

# Newsletter

March 2019



## Abstract

In the first section of this newsletter, we report about talks and a publication in reference to the eHive project. We also present the new eTwinning platform of the EU. In a detailed article about the up to now built and shipped versions of the eHive we discuss differences and similarities on the basis of self-created CAD models. Doing this, we try to present the progress in the eHive's development in a more descriptive manner than before. We conclude by pointing to our new designed website and its features.

## Dear readers,

almost two years went by since our last newsletter. We want to apologize for this. In the last 24 months, the eHive project always developed in small steps. It is still supervised by BeeBIT e.V. and its voluntary working members. In the future, we want to publish small and big news directly on a blog on our website <https://beebit.de/en> instead of waiting until enough material for a newsletter is ready. The smaller articles will then be regularly summed up to an elaborate newsletter.

Since the last newsletter, our network grew by three eHives in Mönchengladbach (DEU-MNG-1), Bremen (DEU-OEG-1) and München (DEU-LPG-1). Moreover, an eHive was sent to Aschaffenburg (DEU-FDG-1).

You will find a short summary of further activities in the following sections. Subsequently, we describe different versions of the eHive and our website's new design and features.

## Talks, Publications, Networks

### Talk at the »Technische Universität München« (TU Munich)

During a didactic teaching seminar in the summer term (2017 and 2018) with focus on »Innovations in the didactic of natural sciences - gain of scientific knowledge using the honeybee model organism« Christoph Bauer (vice chairman of BeeBIT e.V.) presented the possible use cases of eHives in school classes and in small research projects in front of university students.

### Science On Stage Berlin

In November 2018 Dr. Monika Fröhlich and Christoph Bauer were invited to the national »Science on Stage« festival in Berlin. There they presented innovative teaching methods in front of German teachers. These methods are related to the eHive project. On top of that, experiments about conditioning and the making of durable biological preparations were shown.

### Journal article in »Biologie 5-10«

The article »Varrose online erkennen« (»Detect the varroa disease online«) was written by Isabelle and Christoph Bauer and published in the journal »Biologie 5-10« of the Friedrich Verlag. In the article a lesson is presented, that is based on the eHives' data. By comparing the weight diagrams of two eHives in the same time period, conclusions about the health of the corresponding bee colonies can be deduced. The article can be downloaded here (only available in German).

## eTwinning

The eTwinning platform of the EU allows European students from different countries to work together on educational projects. It will be possible to use the eHives' data for establishing a collective ›bee project‹.

BeeBIT already received the first requests concerning this topic. If you are interested in such a project, we would be happy to offer you support.

## Versions of the eHive

The first eHive with version number 0.1 was built by a school seminar of the ›Deutschhaus-Gymnasium‹ in Würzburg back in 2014. This prototype was stocked with bees and operated for one year. During operation, data was collected on location. In 2015 it was replaced with the eHive 0.2 that was built in cooperation with the ›Franz-Oberthür-Berufsschule‹. This version was shipped to our partners from the EU project. At first, it did not work properly, but until April 2016 amendments were applied. Since then the eHives work comparatively stable.

Since 2017 eHives are distributed by the BeeBIT association. After the first two eHives, the design was slightly changed, but the functionality stayed the same. Hence, the eHive 1.2 is the only one that can be purchased at the moment. The weather station at all different versions of the eHive is the ›Davis Vantage Pro 2 Plus Cable‹. CAD models of the eHives are shown in Fig.1.

### eHive 0.2

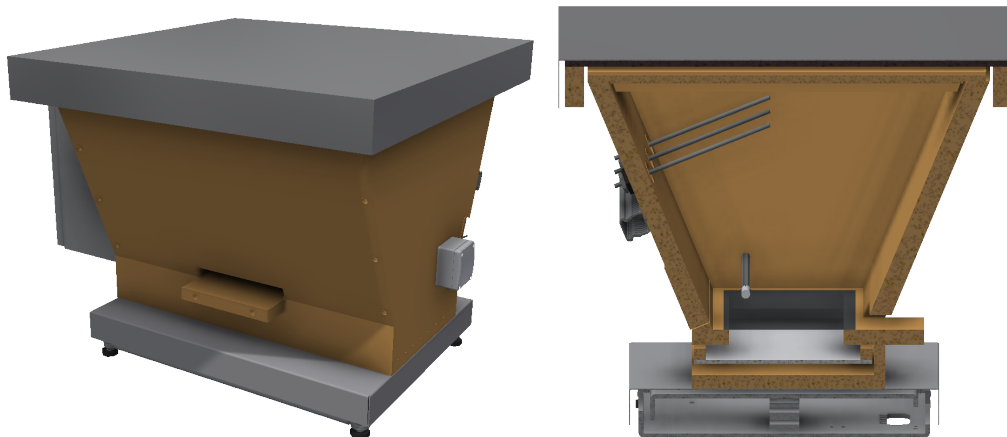
The eHive 0.2 exists in two models: As ›Zander‹ hive (eHive 0.2.1) and as ›Top-Bar-Hive‹ (eHive 0.2.2). At the beginning all eHives were Top-Bar-Hives, because these allow the bees to live closer to nature. A small hive with 13 not-preshaped honeycombs was used. In it six temperature sensors were obstructed and one outer honeycomb was replaced by a wooden separation board in order to distribute the sensors symmetrically. A humidity sensor is installed in the lower part of the hive.

The sensors' data go through a junction box on the side of the hive and are guided from there by a water-resistant RJ-45-cable with screw connectors until the data ends up in the actual junction box that contains all the electronic components. At some eHives this box is mounted on the other side of the eHive, at some it is attached to different support structures or is laying on the ground.

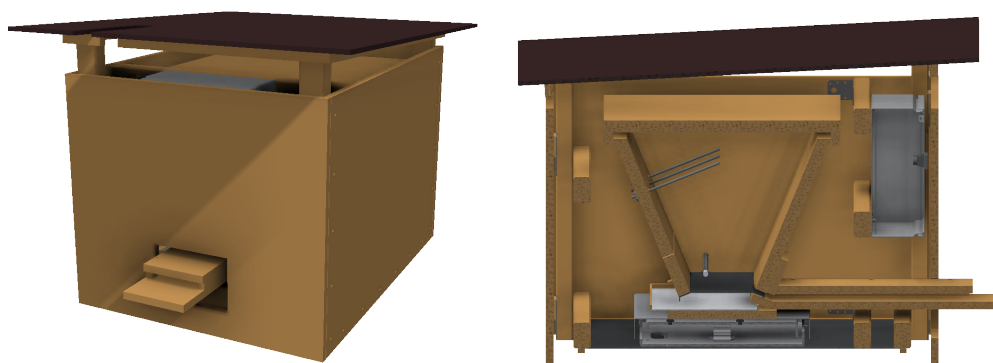
To offer compatibility with other hives some of the eHives were converted to other hive-types (other than the Top-Bar-Hive). During conversion only five temperature sensors were installed due to spatial limits. The weather station was attached to an external support. This produced different heights of the weather stations and their wind detectors and different distances to the corresponding eHive. For weather protection a roof had to be provided by the local institution. It was not possible to enforce this on all location.

### eHive 1.1

The two hives of version 1.1 were built in early 2017 with the most striking change being the new wooden outer case. It contains the eHive and all electronic components and serves as a weather protection. At this outer case the attachment for the weather station is mounted. The height of the weather station was defined to be 2 m and the height of the wind sensor 10 m. Both eHives are built as Top-Bar-Hives and have the dimensions of a Zander hive for 12 honeycombs at the top part. Between the combs six temperature sensors are installed. Both the temperature sensors' connection cables as well as the cables from the humidity sensor, the scale and the weather station are guided directly to the central junction box. This avoids unnecessary causes of defect. Because no more eHives of version 1.1 are planned, this version does not exist in other hive types than the Top-Bar-Hive.



(a) eHive 0.2.2



(b) eHive 1.1



(c) eHive 1.2 (without inner hive)

Fig.1: CAD models of the eHives.

## eHive 1.2

The eHive 1.2 is almost identical to version 1.1, only some changes at the outer case were made. It is enlarged by a removable heightening in order to support hive types with multiple honeycomb boxes. Furthermore, the roof is divided into two parts. This simplifies the usage and allows a waterproof lead through of the weather station's mounting rod through the smaller non-removable roof. The first eHive of version 1.2 was shipped in early 2019. Since then, it can be purchased with different hive types (almost all popular types as well as Top-Bar-Hive).

## New designed website

On the 1<sup>st</sup> of march a new designed website was launched at our web address <https://beebit.de>. The diagram viewer (<https://beebit.de/diagram>) and the teaching resources management system (<https://beebit.de/trms>) were unaffected by this.

Since many month, we thought about a new design for our website and tried to expand and renew the published information. With the new website, a blog system was implemented in which small or big news can be released easily. At <https://beebit.de/en/blog> you find worth reading articles from the up-to-now spreaded newsletters. In future, the new written and published articles will be summed up to big newsletters in regular time periods. This provides the chance for you to access news on the blog directly without having to wait for a newsletter. In consequence, you can read the articles shortly after they are written.

Furthermore, the start page contains a new feature: a table with informations about the technical state of the eHives. As you may have noticed, not all eHives send data. We tried to make the reasons for this transparent in the table. It will be updated in regular time periods.

On the old website all up-to-now released newsletters could be accessed. The new blog system makes this largely unnecessary. However, if you wish to read the old newsletters, they can be downloaded by clicking on the following links. You will be redirected to the corresponding PDF file on our server.

- Newsletter August 2015 (EN)
- Newsletter August 2015 (DE)
- Newsletter November 2015 (EN)
- Newsletter November 2015 (DE)
- Newsletter January 2017 (EN)
- Newsletter January 2017 (DE)
- Newsletter April 2017 (EN)
- Newsletter April 2017 (DE)

Please keep in mind that the old newsletters may contain outdated information. Up-to-date informations about the eHive project can be found for example on the FAQ page of the website at <https://beebit.de/en/faq>.

The BeeBIT Team

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