modbar®
modular brewing systems

Operating Manual
Espresso EP System

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Warnings and General Guidelines

- This machine is for professional use only, and should be installed in locations where its use and maintenance is restricted to trained personnel. Children are forbidden to operate or play with the machine.
- The equipment must be installed to comply with the applicable federal, state, or local electrical and plumbing code. The installation also must comply with the manufacturer's instructions, and must be performed by qualified and authorized personnel.
- Ensure that the specifications on the equipment name plate correspond to the main electrical supply to which you will connect the Modbar.
- Safe electrical operation of this device will be achieved only when the connection to the power outlet has been completed correctly and in observance of all local, national, and international electrical codes and safety regulations, and particularly by grounding the unit. Make sure grounding has been done properly as it represents a fundamental safety requirement. Ensure qualified personnel check such connection.
- Improper use or installation of Modbar equipment can cause product damage and or serious injury to end user. Modbar will not be held responsible for any damages or injuries occurring if equipment has been misused, installed improperly, or tampered with.
- When you receive your equipment, thoroughly inspect the packaging and equipment for any signs of damage. If damage is suspected, please contact Modbar support before attempting to install or operate the equipment.
- Modbar equipment is not intended for use outdoors or in an unconditioned environment where freezing temperatures may occur.
- Do not leave machine unattended during brewing processes.
- Do not use wet cloth to clean screens or switches on unit(s) as they are not waterproof.
- Repairs to Modbar equipment should be made only by trained technicians and use only Modbar approved parts.
- Incorrect installation may cause injury and/or damages to people, animals, or objects, for which the manufacturer shall not be held responsible.
- We do not recommend using adapters, multiple plugs and/or extension cords. If you cannot avoid using them, make sure that they are exclusively of the kind which conforms to local, national, and international electrical codes and safety regulations, being careful not to exceed the power and current ratings indicated on such adapters and extension cords.
- This device must be used exclusively for the functions which it has been designed and built for. Any other application is inappropriate and dangerous. The manufacturer shall not be responsible for any damages caused by improper and/or irrational use.
- Using any electrical device requires that certain fundamental rules be observed.
    - Do not touch the device with wet or humid hands and feet.
    - Do not use the device while having no shoes on your feet.
    - Do not use extension cords in bath or shower rooms.
    - Do not unplug the device from the power outlet by pulling on the power supply cable.
    - Do not expose the device to atmospheric agents (rain, sun, etc.).
    - Do not allow children or untrained people to use this device.
    - Do not clean the control panel with a wet cloth since it is not watertight.
- Before performing any maintenance and/or cleaning operations, turn the main power switch to the OFF position and disconnect the machine from the power source by unplugging the cord or by switching off the relative circuit breaker. For any cleaning operations, follow exclusively the instructions contained in the manual.

- If the equipment is operating in a faulty manner or breaks down, turn the main power switch to the off position, disconnect the machine from the power source (as described in the previous paragraph), and close the water supply valve. Do not attempt to repair it. Contact a qualified and authorized professional to perform any repair. Any repairs must be performed exclusively by the manufacturer or by an authorized technician using only original parts. Noncompliance with the above could compromise the safe operation of the equipment.
- Do not obstruct air intake and exhaust grilles.
- The machine's power supply cable must not be replaced by users. In the event that the power supply cable is damaged, shut off the equipment, disconnect the machine from the power supply by switching off the relative circuit breaker, and close the water supply valve. To replace the power supply cord, contact a qualified professional.

CAUTION – Risk of fire and electric shock. Replace only with manufacturer's cord set, part No. E-0118-01

ATTENTION - Risque d'incendie et de choc électrique . Remplacez-la uniquement avec le cordon de série du fabricant , partie n ° E-0118-01

Product Handling and Transportation

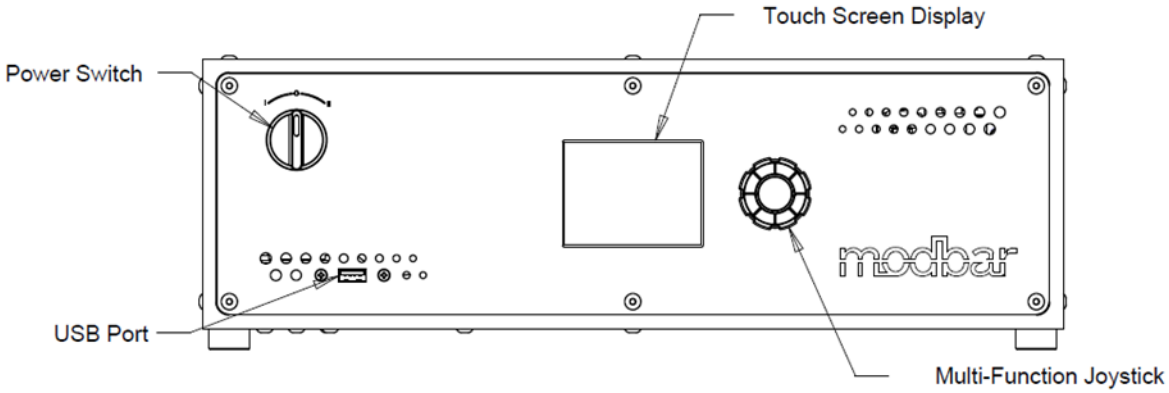
Modbar equipment is shipped in factory approved packaging. Upon receipt of equipment, thoroughly inspect the packaging for damage. If damage is suspected, contact Modbar immediately.

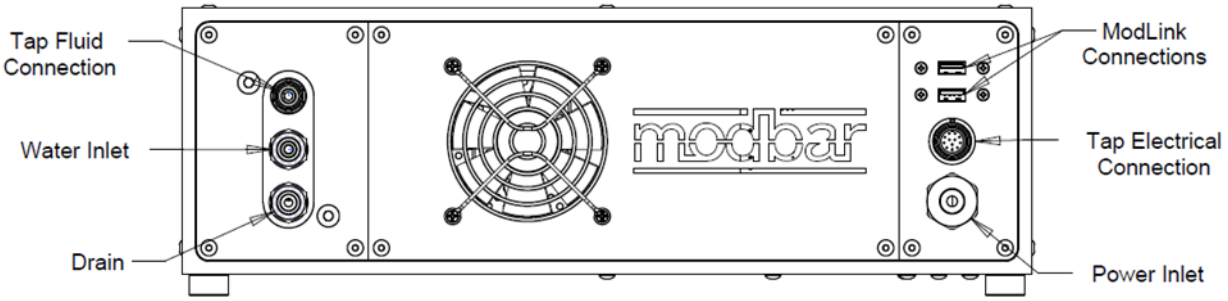
In the event that equipment needs to be returned to Modbar, or shipped for any reason, it should be shipped in the factory approved packaging. If you have discarded the packaging, please contact Modbar for replacements.

The equipment must be properly drained prior to shipment, to avoid damage from freezing. If you have questions about how to properly drain equipment for shipping, please contact Modbar support.

Do not store the equipment in places where temperature may cause water in the boilers to freeze.

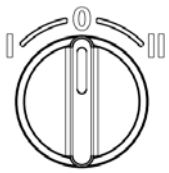
Product Description





Power Switch Function

The three-position power switch on the Modbar module has three separate functions, as illustrated in the following image.



0 - Off

In this position, the module is in the off position.

I - Standby Mode

In this position, the module is in standby mode. When in standby mode, all operations function as normal, but no power is applied to the heating elements. This mode is used for priming the system upon installation, and can also be useful for some diagnostic applications.

II - Operating Mode

In this position, the module is in operating mode. Power is applied to the heating elements, and all functions operate as normal.

Startup Instructions

Installation

Upon installation, the Modbar module must be primed before use. This is accomplished by the following steps.

- Ensure that filtered water is supplied to the module.
- Ensure that the power switch is in the off position.
- Ensure that the module power cable is plugged into its appropriate power source.
- Turn the power switch counter-clockwise to place it in standby mode.
- Actuate the tap handle in manual mode, as described in the “Dispensing Operations” section of this guide.
- After water begins to pour from the tap (This may take some time on a new system) allow water to flow for at least 30 seconds to ensure that the system is primed.
- At this point, it is safe to turn the switch clockwise into operating mode.

General Use

During general use, the module is already primed, and it is not necessary to prime the system. To start the module, follow these steps:

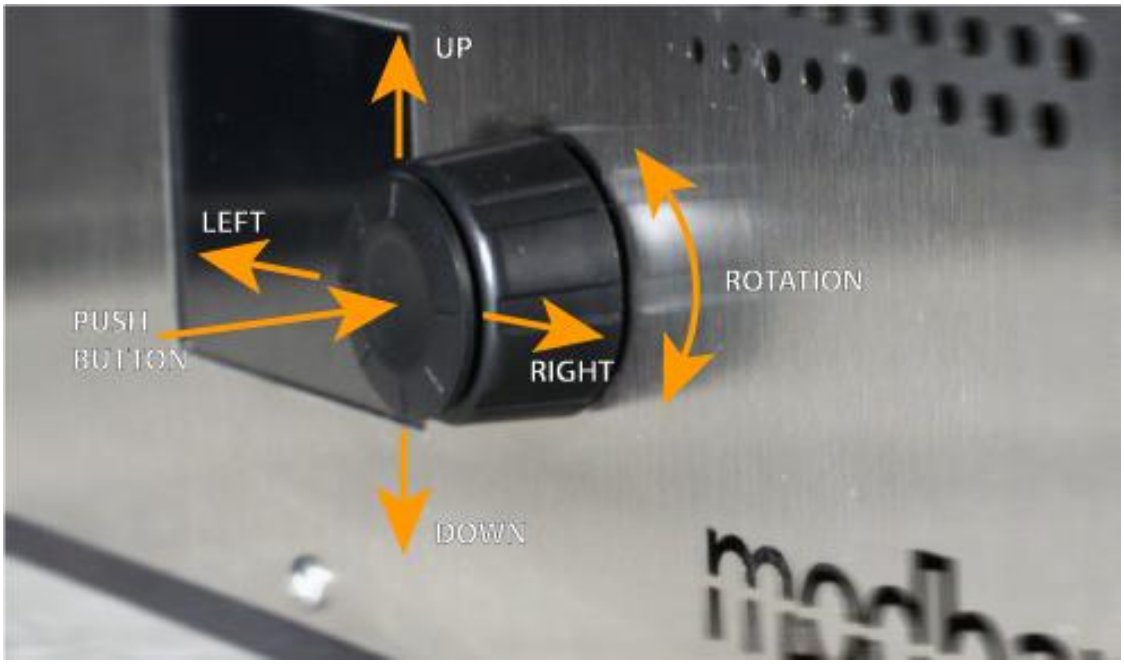
- Ensure that filtered water is supplied to the module.
- From the off position, turn the power switch clockwise to place it into operating mode.
- At this point, the elements will begin to heat. When each heat zone reaches set temperature, the module is ready for use.

Operations and programming

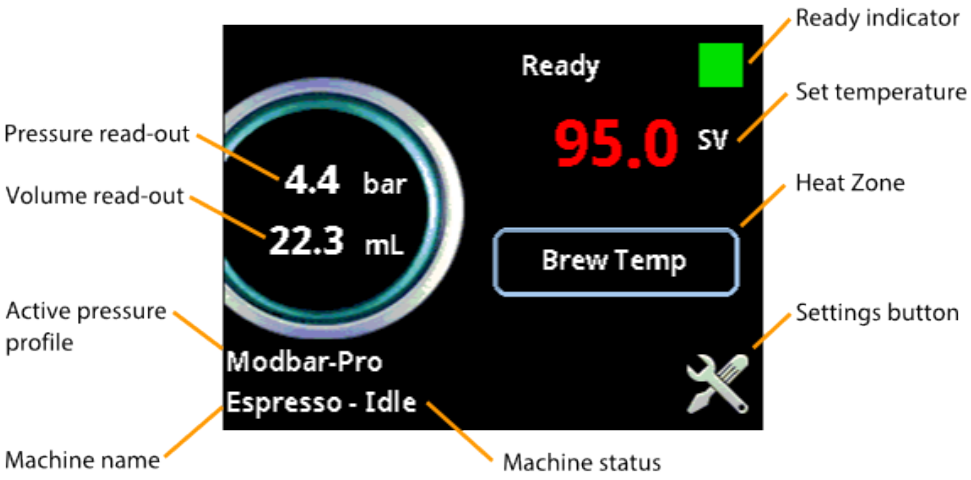
Equipment Operation

Interface

The touch screen is used for *selecting* and *displaying* data. The multi-function encoder is used for *editing* data. The functions of the encoder are shown below:



Home screen



Process value: This is the current value in degrees of the active heat zone (selected by the heat zone button).

Set temperature: This is the current set-point value in degrees for the active heat zone. To change the set temperature, simply touch the red value on the screen and the value will be highlighted. Rotate the encoder left or right to change the value in 1-degree increments. Press the joystick up or down to change the temperature in 1/10 degree increments. Press the center button on the joystick to save the change. (These temperatures are saved to the currently selected profile)

Ready indicator: This square icon indicates whether the machine is at temperature to dispense. When first starting the machine, the indicator will remain red in color until all temperature zones are heated to set temperature. Once all zones are at temperature, the icon will turn green, indicating that we are now ready to dispense.

Heat zone: In automatic temperature mode, this button has no function. In manual temperature mode, pressing this button cycles through the 3 heat zones on the espresso EP system: Inlet Boiler, Outlet Boiler and Brew Head. *(Refer to "Advanced preferences screen page 2")*

Settings button: This button navigates to the main settings screen.

Machine status: Displays the current status of the module & tap.

Machine name: Displays the machine name (user editable in advanced preferences).

Active pressure profile: Displays which pressure profile is currently selected.

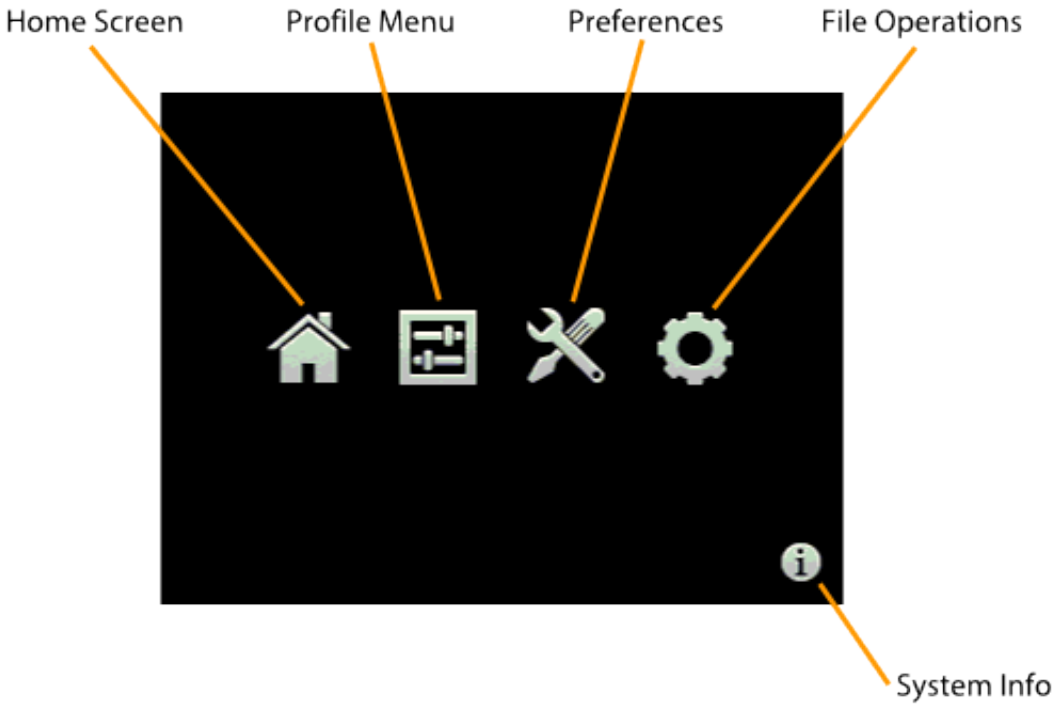
Volume read-out: Displays real-time fluid volume information during any given dispensing cycle (Manual, Auto and Rinse).

Pressure read-out: Displays current pressure in the module.

*Tip: When the module is in setup mode (no heaters, main switch in the left position), the pressure read-out will accurately indicate your water supply pressure. *boilers must be below 70°C or 150°F*

Main settings screen:

home -> main settings



Home screen: This button navigates back to the home screen / dashboard.

Profile menu: This button navigates to the profile selection menu.

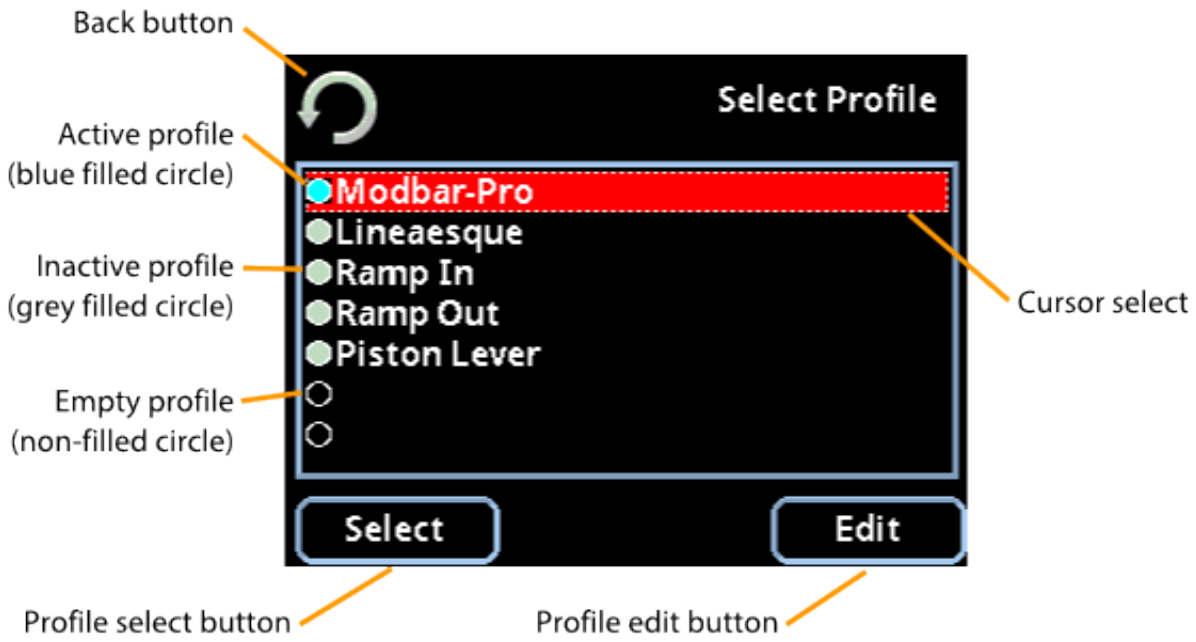
Preferences: This button navigates to the system preferences page.

File operations: This button navigates to the file operations page.

System info: This button displays the system version and software information.

Profile selection screen:

home -> main settings -> profile selection



Back button: Wherever you see the back button it will take you to the previous screen.

Active profile: This is the profile that is active and is used when the espresso tap lever is positioned to the Automatic brewing position, indicated by the blue filled circle.

Inactive profile: These profiles are present and contain profile data, but are not currently activated, indicated by the gray filled circle.

Empty profile: These are empty profile slots and may not be used until profiling data is entered. Empty profiles are indicated by a non-filled circle.

Profile select: Pressing profile select will set the current cursor selected profile to the active profile.

Profile edit: Press the profile edit button to edit the profile data for the current cursor selected profile.

Cursor select: The dotted outline cursor select indicates which profile is selected on screen. You may use the rotary encoder or up/down function of the joystick to navigate the profiles list. Pressing the pushbutton will activate a selected profile.

Tip: When selecting a profile, this menu is also duplicated on the tap display. Depending the installed distance between the module and tap, it is possible to navigate the menu from the tap screen and scroll through the profiles using the encoder button. Pressing the center encoder button selects the profile highlighted on the tap. The center encoder button also navigates to the profile selection menu from the home screen.

Pressure profiling

The pressure profiling capability of the Modbar espresso EP system can be programmed in “simple” or “advanced” modes, each of which have their own settings screen. It is important to understand the variables, their definitions, and how they work together to design successful profiles that provide desirable extraction characteristics.

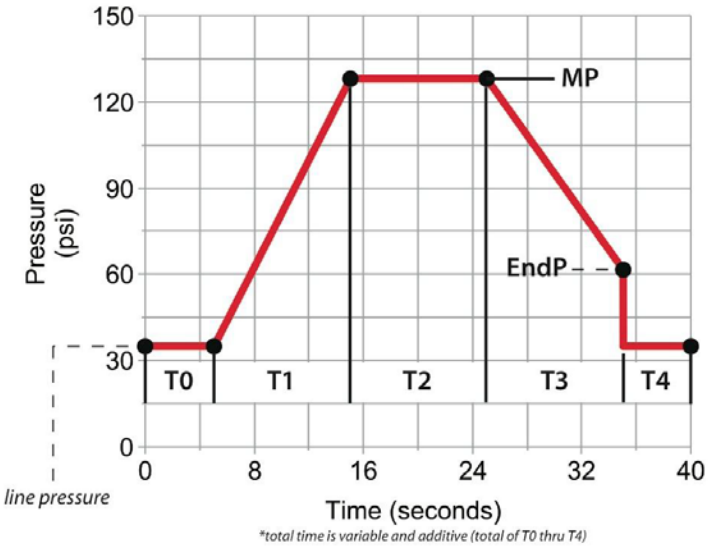
The system is quite extensive and is capable of simulating almost any espresso machine or pressure condition available on the market today.

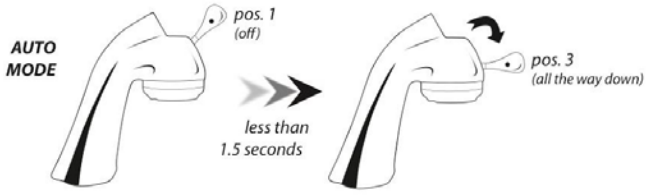
Study of the following reference guide will allow you to successfully use the simple and advanced programming menu interfaces that follow:

Pressure profiling reference guide

modbar modular brewing systems

For operating in Automatic Mode





Variable Definitions:

T0 - Pre-pump time (line pressure only)
T1 - Time from Line Pressure -> Max Pressure (MP)
T2 - Time to hold at Max Pressure
T3 - Time from Max Pressure -> End Pressure (EndP)
T4 - Post-pump time (line pressure only)

** Any one or multiple variables may be omitted to change the shape of the pressure profile. At least one variable is required.*

MP - Max Pressure, the peak pressure that the pump will achieve during extraction. Also applies to manual brewing mode.

MV - Maximum Volume (default “0”), when set to “0” no volumetric metering will be performed, any setting above “0” will interupt the Auto and Manualbrewing cycles when the set volume of water has been dispensed.

EndP - End pressure, any pressure *above* line pressure may be set, this is the pressure that will be achieved at the end of duration “T3”

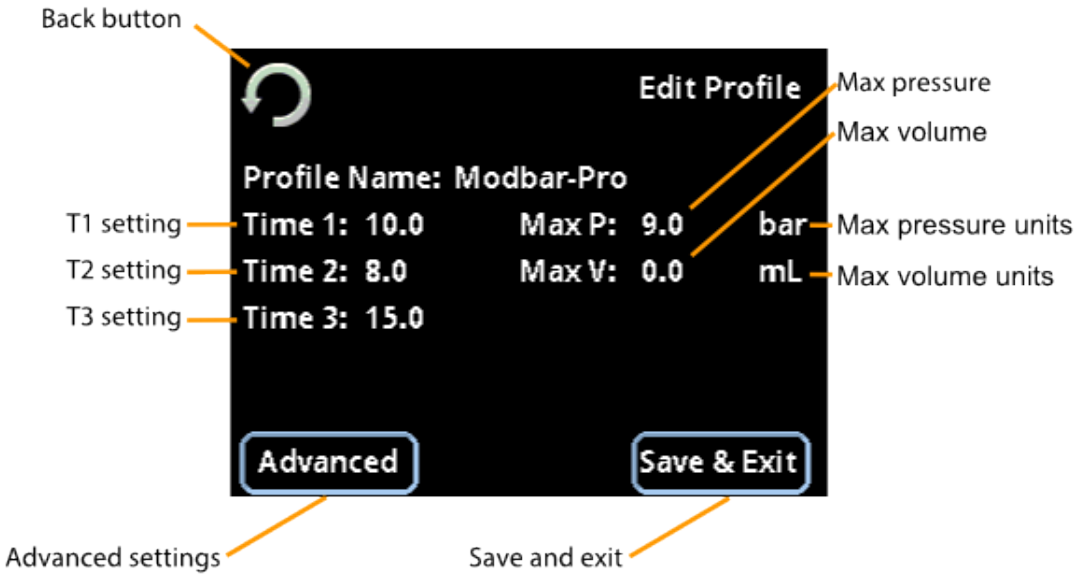
RNSt - Rinse Time, how long (in seconds) to perform auto-rinse function.

RNSd - Rinse Motor Duty, what percentage of motor speed (0-100) to provide flow during auto-rinse function.

MEp - Manual End Pressure, this is the pressure that will be performed when the lever handle is moved from position 3 to position 2 during manual mode use.

Profile edit screen (simple):

home -> main settings -> profile selection -> edit profile

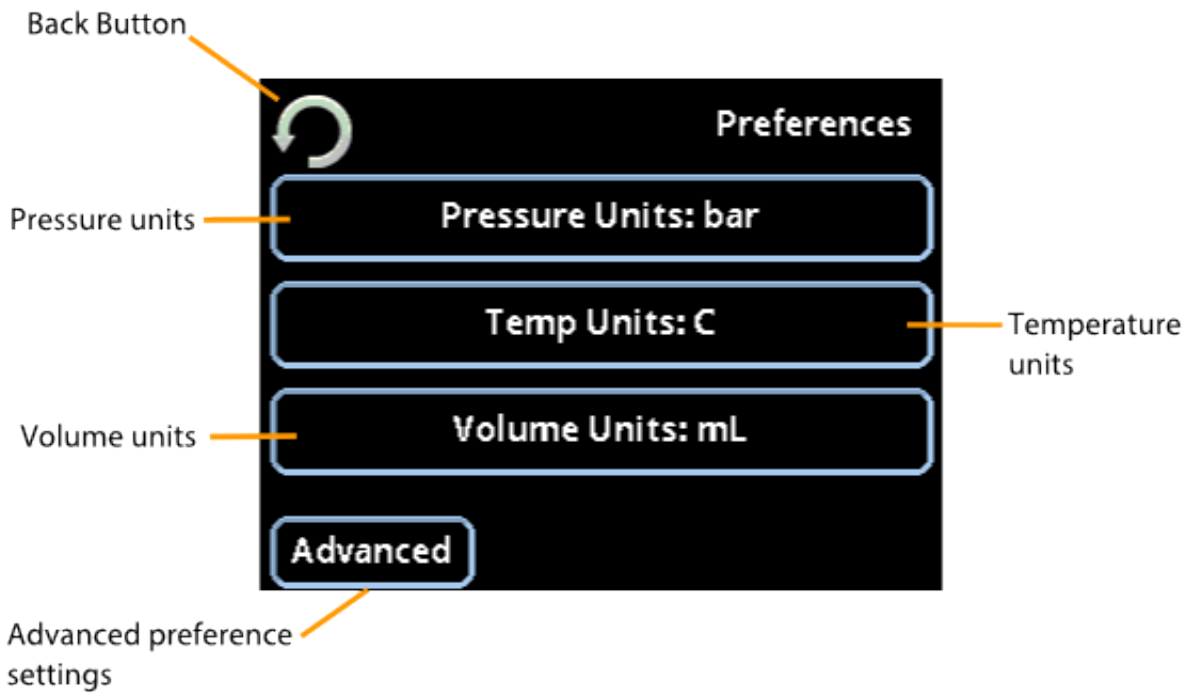


Profile edit screen (advanced):

home -> main settings -> profile selection -> edit profile -> advanced

Preferences screen:

home -> main settings -> preferences



Pressure units: This button sets the system's pressure units, in: bars or psi

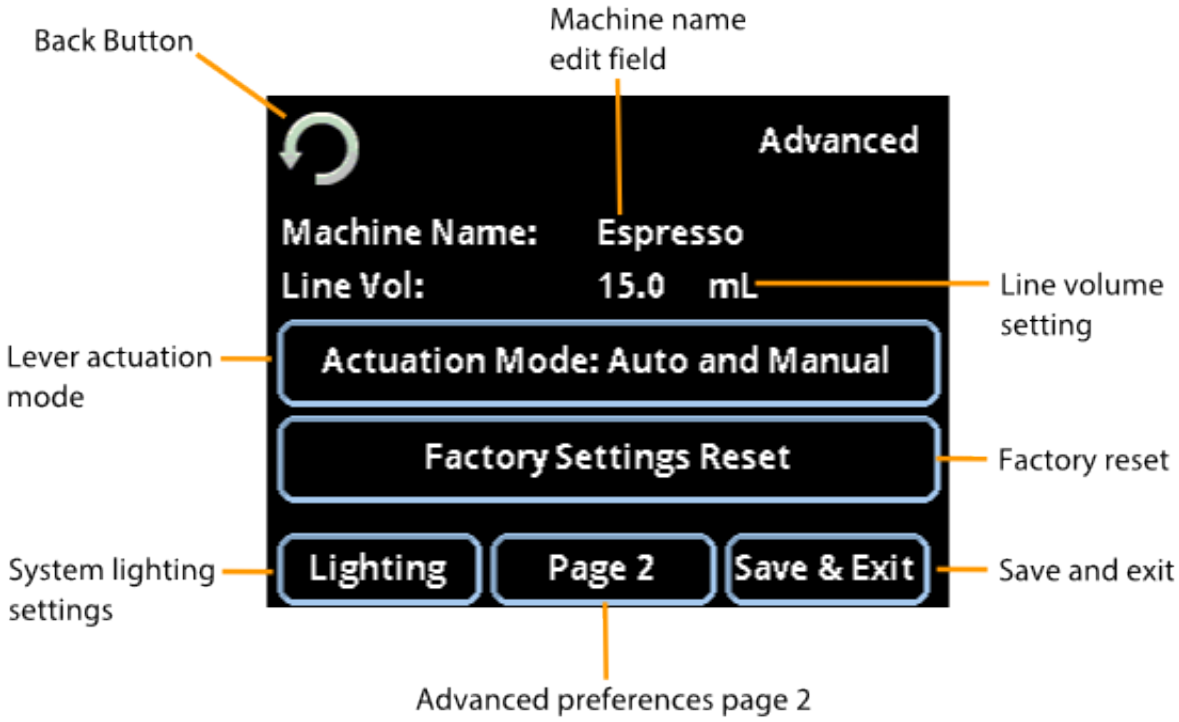
Temperature units: This button sets the system's temperature units, in: Celsius (C), Fahrenheit (F) or Kelvin (K)

Volume units: This button sets the system's volume units to: Milliliters (mL) or Fluid Ounces (oz.)

Advanced: This button navigates to the advanced preference settings page.

Advanced preferences screen:

home -> main settings -> preferences -> advanced



Machine name: This is a descriptive name for the module, touch the name to highlight the field, use the encoder wheel and push-button to rename the machine if desired.

Line volume: This value is used to accommodate for water in the line between the module and the tap. It may also be used to account for water loss to absorption by the coffee puck.

The line volume setting may also be used to correct discrepancies between two different espresso modules that are using the same brewing profile and/or volumetric setting. For example, if two espresso modules are both programmed to dispense 36 mL and one of them dispenses slightly more than the other, the line-volume setting may be increased on the overproducing module to adjust the output accordingly.

Lever operation mode: Use this setting to control the behavior of the lever actuator on the espresso tap. "Auto and Manual" allows for the use of both automatic pressure profiling mode and manual operation mode. "Auto" limits the function to only automatic pressure profiling mode. "Manual" limits the function to only manual operation mode.

Factory reset: This will return **all of the system settings** to their original factory values. ATTENTION! You will lose all stored pressure profiles and other settings. A confirmation screen is presented to confirm the operation of Factory Reset.

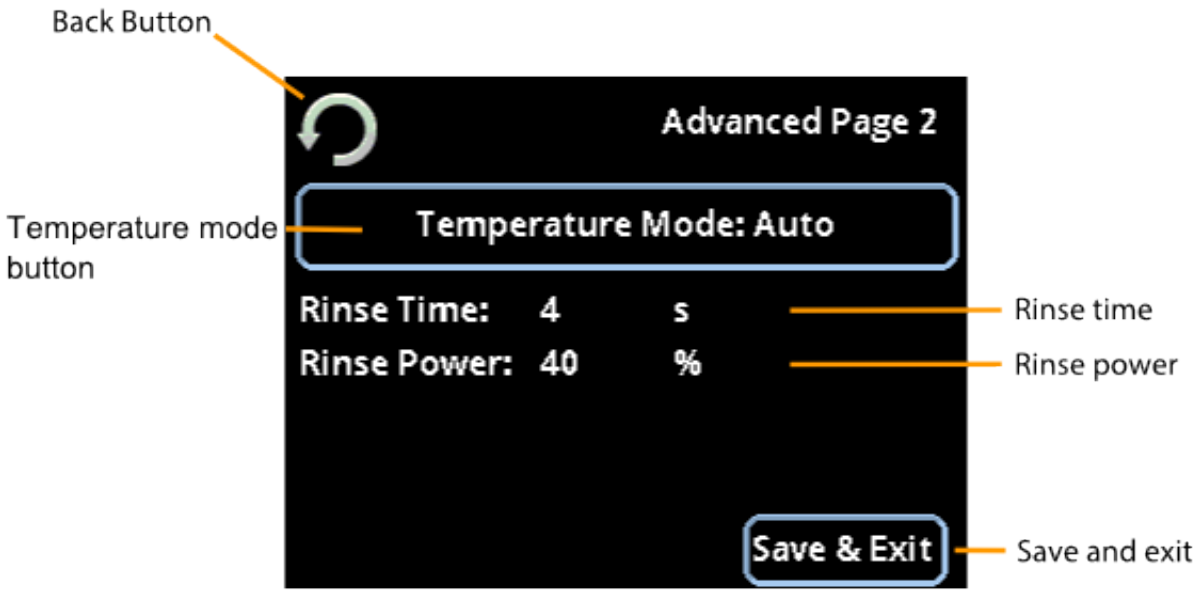
Lighting: This button navigates to the lighting settings screen.

Advance preferences page 2: This button will navigate to page 2 of the advanced preferences screen

Save & Exit: You guessed it! This button saves the settings changes and exits the current screen.

Advanced preferences screen page 2:

home -> main settings -> preferences -> advanced -> page 2



Temperature mode button: This button will toggle between Automatic and Manual temperature modes.

Automatic temperature mode is calibrated at the factory to deliver the best temperature performance using a single temperature setting.

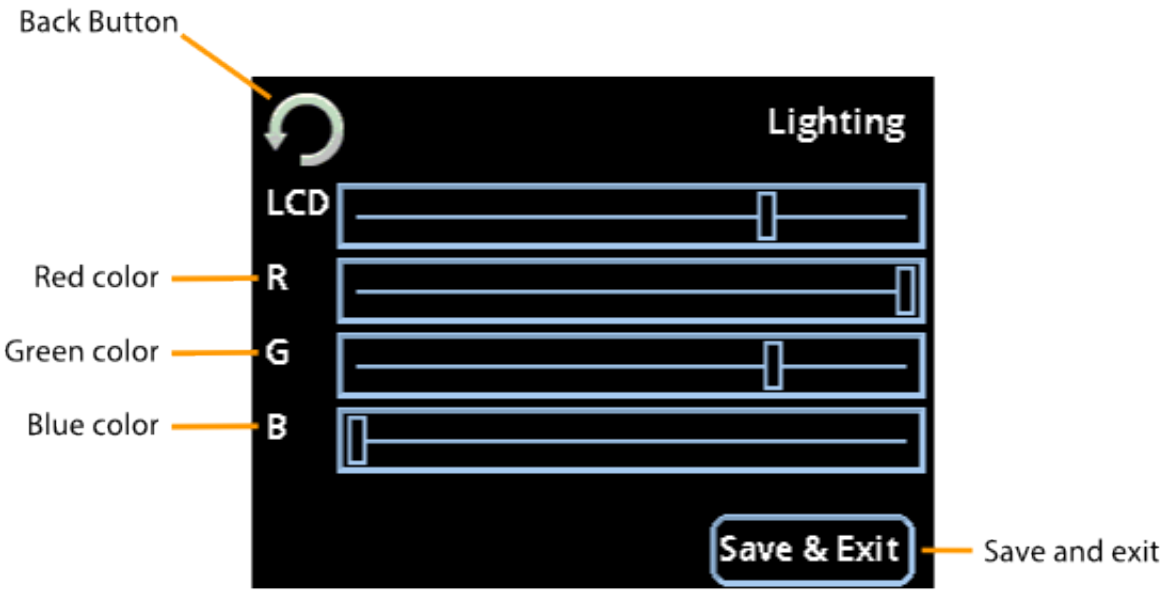
Manual temperature mode gives you independent control over the set points of each temperature zone from the home screen: Inlet boiler, outlet boiler, and brew head. At the home screen, pressing the Heat Zone button will allow you to cycle through each zone and set its temperature independently.

Rinse Time: The rinse time value controls the number of seconds of the rinse cycle, and can be modified for a shorter or longer rinse cycle.

Rinse Power: The rinse power value controls the motor speed percentage during the rinse cycle. This can be modified for a more powerful or less powerful rinse.

Lighting screen:

home -> main settings -> preferences -> advanced -> lighting

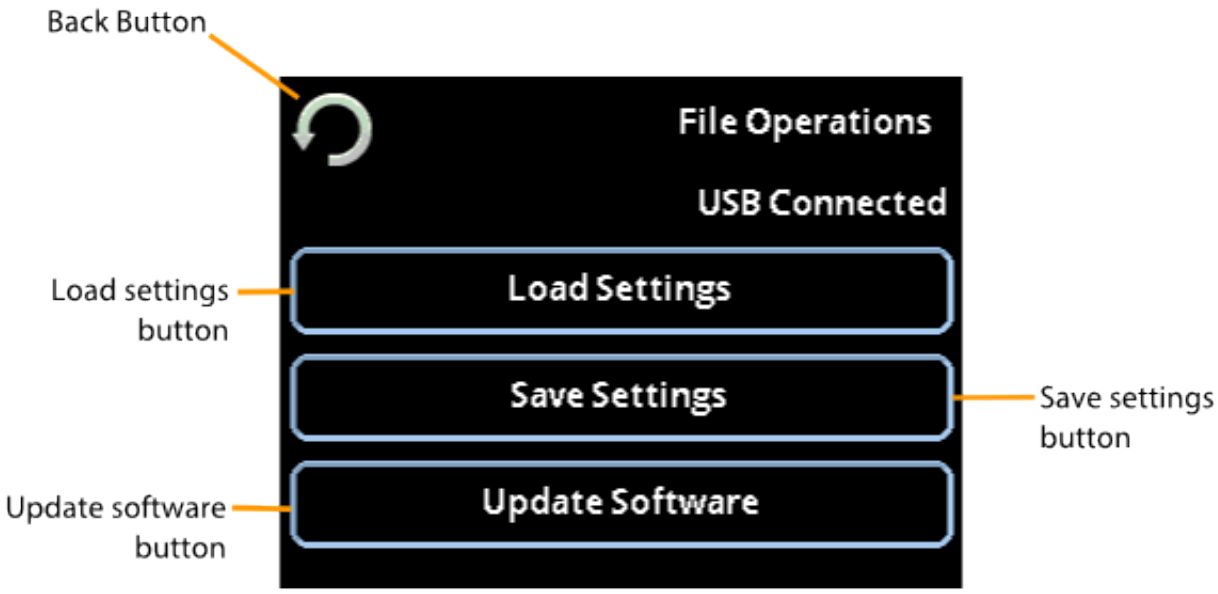


LCD backlight: Use this slider to control the brightness of the touch screen display.

RGB: Using the RGB color sliders you can create any color of the rainbow for the module's internal LED lighting.

File operations screen:

home -> main settings -> file operations



Load settings: This button will navigate to the load settings screen.

Save settings: This button will navigate to the save settings screen.

Update software: This button will navigate to the update software screen.

Load settings screen:

home -> main settings -> file operations -> load settings

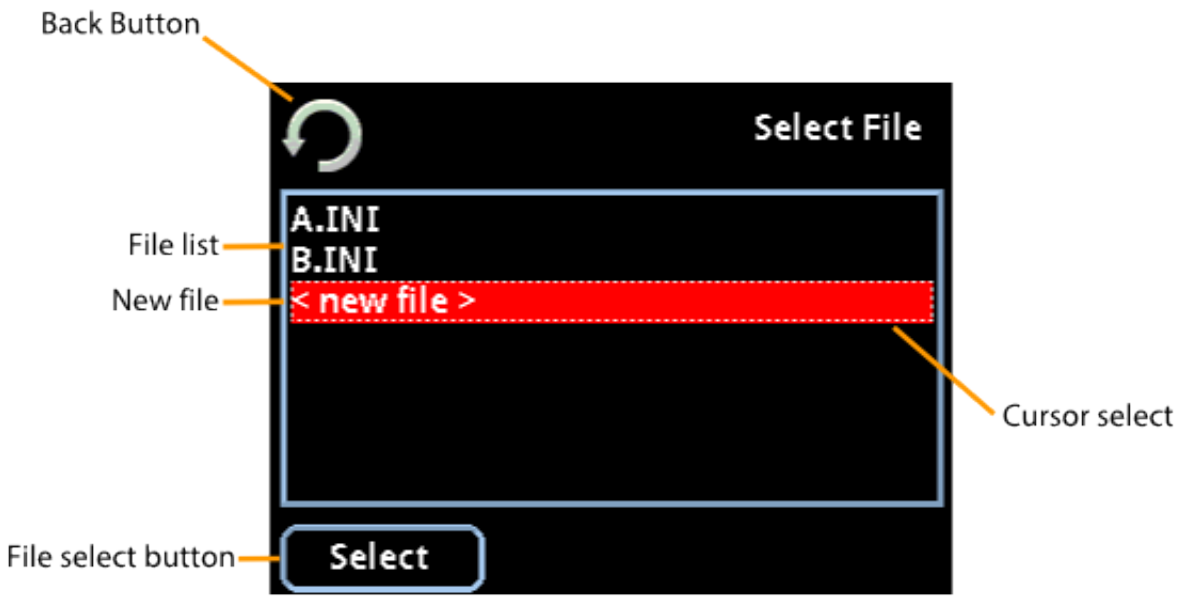
File list: This area displays all of the settings files that are currently saved to the USB drive.

Cursor select: The dotted outline cursor select indicates which file is selected on screen. You may use the rotary encoder or up/down function of the joystick to navigate the file list.

File select button: Pressing select will load the currently selected settings file. This includes pressure profiles and all other user accessible settings and preferences. Note: existing profiles will be overwritten.

Save settings screen:

home -> main settings -> file operations -> save settings



File list: This area displays all of the settings files that are currently saved to the USB drive.

New file: This option allows the creation of a new settings file. To create a new settings file, highlight the < new file > option, and select it by either pressing the center encoder button or the file select button on the touch screen.

Cursor select: The dotted outline cursor select indicates which file is selected on screen. You may use the rotary encoder or up/down function of the joystick to navigate the file list.

File select button: Pressing select will save the current settings to the selected file. This includes pressure profiles and all other user accessible settings and preferences.

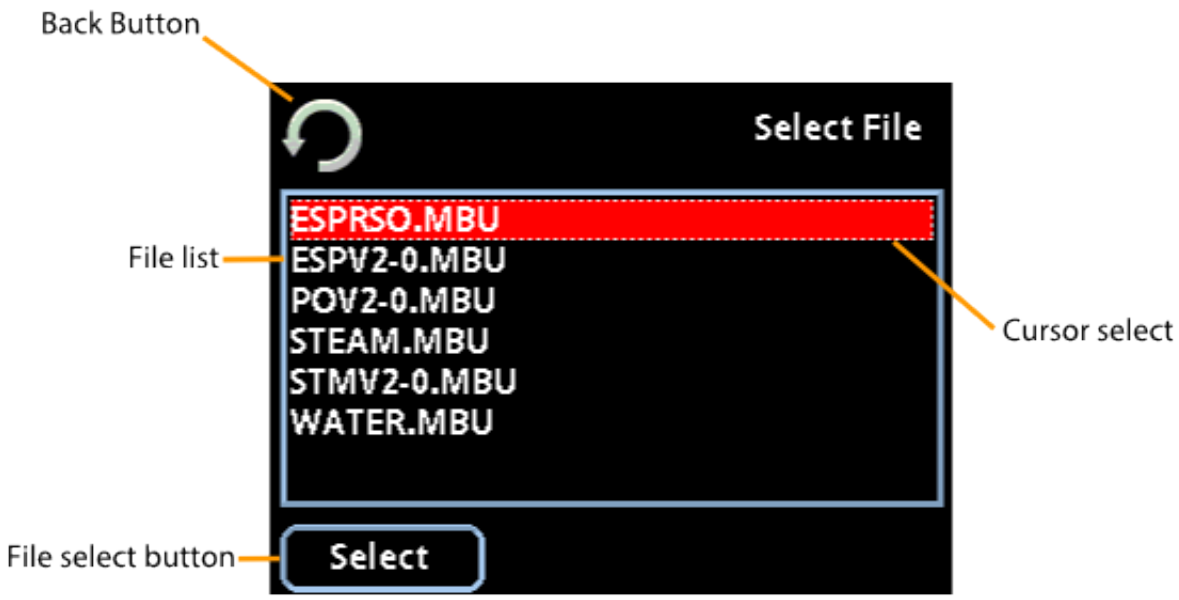
New file screen:

home -> main settings -> file operations -> save settings -> new file

File name: This is a descriptive name for the settings file. Touch the name to highlight the field, use the encoder wheel and push-button to rename the file if desired.

Update software:

home -> main settings -> file operations -> update software



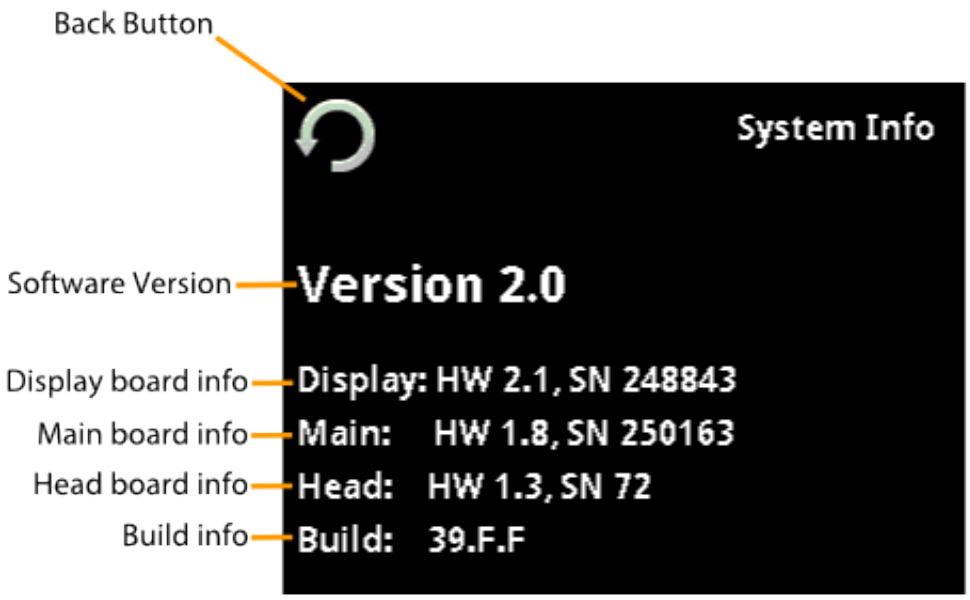
File list: This area displays all of the software update files that are currently saved to the USB drive.

Cursor select: The dotted outline cursor select indicates which file is selected on screen. You may use the rotary encoder or up/down function of the joystick to navigate the file list.

File select button: Pressing select will install the selected software update on the system. The software update process is complete when the machine reboots, displaying the Modbar logo on both the module touch screen and espresso tap displays.

System info screen:

home -> main settings -> system info



Software Version: This field displays the current software version loaded on the machine.

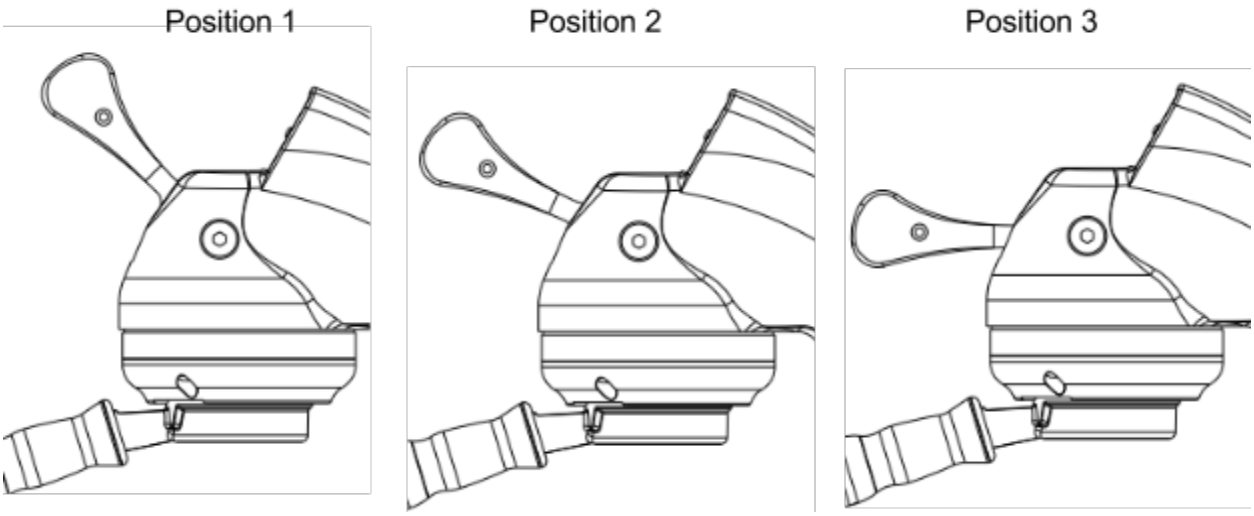
Display board info: This field displays the hardware version and serial number of the display board.

Main board info: This field displays the hardware version and serial number of the main board.

Head board info: This field displays the hardware version and serial number of the brew head board.

Build info: This field displays the software build of each of the circuit boards in the system.

Dispensing Operations



The Modbar espresso tap is able to command multiple functions using a single handle. We do this by combining the movement of three handle positions, as illustrated in the above diagram. Following are instructions for operating each of the tap functions.

Automatic Operations

Automatic mode dispenses using the currently selected profile to control pressure profiling. To activate the machine in automatic mode, simply pull the handle from Position 1 to Position 3, and the tap screen will display Auto and start counting down time based of the total time of currently selected profile.

Manual Operations

Manual mode dispenses using only the MaxP (Maximum Pressure) and MEp (Manual End Pressure) values from the currently selected profile. To operate in manual mode, pull the handle from Position 1 to Position 2. While the handle is at Position 2, the tap will dispense at line pressure ("pre-infusion"). After remaining in Position 2 for a minimum of two seconds, the tap screen will display Manual and continue counting time up from zero. To turn on the pump and dispense at MaxP place the handle in Position 3. After dispensing at MaxP, place the handle back to Position 2 to dispense at the programmed MEp and/or return the handle to Position 1 to cease dispensing.

Rinsing

To activate the pre-programmed rinse cycle, quickly move the handle from Position 1 to Position 2, and back to Position 1. This quick *toggle* activates the rinse cycle as programmed in the profile screen. The parameters for duration and pump duty cycle can both be adjusted to your personal preference.

Cleaning cycle

The Modbar also has integrated cleaning/back flushing cycle functionality built in. To use the cleaning cycle:

- Activate the cleaning cycle by toggling the handle 3-times in short succession. The toggle motion is the same as used in the rinsing cycle.
- The tap screen will display “Clean” and start counting down from 99. During this time it will automatically cycle the pump on and off per a typical cleaning cycle.
- When finished, rinse the group well with a regular filter by actuating the rinse cycle several times.

Maintenance

General service/maintenance safety guidelines

- Before performing any maintenance and/or cleaning operations, turn the main power switch to the OFF position and disconnect the machine from the power source by unplugging the cord or by switching off the relative circuit breaker. For any cleaning operations, follow exclusively the instructions contained in the manual.
- Always use care when performing maintenance, as the equipment may be hot. We recommend allowing the equipment to fully cool before performing any maintenance procedures.

Regular cleaning procedures

Regular cleaning procedures are important to both the longevity of the equipment and to the quality of the beverages which it produces. Following these procedures will help ensure long life and great tasting beverages.

Back flushing

Back flushing must be performed on a regular basis to ensure the proper function and cleanliness of the espresso EP system. We recommend following this procedure on a nightly basis.

- Put one scoop of detergent into a blind filter, and insert it into the group to be cleaned. (Use the amount of detergent recommended on the package)
- Activate the cleaning cycle by toggling the handle 3-times in short succession. The toggle motion is the same as used in the rinsing cycle.
- The tap screen will display “Clean” and start counting down from 99. During this time it will automatically cycle the pump on and off per a typical cleaning cycle.
- When finished, run a steady stream of water through the brewhead.
- Re-insert the the blind filter and run the automatic cleaning cycle once more, this time removing the filter during the pauses, dumpling water from the filter and re-inserting the filter before the cycle re-engages the flow of water. (If water begins to flow *before* you have a chance to insert the filter, wait until the cycle pauses again to avoid the risk of being splashed and burned by hot water)
- Discard the first shot of espresso before resuming normal service to “season” the brew head.

Cleaning Filters

- Put 2 or 3 teaspoons of detergent powder for coffee machines in about 1/2 a liter of water inside a heat-resistant container and boil.
- Dip filters in the boiled solution and leave them fully submerged for about 30 minutes.
- Rinse thoroughly with clean water and run hot water through one group several times with the filters in place.
- Make one cup of coffee and discard in order to remove any unpleasant flavor

Cleaning the diffuser screen

Over time, coffee grounds may slowly build up on and obstruct the diffuser screen. To clean it, you must first remove it by unscrewing the diffuser screw with a flat screwdriver.

- Put 2 or 3 teaspoons of detergent powder for coffee machines in about 1/2 a liter of water inside a heat-resistant container and boil.
- Place diffuser screen(s) and diffuser screw(s) in the solution and leave them fully submerged for about 30 minutes.
- Install and run hot water through each group several times with the screen installed.

Cleaning the exterior of the equipment

The exterior of the taps and modules should be periodically cleaned. We recommend wiping the equipment with a damp microfiber cloth. Do not use cleaning solutions containing strong acids or caustic solutions. Take care not to use excessive liquid when cleaning around electronics, so as not to damage them.

Water Filtration/Softener

It is very important that the media for your water filtration is replaced on a regular basis, in accordance with the manufacturer's recommendations. Please refer to the documentation for your filtration system for proper operating and cleaning instructions.

Preventative maintenance

It is important that periodic maintenance be performed to keep your equipment in peak operating condition. Maintenance should be carried out by a qualified technician. Depending on usage, schedules may vary, but we recommend the following:

Every 3-4 Months

- Replace group gaskets - Replace diffuser screens - Check brew temperature - Check brew pressure - Check water quality	- Inspect water dispensing solenoid valve - Inspect plumbing for leaks or clogs - Check all switches for proper operation - Check filter baskets

Every Year

- Replace filter baskets - Inspect electrical wiring	- Inspect boiler safety switches - Remove and clean/inspect boiler temperature probes

Every 3 Years

Check the interior of the boilers, and if necessary rinse out with a proper cleaning product allowed for food and beverage appliances

Water Quality

Water quality is very important to the proper function of your Modbar equipment. Improper water filtration can lead to serious problems with both your equipment and the quality of the coffee produced. At a minimum, the following water standards need to be met.

Value	Units	Minimum	Maximum
T.D.S.	ppm	90	150
Total Hardness	ppm	70	100
Total Iron	ppm	0.0	0.02
Free Chlorine	ppm	0.0	0.05
Total Chlorine	ppm	0.0	0.1
pH		6.5	8
Alkalinity	ppm	40	80
Chloride	ppm	0	30

For more detailed information about water quality, please visit www.modbar.com/support.

Basic diagnostics

Module not heating

Verify that the power switch is turned clockwise to the operating mode position and not counter-clockwise to the standby mode position. Also, ensure that the tap is plugged in. If the module loses communication with the tap, all heating is terminated.

Note on safety reset switches:

The espresso EP module features two safety reset thermostat controlled switches, one on each boiler. The espresso tap also features one safety reset switch on the brew head. If a boiler (or brew head) does not heat it may be due to the activation of one of these switches, which is triggered by excess temperature and signifies abnormal operation and possibly failed components. The safety switches mentioned are all internal to the module and tap and *are not* user re-settable. If you believe a safety switch has been activated, the module or tap may require service by an authorized technician. Please contact Modbar for additional support and information.

Tap not dispensing

Verify that the water supply to the module is turned on. Also, verify that there are no kinks in the fluid line between the tap and the module. Verify that the tap display is functioning as normal. If it is not, please check that the tap electrical connection is plugged in. If you are still having trouble, please contact Modbar Support.

Pump is overshooting pressure

Verify that your profile has a minimum of 2 seconds programmed for T1. Less time can cause the pump to overshoot, as it is climbing to pressure to quickly.

Also, ensure that your filtration supply is adequate for all of the equipment installed on it. In some cases, running a sink or other equipment connected to the same filtration line as the Modbar will cause pressure spikes during the extraction process. This is due to a sudden amount of water being drawn by a different device. This causes the pump to compensate for the reduced flow rate, and the pressure to spike once the device stops drawing water.