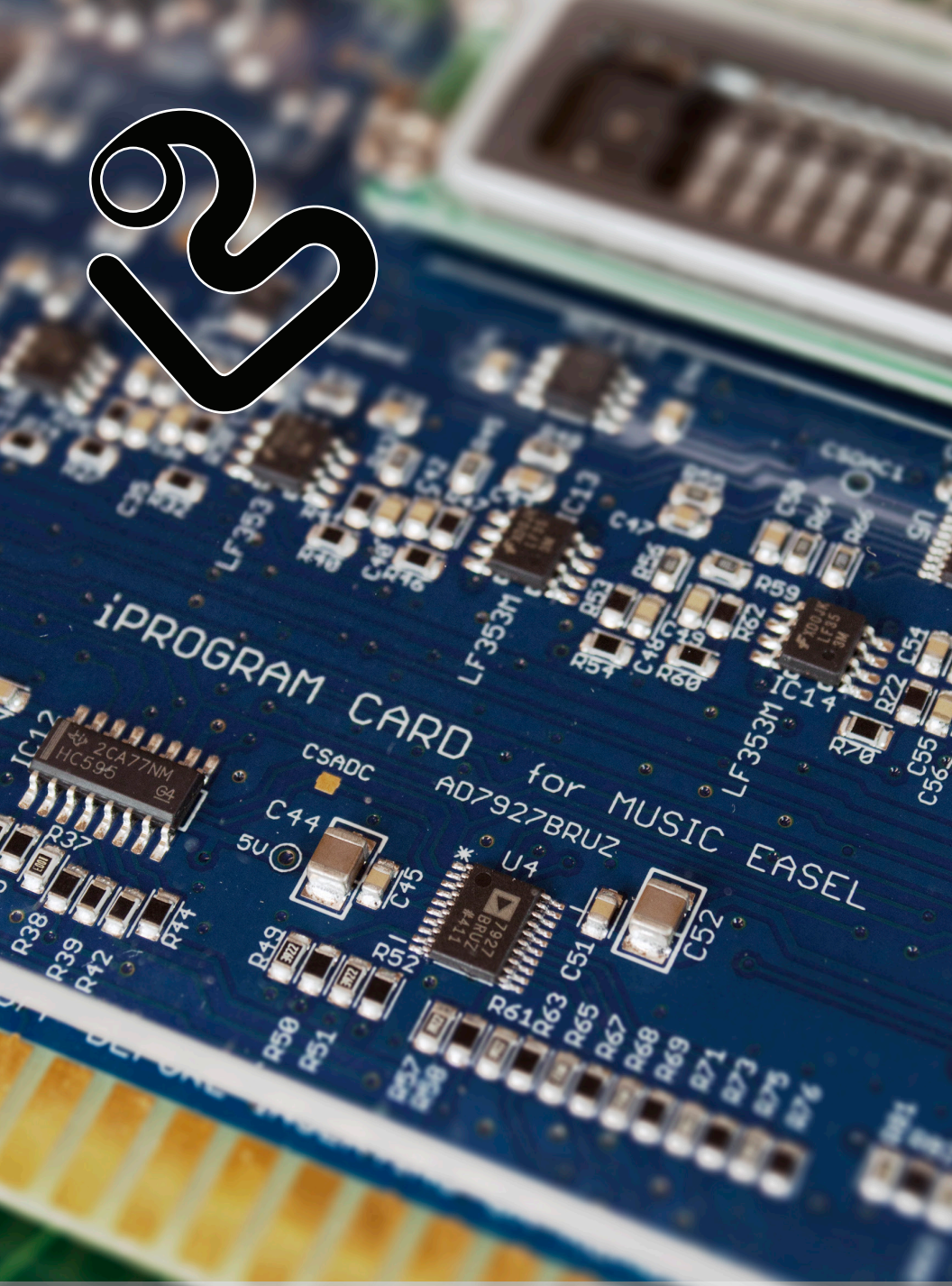

iPROGRAM CARD
for MUSIC EASEL
AD7927BRUZ
CSADC
5V
C44
C45
U4
C52
C51
IC12
IC14
LF353M
HC595

User Manual

Table of Contents

Warning/Features.....2

Hardware Overview.....3

Blinking WiFi Network Info.....4

MIDI Via USB Connectivity.....6

Easel208Pad iPad App Quick Start Guide.....8

Appendix A: Updating Firmware.....11

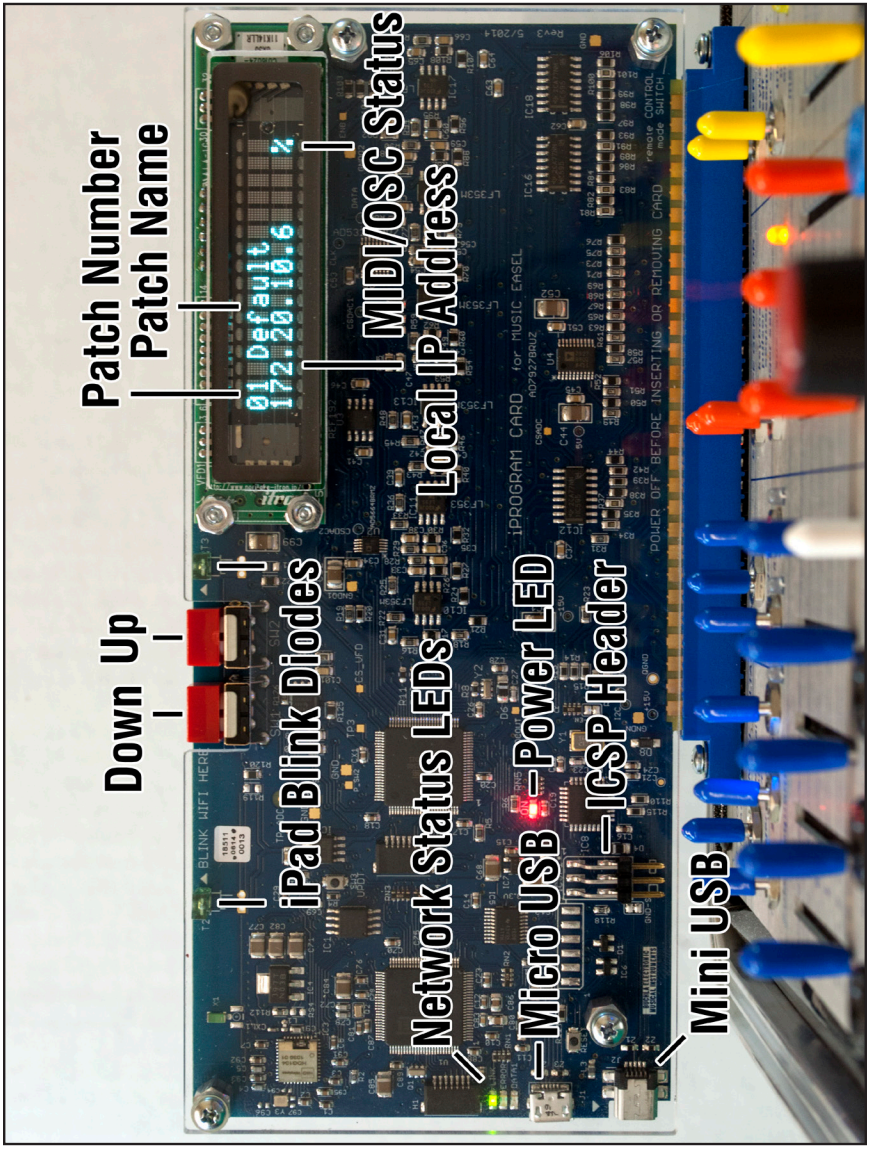
WARNING

Never insert or remove the iProgram Card from the Easel card slot while the Easel is powered on. This may cause damage to the iProgram Card.

Features:

- Full wireless (Open Sound Control) and wired (MIDI over USB) integration with the Easel208Pad iPad app that allows for live remote control of the Easel, limitless preset storage, management of the presets stored on the iProgram Card, and the ability to voltage control certain parameters not accessible via the physical 208 panel
- Storage of up to 24 presets that can be recalled without the need for any additional hardware
- Firmware updateable via USB

Manual written by Charles Seeholzer
For support questions contact info@buchla.com


Patch Number
Patch Name
01 Default
172.20.10.6
MIDI/OSC Status
Local IP Address
Down
Up
iPad Blink Diodes
Network Status LEDs
Micro USB
Power LED
ICSP Header
Mini USB

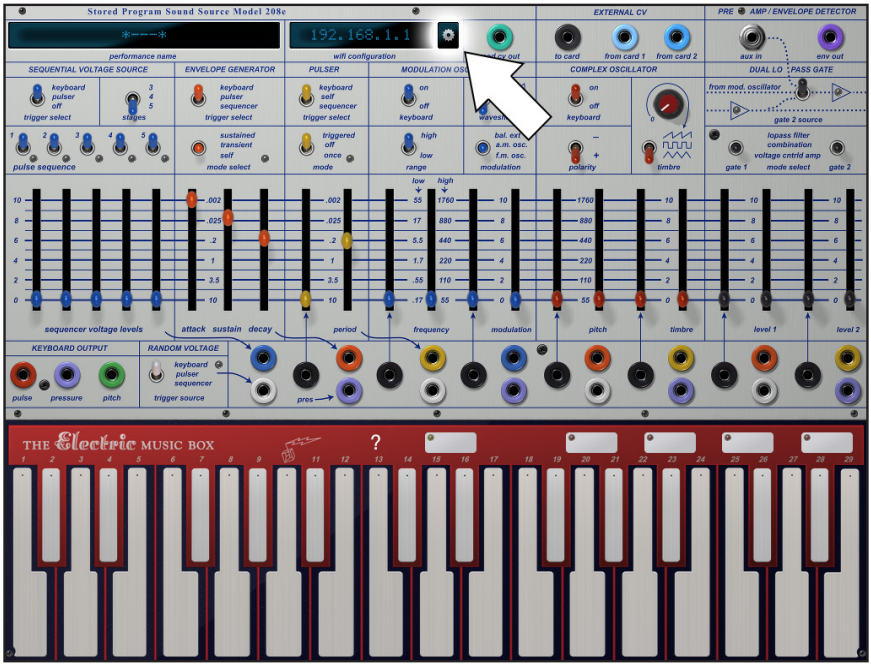
Blinking WiFi Network Info:

The iProgram Card can store one wireless network name and password at a time. This information is communicated to the iProgram Card optically from the iPad Easel app by blinking the data to two diodes located at the top of the iProgram Card.

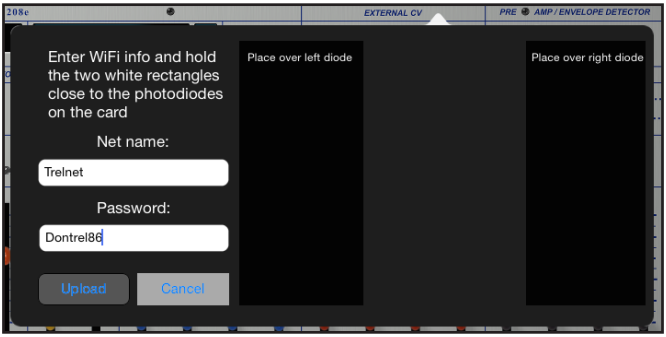
Things required:

- iProgram Card
- iPad with Easel208Pad app

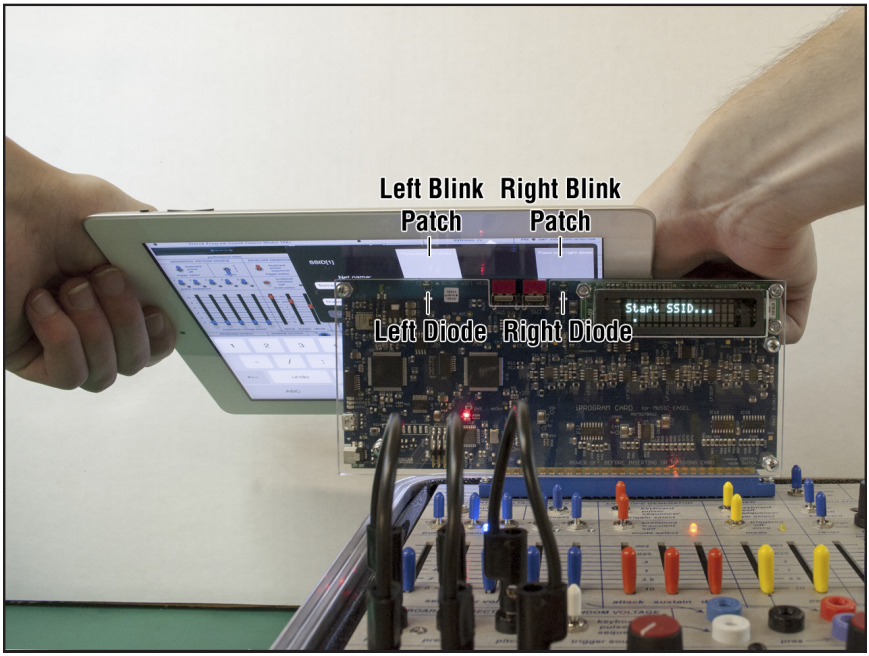
1. With the Easel powered off, plug the iProgram Card into the Easel. Hold down the right red button on the iProgram Card and power on the Easel. After displaying the firmware version of the card, the screen should display the message “Use iOS app to enter Wifi info.”
2. In some cases moving your hand away from the buttons and briefly blocking light to one or both of the green diodes at the top of the card can cause the screen to go blank. This does not affect the transmission of data from the iPad to the iProgram Card.
3. Open the iPad Easel app and tap on the gear icon at the stop of the screen.



4. A window will open with input fields to input your WiFi network name and password. The screen brightness should automatically increase to maximum. If not, manually adjust the screen to its maximum brightness. In addition, avoid blinking the network information to the iProgram Card in direct sunlight or bright lighting.



5. To blink the network information to the iProgram card, you will need to align the two black rectangles to the right of the network information text fields with the two green photodiodes at the top of the iProgram card. It is important to make sure that the left box on the iPad screen is above the left photodiode on the card (when looking at the display side) and that the right box is above the right photodiode on the card, as shown below.



6. Tap the “Upload” button in the iPad app, and the window will begin a countdown giving you 5 seconds to align the iPad with the iProgram Card as previously described.
7. As the WiFi network information is transmitted, the iProgram Card display should update to reflect the data it is receiving (e.g., a period for each character of the SSID/password, or the transmission’s beginning and end).
8. After the transmission is complete, the card will restart and prompt you to enable WiFi. Press up on the iProgram Card and it will briefly display the WiFi network name and password, allowing you to verify that both are correct, and then attempt to connect to the network.
9. After successfully connecting to the network, the iProgram Card display will show the name of the first preset stored on the card, as well as the card’s local IP address on the network.

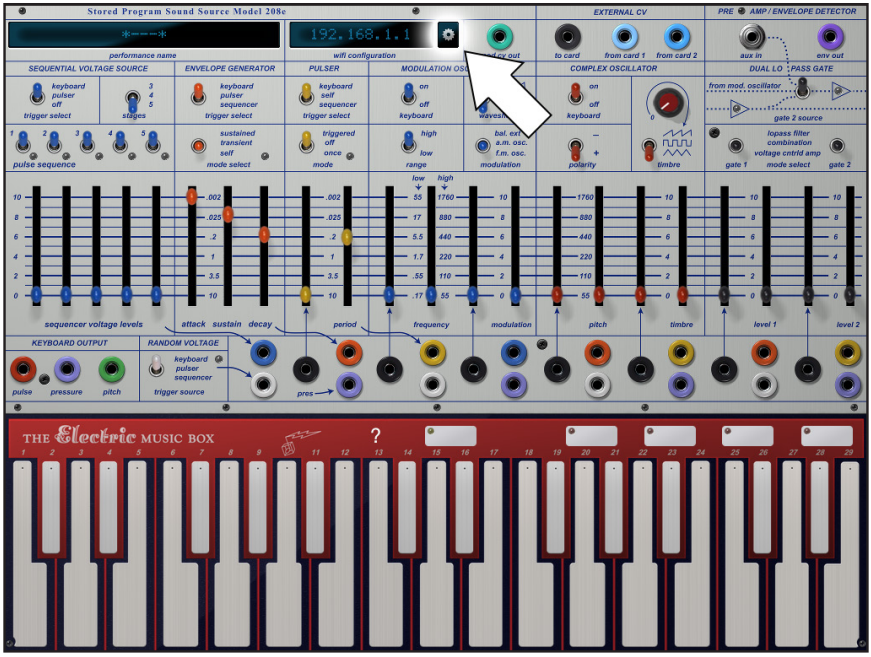
Connecting the iProgram Card to the iPad App via USB:

The iProgram Card has the ability to be addressed as a USB MIDI device via its mini USB port. This allows a hardwired connection between the iProgram Card and its control hardware in the case that there is no wireless network available, or if you prefer not to use one.

Things required:

- iProgram Card
- iPad with Easel208Pad app
- iPad 30-Pin Camera Connection Kit/Lightning to USB Adapter

1. With the Easel powered off, insert the iProgram Card into the Easel and power it on. Press down on the iProgram Card to select “WiFi Off.”
2. Connect the iPad to the iProgram Card via a mini USB cable and a USB to iPad adapter.
3. Open up the Easel208Pad app and tap on the gear icon at the top of the screen.



4. A card connection setup window will pop up. Tap the “MIDI” option.

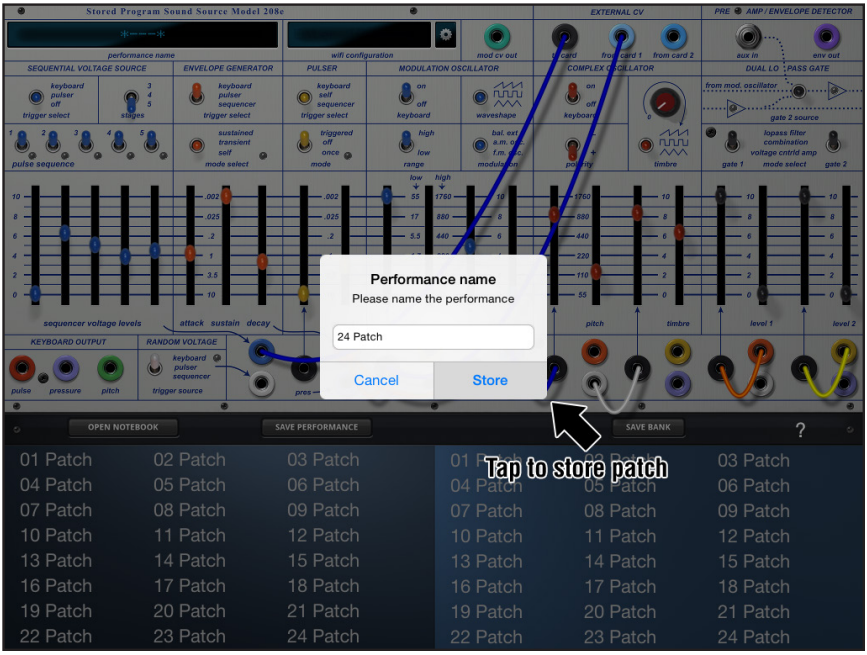
5. Another window will pop up showing a list of available MIDI devices. Scroll down the list to “iProgramCard” and tap anywhere outside the window to dismiss it. The app should now display “MIDI Connected” at the top of the screen.

Creating virtual patch cables:

Deleting a patch cable:

Accessing patch management:

Saving patch:



Creating a bank of patches and loading onto iProgram Card:

Hidden CV inputs:

Appendix A

Updating Card Firmware:

The iProgram Card has a dedicated MCU for USB communication. When the card is shipped, this comes pre-flashed with firmware that allows the card to communicate with the iPad app via MIDI over USB. This would be useful in a case where there is no wireless network available. In order to upload new firmware, the USB MCU must first be flashed with USB to serial firmware.

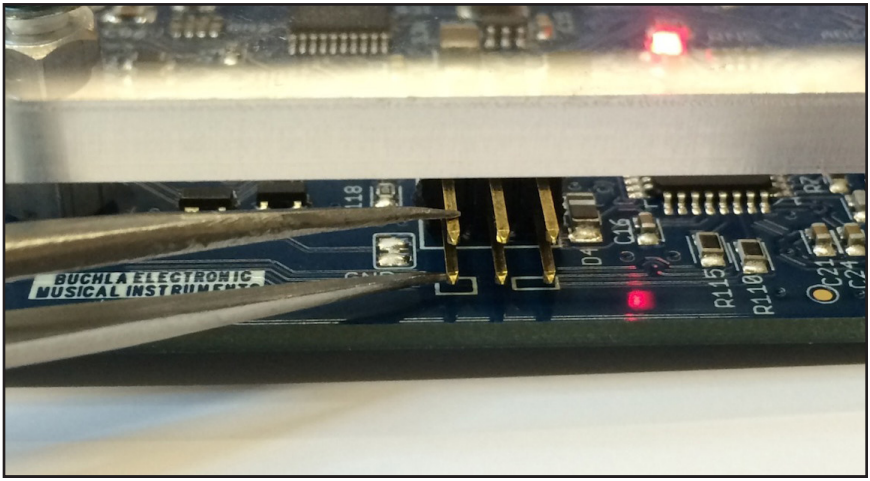
Things required:

- iProgram Card
- Mini USB Cable
- Computer with Mac OS X 10.7 or later
- Tweezers/paperclip/other metallic object

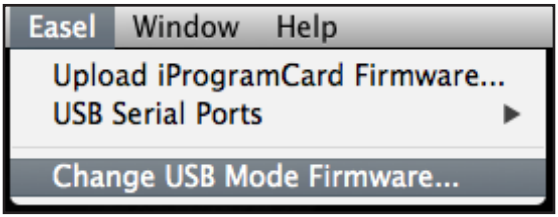
Available at http://buchla.com/

- Latest iProgram Card firmware
- Buchla Firmware Utility 1.6 or later
- USB to serial firmware
- USB to MIDI firmware

1. With the Easel powered off, plug the iProgram Card into the Easel, then power on the Easel.
2. Using a mini USB cable, connect the iProgram Card to a computer.
3. Take a pair of tweezers, a paperclip, or another slim, metallic object and short the two leftmost pins on the header labeled ICSP1 at the bottom left of the iProgram Card as shown.



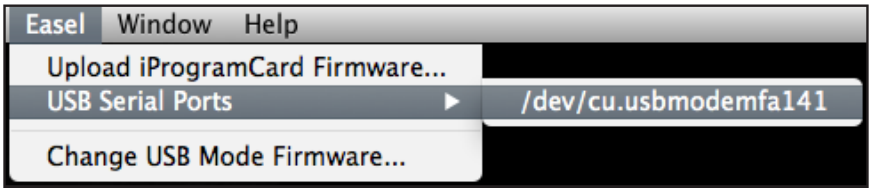
4. Keep the pins shorted for 2 seconds before removing the metal object. Putting the USB into DFU mode with this method sometimes resets the main MCU, and the display might clear.
5. Open Buchla Firmware Utility.
6. Under the “Easel” menu at the top, select “Change USB Mode Firmware…”



7. Navigate to hex file for the USB to serial firmware on your hard drive and click “Open”
8. The window should display text similar to what is below:

```
Erasing USB interface chip.

Attempting to change iProgramCard firmware mode via dfu_
programmer USB... please wait.

     target: atmega16u2
    chip_id: 0x2fef
  vendor_id: 0x03eb
    command: flash
      quiet: false
      debug: 10
device_type: AVR
------ command specific below ------
   validate: true
   hex file: /Path/to/USBserial.hex

Validating...
7414 bytes used (60.34%)

Restarting USB interface chip.


Done!
```

9. Close the Buchla Firmware Utility and reopen it.
10. Under the “Easel” menu at the top, select the device listed under “USB Serial Ports” as shown.



11. Select, from the same “Easel” menu “Upload iProgramCard Firmware…” and open iProgramCard_v**.hex where ** is the current firmware version downloaded from http://buchla.com/
12. The window should display text similar to what is below:

```
Attempting to write new firmware to iProgramCard via avr-
dude USB serial... please wait.

avrdude: AVR device initialized and ready to accept in-
structions

Reading | ################################### | 100%
0.03s

avrdude: Device signature = 0x1e9801
avrdude: reading input file “/Path/to/iProgramCard_v**.
hex”
avrdude: writing flash (37414 bytes):

Writing | ################################### | 100%
5.41s

avrdude: 37414 bytes of flash written


avrdude done.  Thank you.
```

13. Repeat steps 3 through 6 using the hex file for the USB to MIDI firmware instead of the USB to serial firmware
14. The window should display text similar to what is below:

```
Erasing USB interface chip.

Attempting to change iProgramCard firmware mode via dfu_
programmer USB... please wait.

     target: atmega16u2
    chip_id: 0x2fef
  vendor_id: 0x03eb
    command: flash
      quiet: false
      debug: 10
device_type: AVR
------ command specific below ------
   validate: true
   hex file: /Path/to/USBMIDI.hex

Validating...
3418 bytes used (27.82%)

Restarting USB interface chip.


Done!.
```

15. The MIDI via USB functionality of the mini USB port has been restored, the iProgram Card has the latest firmware, and is ready for use.

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