Instructions Manual
GBS-1 Classic

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KOD

PIN

WARNING!!! IMPORTANT

Conditions of Use for Gel Batteries

The battery while installed in the weighing scale must not remain discharged and must be recharged immediately. Leaving the battery discharged may result in shortening its life, reducing its capacity or damaging it.

When not in use, the battery should be recharged regularly, at intervals no longer than 2 weeks.

The battery can be stored and used in temperatures between 0°C and 35°C. Storing and using the battery outside the indicated temperature range will limit its life or lead to its
failure.

The waranty covers the replacement of the scale battery free of charge if any factory defect is found. Factory defects of the battery are considered to be:

- break in internal connections
- internal short circuit
- leakage (not caused by external force)

The warranty is no longer valid if:

- the battery has been stored and used in temperatures below 0°C and above 35°C
- the battery has been kept in a discharged state (voltage below 10.8V) for more than 20 hours
- deep discharge of the battery (voltage below 9.9V)
- the battery has been charged with equipment other than the dedicated charger
- the battery was used to power equipment other than the weighing scale
- mechanical damage to the battery casing is found

Beehive scale GBS-1 Classic use – manual.

The scale consists of a table with movable desktop attached to the tensometric sensor using a controller with a display and GSM communications module, and the powering battery module.

1. Preparing the scale to work.

The scale will be ready to work when all the elements included will be connected. The next steps should be completed accordingly:

- Using a screwdriver, unscrew four screws that secure the controller case's lid, after that, take off the lid.
- The controllers' electronic board is attached to the lid and on that board there is a spot signed as SIM which is a slot to insert a SIM card. The card is supposed to be inserted into that slot.

ATTENTION: The SIM card should be prepared to work before. In order to do that, one must register the card in a manner that is determined by the provider and then you need to activate the card inside an external device such as mobile phone in a manner determined by the provider.
The first activation the provider sends a special sms informing the client about the activation status and enabled services. Before inserting the card to the scale, all messages should be deleted. In a later time, if one must activate additional services, you will use the external device such as phone to do that and then delete the messages.
The SIM card cannot have protection other than PIN number. In case the SIM card is blocked and you need to use the PUK number provided by the operator using the same external device.

- A battery sustaining the local clock should be inserted to the socket CR2032.
- Check the correctness of the mounted GSM antenna.
- Put the controller's lid onto the case and screw the screws which mount the lid.
- The taken cable with 5-bolt plug from the scale's table, plug it into the socket that is located on the left side of the controller's case and tighten the top cap that secures the socket.
- To the 3-bolt socket plug the hive's temperature sensor in.
- At this moment, you can turn the scale on using a gray cable with the 2-bolt plug with a socket in the battery module. The controller's display should spark a light with a text showing the software version and the controller's serial number.

WARNING: In case the battery's voltage is detected too low, the scale will notify the user using the display and will turn off. The proper battery must be plugged in.

2. How the scale works.

Everytime the power is switched on, the controller will ask to type the special code delivered by the manufacturer. After implementing the correct code, the controller will check the status of all subsystems and in the event of any irregularities unenabling the additional work the controller will display the adequate information. The messages will be described in **Starting Sequence** menu.

After a successful launch of the starting sequence, the scale is ready to work. At this moment, the controller will be trying to connect with the GSM network – the message ***GSM connecting*** will pop up at the display. If the connetion fails, the display will show commands which will be applied in a manner specified in the **GSM Communication.**

If this is the controller's first start, certain options must be first applied in order for the controller to know when to store data, when to set the exact timer, under what number should the device send information, the SIM card's PIN and ID given to the device by the user.

During the optimal work mode, at certain time the scale registers the actual state and mass changes – the information is saved inside a local datastore. Therefore, it is sent to the user via SMS and to a server. The scale may detects anomalies (unexpected loss of mass) using the SMS and displayed information: **ALARM: MASS LOSS!**

The actual condition (status) of the scale can be checked by sending SMS to the controller (using its' SIM card number) with the content **#INFO** or **#info**. At the moment of checking the condition (status) of the scale, the data will be archived in the local memory and also sent to a server. In case of any connection problems with GSM, the scale will be trying 3 times every 5 minutes to deliver the response or to send the data to the server.

In case the controller receives the SMS with content different than mentioned above, an automatic transfer of the received message to the user will be conducted. That method enables the user to receive the information about his funds and one-only access codes, to help managing the account that is assigned to the SIM through the Internet.

Receiving and handling the SMS (indicative responses and message transferring) is reduced over time. It means that if the messages had been sent one by one, the message that had been handled will be the first one, the second one after 3 minutes.

Override is possible to force the data save into the local memory bank or to send it via SMS with the actual status while being the **Information 6** mode after clicking **ENTER**.

When the beehive temperature sensor is connected to the controller, the display can show measured values. At the moment of registering the information data, these are added to the data sent via the SMS and to the server.

To save the energy, the scale's system is put to sleep after 120 seconds, the display is turned off. To wake the system up, an external SMS should be sent or the time of registering data had arrived. Optional waking the system up - press **SELECT** button.

If during the device's normal operating conditions, the battery will reach 10% of its' maximum power capacity, the **WARNING: BATTERY LOW** will be displayed. The controller will enter a power save state turning the display off. The user will be immediately notified by the SMS about device's low power. The replacement of the battery-cells – necessary for the scale to work properly. Additionaly, before replacing the battery with a new battery, the information about low battery level will be sent together with every new information via SMS.

Emergency information or warnings will be spotted on the display for at least 30 seconds. The information can be interrupted by pressing **ENTER**.

3. Work mode and options.

The description of the displayed screens and the buttons that operate them.

Security display.

- In the first line: 16 signs in the first part of a special identification number: XXXXXXXXXXXXXXXX
- In the second line: 8 signs in the second part of a special identification number: XXXXXXXX, and also a place to enter a 5-sign code: XXXXX.

Buttons:
ENTER: Transfering the flashing cursor to the place where the value is currently changing. Accepting the entered code. If the entered code is not valid, the digits are reset, and the cursor once again indicates the first digit.
DOWN: Lowers the value of the entered digit.
UP: Increases the value of the entered digit.
SELECT: inactive.

Information 1.

- In the first line: the information screen's number: 1, actual mass, the mass difference since the last data log received.
- In the second line: actual time, temperature, the GSM signal strength, battery's status.

Warning: When the temperature sensor is not connected or work improperly, that information will not be displayed.

Buttons:
ENTER: Holding the button will reset the balance (TAR). The Tar's value is saved in a non-volatile steady state memory.
DOWN: A transition to the information screen number 6.
UP: A transition to the information screen number 2.
SELECT: A transition to the saved data's screen log.

Information 2.

- In the first line: the information screen's number: 2, actual mass, the mass difference since the receive of the last data log.
- In the second line: beehive temperature, the GSM signal strength, the battery status. When the temperature sensor is not connected or work improperly, that information will not be displayed.

Buttons:
ENTER: inactive
DOWN: A transition to the information screen number 1
UP: A transition to the information screen number 3.
SELECT: A transition to the saved data's screen log.

Information 3.

- In the first line: the information screen's number: 3, ID: identification number of the device set by the user.
- In the second line: The name of the GSM provider, GSM signal strength, battery status.

Buttons:
ENTER: inactive
DOWN: A transition to the information screen number 2
UP: A transition to the information screen number 4.
SELECT: A transition to the saved data's screen log.

Information 4.

- In the first line: the information screen's number: 4, ID: identification number of the device set by the user.
- In the second line: actual date and time.

Buttons:
ENTER: Inactive.
DOWN: A transition to the information screen number 3.
UP: A transition to the information screen number 5.
SELECT: A transition to the saved data's screen log.

Information 5.

- In the first line: The information screen's number: 5, SN: P letter and the device's serial number.
- In the second line: FMW: the version of the local software.

Buttons:
ENTER: Inactive.
DOWN: A transition to the information screen number 4.
UP: A transition to the information screen number 6.
SELECT: A transition to the saved data's screen log.

Information 6.

- In the first line: The information screen's number: 6, SMS Test.
- In the second line: Press ENTER

Buttons:
ENTER: Sends SMS with the actual weight status and saves that data in the log.
DOWN: A transition to the information screen number 5.
UP: A transition to the information screen number 1.
SELECT: A transition to the saved data's screen log.

Saved data log.

The local memory saves up to 5 last entries.

- In the first line: the letter L, number of the last entry to the log, saved weight, saved mass difference.
- In the second line: the date, time of the entry.

Buttons:
ENTER: hold to erase entries from the log.
DOWN: a transition to the last entry.
UP: a transition to the next entry or to the beginning of the log.
SELECT: a transition to the options screen (LOGIN). Hold to return to the previous information screen.

The log saving type.

The flashing letter means the starting position of the cursor in the options mode.

- In the first line: letter F, LOG FORMAT
- In the second line: Type, type number

The log saving type means the choice of repeatability and the exact time of the entry during the day.
Type 1: The entry will be conducted everyday at 9:00 P.M.
Type 2: The entry will be conducted everyday at 3:00 P.M. and 9:00 P.M.
Type 3: The entry will be conducted everyday at 12:00 P.M., 5:00 P.M. and 9:00 P.M.
Buttons:
ENTER: the transfer of the flashing cursor to the exact place where the value changes. Hold the button to transfer the cursor to the starting position and to save the settings in the memory.

DOWN: decreases the adjusted value.
UP: increases the adjusted value.
SELECT: a transition to the time settings screen. Hold the button to return to the previous information screen. The button is inactive, when the starting position of the cursor is not set with the **ENTER** button.

Clock settings.

The flashing letter means the starting position of the cursor in the settings mode.

- In the first line: letter T, TIME
- In the second line: date to set, time to set.

ENTER: the transfer of the flashing cursor to the exact place of the adjusted value. Hold the button to transfer the cursor to the starting position and to save the settings in the memory.
DOWN: decrease the adjusted value.
UP: increase the adjusted value.
SELECT: a transition to the ID settings screen. Hold the button to return to the previous information screen. The button is inactive when the cursor is not set at the starting posiotion with the **ENTER** button.

The device's number identification (ID) settings.

The flashing letter means the starting position of the cursor in the settings mode.

- In the first line: letter D, SCALE ID
- In the second line: the identification number in the form of XXXXXX

The identification number is set by the user to mark the weight according to the user's will. The identification number is sent via SMS in order to differentiate the weight in the event of having and operating many scales at the same time.

ENTER: a transfer of the flashing cursor to the exact place of the changed value. Hold the button to transfer the cursor to the starting position and to save the data in the memory.
DOWN: decreases the adjusted value.
UP: increases the adjusted value.
SELECT: a transition to the user's telephone number settings screen. Hold the button to return to the previous information screen. The button is inactive, when the cursor is not set at the starting position with the **ENTER** button.

SMS number settings.

The flashing letter means the starting position of the cursor in the settings mode.

- In the first line: letter S, SMS NUMBER
- In the second line: telephone number in the form of + XX XXX XXX XXX

The SMS number is the user's telephone number. Only notifications will be received from the device.

ENTER: a transfer of the flashing cursor to the exact place of the adjusted value. Hold the button to will transfer the cursor to the starting position and to save the data in the memory.
DOWN: decreases the adjusted value.
UP: increases the adjusted value.
SELECT: a transition to the PIN number's settings screen. Hold the button to return to the previous information screen. The button is inactive, when the cursor is not set at the starting position with the **ENTER** button.

PIN number settings.

The flashing letter means the starting position of the cursor in the settings mode.

- In the first line: letter P, PIN NUMBER
- In the second line: PIN number in the form of XXXX

Correct PIN number activates the SIM card access. If the number is not typed on the screen, instead of digits, dashes will appear: - - - -
ENTER: a transfer of the flashing cursor to the exact tplace of the adjusted value. Hold the button to transfer the cursor to the starting position and to save the data in the memory.
DOWN: decreases the adjusted value.
UP: increases the adjusted value.
SELECT: a transition to the settings screen (shows the limit of the SMS sent). Hold the button to return to the previous information screen. The button is inactive, when the cursor is not set at the starting position with the **ENTER** button.

The SMS limit settings.

The flashing letter means the starting position of the cursor in the settings mode.

- In the first line: letter E, SMS limit
- In the second line: various settings

The limit of the SMS that is to be sent is daily in response to the question i.e. #info. The meter is reset everyday at 0:00. Available options:

EKO – a response to 5 questions.
NORMAL – a response to 10 questions.
HIGH – a response to 20 questions.

ENTER: a transfer of the flashing cursor to the exact place of the adjusted value. Hold the button to transfer the cursor to the starting position and to save the settings in the memory.
DOWN: choose to lower the variation (HIGH to NORMAL, NORMAL to EKO).
UP: choose to raise the variation (from EKO to NORMAL, NORMAL to HIGH).
SELECT: a transition to the manufacturer's codes screen. Hold the button to return to the previous information screen. The button is inactive, when the cursor is not set at the starting position with the **ENTER** button.

Manufacturer's codes.

The flashing letter means the starting position of the cursor in the settings mode.

- In the first line: letter C, ENTER CODE
- In the second line: the code in the form XXXX

The manufacturer's codes are needed to perform controller's special functions, e.g., memory format and the return to default settings.

ENTER: a transfer of the flashing cursor to the exact place of the adjusted value. Hold the button to transfer the cursor to the starting position and to save the settings in the memory.
DOWN: decrease the adjusted value.
UP: increase the adjusted value.
SELECT: a transition to the previous information screen. Hold the button to return last chosen information screen. The button is inactive, when the cursor is not set at the starting position with **ENTER** button.

4. **Starting sequence.**

After activating the power and entering the code, the controller check the status of the devices that are in the system. If any inconsistencies appear, the display might show:

- **BUTTON ERROR –** if any button is pressed. It is a serious error and the scale's action is paused/suspended. The controller is supposed to be turned off and then the button's malfunction has to be checked.
- **MEMORY ERROR –** it means that the local memory is damaged. It is a serious error and the scale's action is paused/suspended.
- **WARNING: Time is not set –** it means that the local clock is not set. It may also suggest that the battery sustaining the local clock is depleted and must be replaced with a new one. After replacing the battery, the time is to be set in the

Clock Settings. The warning does not stop the device's activity. It is shown at the display for 30 seconds. You can interrupt the display of the warning by pressing **ENTER** button.

- **ERROR: scale not connected –** the table with a sensor is not connected to the controller or is wrongly connected. Connection status should be checked and fixed. The warning does not stop the device's activity. It is shown at the display for 30 seconds. You can interrupt the display of the warning by pressing **ENTER** button.
- **WARNING: sensor not connected –** it means the connection loss with humidity and temperature sensor. When the sensor is not connected, no information about humidity or temperature will be shown at the display, nor the information through SMS will be sent. The warning does not stop the device's activity. It is shown at the display for 30 seconds. You can interrupt the display of the warning by pressing **ENTER** button.
- **WARNING: Battery low –** a warning about low battery power level. If the battery's power level is lower than 10% of the max. capacity, the controller goes into battery saving mode (The screen will no longer be highlighted). Additionaly, to every SMS sent and newer information added to the server, the low battery level information is added. Replacement of the battery is necessary. The warning does not stop the device's activity. It is shown at the display for 15 seconds. You can interrupt the display of the warning by pressing **ENTER** button.

5. Komunikaty GSM

- **GSM connecting –** The message is displayed every time when the GSM connection is being tested.
- **SMS received –** an information about received SMS.
- **Sending SMS –** an information about an ongoing SMS and the data being transferred into the server.
- **PIN is required but is not set –** an information saying that the SIM card needs PIN number but the PIN number is not set yet. Therefore, you must enter **PIN number settings** and add the PIN number. Be careful: remember to enter correct PIN number. Entering wrong PIN numbers will eventually block the SIM card.
- **SIM CARD ERROR: SIM not found! -** an information about missing the SIM card. Check if the SIM card is inserted into the socket and if is inserted correctly.
- **SIM CARD ERROR: PIN is incorrect –** an information about the introduced PIN number. You must move to the **Pin number settings** and enter the correct PIN number. Be careful: remember to enter correct PIN number. Entering wrong PIN numbers will eventually block the SIM card.
- **SIM CARD ERROR: PIN test error –** an information is being shown in the event of a failed connection with the SIM card or the SIM card is damaged.

- **SIM CARD ERROR: Card locked –** an information is being shown about the restricted access to the SIM card. Unlock the SIM card using an external device, i.e. Mobile phone.
- **ERROR: GSM ISSUE –** an information is being shown about a serious hardware problem with the GSM device. The GSM device in that case is being disconnected, there will be no possibility to connect GSM but the scale's system can still operate and save the data in the local memory.

6. Information message.

Bee scale report	Headline
ID: XXXXXX	Identification number assigned by the user in the menu -> Device's identification number settings
Weight: XX.XX kg	Actual weight
Diff: XX.XX kg	Weight difference since the last entry
Temp1: XX*C	Hive's temperature
Batt: XX%	Charged battery level
State:	Scales status. OK – everything is alright. Battery low! - charge the battery. Mass loss! - A mass loss occurred.
SMS: XX	The number of the responses sent (#info). The limit, how many messages are supposed to be send, can be set in the menu.