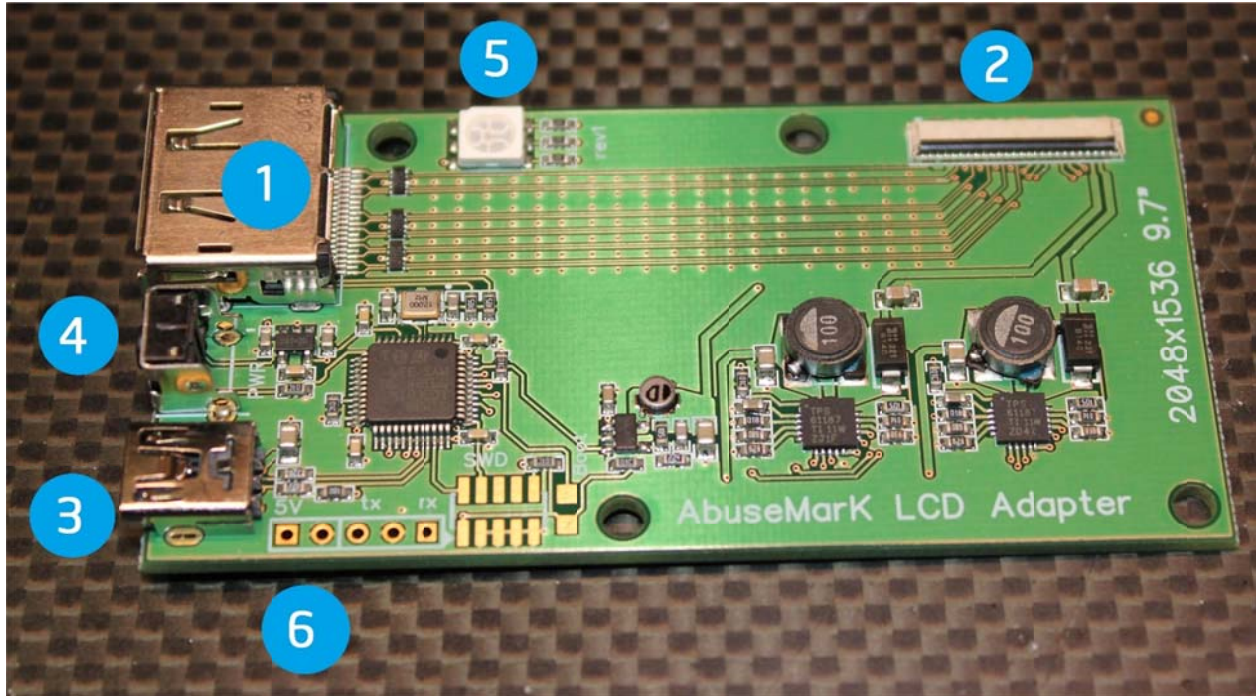


# AbuseMarK LCD Adapter (rev1)

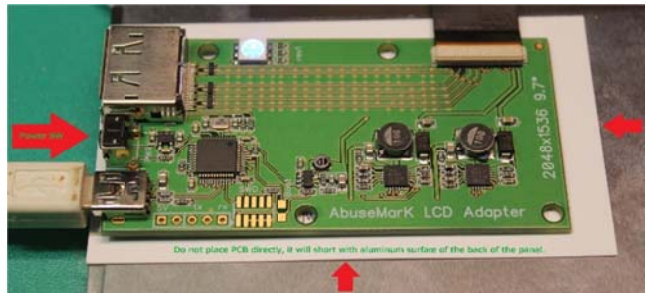
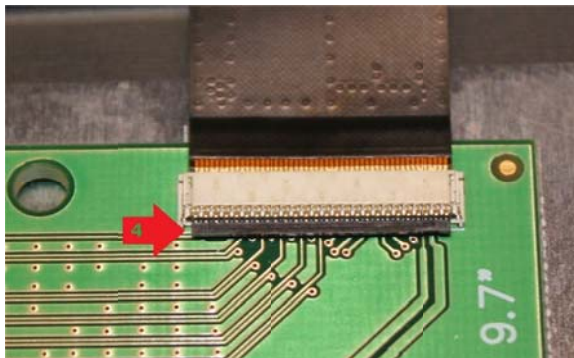
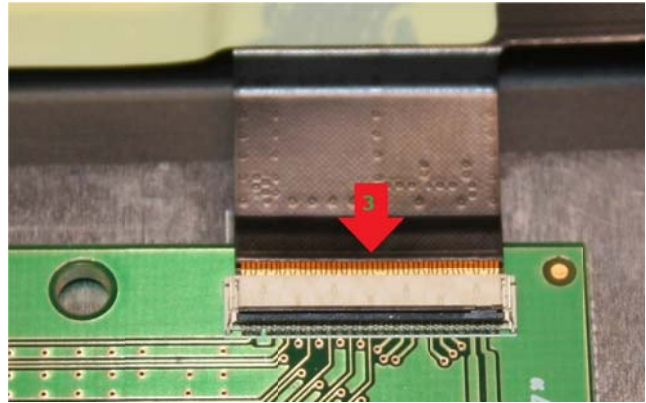
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1. DisplayPort connector
2. 51-pin FPC connector for LCD
3. USB connector for power or firmware update
4. Power button
5. Power/Status LED
6. External 5V source (see External Power section)

For functionality of Power button, see the “LCD Adapter firmware features and operation” section (last page).

# Connecting adapter to LCD Panel

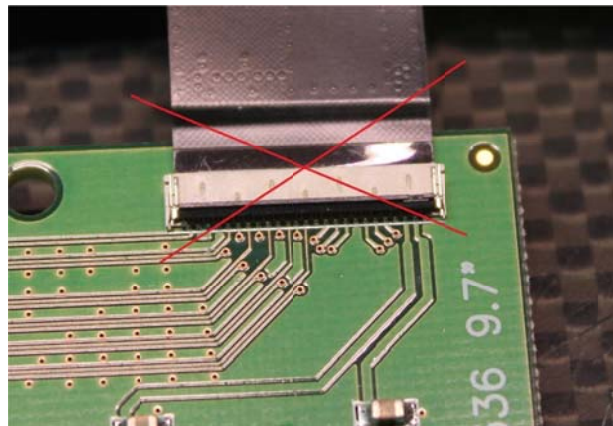
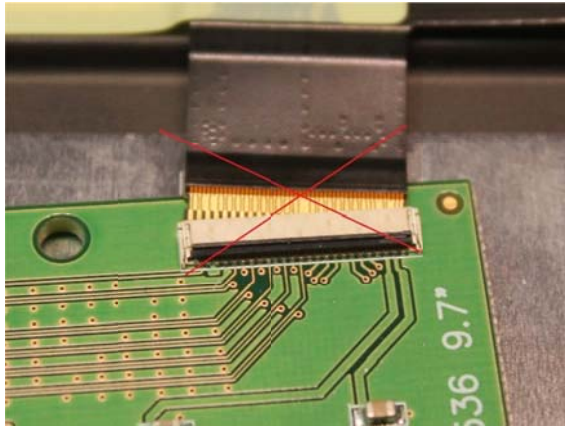


1. Carefully lift up lever on the back of connector
2. Align FPC cable with circuit (gold) side facing up, and push it into connector
3. Stop when cable reaches shown position. Do not force cable further into the connector
4. While keeping cable aligned, push back on the lever to lock cable inside

If testing with the board on the back of LCD, make sure to place paper or some other non-conductive material between. Or else, the board will short circuit with the aluminum back of the panel.

## Improper connection examples

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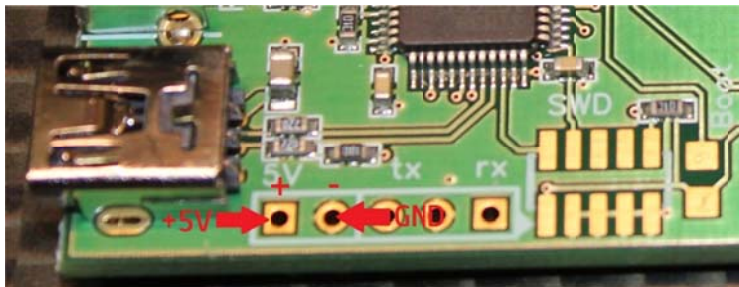
Left image: Cable not aligned correctly, not fully inserted. Powering up like this will likely burn the panel.

Right image: Cable inserted circuit (gold) side down, this is incorrect.

## External Power 5V source

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When arranging many panels in array, its easier to source a single 5V connector for all panels and avoid USB cable mess.



A standard 2.54mm (0.1") pin header connection is provided for this purpose. User can solder in pin header or wires directly. Left-side is positive (+) and right side is negative (-). The following 3 pads (tx, GND, rx) are NOT related to power and 5V must not be connected to them at any time. These pads are for emergency firmware recovery or debugging.

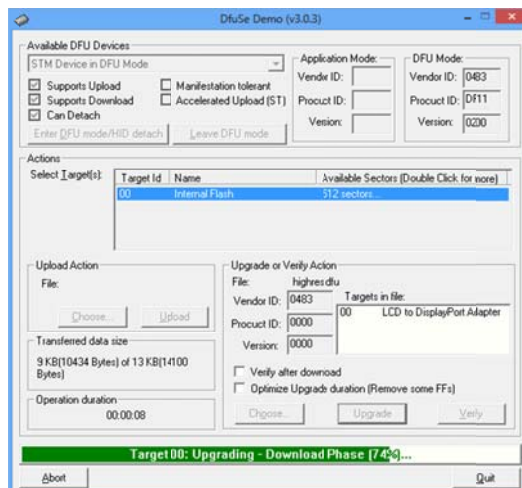
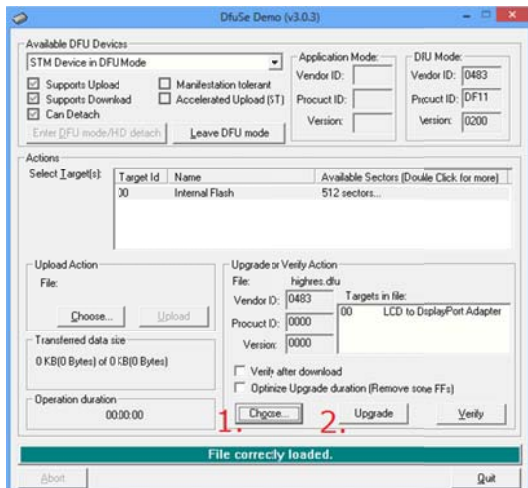
# LCD Adapter firmware upgrade and operation

## Required software

- STMicroelectronics DFuSe USB Device Firmware Upgrade GUI: <http://www.st.com/web/en/catalog/tools/PF257916>
- For firmware update on unsupported or niche OS (ex. Linux), one might be able to use DFU-UTIL from <http://dfu-util.gnumonks.org/>. This method is not supported and not documented here.

## Upgrade procedure

- Remove power (Unplug USB or disconnect external 5V), and press and HOLD Power button, while connecting USB cable. Firmware update on external 5V power is NOT supported.
- Status LED will light up RED and remain lit, and new device will install “ST Device in DFU mode”
- Start DFuse Demo application
- In the “Upgrade or verify” box in the GUI, make sure to uncheck Verify After download, if checked
- Choose upgrade file, would be called like “highres\_rev1.dfu”
- Click “Upgrade” button
- While upgrading, LED will flash green and red depending on mode.
- When finished, unplug and reconnect USB.





# LCD Adapter firmware features and operation

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When connected by USB or external 5V source, adapter defaults to full power on, with status LED glowing **BLUE**.

One press on power button will switch to STANDBY mode, which turns off backlight, but keeps DisplayPort connection. This mode is used to keep power consumption lower, or to save backlight lifetime. In this mode, status LED is glowing **RED**.

To fully turn off the adapter (including disconnect from DisplayPort signals), press the power button twice.

●→●→☀ (BLUE – full power on -> RED – standby -> Full power off (LED off))

Since most common use case does not involve disconnecting from DisplayPort (as this would cause other monitors to flicker while display adapter is reconfiguring), if adapter is in standby mode for more than a few seconds, pressing the power button returns to Full power mode, turning on backlight.

●→●→Wait 2+ seconds→● (BLUE – full power on -> RED – standby -> if monitor is in standby for a few seconds, pressing Power again will go back to FULL power mode (BLUE LED)).

To change brightness, press and hold the power button for more than a second. This enters brightness control mode. In this mode, status led glowing cycles between 2 colors - **YELLOW** means brightness DOWN adjustment, and **PURPLE** means brightness UP adjustment. Once in brightness adjustment mode, short clicks on power button will adjust brightness in steps up or down respectively. Hold power button again to switch to next mode, or to save.

●→●→●→● When required brightness is achieved, hold the button until status LED is glowing **BLUE**. This will save current brightness to non-volatile memory.

Other features may be added via firmware updates at a later time.

This information is current as of 2014/03/21.

# LCD Adapter serial console (advanced)

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A “serial console” feature is provided in latest firmware, to control backlight brightness, as well as power to panel/backlight. This feature is for advanced users and is not needed for normal operation.

To use, connect a 3.3V TTL to USB/Serial adapter to the TX, RX pins, shown on the picture to the right. The pin between TX, RX is Ground and is to be connected to GND or similar pin on the TTL>Serial adapter. Depending on adapter type, RX on the board might need to be connected to TX on adapter, and TX to RX.



After hardware connection is made, open a serial terminal program (for example PuTTY or HyperTerminal, etc) and connect to the COM port assigned to USB/Serial adapter at 115200 baud, 8N1.

To check console operation, press the Enter key a few times and type “help” followed by Enter. If nothing is shown on screen, swap RX/TX wires.

The following commands are available on serial console

`set brightness=xxx` where xxx is a value from 10 to 950 to set backlight brightness. Note there are no spaces around the equal sign.

`control bl|dp on|off` will control power to backlight (bl) or DisplayPort (dp) to turn on or off. For example, to turn off backlight, type “`control bl off`” and press Enter. Note that turning off DisplayPort power will disconnect the display from PC, causing graphics driver restart.

`strobe duration [brightness]` will strobe (flash) backlight for duration microseconds optionally setting brightness to a given value (otherwise default brightness value is used). Backlight power must be off before using this command, this can be achieved by typing “`control bl off`”. For example, to strobe for 100ms with backlight at 50% power, type “`strobe 100 500`” and press Enter. If brightness setting is not required, “`strobe 100`” is sufficient.

`save` will save current settings (only brightness at this moment) to eeprom.

`status` will print current power status of Backlight and DisplayPort.

`version` will print current firmware version and build date.

Other commands might be added in the future update.

This information is current as of 2014/03/21.