How to define a bio protocol in the LCD User Interface

EasyPCR

- Intro message
- Main page
- Main menu
    - Define Bio Protocol
        - Intro Denaturing
        - How many cycles
        - Denaturing
        - Annelaing
        - Extension
        - Final Extension
    - Settings
        - Buzzer
        - Wi-Fi
            - Wi-Fi On/Off
            - Reset Wi-Fi Config
            - Status
        - Firmware Update
    - Dev settings
        - PID tuning
        - Re-provision

This is the introduction message after the activation of buzzer (x2 beep) then the user is ready to explore the menu.

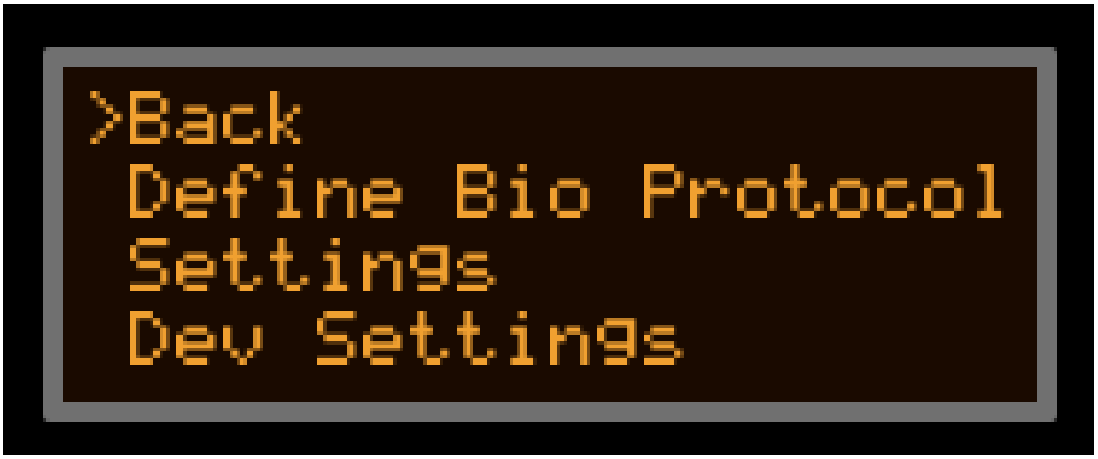
Intro message

1st line: It appears the stage of each bio protocol (Intro Denaturing, Annealing, Extension, Final Extension) is idle in this case.
2nd line: The temperature of the LID heater.
3rd line: It appears on the left side the temperature for the hotplate.
4th line: It is empty in that case

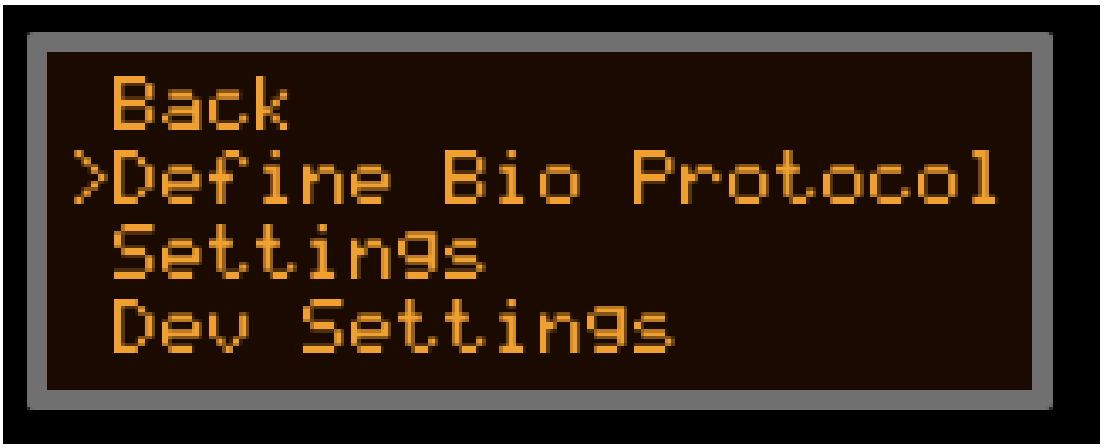
Main page

By clicking the push button a menu will appear in the LCD. Rotating the encoder the ‘ > ‘ will move and indicate in which sub-menu will select.

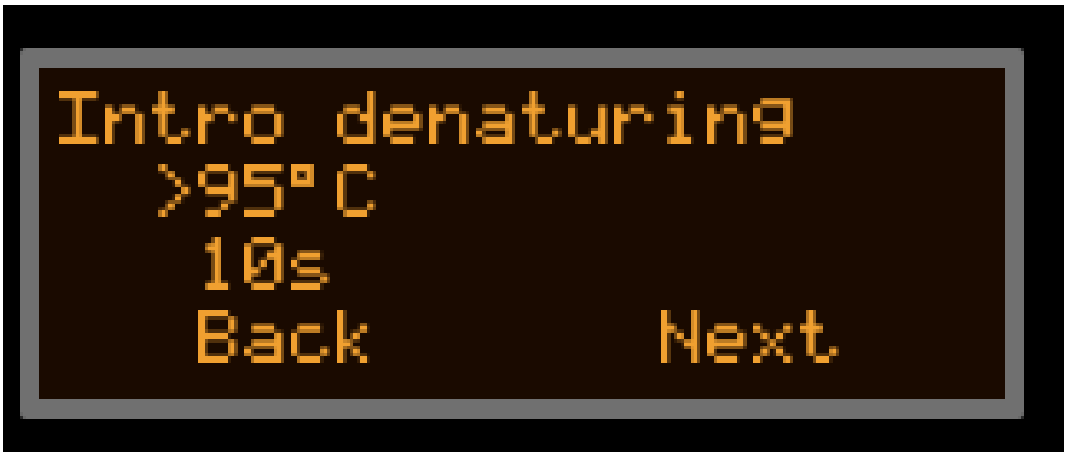
Main menu



Define Bio Protocol



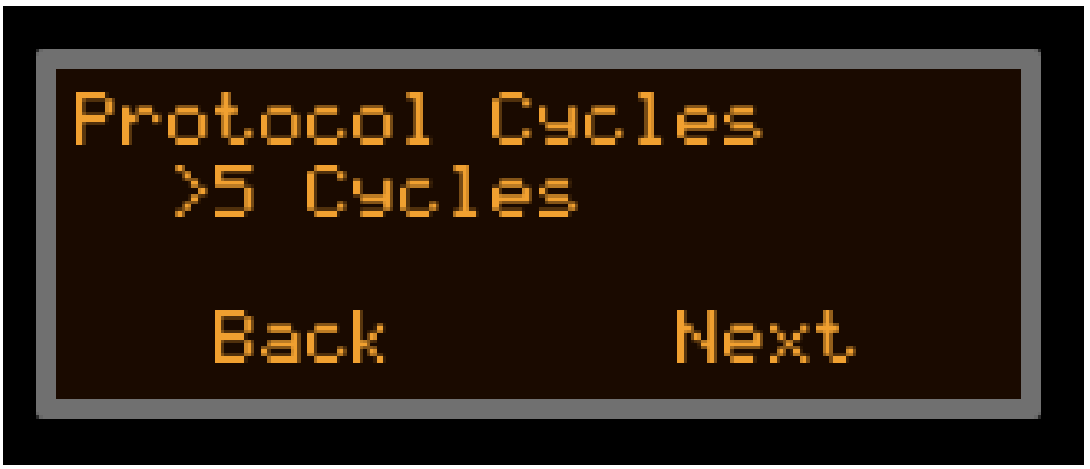
Intro Denaturing



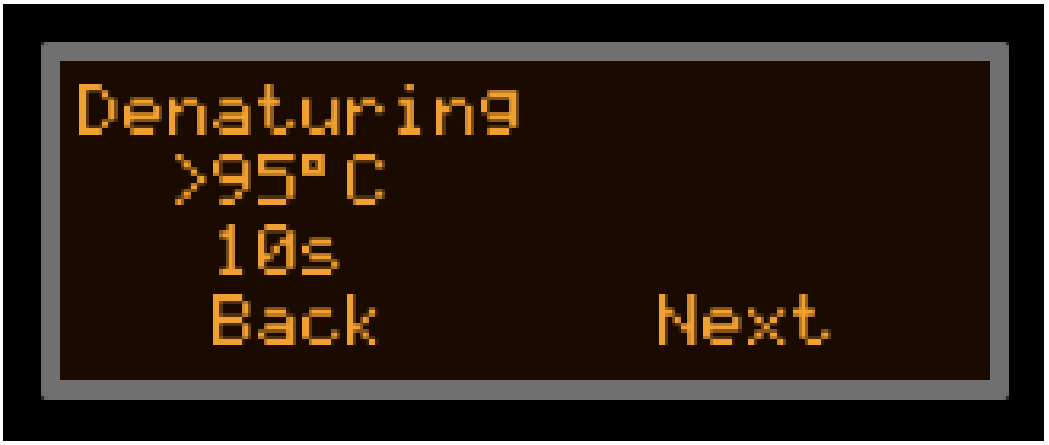
The first stage is Intro Denaturing, the user should define the Temperature, the duration in seconds (min 10 seconds, max 10 minutes. There is a choice to go ‘Back’ in the main menu or select ‘Next’ to continue with the definition of the bio protocol.

Define how many cycles

The user should define how many cycles can run the experiment, minimum is 5 cycles and maximum 55 cycles.

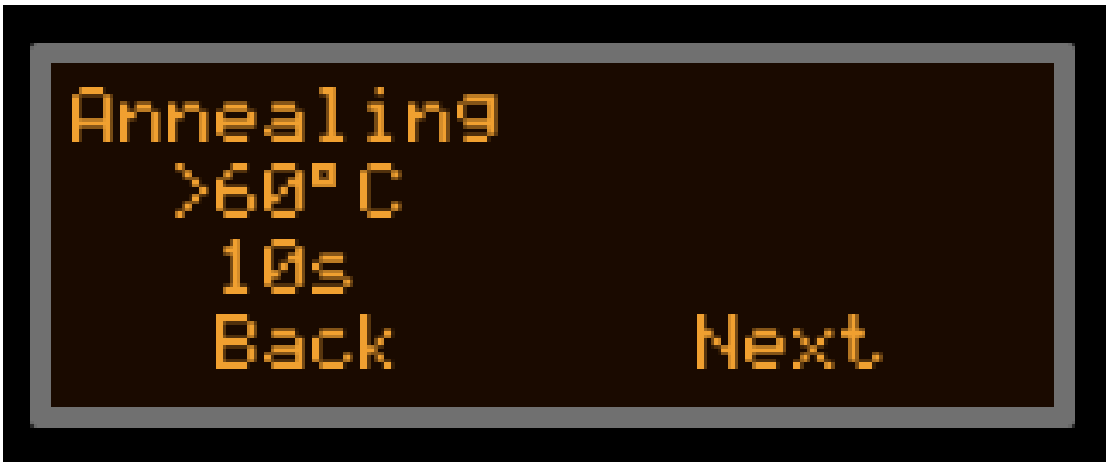


Denaturing



The second stage is Denaturing, the user should define the Temperature in Celsius, the duration in seconds. There is a choice to go ‘Back’ in the main menu or select ‘Next’ to continue with the definition of the bio protocol.

Annealing

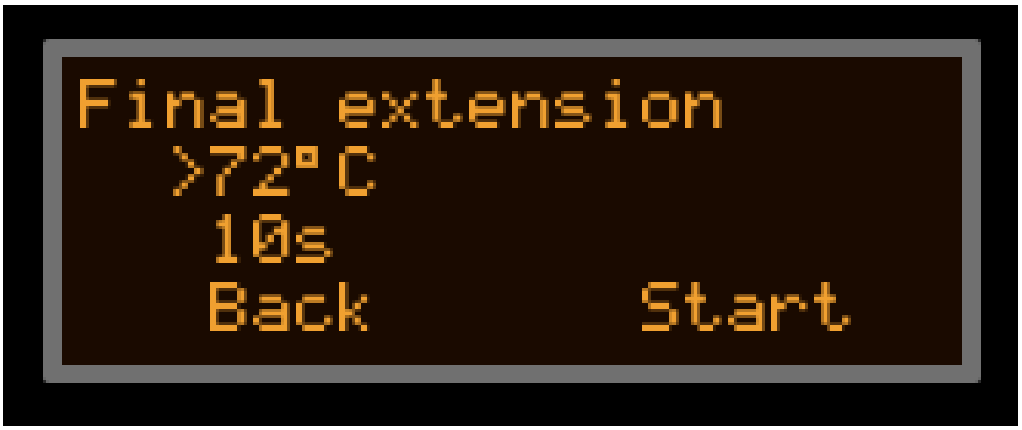


The third stage is Annealing, the user should define the Temperature in Celsius, the duration in seconds. There is a choice to go ‘Back’ in the main menu or select ‘Next’ to continue with the definition of the bio protocol.

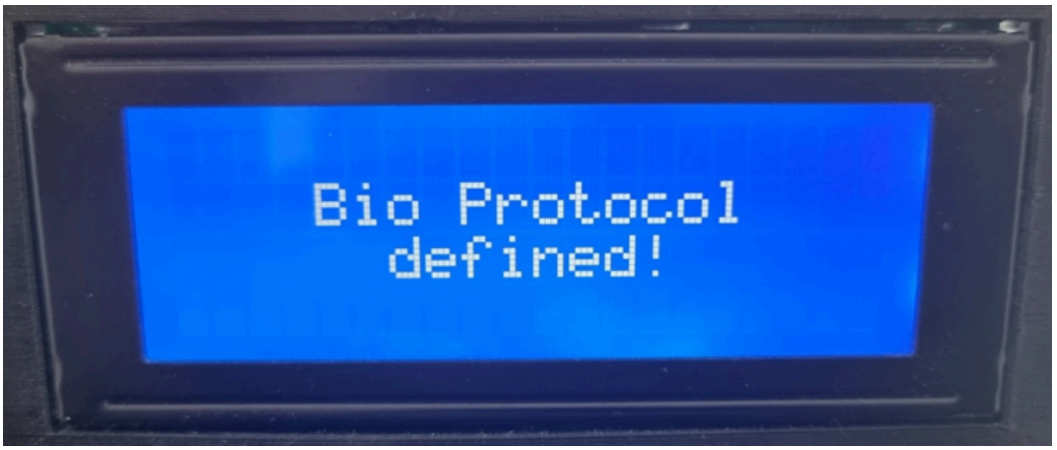
Extension

The fourth stage is Extension, the user should define the Temperature in Celsius, the duration in seconds. There is a choice to go ‘Back’ in the main menu or select ‘Next’ to continue with the definition of the bio protocol.

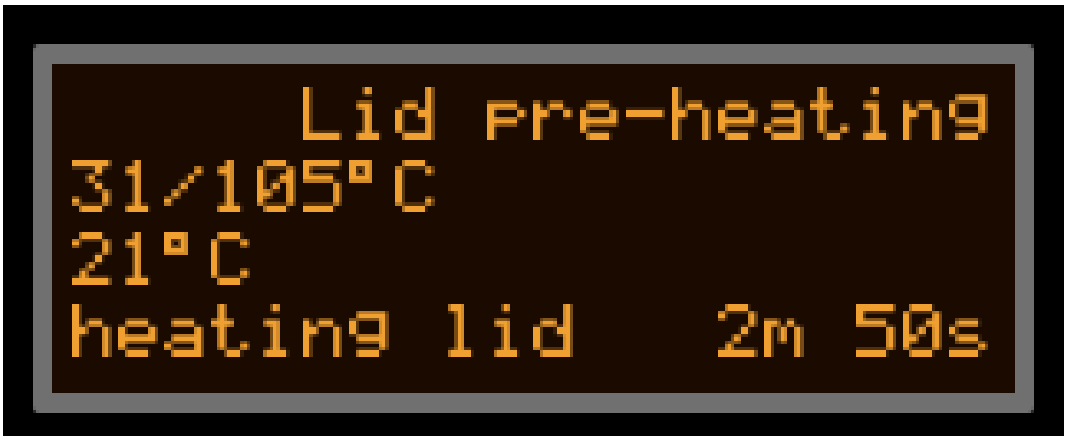
Final Extension



The fifth stage is Final Extension, the user should define the Temperature, the duration in seconds (min 10 seconds, max 5 minutes. There is a choice to go ‘Back’ in the main menu or select ‘ Start ’ to finalize the definition of the bio protocol.After successfully defining all the stages then a message ‘Bio Protocol defined’ appears and the thermocycler will start to procedure all the commands.

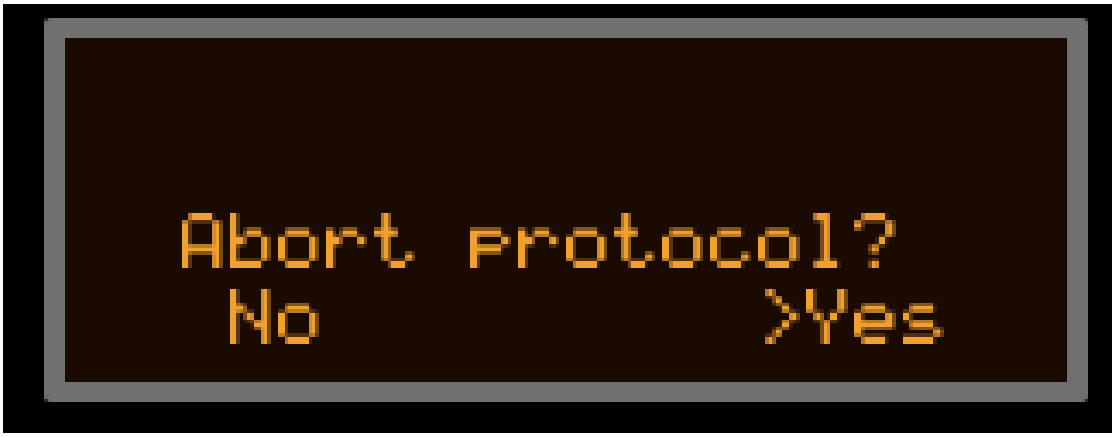


Main Page temp, cycles, stage

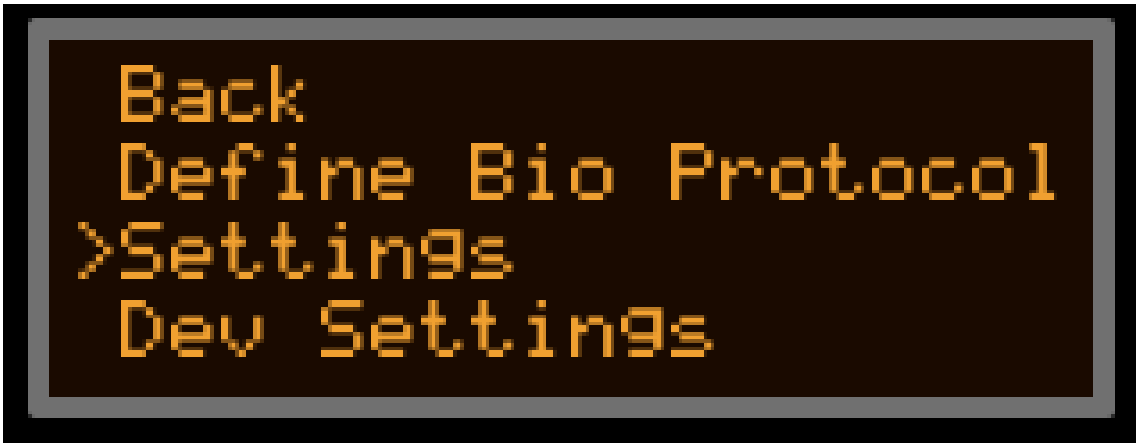


During the pre heating either of the LID heater or the hotplate block the red LED is active, while the BLUE led is active when the cooling part is applied in the bio protocol. During the bio protocol the user is able to abort the protocol by clicking the rotary encoder and click ‘YES’

Abort protocol



Settings



In the settings section the user can make changes for the Wi-Fi , the buzzers and update the firmware when there is a new version.

Buzzer

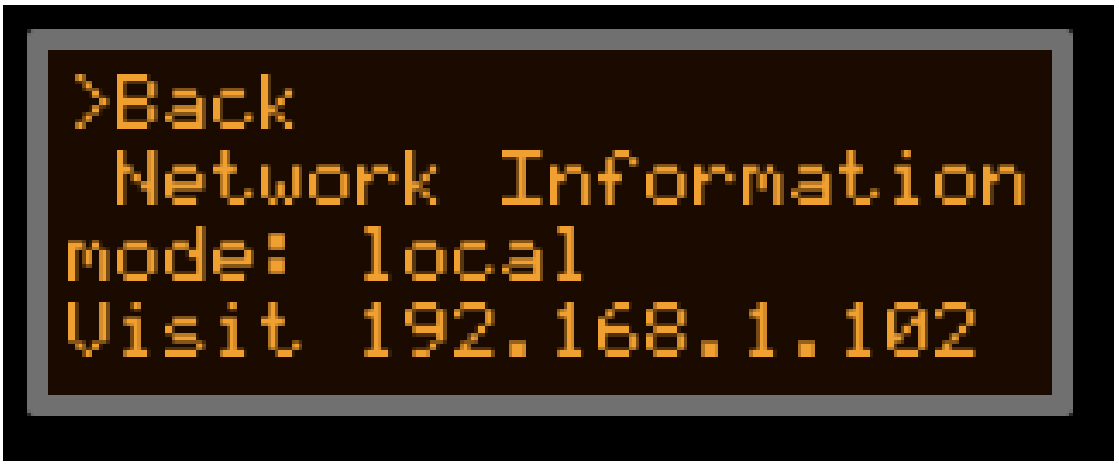
The Buzzer can be active or completely off depending on the user preferences, but we suggest that the buzzer should be active in order to listen to some sound indicators during the PCR process.

Wi-Fi

The Wi-Fi connectivity can be switched off if the user wants to save battery or it needs to avoid interference between other devices of the network. The user can switch it off by clicking the Wi-Fi tab and selecting ‘Off’.

The user can reset the Wi-Fi configuration in case that wants to connect to another network, or select another mode like local or cloud, then selecting reset Wi-Fi config and ‘Yes’ when it appears the menu are you sure.

Status

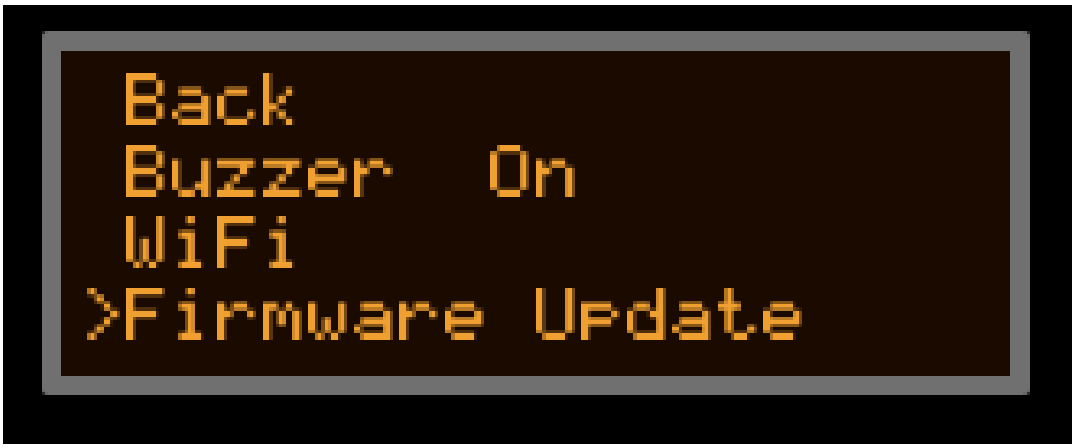


By clicking Status the user can view important info like in which mode selected local or cloud and the IP address that can view the user interface in my case is 192.168.1.102.

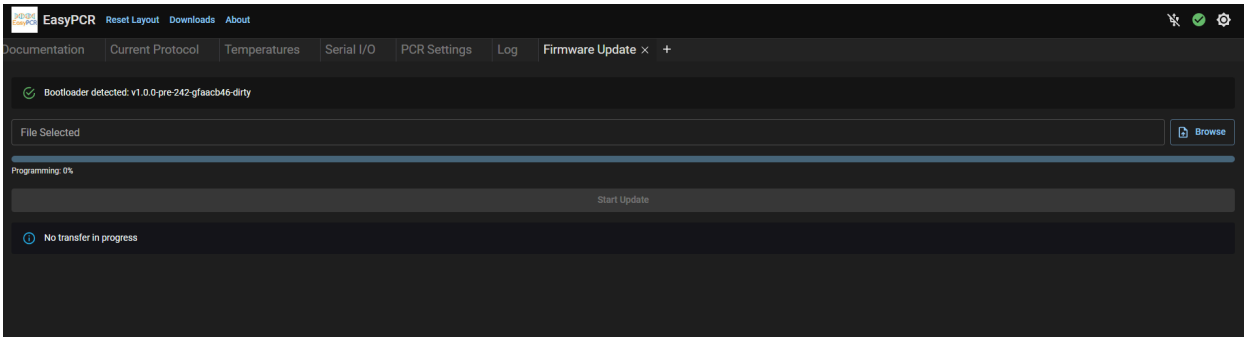
Network Information

The network information the user can view the SSID of the router, the IP, the signal strength in dB, these information are important if the user forgets in which mode or network connected and it will be very useful to know.

Firmware Update



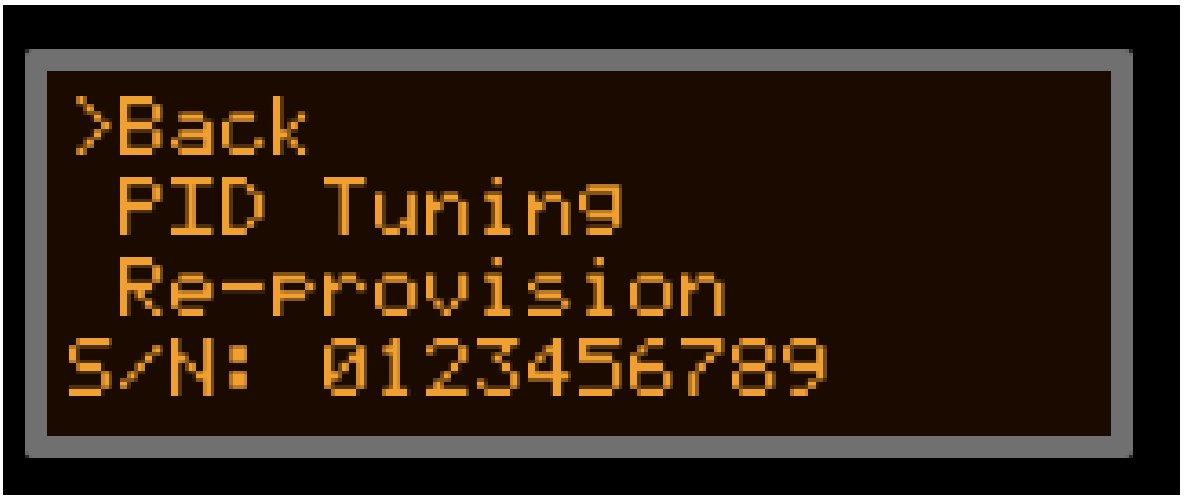
The user can update the firmware when there is a new version but the following steps need to follow. Connect a usb-c cable in the device, select in the LCD menu Firmware Update and in the menu are you sure click ‘Yes’. Next step is to open a browser and type ui.easypcr.io , select the bootloader USB connection. Last step select the firmware and click update, wait till complete the process 100%.



Please do not disconnect the USB-C cable , this process will take around 2 minutes. When the upgrade is successful the device will automatically reboot and you will see the intro message and the main page with the temperatures of the LID and peltier.

Device Settings

The settings for the device are only for experienced users that would like to configure the instrument but we suggest not change in any settings for the PID.



The user can view the serial number which is very important to check the day of purchasing to identify the warranty period. The user is able to change some crucial values for the PID controller like the Kp, Ki, Kd but this is only for experienced users that want to contribute to our biotech community. Please DO NOT CHANGE ANY VALUE!!!

PID tuning