

Proposed tweaks to the Community Edition UI

Ref: Issue #121

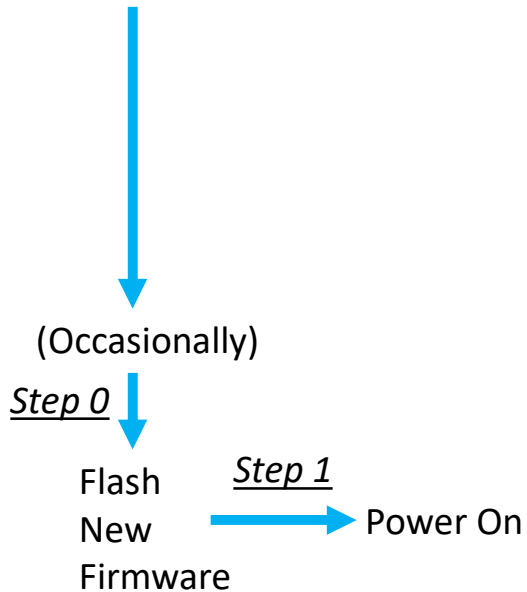
Sketched by @Thinkersbluff

Last Update: 30 Jan 2021

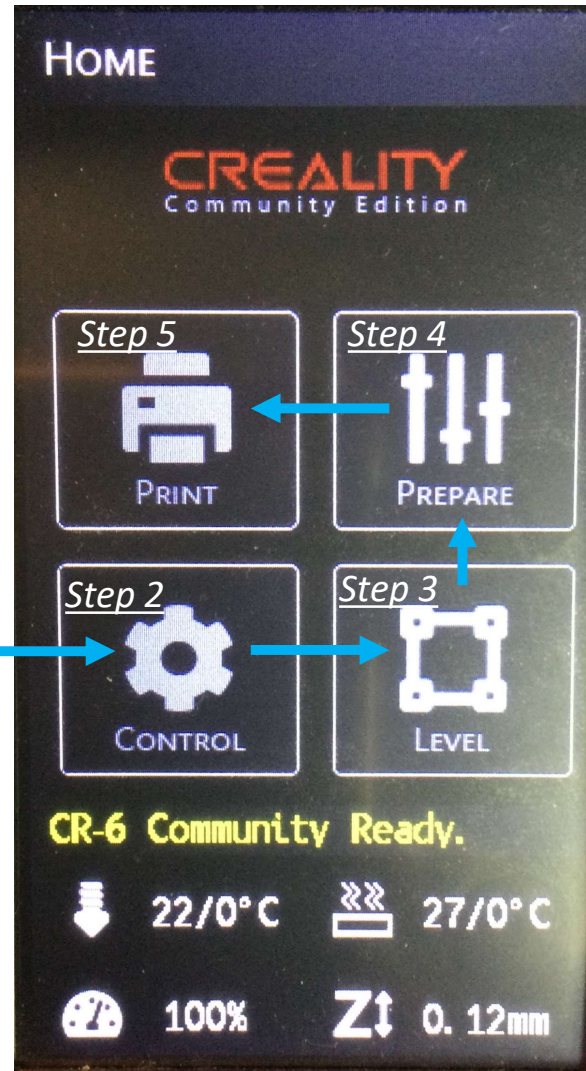
Summary

- This version proposes a few minor edits to the Community Edition User Interface, in partial response to the call for inputs posted as FR issue #121 <https://github.com/CR6Community/Marlin/issues/121>
- A simple Use Case Analysis is proposed (see appendix) as the basis for identifying and evaluating changes to the current UI structure
- The HOME screen is selected for analysis
- Two minor edits are recommended, to align the menu structure with the User Workflow suggested by the original menu structure inherited from Creality's firmware.
- This package is a Work In Progress. Any and all inconsistencies evident to other readers of this package are defacto invitations to the reader to challenge and enhance these analyses and to support alternative proposals.

Basic workflow – Creality Legacy UI



NOTE: Logically, one could argue that “Level” is a subset of the “Configure Printer” workflow, but it is also something that users may do as part of their “Prepare to Print” workflow, so it seems reasonable to keep it as its own menu.



Print:

If printing from SD card:

- Browse files on SD card
- Select file to print

For every print, as required:

- Monitor print status
- Pause or Stop (abort) print
- Tune printer while printing (feed rate; flow rate; Nozzle temp; Bed temp; fan speed; LED on/off; Z-Offset; Retraction)

Control:

1st time after Flashing:

- Verify Info
- Reset Factory defaults

Every time, after power on:

- Set preferred values for LED (on/off), Sound (on/off), Standby % brightness, Fan (on/off) Pre-Heat temperatures
- Reset PID (if required)
- Reset esteps (if required)
- Set Nozzle or Bed temp

Prepare:

If required:

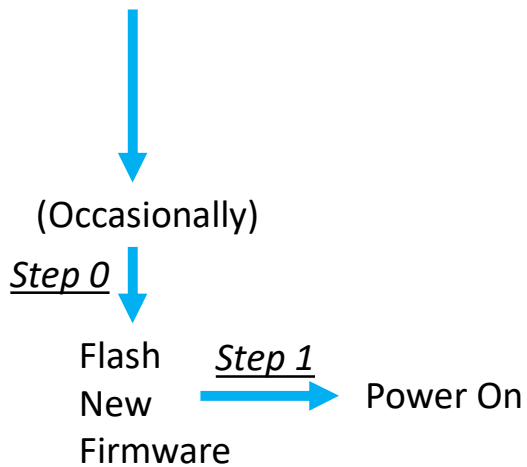
- Home X,Y,Z
- Move axes
- Load/Unload filament
- Disable Steppers
- PreHeat nozzle + bed
- Turn off all Heaters (“Cooldown”)

Level:

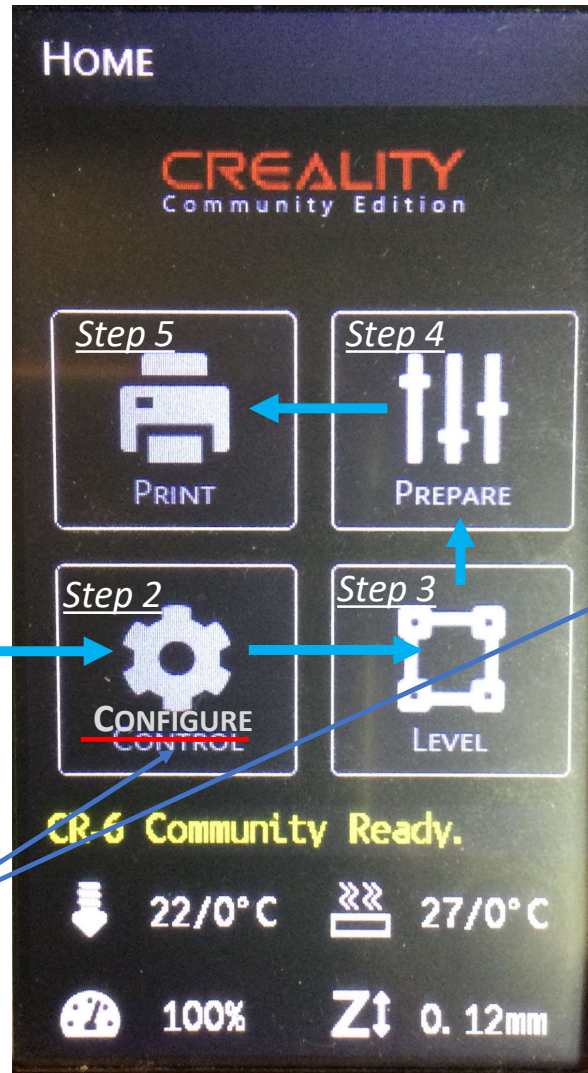
If required:

- Run ABL
- View ABL Mesh values
- Set Z-Offset

Basic workflow – Proposed Community Edition UI



1 Group together all functions used to configure the printer itself



Print:

- If printing from SD card:*
- Browse files on SD card
 - Select file to print
- For every print, as required:*
- Monitor print status
 - Pause or Stop (abort) print
 - Tune printer while printing (feed rate; flow rate; Nozzle temp; Bed temp; fan speed; LED on/off; Z-Offset; Retraction)

Prepare:

- If required:*
- Home X,Y,Z
 - Move axes
 - Load/Unload filament
 - Disable Steppers
 - PreHeat nozzle + bed
 - **Set Nozzle or Bed temp**
 - Turn off all Heaters ("Cooldown")

Control CONFIGURE:

- 1st time after Flashing:*
- Verify Info
 - Reset Factory defaults
- Every time, after power on:*
- Set preferred values for LED (on/off), Sound (on/off), Standby % brightness, Fan (on/off) Pre-Heat temperatures
 - Reset PID (if required)
 - Reset esteps (if required)
 - **Set Nozzle or Bed temp**

Level:

- If required:*
- Run ABL
 - View ABL Mesh values
 - Set Z-Offset

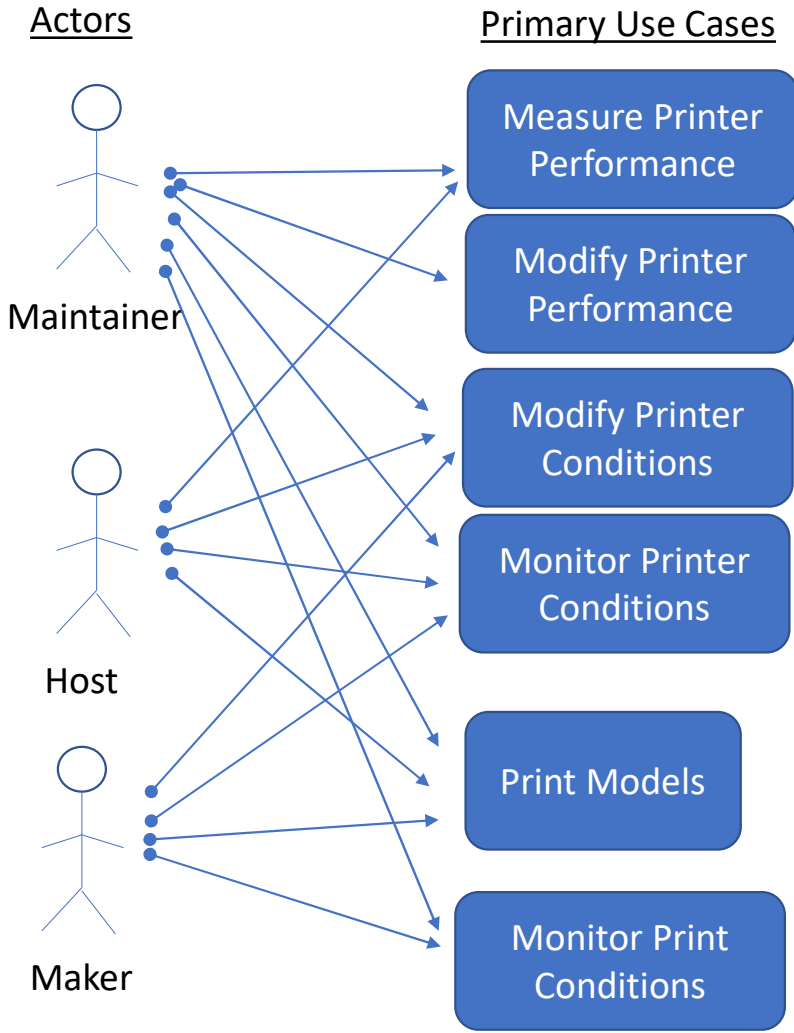
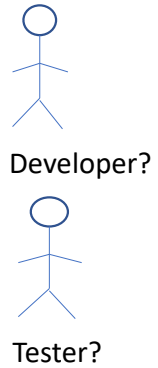
"Set Current (Nozzle/Bed) Temperature" is not required, by the "Configure Printer" workflow

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Supporting Use Case Analysis

Primary Use Case Analysis Example:

Compare this diagram to the current UI menu structure. Correct this picture until it looks complete. Identify any menu or firmware design changes inspired in the course of the exercise.



Specific Design Cases to Consider

- “Measures of Printer Performance”:
- Probe Repeatability (M48)
 - Mesh Validity (G26)
 - Temperature vs Target Value (Bed, Nozzle, *Enclosure*)
- “Printer Conditions”
- Temperature (Bed, Nozzle, *Enclosure*)
 - Extruder Position (X, Y, Z, E)
 - Stepper Motor/Driver States (Active, Locked, Disabled)
 - Key Parameter Values (Bed Mesh values; Offset values (X, Y, Z); Pre-Heat Temperature values (Bed, Nozzle); eSteps (X, Y, Z, E); PID Values etc... (M503, M502, M500)
 - Filament present/not-present
 - Fan speed (Extruder, Part Fan, PSU Fan, Controller Fan)
 - Firmware version installed (Motherboard; Display)
 - Display brightness; Sound ON/OFF; ...?
 - LED ON/OFF
- “Models”
- Calibration test models (Temp Towers; Flow Tests; eStep Cubes; etc.)
 - Spiral-Mode/Vase models
 - Print-in-Place models
 - ...
- “Print Conditions”:
- | | | |
|------------------|-----------|-------------------|
| • Uploading file | • Stopped | • % Completed |
| • Heating | • Aborted | • Print Completed |
| • Printing | • Resumed | • Print Failed |
| • Paused | | |

Related UI Controls

Reason(s) for modifying these parameters:

Configure the Printer to prepare for printing in general

Configure the Printer to prepare specifically for the next print job

Modifiable Printer Condition Parameters

- Temperature (Bed, Nozzle, *Enclosure*)
 - Set Target PreHeat PLA Settings
 - Set Target PreHeat PETG Settings
 - Measure/Set PID Parameters
 - Set Default Probing Temperatures
- Steps/mm (X, Y, Z, E)
 - Measure/Set eSteps
- Bed Mesh values;
 - Specify Probe Heater On/Off Behaviour
 - Measure/Set Mesh Values
 - View Mesh Values
- Offset values (X, Y, Z);
 - Measure/Store Z-Offset
- Extruder Position (X, Y, Z, E)
 - Home, Move (X, Y, Z)
 - Load/Unload Filament
- Stepper Motor/Driver States (Active, Locked, Disabled)
 - Disable Steppers
- Fan speed (*Extruder*, Part Cooling Fan, *PSU Fan*, *Controller Fan*)
 - % Fan Speed (0-100%)
- Firmware version installed (Motherboard; *Display*)
 - Information
- Display brightness;
 - Screen Saver % brightness
- Sound ON/OFF
 - Sound On/Off
- LED ON/OFF
 - LED On/Off (Default)
- Filament present/not-present
 - Runout Sensor On/Off?*

Allocate the applicable controls to this menu:

CONFIGURE

PREPARE

Current* UI: (*v5 Beta, 30 Dec 2020 version)

•Control

- Temperature
 - Nozzle temp
 - Bed temp
 - Fan
 - PID tuning
 - Preheat PLA & PETG settings
- LED
- Screen stand-by
- Screen stand-by brightness
- Sound
- E-steps
- Restore factory settings
- Info / about

• Print

- Print confirmation
- Print progress
- Print finished

• Leveling

- Set Z-offset
- Auto bed leveling

• Prepare

- Move
- Filament extrude
- Disable steppers
- Preheat PLA
- Preheat PETG
- Cooldown

I think a new menu structure would be leaning on four pillars:

- Print preparation
- Printing**
- Settings
- Calibration

The menu structure would be something like this for:

Modify Printer Configuration

Settings

- Temperature
 - Preheat PLA/PETG/ABS settings
- Screen settings
 - Standby / brightness / standby time / sound
- Probing
 - Perhaps future settings for [#116](#) and [#106](#)
- LED
- Reset to factory settings (this is duplicate with calibration but I don't think that is an issue)
- Info / about

Menu organization philosophy =?

- **Group by what is controlled?**
 - **Group by workflow requirements?**
- What about MONITORING requirements?**

Modify Printer Performance

Calibration

- PID
- E-steps
- Leveling
- (perhaps advanced steps/mm settings in the future)
- Reset to factory settings

Print Models

Print preparation

- Move
- Temperature
 - Preheat PLA/PETG/ABS
 - Hot-end / bed temps
 - Fan (is this actually necessary?)
- Load / unload filament
- Disable steppers
- Cooldown