



**RAPT PILL**  
**Hydrometer & Thermometer**  
**KL20596**  
**Instruction Manual**



KegLand Distribution PTY LTD

[www.kegland.com.au](http://www.kegland.com.au)



### Watch our helpful instructional YouTube Videos

Video instructions now available. The KegLand YouTube Channel (<https://www.youtube.com/KegLand>). You can find the link on our website [www.KegLand.com.au](http://www.KegLand.com.au)

If there is any part of these videos above that you do not understand or you cannot access please call or email [www.KegLand.com.au](http://www.KegLand.com.au) or your nearest KegLand Distributor for more assistance.

### Contents

- ..... 1
- Warning..... 4
- Battery Installation ..... 4
- LED Indicators..... 5
- Registering your Device ..... 6
  - 1. Sign up for a RAPT account ..... 6
  - 2. Connect your smart phone or tablet to the RAPT Pills Wi-Fi Network..... 6
  - 3. Open the RAPT Pill Captive Portal ..... 6
  - 4. Connect the RAPT Pill to your home Wi-Fi network ..... 6
  - 5. Check for new firmware..... 7
  - 6. Register your RAPT Pill to your account on the RAPT Cloud ..... 7
- RAPT Pill Captive Portal ..... 7
  - WiFi ..... 8
  - Registration ..... 8
  - Settings..... 8
  - Diagnostics ..... 9
  - Calibration ..... 9
- Assembly Instructions..... 10
- Operation Instructions..... 11
- Sleep Mode ..... 11
- Calibration ..... 11
  - 1: Standard Calibration ..... 12



2: Advanced Calibration .....	12
3: Custom Calibration .....	13
Updating Firmware .....	15
Bluetooth Operation.....	15
Enable Bluetooth/WiFi.....	15
Using RAPT Pill with KL31936 Complete Wireless Charging Kit .....	16
Troubleshooting Wireless Charging .....	16
Red LED does not illuminate .....	16
Green LED does not start flashing.....	16
Troubleshooting Registration and Telemetry issues .....	17
NOTE: ALWAYS Check for new firmware in the Diagnostics screen of the pill captive portal before attempting to register the pill to the RAPT Portal .....	17
Validation code is not appearing on the Pill Captive Portal.....	17
No telemetry is being displayed on the RAPT Portal. ....	17
Determine whether your RAPT Pill is connected to Wi-Fi .....	17
Check that the Pill firmware is up to date .....	17
Check the signal strength.....	17
Re-Register Your RAPT Pill .....	18
General Troubleshooting .....	18
Red (battery) light flashes very rapidly when plugged in to USB-C.....	18
Lights turn off immediately when disconnected from USB-C .....	19
Battery level reads 0% or not displaying in the RAPT Portal.....	19
The lights on the Pill stop flashing when it is unplugged .....	19
There are no lights on the Pill when unplugged .....	19
Cannot access the Pill Captive Portal .....	19
The green light is flashing but cannot access the Captive Portal .....	20
Telemetry is only received when the Pill is powered by USB-C .....	20
Validation code is not appearing on the Pill Captive Portal.....	20
Error message displayed on phone or tablet when connecting to the Pill Captive Portal.....	20
Warranty (Australia) & Support .....	21

## Warning

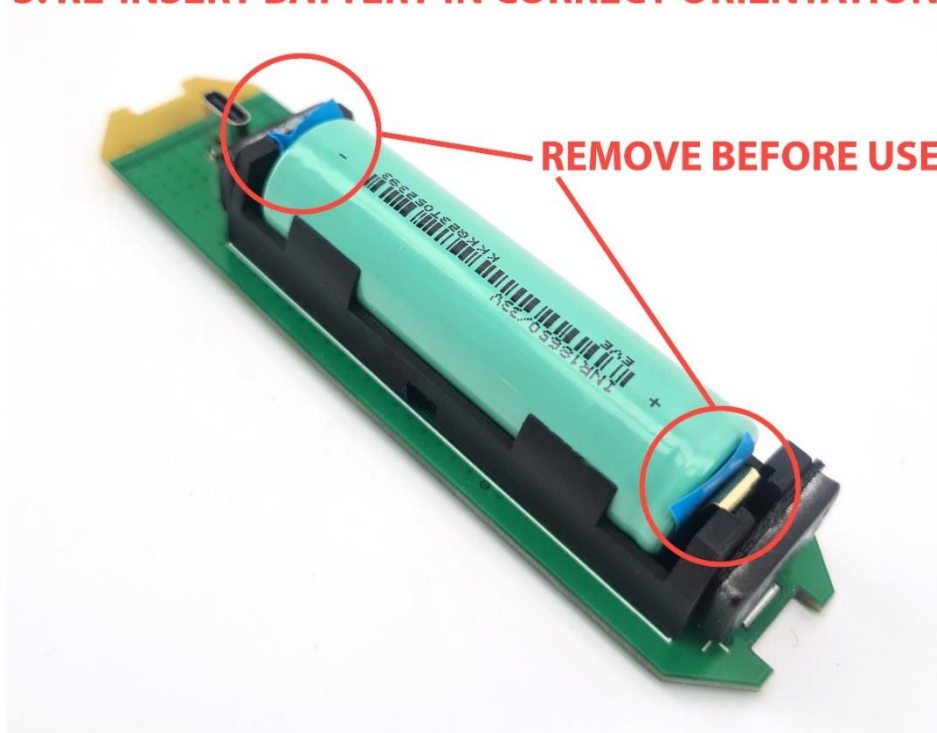
- Fully Charge the Li-ion battery after installation before first time use by plugging a USB-C cable into the USB-C charging port on the circuit board until the RED charging LED turns off. This allows the device to calibrate and correctly determine the remaining battery charge.
- Incorrect battery orientation can damage the circuit board.
- Always leak test your RAPT Pill by submerging in water prior to sanitising and dropping in your fermenter
- **Only use KegLand approved cleaners such as [StellarOxy](#) and [StellarClean](#) and sanitisers such as [StellarSan](#) or [Phosphoric Acid](#).**

## Battery Installation

The battery will come pre-installed in the RAPT Pill with a non-conductive strip on each terminal to prevent the device from being activated during transit. Before plugging the device into power, you will need to remove the battery and remove the two non-conductive strips from the terminals. Then reinstall the battery making sure you follow the (+) and (-) inscriptions on the battery and battery housing to ensure you install the battery in the correct orientation.

### BEFORE CHARGING:

1. REMOVE BATTERY
2. REMOVE BLUE NON-CONDUCTIVE STRIPS
3. RE-INSERT BATTERY IN CORRECT ORIENTATION



Only use KegLand approved 18650 rechargeable Lithium-ion batteries ([KL26734](#)). If non-approved batteries are used the device will require [calibration](#).



Once installed ensure your battery has good contact with the terminals. After installing the battery rotate it slightly within the battery holder to ensure it has good contact.

Important: Once you have installed the Li-ion battery in the correct orientation FULLY charge the battery before first time use by plugging a USB-C Cable into the USB-C Charging port on the circuit board (USB-C cable NOT included). Leave the USB-C Cable plugged in for at least 24 hours.

### LED Indicators

The RAPT Pill features two onboard LEDs

#### Charging LED (**RED**)

- Solid Red when plugged into USB-C – Charging
- No Red Light when plugged into USB-C – Fully charged
- Red Light flashing rapidly – battery not inserted/inserted incorrectly

#### ESP LED (**GREEN**) When *not connected* to USB-C

- Solid green: will pulse green briefly when sending telemetry/movement detected



ESP LED (**GREEN**) When *connected* to USB-C

- Slow green flashes (approx. one every 1.6 seconds): Searching for WiFi network
- Faster green flashes (approx. 3.2 per second): Connected to WiFi
- Rapid Green Flashes: Movement detected

## Registering your Device

### 1. Sign up for a RAPT account

To utilise the Wi-Fi connectivity of the RAPT Pill you will need to sign up for an account on the RAPT portal. This will allow you to track and monitor your specific gravity and fermentation temperature in real time.

1. Sign up for an account on the RAPT portal. <https://app.rapt.io/>
2. Once signed up log in to your account on the RAPT portal.

### 2. Connect your smart phone or tablet to the RAPT Pills Wi-Fi Network

1. Plug your Rapt Pill into a charger or computer with a USB-C cable (not included).
2. On your smart phone or tablet, open your Wi-Fi settings and connect to the "RAPT Pill XXXX" Wi-Fi network using the password "kegland1".

### 3. Open the RAPT Pill Captive Portal

1. Once you have connected your smart phone or tablet to your RAPT Pills Wi-Fi network you will need to open the RAPT Pill Captive Portal.
2. Your smart phone or tablet should provide a prompt to sign into the network of your RAPT Pill when you connect to its Wi-Fi Network. Clicking on this prompt will open the RAPT Pill Captive Portal.

If you are not prompted to sign into the network of your RAPT Pill by your smart phone or tablet then open your Wi-Fi settings and select the "RAPT Pill XXXX" Wi-Fi network again to open the Pill Captive Portal.

**TIP:** Once you have opened the RAPT Pill Captive Portal navigate to **Diagnostics** and write down the **IP (AP)**. This is the IP address of your RAPT Pill and can be input into your web browser to quickly connect the RAPT Pill Captive Portal when plugged into power.

Once you have connected to your RAPT Pill's Wi-Fi network and opened the Pill Captive Portal you will still need to connect your RAPT Pill to your home Wi-Fi network and register the device to your RAPT account before the RAPT Pill will send any telemetry.

### 4. Connect the RAPT Pill to your home Wi-Fi network

1. Select your home Wi-Fi network in the RAPT Pill captive portal, enter your home Wi-Fi network password and select **Join**. This will connect your Pill to your Wi-Fi network.



NOTE: The RAPT Pill cannot connect to 5GHz networks so if you have a dual band router make sure you are connecting to the 2.4GHz network.

2. Once you have joined, click on the **Registration** link to see your **MAC address** and **User Code**. Write both of these down or copy them on your device. You will need to enter the MAC address and User Code to register your Pill on your RAPT account.

### 5. Check for new firmware

1. While the Pill Captive Portal is open, navigate to the Diagnostics screen.
2. Select **Check for new firmware**. If a newer firmware is available, this will be downloaded and installed.

### 6. Register your RAPT Pill to your account on the RAPT Cloud

1. Ensure your RAPT Pill is connected to your Wi-Fi network (above). Note – if you click on your Wi-Fi network, you can note the IP address of the Pill. This can be used to access the Pill AP in a browser.
2. Ensure you are logged in to the RAPT Portal (<https://app.rapt.io>) on a **second device that is connected to the same home Wi-Fi network as the Pill you are registering**.
3. In the RAPT Portal select **Add New Device**. Select **Pill (Digital Hydrometer)** from the drop down. Select **Next** and enter the **MAC address** and **Validation Code** when prompted in the required fields, then select Next.
4. Enter the Pill Details when prompted. This is a user assigned name for your RAPT Pill so that you can identify it in the RAPT Portal. Select enter (the checkmark) when done

Congratulations! Your RAPT Pill is connected to Wi-Fi and registered to your RAPT Portal.

## RAPT Pill Captive Portal

The Rapt Pill Captive Portal can only be accessed when the RAPT Pill is plugged in to USB-C. You can access the Captive Portal in two ways. You can connect directly to the Pill's WiFi using a phone, tablet or computer. Simply connect to the Pill's WiFi network (the network name will be in the form RAPT Pill XXXX where the last 4 digits correspond to the last digits of the Pill's MAC address).

Alternatively, once the Pill has been connected to your WiFi network, you can access the Captive Portal by entering the Pill's IP address on a browser. The IP address can be found in the Diagnostics screen of the Captive Portal.

Note: The Pill Captive Portal will close automatically after 10 minutes when the Pill is plugged in to USB-C.

If the Pill is disconnected from USB-C within 10 minutes the Pill Captive Portal will close.

This is by design to maximise battery life.

**To keep the Captive Portal open for up to 10 minutes while disconnected from USB-C (for example, in order to perform calibration of the Pill) you must first open the Diagnostics or the Calibration screen of the Pill Captive Portal.**



There are five options available in the Captive Portal.

### WiFi

This screen is where we [select and connect to the desired user WiFi network](#) when first setting up the Pill. Once connected, this screen displays the network that the Pill is connected to, as well as a list of available WiFi networks.

Note: The RAPT Pill can only store one network at a time. Should you need to connect it to a different network, this must be done manually through this screen.

### Registration

When the Pill is first set up, this is where you navigate in order to see the MAC Address and Validation Code to register. Once registered, you can elect to **Clear Registration** in this screen. This should not be necessary in normal use.

If you are not receiving telemetry in the RAPT App, check the Registration Screen in the Pill Captive Portal. If there is not a message displaying "REGISTRATION DONE!" then your Pill has not been successfully registered to the RAPT App. Please refer to Troubleshooting below.

### Settings

The Settings tab enables you to select the Telemetry method. You can toggle between **WiFi** and **Bluetooth**. WiFi telemetry is the default option. Bluetooth should only be selected if you have a suitable Bluetooth enabled RAPT device such as a RAPT Fermentation Chamber or a RAPT Temperature Controller. Bluetooth will only work within the RAPT ecosystem.

Note: **Bluetooth requires a compatible RAPT device such as a Fermentation Chamber or Temperature Controller. Bluetooth will not broadcast unless the RAPT Pill is first registered to the RAPT Portal using WiFi.**

The Telemetry Interval can be set in this screen. The default telemetry interval for WiFi is 60 minutes (recommended) or 5 minutes for Bluetooth. Setting shorter telemetry intervals will impact battery life negatively.

The *minimum* telemetry interval for WiFi is 15 minutes.

The recommended telemetry interval for Bluetooth is 5 minutes. Real world testing has shown that this is optimal (with current firmware) for balancing data logging and battery life. Note: The default **Sensor Timeout** for RAPT Fermentation Chambers and Temperature Controllers is 130 seconds, thus it is important for Bluetooth operation that this is changed to a value higher than the Bluetooth Telemetry Interval. We recommend setting Bluetooth Telemetry Interval to 5 minutes and the RAPT Fermentation Chamber or Temperature Controller Sensor Timeout to at least 360 seconds.

Note that a warning may appear in the Captive Portal when setting a Bluetooth Telemetry interval of less than 60 seconds. This is to ensure compatibility against future Bluetooth integration and can be disregarded when using the Pill entirely within the RAPT ecosystem.

The Set Temperature Offset option allows to calibrate your RAPT Pill against a known, calibrated thermometer. Note: During calibration the displayed temperature will generally be higher than actual, as the battery will be in use and thus affecting the board temperature. For temperature





calibration we recommend comparing against a calibrated thermometer during normal use. Use of the temperature offset will not be needed in most cases.

### Diagnostics

The diagnostics screen shows real time telemetry from the RAPT Pill, including temperature, accelerometer values, angle etc. The current firmware can be checked in this screen.

The Telemetry Sent information can be useful when troubleshooting. Telemetry sent is presented in the form X/Y, where X is Telemetry received (by the RAPT device over Bluetooth, or the RAPT Portal over WiFi) and Y is Telemetry sent. Thus, in normal operation these values should be the same. If there is no Telemetry received (thus a value such as 0/18) then this is a good indicator that there is potentially a network or registration issue.

From the **Diagnostics** screen you can manually:

**Send Telemetry now:** this will manually send a telemetry packet to the RAPT cloud or to a Bluetooth enabled RAPT device

**Check for new firmware:** This will manually check for updated firmware and allow you to force an update if a firmware update is available.

**Send diagnostics log.** This will manually send a diagnostics log. This is not required unless requested by KegLand.

**Reboot device:** This will reboot the Pill. This can be helpful in the event of network or wifi issues.

**Factory reset:** This will restore the device to factory settings. This will remove all calibration, WiFi settings and registration.

**Get gravity data:** This displays current gravity velocity data. If there has been no change in gravity over a certain interval then this data will not be valid.

### Calibration

The Calibration allows you to calibrate the Pill using the Standard, Advanced or Custom calibration methods. **Standard** is recommended for most users. **Advanced** is recommended for potentially better accuracy in high gravity worts. **Custom** calibration is generally not required but is an option for the advanced user.

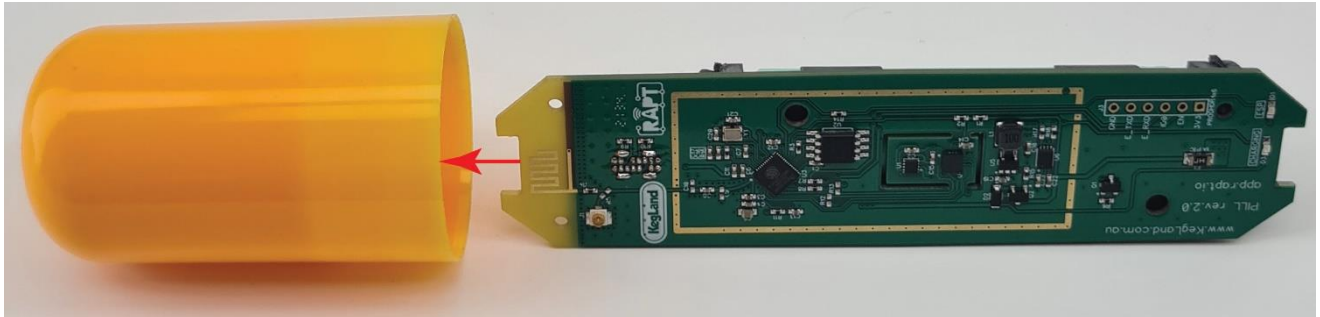
Should you need to clear an existing calibration this can be done here as well.

Real time angle and current calculated gravity can be seen in this screen.

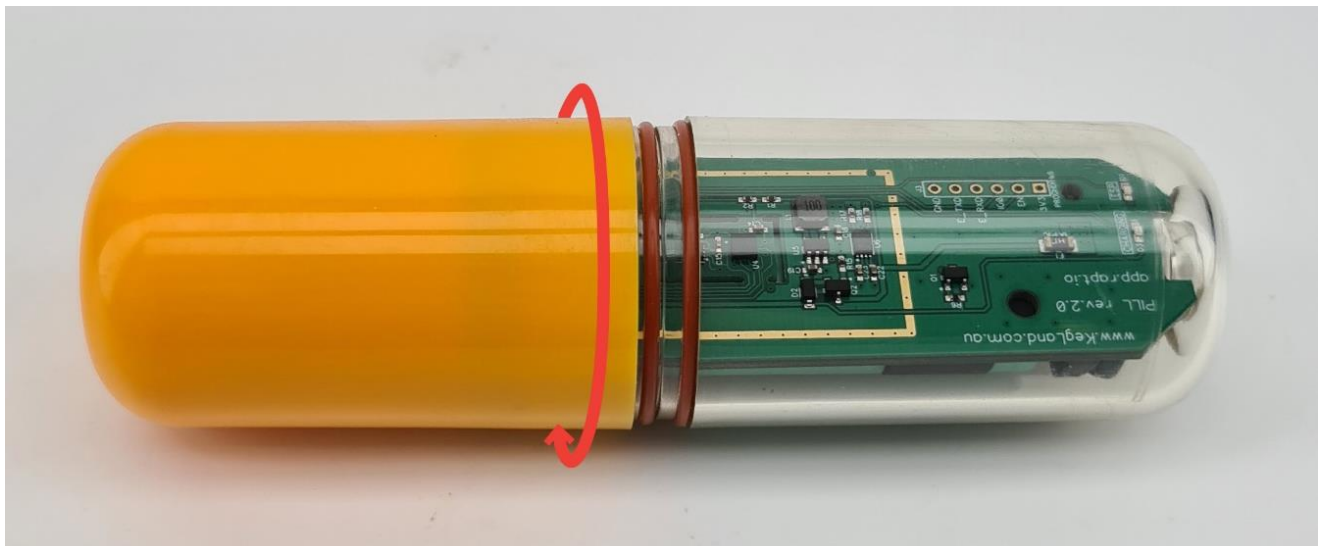
Please refer to the separate [Calibration section](#) in this manual for full calibration instructions

## Assembly Instructions

When installing the circuit board into the housing it is important to insert the circuit board in the correct orientation to ensure the correct weight distribution for accurate readings. The yellow end of the circuit board should be inserted into the yellow housing as shown below.



Once the circuit board has been inserted into the yellow housing, screw the two housings together hand-tight until both o-rings are hidden to ensure formation of a hermetic seal





### Operation Instructions

After charging, assembly and device registration your RAPT Pill should be calibrated before use. Refer to the [Calibration](#) section for instructions on how to calibrate your device.

1. Calibrate and then assemble your RAPT Pill. After calibration confirm your RAPT Pill is correctly sending telemetry to the RAPT Portal by leaving it in a jug of water or sugar solution for an hour and checking to see if telemetry has been received by the RAPT Portal.

It is best to conduct this test in the position where the Pill will be located during fermentation such as if you are fermenting in a fermentation chamber place the Pill in a jug in the fermentation chamber to confirm that telemetry is received and your RAPT Pill has good signal strength.

2. Once it is confirmed that your RAPT Pill is sending telemetry then sanitise your RAPT Pill with an approved sanitiser such as **StellarSan** or **Phosphoric Acid** which has been correctly diluted according to the instructions on the sanitiser's container.
3. Drop your RAPT Pill into your fermenter to monitor the specific gravity and temperature of your brew in real time.

### Sleep Mode

The RAPT Pill will enter sleep mode when the device is in a horizontal orientation. It will automatically wake up when its orientation is changed indicated by the illumination of a green light on the circuit board.

When not in use ensure the RAPT Pill is in a horizontal orientation to ensure it remains asleep.

### Calibration

- **Calibration before first use is strongly encouraged for best results.**
  - **It is recommended to recalibrate after the Pill is connected to USB-C, as tiny changes when opening/closing the housing can affect calibration.**
1. Plug your Rapt Pill into a charger or computer with a USB-C cable (not included).
  2. On your smart phone or tablet, open your Wi-Fi settings and connect to the "RAPT Pill XXX" access point (AP) using the password "kegland1". You may not need to enter the password if you have previously connected your device to the Pill's Wi-Fi.
  3. Open the Pill Captive Portal when prompted to sign into the network of your RAPT Pill by your smart phone or tablet.

If you are not prompted to sign into the network of your RAPT Pill by your smart phone or tablet then open your Wi-Fi settings and select the "RAPT Pill XXXX" Wi-Fi network again to open the Pill Captive Portal.

3. Once the RAPT Pill Access Portal is open on your phone or tablet, navigate to the **Calibration** tab.



4. Select the desired calibration method ([Standard](#), [Advanced](#) or [Custom](#)) and follow the relevant steps.

**IMPORTANT: The RAPT Pill is designed to disconnect from the RAPT Portal once the USB-C cable is unplugged to preserve battery life. Opening the Calibration or Diagnostics screen *before* disconnecting will keep the Pill Portal active to allow calibration of the Pill. You will be prompted after 10 minutes to “Click Here To Maintain Connection” if the calibration process takes longer than 10 minutes.**

Once you have entered a Calibration mode, please assemble your Pill according to the directions so that it can be removed from the USB and calibrated according to the instructions below.

There are three ways to calibrate your RAPT Pill: [Standard Calibration](#), [Advanced Calibration](#) and [Custom Calibration](#).

### 1: Standard Calibration

The Standard calibration mode is recommended for most users.

Standard calibration is the quickest and simplest method of calibration.

1. Fill a container of sufficient volume to hold the RAPT Pill in suspension with a liquid of known gravity. It is simplest and easiest to use water which has a gravity of 1.000.
2. Once the angle reading has stabilised\* enter the gravity (1.000 for water) and press Calibrate. Wait until the screen indicates that calibration is complete.

Your Pill is now ready to use!

\* The angle will never be completely steady, as it is extremely sensitive. Press Calibrate when the RAPT Pill has stabilised as much as possible.

### 2: Advanced Calibration

The advanced calibration mode can give greater accuracy across a wider range.

Advanced calibration is also quite quick and easy, and can provide a more accurate result than Standard Calibration. It is the same procedure as standard calibration, but in addition to water at 1.000, have a solution of a known gravity prepared.

We recommend using a gravity in the range that your fermentation will start – 1.040-1.060 for typical beers, for example.

1. Fill a container of sufficient volume to hold it in suspension with a liquid of known gravity. It is simplest and easiest to use water which has a gravity of 1.000.
2. Prepare another vessel capable of holding the Pill in suspension with a solution of known gravity in the range representative of the upper limit of your starting gravities.



3. Place the Pill in the weaker solution. Once the angle reading has stabilised enter the gravity (1.000 for water) and hit Calibrate. Wait until the screen indicates that calibration is complete.
4. Place the Pill in the stronger solution. Enter the gravity as determined by a calibrated hydrometer. Once the angle reading has stabilised press Calibrate. Wait until the screen indicates that calibration is complete.

### 3: Custom Calibration

Warning! Custom Calibration is for advanced users only.

This mode can provide the most accurate readings across a wider range than the other calibration modes.

Only proceed if you are comfortable with spreadsheets and complex curves. If you are working with solutions with gravities higher than 1.080, then custom calibration is advised.

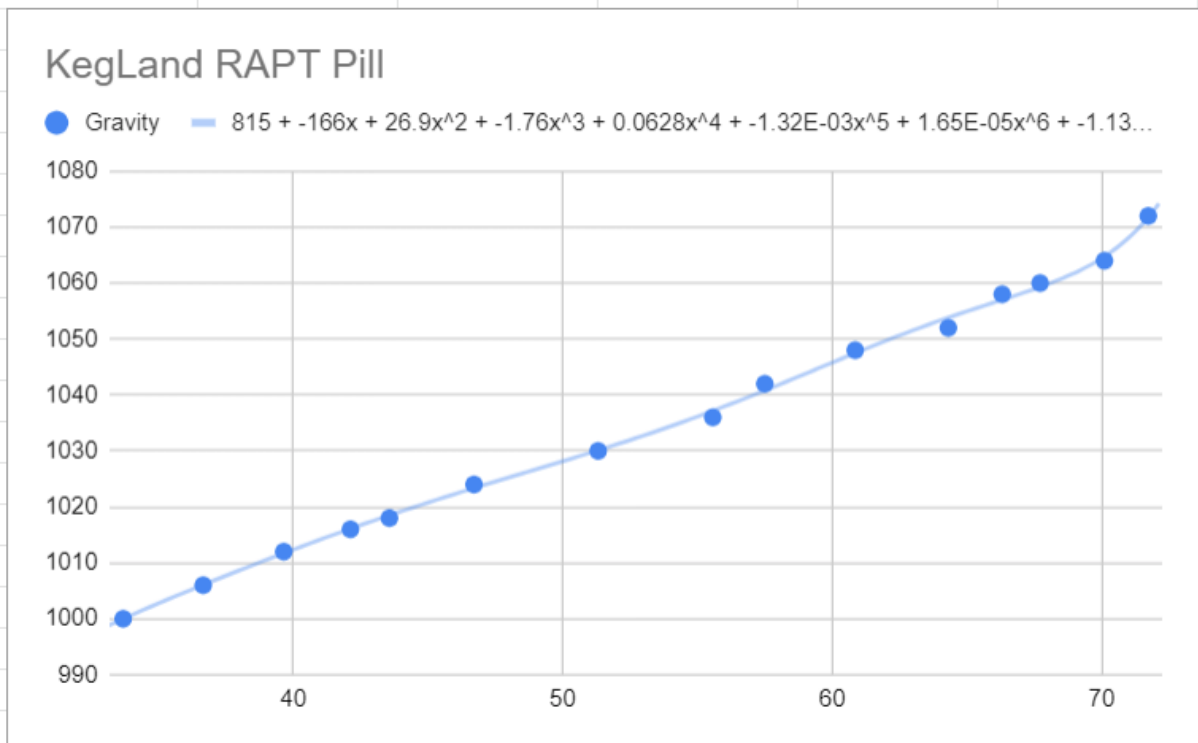
For Custom calibration, you will need to take readings at various gravity points roughly 10 gravity points apart, and make a note of the angle of the Pill at each point. We recommend readings from 1.080 down to 1.000, 10 points apart (so, 1.080, 1.070, 1.060 etc). Note that it does not matter if the gravity readings are not exactly 10 points apart, as long as the gravity reading is correct. Use of a hydrometer that is known to be accurate is quite important.

To perform Custom Calibration, it is easiest to start with the strongest solution and dilute to progressively weaken the solution. It is important to use a calibrated hydrometer to ensure accurate gravity readings.

1. Place the Pill in the first solution of known gravity. Wait for the angle to stabilise, then make a note of the angle and the gravity.
2. Repeat this step for solutions of different gravity, making a note of the angle and the gravity at each step. It is easiest to dilute the starting solution in steps of approximately 10 points. Finish with a reading in a solution with a gravity of 1.000 (IE water).

Once you have sufficient readings, the angle and the gravity need to be entered on an Excel spreadsheet (or similar such as Google Sheets) as a graph with gravity on the 'y' axis and angle on the 'x' axis. The more readings you take, the more accurate this calibration will be. We recommend a minimum of 6 samples, with 10 or more providing a greater degree of accuracy.

When you have created the graph, create a polynomial trend line onto the graph with the degree of the polynomial being *at least* one less than the number of data points. If the trend line creates an irregular curve (such as not passing through the data point at 1.000 correctly or not following a polynomial shape) reduce the number of data points (ensuring that there are still more data points than the degree of the polynomial) until the curve matches.



With 10 data points, a polynomial degree between 5 and 8 will typically give the best results. **This is a sample only**

Copy the equation of the trend line that is generated once this is done.

Paste this equation into the field provided on the Custom Calibration screen (In Google Sheets, set your label to Use Equation).

This will look similar to this:

$$y = 0.0000023109x^5 - 0.0005741632x^4 + 0.0568746764x^3 - 2.8119846525x^2 + 71.1087310405x + 265.6578215178$$

This is a sample only – DO NOT USE THIS EQUATION AS IT WILL NOT BE ACCURATE

Substitute x in this equation with “\*angle^” thus:

$$y = 0.0000023109*\text{angle}^5 - 0.0005741632*\text{angle}^4 + 0.0568746764*\text{angle}^3 - 2.8119846525*\text{angle}^2 + 71.1087310405*\text{angle} + 265.6578215178$$

**This is a sample only – DO NOT USE THIS EQUATION AS IT WILL NOT BE ACCURATE**

Paste this equation into the field in your Custom Calibration to complete the calibration. Congratulations! Your Pill is calibrated and ready to go.



## Updating Firmware

Your RAPT Pill will automatically check and install for firmware updates when plugged in to USB power with a USB-C cable (not supplied).

To check the firmware on your Pill, plug the Pill in with a USB-C cable then open the Pill Access Portal by connecting to the Access Point on your phone or tablet or through the Pill IP address.

1. Plug your Pill in to USB power with a USB-C cable.
2. Connect to the Pill Access Portal with your phone or tablet or through the Pill IP address.
3. Navigate to the **Diagnostics** page.
4. Check that your Pill is running the latest firmware.
5. If a firmware update is available, this will be updated automatically when the Pill is plugged in to USB with a USB-C cable (not supplied) or placed on the Wireless Charger (purchased separately).
6. To check and update manually in the event that this is not up to date, select **Check for new firmware**. Your device will automatically download and update the most current available firmware.

## Bluetooth Operation

The RAPT Pill can send telemetry via WiFi or Bluetooth. For general use WiFi is the default option.

Bluetooth will only work if the RAPT is paired with a Bluetooth capable RAPT device such as a RAPT Fermentation Chamber, a RAPT Temperature Controller or a RAPT Gen 4 BrewZilla.

### Enable Bluetooth/WiFi

To enable Bluetooth on the Pill, you must first connect to the Pill Captive Portal by following the [instructions above](#). Then, navigate to the [Settings](#) page of the Captive Portal.

There is a dropdown menu for Telemetry Method. This enables you to switch between WiFi or Bluetooth for telemetry, and also to set the desired telemetry interval.

The default telemetry interval for WiFi is 60 minutes.

The default telemetry interval for Bluetooth is 60 seconds.

It is not recommended to set shorter telemetry intervals. Shorter intervals will impact battery life.

Recommended telemetry intervals are 60 minutes for Wifi and 5 minutes for Bluetooth – this provides the best combination of accurate reporting and battery life.

Once Bluetooth has been enabled in the Pill Captive Portal, the Pill must be Bonded with a RAPT Bluetooth device such as a RAPT Fermentation Chamber, a RAPT Temperature Controller or a RAPT Gen 4 BrewZilla.



**Note:** Bluetooth requires a compatible RAPT device such as a Fermentation Chamber or Temperature Controller. Bluetooth will not broadcast unless the RAPT Pill is first registered to the RAPT Portal using WiFi.

When a Pill has been bonded with a compatible RAPT device the RAPT device can then be set to use the Pill as the Temperature Sensor. Doing this allows temperature control using real time telemetry from the bonded Pill. This will also display up to date temperature and gravity data on the RAPT device.

### Using RAPT Pill with KL31936 Complete Wireless Charging Kit

Use of the [KL31936 Complete Wireless Charging Kit with the RAPT Pill](#) is very useful for increasing ease of use and minimising the need to calibrate the Pill after charging, updating firmware etc.

Once the Complete Wireless Charging Kit or the [KL32452 Barebones Wireless Charging Kit \(Coil and Weights only\)](#) has been correctly installed (please refer to [this video](#) for an installation guide) then the Pill can be wirelessly charged.

Wireless charging also allows for updating the firmware and accessing the Pill Captive Portal without needing to open the Pill housing to plug the Pill into USB-C.

To charge the Pill simply place it on the wireless charging base, ensuring that the coils are centred over the indicated charging spot on the base. When the Pill is placed on the base the red LED will illuminate to indicate that the Pill is charging. The green LED will start flashing indicating that the Pill is broadcasting a signal so that you can connect to the RAPT Pill XXXX WiFi to open the Captive Portal.

RAPT Pills will periodically check for OTA (Over The Air) firmware updates when charging commences, so this is typically all that is required to ensure that your firmware stays up to date.

### Troubleshooting Wireless Charging

#### Red LED does not illuminate

- The Pill may not be centred on the battery icon on the wireless base station
- The base station may not be plugged in to USB-C or the USB-C may not be providing sufficient power
- The Wireless Charging Kit may not be installed properly
- The 18650 Li-ion battery may be faulty

#### Green LED does not start flashing

- The battery may not be sufficiently charged to power the Pill board. Wait at least 6 hours for sufficient charge, then remove the Pill from the wireless station and replace on the station after 60 seconds
- The Pill may require a reboot. Remove the Pill from the wireless station. Open the housing and unplug the wireless kit from the USB-C port on the Pill board. Wait for at least 30 seconds, then plug the wireless charging kit back in and replace the Pill on the charging station





## **Troubleshooting Registration and Telemetry issues**

**NOTE: ALWAYS Check for new firmware in the Diagnostics screen of the pill captive portal before attempting to register the pill to the RAPT Portal**

### **Validation code is not appearing on the Pill Captive Portal**

If the space for the user/validation code on the Pill Captive Portal is blank then make sure that your RAPT Pill is connected to your home Wi-Fi network (See [Determine whether your RAPT Pill is connected to Wi-Fi](#) below).

If the Pill is connected to your WiFi network but there is no validation code then navigate to the Diagnostics screen of the Captive Portal and select Check for new firmware.

### **No telemetry is being displayed on the RAPT Portal.**

The default setting for telemetry is 60 minutes. As a result, you will not see telemetry in the RAPT Portal right away. Should the telemetry data not appear after 60 has passed you should check the following:

#### **Determine whether your RAPT Pill is connected to Wi-Fi**

If your RAPT Pill is not connected to your home Wi-Fi network it will be unable to send telemetry to the RAPT Portal.

To check this, plug your RAPT Pill in to power and open the RAPT Pill Captive Portal and Navigate to **Wi-Fi**. Check that it shows that the RAPT Pill is connected to your home Wi-Fi network.

You can also check by navigating to **Diagnostics** and checking that it shows your network's IP address next to **IP (STA)**.

To connect your RAPT Pill to your home Wi-Fi network, see [Connecting the RAPT Pill to your Home Wi-Fi Network](#)

#### **Check that the Pill firmware is up to date**

Connect to the Pill Captive Portal and navigate to the Diagnostics screen. Select Check for new firmware. If a more up to date firmware is available this will be downloaded and installed.

#### **Check the signal strength**

If your RAPT Pill is connected to your home Wi-Fi network and there is no telemetry being received check that your RAPT Pill has a good signal strength in the area/vessel/chamber you are fermenting in.

To check the signal strength, log in to the RAPT Portal and click on the **information symbol** ⓘ below your RAPT Pill on the dashboard.

Signal strength is represented on a scale of 0 to -100dbm



Signal Strength (dBm)	What it means
0 to -30dBm	Maximum signal
-50dBm	Excellent signal
-60dBm	Good, reliable signal
-70dBm	Ok, not a strong signal
-80dBm	Poor, unreliable signal
-90dBm	Unusable

**Re-Register Your RAPT Pill**

If your RAPT Pill is still not sending telemetry despite being connected to Wi-Fi and with a good, reliable signal strength then you may need to re-register your RAPT Pill to your account. To re-register your RAPT Pill do not delete the device from the RAPT Portal, instead follow the steps below:

Connect the Pill via USB-C cable. Open the Pill Captive Portal on your smart phone or tablet. (See [Opening the RAPT Pill Captive Portal](#)).

Go to the **Registration** tab in your Pill Captive Portal.

Click the **Clear Registration** button, and wait a couple of seconds for a new **User Code** to be generated.

*Note: If there is no Clear Registration option then the Pill has not been registered to the RAPT Portal and this step can be skipped.*

In a separate device, open and sign in to the **RAPT Portal** (<https://app.rapt.io>).

Click on the **Edit** button of the RAPT Pill that you wish to re-register.

Go to the **Troubleshooting** tab.

Click the Reset Device Authentication button.

When prompted, enter the new user/validation code that was generated and click **Save**. Your RAPT Pill should now be registered successfully.

If you are unable to sign up for an account or your RAPT portal displays an error please forward as many visual pieces of supporting information and a detailed description of the error to [beer@kegland.com.au](mailto:beer@kegland.com.au)

**General Troubleshooting**

**Red (battery) light flashes very rapidly when plugged in to USB-C**

Please install the battery or check that it is making good contact with the terminals.



### **Lights turn off immediately when disconnected from USB-C**

This is normal. To conserve battery power, the Captive Portal will disconnect as soon as the Pill is unplugged from USB-C.

In order to keep the Captive Portal open, you must *first* open either the **Diagnostics** or the **Calibration** screen of the Pill Captive Portal *before* disconnecting the Pill from USB-C. The Captive Portal will timeout automatically after 10 minutes.

If the Pill disconnects despite the Diagnostics or Calibration screen being open, please check the charge level of the battery – it may be insufficient to power the Pill. The battery may be faulty, or not making good connection to the terminals. A fully charged battery has around 4.2V – this can be tested with a multimeter.

*If the battery has a good charge level but is not powering the Pill it may be necessary to gently bend the terminals out in order to ensure there is good contact with the battery.*

### **Battery level reads 0% or not displaying in the RAPT Portal**

This indicates that the Pill has not detected a fully charged battery. Note that the battery must be charged in the Pill for this to be detected the first time.

1. Ensure the RAPT Pill is successfully registered to your RAPT login (the calibration figure will not work unless the pill is linked with your RAPT account)
2. Discharge the battery by using the RAPT Pill for at least 1-2 weeks or by removing the battery and discharging in a device that uses power faster
3. Plug the pill into the USB Type C charging cable for 24 hours. This will allow the Pill to register a fully charged battery which enables accurate battery life data to be displayed.

### **The lights on the Pill stop flashing when it is unplugged**

This is normal behaviour. In order to keep the lights flashing maintaining an open Captive Portal you must *first* open either the **Diagnostics** or the **Calibration** screen of the Pill Captive Portal *before* disconnecting the Pill from USB-C.

### **There are no lights on the Pill when unplugged**

This is normal. The Pill will be 'asleep' by default and will wake briefly at the set interval to send telemetry. The green light will flash briefly when this happens. It may also wake when movement is detected.

### **Cannot access the Pill Captive Portal**

This can only be accessed when the Pill is plugged in to USB-C. Access to the portal will cease after 10 minutes and the Pill will enter a sleep state. Unplugging and reconnecting to USB-C after at least 30 seconds will allow it to be reconnected.

In the event that unplugging and reconnecting does not work, you may need to reboot the Pill. To do this, unplug the Pill from USB-C and then carefully remove the battery. If using the wireless charging kit you can unplug the battery from the on board USB-C port instead. Wait for at least 30 seconds then reinstall the battery (ensure correct polarity) and plug the Pill back into USB-C.



### **The green light is flashing but cannot access the Captive Portal**

Ensure that you have connected to the Pill's wifi network on your phone or tablet (in the form KegLand Pill XXX)

If the Pill Network does not show up in your list of WiFi networks it may be necessary to 'reboot' the Pill. To do this, unplug the Pill from USB-C and carefully remove the battery. Wait for 30 seconds then reinsert the battery (being careful to observe correct polarity) and plug the Pill into USB-C. The Pill WiFi Network should now appear in your list of networks.

### **Telemetry is only received when the Pill is powered by USB-C**

Ensure you have updated to the current firmware. Check that the battery is making good connection with the battery terminals of the Pill's board. It may be necessary to gently bend these out in order to ensure the battery is making good contact in order to power the Pill when it is not connected to USB-C

### **Validation code is not appearing on the Pill Captive Portal**

If the space for the Validation code on the Pill Captive Portal is blank then make sure that your RAPT Pill is connected to your home Wi-Fi network (See [Determine whether your RAPT Pill is connected to Wi-Fi](#) below). If it is connected to WiFi but not displaying a validation code then perform a Check for new firmware to update to the current firmware.

### **Error message displayed on phone or tablet when connecting to the Pill Captive Portal**

You may occasionally see an error message on your phone or tablet when connecting to the Pill Captive Portal. This will display a message that the 'network is not connected to the internet' and your device may not allow a connection to the Pill.

To clear this message and allow connection select the Pill WiFi Network on your phone or tablet and select the "Forget This Network" option. Unplug the Pill and plug it back in after 60 seconds. You may now connect to the Pill Captive Portal. You will need to re-enter the Pill password (kegland1)



## **Warranty (Australia) & Support**

Please join the Facebook [RAPT Users Group](#) for support on how to use your RAPT Pill & Thermometer or the RAPT Portal.

If you need hardware support, please contact your nearest distributor.

The RAPT Pill & Thermometer comes with a 12-month warranty when sold in Australia. To lodge a warranty claim in Australia please forward as many visual pieces of supporting information and a detailed description of your issue to [beer@kegland.com.au](mailto:beer@kegland.com.au)

If you purchased your unit from an international distributor, you will be required to go through their warranty claims process.

For a full terms and condition please visit our website here -> [Terms & Conditions](#)