OLED Button Control Board

Product Specification

Part Name: OLED Push Button Control Board
Part ID: CY-7031
Doc No.: SCY-7031-V03

Customer:
Approved By:
Date:

Chung Yuan Technology CO., Ltd

Table of Contents

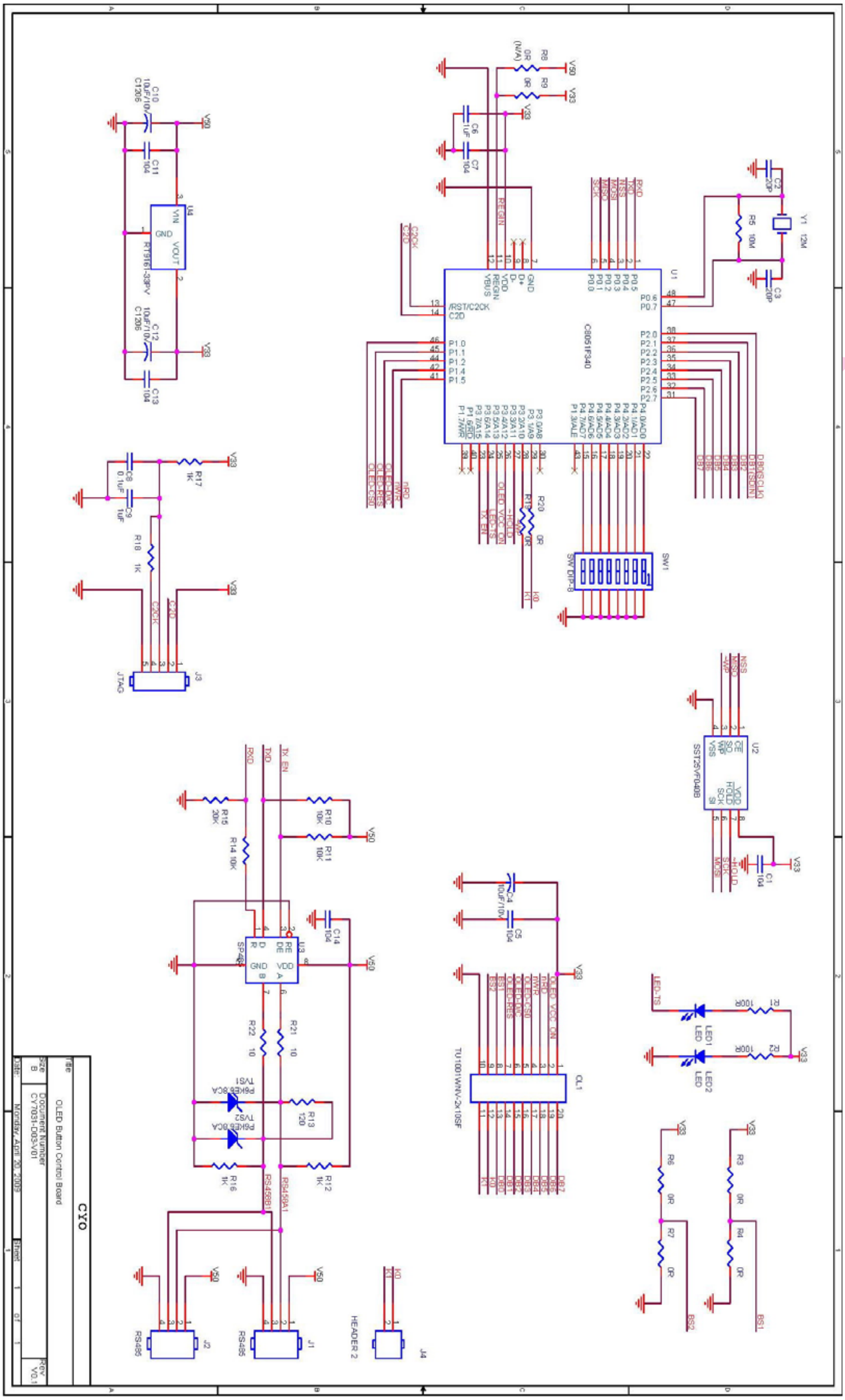
Record of Reversion

Rev	Issued Date	Description
V1.0	12/19/2008	New Create

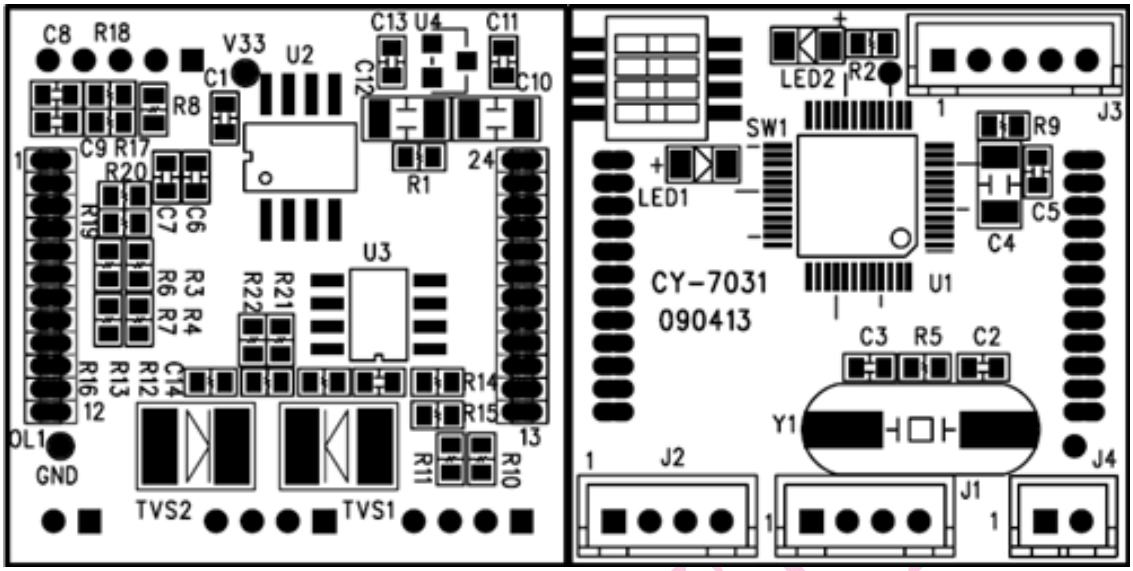
1. Features

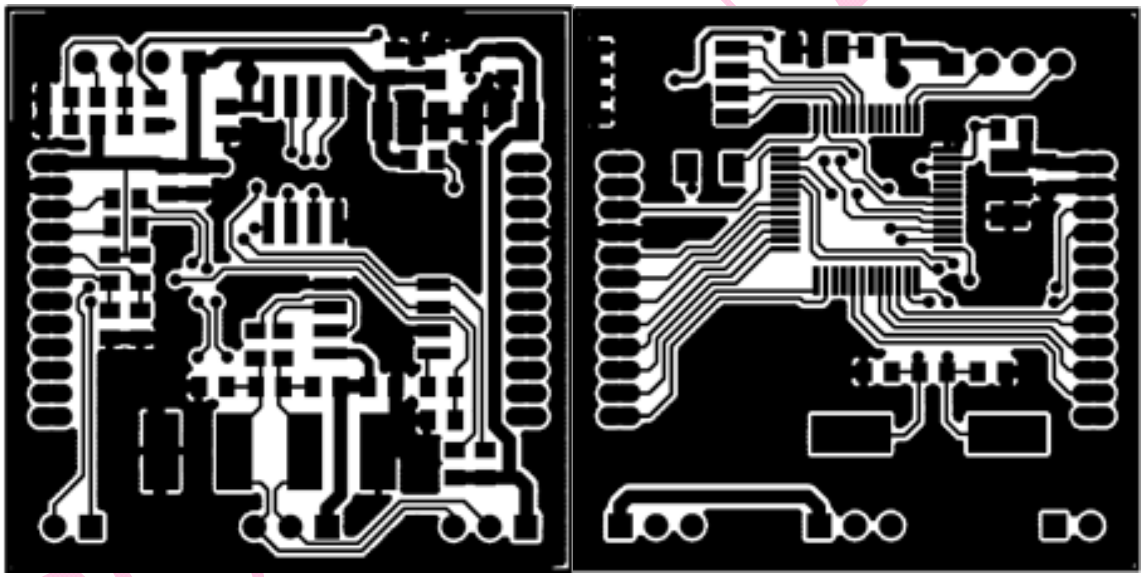
- MCU Silicon Labs C8051F340
  - 64K Program Flash Memory
  - 4352RAM
- Build-in 4M-Bit Image Flash Memory
  - OLED 96x64 RGB Mode: Memory Capacity 40 images.
  - OLED 96x96 RGB Mode: Memory Capacity 24 images.
- RS485 Communication Interface
  - Baud Rate: 115200 bits/sec
  - Data Bit = 8/Parity = None
  - Stop Bit = 1/ Hand Shaking = None
  - Driver are Short-Circuit Current Limited & Protected Against
- ID Address 1~16
  - DIP Switch Define Address from 1 to 16
  - Allows up to a total of 16 Transceivers on a Bus
- Voltage Supply Input: 5V
- PC Application Software

2. Schematic



3. PCB Layout


C8
R18
V33
U2
C13
U4
C11
C1
C12
C10
R8
C9
R17
R20
R19
C7
C6
R1
24
U3
R6
R7
R3
R4
R22
R21
R16
R13
R12
C14
R14
R15
12
13
OL1
GND
R11
R10
TVS2
TVS1
LED2
R2
J3
SW1
R9
LED1
C5
C4
CY-7031
090413
U1
C3
R5
C2
Y1
J2
J1
J4



4. Connector Assignment

4.1. Dip Switch Setup

- **ON=O /OFF=X**

ID Address	SW1_1	SW1_2	SW1_3	SW1_4
1	X	X	X	X
2	O	X	X	X
3	X	O	X	X
4	O	O	X	X
5	X	X	O	X
6	O	X	O	X
7	X	O	O	X
8	O	O	O	X
9	X	X	X	O
10	O	X	X	O
11	X	O	X	O
12	O	O	X	O
13	X	X	O	O
14	O	X	O	O
15	X	O	O	O
16	O	O	O	O

4.2. J1 & J2 (RS485 & Power Supply)

J1	PIN 1	PIN 2	PIN 3	PIN 4
FUNCTION	+5V	TA	TB	GND

J2	PIN 1	PIN 2	PIN 3	PIN 4
FUNCTION	+5V	TA	TB	GND

- +5V : Positive Supply
- TA : RS485 Non-inverting Receiver Input and Non-inverting Driver Output
- TB : RS485 Inverting Receiver Input and Inverting Driver Output
- GND : Ground

5. Protocol Description

5.1. Package structure

◆ **Structure**

Byte 1	Byte 2	Byte 3	Byte 4 ~
0x1b	Destination Device ID	0xff – Device ID	Payload

◆ **Description**

- Byte 1: Always 0x1b
- Byte 2: The device ID of receiver

ID number	Device	Remark
0x00	Host	
0x01 ~ 0xFE	Specific OLED button	
0xFF	All of OLED button	Don't need to respond any message to Host

- Byte 3 : the number of 0xff minus byte 2
- Byte 4~ : Payload

5.2. Command (The contents of payload)

◆ **Display Internal Image**

- Function: Display the image which is stored in internal memory of OLED button.

Sender	Payload Syntax	Description
Host	"D" + xxx (Notice : image 000 is for power on.)	xxx is the image number 96x64 OLED : xxx is from 000 to 40 96x96 OLED : xxx is from 000 to 24
OLED button	"OK"	Done

◆ **Set Display on/off**

- Function: Turn-on or turn-off the OLED.

Sender	Payload Syntax	Description
Host	"d0"	Turn-off OLED
Host	"d1"	Turn-on OLED
OLED button	"OK"	Done

◆ Set Display Brightness

- Function: To adjust the brightness of OLED.

Sender	Payload Syntax	Description
Host	”B“ + xx	xxx is the base of OLED brightness, from 00 to 15.
OLED button	“OK”	Done

◆ Transfer image

- Function: Transmitting an image and show it on OLED immediately.

Sender	Payload Syntax	Description
Host	”G“ + hhhh + “S” + d0 + d1 + d2 + … + d(hhhh-1)	hhhh is the quantity of byte of image in hexadecimal (0x0000~0xffff), d0 d1 d2 … are the image data
OLED button	“OK”	Done

◆ Save image to internal memory

- Function: Store the current image of OLED in memory.

Sender	Payload Syntax	Description
Host	”S“ + xxx (Notice : image 000 is for power on.)	xxx is the image number 96x64 OLED : xxx is from 000 to 40 96x96 OLED : xxx is from 000 to 24
OLED button	“OK”	Done

1. Request product information

- Function: Asking the product information of OLED button.

Sender	Payload Syntax	Description
Host	”I“	
OLED button	ppppppp+ fffff	ppppppp is the product ID, the firmware version is the fffff

- The Product ID list:

Item	Product ID	Description	Brand
1	CY-1021 CY-3021	96 x 64(RGB) OLED Button 96 x 64(RGB) OLED Display Module	CYO
2	CY-1031 CY-3031	96 x 96(RGB) OLED Button 96 x 96(RGB) OLED Display Module	CYO

2. Request switch status

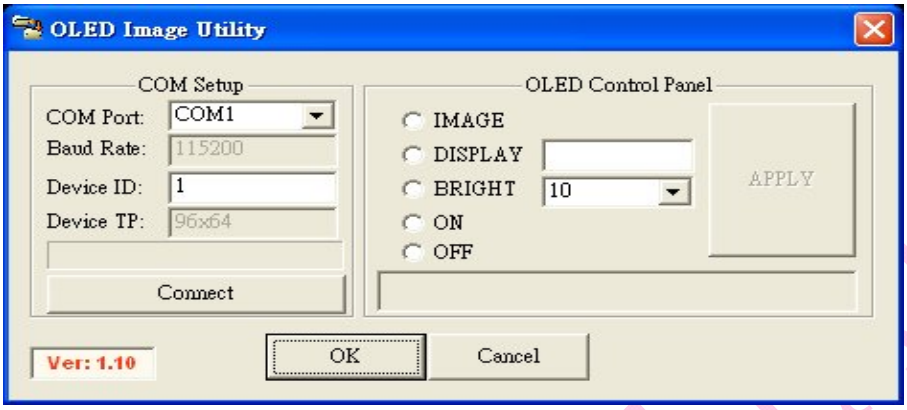
- Function: Asking the switch status.

Sender	Payload Syntax	Description
Host	“T”	
OLED button	“0”	The switch of OLED button is OPEN.
OLED button	“1”	The switch of OLED button is CLOSE.

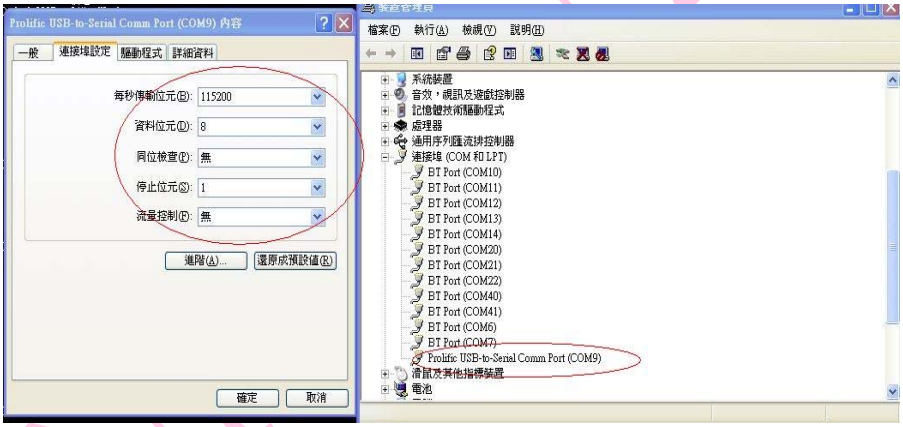
6. Application Software

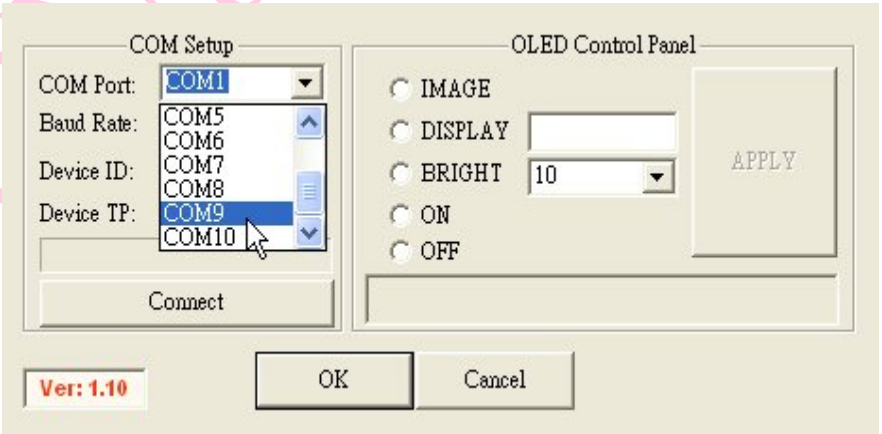
6.1. Setup

1. Run OLED converter program



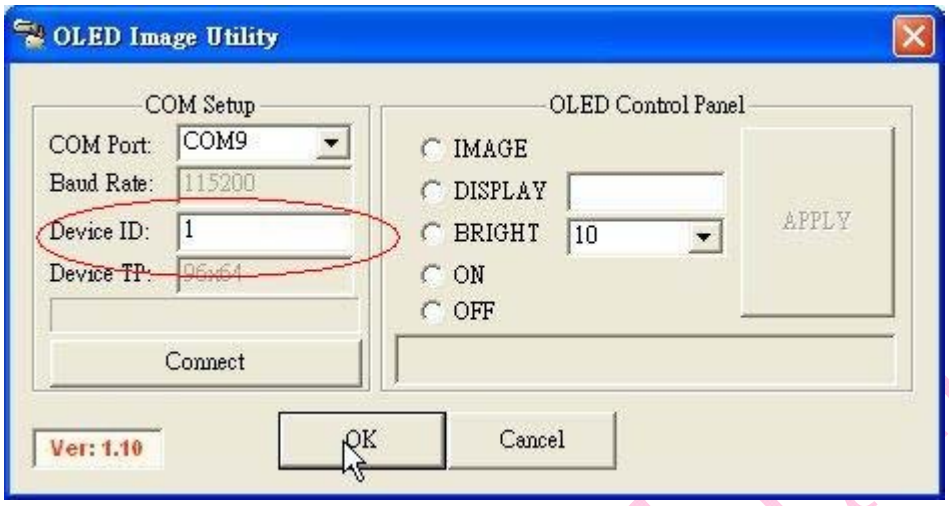
3. Select COM Port





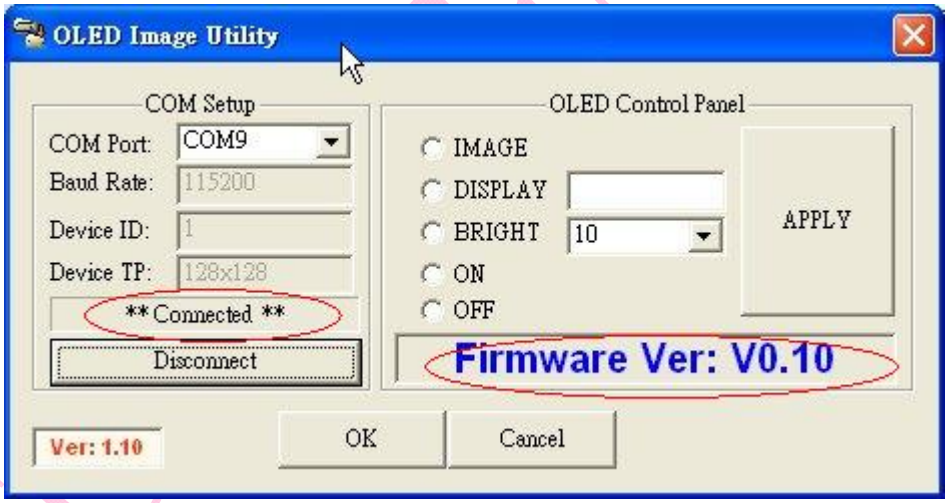
- Check PC COM port
- Setup Baud Rate 11520
  Data Bit=8 / Parity=None
  Stop Bit=1/ Hand Shaking=None
- Setup OLED converter COM Port

4. Input ID Address



- To make sure your dip switch and the device ID are the same.
- Regarding to Dip Switch setup, please refer to Section 4.1..

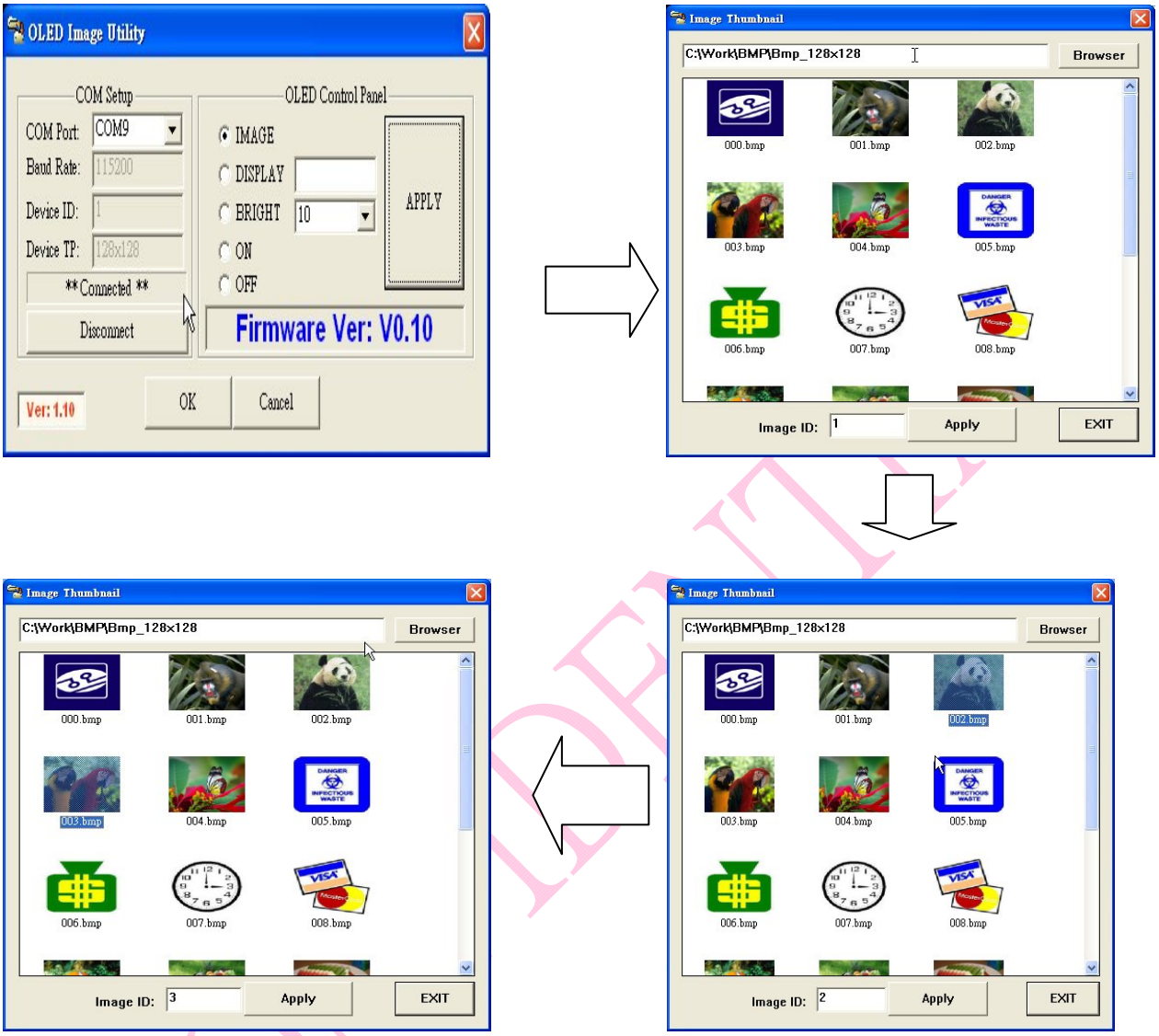
5. Click Connect



- Click on connect icon
- Feedback “**Connected**” and “Firmware Ver:“ mean your PC and the control board are linked.
- Feedback “**FAILED**”: please check Section 6.1. Setup Point 1 to 3.

6.2. OLED Control

◆ IMAGE



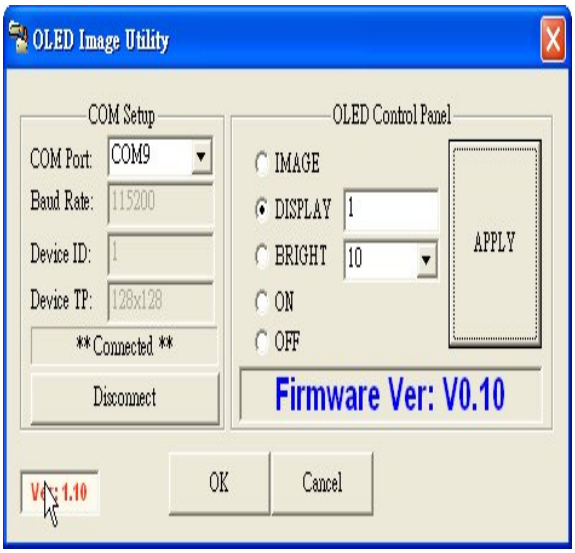
- How to storage your images into the control board?

1. Select IMAGE icon and Click “APPLY”.
2. Select one image file and input Image ID.
   - Image File supports BMP format only.
   - BMP pixel cannot be smaller than OLED Resolution.
   - Image ID input must follow table below:

OLED PIXEL	96x64	96x96
Image ID	1~40	1~24

3. Click “Apply” after setup your image ID & file, the image will show up on OLED Display. This image is stored in the control board memory.
4. Store your images into the control board by the steps above.

◆ **DISPLAY**



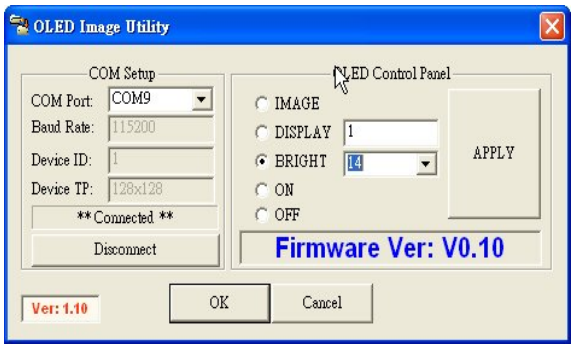
Display 1

Display 3

Display 2

- How to show up your image on OLED Display?
  1. Make sure all your images are already stored in your control board memory.
  2. Select DISPLAY icon and input the image number, then Click “APPLY”.
  3. The image will show up on OLED as your command.

◆ BRIGHTNESS

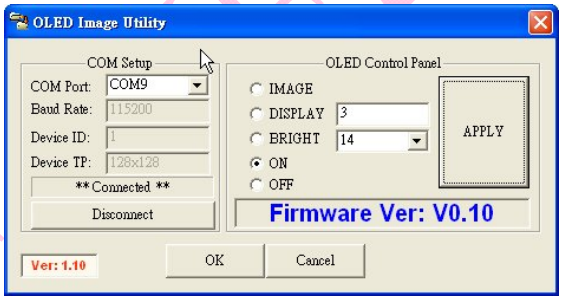


Bright 10: 

Bright 15: 

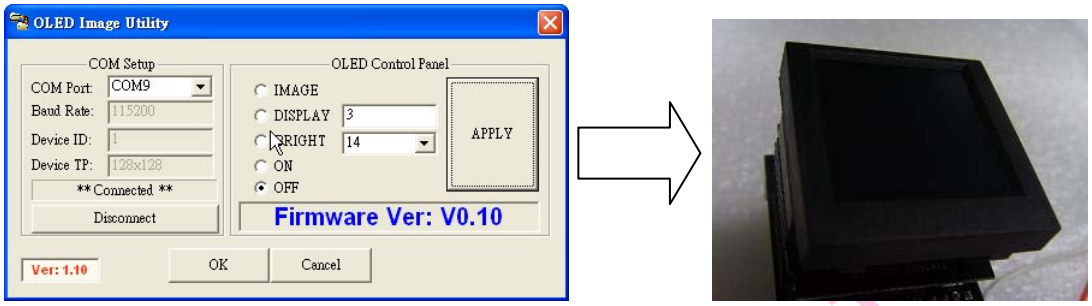
- How to adjust the brightness of your OLED image?
- Select BRIGHT icon and input the brightness level, then Click “APPLY”.
  1. The higher (bigger) the brightness level, the brighter.

◆ ON



- How to turn on your OLED Display?
  1. Select ON icon and Click “APPLY”. Your OLED will light up.

◆ **OFF**



- How to turn off your OLED Display?
  1. Select OFF icon and Click “APPLY”. Your OLED will power off.