

# Manuel Beescale V10

## Table of contents

First steps.....	2
Installing the scales under your hives.....	3
Consult the website.....	4
To detect a honeydew.....	5
To detect swarming.....	5
.....	5
To estimate the winter colony strength.....	6
Monitoring snowfall.....	7
To detect a colony looting.....	8
To detect an opening / a break-in.....	9
To change the batteries.....	9
How to determine whether the scales are working upon installation.....	9
If the scales do not emit a signal.....	9
If the scales are broken.....	9
Scale settings.....	10

## First steps

The package contains a complete set of Beescale scales which have been fully set up and are already operational. The setup is taken care of when the order is placed. Simply position the scales underneath the hives and then connect to the website to obtain the weight and temperature of your hives.

### Operating principle:

The scales automatically emit the weight of the four sensors and the inside temperature of the enclosure every hour. These values are available live on the [beescale.org](http://beescale.org) website (information available within 3 to 4 minutes).

The values will not be updated if you are not in a Sigfox zone. Since four measurements are taken, care must be taken at the time of installation to distinguish between hives P1, P2, P3 and P4.

### Notification:

Your email address is also automatically set up before the delivery. You will therefore receive a notification email within less than four minutes if:

- The weight suddenly changes by ten kilos or more on at least one set of scales
- The temperature rises above 40°C
- The battery is low
- A scale cable is cut

### Maintenance:

No maintenance work is required apart from changing the batteries (once a year for LiFePO4, every 3 years for Li-ion). The scales delivered with a solar panel do not require any maintenance.

### Functions:

- Honeydew monitoring
- Swarm monitoring
- Anti-theft / anti-intrusion (\*)
- Wintertime furniture monitoring
- Wintertime colony strength estimation
- Looting follow-up

(\*) place a weight on the top of your hive so that the roof and the weight together represent more than 10Kg. You'll be immediately notified by email if the hive opens.

### Location:

The scales do not contain a GPS system which means that it is impossible to locate it precisely with the given data.

### Precaution:

Do not install the enclosure with the aerial facing South as there will be too much sunlight,. Ensure that the sensors are protected from rain.

### Site [www.beescale.org](http://www.beescale.org):

The website has been created to suit your requirements and log-in codes are provided when the order is placed. By connecting to the website you can gain automatic access to all your scales. Simply type [www.beescale.org](http://www.beescale.org) directly into the search bar (not your search engine) to connect at any time..

## Installing the scales under your hives

Place the four hive scale-plates on the pallet. Make sure that all four stems of the scale-plate are on a perfectly even surface). Take care to differentiate between P1, P2, P3 and P4.



If the bottom of your hives is made from plastic Nicot, you will need to install an adaptor (the hive scale-plates measure 30x30 and are therefore adapted either to small hives such as Warré types or larger hives with a solid wooden base. If the hive base is flexible, you will need to add a 45x45 tile as reinforcement). You will also need to place a tile under the plate to obtain a better signal.



Attach the enclosure to the side of the hive (the temperature sensor is inside the enclosure; it has to be protected from the sun to avoid overheating).

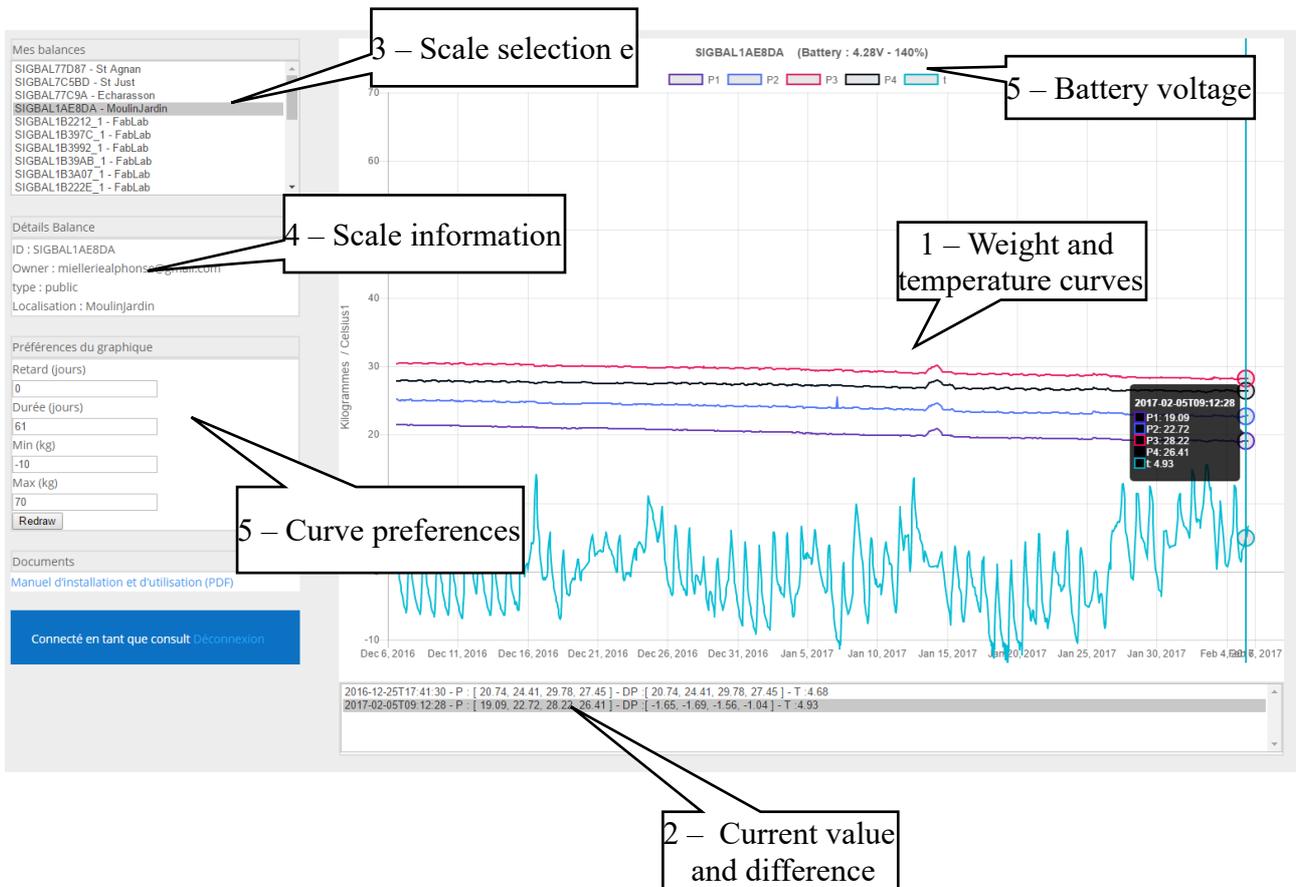


Number the hives from P1 to P4 according to the numbers of the scale-plates under each colony.



## Consult the website

Connect to [www.beescale.org](http://www.beescale.org) and you will see the following screen:



To zoom in on the curves:

Explore the parameters (5). The **Delay** parameter corresponds to the number of days between the current date and the latest date on the screen. The **Period** parameter corresponds to the number of days to be displayed.

To determine the weight difference between two dates:

Click on the first date → the value appears in zone (2)

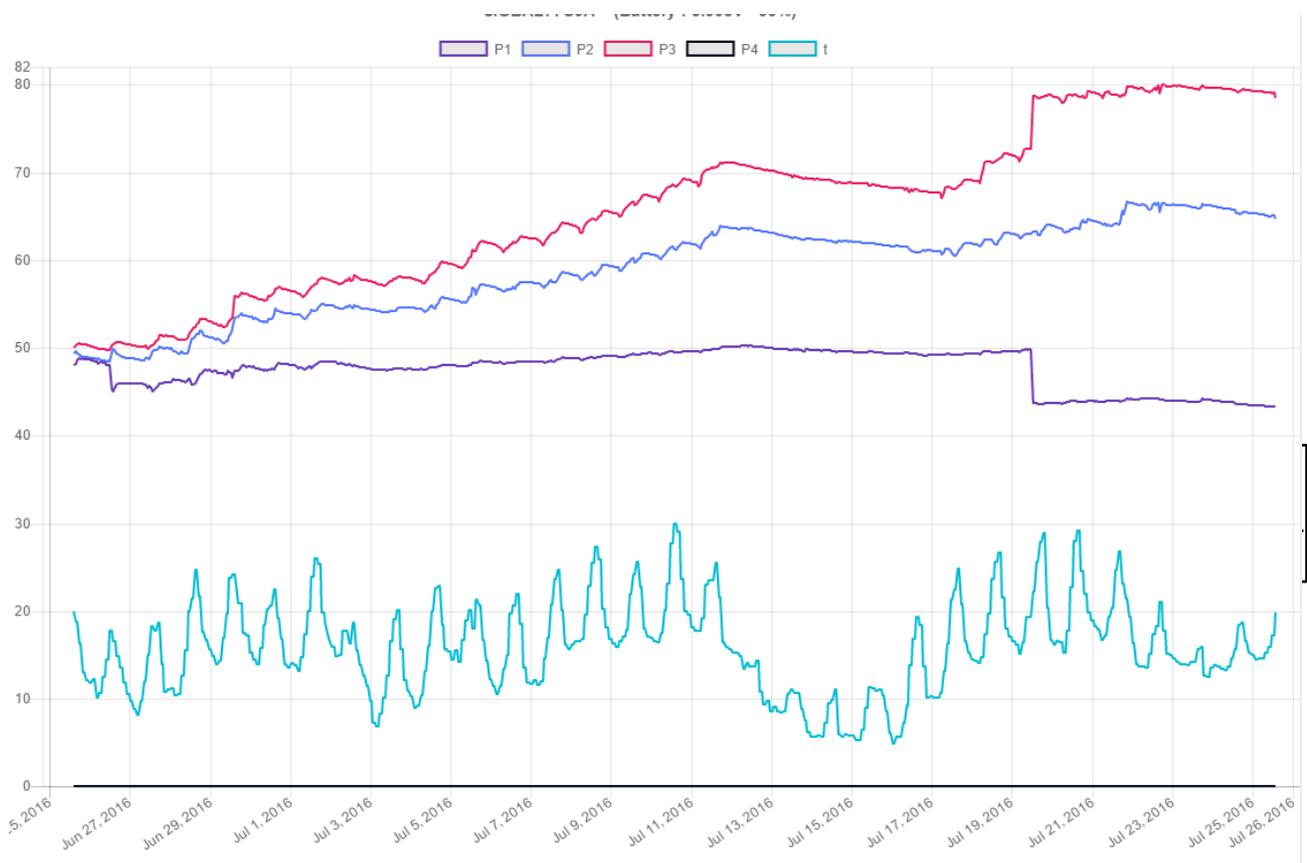
Click on the second date → the new value appears in zone (2) with the weight difference.

## To detect a honeydew

Consult your curves at around 11am-midday on a favourable day. Compare the current value to the same value twenty-four hours earlier. If honeydew is present, you should see an increase from a few hundreds of grams to several kilos.

## To detect swarming

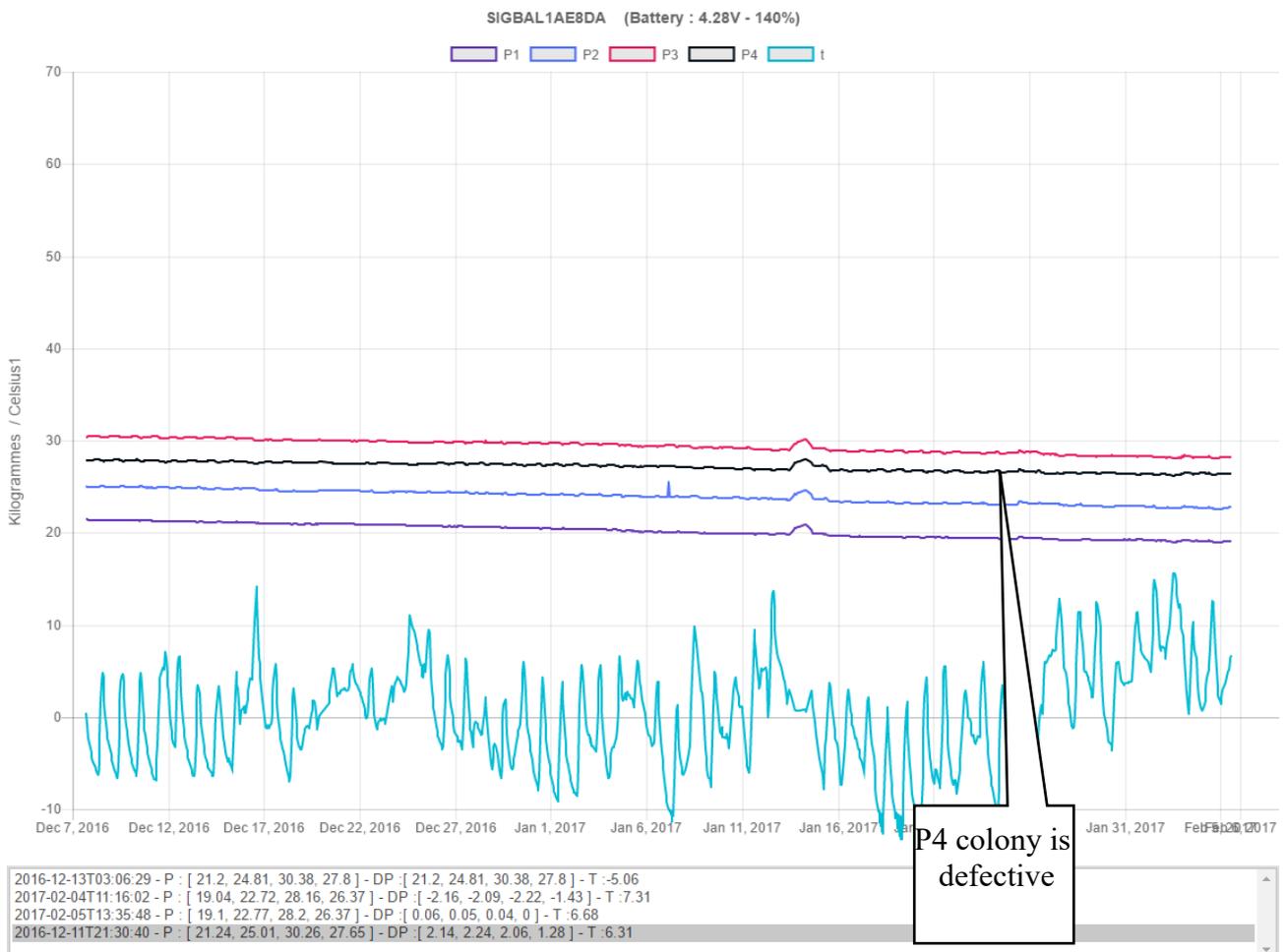
Your hive will suddenly increase by a few kilos without human intervention.



## To estimate the winter colony strength

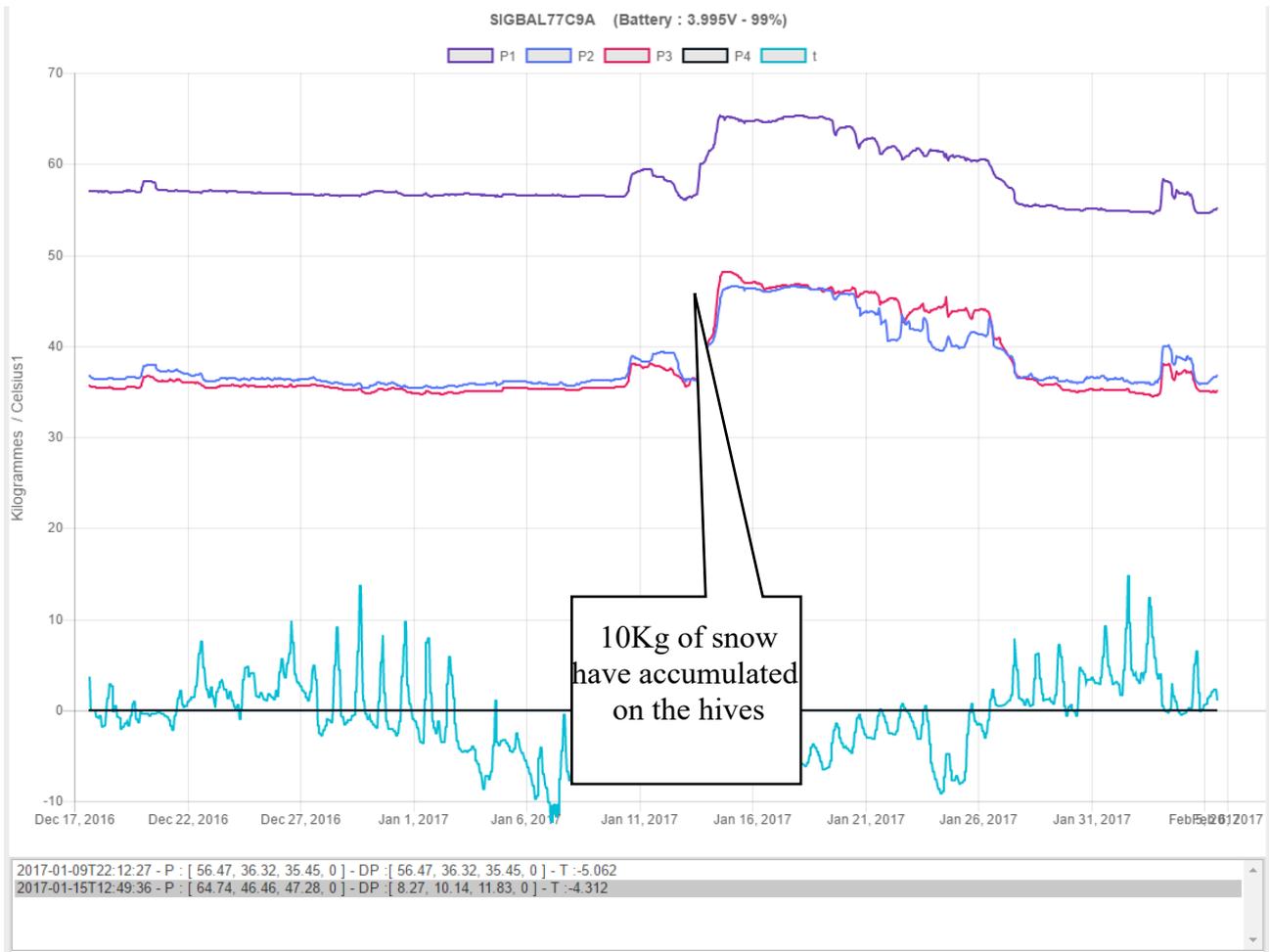
Display the curves over a period of 21 days. Click on the beginning and the end. The difference is displayed allowing you to organise your colonies by strength according to the quantities consumed.

If colonies are weakening, the curve gradually becomes lower and with practice you will be able to determine whether, a colony is dead or alive.



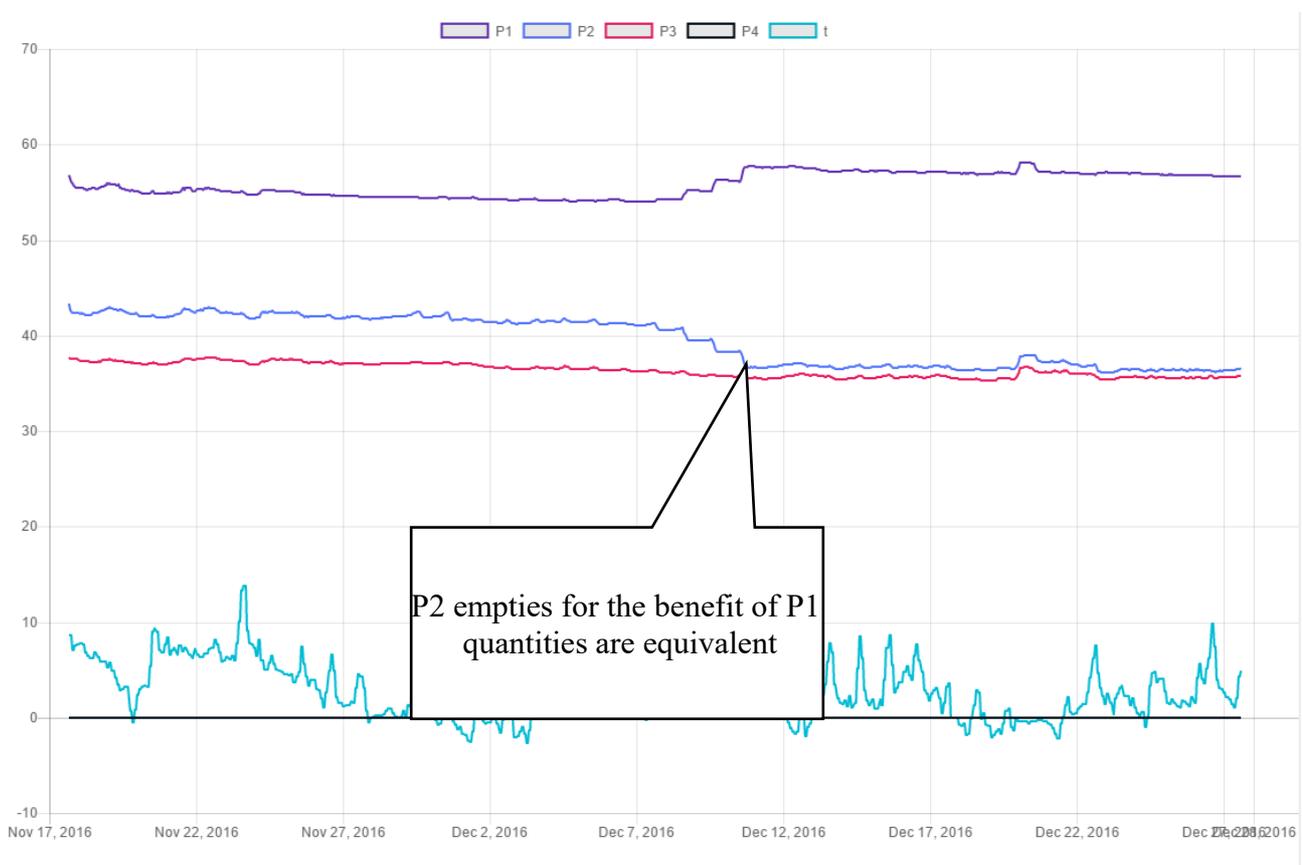
## Monitoring snowfall

The weight of snow can immediately be seen in the curves. When the snow is completely melted, the curves will go back to normal.



## To detect a colony looting

Some hives become empty while others increase in size.



## **To detect an opening / a break-in**

If your roofs are ballasted and the hive weighs more than 10Kg you will receive an email notification as soon as the hive is opened or moved. The weight is then saved every hour or every two minutes if it changes by more than 10Kg.

## **To change the batteries**

To change the batteries, simply unscrew the four screws on the enclosure and open carefully.

You will then need to insert fully charged batteries making sure that they are positioned correctly. If you reverse the polarity, you will immediately destroy the voltage regulator on the electronic card. If this happens, the regulator can be replaced but the scales will have to be returned to the workshop.

Before you screw the lid back on, briefly tap on the "RESET" button. An LED should be displayed. If you are not certain you can tap "RESET" a few times. Do not touch the "mode" button.

Make sure that you do not cut the wires when replacing the lid. Screw down firmly.

An alarm will warn you if the battery is low and the battery voltage will be displayed at the top of the graph. With LiFePO4 technology, a voltage of 6V is a sign of low battery.

The batteries are in 18650 format and the scale operates with LiFePO4 or Li-ion batteries.

## **How to determine whether the scales are working upon installation**

During installation, the hives will be placed on the scales and of the weight will increase from 0Kg to several tens of kilos. You will receive an email within less than four minutes indicating that the weight has changed. If you have a Smartphone with you at the apiary, you will be able to consult your emails.

If the scale emits once, it will keep emitting.

If the zone is within the limits of Sigfox coverage (RSSI < -132dB), the data will not reach the server fully. Data will generally be missing for 4 or 5 but this will not disrupt the interpretation of the curves.

## **If the scales do not emit a signal**

1 – Check on the internet that you are in a Sigfox coverage zone and that you have set the aerial up correctly, i.e. vertically, far from any obstacles. Be aware that your telephone could disrupt the emissions if it is less than three meters away from the aerial.

2 – Check that the batteries are correctly installed (this is the only non-welded component).

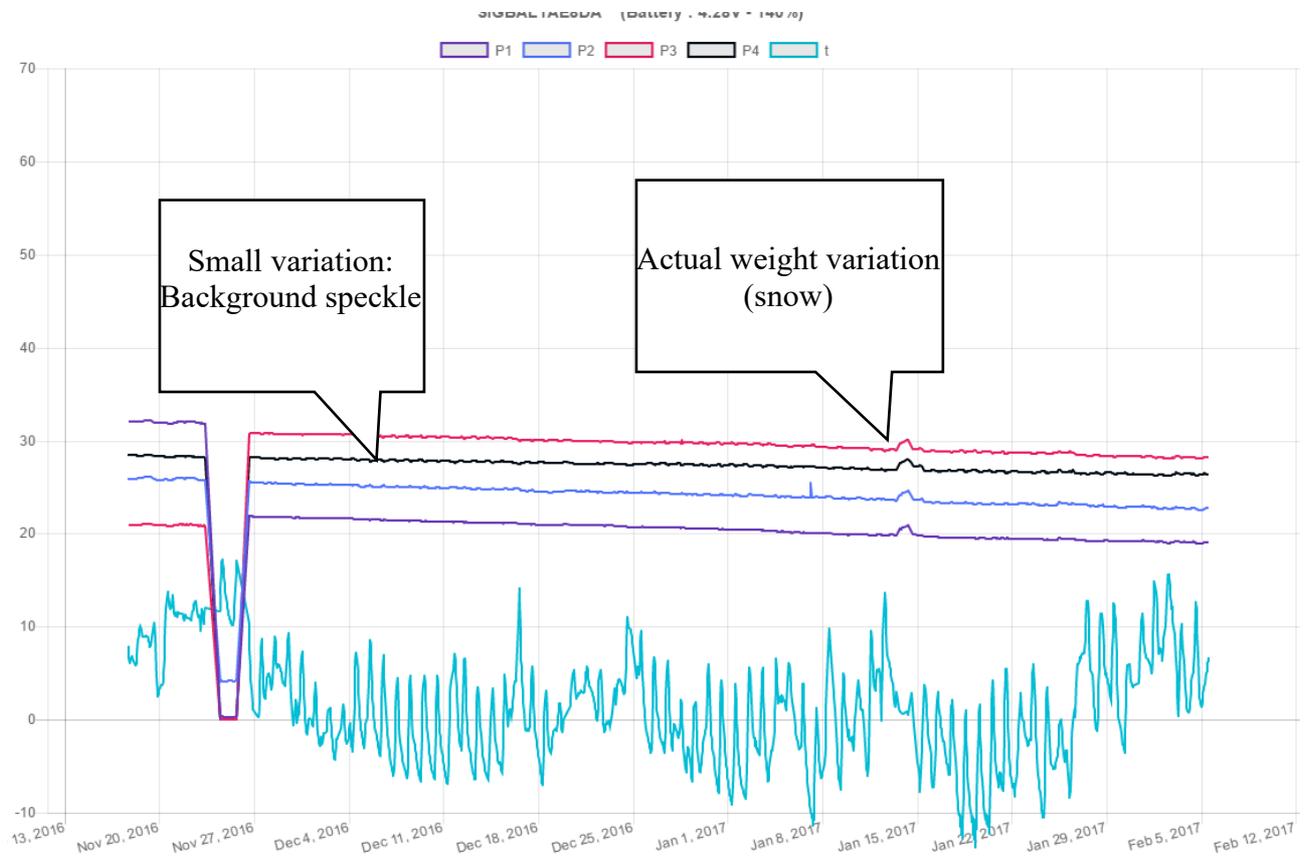
3 – Tap the RESET button and check that the LED lights up.

## **If the scales are broken**

If a wire is cut or snatched, a set of scales is broken or an aerial is damaged, any of the parts can be replaced by returning the equipment to the workshop. The component will be changed and the scales reset to zero.

## Scale settings

It should be pointed out that the scales are designed to monitor usable weights on 4 hives at an optimum price. It is not a scientific measuring instrument, but an economical beekeeper's tool. However, it is essential to differentiate between the background speckle and the actual measurement variation. The order of magnitude for this background speckle is around 200g at a constant temperature.



### Fairness / reliability / drift:

The measurement is very reliable, and an average variation of less than 200g is recorded with a constant temperature is (several weeks of observations).

Nevertheless, the measurement is still approximate. Sensors can give values varying between 500g and 1Kg. A variation of 1Kg should always be added to your estimations.

The drift is very weak except for the first minutes of load steps.

### Precision:

Two digits are displayed after the decimal point even if they are not necessarily significant.

### Sensitivity to temperature:

The measurement is more or less sensitive to the temperature with the different sensors. It is important to differentiate between weights in the estimations and to try to evaluate the differences at a constant temperature.

Some sensors are sensitive to an increase in temperature and others to a temperature drop. The variation can range from 0g to 400g for a temperature of 10°C.