THine Solutions

THSCU101
Camera Extension Controller
User Manual

Rev. 1.11

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Overview

THSCU101 controller is a Windows PC application software to control camera extension functions embedded in the THSCU101.
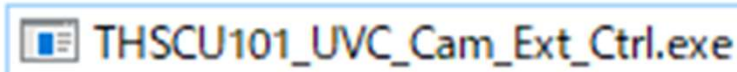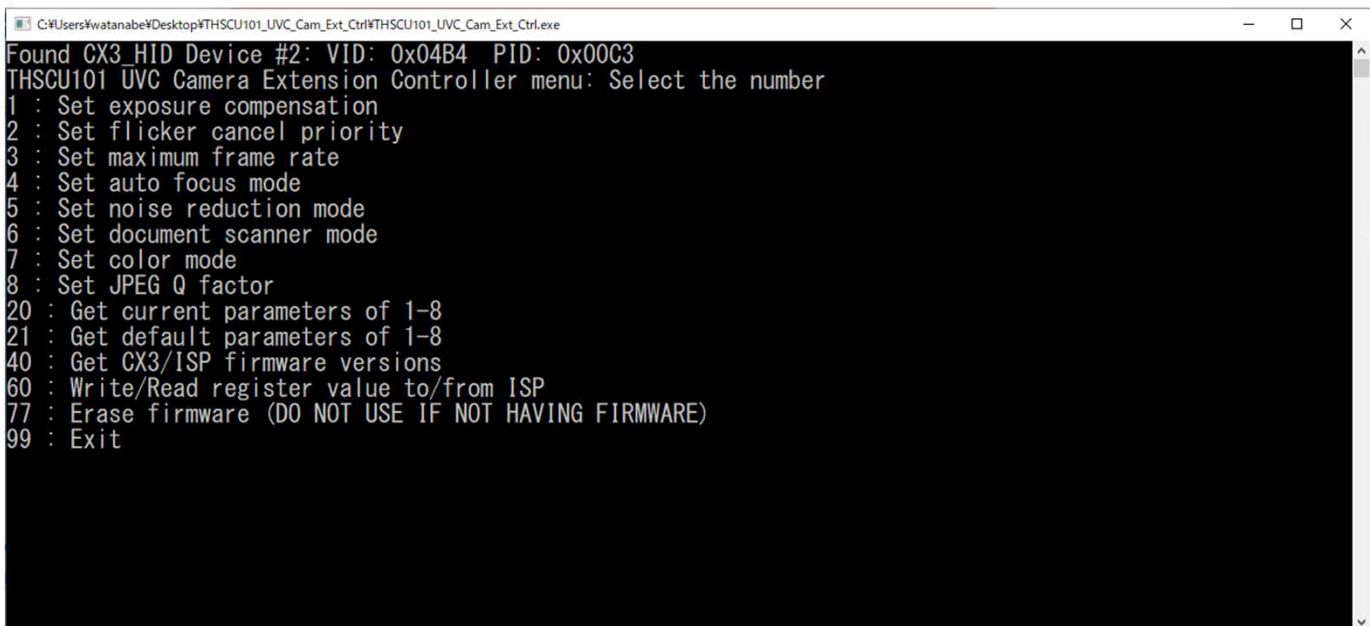
Camera extension functions include several unique functions which are not supported by UVC.

Here are examples of camera extension functions

Exposure compensation, Flicker cancel priority, Maximum frame rate control, Auto focus mode, Noise reduction mode, Document scanner mode, Color mode, JPEG Q factor control and some debugging purpose functions

How to Launch

1. Stream the image from THSCU101.

2. Double click "THSCU101_UVC_Cam_Ext_Ctrl.exe". Then THSCU101 UVC Camera Extension Controller is launched.

1 : Set exposure compensation

1. Enter "1"

```
THSCU101 UVC Camera Extension Controller menu: Select the number
1 : Set exposure compensation

99 : Exit
1
```

2. then current and selectable setting are displayed

```
1
Current Setting = 6        Current setting                    Selectable settings
0: -6/3,  1: -5/3,  2: -4/3,  3: -3/3,  4: -2/3,  5: -1/3,  6: 0,  7: +1/3,  8: +2/3,  9: +3/3,  10: +4/3,  11: +5/3
  12: +6/3
Enter a value on a scale of 0-12
```

3. and you can choose new setting (e.g., 3) among displayed options.

```
Enter a value on a scale of 0-12
3
```

2 : Set flicker cancel priority

1. Enter "2"

```
THSCU101 UVC Camera Extension Controller menu: Select the number
1 : Set exposure compensation
2 : Set flicker cancel priority
99 : Exit
2
```

2. then current and selectable settings are displayed

```
99 : Exit
2
Current Setting = 0      Current setting
0: Put priority to AE,  1: Put priority to flicker cancel
```
Selectable settings

3. and you can choose exposure setting(e.g. 1) with AE priority or flicker cancel priority

```
Enter 0 or 1
1
```

"0:Put priority to AE"   : Prioritize proper exposure without considering flicker
"1:Put priority to flicker cancel"   : Prioritize removing flicker without considering proper exposure

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3 : Set maximum frame rate

1. Enter "3"

```
Found CX3_HID Device #2: VID: 0x04B4  PID: 0x00C3
THSCU101 UVC Camera Extension Controller menu: Select the number
3 : Set maximum frame rate
99 : Exit
3
```

2. then current and selectable settings are displayed

```
99 : Exit
3                    Current setting
Current Setting = 0x0                          Selectable settings
0: Disable Max Frame Rate Control, 3-60:  Max frame rate
Enter 0 or 3-60
```

3. and you can specify max frame rate (e.g. 30) from 3-60.

```
Enter 0 or 3-60
30
```

"0:Disable Max Frame Rate Control"   : The frame rate is only limited by exposure control
"3-60:Max frame rate"   : The frame rate is limited by not only exposure but by the value

4 : Set auto focus mode

1. Enter "4"

```
Found CX3_HID Device #2: VID: 0x04B4  PID: 0x00C3
THSCU101 UVC Camera Extension Controller menu: Select the number

4 : Set auto focus mode
99 : Exit
4
```

2. then current and selectable settings are displayed

```
Current Setting = 0xf    Current setting                        Selectable settings
Enter one of the below option
        0: One Shot Contrast AF
        3: Continuous Contrast AF
        8: One Shot Contrast and PDAF Hybrid AF
        F: Continuous Contrast and PDAF Hybrid
Enter 0,3,8 or F
```

3. and you can select Auto focus setting (e.g. 8)

```
Enter 0,3,8 or F
8
```

Number	Option	One shot or Continuous	AF methodology
0	One Shot Contrast AF	One shot	Contrast
3	Continuous Contrast AF	Continuous	Contrast
8	One Shot Contrast and PDAF Hybrid AF	One shot	Best combination of PDAF and contrast
F	Continuous Contrast and PDAF Hybrid AF	Continuous	Best combination of PDAF and contrast

5 : Set noise reduction mode

1. Enter "5"

```
Found CX3_HID Device #2: VID: 0x04B4  PID: 0x00C3
THSCU101 UVC Camera Extension Controller menu: Select the number
5 : Set noise reduction mode
: : :
99 : Exit
5
```

2. then current and selectable settings are displayed

```
99 : Exit
5
Current Setting : 1        Current setting
1: Auto mode, 2:Fixed mode   Selectable settings
Enter 1 or 2
```

3. and you can select noise reduction auto mode or fixed mode

```
2
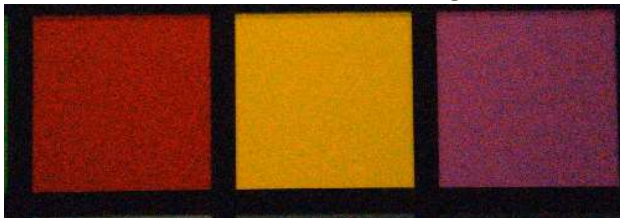```

## 4. The current fixed noise reduction strength is displayed if you choose "2: Fixed mode"

```
Current Setting = 0x0   Current fixed noise reduction setting
0:Weakest, 10:Strongest    Selectable strength parameters
```

5. and you can enter the fixed noise reduction strength (e.g. 8)

```
8
```

Fixed Noise reduction strength is 0   Fixed Noise reduction strength is 10

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6 : Set document scanner mode

1. Enter "6"

```
Found CX3_HID Device #2: VID: 0x04B4  PID: 0x00C3
THSCU101 UVC Camera Extension Controller menu: Select the number
6 : Set document scanner mode
99 : Exit
6
```
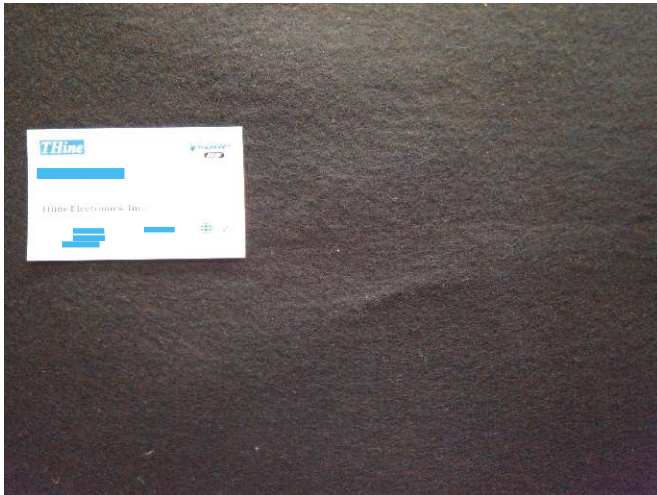
2. then current and selectable settings are displayed

```
99 : Exit
6                              Current setting
Current Setting :Normal mode
1:Normal mode, 2: Document scanner mode    Selectable settings
Enter 1 or 2
```
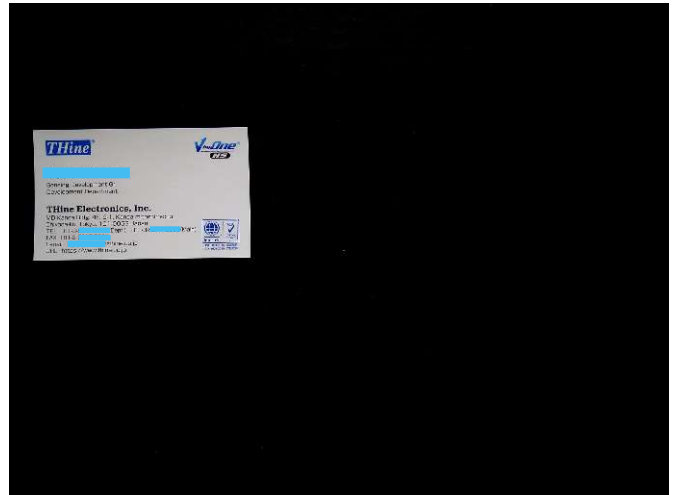
3. and you can select the mode (e.g. "Document scanner mode")

```
2
```

1: Normal mode

2: Document scanner mode

7 : Set color mode

1. Enter "7"

```
Found CX3_HID Device #2: VID: 0x04B4  PID: 0x00C3
THSCU101 UVC Camera Extension Controller menu: Select the number

7 : Set color mode
   :   :   :
99 : Exit
7
```

2. then current and selectable settings are displayed

```
99 : Exit
7                    Current setting
Current Setting = 0                            Selectable settings
1:Color, 2: Mono, 3: Negative, 4: Black and White
Enter 1 - 4
```

3. and you can select the mode (e.g. "Black and White")

```
4
```

4. The black and white threshold settings are displayed if you choose "4: Black and White",

```
4
Current Setting = 0       Current black and white threshold setting
Select black and white threshold
0:Auto, 1 - 255 : Threshold value    Selectable threshold
Enter 0 - 255
```

5. and you can enter black and white threshold setting (e.g. 127)

```
127
```

0   : Threshold values of black and
            white is automatically determined
1-255 : Threshold value of black and
            white
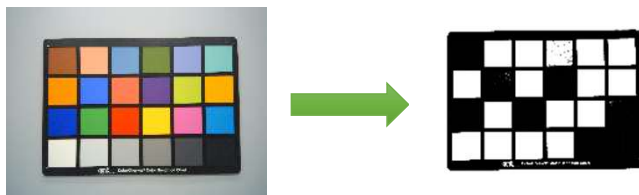
Number	Option	Image example
1	Color	
2	Mono	
3	Negative	
4	Black and white (threshold 127)	

8 : Set JPEG Q factor

1. Enter "8"

```
Found CX3_HID Device #2: VID: 0x04B4  PID: 0x00C3
THSCU101 UVC Camera Extension Controller menu: Select the number
8 : Set JPEG Q factor
99 : Exit
8
```

2. and current and selectable settings are displayed

```
99 : Exit
8
Current Setting = 1          Current setting
0:Manual control , 1: Auto control     Selectable settings
```

3. then you can enter the JPEG Q factor control mode (e.g. Manual control).

```
0
```

"0:Manual control"   : Q factor is set to fixed value, see next page
"1:Auto control"   : Q-factor is automatically controlled

4. The current JPEG Q factor setting and selectable Q factor range are displayed if you choose "0: Manual Control"

```
Current Setting = 95     Current setting
13-100: JPEG Q factor          Selectable JPEG Q factor
Enter 13 – 100
```

5. then you can enter JPEG Q factor (e.g. 90)

```
90
```

13-100 : Q factor selectable range. Smaller value is smaller file size, bigger value is better image quality.

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20 : Get current parameters of 1-8

1. Enter "20"

```
Found CX3_HID Device #2: VID: 0x04B4  PID: 0x00C3
THSCU101 UVC Camera Extension Controller menu: Select the number
...
20 : Get current parameters of 1-8
...
99 : Exit
20
```

2. then current settings are displayed

```
20
Exposure compensation = 6(0-12)
Flicker cancel priority = 0(0:Put priority to AE, 1:Put priority to flicker cancel)
Max frame rate = 0 (0: Disable, 3-60)
Auto focus mode = 0xf  (0, 3, 8, F)
Noise Reduction mode = 1 (1:Auto mode, 2: Fixed mode)
Noise reduction level in fixed mode = 0 (0: Weakest, 10: Strongest)
Document scanner mode = 1 (1:Normal mode, 2: Document scanner mode)
Color mode = 1 (1:Color, 2: Mono, 3: Negative, 4: Black and White)
Black&White threshold = 0 (0:Auto, 1-255: Threshold value)
JPEG compression = 1 (0:Manual control , 1: Auto control)
JPEG compression Q factor = 95 (13-100: JPEG Q factor )            Current setting
```

21 : Get default parameters of 1-8

1. Enter "21"

```
Found CX3_HID Device #2: VID: 0x04B4  PID: 0x00C3
THSCU101 UVC Camera Extension Controller menu: Select the number
...
21 : Get default parameters of 1-8
99 : Exit
21
```

2. then default settings are displayed

```
21
Exposure compensation = 6(0-12)
Flicker cancel priority = 0(0:Put priority to AE, 1:Put priority to flicker cancel)
Max frame rate = 0 (0: Disable, 3-60)
Auto focus mode = 0xf  (0, 3, 8, F)
Noise Reduction mode = 1 (1:Auto mode, 2: Fixed mode)
Noise reduction level in fixed mode = 0 (0: Weakest, 10: Strongest)
Document scanner mode = 1 (1:Normal mode, 2: Document scanner mode)
Color mode = 1 (1:Color, 2: Mono, 3: Negative, 4: Black and White)
Black&White threshold = 0 (0:Auto, 1-255: Threshold value)
JPEG compression = 1 (0:Manual control , 1: Auto control)
JPEG compression Q factor = 95 (13-100: JPEG Q factor )       Default setting
```

40 : Get CX3/ISP firmware version

1. Enter "40"

```
Found CX3_HID Device #2: VID: 0x04B4  PID: 0x00C3
THSCU101 UVC Camera Extension Controller menu: Select the number

40 : Get CX3/ISP firmware versions

99 : Exit
40
```

2. then CX3 and ISP firmware versions are displayed

```
40
CX3 Firmware Version = 1.18
CX3 Build Date(Year/Month/Date) = 2020/11/4
THP7312 Firmware version = 3.10
```
CX3 and ISP firmware version

60 : Write/Read register value to/from ISP

1. Enter "60",

```
Found CX3_HID Device #2: VID: 0x04B4  PID: 0x00C3
THSCU101 UVC Camera Extension Controller menu: Select the number
...
60 : Write/Read register value to/from ISP
99 : Exit
60
```

2. and write or read settings of the access are displayed

```
1: Write register, 2: Read register    Write or read settings
```

3. then you can select write or read access. (e.g. "1")

```
1: Write register, 2: Read register
1
```

"1: Write register"	: Write the specified value to the specified register address
"2: Read register"	: Read a byte from the specified register address

4. Enter the register address to write (e.g. F008)

```
Enter: 16-bit Register Addr in HEX format
F008
```

5. and enter the value(HEX) to write (e.g. 00)

```
Enter: 8-bit Write Value in HEX format
00
```

6. then the value is written into the specified register address. (*)

```
Wrote 0x00 to register(address=0xf008)
```

* The image streaming from THSCU101 stops if you write 0x00 to 0xF008.

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77 : Erase firmware (DO NOT USE WITHOUT FIRMWARE)

1. Enter "77"

```
Found CX3_HID Device #2: VID: 0x04B4  PID: 0x00C3
THSCU101 UVC Camera Extension Controller menu: Select the number
. . .
77 : Erase firmware (DO NOT USE IF NOT HAVING FIRMWARE)
99 : Exit
77
```

2. then selectable options are displayed.

```
After erasing, you have to program the firmware binary into Flash ROM.
Are you sure to erase firmware from Flash ROM ?
0 : Return to TOP menu, 77 : Excecute Erasing    Selectable options
```

3. Enter 77 again

```
77
```

4. then you can erase the firmware.

"0: Return to TOP menu"   : Return to the top menu. The firmware is NOT erased.
"77: Execute Erasing"   : Erase the firmware.