K2 Prime firmware version 3.12 and Asia – Release notes

This zipped folder contains the files and instructions to upgrade your K2 Prime fluxer with the current firmware (operating system) version 3.12 and 3.12-Asia

Please read carefully all sections between your current firmware version and this one. Specific adjustments may be needed, while others may not be available on your fluxer.

New features version 3.12 and 3.12-Asia

- Minor bugs corrected. Minor temperature variation with the ramping parameter. It is now fully accurate.
- 15°C/m and 25°C/m added as ramping range.

New features version 3.11 and 3.11-Asia

- German language added to the language selection in V3.11.
- Indonesian language added to the language selection in V3.11-Asia. Asia version has English, French, Indonesian, Russian, and Chinese.
- A manual control of the temperature has been added to the special window 2206. Using the password 2206, the furnace temperature can be adjusted to the desired values. The temperature will be reset by leaving the special window 2206.
- A new special window has been created. Using the password 2207, the special window will appear and show the status of the different sensors.
- A DEBUG button has been added to the Error Window if the error is linked with the motorized motions. The DEBUG button will automatically open the special window 2207 mentioned above. It will allow to determine if a sensor is faulty.
- Minor bugs corrected. Button "NO" is now displayed when a popup window is asking to confirm an action.

New features version 3.00

- A new parameter has been added to window 2206. (Enter passcode 2206 with the numeric keyboard to access this special parameter window.) This added parameter allows a tilting adjustment for the loading of the crucible in the new "Black Disk" ceramic crucibles holder with auto locking mechanism. The "tilt loading" parameter can be adjusted from 0° to 25°. The recommended setting for this parameter is around 20° to facilitate the loading and unloading of the crucibles. This is partly a matter of personal preference.
- The twisting correction system is now using an adjustable parameter to adjust the reference angle to produce the correction. In the previous version, this reference angle was preset to 31°. Now, the reference position can be adjusted from 30° to 35° in 0.1° increments. This allows an easier mechanical adjustment of the mechanism and offers a more accurate twisting correction operation. This new parameter is also located in special window 2206.

New features version 2.05

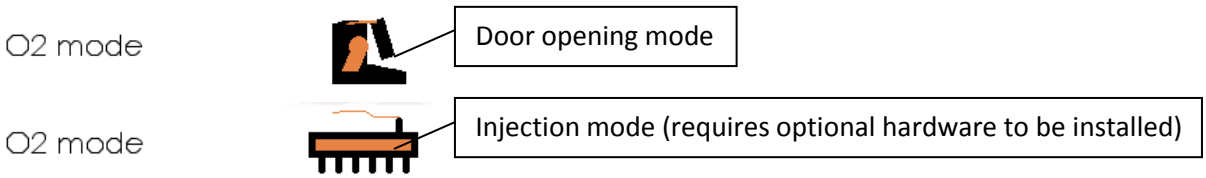
- Italian and Portuguese languages added to the language selection.
- A new parameter has been added to window 2206. This parameter is factory adjusted to select the correct sliding speed of holders according to the pulleys dimension installed on specific unit. This parameter should not be modified by the user.

New features version 2.01

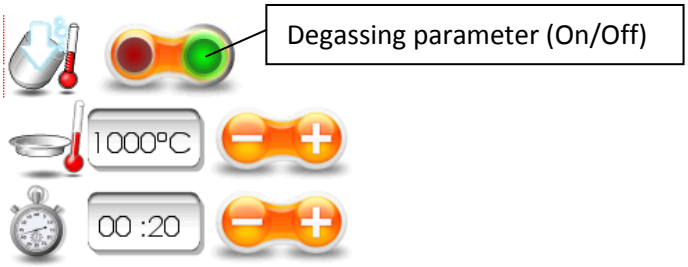
- Chinese language added to the language selection.

New features version 2.00

- Major firmware revision generated with a new compiler version. Many changes have been made to optimize the execution speed and stability of the HMI.
- O2 parameters used in heating steps 1, 2 and 3 that were initially designed to control the injection of oxygen through the optional oxygen injector manifold. It is now possible to alternatively open the door to liberate bad vapors produced and introduce new fresh air every 30 seconds when this parameter is turned ON. To activate this alternate function, the user has to enter special passcode 2206, adjust the O2 mode to door opening and press send button.



- Print screen is recorded when touching the upper left corner of the HMI. It is recorded on the inserted USB memory in the hardcopy directory. PRN is displayed when touching the working area. If no USB memory is inserted, print screen is not recorded.
- Degassing parameters have been added in pouring window parameters



When turned ON this parameter will allow to execute the degassing function. If the degassing temperature is 10°C below the one of step 4 (or more), the door will open to reduce temperature more efficiently. Once the temperature is reached, the duration timer of degassing function is started. Then, the temperature of step 4 is reached again before the pouring is executed. During all degassing function, rocking speed and rocking angle parameters of step 4 are used.

New features version 1.75

- Russian language added to the language selection.
- Load beaker position can be adjusted using a parameter. The parameter can be accessed by using the special access passcode "2206".

New features version 1.74

- With the appropriate hardware added, this software allows the unit to control the door operation. This new hardware includes a cam system that keeps the door closed when no power is applied (door close by gravity). This update can be ordered from Katanax using part number: KP5022A. The cam assisted parameter can be turned ON from a single interface window with special access passcode "2206". Adjustment is required after firmware update. Do not turn ON this parameter unless your instrument is equipped with this hardware. If the door remains closed when power is removed from the unit, it means that the instrument is equipped with the cam assisted hardware.
- With the appropriate hardware added, this software allows the unit to apply a twisting correction of the crucible holder before it moves out for pouring. Please contact Katanax for ordering information if you are interested by this option. The twisting correction parameter can be turned ON from a single interface window with special access passcode "2206". Adjustment is required after firmware update. If the hardware is not installed for this option, the twisting correction parameter must remain OFF and buttons (31° and SYNC) should not be used in the special interface window (2206 passcode).
- The loop operation can be activated for testing purpose of the unit (repetitive test after adjustment or maintenance). This will repeat forever the same recipe once the start button is pressed. By pressing the Stop button the method will be stopped and the loop operation parameter reseted. This parameter can be turned from a single interface window with special access passcode "2206". **Do not produce sample when setting this parameter to ON. The initial beads made will return in the furnace**

and may explode under thermal shock inside the furnace. This will of course produce very important damages to the unit. The end beep buzzer should be adjusted to 5 seconds for the loop operation to work properly.

- If a USB memory is inserted into the HMI before the unit is turned ON and kept in the unit during the operation, the system will automatically save alarm events that occur in a file named "EL_YYYYMMDD.evt" on the main root folder. One file will be created each day. So, in case of problem that needs assistance from Katanax, this file can be sent by e-mail to Katanax (info@katanax.com) for support.

New features version 1.70

- All motor motions are now using software offset parameters for the fine adjustment of reference positions. All offset positions can be adjusted and tested from a single interface window with special access passcode "2206". Adjustment is required after firmware update and should not have to be re-done unless parts are replaced or removed and re-installed for maintenance. In these cases, small adjustment of offset might need to be done, but this can then easily be done right from the interface screen.
- Fault conditions detection has been improved. The system now detects any slippage of the rocking, sliding and door movements. If this occurs and is not resolved within a maximum period of time, an error is generated and the instrument is stopped (power is removed from furnace and motions are stopped). Instrument shows an error with a brief description of the problem encountered. The user can manually resume and try to continue. Katanax or trained maintenance personnel should be informed of such error as soon as it occurs.
- Furnace door opening: if the door opens when it should not, an error is generated and the instrument is stopped (power is removed from furnace and motions are stopped). The user can manually resume and try to continue, if it is believed that the event is unlikely to occur again.

New features version 1.63

- Manual non-wetting agent (NWA) injection: the switch to activate manual NWA is in step 4. It is labeled "NWA". It can be turned ON or OFF. When turned ON, the instrument will reach temperature of step 4, open the door and slide holders out. Message on HMI appears and a repetitive beep is emitted. When new safety door locking mechanism is used, it unlocks the safety shield and waits for it to be opened and closed, before bringing back the holders in the furnace. The operation can be resumed also by pressing start button. When no safety door locking mechanism is installed, user must press start button to resume after manual NWA is done. Holders will then move in and temperature of step 4 will be reached again and duration timer will then be started.
- Start-up zone: Two global parameters have been added to allow the instrument to start the fusion when the temperature of the furnace is within accepted tolerances. Displayed in the global parameters screen. The small graphics we use makes it easy to understand. When the furnace actual temperature is within the limit set by the user, holders move in to start fusion. (If temperature is above the tolerances, the system opens the door to cool down the furnace faster.)
- Load beaker button: For people who make solution, or just to clean the pan under the platinumware holders, we have added a button that allows the holders to move back and clear the beaker area for loading/unloading. This button is located at same position of the stop button (when fusion is running). So, if you press on this button or on mechanical red button when no fusion is running, the holders will move backward to clear the beaker area. If you press it again, they will move back to standard position. The fusion can be launched when holders are in beaker loading position. System will automatically take care to move them first and then open the door.
- This version is ready to control the locking mechanism use with the safety door sensor. To activate the locking mechanism, the security door protection parameter in global parameter must be adjusted to enable position. If no locking mechanism installed, the parameter must remain to disable. Otherwise, functionality problem may occur. (Instruments manufactured before June 2011 can be upgraded with this locking mechanism, part number KP5510A.)
- Table to select method (fusion program/recipe). This is faster and allows you to see all methods on one table.
- Time bar that shows evolution of fusion on the graphic.
- Pouring angle adjustable to 130°
- Pouring with shaking: crucible holder can now be setup to shake after pouring. A maximum of 25 "shakes" at amplitude between 1 and 20 degrees can be set.

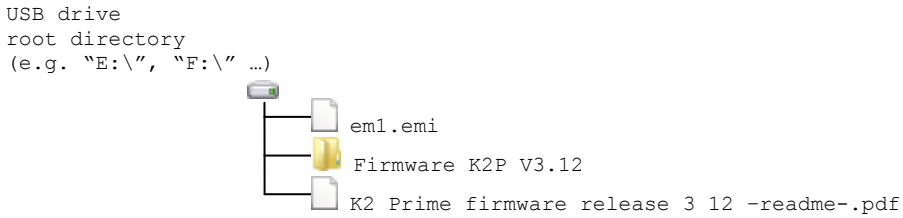
- Detection of many execution errors (communication problems, temperature not increasing, over-temperature ...). The system shows a pop-up window with a short description of the error. This will be helpful to find and resolve quickly such issues.
- Spanish language added to the language selection.
- Firmware is ready to control an optional custom oxygen injector in the furnace. A parameter is used to control an optional valve that can be turned ON or OFF at each heating step.

Apply the upgrade to your instrument

If upgrading from version 1.63 or later, it is not necessary to update history files, so all your recipes will remain unchanged.

If your firmware version is older than 1.63, you will need to update the "history files"; **this will erase all methods/programs stored on the fluxer**. So, if you want to re-create them afterwards, you will need to take them in note *before* you do the upgrade.

1. Extract (unzip) the compressed folder file directly onto a USB drive "letter" (i.e. root directory).
2. The structure of your drive should look like this :



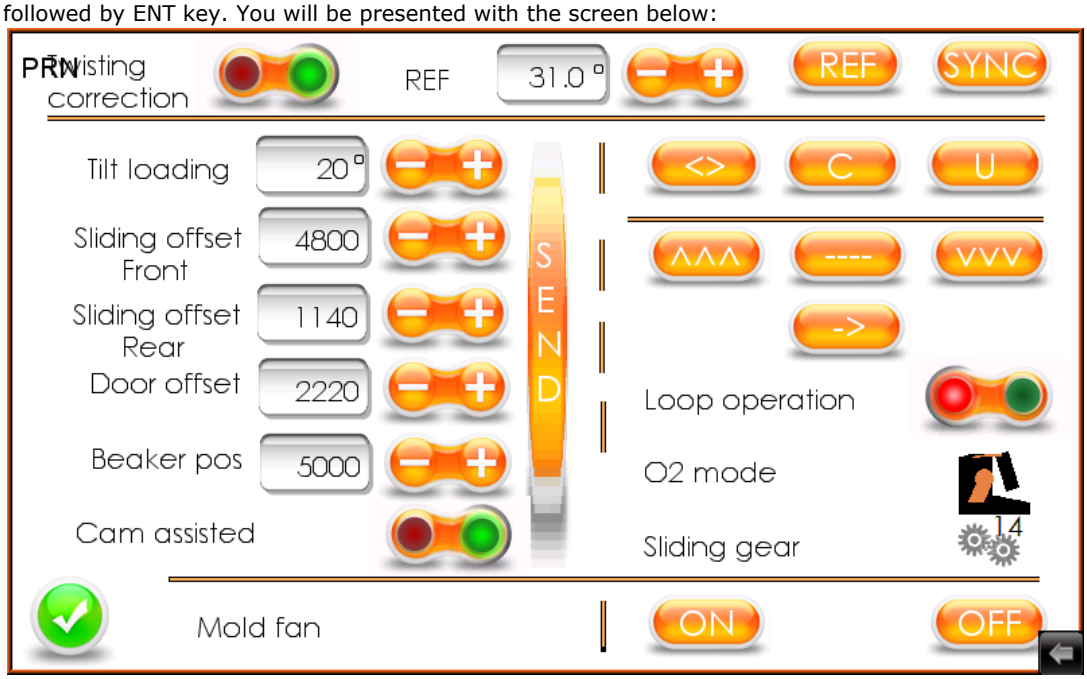
3. Insert the USB drive into the K2 Prime. The hole to insert the USB memory is located at the bottom left of HMI (human machine interface).
4. A dialog will automatically pop up, after a few seconds.
5. Touch "Download".
6. A dialog will appear, requesting a password and what data to download. The password is "111111" (six times the digit one). You may have to drag the dialog window to the left, to show the keyboard and then type the password.
7. Select "Download Project Files" to upgrade the firmware.
8. Select "Download History Files" to update the fusion recipes if not upgrading from version 1.63. Note that this will erase ALL fusion programs currently stored on your fluxer, but is unfortunately necessary for updating from older version than 1.63.
9. Touch "OK".
10. Now, choose where you want the data to be fetched. By default, you will have to double-click on "USBDISK", then double-click on its sub-directory, named "disk_a_1", then highlight the folder named "Firmware K2P V3.12".
11. Click "OK" to start the transfer to the USB drive. The screen will black out, and the fluxer will re-boot.
12. Note that there could be strange messages on the screen (like "Overheating", even if the furnace is at room temperature). Just press OK to continue if that is the case.
13. During the first boot-up, the firmware motor upgrade takes about 1 minute to be performed. Do not interrupt it. Do not turn OFF the instrument until you have reached the main screen (where you can execute fusion method).
14. The new firmware or programs are loaded, and you can remove the USB drive.
15. Now proceed to parameter adjustments (next section).

Adjustment of parameters

Before attempting to run any fusion, it is important that offset parameters be perfectly adjusted. Not doing it may result in damage to the unit.

Preparation:

1. Select and load TEST method number 6. This method is used to test unit at low temperature without heating. (Should this method not be still present in your instrument, then copy the Oxide method and call it "TEST"; change all temperatures of all steps to 20°C)
2. Press on the padlock icon at bottom right of the main screen and enter the following code "2206" followed by ENT key. You will be presented with the screen below:



Adjustments:

1. Set the twisting correction parameter (if upgrading from firmware **version 2.06 or older**):
    a. Set the REF ("reference") twisting correction parameter to 31°.
    b. Then, to verify if the REF parameter is optimally adjusted, press the U button and wait for reset operation of the crucible holder to complete, then press the REF button. The crucibles holder will move rotate to the back and stop at the set REF angle. In this position the anti-twisting posts mounted on the left and right orange collars must be in the closest position possible without touching the mold holder orange brackets. (One side may exhibit a larger gap.)
    c. If one of the posts hits or touches the bracket at this stage, then the REF angle will need to be decreased.
    d. Press the SYNC button to verify that 3 full bumps are executed on both sides. This is what one wants when holder is perfectly aligned (not twisted), but sometimes, the number of bumps can be lower, or uneven between right and left sides, in which the REF parameter needs to be increased.
    Note: A "reset" motion (i.e. crucibles back into straight-up loading position) is done after a twisting correction is triggered by pressing on SYNC. Wait for the reset to complete before attempting other actions on the interface.

    e. If needed, re-adjust the REF angle to obtain the closest position without contact, and then use SYNC button to check that you correctly obtain 3 simultaneous full bumps on each side.
2. Set the "Tilt loading" parameter (if upgrading from firmware **version 2.06 or older**):

a. This parameter controls the tilting of the crucibles holder to facilitate the manual loading and unloading of the crucibles.
b. Enter the desired value. (Katanax recommends setting for this parameter at 20°.)
c. Press SEND (vertical button) to transfer the parameter to the motor controller.
d. Press U to order the fluxer to move the crucible holders in loading position, at your set angle.
e. Test if this angle is convenient by inserting a crucible in the holder, and fine-tune the parameter if needed.

3. Adjust the offset parameters (if upgrading from **version 1.63 or older**)
   a. Set the "sliding front", "sliding rear" and "door offset" parameters to the ones on the picture above (5000, 150 and 1000 respectively). These values should be close to the settings your unit will require.
   b. Press SEND (vertical button) to transfer the setting values to the motor controller.
   c. Press the ^^^ button. This will open the door and move the holders inside the furnace.
   d. Verify that the holders move deep enough inside the furnace to clear the door from closing. Also verify that the holders' sliding motion is not stopped by hitting its end-of-travel bumper. In other words, we want the holders to move deep enough, but not too much.
   e. Press the VVV button. This will re-open the door and slide the holders out of the furnace. Verify that the molds are vertically aligned with the beaker/fan chimneys. Also verify that the holders' sliding motion is not stopped by hitting its end-of-travel bumper.
   f. Verify that the door is properly closed. A small gap, smaller than 1mm is recommended to be kept vertically. This is to allow thermal expansion of insulation material to occur.
   g. If adjustment needs to be done, change the values progressively and test the results using ^^^ and VVV alternatively.

      - Sliding offset front: 4000 to 8500 (standard 5000) – larger value will move further to the front
      - Sliding offset rear: 0 to 2500 (standard 150) – larger value will move further to the back
      - Door offset: 1000 to 2500 (standard 1000 when door closing sensor not re-adjusted; see door sensor adjustment note) – larger value will close the door tighter (too tight a closed door may result is the door bouncing open again, causing an error to be displayed)
      - You need to adjust sliding and door offset parameters if you upgrade from version 1.63 or older. Otherwise, the factory preset parameters will be kept with the firmware upgrade and still good. You can run the above procedure to confirm that settings are good.

***** Door closing sensor adjustment note**:

If even the lowest door offset value (1000) causes the door to close too tight, or bounce back open, you will need to proceed with the door closing sensor adjustment.

- Unplug your K2 Prime.
- Follow instructions in K2Prime manual - Furnace top/back removal to remove the top/back panel.
- Slightly release the two screws that hold the top sensor and adjust the top sensor to the lowest possible position (see picture below).
- Close the furnace top/back panel, reconnect and proceed to door offset adjustment.