ILITEK
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ILITEK
Liunx Daemon

Version: V1.0.2.0
2020-09-24

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1 Purpose

➢ In Linux OS, Ilitek offers a method, “Command Line”, to command Ilitek IC to upgrade FW, test sensor and read FW version, etc.

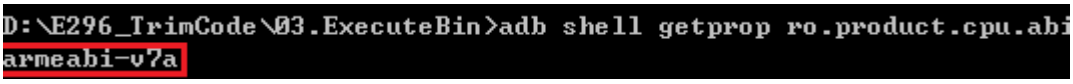
2 Install Daemon

➢ Example : (Android Platform)

2.1 check ARM base

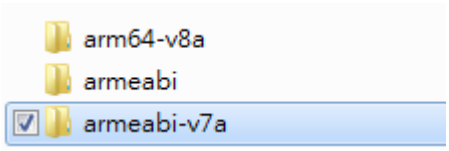
2.2 Excute: adb shell “getprop ro.product.cpu.abi”，

Pop up a screen as below. It is arm type in red marking information.



2.3 Open the corresponding “arm type” folder in “libs” directory. Copy the ilitek_ldvX.X.Xfile and paste into “data” folder in system directory.

Step1: Into “libs” directory :



Step2: Into “armeabi-v7a” directory, and copy “ilitek_ldvX.X.X”. Paste the file into data folder in system directory.

Command : adb push ilitek_ldvX.X.X /data/

X.X.X means daemon version.

2.4 Open Daemon Athority

➢ Need an authority in system root.

2.4.1 Command :adb shell setenforce 0

2.4.2 Command:adb shell chmod 777 ilitek_ldvX.X.X

3 Command list

Commands are listed as below :

Functions	Para							
	Para1	Para2	Para3	Para4	Para5	Para6	Para7	Para8
	Function	Interface	Protocol	Device	I2C address	Control Parameter1	Control Parameter2	Control Parameter3
RawData	RawData	I2C	V3/V6	/dev/ilitek_ctrl	41	Frames		
	RawData	USB	V3/V6	null	null	Frames		
BG-RawData	BG-RawData	I2C	V3/V6	/dev/ilitek_ctrl	41	Frames		
	BG-RawData	USB	V3/V6	null	null	Frames		
BGDatas	BGData	I2C	V3/V6	/dev/ilitek_ctrl	41	Frames		
	BGData	USB	V3/V6	null	null	Frames		
SensorTest	SensorTest	I2C	V3/V6	/dev/ilitek_ctrl	41	Functions	[Profile path]	
	SensorTest	USB	V3/V6	null	null	Functions	[Profile path]	
Frequency	Frequency	I2C	V3/V6	/dev/ilitek_ctrl	41	StartValue	EndValue	Step
	Frequency	USB	V3/V6	null	null	StartValue	EndValue	Step
PanelInfor	PanelInfor	I2C	V3/V6	/dev/ilitek_ctrl	41			
	PanelInfor	USB	V3/V6	null	null			
FWUpgrade	FWUpgrade	I2C	V3/V6	/dev/ilitek_ctrl	41	HexPath	[Version]	
	FWUpgrade	USB	V3/V6	null	null	HexPath	[Version]	
Debug	Debug	I2C	V3/V6	/dev/ilitek_ctrl	41	Debug_Para		
	Debug	USB	V3/V6	null	null	Debug_Para		
Console	Console	I2C	Write len	Read len	Data			
	Console	USB	Write len	Read len	Data			
Script	Script	I2C	Null	/proc/ilitek_ctrl	41	[Script path]		
	Script	USB	Null	Null	null	[Script path]		
ControlMode	ControlMode	I2C	V3/V6	/proc/ilitek_ctrl	41	mode		
	ControlMode	USB	V3/V6	Null	null	mode		
CDC	CDC	I2C	V3/V6	/proc/ilitek_ctrl	41	Type	Frames	
	CDC	USB	V3/V6	Null	null	Type	Frames	

Regarding Protocol V3 and V6, the corresponding IC solutions are listed as below :

V3	For IC: 2511/2510/2315/2312/2712
V6	For IC: 2316/2326/2520/2323/2322/2521

IC 2312 USB will be an example in following illustrations. The corresponding protocol is V3.

4 Read RawData

Command：

RawData	I2C	V3/V6	/dev/ilitek_ctrl	41	Frames
RawData	USB	V3/V6	null	null	Frames

“Frames” : define how many frame data is needed.

Example (get 1 frame data)：

4.1 Command:

a. USB : ./ilitek_ldvX.X.X RawData USB V3 null null 1

b. I2C : ./ilitek_ldvX.X.X RawData I2C V3 /dev/ilitek_ctrl 41 1

```
root@jrinm-VirtualBox:/home/jrinm/Work/Ilitek_Upgrade/Test# ./ilitek_upgrade RawData USB V3 null null 1
open_usb_hid_device, ILITEK usb_hid device found, devnum=3, 0x222A:0x0001
Para:USB
GetKernelVer, mcu kernel version: 03.21.07.31.01, ret=1
GetFWVersion, firmware version: 0x03.0x00.0x00.0x00.0xFF.0xFF.0xFF.0xFF, ret=1
GetProtocol, ProtocolVersion: 2.3, ret=1
PanelInfor, max_x=16384, max_y=9600, xch=20, ych=21, ret=1
CDC Datas: 1/1 Frames
Y_ 0CH: 117, 123, 125, 124, 121, 126, 124, 124, 120, 114, 126, 129, 135, 128, 129, 130, 141, 129, 132, 127,

Y_ 1CH: 117, 123, 124, 124, 121, 125, 124, 124, 120, 114, 126, 129, 135, 128, 128, 130, 141, 129, 132, 128,

Y_ 2CH: 117, 124, 125, 124, 121, 126, 124, 124, 120, 114, 126, 129, 135, 128, 129, 130, 142, 129, 133, 128,

Y_ 3CH: 117, 123, 124, 123, 120, 126, 123, 123, 121, 114, 126, 128, 134, 128, 128, 130, 141, 129, 132, 127,

Y_ 4CH: 116, 122, 124, 123, 120, 125, 123, 123, 119, 114, 125, 128, 134, 127, 128, 129, 141, 129, 132, 127,

Y_ 5CH: 117, 123, 124, 123, 122, 126, 122, 124, 120, 114, 126, 128, 134, 128, 129, 129, 141, 129, 132, 127,

Y_ 6CH: 117, 123, 124, 124, 122, 126, 123, 124, 120, 115, 127, 129, 135, 128, 129, 130, 142, 129, 133, 128,

Y_ 7CH: 118, 123, 125, 124, 122, 126, 123, 124, 120, 114, 126, 129, 135, 128, 129, 130, 141, 130, 133, 128,

Y_ 8CH: 118, 123, 125, 124, 122, 126, 123, 124, 120, 115, 126, 130, 135, 129, 129, 130, 142, 130, 133, 128,

Y_ 9CH: 118, 123, 125, 124, 122, 126, 123, 124, 120, 114, 126, 129, 135, 129, 129, 131, 142, 130, 133, 127,

Y_10CH: 118, 123, 125, 124, 122, 127, 124, 124, 120, 115, 127, 129, 135, 129, 130, 131, 142, 130, 133, 128,

Y_11CH: 117, 123, 124, 123, 121, 126, 123, 124, 120, 115, 126, 129, 134, 128, 128, 130, 141, 129, 132, 127,

Y_12CH: 118, 123, 125, 124, 122, 126, 123, 124, 120, 115, 126, 129, 135, 128, 129, 131, 142, 130, 133, 127,

Y_13CH: 118, 123, 125, 124, 122, 126, 123, 124, 120, 115, 126, 129, 135, 129, 129, 130, 142, 130, 132, 127,

Y_14CH: 118, 124, 125, 124, 122, 126, 123, 124, 121, 115, 126, 130, 135, 129, 129, 130, 142, 130, 133, 128,

Y_15CH: 118, 124, 125, 124, 122, 126, 124, 124, 120, 115, 126, 129, 135, 129, 129, 130, 142, 130, 132, 128,

Y_16CH: 119, 124, 124, 124, 121, 126, 123, 124, 120, 115, 126, 129, 135, 128, 129, 130, 142, 129, 132, 128,

Y_17CH: 121, 124, 125, 124, 122, 126, 123, 124, 120, 115, 126, 129, 134, 128, 129, 130, 141, 129, 132, 127,

Y_18CH: 121, 126, 125, 124, 122, 126, 123, 124, 120, 115, 126, 129, 135, 129, 130, 130, 142, 129, 132, 128,

Y_19CH: 125, 134, 128, 125, 123, 126, 123, 124, 120, 115, 126, 129, 134, 129, 129, 130, 142, 129, 132, 127,

Y_20CH: 198, 110, 109, 109, 102, 109, 104, 105, 102,  96, 104, 110, 113, 108, 109, 109, 120, 111, 111, 111,

Success!!
Success!!
Success!!
```

5 Read BG-RawData

Command：

BG-RawData	I2C	V3/V6	/dev/ilitek_ctrl	41	Frames
BG-RawData	USB	V3/V6	null	null	Frames

“Frames” : define how many frame data is needed.

Example (get 1 frame data)：

5.1 Command:

a. USB : ./ilitek_ldvX.X.X BG-RawData USB V3 null null 1

b. I2C : ./ilitek_ldvX.X.X BG-RawData I2C V3 /dev/ilitek_ctrl 41 1

```
root@jrinm-VirtualBox:/home/jrinm/Work/Ilitek_Upgrade/Test# ./ilitek_upgrade BG-RawData USB V3 null null 1
open_usb_hid_device, ILITEK usb_hid device found, devnum=3, 0x222A:0x0001
Para:USB
GetKernelVer, mcu kernel version: 03.21.07.31.01, ret=1
GetFWVersion, firmware version: 0x03.0x00.0x00.0x00.0xFF.0xFF.0xFF.0xFF, ret=1
GetProtocol, ProtocolVersion: 2.3, ret=1
PanelInfor, max_x=16384, max_y=9600, xch=20, ych=21, ret=1
BG-CDC Datas: 1/1 Frames
Y_ 0CH: 129, 128, 128, 129, 129, 129, 128, 129, 128, 129, 128, 128, 129, 129, 128, 128, 128, 127, 129, 129,

Y_ 1CH: 128, 129, 129, 128, 129, 128, 128, 129, 129, 129, 129, 128, 128, 129, 127, 128, 128, 127, 129, 128,

Y_ 2CH: 129, 129, 129, 129, 130, 129, 128, 130, 130, 129, 129, 129, 129, 129, 129, 128, 128, 128, 129, 129,

Y_ 3CH: 128, 128, 128, 129, 129, 128, 127, 129, 130, 128, 129, 128, 127, 128, 128, 128, 127, 127, 129, 129,

Y_ 4CH: 128, 128, 128, 128, 128, 130, 128, 129, 129, 129, 129, 128, 127, 128, 128, 127, 127, 127, 128, 127,

Y_ 5CH: 128, 129, 128, 130, 129, 129, 128, 129, 130, 129, 129, 129, 128, 129, 129, 128, 128, 127, 130, 129,

Y_ 6CH: 129, 129, 129, 130, 129, 129, 128, 130, 130, 129, 130, 129, 129, 128, 128, 128, 128, 127, 129, 129,

Y_ 7CH: 129, 129, 129, 128, 128, 129, 128, 129, 129, 128, 128, 128, 128, 128, 128, 127, 127, 127, 129, 128,

Y_ 8CH: 129, 129, 129, 130, 129, 129, 128, 129, 129, 128, 129, 129, 128, 127, 128, 127, 127, 127, 130, 129,

Y_ 9CH: 128, 129, 128, 128, 128, 128, 128, 128, 129, 128, 128, 128, 128, 128, 128, 127, 126, 127, 128, 128,

Y_10CH: 129, 129, 129, 129, 129, 129, 129, 128, 129, 129, 129, 129, 128, 129, 128, 128, 127, 127, 128, 129,

Y_11CH: 129, 129, 129, 130, 129, 130, 130, 129, 130, 128, 129, 128, 128, 129, 129, 128, 128, 128, 129, 128,

Y_12CH: 129, 129, 129, 130, 129, 129, 129, 130, 130, 129, 129, 128, 128, 129, 129, 128, 128, 127, 128, 130,

Y_13CH: 129, 129, 129, 129, 129, 128, 129, 129, 130, 128, 129, 127, 127, 128, 127, 128, 128, 127, 129, 128,

Y_14CH: 129, 129, 129, 129, 129, 129, 129, 129, 130, 129, 130, 129, 129, 128, 129, 128, 128, 128, 128, 129,

Y_15CH: 129, 129, 129, 129, 130, 128, 130, 129, 130, 128, 129, 128, 127, 128, 129, 128, 128, 128, 128, 129,

Y_16CH: 129, 129, 128, 129, 129, 128, 130, 129, 129, 128, 129, 128, 128, 128, 129, 128, 127, 128, 128, 128,

Y_17CH: 129, 129, 128, 128, 129, 129, 128, 128, 128, 129, 129, 128, 127, 128, 128, 128, 128, 127, 128, 129,

Y_18CH: 128, 129, 128, 128, 129, 129, 128, 128, 129, 128, 128, 128, 127, 128, 129, 127, 128, 128, 127, 128,

Y_19CH: 129, 129, 129, 129, 128, 129, 129, 128, 129, 128, 128, 128, 127, 127, 129, 127, 127, 127, 128, 129,

Y_20CH: 130, 129, 129, 129, 129, 130, 129, 129, 130, 128, 128, 128, 129, 128, 129, 127, 127, 128, 129, 128,

Success!!
Success!!
Success!!
```

6 ReadBGDatas

Command：

BGData	I2C	V3/V6	/dev/ilitek_ctrl	41	Frames
BGData	USB	V3/V6	null	null	Frames

“Frames” : define how many frame data is needed.

Example (get 1 frame data)：

6.1 Command:

a. USB : ./ilitek_ldvX.X.X BGDatas USB V3 null null 1

b. I2C: ./ilitek_ldvX.X.X BGDatas I2C V3 /dev/ilitek_ctrl 41 1

```
root@jrinm-VirtualBox:/home/jrinm/Work/Ilitek_Upgrade/Test# ./ilitek_upgrade BGData USB V3 null null 1
open_usb_hid_device, ILITEK usb_hid device found, devnum=3, 0x222A:0x0001
Para:USB
GetKernelVer, mcu kernel version: 03.21.07.31.01, ret=1
GetFWVersion, firmware version: 0x03.0x00.0x00.0x00.0xFF.0xFF.0xFF.0xFF, ret=1
GetProtocol, ProtocolVersion: 2.3, ret=1
PanelInfor, max_x=16384, max_y=9600, xch=20, ych=21, ret=1
Error! This MCU Don't Support BGData Function!
Error! Get BGData Failed!!
Error! Get BGData Failed!!
Error! Get BGData Failed!!
```

Here Because IC 2302 not support “BGDatas”，Tool comes an alarm of “This MCU Don’t Support BGData Function!”

7 Sensor Test

SensorTest can do Open/Short, Self, DAC ,All Node and Uniformity tests. Parameter setting as below: (Notice: Uniformity test just support newflow style)

Functions(“1” enable，”0” disable)							
Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
keep	keep	Uniformity Test	All Node Test	DAC test	Self test	Open test	Short test

Command：

SensorTest	I2C	V3/V6	/dev/ilitek_ctrl	41	Functions	[Profile path]
SensorTest	USB	V3/V6	null	null	Functions	[Profile path]

“Functions” means test item. Every bit represent corresponding test item. “1” means enable and “0” means disable. Please refer to above Function Table.

[Profile path] is option. If sensor test with default criteria, keep the parameter blank; if not, daemon will load the profile criteria.

Following example shows how to do open/short test.

7.1 Command:

a. USB : ./ilitek_ldvX.X.X SensorTest USB V3 null null 3

b. I2C : ./ilitek_ldvX.X.X SensorTest I2C V3 /dev/ilitek_ctrl 41 3

```
root@jrinm-VirtualBox:/home/jrinm/Work/Ilitek_Upgrade/Test# ./ilitek_upgrade SensorTest USB V3 null null 3
open_usb_hid_device, ILITEK usb_hid device found, devnum=3, 0x222A:0x0001
Para:USB
GetKernelVer, mcu kernel version: 03.21.07.31.01, ret=1
GetFWVersion, firmware version: 0x03.0x00.0x00.0x00.0xFF.0xFF.0xFF.0xFF, ret=1
GetProtocol, ProtocolVersion: 2.3, ret=1
PanelInfor, max_x=16384, max_y=9600, xch=20, ych=21, ret=1

Short Datas:
X_CH_SLK:  148, 154, 131, 164, 136, 140, 131, 120, 152, 164, 126, 160, 144, 156, 124, 140, 154, 164, 144, 198,
X_CH__LK:  149, 154, 133, 164, 138, 141, 131, 121, 151, 165, 126, 161, 145, 157, 125, 142, 155, 165, 144, 198,
Y_CH_SLK:  160, 144, 156, 125, 141, 154, 164, 144, 198, 160,  92, 164, 158, 183, 148, 176, 130, 102, 164, 124, 142,
Y_CH__LK:  160, 144, 156, 126, 141, 155, 165, 145, 199, 160,  92, 164, 159, 183, 149, 177, 131, 103, 165, 124, 143,
```

```
Open Datas:
Y_ 0CH:  30,  32,  31,  30,  31,  32,  35,  35,  32,  32,  30,  34,  39,  33,  38,  31,  33,  30,  32,  40,
Y_ 1CH:  30,  32,  31,  30,  31,  32,  35,  35,  32,  32,  30,  34,  39,  33,  38,  31,  34,  30,  32,  40,
Y_ 2CH:  30,  32,  31,  30,  31,  32,  36,  35,  32,  32,  30,  34,  39,  33,  38,  31,  34,  30,  32,  40,
Y_ 3CH:  30,  32,  31,  30,  31,  32,  36,  35,  32,  32,  30,  34,  39,  33,  38,  31,  34,  30,  32,  40,
Y_ 4CH:  30,  32,  31,  30,  31,  32,  36,  35,  32,  32,  30,  35,  39,  33,  38,  31,  33,  30,  32,  40,
Y_ 5CH:  30,  32,  31,  30,  31,  32,  36,  35,  32,  32,  30,  34,  39,  33,  38,  31,  33,  30,  32,  40,
Y_ 6CH:  30,  32,  31,  30,  31,  32,  36,  35,  32,  32,  30,  35,  39,  33,  38,  31,  33,  30,  32,  40,
Y_ 7CH:  30,  32,  31,  30,  31,  32,  36,  35,  32,  32,  30,  35,  39,  33,  38,  31,  33,  30,  32,  40,
Y_ 8CH:  30,  32,  31,  30,  31,  32,  36,  35,  32,  32,  30,  34,  39,  33,  38,  31,  33,  30,  32,  40,
Y_ 9CH:  30,  32,  31,  30,  31,  32,  36,  35,  32,  32,  30,  34,  39,  33,  38,  31,  33,  30,  32,  40,
Y_10CH:  30,  32,  31,  30,  31,  32,  36,  35,  32,  32,  30,  34,  39,  33,  38,  31,  33,  30,  32,  40,
Y_11CH:  30,  32,  31,  30,  31,  32,  36,  35,  32,  32,  30,  34,  39,  33,  38,  31,  34,  30,  32,  40,
Y_12CH:  30,  32,  31,  30,  31,  32,  36,  35,  32,  32,  30,  34,  39,  33,  38,  31,  33,  30,  32,  40,
Y_13CH:  30,  32,  31,  30,  31,  32,  36,  35,  32,  32,  30,  34,  39,  33,  38,  31,  34,  30,  32,  40,
Y_14CH:  30,  32,  31,  30,  31,  32,  36,  35,  32,  32,  30,  34,  39,  33,  38,  31,  33,  30,  32,  40,
Y_15CH:  31,  33,  31,  30,  31,  32,  36,  35,  32,  32,  30,  34,  39,  33,  38,  31,  33,  30,  32,  40,
Y_16CH:  32,  33,  31,  31,  31,  32,  36,  35,  32,  32,  30,  34,  39,  33,  38,  31,  33,  30,  32,  40,
Y_17CH:  35,  34,  32,  31,  31,  33,  36,  35,  32,  32,  30,  34,  39,  33,  38,  31,  33,  30,  32,  40,
Y_18CH:  35,  36,  32,  31,  31,  33,  36,  35,  32,  32,  30,  34,  39,  33,  38,  31,  33,  30,  32,  40,
Y_19CH:  40,  48,  36,  32,  32,  33,  36,  36,  32,  32,  30,  34,  39,  33,  38,  31,  33,  30,  32,  40,
Y_20CH: 190,  44,  37,  38,  32,  33,  36,  36,  32,  33,  30,  35,  39,  33,  38,  31,  34,  30,  32,  40,

-----------------------------------------------TestResult-----------------------------------------------
SensorTest: Open Test NG!
SensorTest: NG!
SensorTest: NG!
SensorTest: NG!
```

How to use newflow to run Open and Uniformity tests item.

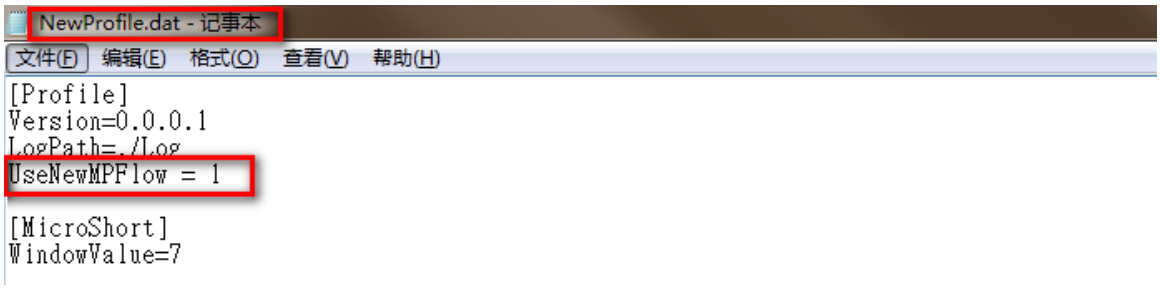
7.2 If use the profile named “dat”.

Command:

a. USB : ./ilitek_ldvX.X.X SensorTest USB V3 null null 34 NewProfile.dat

b. I2C : ./ilitek_ldvX.X.X SensorTest I2C V3 /dev/ilitek_ctrl 41 34 NewProfile.dat

Open newflow key: Set UseNewMPFlow = 1 in Profile file,as below:



Create the benchmark values of Open test and Uniformity test for daemon version 2.X.X.X.

a. Prepare ten pcs or more sample TP

b. Set UseNewMPFlow = 1 and the right LogPath

c. Set CreateGolden = 1 in Profile file

```
[Profile]
UseNewMPFlow=1
CreateGolden=1
OffsetValue=4096
```

d. Set OffsetValue to Profile file

```
[Profile]
UseNewMPFlow=1
CreateGolden=1
OffsetValue=4096
```

e. Test each TP with Linux_Daemon Tool. Tool will save the logs into the path you setted(LogPath)
f. Use another tool named “SensorTest.exe” to create the benchmark value with the "Load Benchmark from Log" function.
g. Copy the benchmark values from “sensor test profile” to “ourself profile”. The datas looks like as below.

```
[YDriven]
0=4577,4598,4598,4596,4600,4601,4597,4598,4596,4593,4598,4596,4594,4597,4595,4596,4596,4595,4593,
1=4547,4568,4564,4564,4568,4567,4565,4566,4566,4563,4568,4568,4566,4569,4567,4564,4568,4567,4563,
2=4545,4566,4564,4564,4568,4567,4567,4568,4566,4565,4568,4568,4564,4567,4565,4566,4568,4567,4563,

[YDriven_Open]
0=4579,4599,4597,4595,4600,4600,4597,4598,4596,4593,4597,4599,4596,4598,4594,4594,4595,4596,4595,
1=4545,4567,4565,4563,4568,4570,4567,4568,4566,4563,4567,4567,4566,4566,4564,4564,4567,4568,4563,
2=4545,4565,4563,4563,4568,4566,4567,4566,4566,4563,4567,4567,4566,4568,4566,4564,4567,4568,4565,

[YDriven_Open1]
0=4223,4234,4231,4233,4234,4235,4233,4233,4233,4232,4232,4233,4233,4235,4232,4233,4231,4232,4231,
1=4215,4224,4221,4223,4226,4225,4227,4223,4223,4224,4224,4223,4225,4223,4224,4223,4221,4224,4223,
2=4213,4222,4221,4223,4226,4223,4223,4223,4223,4222,4224,4223,4225,4223,4224,4225,4221,4224,4223,
```

7.3 If use the profile named “ini”.

```
[Panel_Info]
XChannel=63
YChannel=35
```

If "" XChannel "and" YChannel "do not match IC, it Judge fail.

```
][Report]
 Path=Log
```

"Path" is the path generated by Log file. if no setting will be current path.

8 Frequency

Command：

Frequency	I2C	V3/V6	/dev/ilitek_ctrl	41	FreqValue		
Frequency	USB	V3/V6	null	null	FreqValue		

“FreqValue” is frequency command value.

8.1 Protocol V3 format:

Start	End	Step

“Start” is the initial frequency and unit is KHz.

“End” is end frequency and unit is KHz.

“Step” is a value added to frequency and unit is 100 * Hz.

8.2 Protocl V6.0.0 and ProtocolV6.0.1 format:

MC sine start	MC sine end	MC sine step	MC SWcap start	MC SWcap end	MC SWcap step	SC SWcap start	SC SWCap end	SC SWCap step

“MC sine start” “ is the initial frequency and unit is KHz.

“MC sine end” is end frequency and unit is KHz.

“MC sine step” is a value added to frequency and unit is 100 * Hz.

“MC SWcap start” is the initial mutual switch cap and unit is T.

“MC SWcap end” is end mutual switch cap and unit is T.

“MC SWcap step” is a value added to mutual switch cap and unit is T.

“SC SWcap start” is the initial self switch cap and unit is T.

“SC SWcap end” is end self switch cap and unit is T.

“SC SWcap step” is a value added to self switch cap and unit is T.

8.3 Protocol 6.0.2 above Format:

MC sine start	MC sine End	MC sine step	MC SWcap start	MC SWcap end	MC SWcap step	SC SWcap start	SC SWCap end	SC SWCap step
Frames	Type							

“Frames” is set the number of samples.

“Type” is the format of the output type.

Type(“1” enable，”0” disable)							
Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Reserved	Reserved	Reserved	Reserved	Reserved	Frame count	Average	Max

Example :

Initial frequency is 30KHz，end frequency is120KHz，add 500Hz in every step:

8.4 Command:

a. USB : ./ilitek_ldvX.X.X Frequency USB V3 null null 30 120 5

b. I2C : ./ilitek_ldvX.X.X Frequency I2C V3 /dev/ilitek_ctrl 41 30 120 5

```
root@jrinm-VirtualBox:/home/jrinm/Work/Ilitek_Upgrade/Test# ./ilitek_upgrade Frequency USB V3 null null 30 120 5
open_usb_hid_device, ILITEK usb_hid device found, devnum=3, 0x222A:0x0001
Para:USB
GetKernelVer, mcu kernel version: 03.21.07.31.01, ret=1
GetFWVersion, firmware version: 0x03.0x00.0x00.0x00.0xFF.0xFF.0xFF.0xFF, ret=1
GetProtocol, ProtocolVersion: 2.3, ret=1
PanelInfor, max_x=16384, max_y=9600, xch=20, ych=21, ret=1
Fre Datas
  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,
 4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,
4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,
,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,

The Min1 Value is: 3, Fre is:1020 (100*Hz), TXPW is:234
The Min2 Value is: 3, Fre is:305 (100*Hz), TXPW is:785
The Min3 Value is: 3, Fre is:300 (100*Hz), TXPW is:799
```

c. USB : ./ilitek_ldvX.X.X Frequecy USB V6 null null 30 120 5 4 100 4 4 100 4

```
root@bu3test-ThinkPad-X220:/home/Luca/work/ilitek_ld/00. Codebase/01. SourceCode# ./ilitek_ldv3_0_0_1_x86_x64 Frequency USB V6 null
null 30 120 5 4 100 4 4 100 4
open_usb_hid_device, ILITEK usb_hid device found, devnum=96, 0x222A:0x0001
Para:USB
Func_Frequency,276,start:30,end:120,step:5
ILITEK LINUX DAEMON V3.0.0.0
GetKernelVer, mcu kernel version: 20.25.00.00.03, 0x2520 ret=64
GetFWVersion, firmware version: 0x07.0x00.0x00.0x00.0xFF.0xFF.0xFF.0xFF, ret=64
GetProtocol, ProtocolVersion: 6.0.1, 0x60001, ret=64
CoreVersion=0x7.0x0.0x0.0x1
PanelInfor_V6, max_x=16384, max_y=16384, xch=28, ych=17, IC Number:1 ,Support Mode:1ret=64
MC Sine Start:30 End:120 Step=5, data length:19
MC SWCap Start:4 End:100 Step=4, data length:25
SC SWCap Start:4 End:100 Step=4, data length:25
Frame number = 0, Scan data Return = 0x1
ptl.ver=0x60001 protocol:0x60002
total len:69, count:1
SetDataLength_V6, Set data length:2048, ret=0
Get data end
inGettedCounts =138,d_len=138,inNeedCounts=138
MC Sine Fre Datas
MC Sine Start:30 End:120 Step=5, data length:19
Max Value
addr_start:0 addr_end:19
4,2,4,2,5,2,4,3,5,4,4,4,2,6,2,5,2,5,3,
The Min1 Value is: 2, Fre is:35
The Min2 Value is: 2, Fre is:45
The Min3 Value is: 2, Fre is:55

MC SWCap Fre Datas
MC SWCap Start:4 End:100 Step=4, data length:25
Max Value
addr_start:19 addr_end:44
2,2,3,3,2,3,3,3,3,2,3,3,3,3,3,2,3,3,2,3,3,3,3,3,3,
The Min1 Value is: 2, Fre is:4
The Min2 Value is: 2, Fre is:8
The Min3 Value is: 2, Fre is:20

SC SWCap Fre Datas
SC SWCap Start:4 End:100 Step=4, data length:25
Max Value
addr_start:44 addr_end:69
6,7,7,10,8,8,9,40,20,9,7,11,7,8,10,9,20,45,42,11,7,9,8,7,10,
The Min1 Value is: 6, Fre is:4
The Min2 Value is: 7, Fre is:8
The Min3 Value is: 7, Fre is:12
```

9 ReadPanelInfor

Command：

PanelInfor	I2C	V3/V6	/dev/ilitek_ctrl	41
PanelInfor	USB	V3/V6	null	null

Example：

9.1 Command:

a. USB : ./ilitek_ldvX.X.X PanelInfor USB V3 null null

b. I2C : ./ilitek_ldvX.X.X PanelInfor I2C V3 /dev/ilitek_ctrl 41

```
root@jrinm-VirtualBox:/home/jrinm/Work/Ilitek_Upgrade/Test# ./ilitek_upgrade PanelInfor USB V3 null null
open_usb_hid_device, ILITEK usb_hid device found, devnum=3, 0x222A:0x0001
Para:USB
GetKernelVer, mcu kernel version: 03.21.07.31.01, ret=1
GetFWVersion, firmware version: 0x03.0x00.0x00.0x00.0xFF.0xFF.0xFF.0xFF, ret=1
GetProtocol, ProtocolVersion: 2.3, ret=1
PanelInfor, max_x=16384, max_y=9600, xch=20, ych=21, ret=1
Success!!
Success!!
Success!!
```

10 FWUpgrade

Cammand：

FWUpgrade	I2C	V3/V6	/dev/ilitek_ctrl	41	HexPath	[Version]
FWUpgrade	USB	V3/V6	null	null	HexPath	[Version]

“HexPath” : A specific path of new FW.

[Version] is optional. If upgrading FW directly, keep the parameter blank; if not, need to benchmark FW version，need to fill in a comparative FW version. The number is Hexadecimal.

Version Explanantion：

1. When the parameter (Version) is blank, FW would be upgraded directly. If it is not blank, version would be compared and then FW be upgraded when current version smaller than new version.
2.FW version format：0102030405060708, which is Hexadecimal with total 16 digits.
Example : FWVer=3.2.A.8.FF.FF.FF.8->03020A08FFFFFF08

Example :

10.1 Command:

a. USB : ./ilitek_ldvX.X.X FWUpgrade USB V3 null null HexPath
b. I2C : ./ilitek_ldvX.X.X FWUpgrade I2C V3 /dev/ilitek_ctrl 41 HexPath

```
root@jrinm-VirtualBox:/home/jrinm/Work/Ilitek_Upgrade/Test# ./ilitek_upgrade FWUpgrade USB V3 null null ./ILI2302_20_21.hex
open_usb_hid_device, ILITEK usb_hid device found, devnum=3, 0x222A:0x0001
Para:USB
Hex filename:./ILI2302_20_21.hex
GetICMode, Mode:0x5A  ret=1
SetProgramKey, ret=1
ChangeTOBL, ret=1
open_usb_hid_device, ILITEK usb_hid device found, devnum=3, 0x222A:0x0001
WriteCMDWithData, read command fail
GetICMode, Mode:0xC0  ret=0
ChangeToBootloader, current op mode is application mode, wait 5 sec, after change to bootloader mode, 0xC0, 1
open_usb_hid_device, ILITEK usb_hid device not found
ChangeToBootloader, current op mode is application mode, wait 5 sec, after change to bootloader mode, 2
open_usb_hid_device, ILITEK usb_hid device found, devnum=4, 0x222A:0x0006
GetICMode, Mode:0x55  ret=1
ChangeToBootloader, check again, current op mode is bootloader mode, can update firmware, 0x55, ret=1
GetProtocol, ProtocolVersion: 1.6, ret=1
UpgradeFirmware_USB_Pro1_6, hex file size, 0x2C485
UpgradeFirmware_USB_Pro1_6, read hex file to memoery, completed
GetKernelVer, mcu kernel version: 03.22.01.F0.00, ret=1
UpgradeFirmware_USB_Pro1_6, df_start_addr = 1f000
page_number = 16, page is 512 bytes
UpgradeFirmware_USB_Pro1_6, parsing hex file...
UpgradeFirmware_USB_Pro1_6, ap_start_address:0x000000, ap_end_address:0x00FB2F, ap_check = 0x556632
UpgradeFirmware_USB_Pro1_6, df_start_address:0x01F000, df_end_address:0x01F430, df_check = 0x001406
UpgradeFirmware_USB_Pro1_6, parsing hex file completed
WriteDataFlashKey, ret=1
UpgradeFirmware_USB_Pro1_6, upgrade firmware(data flash), 100%
32 no 0 ap_end_addr 32 = 0xFB5F
ap_end_addr = 0xFB5F
WriteAPCodeKey, ret=1
ILITEK: Firmware Upgrade, 99%. UpgradeFirmware_USB_Pro1_6, upgrade firmware(ap code), 100%
SetProgramKey, ret=1
ChangeTOAP, ret=1
open_usb_hid_device, ILITEK usb_hid device found, devnum=4, 0x222A:0x0006
GetICMode, Mode:0xC0  ret=1
ChangeToAPMode, current op mode is bootloader mode, wait 5 sec, after change to application mode, 1
open_usb_hid_device, ILITEK usb_hid device not found
ChangeToAPMode, current op mode is bootloader mode, wait 5 sec, after change to application mode, 2
open_usb_hid_device, ILITEK usb_hid device found, devnum=5, 0x222A:0x0001
GetICMode, Mode:0x5A  ret=1
ChangeToAPMode, upgrade firmware finish
soft_reset, ret=1
UpgradeFirmware_USB_Pro1_6,Firmware Upgrade Success
Upgrade firmware Success!
Upgrade firmware Success!
Upgrade firmware Success!
```

11 Debug

Command：

Debug	I2C	V3/V6	/dev/ilitek_ctrl	41	Debug_Para
Debug	USB	V3/V6	null	null	Debug_Para

“Debug_Para” is a parameter for Debug.

Debug_Para:
Debug_Para=1, enable “Debug” function
Debug_Para=0, disable “Debug” function

Example：

11.1 Command:

a. USB : ./ilitek_ldvX.X.X Debug USB V3 null null 1
b. I2C : ./ilitek_ldvX.X.X Debug I2C V3 /dev/ilitek_ctrl 41 1

12 Control Mode

Command：

ControlMode	I2C	V3/V6	/dev/ilitek_ctrl	41	Mode
ConTrolMode	USB	V3/V6	null	null	Mode

“Mode” is mode value

Example：

12.1 Command:

a. USB : ./ilitek_ldvX.X.X ConTrolMode USB V3 null null 1

b. I2C : ./ilitek_ldvX.X.X ConTrolMode I2C V3 /dev/ilitek_ctrl 41 1

```
root@bu3test-ThinkPad-X230:/home/bu3test# ./ilitek_ldv2_0_D_2_x86_x64 SensorTest USB V3 null null 19 NewProfile.dat
bash: ./ilitek_ldv2_0_D_2_x86_x64: No such file or directory
root@bu3test-ThinkPad-X230:/home/bu3test# ./ilitek_ldv2_0_E_0_x86_x64 ControlMode USB V3 null null 1
open_usb_hid_device,176,usb_find_busses pass
open_usb_hid_device,180,usb_find_devices pass
open_usb_hid_device,186, dev->descriptor.idVendor= 0x1d6b, dev num:1
open_usb_hid_device,186, dev->descriptor.idVendor= 0x222a, dev num:83
open_usb_hid_device, ILITEK usb_hid device found, devnum=83, 0x222A:0x0001
Para:USB
ILITEK LINUX DAEMON V2.0.E.0
TransferData, read command fail
Set mode Success, mode:1
ControlMode, Success!!
software_reset_V3
```

13 Console

Command：

ControlMode	I2C	Write len	Read len	Data	
ConTrolMode	USB	Write len	Read len	Data	

“Data” is write command.

Example：

13.1 Command:

a. USB : ./ilitek_ldvX.X.X Console USB 1 8 40

b. I2C : ./ilitek_ldvX.X.X Console I2C 1 8 40

```
root@bu3test-ThinkPad-X220:/home/Luca/work/ilitek_ld/00. Codebase/01. SourceCode# ./ilitek_ldv3_0_0_1_x86_x64 Console USB 1 8 40
open_usb_hid_device, ILITEK usb_hid device found, devnum=96, 0x222A:0x0001
Para:USB
the temp is 40
viConsoleData, Return data: 07.00.00.00.FF.FF.FF.FF., ret=64
Console, Success!!
software_reset_V3
```

14 CDC

Command：

CDC	I2C	V3/V6	/dev/ilitek_ctrl	41	Type	Frames	
CDC	USB	V3/V6	null	null	Type	Frames	

“Type” is CDC data type.

V3 Type List				
DAC_P	DAC_N	Raw	BG	SE

V6 Type List					
DAC_P	DAC_N	Raw_BK	Raw_NBK	BG	SE

“Frames” : define how many frame data is needed.

After the execution is completed a csv file, will be generated and can be replay in the ITS tool.

Example：

14.1 Command:

a. USB : ./ilitek_ldvX.X.X CDC USB V6 null null SE 2

a. I2C : ./ilitek_ldvX.X.X CDC I2C V6 /dev/ilitek_ctrl 41 SE 2

```
/ilitek_ldv3_0_4_0_arm CDC I2C V6 /dev/ilitek_ctrl 41 SE 2                    <
OpenI2CDevice, device node is /dev/ilitek_ctrl
Change to Suspend mode:Success
Para:I2C
ILITEK LINUX DAEMON V3.0.4.0
GetKernelVer, mcu kernel version: 20.25.00.C0.03, 0x2520 ret=0
GetFWVersion, firmware version: 0x07.0x00.0x00.0x00.0xFF.0xFF.0xFF.0xFF, ret=0
GetProtocol, ProtocolVersion: 6.0.4, 0x60004, ret=0
CoreVersion=0x7.0x0.0x0.0x5
GetFWMode, FW Mode: 0x00
PanelInfor_V6, max_x=16384, max_y=9600, xch=28, ych=17, IC Number:1, Block Number:1, Support Mode:4ret=0
GetICMode, Mode:0x5A, AP mode
Record file:Record/2011_01_03_09_27_07.csv
Type:SE
Change to Suspend mode:Success
Change to Test mode:Success
d_len=0 x_ch:28 y_ch:17
SetDataLength_V6, Set data length:1024, ret=0
Get data end
inGettedCounts =476,d_len=476,inNeedCounts=476
SE Datas: 0/2 Frames
Y_ 0CH:   1,   0,   1,   2,   2,   0,   0,   0,   0,   1,   0,   0,   1,  -1,   0,   0,   0,   0,   0,   0,   0,   0,   1,   1,   1,   0,   1,   3,
Y_ 1CH:  -1,   0,  -1,   1,   0,   0,  -1,   1,   0,   0,   0,   0,   1,   1,  -1,  -1,   1,   0,   0,   1,   1,   0,   0,   1,   0,   1,   1,   1,
Y_ 2CH:   0,   1,  -1,   0,   0,   0,   0,   0,  -1,   1,  -1,   0,   1,   0,  -1,  -1,   0,  -1,  -1,  -1,  -1,   1,   0,   1,   0,   1,   0,   0,
Y_ 3CH:   0,   1,   0,   1,   0,  -1,   0,   0,   0,   0,   0,  -1,   0,   0,  -1,   0,  -1,   0,   0,   0,   0,   0,   2,   0,   0,  -1,   0,   1,
Y_ 4CH:  -1,   0,   0,   0,   2,   0,   0,   0,   0,   0,   0,   1,   0,   1,   0,  -1,   1,   1,   0,   0,   1,   1,   1,  -1,   0,   0,   1,   1,
Y_ 5CH:   1,   0,   1,   2,   0,   1,   2,   0,   1,   1,   0,   1,   1,   0,   2,   2,   0,   1,   1,   2,   0,   0,   1,   1,   2,   1,   1,   2,
Y_ 6CH:   0,   3,  -1,   0,   2,   1,   0,   2,   0,   0,   0,   0,   1,   0,   1,   0,   1,   0,   2,   1,   2,   1,   1,   1,   1,   1,   1,   2,
Y_ 7CH:   0,   0,   0,   0,   0,   0,   0,   0,   0,   0,   0,   1,   1,   0,  -1,   2,   1,  -1,  -1,   0,   0,  -1,   1,  -1,   1,   1,   2,   1,   2,
Y_ 8CH:  -1,   1,   0,   0,   0,   1,   0,   1,  -1,   0,   1,   0,   0,   0,   0,   0,  -1,   0,   0,   0,   0,   0,  -1,   0,  -1,  -1,   0,   1,  -1,
Y_ 9CH:   1,  -1,   0,   1,   0,   0,   0,  -1,  -1,   0,   0,   0,  -2,   0,   0,  -1,  -1,   0,   0,  -1,   0,   0,   1,   1,   1,   0,   1,   1,
Y_10CH:   1,   0,   1,   2,   0,   0,   1,   1,   0,   0,   0,   1,   1,  -1,   0,   0,   0,   0,   1,   0,   2,   0,  -1,   2,   0,   1,   1,   0,
Y_11CH:   0,   0,   0,   0,   1,  -1,  -1,   0,   0,   1,   2,   1,   0,   0,   0,   0,   0,   0,   0,   0,   1,   1,   0,  -1,   1,   0,   0,   0,
Y_12CH:   0,   1,   1,   0,   0,   0,   0,   0,   1,  -1,   1,   1,   0,   0,   0,   0,   1,   1,   1,   0,   1,   0,   1,   1,   1,   1,   1,   2,
Y_13CH:   1,   0,   0,   0,  -1,   0,   0,   0,   2,   0,   1,   1,   0,   0,   0,   1,   0,   1,   0,   0,   1,   1,   0,   1,   1,   2,   2,   2,
Y_14CH:   0,   0,   0,   0,   0,   0,   0,   1,   0,   0,   1,   0,   1,   1,   1,   1,   0,   1,   1,   1,   1,  -1,   2,   0,   1,   2,   2,   2,
Y_15CH:   0,   0,   1,   0,   0,   0,   0,   0,   0,   0,   0,   0,   0,   2,   0,   1,   2,   1,   1,   2,   0,   2,   1,   1,   2,   2,   1,   3,
Y_16CH:   0,   0,   0,  -1,  -1,   1,   0,   0,  -1,   0,  -1,  -1,   0,  -2,  -1,   0,   0,   0,   0,   0,   0,   2,   0,   0,   1,   1,   0,   3,
SetDataLength_V6, Set data length:1024, ret=0
Get data end
inGettedCounts =45,d_len=45,inNeedCounts=45

Self X:  -2,  -5,  -7, -11,  -6,  -4,  -7,  -6,  -1,  -3,  -6,  -9,  -3,  -1,   1,  -2,   3,   7,  10,   9,   5,   1,   5,  12,   6,   7,  12,  24,
Self Y:   0,  -4,  -6,   3,  -1,  -2,  -2,  -6,  -3,   2,   1,   0,   2,   7,   6,   9,  24,
SetDataLength_V6, Set data length:1024, ret=0
Get data end
inGettedCounts =476,d_len=476,inNeedCounts=476
```

15 Q&A

1. How to use daemon?
   Step 1: Put “Daemon” file in the main folder
   Step 2: Write command (refer to the Chapter **3**)
2. How to trigger function?
   ./[File name] [Function] [Interface] [Protocol] [I2C address] [Control parameter 1] [Control parameter 2] [Control parameter 3]