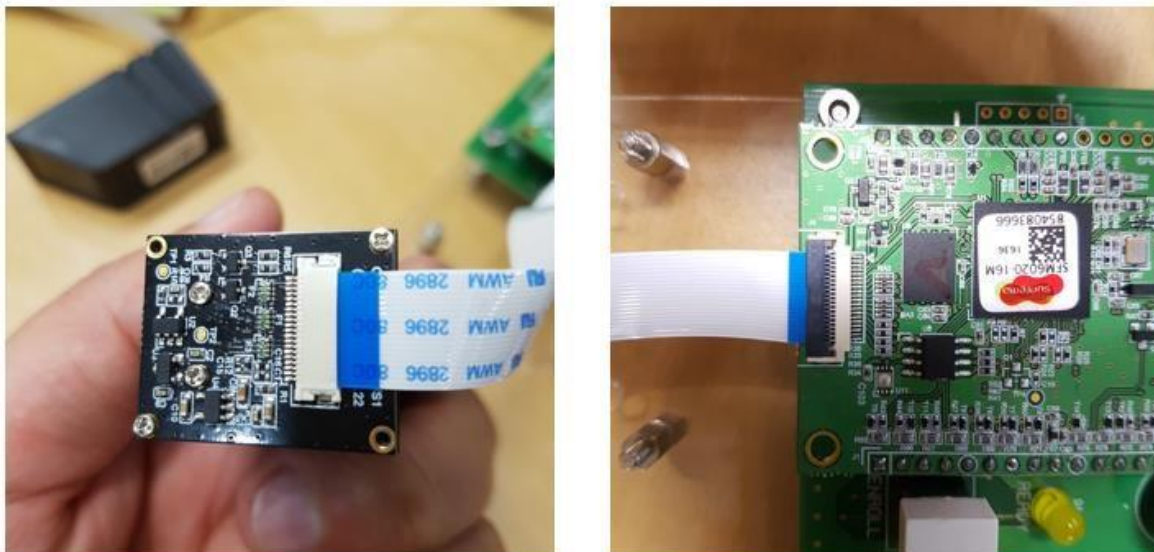: Make the cable connection with the sensor like as below.

Fig2) Connection sensor

2.1.3 Connection Power or USB

: Power connector has 3 functions lines,

- Power (VCC)

- Protocol UART interface (RXD, TXD) : this is the same with COM port(LS1) in EVK board.

- USB interface (D+, D-) : Quickly it may update the OS + Firmware. Or you can use as
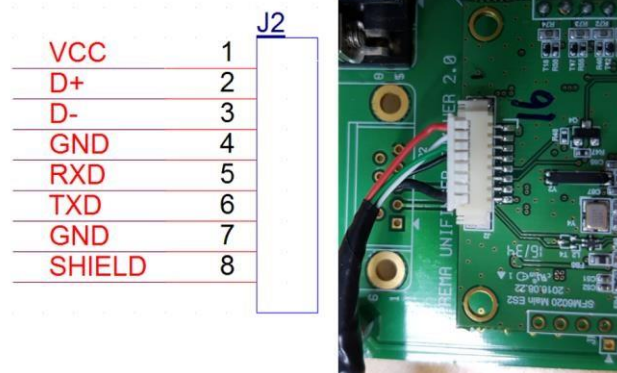
protocol interface

Fig3) Connection Power cable

2.1.4 Power on

: If SFM60x0 module boot complete, sensor red-LED turned twice.

2.1.5 Buttons events

: EVK2.0 board have the each events of 3 buttons.

- Enroll

- Identify

- Delete

2.2 **USING** UNIFINGERUI APPLICATION

For SFM60x0, UnifingerUI version is 5.3.7 like as below. You can download it from suprema

'support > download' site. https://supremainc.com/en/resource-category/downloads

Fig4) UnifingerUI ver5.3.7

2.2.1 Setting COM port

: SFM60x0 use the interface of protocol by COM port. (only RS232)

The default setting is like as below. (baud rate : 115200bps)

The baud rate is dependency on the host UART chip or module. The SFM60x0 is support from 9600bps to 921600bps. Never use more than that.
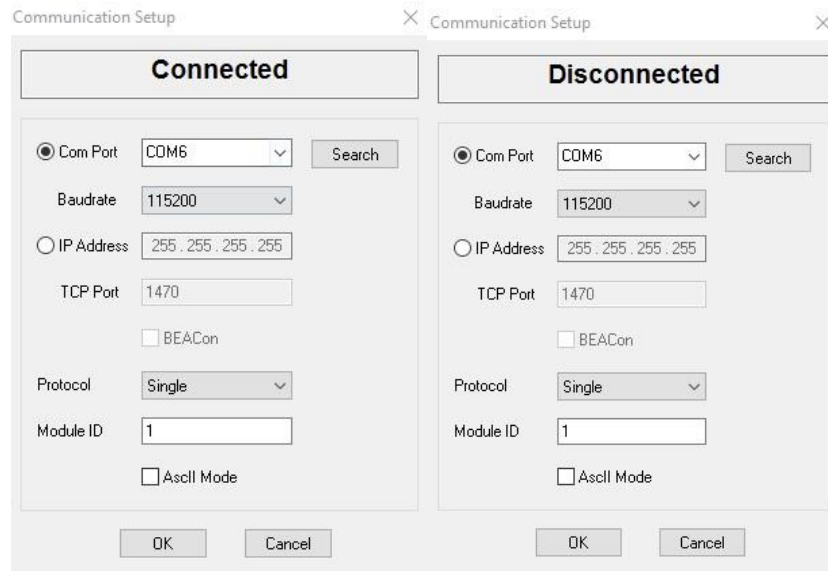

Fig5) Setting COM port

2.2.3 Functions

: You can use the various functions better than using EVK board.

After connecting COM port successfully with SFM60x0 module, UnifingerUI display some text like as below.

Fig6) UnifingerUI with SFM6020 module

2.2.3.1 Free Scan mode

: System parameter is set by UnifingerUI, can config free scan mode to 'on'. (default 'off') As well as this, you can config the various modes in 'System' tab.
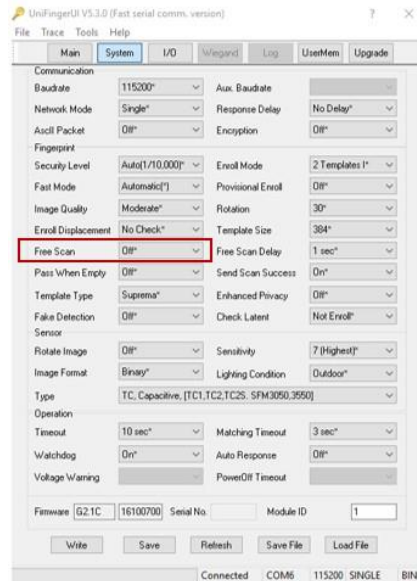

Fig7) Free Scan mode

2.2.3.2 Upgrade

: Suprema will provide the firmware for 'bug fix', 'performance improvement' etc...

Support firmware will be the kernel or firmware.

It is important, never apply another binary file, please use the own firmware.

So, you can upgrade the firmware with UnifingerUI like as below.

The firmware file is get from suprema support > download site.

https://supremainc.com/en/resource-category/downloads

The firmware file type is '**SFMFW**_SFM6020_OP6_G31C_XXX.bin'.

cf. 'SFMOS_SFM6020_OP6_G31C_XXX.bin' is OS binary file, this file must be use OS upgrade with SFM6_USBCloner tool.
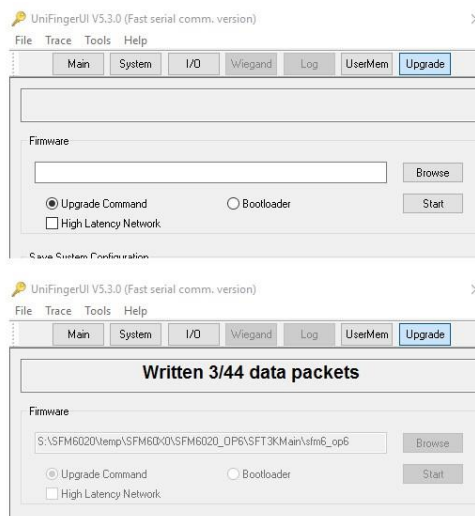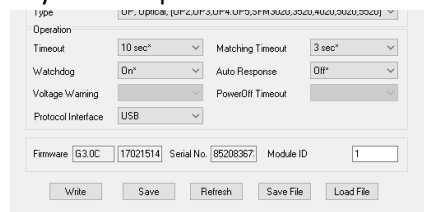
Fig8) Upgrade firmware

2.2.3.3 USB interface

: You can use the UART as well as the USB as the protocol interface. If you select the USB port, don't matter the baud rate – it is automatic, up to 2Mbps.

- **Setup USB protocol mode with using UnifingerUI (version 5.4.0)**

  : System > Operation > Protocol Interface: Select from UART to <u>USB</u> like as below and <u>Save</u>.

  SFM6000 will reconnect to the other COM port.

The Com port must be reconnected to the UnifingerUI.

- **Driver installation**

   : This process differs on each operation system, follow the directions below that pertain to your OS:
   - ✓ Windows
   - ✓ Linux

- **Windows Driver Install**

   Step1. Connect a power supply to the SFM60x0 with using USB cable from Suprema.

   Step2. Connect a USB cable from the SFM60x0 to an available USB socket your computer.

   Step3. Upon connecting the module, Windows will automatically attempt to install the driver and, unsurprisingly, it will fail. We'll have to manually install the driver.

   Step4. Open the Device Manager. (Either Start > Run > devmgmt.msc, or go to the Control Panel, select System and clock Device Manager.)

   Step5. Locate the Gadget Serial v2.4 device, under the Other devices tree. Right-click that and select Update Driver Software...
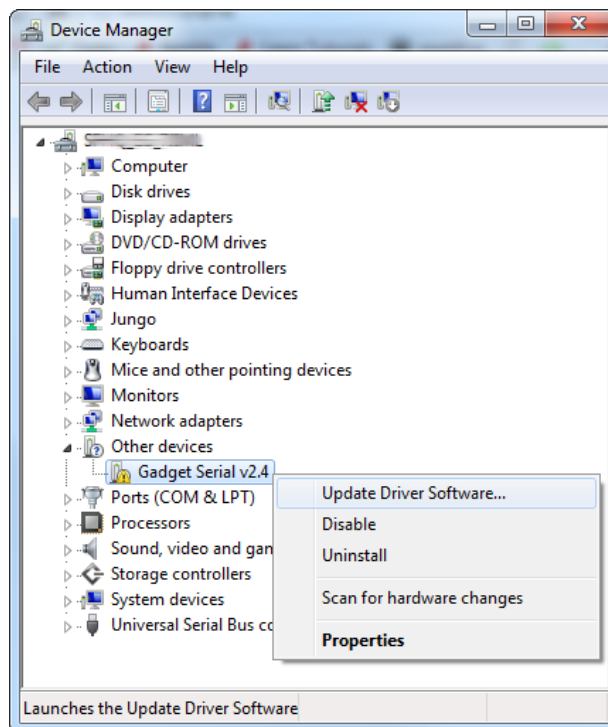
Step6. On the first windows that pops up, clock Browser my computer for driver software. And on the next page select Browse... and navigate to the `SFM6000\Gadget_Serial_V24` folder within your Suprema software installation. Then click Next.
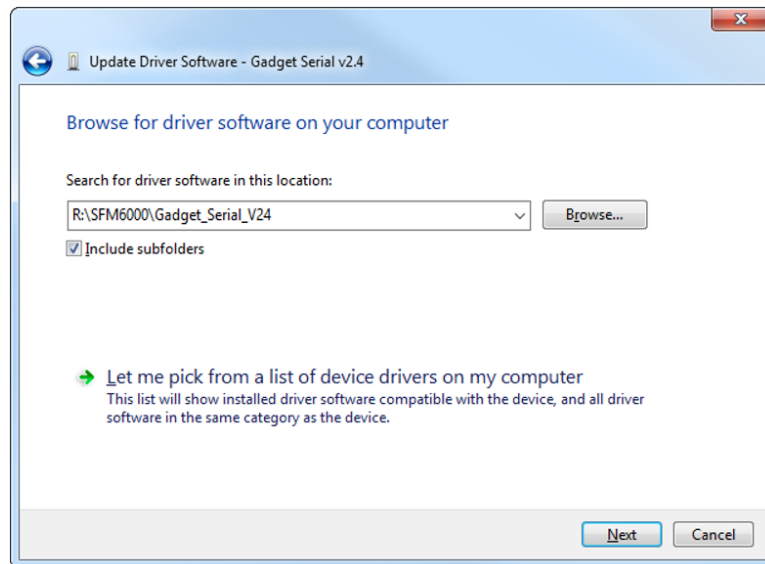
Step6-1. If the driver installation fails in step6 or could not find the driver, click "Let me pick from a list of device drivers on my computer" and select the device driver like as below.
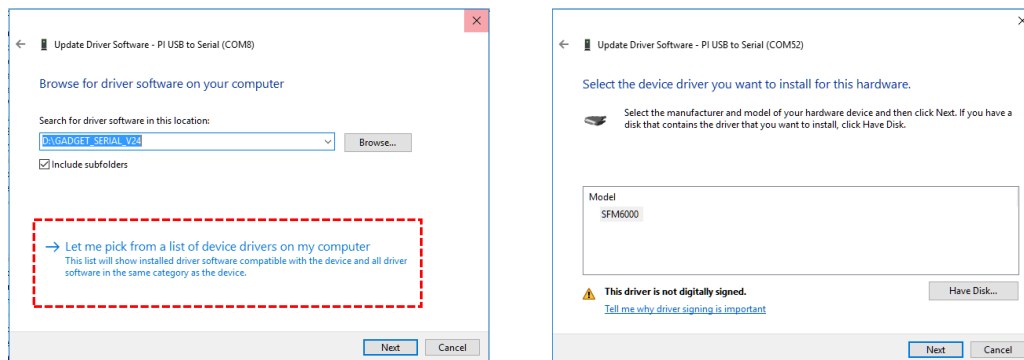
Step7. Click Install on the next Windows Security windows that pops up. And, after several loading-bar-scrolls, the installation should complete and you should be greeted with a Windows has successfully updated your driver software window.

Step8. Look back at the Device Manager, under the Ports tree now. There should be an entry for SFM6000 (COM #) – The name may be different, but it does not matter. Remember which COM # your SFM6000 module is assigned, it will be important for using UnifingerUI.

• **Linux Driver Install**

: Android's kernel is Linux so you must know Linux.

Drivers are not necessary to use the SFM6000 with Linux. Follow the steps below to install the module:

Step1. Connect a power supply to the SFM60x0 with using USB cable from Suprema.

Step2. Connect a USB cable from the SFM60x0 to an available USB socket your computer.

Step3. Open a terminal and type `ls /dev/ttyACM*`

Step4. Take note of the port number that the SFM6000 is assigned to, it will be important for using Android APP.
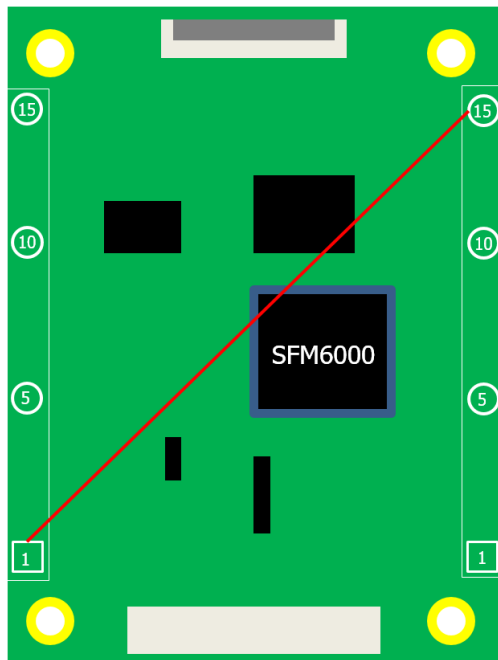
3.1 Reset the system parameter

If you accidentally set a UART baud rate that is not supported by the Host, or if you change the Interface to USB and the USB driver is not installed in the Host, you will want to initialize the System Parameter.

Requirement : Must upgrade OS – SFMOS_SFM60X0_OX6_G31C_XXX.bin

Step1. Power off the SFM60x0 module.

Step2. Remove the sensor from the SFM60x0 module.

Step3. Connect the J1 (15) and J3 (J1) pins as shown below.

Step4. Power on the SFM60x0 module.

Step5. Wait for 10seconds, in this the system parameter will be reset.