

Adaptive Firmware Upgrade Instructions

1. Introduction

The Adaptive products are all in-field upgradable allowing them to receive enhanced functionality or apply software updates. This is a robust fail-safe procedure that can be carried out using the Adaptive HMI application or a standalone program.

No special tools are required other than the normal serial cable used for communication and access to the power supply for the module. Optional access to the board LEDs for visual indication may be helpful.

2. Upgrade Process

All the Adaptive boards contain 2 programs, the first is a boot loader that is responsible for verifying the firmware and the second is the firmware itself. When power is applied the boot loader runs and checks for a valid application, and if found starts it, which provides the normal operation mode for the device.

If no valid application can be found or it is deemed corrupt the boot loader will wait for external communication to upload new firmware.

The combination of this two-step process ensures that the board can always be reprogrammed with firmware, even if a firmware upload is interrupted before it finishes.

To start the upload of new firmware the board needs to be placed in the boot mode, which can vary depending on the state of the board and also the product. The exact process is detailed in the sections below.

3. Entering Boot Mode

Adaptive boards have a number of LEDs that indicate the normal operating status of the boards, when boot mode is entered the LEDs will all be off except for a red LED that flashes approximately twice a second.

- a) Board with no valid firmware (All Adaptive boards)
If no valid firmware is detected on powerup the board will enter boot loader mode and remain in that mode until valid firmware has been downloaded.
- b) Delayed Startup
Some boards do not have an external trigger available to enter boot mode and therefore they enter boot loader mode directly on power up. They remain in this mode for approximately 8 seconds waiting for a firmware download. If after the delay no firmware download has started and valid firmware is already present on the board it will be started.
- c) Automatic Entry Via USB
Boards that have a USB serial port option can be forced to enter boot mode automatically by the HMI when the 'Upgrade Firmware' option is selected. This can be done at any time, however be aware that when the board enters boot mode that the TEC bridge and fans will be switched off for safety.

d) Using Non-USB Port RS232 / RS485

Some boards can be fitted with optional isolated RS232 or RS485 boards or a switchable port which can be selected between RS232/485 or USB such as the Power CyCLO. On these boards the easiest way is to ensure the USB is selected and use the HMI to enter the boot mode, however the RS232/485 interface may be used but it relies on the board being switched on and the download starting within the 8 seconds using the 'Delayed Startup' mode.

4. Upgrading Firmware

To upgrade the firmware on a board ensure you have a copy of the Adaptive HMI software version 1.04 or above installed on the PC that you will use to do the upgrade.

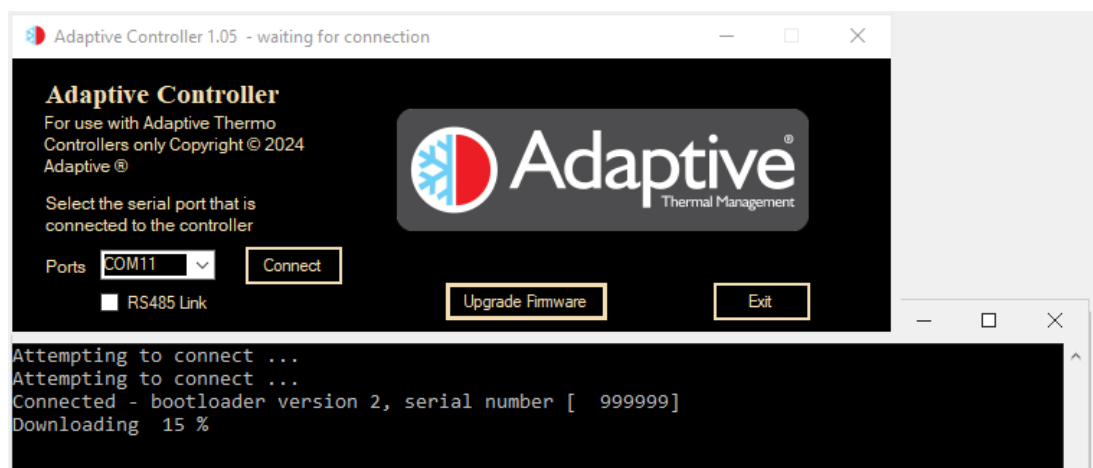
Confirm the method required to enter the boot method for the type of board you have (see above) and connect the appropriate communication lead.

Obtain the appropriate firmware for the board you wish to upgrade such as. **CyCLO_2p00.1d**

Note: Do not rename the firmware's filename or store it in a location path that has any spaces, if this is attempted then when the 'Open' is clicked to start the download the process will flash up a window but it will terminate immediately.

Upgrade Process

1. If the onboard USB port is being used for the communication method power on the board to allow PC to detect it, which is usually takes around 5 seconds.
2. Open the Adaptive HMI and select the serial port.
3. Click on 'Upgrade Firmware' and select the firmware to download to the board but **do not** click 'open' at this stage.
4. If the boot entry method is options a) or c) above then click 'Open' to download the firmware otherwise for options b) or d) toggle the power to the board and click 'Open' to start the download.
5. A window should open that shows the download process – see below. It may take a few seconds to connect before a progress percentage is shown and updated as the process continues. The red LED will also now flash rapidly while the download is in progress.



6. After a successful download of new firmware, a message should appear indicating that the board should be power cycled before being used.

```
Attempting to connect ...  
Attempting to connect ...  
Connected - bootloader version 2, serial number [ 999999]  
Downloading 100 %  
Download complete - power cycle before using
```

7. Exit the Adaptive HMI and restart it to confirm that the board reports the new firmware version in the title bar.
8. If there are problems connecting to the board verify that the red LED is flashing before selecting 'Open'. Also ensure that you have obtained the correct firmware for the board as the upgrade process will reject any firmware that is not suitable.