

## ProBee - instructions for using the external camera

The external camera is a device that operates on the principle of controlled photo trap, connected to the ProBee portal.

The camera is fully equipped for autonomous operation (battery, memory card, SIM card), it uses T-Mobile network for sending pictures. The availability of this network is a prerequisite. The requirement for quality of signal is the same as for making a phone call at that location.

All camera images are sent to the ProBee server where the users can see them on their portal.

At the beginning it is necessary to assign the camera to a specific apiary. This can be done in the Sensors section (Tools/Sensors) by clicking on the pencil icon  in the first column and selecting the appropriate apiary in the third column. If you want to assign the camera to a specific beehive for some reason, it is also possible. In this case, you do not select the apiary in the third column but the hive in the second column.

By default, the camera is set to take pictures as a photo trap, i.e. taking a picture when a live creature is detected. The detector sensitivity is about 20m. Because apiaries are very often at sunny locations and photo traps of all types are subject to false detection by direct exposure or reflection of sunlight, it is recommended to turn off the basic photo trap function for the time of sunshine. To do that, take the same steps as in the paragraph above (Tools/Sensors), click on the pencil icon  in the first column, in column Command 1 set the time for turning off in the morning and in column Command 2 set the time for turning on in the evening. It is also possible to set a specific hour for the camera to take a picture daily without motion detection (Frame time column). By default, this function is set to noon - 12.00.

Motion detection will also be automatically turned off at the time of inspection if the inspection is pre-set in the system for the particular apiary or beehive. The pre-set must include the correct date and time (not available yet - we are preparing).

To start the camera operation, the following steps are required.

1. Screw in the supplied antenna.
2. Attach the camera using the supplied tape or any other way to a suitable place at the apiary.
3. Open the bottom cover and move the switch from position Off to the middle position (Config). The camera will light up the display and after a while (normally within 1 min.) it will show the T-Mobile network connection, besides some other information. If that does not happen, turn the camera off and after circa 10 seconds turn it on again. If the network connection fails, even though the antenna is properly screwed in, the GSM signal is probably low in that place and the camera cannot be used. In such case, you can try to move the camera to another place and try again, sometimes it is enough to change the position by just a few dozen meters.
4. Only after the correct T-Mobile network connection is displayed, move the switch to position On. Then close the camera bottom cover.

If you have already assigned a camera to an apiary or a hive in ProBee (see above), the icon !!! with a number should appear in the Camera column in the list of apiaries or hives. The number indicates how many images have been sent to ProBee. **Attention!** The icon !!! will not appear until at least one image has been uploaded and the website refreshed. The camera is powered by 8 AA batteries. Their

lifetime depends on the number of images sent (about 2 months for 1 image per day). We recommend using lithium batteries that have the longest durability and are resistant to low temperature. Do not use ordinary rechargeable batteries. They do not have sufficient voltage even when fully charged. Note: The camera records the time and other data for each image. Unfortunately, it does not have any time synchronization and is not able to make automatic shift between summer and winter time, so it will show a different time during one half of a year. It is also possible that the internal clock will drift after a long period of time. If the batteries are left empty for a longer period, the date will set to 1.1.2017. This information is shown at the bottom of each image and cannot be deleted. The correct information is only the time of upload the image on the ProBee portal.