

## **FAQ IKAWA FOR PROFESSIONALS - APP 2.3**

### **FIRMWARE V21 UPDATE**

#### **WHAT HAS BEEN UPDATED?**

IKAWA has made an update to the firmware of the Sample Roaster, launching Firmware V21, after beta testing V20, to supersede V19.

Firmware is software that makes hardware work. In this case, it is responsible for allowing the app to communicate with the roaster, and for the hardware devices in the roaster to communicate with each other and do what they are supposed to do.

The key features in this firmware update are:

- Improved Preheating settings to preserve life of heating element
- PID control of the fan speed to create even greater consistency and uniformity from roaster to roaster.
- A predictive element within the temperature control algorithm which will help the roaster control the temperature even more accurately, and minimise overshoot, particularly in the early stage of the roast.

With the new V21 firmware, roasts on your Sample Roaster will have an even greater degree of roast to roast consistency, and profiles shared with customers will also be even more consistent, roaster to roaster.

To install the firmware, simply download the IKAWA Pro app 2.3 from iTunes and follow the instructions that appear when you connect to your roaster.

Please make sure you are clear about the voltage of your roaster before starting the update, and that your iPad / iPhone has a good connection to your roaster. The update will take around 5 minutes.

#### **WHAT HAS BEEN UPDATED? IN DEPTH**

More information about the specific changes:

##### **Preheating settings**

When a roaster is in pre-heat before starting the roast, we currently allow the heating element to heat at maximum power. The fan speed during pre-heat is currently determined by the first point in the particular roast profile, so is variable during pre-heat depending on the roast profile being used.

Through a long period of testing, we have learnt that this sudden application of maximum power, combined with an unsuitable fan speeds, can in some cases have a detrimental effect to the longevity of the heating element.

To preserve the heating element's lifespan, we have changed the firmware to limit the maximum power to the heating element to 80% of maximum power during the preheat phase. Similarly, we have programmed the fan speed to be at 80% during pre-heat.

This gives enough power to enable the roaster to reach drop temperatures of over 200°C (392°F), in a way that preserves the life of heating element.

Very few roast profiles start at temperatures above 200°C, but if for any reason your roaster struggles to achieve you desired drop temperature, we recommend you edit your profile to have a slightly lower start temperature, and add a new data point on your roast at the higher temperature.

You may notice a slightly different sound, due to different airflow, but as soon as the roast starts, the roaster will follow the prescribed curve as normal.

It's worth noting that heating elements are still very reliable, and some of our earlier customers and more frequent users have clocked up thousands of roasts with no issues.

### **PID control of the fan speed**

When designing a roast profile on the IKAWA Pro app you can set up to 10 fan points, between the range of 60 - 100% of the maximum.

During blow-over the fan operates in an overdrive mode, with more than 100% of the programmable power and rotates at around 21,000 revolutions per minute.

Intensive testing has shown there is a degree of tolerance for the fans. Even if that variation is +/- 1% that equates to 210 rpm which can affect consistency.

We have changed the firmware to program the fan according to an absolute number of rotations, rather than % of max power.

This means that regardless of tolerance on fan construction, it will always spin at the same speed when programmed to the same %. For example 70% will always equate to 11,150rpm.

Working with absolute numbers will bring increased consistency when repeat roasting on your roaster, and creates even greater roaster to roaster consistency.

### **Predictive Temperature Control Algorithm**

After starting the roast, you will be familiar with the way the temperature in the roast chamber immediately drops as the cool coffee enters.

To date, the firmware has been programmed to apply maximum heat to return the actual temperature to the desired one, and at reaching it, reduces heat applied to follow the prescribed roast curve. Often, particularly at hotter start temperatures, this creates an

overshoot. While the overshoot is not the intended profile, the roaster does consistently overshoot by the same amount each time.

*Same roast profile on V19 (left) and V21 (right) firmwares - note impact of predictive temp control*



We have added a new, predictive element within the temperature control algorithm which allows the roaster to react immediately to changes in fan speed or temperature, and has also helped minimise overshoot in the early stage of the roast.

***If you have any specific questions or feedback, please email [support@ikawacoffee.com](mailto:support@ikawacoffee.com)***