

Procedure for installing the SanDevices UPG1 Upgrade Module when a Prop Programmer is not available.
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This procedure is not without risk. If for whatever reason the upgrade module does work properly with your controller, the controller will no longer be useable. For this reason it is recommended that you have a Parallax Prop Plug programmer available. This will allow you to restore the board to its former state if necessary.

If you have multiple boards to upgrade, do not try to upgrade more than one if you are not successful with the first.

Please note this upgrade procedure involves loading a new firmware file onto the E680 or E681. Once this file is loaded the board will not be useable until the upgrade module is installed and operating properly. So it's important that you follow this order:

Make sure that you have all necessary files and a UPG1 module.

Make sure that you have an upgradeable controller (the existing Ethernet module must be socketed, not soldered directly to the circuit board).

First, install the new firmware (the old Ethernet module must remain in place during this procedure).

Then, install the UPG1 module itself.

Remember, you should NOT install the "-6" firmware unless you have a UPG1 module in hand, and a board to be upgraded that has a socketed Ethernet module, since once that firmware has been installed the board will no longer function until the existing Ethernet module has been replaced by the UPG1.

These instructions apply to the UPG1 upgrade module sold by SanDevices. A similar module is sold by DIYLEDEpress. If you have the DIYLEDEpress upgrade module please consult that web site for documentation specific to your device.

The first step of the upgrade procedure involves using the GF command to load a new firmware file. If you have previously loaded new firmware this way, you will already be familiar with this procedure, if not, here are the steps. The firmware file you load should be of the type "E68X-6v2.0xx-01.eeprom", where X is 0 for updating an E680, and 1 for updating an E681. As of this writing the current file version is 2.045. So, to upgrade an E681, you would need the file: E681-6v2.045-01.eeprom.

The GF command is used to load a new firmware file over the network. Follow this procedure to update the controller firmware via the network. Not only does this eliminate the need for a dedicated programmer, it allows updating the firmware of controllers that are installed in locations where physical access to the controller is difficult.

The firmware updater is a small program written in Python that sends the firmware file to the E682 controllers on your LAN. Please follow these steps to do an update.

- 1) Download and install Python version 2.6 on your PC. As of July 2012 this link is good, if there's an issue, please Google "python 2.6 download" for a current link.

<http://www.python.org/ftp/python/2.6.6/python-2.6.6.msi>

This will download a file named python-2.6.6.msi. Double-click this file to install Python. Accept all of the defaults during the installation. This will install Python into a folder named Python26 in the root of your C: drive (C:\Python26).

- 2) Download the firmware loader program from sandevices.com (fwloader_1_0.py) (or if this is an email it should be attached), and move it into the C:\python26 folder. Keep the python26 folder open on your desktop. Steps 1 and 2 only need to be done the first time you do an upgrade. For subsequent upgrades begin with step 3.
- 3) Download the new firmware file from the sandevices.com web site, or if this is an email it will be attached. This will be a file with the type ".eeprom". The latest firmware versions for each device will be on the web site. Make sure you download the proper file for your controller:

E680-6v2.045-01.eeprom to upgrade an E680 or

E681-6v2.049-01.eeprom to upgrade an E681. Note that these versions are current as of 11/17/2012 and could change. Copy the firmware file (.eeprom file) into the c:\Python26 folder, and then (important!), rename it as: firmware.eeprom

- 4) Some items to check before proceeding:
If you have more than one network connection to your PC (say you use a wireless connection for internet access, but a wired Ethernet connection to the E68X), you will need to disable all network connections other than the one to the E68X.
Make sure that no SACN/E1.31 'senders' are running on your network.
Make sure that Test Patterns are turned OFF on the E68X.
- 5) Bring up the web configuration page for the controller that you are updating. If you have not changed the as-shipped default address, you would access the controller by typing 192.168.1.206 in the address bar of your web browser.
- 6) Double-click the fwloader_1_0.py icon in the python26 folder. This should open up a black window with the text "Firmware File: firmware.eeprom found". If the black window disappears immediately it means that the firmware file has not been properly renamed (to firmware.eeprom), or has not been placed in the C:\Python26 folder.
- 7) Type the 2-letter command GF (get firmware) into the command box on the E682 controller web page. Do this within 10 seconds of starting the updater.
- 8) You should see the controller restart after about 90-120 seconds, and you will see the normal start-up sequence of the LEDs. If you don't see the LEDs doing the start-up sequence, just wait at least 3 minutes. The black command window for the updater will close automatically after about 90 seconds.
- 9) Try to refresh the configuration page of the E68X. IMPORTANT: You MUST refresh the page by typing an actual command in the command box, either a legitimate command or a dummy command such as XX. If you refresh using F5 or your browser's "refresh" button, you will actually send another GF command and that will start a new firmware update attempt which will wipe out the result status of the last one.

If the firmware update was successful, you will be unable to access the controller's web PAGE. If you CAN access the web page, it means that the update failed. The reason for the failure should be indicated on the page as "Last Firmware Update Status".

If the first attempt fails, try again. If you see the same failure status after another attempt, these are the most likely causes:

If the status says "Timed Out" and If the "black window" appears only very briefly then disappears, it means you have not placed the firmware file in the C:\Python26 folder, or you have not properly renamed it as "firmware.eeprom".

If the black window stays active for more than a minute, and the status is "Timed Out", check that you have followed the steps in item 4.

If you see a different failure status, or if you can't determine the cause of the failure, please contact SanDevices by email.

If you are unable to access the controller's web page after the firmware update attempt, then most likely the update was successful, and you should proceed with step 10.

- 10) Remove the power to the E68x.

Unplug the old Ethernet module, and plug the UPG1 in its place. **IMPORTANT:** The UPG1 plugs in with the Ethernet connector facing towards the pixel connectors, in other words 90 degrees CCW from the previous direction. Make sure that the UPG1 is oriented in this direction, and make sure that the pins line up properly with the connectors on the board. Make sure your Ethernet cable is connected to the UPG1. You may want to use a “bootless” cable to make it easier to route the Ethernet cable clear of other components on the board.



- 11) Power up the controller, and after the red LED comes on and stays on, try to access the controller's web page. If the upgrade was successful you should see a status page where the controller identifies itself as a “-6” model. All previous configuration options should remain intact after the upgrade.

At this point the upgrade is complete. Please refer to the E682 operating manual, available on the SanDevices web site, for detailed information. Basically, the user interface is the same as before, but you now have 6 'sockets' available instead of 4, and the web server now has a dedicated socket of its own, so it can run continuously without interfering with SACN/E1.31 reception.

Important: Once you have upgraded a controller with the UPG1, all future firmware updates to this controller should use files of type E680-6 or E681-6, depending on controller type. In other words, if you have an upgraded E681, for all future firmware updates, you should download the firmware version specifically for the E681-6, **NOT** firmware for a standard E681, or firmware for an E682..

In Case of Difficulty:

Before replacing the old Ethernet module with the UPG1, make sure that you are unable to access the controller web page. If you can still access the controller web page with the old Ethernet module installed, this means that either the firmware update was unsuccessful, or you installed the wrong firmware. Please repeat the firmware update process.

If you are unable to access the web page after installing the UPG1 verify that the UPG1 is positioned correctly, that the Ethernet connector is pointing 'down', and that all of the UPG1 pins are lined up properly with the sockets. If you still can't access the configuration page, power down, put the old Ethernet module back in, power up and try the web page again. If successful it means that the firmware update failed, so please repeat the procedure.

If you're having trouble getting the firmware update to complete successfully, check the following:

You need to enter the GF command within 10 seconds or so of starting the updater.

The following status messages may be displayed for “Last Firmware Update Status”:

None Tried	no firmware update has been attempted since the last controller restart.
Timed Out	the update operation timed out before receiving the complete firmware file. This can be caused by a number of reasons: The firmware file isn't being sent (the black windows should stay open for more than a minute). Another SACN sender (LOR, Madrix, Sacnview, etc) is active on the network. The controller has a test pattern enabled. You have more than one network connection on your PC, and Python is sending upgrade firmware to the wrong one. You waited too long before typing the GF command.
Not For Me	the firmware file being sent is not compatible with this hardware. Contact SanDevices.
>1 Senders	more than one instance of the updater program was sending a firmware file at the same time.
Bad CRC	the received file was not valid
Running	a firmware update is currently in progress (note that repeatedly refreshing the web page while a firmware update is running may cause it to time out).

The firmware update process involves several steps. First the firmware file is downloaded to the controller. Next it is checked to make sure that it is a valid firmware file, and that it is for that controller type (E680, E681, or E682). Next the new firmware file is written to the non-volatile memory on the E68x, and finally the E68x restarts.

It is important to not interrupt power to the E68x controller, or reset it, during the time that the new file is written to the eeprom. WAIT until you see the “start-up” sequence on the LEDs, or wait a minimum of 3 minutes after typing the GF command.