Operation manual

Beehives GSM monitor FILIP-WG

Wooden-stainless Beehive scale for weighing beehives with remote transmission and LED display

beehive.operchip.com	Watchbees
http://www.operchip.com/beehive/index.php/site/index	WEB Cloud
www.operchip.org:8069/shop	E-shop
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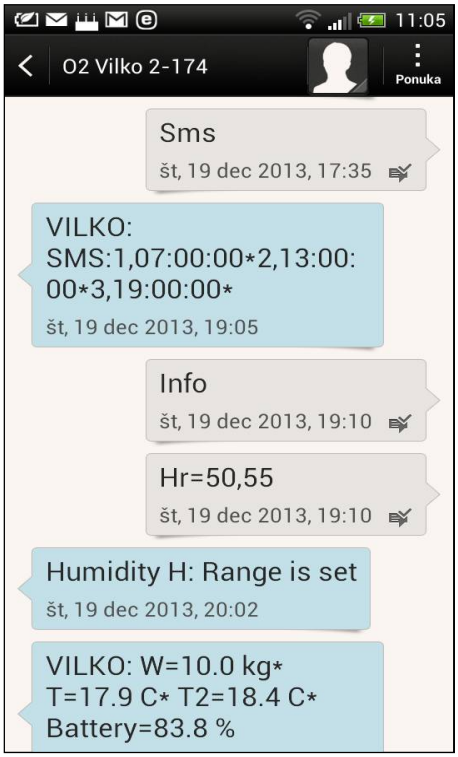
CONTENTS

1. DESCRIPTION

A multifunctional weighing device FILIP-WG is developed on the basis of the specific requirements and practical needs of beekeepers. Its main task is measurement, processing, storage and subsequent transmission of currently measured data to the user via a GSM connection (mobile telephone network) without having to visit the site or the apiary where the device is installed. FILIP-WG is designed to be installed under so called reference beehive. The beekeeper uses the measured data to make his work more effective and to manage all the necessary beekeeping routines at the apiary on time. It protects the beehive and the apiary against unauthorized access and has the siren connection possibility.

It is possible to connect two weighing platforms without electronic unit to FILIP-WG.



2. PROPERTIES

FILIP-WG automatically measures, stores and sends the following information:

Weight - the weight of a hive/hives

Temperature – **Tb** sensor – is a part of the basic equipment and is installed in the frame of the scale
EST sensor - measures the inside temperature of the beehive (according to the location of the sensor, cable length 3 m) *
ESTH combined sensor - measures the outdoor temperature (according to the location of the sensor, cable length 3 m) *

Humidity - **ESTH** combined sensor - measures the humidity of the environment (according to the location of the sensor, cable length 3 m) *

Movement, Impact – device (accelerometer) is able to detect movement or impact
Battery status – indicates the state of charge of the battery
Alarms – according to the settings device sends alarm SMS messages, emails and recordings to the website, or makes a call on your phone
***** Depends on the equipment

It is possible to communicate and make settings via SMS messages sent to FILIP-WG and to monitor the status of the device using received SMS messages, emails, or via the Internet. The basic parameters can be set with any mobile phone via SMS messages.

All measured variables as well as alarms are sent to the specified mobile phone through SMS messages and making a call in the case of security violation.

The data transmission to the WEB server is protected via the GSM data connection.

When activated, the user can keep track of all the measurements, states, alarm messages and scale settings on the website.

When activated, the user can keep track of the device state and alarms by email.

Part of the scale is the accelerometer, which senses any movement (displacement, impact) and informs the beekeeper. There is one input available (e.g. for the connection of the apiary doors switch which instantly sends an SMS warning when the doors are open), and one voltage free output for switching other devices (light, siren, motion detection camera, etc.)
The scale can be supplied from a built-in battery or from an external source. Recharging the battery is also possible using the solar panel.

2.1. SUMMARY OF THE ADDITIONAL FUNCTIONS AND FEATURES

The beehive GSM monitor connects automatically after startup as a web client to the WEB server. There must be activated internet on your SIM card and activated permission to use the web on the beehive GSM monitor.

After registration and logging in to the website http://www.operchip.com/beehive/ it is possible to monitor the device and view records processed in the form of graphs and tables. Records can be exported.

The device stores measured and excessive values (in regard to set values) in local memory in preset intervals. For example every two hours. Between measurements the device is in the idle mode and does not work.

In the preset interval for GSM modem awaking the device sends the measured values on a WEB server. For example once a day.

It is also possible to set 8 different times that will repeat after 24 hours, when the device sends the current status via SMS.

In case of security violation, an alarm is immediately sent via SMS and WEB and the phone starts ringing. Even if the device was in the idle mode.

There are 5 phone numbers available for controlling the device. 1 number is used for configuration, requests, information SMS, events and alarms. 4 numbers for configuration and requests. 2 numbers are used for making a call in case of alarm.

If the battery is discharged below 30% of its capacity, the device sends an SMS message about low battery capacity.

If the battery is discharged below 10%, the GSM modem will be temporarily out of service, but the measurements will be carried out and continue to be stored in local memory. If the voltage of the battery rises above 40%, GSM modem will come into service again. The measured data will not be lost.

If the battery is discharged to 0%, the device goes into sleep and will awake only after replacing the battery. This is a protection against the complete destruction of the battery.

Replacing the battery and inserting the SIM card into the electronic unit is easy accessible using telescopic mechanism.

There is a detachable front wooden lid and a protective Velcro sleeve for comfortable access to the battery and electronic unit, there is no need to move the beehive.

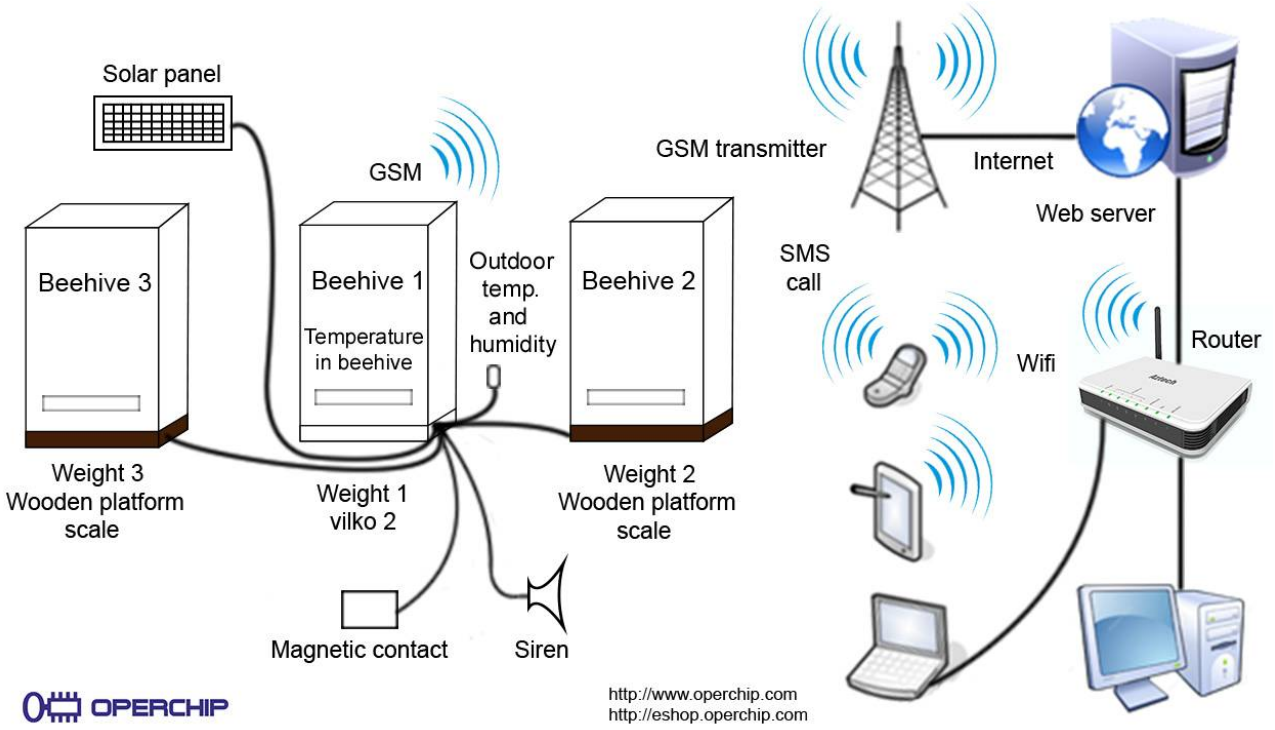
There is a possibility of screwing a stainless steel frame on the bottom of the pedestal, as a protection against stealing.

There is also a possibility of screwing a pad on the weighing platform from above. There is no need of plywood cover.

In case of the weak GSM signal, it is possible to connect external GSM antenna.

2.2. EXAMPLE

Functional scheme of the whole system for a beehive monitoring.



It is possible to connect only those components that will be used. For example, a scale for one beehive with the inner temperature sensor. Then the device will be controlled via SMS and optionally monitored via email and the WEB interface.
The figure shows the full functionality of the system for monitoring and protection of three beehives. The WEB server is located in the **Cloud**, common to all the monitoring of beehives. The user must have at least one weight FILIP 2, one beehive and a mobile phone. If he wants to take advantage of the cloud services (it is not a condition), he must register for free on the web page www.operchip.com/beehive .

2.3. SWITCHING MODE

GSM scales FILIP can work in two modes, and can be switched off permanently by a magnet: As ***simple scales*** in the mode DISP, which does not switch on GSM module and the weight and battery condition can be read only on red LED display. In this mode, regular measurements are carried out and

stored in the scale's memory according to set intervals, which can be adjusted in the GSM mode via SMS, e.g. "*timer=60,0*" – measurements will be carried out once an hour. If measuring is set as once per 24 hours, the capacity of scales memory can be used for records for more than 1,5 year. If you switch the scales into the mode GSM with activated chip SIM, and you will turn on WEB in the scales, the entire history will be downloaded on WEB server, and will have access to it. Switching from this mode to the mode GSM can be carried out by putting the magnet to the scales on the period longer than 10 seconds in the time, when the scales is active. On the display, there will be the text "*FSLP*" and the scales will turn off. By repeated putting the magnet you can wake up the scales, and it will work in the GSM mode.

In the ***mode GSM,*** the entire functionality of the scales is supported. In the case that chip SIM in the scales will not be activated, the scales will display on the display the text "*noOP*" – mobile operator is not accessible. If the chip SIM is active in the scales, and on the display, there is the text "*noSG*" or "*noOP*", maybe the signal of mobile operator is weak. You have to connect to stronger antenna or to switch the scales into the mode DISP. The scales will carry out regular measurements even if the mobile operator is not available, and immediately, after it will be available, recorded data will be downloaded from the scales to the WEB server, and you will have access to these data. Switching from this mode into the mode DISP can be carried out by putting the magnet to the scales for the period longer than 10 seconds in the time, when your scales is active. On the display, there will be the text "*FSLP*" and the scales will turn off. By repeated putting the magnet, you will wake up the scales and it will work in the mode DISP. On the display, there will be the text "*dISP*" for informing, which mode the scales operate in.

Permanent switch-off of the scales can be done by putting the magnet to the scales for the period longer than 10 seconds, when the scales are active. On the display, there will be the text "*FSLP*" and the scales will turn off permanently. The switch-on can be carried out by repeated putting the magnet next to the scales.

Switching the modes of the scales can be done also by means of SMS, if the scales is in the mode GSM. A command "*reset=0*" switches the scales from the mode GSM to the mode DISP.

3. DESCRIPTION OF THE INDIVIDUAL PARTS

Weighing frame (4) - stainless steel or coated steel frame is an essential part of the scale. The frame is composed of two parts – the lower frame and the upper frame. There is a tensometric sensor (3) installed in the frame. The frame together with the tensometric sensor forms the so-called weighing platform. The electronic unit (15) and the battery (11) are mounted on the weighing platform.

Tensiometric sensor (3) - is installed in the weighing frame. It transfers power into the electronic signal

Electronic unit (15) – processes and evaluates the output of the all connected sensors

GSM modem - is integrated directly in the electronic unit (15). It is possible to connect the device to the telephone and data network of the selected operator by inserting the SIM card into the SIM card holder. GSM modem allows communication with the device in the form of SMS messages, emails and sending the data to the WEB server.

GSM antenna (6) (7) - internal, integrated in the electronic unit (15). An external antenna can be connected via the connector (6). (There must be installed a cable that connects the electronic unit with the connector for the external GSM antenna.)

Battery (11) – lead, rechargeable. Supplies the electronic unit.

Accelerometer - monitors the scale movement, fall or shocks. It is integrated directly in the electronic unit (15). After the activation of the accelerometer for example when moving the scale an ALARM SMS, email, information on the WEB will be sent and the device will dial a phone number on the position 1 and 2. Before the intentional moving with the device, it is necessary to deactivate the accelerometer with the command "ACCOFF".

Temperature and humidity sensor (8) – is not a part of the equipment

Temperature sensor (5) (9) – 2 x external

Magnetic contact – Serves for "waking up" the scales by means of the magnet accessible from the backside of weighing platform from the mode „Sleep" (SLEEP mode)

Connector for connecting the external charger or solar panel – Industrial waterproof connector M8.

Cable for connecting magnetic contacts for securing and sirens.

Accumulator charger – enables charging of partially or fully discharged accumulator, with the voltage of 5V.

In the version with the LED display, there is a red LED display with 4 characters at the backside of the electronics. 3 characters are for the weight in kg; decimal point, and the value of decimals of kg.

Weight measuring takes a few seconds, depending on busyness of the electronics and enabled functions.

If the scales show the weight of the second platform too, it will switch the values on the display in the interval of 8 seconds – sign 1, weight of the first platform; sign 2, weight of the second platform, and so on.

If the weight will not be available – it has not been measured yet, the display shows 4 characters "----".

4. TECHNICAL PARAMETERS

Maximum weighing capacity	150 kg
Accuracy	500g/100 g
Platform dimensions	450 x 450 x 55 mm
Protection	IP 65
Operating temperature	-10 to + 50 ° C
Supply voltage	6 V / 4Ah lead battery
Battery capacity	3-6 months according to the settings
External power supply	from 10 to 24 V AC
Communication interface	SMS, GPRS (HTTP), RS232
Protocol	OPERCHIP
Operating system	Operchip NOW-OS v1.0
Number of supported phone numbers	5
WEB interface	http://www.operchip.com/beehive/
Inputs	digital - sensing connected/disconnected GND potential 2 x analog thermistor, 12 bit resolution 3 x analogue tensiometer bridge, 24 bit resolution
Outputs	relay - 30VDC 1A/125VAC 0,3A; max. 250VAC, 220DC, 2A; 62, 5VA/30W
Sensors	2 x thermistor 10 k, 1 x digital temperature humidity, 3 x tensiometer
Electric strength	EN 60669-2-1
Working position	horizontal
Connection	Wago spring clamp terminals
Cross-section of connected cables	max. 0, 5mm2 cable + wire end ferrule, isolated part 7,6mm

5. INSTALLATION AND COMMISSIONING

5.1. UNPACK, ASSEMBLE AND PREPARING FOR THE OPERATION

Before installation at the place of operation, it is necessary to check and prepare the scale.
We recommend that you familiarize yourself with the meaning and format of sent and received SMS commands and messages before installing the scale.

Commands (SMS messages) sent from the phone to FILIP-WG are in the operation manual marked with **red color.**

SMS messages received by the phone from the scale are in the operation manual marked with **blue color.**

Check completeness of the delivery according to bill of delivery and pay attention to weighing frame, wiring and sensors. Visually check potential damages caused by the transport. The scale is set and calibrated in the production.

5.2. INSTALLING THE SIM CARD - FIRST ENGAGEMENT

The scales will turn on by attaching the magnet to electronic scales. If you want to use the functions of the GSM network, SIM card in the scales must be active. SIM card is firmly fixed in the scales and it is not necessary to insert it. To find, whether the SIM card is active or not, the scales will not show on the display the text "noOP" after waking up by the magnet. If the SIM card is not active, there will appear a text after 1 minute on the display: "noOP". The activation of the SIM card you can request by email on info@operchip.com. If a SIM card is not active, you can use the scales as local, and the weight will be showed on the LED display.
Blinking signalization red LED diode signalizes active condition of the modem. LED display will light up on 2 minutes and will show measured value or the weight, and accumulator condition, operator availability, or the presence of GSM network signal. You can communicate with the scales via SMS commands. Modem will stay in active condition after connecting - mode ACTIVE (receives and sends the SMS messages) for 30 minutes. This time can be used for sending the basic SMS for setting the scales. Modem will turn off automatically after 30 minutes – mode SLEEP, LED diode is not blinking. In the mode SLEEP, the scales do not accept any SMS commands.

5.3. SECURITY SYSTEM

FILIP-WG is equipped with the security system for the apiary station, hives and the scales itself. It contains the vibration sensor, which activates the alarm, if the scales move. The sensitivity can be adjusted.

It has an input for magnetic contacts or detectors of motion or the photo-trap. Magnetic contacts can be used for securing the entry into the object via entry door, or for every hive against falling and stealing. Also, it can monitor the motion of persons or animals close to the apiary station.

It has an output – relay for switching on the siren. In the case of the alarm, the output will automatically turn on for 30 seconds and then turn off. You can connect the siren or warning light to it. The relay can be controlled also via SMS commands "SON" and "SOFF".

The security system activates by the SMS command - "AON" – alarm turn-on; vibration sensor by SMS command - "ACCON". If you request the vibration sensor function in the scales, the alarms must be turned on by SMS command -"AON". To turn off these functions – SMS commands "AOFF" and "ACCOFF".

If the vibration sensor of the scales will be disturbed, alarm will turn on immediately and FILIP-WG will send and SMS about the alarm and will start to call to the mobile phone listed in its list on the position 1. If the call will not be accepted or will be declined, FILIP-WG will start to call the second telephone number in the list. It will not call to the second number, if the first mobile number was accepted or declined. In the case that the beekeeper accepts the call on his/her mobile phone by the alarm, he/she can listen what is happening within

the apiary station area remotely. The scales are equipped with a microphone for loud hearing via GSM network (upon order).

If the beekeeper arrives to the apiary station and the security system is turned on, by opening the door – if there is a magnetic contact connected to the scales – the scales will wake up. From 10 to 45 seconds from opening the door, the beekeeper must call the scales from his/her mobile phone with the authorization to communicate with the scales. The scales will decline the call automatically and turn off the security system. If none of authorized numbers calls the scales, alarm will turn on – the relay will switch on (siren), alarm information SMS will be sent, a the system will call to the mobile phone number, which is listed in the memory on the position 1. Information about the access to the apiary station, as well as all alarm activations are logged on the WEB server, even if the security system is turned off by calling – the internet must be activated in the scales.

By calling to the scales, the security system is alternatively turning off and on. However, the scales must be active or woken up. Alarm condition can be verified on the WEB server or via SMS by the command "SET".

5.4. WORKING CONDITIONS

Yellow signaling LED statuses:

During initialization of the device (after turning on) the LED flashes.
If it flashes with an interval of half a second GSM modem is not registered in the GSM network. The PIN of the SIM card must be set to "0000".
If it is on GSM modem works.
If it flashes with an interval of 2 seconds – if everything works, if the GSM modem is registered in the network, if the modem is on, or if it is registered on the Internet, if the internet in the device is on.

Turning on.

The device is completely functional for 30 minutes and then it goes into ***"sleep".*** An SMS is sent to the phone number 1 - it contains time and date setting, GSM signal strength, battery status. It will send to the WEB server at intervals of 90 seconds the current status of measured variables. For example weight, ambient temperature and humidity, the temperature in the beehive, the battery status.

Waking up.

After attaching a magnet to the device, it immediately wakes up and enters the state ***"turning on "***

Sleep.

The device enters this state automatically after measuring up all of the values, or after sending all of the data to the WEB server, or after responding to the requests, events or alarms via SMS and the WEB. With the magnet it is also possible to make the device to go to sleep immediately if it is not working on a planned activity. If it is busy, it will go to sleep as soon as it finishes the activity. Consumption of the device is reduced to 380uA in the sleep mode and except of possibilities of waking it up with a magnet or an alarm the device does not work.

Measuring without the request to turn on the GSM modem.

A GSM modem is turned off. All other system parts are functional.

Measuring with the GSM modem turned on.

The device is completely functional. In contrast to the status "***turning on***" the device will not send current status of the measured variables to the WEB server and goes into "***sleep***" as soon as it finishes the measurement, or sends information from the history of measurements, alarms, answers to requests, events, or information SMS.

Alarm/Information SMS.

The entire device is active while it sends information and alarms via SMS, WEB, rings mobile phones. It can occur at any time, or at the set time for information SMS.

5.5. ACTIVATION

1. Setting up a phone number – to be able to communicate with the scale via SMS messages you need to **set up** the PHONE NUMBER from which you will communicate with the scale. You set the phone number by sending an SMS message.

2. **Send** this SMS **to the phone number of the SIM card that you inserted into the scale**.
   SMS TEXT **TEL = 1,XXXX**
   TEL = 1, (position in the list where the sender's phone number will be saved to) **XXXX** (production code).
   The production code of the scale can be found on the back of the operation manual.
   !!! Warning: when sending SMS the scale must be ACTIVE - LED must flash!!!

3. Setting up of the phone number from which you sent the SMS to the position No.1 is confirmed by receiving the SMS **Modem: Phone number is set** (the SMS sender's phone number is set to position No.1). After acknowledging the scale will send all SMS messages on the stored phone number.
   !!! If you have not received the acknowledging SMS (**receiving** the **SMS** may take more time (about 5-10 minutes, id depends on the chosen operator and the particular conditions at the place of operation of the scale) follow these steps:
   a) Unplug the device from the battery.
   (b) Remove the inserted SIM card.
   (c) Insert it into your mobile phone and control its PIN code. It must be set to 0000.
   (d) If the PIN code **has not been set to 0000**, it is necessary that the device has been **disconnected** from the power supply before reinserting the card for min. **5 minutes**. After that insert the SIM card with the code 0000 into the modem and repeat the process of activation.
   (e) **Recommendation:** Send from **another** telephone any SMS TEXT message **to the phone number of the SIM card**, which **will be inserted later into the scale**. If the sending and receiving the SMS message was fine (the SMS message has been received correctly), the card should be activated and able to work in the scale.
   (f) Ask your operator whether the card is activated. If everything is OK, repeat the process from Chapter INSTALLING THE SIM CARD – first ENGAGEMENT — from the point 2.

4. **Save into the contacts** in your phone, **the phone number of the SIM card** inserted in the scale.

5. After confirming that the phone number has been set (by receiving an SMS in the format - **Modem Phone number is set**) you can also receive the following SMS message
   FILIP: Date XX.XX.2013 Time XX:XX:XX Battery =XX.X% Signal strength=XX.X%, Active: 30 min (see – "waking up" of the scale with a magnet).
   Make sure that Date and Time are set correctly. Not every mobile network operator supports synchronization of time (in the Slovak Republic supports this service O2 – the status from august 2013). If displayed date and time are **incorrect**, it is necessary to set them manually. Send SMS command for setting date and time (Date and Time Setting (TIME = DDMMYY, HHMMSS)

6. If everything went correctly, the scale is ready to communicate with your mobile phone. You can set other parameters according to instructions in the section "Setting the scale – SMS commands."

7. If you have not received the SMS message - **FILIP: Date XX.XX.2013 Time XX:XX:XX Battery=XX.X% Signal strength=XX.X% Active: 30 min**, you can receive current time setting by sending an SMS command - **SET**
   The answer on the SMS command contains information about date and time setting + further information about the basic settings of the scale - **FILIP Date:06.06.2013 09:20:27*.....** (see - Request of the scale current settings – SET).

If displayed date and time are **incorrect**, it is necessary to set them manually. Send SMS command for setting date and time (Date and Time Setting (TIME = DDMMYY, HHMMSS)

8. If current date and time are correct but the default settings of the scale do not meet your requirements, you can continue with setting the scale parameters. Most often it is about setting the value for the TIMER, setting times for sending SMS info messages and setting the triggers for sending the ALARM SMS messages – weight, temperature, humidity and turning on (activating) of sending ALARM SMS. You can find the overview of all commands for the scale setting in SCALE SETTINGS - SMS commands

9. If you did not manage to set all required settings in time when the modem was in the ACTIVE mode (the LED was flashing) and the scale switched to the SLEEP mode (the LED stopped flashing), you can bring the scale into the ACTIVE mode with a magnet.

10. Device activation with a magnet – hold a magnet on the label M on the electronic unit for 2-3 seconds. Activation of the device is confirmed by beeping. The signaling LED begins to shine and the device is activating (for approx. 1 min). After this time the device is active and you can work with it during the period of 30 min.
    Activation of the scale is acknowledged with the SMS **FILIP: Date XX.XX.2013 Time XX:XX:XX Battery=XX.X% Signal strength=XX.X% Active: 30 min** (see – "waking up" of the scale with a magnet).
    After 30 minutes from activation with the magnet the scale goes automatically into SLEEP mode what is confirmed by beeping.

11. Proper connection and activation of the device has been confirmed by receiving the SMS:
    Modem: Phone number is set.
    You can make additional settings of the scale (are not necessary) by sending information SMS requests such as: – **SET, SMS** and **TEL**, which inform you about basic parameters of the device.

12. Basic settings — if the default settings of the scale do not meet requirements (factory settings are in the list) you can change them at any time by sending a setting SMS command (SCALE SETTING – SMS commands).

13. After finishing activation of the scale attach the upper cover to the electronic unit and tighten the securing screws.

5.6. INSTALATION UNDER A BEEHIVE

When the scale is set we can install it to the selected location under the beehive. We give away the beehive and place the weighing platform there. We place the weighing platform so that after placing the beehive on it we can access the removable cover and the electronic unit! The scale must be placed on a stable and solid base. Horizontal position is ideal, but a slight inclination or protrusion of the beehive does not affect the functionality of the device. We check the connection of external sensors and put on the upper protective cover and protective sleeve.
Then we put the beehive on the platform.

5.7. CONNECTION AND STATUS CONTROL

After installation it is advisable to verify the functionality of the scale (not necessary).
Activate the scale with a magnet (if it is in SLEEP mode).

After receiving the activation SMS (**FILIP: Date XX.XX.2013 Time XX:XX:XX Battery=XX.X% Signal strength=XX.X% Active: 30 min**) send the information SMS: **INFO**

After processing the SMS the scale responds with an SMS with current measured values – weight,

temperature, humidity and condition of the battery (see Request of current measured data – INFO). So we can also check the signal strength on the place (value - **Signal strength=XX.X%**). In case of communication failures, it is possible to connect an additional external antenna.

You can insert the beehive weight into TARE - **WT**. (see function TARE. ....)
The inserted weight can be cancelled anytime with the SMS command - **WCT**

6. ACCESSORIES CONNECTION

6.1. EXTERNAL POWER SUPPLY CONNECTION

Connection to the solar cell:

For connecting the solar charging cell, you should connect the connector of solar cell with the connector on the electronics of weighing platform FILIP-WG.

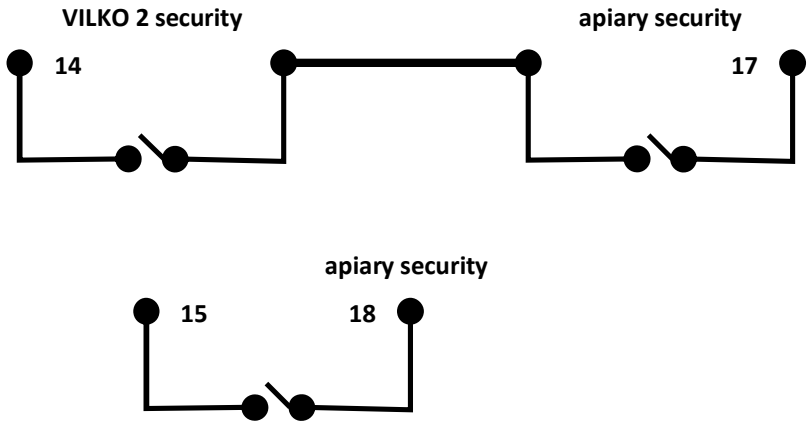
Connection to external source of the voltage:

For connecting the external source of the voltage – USB wire.

6.2. SECURITY INPUT CONNECTION - MAGNETIC CONTACT

Magnetic contact for securing the object of the apiary station can be connected serially between white a blue wire with magnetic contact for securing the weighing platform.

For the siren, there are red and green wires, which are protruding from relay contacts, which turn on the power supply of the siren and activate it.



6.3. EXTERNAL GSM ANTENNA CONNECTION

To screw in the connector of the SMA antenna onto the connector of the SMA electronics.

6.4. WEIGHING PLATFORM 2 CONNECTION

The weighing platform 2 can be connected by easy connecting the connector of weighing platform 2 and the connector of electronics of weighing platform.

7. SMS CONTROL AND MONITORING OVERVIEW

Writing SMS is not case-sensitive. The command SET can have the following forms: SET, Set, SeT, set, ...

Telephone numbers in the text of an SMS must always contain the country code. In this manual is the country code displayed in the following format: +XXX

Temperature (T) and humidity values(H) are displayed in the received SMS only when the respective sensors are connected.

SMS from a phone to FILIP 2. Examples.	Description	SMS from FILIP 2 to a phone. Examples.
LS=1	Language settings: 0 – English, 1 – Slovak, 2 – Czech, support for 16 languages.	**FILIP: The language is set**
	Displays basic parameters after the connection of the device to the battery or waking up with a magnet.	**FILIP: Date 14.01.2014 Time 13:46:43 Battery=90,2% Signal strength=65.0% Active: 30 min**
TEL=1,1AA3	Sets the phone number to the position 1 using the serial number.	**Modem: Phone number is set**
TEL=1,+491635123456 **TEL=5,+4219089876543**	Sets the given number (+421 – country code) to the given position (1-5)	**Modem: Phone number is set**
TEL=2,0	Deletes the number from the position 2.	**Modem: Phone number is set**
TEL	Displays the list of set telephone numbers.	**Modem: TELEPHONE NUMBERS: 1,+XXXxxx402174*2,+XXXxxx247574 *3,+XXX000000000**
V	Displays the list of factory data.	**FILIP: Version:Beehive:1*UM-G-B*v1*UMB-00400001AB5*UMB-004.00.00001AB5*Boot-WEB*v4.5*Image-Beehive*v3.17.305*2014.5.12*www.operchip.com*NOW-OS-v1.00*1***
SQ	Displays GSM network signal quality.	**FILIP: Signal strength 65.0%**
	Warns - weak GSM network signal.	**FILIP: Signal strength 30.0%**
TIME=DDMMRR,HHMMSS	Sets Date, Time: DD=day, MM=month, RR=year HH=hours, MM=minutes, SS=seconds	**FILIP: Time is set**
TZ=+3 **TZ=0** **TZ=-1**	Set GMT 3 GMT, GMT or GMT-1 hour. It only appears when Internet sync is turned on. The "NTPE" command.	**FILIP: Time zone is set**
TZ	Listing the set time zone.	**FILIP: Time zone: GMT+3**
NTPE	Enable time synchronization over the internet using NTP.	**FILIP: NTP enable**
NTPD	Turn off synchronization of time over the internet using NTP.	**FILIP: NTP disable**
NTP=3.sk.pool.ntp.org	NTP server setup.	**FILIP: NTP server is set**
NTP	List of NTP settings for synchronizing time over the Internet	**FILIP: NTP server: Disable, 3.sk.pool.ntp.org**
APN=1,internet,meno,heslo **APN=1,internet,meno** **APN=1,internet**	Sets internet connection on the position 1 (of 4).	**FILIP: APN is set**
WON	Switches WEB on (data sending).	**FILIP: WEB active**
WOFF	Switches WEB off (data sending).	**FILIP: WEB off**
EON	Switches Email on.	**FILIP: Email active**
EOFF	Switches Email off.	**FILIP: Email off**
EMAIL=1,info@operchip	Sets the given email to the position 1	**FILIP: Email is set**

.com	(of 5).	
EMAIL = 1,0	Deletes the email from the position 1.	**FILIP: Email is set**
EMAIL	Displays the list of set up emails.	**FILIP: Email: 1,info@operchip.com**
AON	Switches on ALARM messages sending.	**FILIP: ALARM active**
AOFF	Switches off ALARM messages sending.	**FILIP: ALARM off**
ACCON	Switches on the accelerometer. Alarms be enabled.	**Accelerometer: Enable**
ACCOFF	Switches off the accelerometer.	**Accelerometer: Disable**
ACC = 2, 250,100,0	Sets the accelerometer parameters. Sensitivity: 2g; Activation level: 250 mg; ODR: 100 Hz; Duration: 0ms	**Accelerometer: Parameters are set**
ACC	Displays the list of set accelerometer parameters. Sensitivity: 2g, 4g, 8g, 16g Activation level: in milligrams ODR: measurement frequency	**Accelerometer: Enable, Sensitivity 16 g, Threshold 5000 mg, ODR 100 Hz, Duration 0 ms, Read ok**
	Displays an alarm from the accelerometer. Activated when moving the device.	**Accelerometer: Active**
CR = 1,*100#*	Sets the phone number for automatic credit info to the position 1 (of 4). Position 1 is General.	**Modem: Tel credit is set**
CR	Credit status	**TEXT - According to the operator** **Modem: Credit: unknown**
	Displays message when the credit is low.	**Modem: Credit is 2.00 EUR**
INFO	Displays the current status of the device: W-weight, T-external temperature, T2-temperature, H-humidity, Battery – battery capacity	**FILIP: W =40,1 kg*T= 22,3C*, T2 = 22,4C *H =56.0% *Battery = 91,3%**
SMSON	Switches on the SMS sending.	**FILIP: SMS active**
SMSOFF	Switches off the SMS sending.	**FILIP: SMS off**
SMS=1,0700	Sets the position (1-8) and time of the SMS Info sending	**FILIP: SMS is set**
DSMS=1	Deletes individual (1-8) SMS Info	**FILIP: SMS deleted**
SMS	Displays times of active SMS Info	**FILIP: SMS: 1.07:00:00* 2,13:00:00* 3,19:00:00***
	SMS according to set times as SMS information	**FILIP: W=40,1kg*T=22,3C*T2=22,4C *H=56.0%*Battery=91,3%**
TIMER=60,2	Sets the TIMER – writes measurement every 60 minutes, activates the modem every 60x2=120 minutes	**FILIP: Timer is set**
SET	Displays time, activation of alarms, SMS Info, Internet and email, timing for measurements and GSM module, triggers for sensors and scale 1	**FILIP: Date 08.01.2014 09:12:00 *AlOff*SMSOn*WEBOn*Tim=15,x2* *TR=50,55* T2R=25,26*HR=60,65* WR=10,11* WR2=60,64* Wmax=200.0 kg***

	parameters.	**Wtare=0.0 kg**
SET2	Displays settings, time, scale 1 and scale 2.	**FILIP: Date 08.01.2014 09:12:00 * W2R=10,11* W2R2=60,64* W2max=200.0 kg* W2tare=0.0 kg* W3R=10,11* W3R2=60,64* W3max=200.0 kg* W3tare=0.0 kg**
WA = 2	Activates the number of connected weighing platforms. 1 to 3.	**Weight: Active**
WR=10,11	Sets the range No 1 for the Weight (kg)	**Weight W: Range is set**
	Displays the ALARM SMS - Weight (kg)	**Weight W: ALARM 64,5 kg**
WR2=60,64	Sets the range No 2 for the Weight (kg)	**Weight W: Range is set**
	Displays the ALARM SMS - Weight (kg)	**Weight W: ALARM 64,5 kg**
WT	Sets TARE. Resets the scale, even if it is not empty.	**Weight W: TARE is set**
WCT	Resets TARE. Returns the status of the factory calibration.	**Weight W: TARE is canceled**
W2R=10,11	Sets the range No 1 for the Weight (kg)	**Weight W2: Range is set**
	Displays the ALARM SMS - Weight (kg)	**Weight W2: ALARM 64,5 kg**
W2R2=60,64	Sets the range No 2 for the Weight (kg)	**Weight W2: Range is set**
	Displays the ALARM SMS - Weight (kg)	**Weight W2: ALARM 64,5 kg**
W2T	Sets TARE. Resets the scale, even if it is not empty.	**Weight W2: TARE is set**
W2CT	Resets TARE. Returns the status of the factory calibration.	**Weight W2: TARE is canceled**
TR=5.6	Sets the range for the Temperature T – (^{o}C)	**Temperature T: Range is set**
	Displays the ALARM SMS - Temperature T – (^{o}C)	**Temperature T: ALARM 24,1 C**
T2R=23,24	Sets the range for the Temperature T2-(^{o}C)	**Temperature T2: Range is set**
	Displays the ALARM SMS - Temperature T2 - (^{o}C)	**Temperature T2: ALARM 24,2 C**
HR=60,65	Sets the range for the Humidity (H) - (%)	**Humidity H: Range is set**
	Displays the ALARM SMS – Humidity H – (%)	**Humidity H: ALARM 66,1%**
BR =30,100	Sets the range for the battery. 30% to 100% of its capacity.	**Battery: Range is set**
	Warns that battery has lower voltage than set	**Battery: 29.9% of the Battery is low**
	Informs that the battery if fully charged.	**Battery: 100.0% of the Battery is full**
	Informs that the ALARM contact is active.	**Detector 2: Active**
	Informs that the ALARM contact is inactive.	**Detector 2: End**

SON	Turns on the siren. The siren is also turned on automatically after the alarm contact is activated.	**Siren: Active**
SOFF	Turn off the siren. The siren is also turned off automatically after 30 seconds from the activation of the alarm contact.	**Siren: Off**
SAVE	Saves user settings. Telephone numbers, URLs, Emails, Email settings, Internet settings, Names of Senders, Commands Replies and Events.	**FILIP: Save OK**
LOAD	Loads user settings.	**FILIP: Load OK**
CT=INFO, STATE	Changes the text of a command. The first parameter is an old command, the second one is a new command.	**Modem: Command name is set**
GCT=10	Displays texts of commands from the position in the parameter. 5 commands.	**Modem: Commands: 10,CR;11,GCT=;12,CT=;13,DT=;14,AT=;**
DT=Siren, Buzzer	Changes the text of the sender. The first parameter is an old text; the second one is a new text.	**Modem: The name is set**
AT=Battery is low, Accumulator is low	Changes the text of the response to events and alarms. The first parameter is an old text, the second one is a new text.	**Modem: Alarm name is set**
	Warns that the SMS command does not exist	**FILIP: Command does not exist**
	Warns that the format of the SMS command is invalid	**FILIP: Error command format**
System Command !!!		
WTCON	Switch on measuring of automatic correction of the weight from the ambient temperature for the main scales.	**FILIP: Temperature correct active**
W2TCON	Switch on measuring of automatic correction of the weight from the ambient temperature for the additional scales.	**FILIP: Temperature correct active**
WTCOFF	Switch off measuring of automatic correction of the weight from the ambient temperature for the main scales.	**FILIP: Temperature correct off**
W2TCOFF	Switch off measuring of automatic correction of the weight from the ambient temperature for the additional scales.	**FILIP: Temperature correct off**
WTC=100	Setting of the value of automatic correction of the weight from the ambient temperature for the main scales on 100 g per 1 °C.	**FILIP: Temperature correct set**
W2TC=60	Setting of the value of automatic correction of the weight from the ambient temperature for the additional scales on -60 g per 1 °C.	**FILIP: Temperature correct set**
WTCS	Status report of set automatic correction in grams for the main scales.	**FILIP: 100 gram/degree celsius**

W2TCS	Status report of set automatic correction in grams for the additional scales.	**FILIP: 100 gram/degree celsius**
US	Reprogramming weight with retention of all settings. Check the current version available at http://www.operchip.com/beehive/ Currently in the device detects the command "**V**". It must be enabled web. Command "**WON**.	**FILIP: Update Begin**
UNS	Reprogramming balance settings to overwrite the factory settings. Check the current version available at http://www.operchip.com/beehive/ Currently in the device detects the command "**V**". It must be enabled web. Command "**WON**".	**FILIP: Update Begin**
WZC	Calibration scales to zero. On weight must be no load.	**Weight W: Zero calibration ok**
W2ZC	Calibration scales 2 to zero. On weight must be no load.	**Weight W2: Zero calibration ok**
WVC=80000	Calibration scales to 80 kg. Must be on weight 80 kg.	**Weight W: Weight calibration ok**
W2VC=100000	Calibration scales to 100 kg. Must be on weight 100 kg.	**Weight W2: Weight calibration ok**
WM=150	Setting the maximum scales at 150 kg.	**Weight W: MAXIMUM weight is set**
W2M=180	Setting the maximum scales at 150 kg.	**Weight W2: MAXIMUM weight is set**
RESET	Reset the device. It must be functional GSM module.	**FILIP: Reset Device**
RESET=0	Switch mode GSM into mode DISP.	**FILIP: Reset Device**

8. BASIC FACTORY SETTINGS

Alarms – Off	**AlOff**	
Sending of SMS - On	**SMSOn**	
Sending of data to Web server – Off	**WEBOn**	
Sending of data to Email – Off	**EOff**	
Accelerometer Off	**ACCOff**	
Activate one platform	**WA=1**	
Measurement TIMER	**240,0**	measures every 4h, no activated modem
Set values for ALARMS triggers:		
T-temperature	**TR =-40,80**	
T2-temperature	**T2R=-40,80**	
Humidity H	**HR=0,100**	
Weight 1	**WR=0,150**	
Weight 2	**WR2=0,150**	
Maximum weight	**WM=150**	
Tare	**WTare=0,0kg**	
Weight 1	**W2R=0,150**	
Weight 2	**W2R2=0,150**	
Maximum weight	**W2M=150**	

Tare	**W2Tare=0,0kg**
Weight 1	**W3R=0,150**
Weight 2	**W3R2=0,150**
Maximum weight	**W3M=150**
Tare	**W3Tare=0.0 kg**
Set values of times for SMS Info:	**3. 19:00:00**

9. SMS COMANDS FOR THE SCALE SETTING

Sending of SMS commands – you send SMS commands and requests from your mobile phone

Receiving of SMS messages – the scale sends SMS messages on the default telephone number stored in the position 1 or responds to received SMS commands to the sender's phone numbers stored in the positions 1 to 5.

Ringing – In case of an alarm from the accelerometer or from the security input the scale will ring to default phone numbers stored on the positions 1 and 2.

All messages, information, statuses, measurements, warnings and alarms are sent in the form of as an SMS message.
Consider therefore **the frequency of sending SMS messages** when you are setting up the basic parameters**!**

SMS commands are not case sensitive (with the exception of the production code in the command for setting up the phone number, e.g. tel = 1,1AA0) so the command SET can have the following forms: SET, Set, SeT, set, ...
When writing telephone numbers in SMS texts it is always necessary to write the country code before the phone number. In this manual the country code is displayed in the following format: **+ XXX**

IT IS RECOMMENDED to send SMS commands for adjusting the scale at the time when the device is in the extended active state (approx 30 min) – after "waking up" with a magnet, after connecting the battery or after the activation of the time triggered Info SMS 8.

Setting the parameters of the scale is made by using SMS setting commands. When the scale is set up properly it can lower the frequency of SMS messages sending and so reduce the costs of the operation of the device.

9.1. LANGUAGE SETTING

FILIP-WG supports 16 languages.
LS=2 (language number)
Confirmation of received SMS for language settings: FILIP: The language is set
Supported languages.

English	EN	0
Slovak	SK	1
Czech	CZ	2
German	DE	3
Hungarian	HU	4
Polish	PL	5
Slovenian	SI	6
Bulgarian	BG	7
Estonian	EE	8
Latvian	LV	9
Greek	GR	10
Danish	DK	11

Italian	IT	12
French	FR	13
Spanish	ES	14
Croatian	HR	15

9.2. LANGUAGE SETTING

Communication with the scale is possible via SMS commands. Therefore it is necessary to insert into the memory of the scale the phone number(s) for communication with the scale. **The scale receives commands and responds to them only when they are sent from the phone numbers stored in the memory positions No 1-5.**
Consider well what phone numbers to save into memory of the scale. It is about safety of your device!

!!! Keep in mind that with each phone number stored in the memory of scale is possible to communicate, get information and set parameters of the scale!

It is possible to insert into memory of the scale 5 phone numbers into positions 1 to 5. The phone number in the position 1 has more rights for setting and controlling the scale (ALARM messages and Info SMS are sent only to the phone number in the position 1).
Position No 1 allows you to send, receive, modify and control all SMS commands and messages.
Phone numbers in the positions 2 to 5 have fewer options when communicating with the weight. Positions 3 – 5 are equivalent. The scale rings the phone with the number stored in the position 2 in case of security violation – from the safety input of the accelerometer. The scale sends an SMS to the number from which it received a request.

SMS TEXT for **activating the scale** and inserting the phone number to the position 1 - **TEL=1,XXXX**

TEL=1 (position in the list where will be stored the sender's phone number), **XXXX** (XXXX is the production code of the scale). The production code of the scale can be found on the back of the instruction manual.
When you first set up a phone number, enter the position 1.
Acknowledgement that the SMS was received and the phone number was set: **Modem: Phone number is set**
In memory of the scale in the position 1 is now the phone number from which was sent the SMS command.

The phone number can also be entered into memory of the scale with the following SMS command:
SMS TEXT for inserting a phone number into the position 2 to 5 - **TEL =2,+XXXxxxxxxxxx**

TEL = 2 (position in the list where will be stored the sender's phone number**)**, **+XXXxxxxxxxxx**

(country code +421 for Slovakia + phone number).

Acknowledgement that the SMS was received and the phone number was set: **Modem: Phone number is set**

9.3. HOW TO DELETE AN INSERTED PHONE NUMBER

It is possible to delete a phone number inserted into memory of the scale in the position 1 to 5 with the following SMS command:

SMS TEXT for deleting the phone number from the position 2- **TEL=2,0**

TEL=2 (position 2 from the list of stored phone numbers**),0**

Acknowledgement that the SMS was received and the phone number was deleted: **Modem: Phone number is set**
If you send the SMS from the phone number you want to delete from memory of the scale the acknowledgement will not come because with this command the number has been deleted from the list.

9.4. HOW TO SET DATE AND TIME

Date and time are set automatically after connecting the modem into your operator network if the service is supported (in the Slovak Republic supports the synchronization of time only O2 – the status from august 2013). If not, it is necessary to set date and time using the SMS command.

SMS TEXT - **TIME = DDMMYY, HHMMSS**

TIME = DD (day), **MM** (month), **YY** (year-last two digits of the year), **HH** (hours), **MM** (minutes), **SS** (seconds)

Example: the current date and time-7.7.2013, 7:09:00 is set using the SMS command:

Time = 070713,070900

Acknowledgement that the SMS was received and date and time were set: **FILIP: Time is set**

9.5. TIME ZONE SETTING

By the time synchronization via internet, it is necessary to set the time zone, which can be set in the range -12 to +12 hours against the time GMT.

TEXT SMS for setting the time zone - **TZ=+2**

+2 – time shift by 2 hours forward against the GMT time

Confirmation of received SMS and settings: FILIP: Time zone is set

9.6. CONFIRMATION OF TIME ZONE SETTING

Confirmation of time zone setting against the GMT time.

TEXT SMS for the confirmation of the time zone - **TZ**

Confirmation of SMS delivery and the statement: FILIP: Time zone: GMT+3

9.7. NTP SWITCH ON / OFF

Activation and deactivation of time synchronization via internet NTP.

TEXT SMS for setting - **NTPE NTPD**

NTPE – NTP activated NTPD – NTP deactivated

Confirmation of received SMS and settings: FILIP: NTP enable or **FILIP: NTP disable**

9.8. NTP SERVER SETTINGS

NTP server settings. From this server, the device will synchronize real time and date via internet. The synchronization via NTP server must be activated by the command “NTPE”. It is also necessary to set the time zone by the command “TZ=...” and to activate automatic shift between summer and winter time by the command “SWTE”.

TEXT SMS for setting - **NTP=time.windows.com**

time.windows.com – NTP server

9.9. NTP SETTINGS DISPLAYING

Finds out, whether the time synchronization function is activated through the NTP server. It will show, which NTP server is set.

TEXT SMS for NTP settings displaying - **NTP**

Confirmation of received SMS and settings: FILIP: NTP server: Enable, time.windows.com

Enable – Time synchronization via NTC is activated. **Disable –** Time synchronization via NTC is deactivated.

time.windows.com – NTP server

9.10. HOW TO SET THE TIMER

The timer has two parameters – **measurement** interval (when measured values - weight, humidity and battery status - are written into memory) and **modem activation** interval. Because of energy saving the scale is most of the time in an inactive mode - SLEEP mode.
The modem remains turned on for about 5 minutes after the activation of the timer. Active modem allows sending and receiving SMS messages and sending measurements and settings on the Web server.

SMS TEXT - **TIMER=240,2**

TIMER=240 (every 240 minutes (4 hours) the scale writes measurements into memory, **2** (multiplication factor for the calculation of the modem activation interval– 240 minutes x 2 = 480 minutes = 8 hrs. The modem will be activated every 8 hours for approximately 5 minutes. Then it turns off automatically – SLEEP mode).

Acknowledgement that the SMS was received and the timer was set: **FILIP: Timer is set**

Beekeepers' experience says that there is a different need for monitoring throughout the year. At the time of harvesting is the frequency of measuring and monitoring higher than in other periods of year. Therefore a beekeeper can take full advantage of measuring time variability using the TIMER function. At the time of harvesting activity increase the frequency of measuring, and in the wintertime set longer intervals.

Recommended setting for the summertime – TIMER=240,2

Recommended setting for the wintertime – TIMER=720,2

Minimum interval - TIMER=30,1 **Maximum** interval - TIMER=720,2

Example: we want to write measurements into memory every 2 hours and turn on the modem every 4 hours.

Calculation: 2 hours = 120 minutes (for measuring and writing into memory), 120 minutes x 2 = 240 minutes = 4 hours (for turning on the modem)

Setting the timer: TIMER=120,2 – the scale measures all current variables every 120 min and writes them into memory. Every 240 minutes (4 hours) activates the GSM modem, handles potential SMS requests, responds to them and sends the data with measured values and then goes to sleep again.
After setting the timer or when changing the settings in the course of the day the new time is always calculated from the first minute (00:01) of the day when the Timer was set.

Factory setting for the Timer - TIMER=240,2

TIP: the longer are the intervals for activating of the GSM modem, the longer is the battery life. Consider also possible interference of the hive with the frequent "waking" of the GSM modem.

9.11. HOW TO SET THE NUMBER OF ACTIVE SCALES

Activating the number of connected weighing platforms. Available 1 to 3. Default 1.

SMS TEXT – **WA=2**

WA=2 (two weighing platforms - 1 and 2 are active, see connectors description)

Acknowledgement that the SMS was received and the number was set: **Weight: Active**

9.12. HOW TO SET THE TARE WEIGHT

The weight of the load, accessories and objects on the scale (e.g., beehive, bees, frames, etc.) at the moment of processing of the command will be saved in memory as TARE. The scale will display from that moment the weight of 0,0kg (TARE weight is shown in the overview of settings SET)

Setting of the TARE: SMS TEXT - **WT**

Send the command when on the scale is everything what you want to have in TARE. Ideally at the time when the bees are in the beehive. **But it is on the beekeeper what he wants to have in TARE - empty beehive or full beehive with the bees etc.**

Acknowledgement that the SMS was received and the tare weight was set: **Weight W: TARE is set**

Cancellation of the TARE: SMS TEXT - **WCT**

Acknowledgement that the SMS was received and the tare weight was cancelled: **Weight W: TARE canceled**

After the cancellation of TARE the weight until now displayed in TARE will be displayed from now in the total weight. The current value of TARE is displayed in the informative SMS about scale settings (use the command SET).

Example: The empty scale displays 0,0kg. We put an empty beehive on it with the weight of 20kg.

After sending the SMS **WT** we receive the acknowledgement **Weight W: TARE is set**. From now on the scale displays the weight of 0,0kg and when putting something else on the scale it displays only the net weight.

The settings for the scale 2 and 3 are identical.

9.13. HOW TO SET THE WEIGHT MONITORING

The scale monitors the weight. If the set value is exceeded the scale sends an ALARM SMS message. For monitoring the weight there are two triggering values WR and WR2. By monitoring the weight we can monitor the process of harvesting, dropping the beehive from the unit, theft, swarming, etc.

WR can monitor the lower value of the weight. This value has security feature and informs the beekeeper about e.g. dropping the beehive off the scale. The lower and the upper limit can be set for monitoring the current weight.

WR2 can monitor the upper value of the weight. This value informs the beekeeper about weight gain e.g. at the time of harvesting. The lower and the upper limit can be set for monitoring the current weight.

Values WR and WR2 depend on the beekeeper's decision. It is also possible to use only one value. Limit values for WR and WR2 are 2-190 kg.

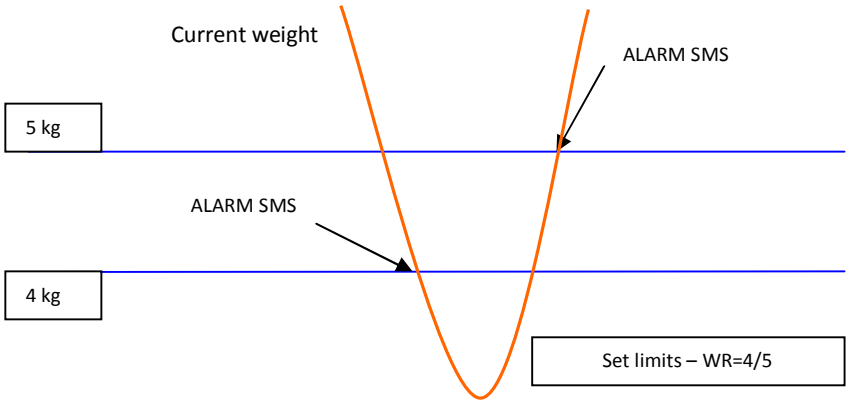
When setting the monitoring of the weight there are always two values for every limit (the same rules are for setting the monitoring of the temperature T, T2, humidity H and battery status)**.** Explanation: When

harvesting the weight can fluctuate so that by setting the range for the limits the SMS ALARM will not be sent every time when the weight exceeds the set value.

Setting the range of WR for the weight: SMS TEXT – **WR=4,5**

WR=4 (4 kg),**5** (5 kg).
The scale sends an ALARM SMS when the weight exceeds the limit of 4/5 kg (after the measurement - depends on TIMER settings).

Example: The current weight is 46kg, the weight limit is set WR=4,5 (4/5 kg). The scale sends an ALARM SMS when the weight drops below 4kg. The next ALARM SMS will be sent when the weight rises above 5kg (see the figure).



Acknowledgement that the SMS was received and the limits were set: **Weight W: Range**

The range can be changed by sending an SMS command with new values for the range.

Setting the range WR2 for the weight: SMS TEXT - **WR2=52,55**
WR2 = 52 (52 kg) ,**55** (55 kg).

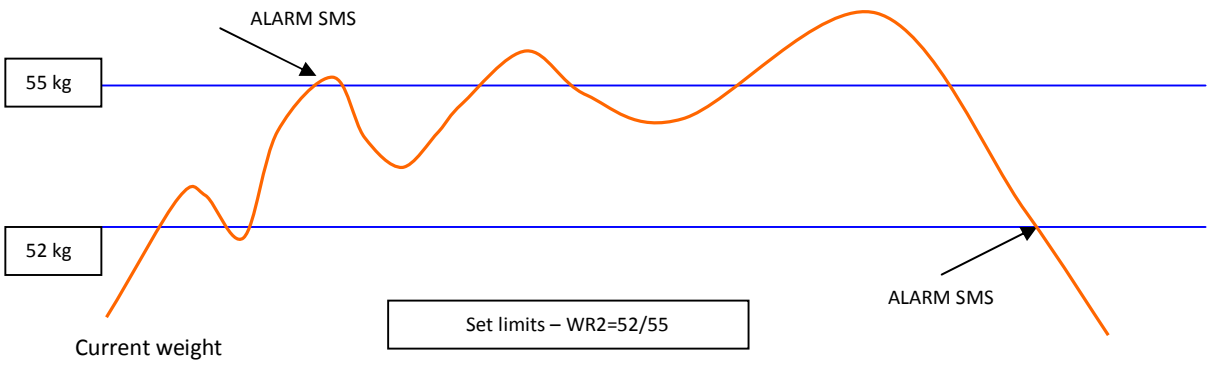
The scale sends an ALARM SMS when the weight exceeds the limit of 52/55 kg (after the measurement - depends on TIMER settings).

Example: the current weight is 46kg, the weight limit is set WR = 52,55 (52/55 kg). The scale sends an ALARM SMS when the weight rises above 55kg. The next ALARM SMS will be sent when the weight drops below 52kg. If does not the scale will not send another ALARM SMS even if the weight rises again above 55 kg (see the figure). The range between the two values for every limit depends on the beekeeper (according to his experience with fluctuations in weight at the time of harvesting).

Acknowledgement that the SMS was received and the limits were set: **Weight W: Range**

The range can be changed by sending an SMS command with new values for the range.

This can be monitored, and set the scope for the weight of two and three.



9.14. HOW TO SET THE TEMPERATURE MONITORING

The device can measure two temperatures independently: T – outdoor temperature (measured by the sensor **EST** from the additional equipment), T2 – outdoor temperature (measured by the sensor **Tb** from the basic equipment or with the external sensor **ESTH** for measuring both temperature and humidity from additional equipment). The temperature sensor **Tb** is a part of every scale. If the external sensor **ESTH** (temperature/humidity) is connected the temperature T2 is measured by this sensor.

The scale sends an ALARM SMS when the temperature goes outside the range. There is a lower and upper limit for temperature monitoring.

SMS TEXT - **TR=20,30,**
T2R = 20,30,
TR = 20 (lower limit 20°C)**,30** (upper limit 30°C).
When the temperature drops below 20°C or rises above 30°C for the first time the device automatically sends an ALARM message (after the measurement - depends on TIMER settings).

Acknowledgement that the SMS was received and the limits were set: **Temperature T: Range is set, Temperature T2: Range is set**

The range can be changed by sending an SMS command with new values for the range.

9.15. HOW TO SET THE HUMIDITY MONITORING

The scale sends an ALARM SMS when the humidity goes outside the range. There is a lower and upper limit for temperature monitoring.

SMS TEXT – **HR=45,50**

HR=45 (lower limit 45%)**, 14** (upper limit of 50%).

When the humidity drops below 45% or rises above 50% for the first time the device automatically sends an ALARM message (after the measurement - depends on TIMER settings).

Acknowledgement that the SMS was received and the limits were set: **Humidity H: Range is set**

The range can be changed by sending an SMS command with new values for the range.

*** - only when the external sensor **ESTH** for temperature and humidity is connected– additional equipment

9.16. HOW TO SET THE BATTERY STATUS MONITORING

The scale sends an ALARM SMS when the battery voltage goes outside the range. There is a lower and upper limit for temperature monitoring.

SMS TEXT – **BR=30,80**

BR=30 (lower limit 30%)**,80** (upper limit 80%).

When the battery voltage drops below 30% or rises above 80% for the first time the device automatically sends an ALARM message (after the measurement - depends on TIMER settings).

Acknowledgement that the SMS was received and the limits were set: **Battery: Range is set**

The range can be changed by sending an SMS command with new values for the range.

9.17. HOW TO TURN ON/OFF THE ACCELEROMETER

Turning the accelerometer on: SMS TEXT – **ACCON**
Acknowledgement that the SMS was received and the limits were set: **Accelerometer: Enable**
Turn the accelerometer off : SMS TEXT – **ACCOFF**
Acknowledgement that the SMS was received and the limits were set: **Accelerometer: Disable**

9.18. HOW TO SET THE ACCELEROMETER

The following parameters can be set:

- Sensitivity of the accelerometer in grams. Allowed values are 2, 4, 8, 16g.
- Level of activation – a threshold where the accelerometer reacts, e.g. 250mg
- Frequency of the accelerometer status measuring. Allowed values are 1, 10, 25, 50, 100, 200, 400, 1000Hz
- Duty cycle shift of the accelerometer status measuring.

SMS TEXT - **ACC=2,250,100,0**

ACC = 2 (sensitivity 2g)**, 250** (activation level 250mg)**, 100** (frequency of the measuring 100Hz)**, 0** (duty cycle shift 0msec)

Acknowledgement that the SMS was received and the parameters were set: **Accelerometer: Parameters is set**

The greater is the sensitivity of the accelerometer, the more sensitive it is to the rotation and change of position. The smaller is the threshold, the smaller is the strength needed to activate the accelerometer. The higher is the frequency of measuring, the faster it detects changes.

9.19. HOW TO SAVE USER SETTINGS

User settings (telephone numbers, URLs, emails, email and internet settings, names of senders, errors, commands, responses and events) can be saved in the EEPROM memory using the command:

SMS TEXT - **SAVE**

Acknowledgement that the SMS was received and the parameters were saved: **FILIP: Save OK**

9.20. HOW TO LOAD USER SETTINGS

User settings (telephone numbers, URLs, emails, email and internet settings, names of senders, errors, commands, responses and events) can be loaded from the EEPROM memory using the command:

SMS TEXT – **LOAD**

The current settings will be overwritten with the loaded settings (the settings that were previously saved with the command SAVE, or the factory settings if the command SAVE was not used yet)!

Acknowledgement that the SMS was received and the parameters were loaded: **FILIP: Load OK**

9.21. HOW TO SET THE TELEPHONE NUMBER FOR CREDIT INFO

There are 4 positions available - position 1 to 4. Position 1 is general – independent of the set operator.

When settings the phone number of a specific operator for credit info in positions 2-4 it is recommended to set to these positions also parameters for logging onto the Internet for the operator.

SMS TEXT - **CR=1,*100#***

CR=1 (position of the phone number for credit info), ***100#*** (phone number for credit info)

Acknowledgement that the SMS was received and the number was set: **Modem: Tel credit is set**

9.22. HOW TO CHANGE THE TEXT OF A COMMAND

To change the text of a command use the following command where the first parameter is the old command and the second parameter is the new command.

SMS TEXT - **CT=INFO,STATE**

CT = INFO (the original command that will be changed), **STATE** (a new command that will replace the original one)

Acknowledgement that the SMS was received and the command was changed: **Modem: Command name is set**

List of commands – factory settings:

TEL =	ACCON	SET	W3CT
TEL	ACCOFF	SET2	TR =
In	ACC =	WR =	T2R =
Time =	ACC	WR2 =	HR =
APN =	CR =	WT	BR =
WON	CR	The WCT	SON
WOFF	INFO	= W2R	SOFF
EON	SMSON	W2R2 =	SAVE
EOFF	SMSOFF	W2T	LOAD
EMAIL =	SMS =	W2CT	CT =
EMAIL	DSMS =	W3R =	AKA GCT =
AON	SMS	W3R2 =	DT =
AOFF	TIMER =	W3t	At =

9.23. HOW TO CHANGE THE NAME OF A SENDER

To change the name of a sender use the following command where the first parameter is the old sender name and the second parameter is the new sender name.

SMS TEXT - **DT=Siren,Buzzer**

DT=Siren (the original text, which we want to change), **Buzzer** (a new name that will replace the original one)

Acknowledgement that the SMS was received and the name was changed: **Modem: The name is set**

List of names of senders – factory settings:

FILIP	Detector 2	Siren	Weight W2
Modem	Temperature T	Speaker	Weight W3
RS232	Temperature T2	Humidity H	
Battery	Temperature E	Accelerometer	
Detector 1	Temperature Ti	Weight W	

9.24. HOW TO CHANGE THE TEXT OF INFORMATION

To change the text of information on events and alarms use the following command where the first parameter is the old text and the second parameter is the new text.

SMS TEXT - **AT=Battery is low, Acumulator is low**

AT=Battery is low (the original name that will be changed),**Acumulator is low** (a new text that will replace the original one)

Acknowledgement that the SMS was received and the text was changed: **Modem name: Alarm is set**

List of events and alarms – factory settings:

ERROR:	Active	User event:	%
End	kg	Battery is full	C
Active	Active: 30 min	Battery is low	

9.25. HOW TO SET APN, USER NAME AND PASSWORD FOR INTERNET ACCESS

There are 4 positions available for internet settings. APN is set to "internet", the name and the password are blank by default. If these settings are not right for your operator search the right settings on the internet.

List of APN for operators from different countries: http://wiki.apnchanger.org/Main_Page

SMS TEXT - **APN =1,internet,name,password**

APN=1 (the position where the settings will be saved), **internet** (obligatory - APN for setting the internet access), **name** (optional - your operator may not require it), **password** (optional - your operator may not require it)

Acknowledgement that the SMS was received and the APN was set: **FILIP: APN is set**

9.26. HOW TO ENABLE/DISABLE THE SENDING OF DATA TO THE WEB SERVER

To be able to send data to the web server the INTERNET service must activated first on the phone number used for the scale.

It is possible to enable the sending of data even if internet is not activated, but date will not be sent.

After the activation of this function the user can keep track on the website of the history of measurements in graphical and numeric form, scale status, settings, alarms, etc. All the information is displayed in one place. The monitoring of the device via the internet is possible only **after registration** on the web server.

SMS TEXT for enabling the sending of data - **WON**

Enabling this service activates the sending of data to the web server but the sending will be **active just after turning off and on the modem** (by disconnecting and reconnecting the battery or waiting until the modem

turns off and on automatically according to the set TIMER).
Acknowledgement that the SMS was received and the sending of data was enabled: **FILIP: WEB active**

SMS TEXT for disabling the sending of data - **WOFF**

Disabling this service stops sending of data (information) to the web server. Even if internet is active data will not be sent to the web server and it will not be able to monitor them on the web site.
Acknowledgement that the SMS was received and the sending of data was disabled: **FILIP: WEB off**

What is needed to monitor the scale on the web site?

- To activate **the internet** service (by your mobile phone operator) for the phone number **in the scale**
- To enable sending of data to the web server with the SMS command
- To register on the web site

After logging onto internet site you can monitor the activity and the settings of your device(s) in your profile.

Recommended Web browser: Google CHROME, Mozilla Firefox
The Internet address of the web site for registration and login: http://www.operchip.com/beehive

9.27. HOW TO ENABLE/DISABLE THE SENDING OF DATA ON EMAIL

To be able to send data on email the INTERNET service must activated first on the phone number used for the scale.

All the events, alarms and info SMS will be also sent to the email.

SMS TEXT for enabling the sending of data - **EON**

Enabling this service activates the sending of data on email (at least one email address must be set) but the sending will be **active just after turning off and on the modem** (by disconnecting and reconnecting the battery or waiting until the modem turns off and on automatically according to the set TIMER).
Acknowledgement that the SMS was received and the sending of data was enabled: **FILIP: active Email**

SMS TEXT for disabling the sending of data - **EOFF**

Disabling this service stops sending of data (information) on email. Even if internet is active data will not be sent on email.
Acknowledgement that the SMS was received and the sending of data was disabled: **off: Email FILIP**

9.28. HOW TO INSERT A NEW EMAIL ADDRESS

There are 5 positions (1 to 5) for emails available in memory. The scale will send events, alarms and info SMS on set emails.

SMS TEXT - **EMAIL=2,info@operchip.com**

EMAIL=2 (the position where the new email address will be saved**), info@operchip.com**

(new email address)

Acknowledgement of receipt of SMS and settings: **FILIP: Email is set**

9.29. HOW TO DELETE AN INSERTED EMAIL

It is possible to delete an email inserted into memory of the scale in the position 1 to 5 with the following SMS command:

SMS TEXT for deleting the email from the position 2- **EMAIL=2,0**

EMAIL = 2 (position 2 from the list of stored phone numbers**), 0**

Acknowledgement that the SMS was received and the email was deleted: **FILIP: Email is set.**

10. AUTOMATIC INFORMATION SMS

Information SMS messages inform the beekeeper about current settings and status of the scale.

10.1. HOW TO ACTIVATE (WAKE UP) THE SCALE WITH A MAGNET

Attach the magnet for 2 seconds on the marked place. Activation of the device is confirmed by a beep. After about 20 seconds the signaling LED starts to flash (it can be seen only if the upper cover of the electronic unit is open) and activation is in progress (it takes about 1 minute). After this time the scale is active for the next 30 minutes.

Activation is confirmed by the SMS: **FILIP: Date XX.XX.2013 Time XX:XX:XX Battery=XX.X% Signal strength=XX.X%, Active: 30 min** (this SMS is also sent after each connection of the battery to the electronic unit, e.g. after changing the battery)

FILIP: Date XX.XX.13 (date), **Time** (time) **XX:XX:XX Battery=XX.X%** (battery status) **Signal strength=XX.X%** (phone signal strength)**, Active: 30 min** (the scale is in ACTIVE mode for about 30 minutes)
After 30 minutes the scale goes automatically into SLEEP mode. There is no SMS about going into SLEEP mode because the modem is in the moment in SLEEP mode as well. Going into SLEEP mode is confirmed just by the sound – a beep.

10.2. HOW TO DISABLE/ENABLE THE SENDING OF INFO SMS

Disable the sending of info SMS if you are not able to receive SMS messages or you are in vacation or during the winter, etc.). All the times for info SMS remain set but they are inactive (the scale does not send info SMS).

SMS TEXT for disabling the sending of info SMS – **SMSOFF**

Acknowledgement that the SMS was received and the sending of info SMS was disabled: **FILIP: SMS off**

If the sending of info SMS has to work, it must be enabled and it must be set at least one time for the sending as well. Without the set time the scale does not send info SMS even if the sending is enabled.

SMS TEXT for enabling the sending of info SMS: SMS TEXT – **SMSON**

Acknowledgement that the SMS was received and the sending of info SMS was enabled: **FILIP: SMS active**

10.3. HOW TO SET TIMES FOR INFORMATION SMS MESSAGES

According to set times the scale **sends** a summary message (info SMS) with the current measured values – weight, temperature, humidity (if the sensor is connected) and battery status. There are 8 times available in which the scale will send the info SMS regularly. The number of set info SMS messages depends on the needs of the beekeeper. Every info SMS has its number (SMS = 1, xxxx), which is just informative, and to that number can be assigned any time. Sent messages are ordered according to set times.

In set times the scale goes from sleep mode into active mode for about 8 minutes, measures basic values and after turning on the modem (**approx. 2,5 minutes after waking up the scale**) the measured values are sent as an info SMS. **The modem when turned on, allows sending and receiving SMS messages.**

Info SMS No 8 (SMS = 8, xxxx) is different – it activates the scale for 30 minutes. **It is recommended to use** this extended time of active mode **for sending SMS for setting the parameters of the scale**. If the modem

is active it responds on every SMS immediately. After all the needed parameters are set it is recommended to cancel info SMS No 8 to save the battery.

SMS TEXT – **SMS=1,2030**

SMS=1 (SMS No 1) **,2030** (time of sending the info SMS – 20:30)

Acknowledgement that the SMS was received and time for sending info SMS was set: **FILIP: SMS is set**

The setting of info SMS is available even if the sending of info SMS is turned off (see the following function – how to turn off/on an info SMS - SMSOFF/SMSON)

Example No 1:	SMS=1,0600	Info SMS message will be sent at 6:00.	(1)
	SMS=2,0930	Info SMS message will be sent at 9:30.	(2)
	SMS=3,1130	Info SMS message will be sent at 11:30.	(3)
	SMS=4,1500	Info SMS message will be sent at 15:00.	(4)
Example No 2:	SMS=1,0600	Info SMS message will be sent at 6:00.	(1)
	SMS=2,1500	Info SMS message will be sent at 15:00.	(4)
	SMS=3,1130	Info SMS message will be sent at 11:30.	(3)
	SMS=4,0930	Info SMS message will be sent at 9:30.	(2)

Info SMS Times – factory settings: SMS=1,0700, SMS=2,1300, SMS=3,1900

Received SMS after setting an info SMS:

FILIP: W=60.0 kg*T=21.2 C*T2=21.3 C*H=41.1 %*Battery=53.8%

FILIP: W=60.0 kg (current weight)***T=21.2 C** (current outdoor temperature T, only if the sensor EST from additional equipment is connected)***T2=21.3 C** (current outside temperature)***H = 41.1%**(current humidity, only if the sensor **ESTH** is connected)***Battery=53.8%** (battery status)

TIP: Smaller the number of info SMS messages, longer the battery life. The number of info SMS messages and their set times is available after sending the SMS command - SMS (see 12.7 INFO SMS LIST)

10.4. HOW TO DELETE AN INFO SMS FROM THE MEMORY

A specific info SMS will be **deleted** from the memory of the scale by the command:

SMS TEXT- **DSMS=1**

In this case the info SMS No 1. Deleting all the info SMS messages with one command is not possible, it is necessary to delete them one by one (use the command SMS to see all set info SMS).

Acknowledgement that the SMS was received and the info SMS was deleted: **FILIP: SMS deleted**

Example: after sending an SMS command **DSMS=5**

Info SMS message No 5 will be deleted from the memory of the scale.

11. INFORMATION SMS REQUESTS

Information SMS inform the beekeeper about the current settings and the status of the scale.

11.1. VERSION - PRODUCTION DATA

The request displays the factory settings of FILIP 2.

SMS TEXT - **V**

Acknowledgement that the SMS was received: **FILIP: Version:Beehive:1*UM-G-B*v1*UMB-00400001AB5*UMB-004.00.00001AB5*Boot-WEB*v4.5*Image-Beehive*v3.17.305*2014.5.12*www.operchip.com*NOW-OS-v1.00*1***

Beehive:1 – Beehives monitor. Element. Version 1.
UM-G-B - Name of the device.
v1- Version of the functionality of the device.
UMB-00400001AB5 - Serial number.
UMB-004.00.00001AB5 - Unique device or element number. (UDN)
Boot-WEB - Boot loader program. Programmable via the WEB interface.
v4.5 - Version of the boot loader program.
Image-Beehive – Software.
v3.17.305- Version of the software.
2014.5.12 – Production date.
www.operchip.com – Manufacturer.
NOW-OS-v1.00- Operating system Operchip and its version. (Network Object World Operating System)
1 – The device has a battery.

11.2. GSM SIGNAL QUALITY

The request displays the GSM network signal quality in percentage. 100% for the strongest signal.

SMS TEXT - **SQ**

Acknowledgement that the SMS was received: **FILIP: Signal strength 65.0%**

11.3. LIST OF PHONE NUMBERS

The request displays the list of phone numbers set for operating the scale.

SMS TEXT - **TEL**
Acknowledgement that the SMS was received: **MODEM: TELEPHONE NUMBERS: 1,+XXXxxxxxxxxx*2,+XXXxxxxxxxxx*3,.....*5,+XXXxxxxxxxxx***

MODEM: TELEPHONE NUMBERS: 1,+XXXxxxxxxxxx (phone number assigned to position 1**) *2, +XXXxxxxxxxxx** (phone number assigned to position 2) .....
In the list there are only the positions with set phone numbers.

11.4. CURRENT MEASURED DATA

The request displays current measured values (weight, temperature, humidity, status of the battery):
SMS TEXT - **INFO**
Acknowledgement that the SMS was received: **FILIP: W=60.0 kg*W2=0.0 kg* W3=48.0 kg*T=21.2 C*T2=21.3 C*H=41.1 %*Battery=53.8%**

FILIP: W=60.0 kg(current weight 1)***W2=0.0 kg** (current weight 2)***W3=29.8 kg** (current weight 3)***T=21.2 C** (current temperature T)***T2=21.3 C**(current temperature T2)***H=41.1%**(actual humidity)***Battery=53.8%** (battery status)

11.5. CURRENT SCALE SETTINGS

The request displays current scale settings.
SMS TEXT - **SET**
Acknowledgement that the SMS was received: **FILIP: Date 06.06.2013 09:20:27*AlOn*SMSOn*WEBOn*Tim=30,x4 *TR=30.31* T2R=18,190*HR=58,60* WR=4,5* WR2=52,55**

***WMax=200,0 kg* WTare=0,0 kg**

FILIP: Date 06.06.2013 (date) **09:20:27** (time) ***AlOn/Off** (alarms on/off) ***SMSOn/Off** (info SMS on/off) ***WEBOn/Off** (sending of data to the Internet on/off) ***Tim=30,x4** (timer setting) ***TR=30,31** (temperature limits 30-31°C) ***T2R=18,19** (temperature limits 18-19°C) ***HR=58,60** (humidity limits 58-60%) ***WR=4,5** (weight limits 4-5kg) ***WR2=52,55** (weight limits 52-55 kg) ***WMax=150.0kg** (maximum weight) **WTare=0.0kg** (tare weight)

11.6. CURRENT SCALE 2 AND 3 SETTINGS

The request displays current scale settings.
SMS TEXT - **SET2**
Acknowledgement that the SMS was received: **FILIP: Date 06.06.2013 09:20:27* W2R=4,5* W2R2=52,55 *W2Max=200,0 kg* W2Tare=0,0 kg* W3R=4,5* W3R2=52,55** ***W3Max=200,0 kg* W3Tare=0,0 kg**

FILIP: Date 06.06.2013 (date) **09:20:27** (time) ***W2R=4,5** (weight limits 4-5kg) ***W2R2=52,55** (weight limits 52-55kg) ***W2Max=150.0kg** (maximum weight) ***W2Tare=0.0kg** (tare weight) ***W3R=4,5** (weight limits 4-5kg) ***W3R2=52,55** (weight limits 52-55kg) ***W3Max=150.0kg** (maximum weight) ***W3Tare=0.0kg** (tare weight)

11.7. LIST OF INFO SMS

The request displays the list of info SMS.
SMS TEXT - **SMS**
Acknowledgement that the SMS was received: **FILIP: SMS Info:1,09:00:00*2,12:00:00* *8,19:00:00**

FILIP: SMS Info:1 (info SMS number) **07:00:00** (sending time) ***2** (info SMS number) **, 12:00:00** (sending time) ***.....**
In the list there are only the positions with set phone numbers.

11.8. ACCELEROMETER SETTINGS

The request displays current accelerometer settings.

SMS TEXT - **ACC**

Acknowledgement that the SMS was received: **Accelerometer: Enable, Sensitivity 16g, Threshold 5000 mg, ODR 100Hz, Duration 0 ms, Read ok**

Accelerometer: Enable, Sensitivity 16g (options: 2g, 4g, 8g, 16g)**, Threshold 5000 mg** (activation level in milligrams)**, ODR 100 Hz,** (measurement frequency) **Duration 0 ms, Read ok**

11.9. CREDIT INFO

If the services of your operator are paid from the prepaid credit, then the credit can be checked sending the following SMS message:

SMS-TEXT **CR**

Acknowledgement that the SMS was received: **+ 4219XX209xxx:** Your current balance is 15.64Eur; the credit is valid till 21.07.2014 14:40

The above SMS TEXT about your credit balance depends on the operator and may be different!

If it is not possible to get the credit info or the operator does not support this service, the response has the following format: **Modem: Credit: unknown.**

11.10. LIST OF COMMANDS

The request displays texts of 5 commands starting from the given position:
SMS TEXT - **GCT = 10**

GCT = 10 (displays the commands from the positions 10 to 14).

Acknowledgement that the SMS was received: **Modem: Commands: 10,CR;11,GCT=;12,CT=;13,DT=;14,AT=;**

Modem Commands: 10 (position number 10)**, CR** (command text)**; 11**(position number 11)**, GCT =**(command text)**; 12**(position number 12)**, CT =**(command text)**; 13**(position number 13)**, DT =**(command text)**; 14**(position number 14)**, AT =**(command text)**;**

11.11. LIST OF EMAILS

The request displays the list of emails.
SMS TEXT - **EMAIL**
Acknowledgement that the SMS was received: **FILIP: Email: 1,info@operchip.com*2,info2@operchip.com**

FILIP: Email: 1,info@operchip.com (email assigned to position 1) ***2,info2@operchip.com** (email assigned to position 2) ... ...

In the list there are only the positions with set phone numbers.

12. ALARMS

During measurement (according to the set interval of the TIMER) the device compares measured values with the set parameters WR, WR2, W2R, W2R2, W3R, W3R2, T, T2, H, B. If the values exceed the parameters the device sends the ALARM SMS message. The Alarm SMS is also sent when **moving devices** (motion, impact, downfall…) what is registered by the accelerometer and by the switch connected to the ALARM INPUT. When activated the accelerometer or the ALARM INPUT the device sends not only the ALARM SMS but also makes a call on the mobile phone even if in "SLEEP" mode. In this case the sending of the ALARM SMS messages **is not** dependent on the settings of the TIMER.
But while monitoring weight, temperature, humidity and battery status the sending of the ALARM SMS messages **is dependent** on the settings of the TIMER.
For example, for the temperature monitoring there are set values TR = 30,32 and TIMER = 30,2 (measures every 30 minutes). The outside temperature is 30.1°C at 13:00. At 13:26 the temperature rises to 32.2°C and exceeds the set limit. According to the settings of the TIMER the scale measures the temperature at 13:30 when the outside temperature rises to 32.6°C. The scale sends the ALARM SMS – **Temperature T: ALARM 32.6 C** on the basis of measurements at 13:30.
Always check the settings of the sending of ALARM SMS messages **(AOff/Aon)** and set the correct mode. **Alarm SMS** messages **are sent** to the **phone number** set **on position No 1**.

When manipulating the device (maintenance, service, transportation, movement) or the weighted object (beehive + accessories) **it is recommended to turn off the accelerometer (ACCOFF).**

12.1. HOW TO TURN ON/OFF THE ALARM SMS SENDING

Turning on the sending: SMS TEXT – **AON**
Acknowledgement that the SMS was received: **FILIP: ALARM active**
Turning off the sending: SMS TEXT – **AOFF**
Acknowledgement that the SMS was received: **FILIP: ALARM off**

12.2. WEIGHT ALARM

The text of the received SMS: **Weight W: ALARM XX,X kg**

The scale sends the SMS when the set limits (lower or upper) for the weight WR and WR2 are exceeded. See the procedure for setting the limits of the weight - How to set the weight monitoring (**WR=XX,XX WR2=XX,XX**)

The same is valid for the scale 2 and 3.

12.3. TEMPERATURE ALARM

The text of the received SMS: **Temperature T: ALARM XX,XX C *****

The text of the received SMS: **Temperature T2: ALARM XX,XX C**

The scale sends the SMS when the set limits (lower or upper) for the temperature T and T2 are exceeded (depends on the external temperature sensors connection).
Temperature T - external (depends on the equipment), measured by the sensor **EST**

Temperature T2 - measured by the sensor **Tb** or the external sensor **ESTH** (temperature/humidity)

See the procedure for setting the limits of the temperature - How to set the temperature monitoring (**TR=XX,XX T2R=XX,XX**)

******* Temperature T - measured only if the external sensor **EST** is connected

12.4. HUMIDITY ALARM

The text of the received SMS: **Humidity H: ALARM XX,X %**

The scale sends the SMS when the set limits (lower or upper) for the humidity H are exceeded.

See the procedure for setting the limits of the humidity - How to set the humidity monitoring (**HR=XX,XX**)

******* Humidity H - measured only if the external sensor **ESTH** (temperature/humidity) is connected

12.5. BATTERY ALARM

The text of the received SMS: **Battery: 28,9 % Battery is low**

Battery: 28.9% (battery status) **Battery is low**

The scale sends the SMS when the battery voltage drops below 30%. In this case it is recommended to charge the battery or replace it by a new one.

The text of the received SMS: **Battery: 100,0 % Battery is full**

Battery: 100.0% (battery status) **Battery is full**

The scale sends the SMS when the battery is fully charged.

12.6. GSM SIGNAL ALARM SMS

The scale sends the SMS when the GSM signal strength drops below 30%.

The text of the received SMS: **FILIP: Signal strenght 30.0%**

12.7. ACCELEROMETER ALARM

The scale sends the SMS when the accelerometer is activated (by movement, impact, downfall...). There is an interval of 3 minutes between ALARM SMS messages so after sending the first SMS ALARM message another one is sent after 3 minutes.

The text of the received SMS: **Accelerometer: ALARM Active**

After the accelerometer has been activated 3 times in a row (sent 3 ALARM SMS messages) the accelerometer is disabled for 60 minutes. In this period even if activated the device does not send ALARM SMS messages. At the end of this period the accelerometer is activated automatically (goes to ACTIVE mode).

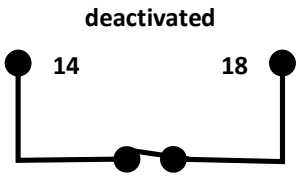
12.8. SAFETY INPUT ALARM

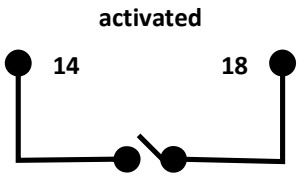
To the safety input can be connected a door switch or a switch monitoring the presence of the beehive etc. It is recommended to use the normally closed contact of the switch. The scale sends one SMS when the switch is activated (open) and another one when the switch is deactivated (closed).

The text of the received SMS (e.g. door open): **Detector 2: Active**
The text of the received SMS (e.g. door closed): **Detector 2: End**

If the normally open contact of the switch is used then the SMS messages are sent in the reverse order.

Terminals for connecting the switch are in the electronic unit..





The **activated ALARM INPUT** switches on the ALARM OUTPUT (siren, light...) for about 30 seconds.

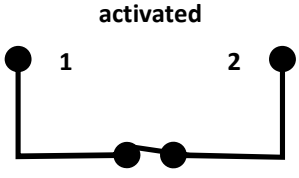
12.9. ALARM OUTPUT

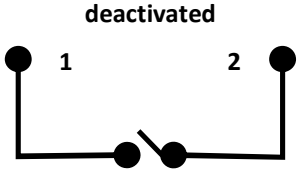
It is a voltage free contact for the connection of external devices e.g. siren, light, motion detection camera, etc. Maximum load – 30 V DC 1 A

The ALARM output is activated either by the ALARM input or by sending the SMS command.

SMS TEXT for turning on the output – **SON**
Acknowledgement that the SMS was received and the output is ON: **OUT: Active**

SMS TEXT for turning off the output - **SOFF**
Acknowledgement that the SMS was received and the output is OFF: **OUT: Off**





13. ERROR SMS MESSAGES

After receiving an incorrect or non-existent SMS command the scale responds:

FILIP: Command no exist – SMS command does not exist

FILIP: Error command format – Incorrect format of the SMS command

14. MONITORING ON THE WEBSITE

14.1. REGISTRATION ON THE WEBSITE

On the website http://www.operchip.com/beehive click on **Register** (on the top menu bar).

Fill in the **Registration** form:

Username – the name for logging in to the website - enter without spaces
Password – minimum 4 characters - use letters or numbers or combination of them
Retype Password - confirm the password - enter it again
Email – email for the registration purposes (you will receive a registration email)
First Name
Last Name
Verification Code – write the displayed verification code into the form

After having completed the registration form, please check all the boxes and click on **Register.**

An activation email will be sent to your email address. Your account will be activated after clicking on the link in the email. If the link is not active, copy it into your browser address. After activating your account, you can log in to the website.

14.2. LOGGING IN TO THE WEBSITE

On the website http://www.operchip.com/beehive click on **Login** (on the top menu bar).

Enter:

Username - enter your username or email
Password

Click on **Login**

After logging in information about your account is displayed (profile).
In the left part of the screen are displayed all your registered scales (your devices) – if there is no scale (device), it is necessary to activate your it.

How to activate the scale: Go to **Add New Device**, enter the pairing code of the scale you want to add to the list of devices. **Pairing code of the scale** can be found on the back of the operation manual.

Click on **Add device.** After receiving the pairing code your scale is displayed in the list of devices (for example UMB_ 001.00.0000**XAXX**). The last 4 characters form the production code of the scale. After clicking on it a new page is open with information about the given weight.

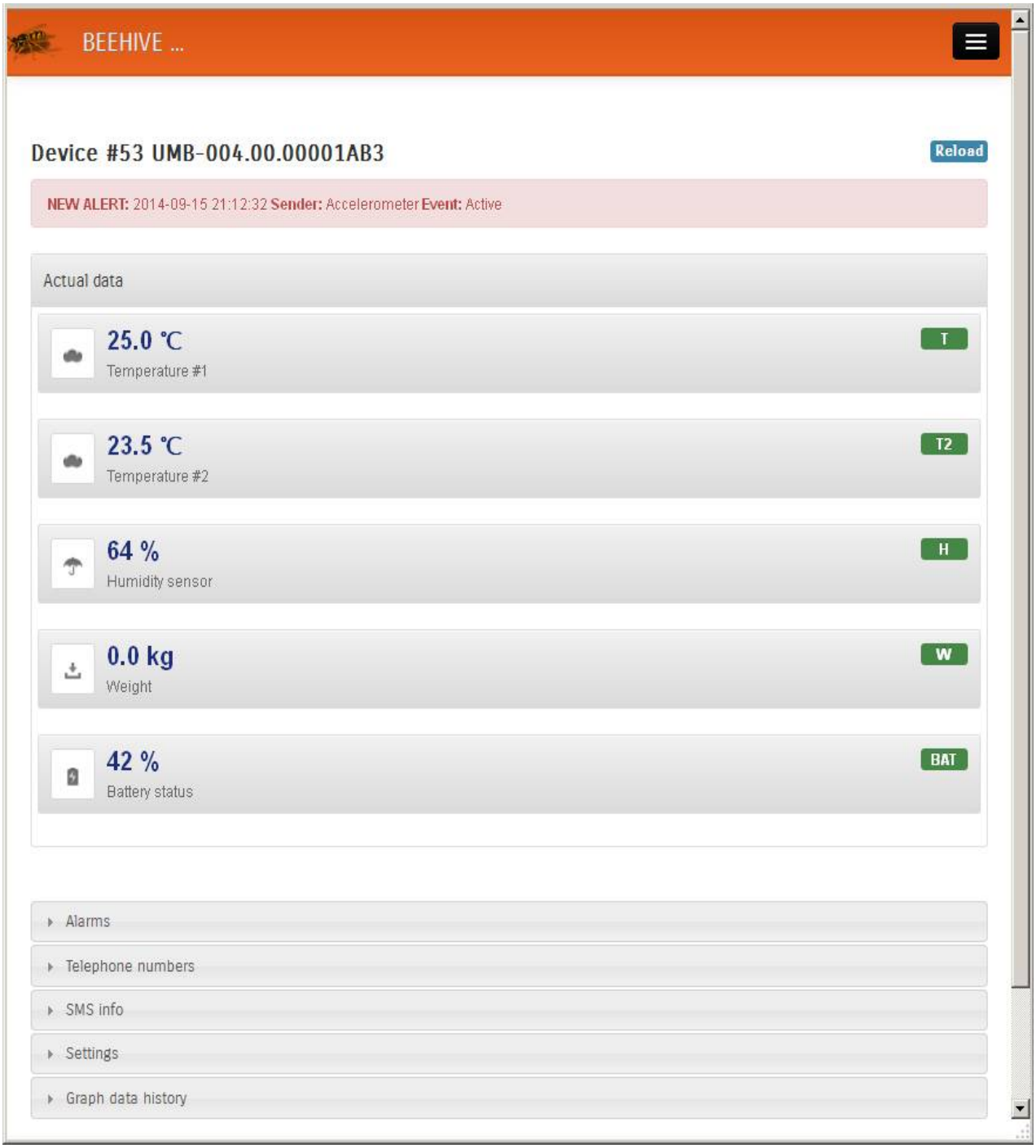
When entered **an incorrect** Pairing code the warning is displayed - Code does not exist!

When entered **a used** code the warning is displayed - Code is already used!

14.3. INFORMATION ABOUT THE WEIGHT DISPLAYED ON THE WEB PAGE:

After the registration on the website the beehives GSM monitor can be used on any computer, tablet or mobile phone. Current information about the settings of the scale as well as measured values are available after clicking on drop down menus (Alarms, Telephone Numbers, ...). The opening of one drop down menu automatically closes the drop down menu that was open previously.

Just above the Alarms bar the serial number of the scale can be seen and next to it is the blue button Reload. Clicking on the button the current data from the scale are displayed. The current data are also displayed automatically after opening the page for the given device.



Alarms bar - list of the alarms ordered by time
Telephone Numbers bar - list of set phone numbers for the communication with the scale
SMS Info bar – list of active (on) and inactive (off) set times for info SMS
Settings bar - list of all the set parameters of the scale

Graph data history bar - all the measurements (made according to Timer settings) in graphical and tabular form

Information about the current status of the scale after waking up with a magnet, after connecting the battery, as well as new alerts and alarms are displayed **over the Alarms bar.**

After **activating the scale with a magnet** or after connecting the battery the current measured values are displayed for the next 30 minutes – Actual data

Temperature T1 (Temperature # 1) - only if the sensor **EST** is connected
Temperature T2 (Temperature # 2)
Humidity H (Humidity sensor) - only if the sensor **ESTH** is connected
Weight W
Battery BAT (Battery status)

The values are updated in the intervals of approx. 1 minute.

New alerts (Alarms) are displayed above the Alarms bar in the following format

NEW ALERT: 2014-01-13 10:35:14 **: Sender** Device **Event:** Ready

NEW Alert : 2014-01-13 (year, month, day) 10:35:14 (time) Sender: Device: Event : Ready (active)

Alerts/Alarms **are displayed** on the page even if the sending of Alarm SMS messages is turned off (the sending to your phone is off).

Bar ► Telephone Numbers

A list of phone numbers for the communication with the scale is shown in the green field. For details about the settings and properties, see How to insert a new phone number – **TEL = 1, XXXX**

SMS Info Bar

An overview of active and inactive info SMS.

1 ON 07:00:00 - **1** - info SMS number, **ON** active - **07:00:00** - set time for the info SMS sending

3 OFF 19:00:00 pm - **3** – info SMS number, **OFF** -inactive, **19:00:00** -the last set time

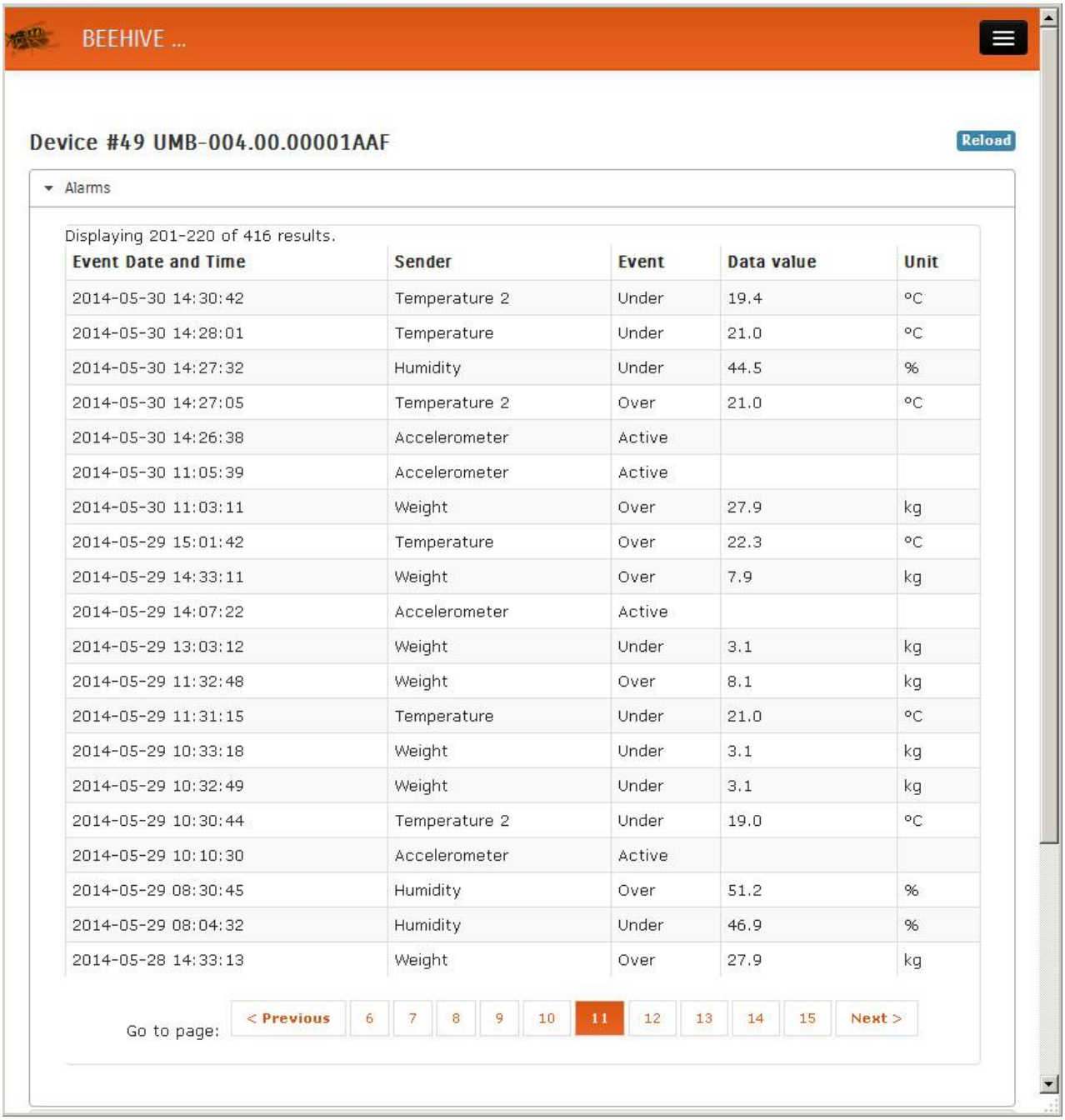
For details about the settings of info SMS messages see How to set times for info SMS **(info SMS = 1 ... SMS = 8)**

Bar ► Settings

Displays an overview of all the basic parameters of the scale
Alarms – sending of Alarm SMS messages off/on, **info SMS** - sending of Info SMS messages off/on, **Timer** - frequency of measurement in minutes (60 = measuring every 60 minutes), **Timer GSM** - frequency of turning on the modem in minutes (120 = modem turned on every 120 minutes), **Temperature, Humidity, Weight** – limit values as triggers for the sending of an Alarm SMS, **Weight tare** -Tare weight value.

Bar ► Alarms

All alerts are archived and sorted in tabular form and available after clicking on the Alarms bar.



Evens description:

Ready - device is ready to work after activating with a magnet or after connection of the battery

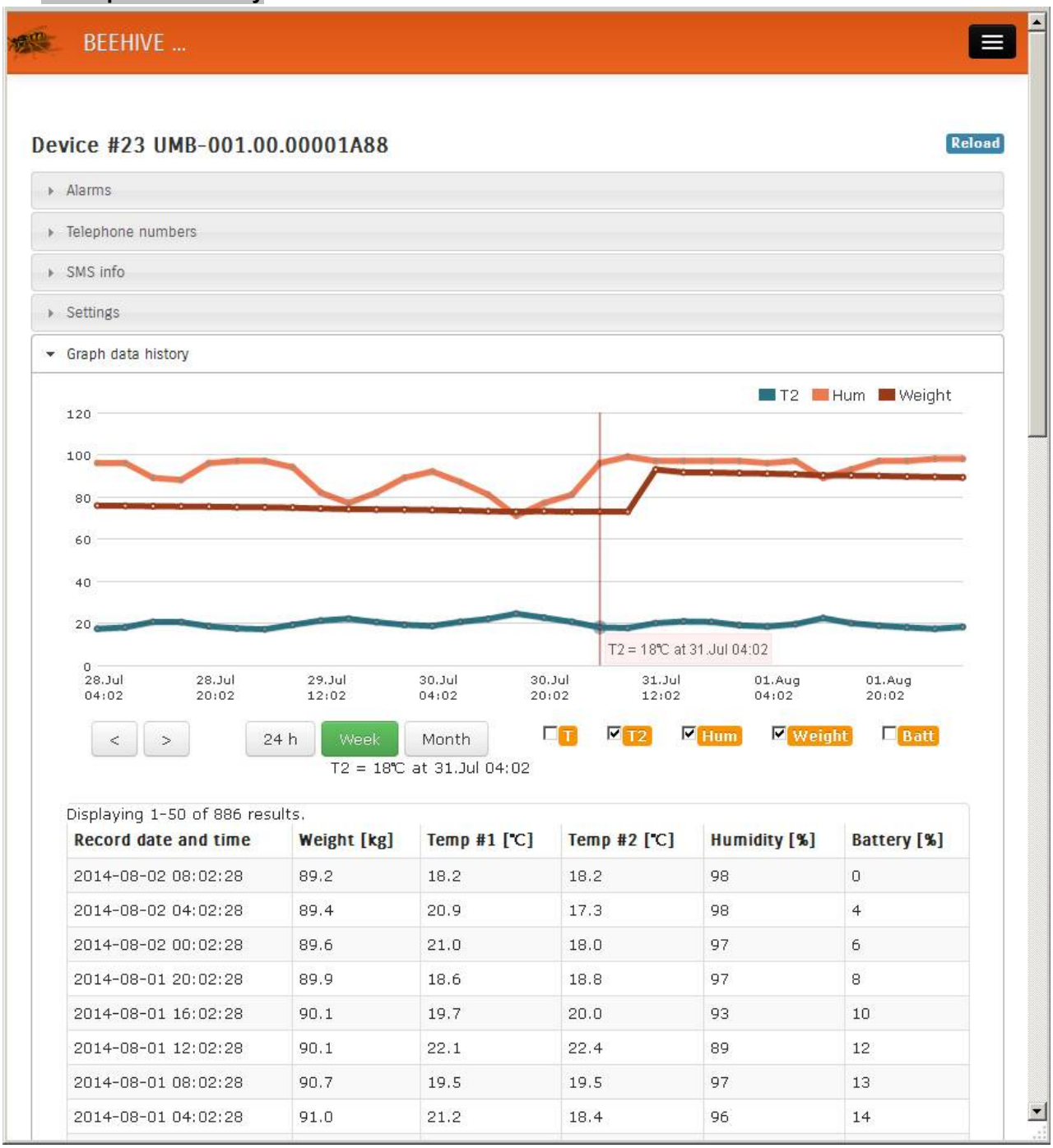
Active - accelerometer has been activated (by movement of the device, impact, etc.)

Over - upper limits for the weight, temperature or humidity were exceeded

Under - lower limits for the weight, temperature or humidity were exceeded

Charged - battery status

Bar ► Graph data history



Record date and time	Weight [kg]	Temp #1 [℃]	Temp #2 [℃]	Humidity [%]	Battery [%]
2014-08-02 08:02:28	89.2	18.2	18.2	98	0
2014-08-02 04:02:28	89.4	20.9	17.3	98	4
2014-08-02 00:02:28	89.6	21.0	18.0	97	6
2014-08-01 20:02:28	89.9	18.6	18.8	97	8
2014-08-01 16:02:28	90.1	19.7	20.0	93	10
2014-08-01 12:02:28	90.1	22.1	22.4	89	12
2014-08-01 08:02:28	90.7	19.5	19.5	97	13
2014-08-01 04:02:28	91.0	21.2	18.4	96	14

Graphical and tabular display of individual measurements sent to the web server. In the chart every measurement is displayed in different color and with its own tag. Below the graph are boxes for the selection of the displayed values.

The value is selected (and displayed in the chart) clicking on the appropriate box.

- buttons for the selection of the time axis of the chart, options: measurements done in the last 24 hours, in the last week or in the last month. The selected view is highlighted in green.

< > - arrow keys for the movement in the chart – left/right

All measurements are in addition sorted chronologically in a table. In this manner the complete history of the records (measurements) is available.

15. SET PHONE NUMBERS

Phone number of the SIM card inserted in **FILIP 2**

Phone number	Note
.....	.....

User's phone numbers list (empty from the factory)

Position:	phone number	Note
Position No 1.:	.....	.....
Position No 2.:	.....	.....
Position No 3.:	.....	.....
Position No 4.:	.....	.....
Position No 5.:	.....	.....

16. SERIAL NUMBER, PRODUCTION CODE, PAIRING CODE

SERIAL NUMBER:

PRODUCTION CODE:

PAIRING CODE: