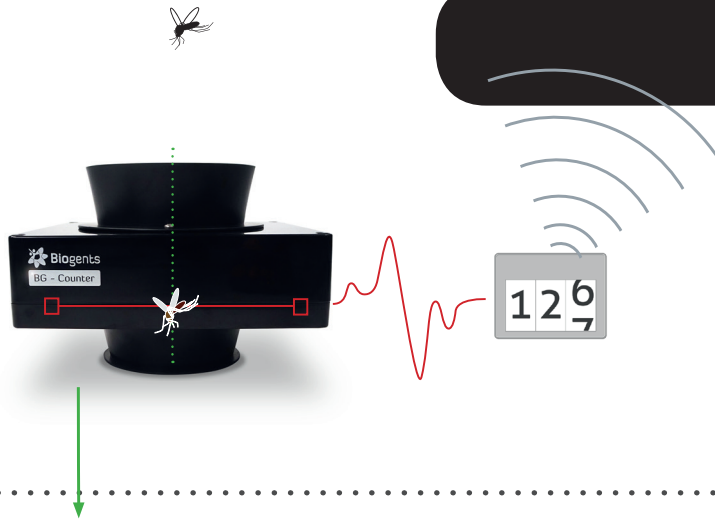




BG - Counter 2 App

(EN) Instruction Manual for the BG-Counter App

Updates for this manual and the complete BG-Counter manual is available online » <https://eu.biogents.com>

Status: October 2023

BG-Counter 2™

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Description of the BG-Counter App

The BG-Counter App is a multifunctional tool that allows you to manage your BG-Counter/s. You can for example remotely switch traps in the field on and off and set up varying time schedules for the traps and application times of CO₂. There are dashboard notification icons, when one of your traps has an issue, such as for example connection problems, ventilator fail, or low CO₂ level. Furthermore, you have access to all collected mosquito count data, and local environmental data such as temperature, humidity, or ambient light. The web

app includes an analyzer tool that you can use for exploratory analysis of the catch count data of single or multiple traps. You can for example compare the mean catch rates of different neighborhoods, or simply visualize the mosquito catches of a single trap on different time ranges and for different temporal aggregations (e.g., 15 min, 1 day, 1 week or 1 month).

The address of the BG-Counter web app is:

» <https://bg-counter.biogents.com/app>

System Requirements

The BG-Counter App is optimized for usage on a screen with a diameter of at least 13 inches. We therefore recommend using a laptop or desktop computer.

Windows PC with Windows 10

Browser: Google Chrome, Firefox, or Edge. Internet Explorer is not supported.

Macintosh with macOS X 12 or later

Browser: Google Chrome, Firefox, or Safari.

Registration: New Customer

Go to » <https://bg-counter.biogents.com/registration/>

The "New Customer Registration" page has the fields specified below that you should fill in. The fields marked with an asterisk are mandatory to fill, while the others are optional.

- Personal Information*
- Mailing Address
- Technical Contact
- Billing Contact

After clicking the "Confirm" button, a new account is created. You will receive a confirmation e-mail (please have also a look for the e-mail in your spam folder). Follow the e-mail verification link. After verifying your e-mail and setting a password, you can access your account at:

» <https://bg-counter.biogents.com/app>

Registration: New Trap

Go to "Traps" and click on the blue "New Trap" button in the top right corner of the screen. Enter one or multiple IMEIs (comma separated) in the field. Click the blue "Assign" button to register your BG-Counter(s). You find the IMEI on a sticker

at the side of the BG-Counter 2, on a sticker on the registration flyer in the BG-Counter 2 box, and at the side of the BG-Counter 2 box.

BG-Counter App: Quick Start

- go to “**Dashboard**”, then click on a location name, then on the “**View/Edit**” button to set the trap name, schedule, mosquito catch threshold, custom groups, etc.
- go to “**Traps**” to check the subscription status of your devices, to assign a manually created location to an IMEI, to register traps, to change the geolocation mode of your traps.
- go to “**Users**”, then click on the “**New User**” button to invite other users
- click on “**Analyzer**” to analyze your data (charts, tables, and maps)
- go to “**Profile**” to set a new password for your account

Basic Concepts

Trap

On the website and in these instructions, the word “trap” refers to a complete system including a trap (BG-Pro or BG-Sentinel) and a BG-Counter 2. Each trap is uniquely identified by the IMEI of the BG-Counter 2.

Location

Each trap is assigned to a location – the place where the trap is installed to count and collect mosquitoes.

IMEI

IMEI stands for International Mobile Equipment Identity. Think of it as your BG-Counter’s fingerprint — it’s a 15-digit number unique to each device.

Info Icons

You find info icons at several places of the web app. Hover over the icon with the mouse and a window with more information will pop up.

Geo-tags

Each Location automatically gets the geo-tags “Country”, “State”, and “City” assigned.

There are two additional geo-tags that you can define yourself: “Custom Group 1” and “Custom Group 2”. If you have multiple traps in the same city, you could, for example, use “Custom Group 1” to specify the neighborhood, and “Custom Group 2” to characterize the biotope, such as for example: suburban, urban, forest, lake, swamp, park, or similar. It is not mandatory to assign your locations to custom groups. The geo-tags allow you to make group-based analyses of your catch count data.

Tables

Sorting function

All tables include a sorting function for every column: click on the arrow that appears, when you hover with the mouse over the name of each column. When you click on the arrow for the first time, it will show upwards and sort the table in an ascending order. When you click on the same arrow again, it will point downwards and sort the table in a descending order. This function is helpful if you have many traps and want to easily identify for example those traps, that have error notifications, or traps that had an unusually high or low catch rate in the previous night.

Search function

All columns that have a magnifying glass icon include a search function: click on the magnifying glass and type in some info that makes it easier for you to find the desired trap/s. For example, in the dashboard, you can specify in the “Catch Count” column, that you only want to see the traps that collected between 150 and 200 mosquitoes since last noon.

Data storage based on Location

Trap counts, environmental data, and other parameters like CO₂ schedule are stored by location. Traps can be assigned to locations manually, or automatically using transmitted GPS coordinates.

When Geolocation is set to "Auto" (= default setting), the location will be automatically determined via geofencing:

- When a trap is within the geofence radius (100 m) of an existing location, it will automatically assign itself to that location
- Otherwise, a new location will be created automatically with a default name that includes the IMEI.

When Geolocation is set to "Fixed", the trap data will be assigned to a selected location independent of transmitted GPS coordinates.

You can edit a location at any time in the Trap Info table of the "Settings: Single Locations" page (see p. 10 for details).

Examples: What does data storage based on location mean for you

These examples are also explained in the video linked on page 39.

Example 1: You have several traps, but you use them only during a part of the year.

At the start of the new season, when you put the traps back to the field at already existing locations, set geolocation to auto and the traps will automatically assign themselves to their locations. You don't need to make sure that a BG-Counter 2 unit with a certain IMEI is placed again at the same location, to have a continuation of historical data.

Example 2: You have more locations than traps and rotate the traps between them.

The collected data will be automatically stored for the location the trap is currently at. Instead of having all the data stored for one IMEI, it is stored for as many locations as the trap was used at.

Example 3: A BG-Counter 2 is defective and replaced. The new BG-Counter 2 is placed at the same location.

The data of the two BG-Counter 2 units (e.g., 2 IMEIs) will be stored for the same location and you will have continuation of your historical data for that location.

Example 4: You need to place two traps within 100 m.

This is also possible, but we recommend creating the locations manually in this case: Click on the "New Location" button above the Location Table of the dashboard. Use Satellite View to determine the exact position on the map and use the right mouse button to set the Location pin on the map. In the "Trap Management" table (main menu: "Traps"), set Geolocation to Fixed and select the location for each trap from the drop-down list of the "Current Location" column.

Main Menu - Overview

Dashboard

- Overview of all locations: Location Table -> identify locations with a high catch count or counters with issues (such as fan fail, low CO₂, etc.)
- Access to the Location Summary Page: Catch Count graph, trap status parameters, Location Info table, and Catch Statistics
- Access to the Settings page (for one or multiple traps)

Analyzer

- Overview table: Choose which location/s or group/s you want to analyze
- Analyze your catch data for different time ranges and temporal aggregations (15 min, 1 Day, 1 Week, 1 Month) in graphs, tables, and maps.
- Data download (raw data).

Traps

- Trap Management table: A list of your traps with information on subscription status, IMEI, Location, Geolocation, diagnostic information, etc.
- Register new BG-Counters

Users

Invite users and give them a role ("Administrator", "Operator" or "Observer").

Profile

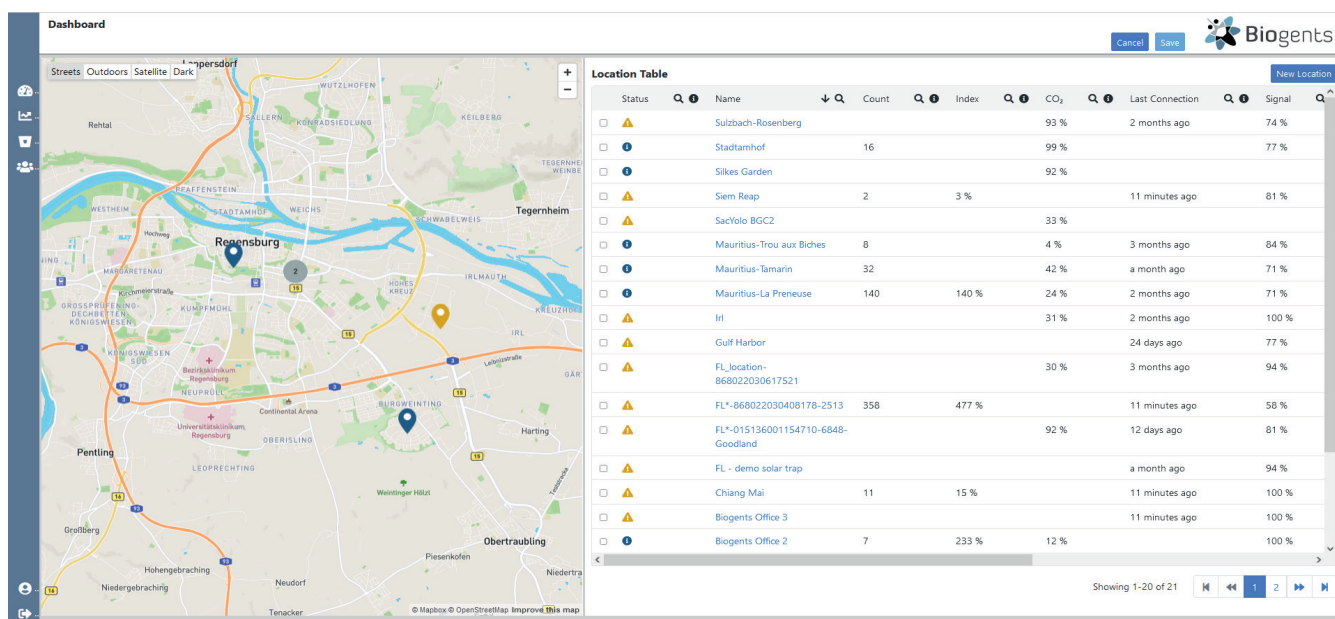
Set a new password

Logout

Logout, or change your login in case you have multiple accounts (for example, you are Admin of a set of traps, but for another e-mail address of yours and another set of locations, you were invited as an observer).

Dashboard

When you access the dashboard (figure below), you get an overview of all your locations in the form of a map and a table. Every pin on the map refers to a trap location, and the color of the pin refers to a notification warning level.



Location Table

The Location Table gives an overview of your locations and helps you to plan your operations, as it includes relevant information such as the catch count since last noon, warning icons, info about signal strength, voltage range and similar. You can sort the Location table by every column by clicking on the arrow that appears, when you hover with the mouse over the name of each column. This function is helpful if you have many traps and want to easily identify for example those traps, that have warning notifications, or traps that had an unusually high or low catch rate in the previous night.

The table includes the following columns:

- **Status:** Color-coded icons. When you hover over a yellow, blue, or red warning icon, the type of warning is displayed.
 - » **Green:** everything is functioning
 - » **Blue:** Info such as "No trap currently assigned", "Trap assigned but no transmission received"
 - » **Yellow:** Warning such as "No connection in the last 8 – 24 h", "CO₂ supply at < 25%"
 - » **Red:** Error message such as "Refill CO₂ (very low or empty)", "Subscription expired, transmission disabled", "Trap fan failure detected!"

You find more detailed information on the dashboard warnings in the section "Troubleshooting" of the complete manual.

- **Name:** Location name. Automatically or manually assigned. Click on the name of a specific location to access the Location Summary page.

- **Count:** Number of mosquitoes counted since last noon.
- **Index:** Number of counted mosquitoes in relation to set **Mosquito Catch Index Threshold**. The field remains empty if you did not specify a threshold. The Mosquito Catch Index Threshold is an integer number (> 0) that you can specify for each trap. You can set a threshold on the settings page that you reach by clicking the blue "View/Edit" button next to the Location Info table (see p. 8).
- **CO₂:** Estimated CO₂ level of the cylinder. To get a good estimate, make sure to always inform on the settings page when you refill CO₂. Also make sure to select the correct cylinder size and the desired flow rate.
- **Last Connection:** The last time when data was transmitted.
- **Signal:** Strength of the transmission signal.
- **Voltage Range:** Min and max supply voltage in the past 24 h. Fully charged battery: >12.8 V. Battery draining or inadequate solar charging: < 11.5 V. The counter will be turned off when the voltage drops to less than 11.2V to protect the electronics. Once turned off, the counter remains turned off until the voltage builds up again to 11.8 V.
- **Fan Status:** Either "On", or "Fail". Fail: currently turned on but no current detected (fan is either defective or not powered).
- **Fan Current:** Current that is drawn by the trap ventilator. Normal range: BG-Pro: 250 mA +/- 20 %. BG-Sentinel: 400 mA +/- 20 %. < 50 mA: fan is either turned off, not connected, or defective. Reading suddenly exceeding normal range: fan blocked by twig or similar.

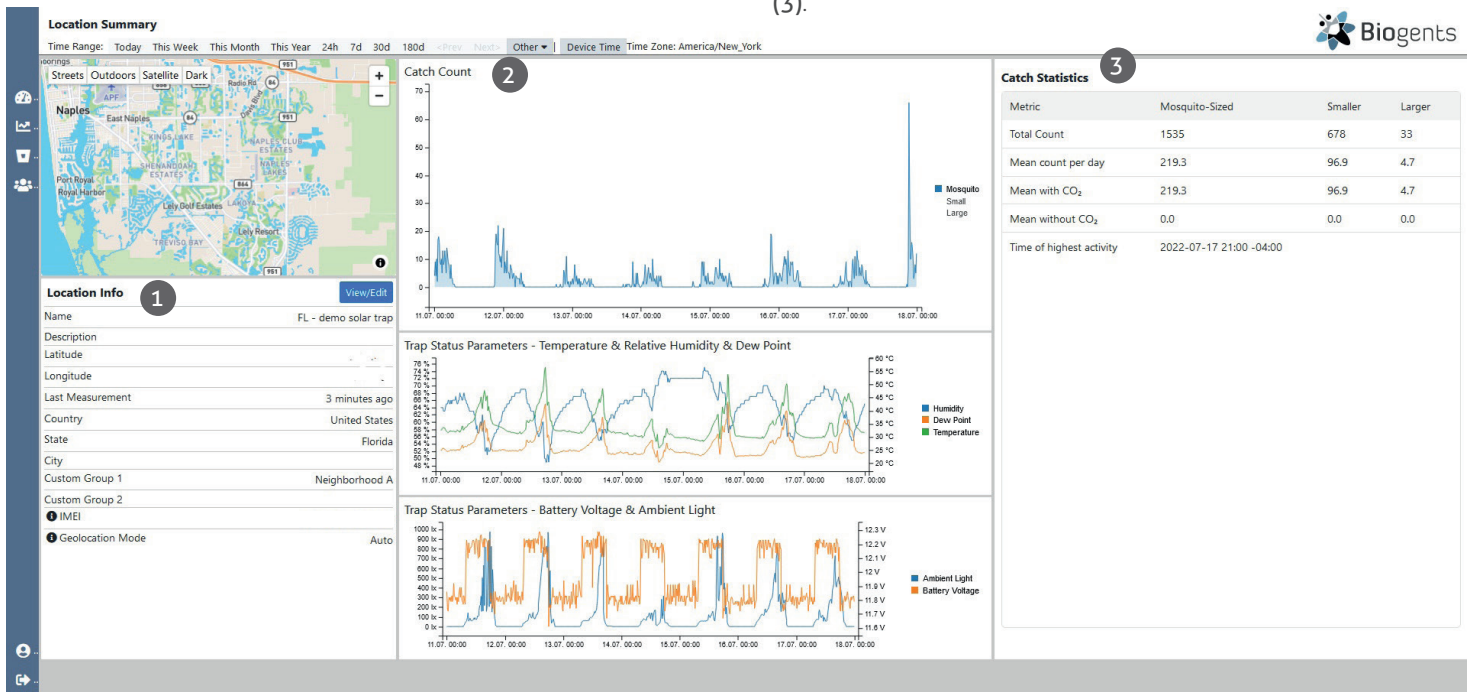
Location Summary Page

There are two ways to access the Location Summary page of a specific location. Choose a location in the table and click on the blue text in the "Name" column. Alternatively, click on a Location on the map. A window with the location name appears. Click on the blue location name.

The objective of the Location Summary page is to give you a comprehensive overview of all location attributes and key

trap parameters to make sure your trap is functioning as planned. When errors occur, this page can help you to pinpoint, when and why certain problems came up.

The Location Summary page (figure below) includes the **Location Info table (1)** with details about the location, a **graphical overview of your catch counts (2)** and **different trap status parameters** (temperature, relative humidity, dew point, battery voltage, ambient light), and the **Catch Statistics table (3)**.



Location Info table

This table (1) provides an overview of relevant information for the location. You can change some of these parameters on the settings page that you reach by clicking the blue "View/Edit" button next to "Location Info":

- **Name:** Every trap has an automatically assigned location name that includes the IMEI and geographical information. Click on the field to change this name in a way that makes it easy for you to identify the trap e.g., the location.
- **Description:** If you want, add a description to your trap such as for example "close to a forest", "airport", "university campus" or whatever best describes the location.
- **Latitude and Longitude:** can be adjusted, by either typing in correct coordinates in the two fields (after clicking the blue "View/Edit" button) or by moving the location pin in the map to the exact location.
- **Last Connection:** The last time the trap successfully connected and sent data.
- **Country:** The country of the location (geo-tag, automatically assigned by geolocation).
- **State:** The state of the location (geo-tag, automatically assigned by geolocation).
- **City:** The city of the location (geo-tag, automatically assigned by geolocation).
- **Custom Group 1:** Geo-tag. Shows a name if the trap was assigned to a custom group (for example: neighborhood, name of a region, biotope, etc.). This field is not editable. To assign this trap to a custom group, click on the blue "View/Edit" button to access the settings page. Note that you can conduct group-based analyses when you assign your traps to custom groups.
- **Custom Group 2:** See above. This is a second Custom Group that you can define.
- **IMEI:** Serial number (IMEI) of the trap that is currently assigned to this location; if empty, you can assign a trap in the Trap menu. This field is not editable.
- **Geolocation Mode:** Auto: trap has been assigned by Geolocation; Fixed: trap has been assigned manually. This field is not editable. You can change the geolocation mode in the Traps menu.

Graphs

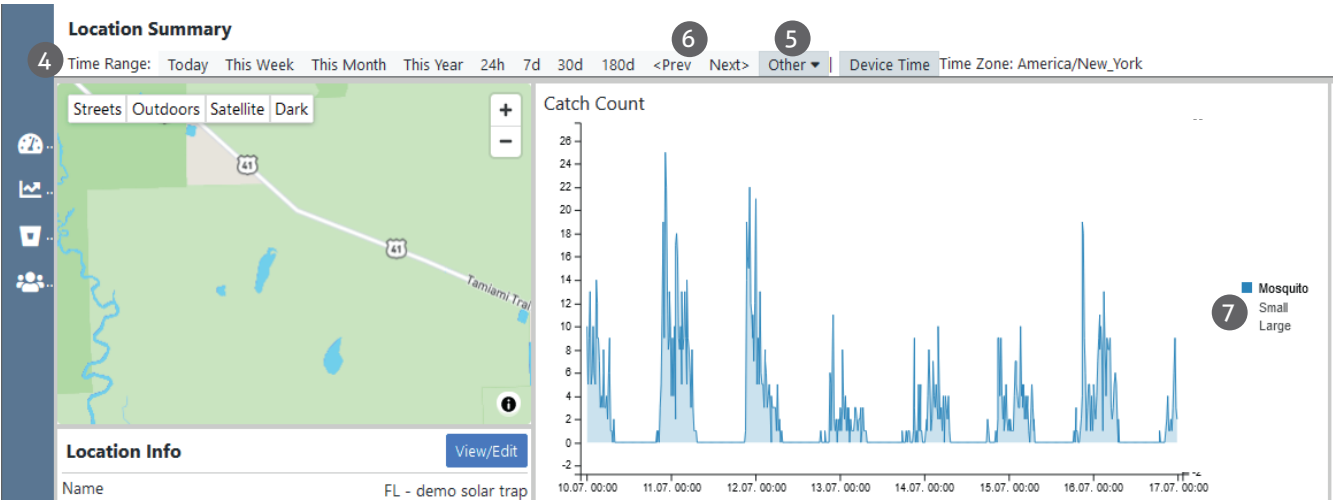
There are three line charts on the Location Summary page:

- "Catch Count" (2)
- "Trap Status Parameters - Temperature, Relative Humidity & Dew Point"
- "Trap Status Parameters - Battery Voltage & Ambient Light"

In the upper left menu, you can change the **time range** (4) of the x-axes of all three graphs. By clicking on **"other"** (5), you can specify a customized time range. When you select one of the time range options **"Today"**, **"This Week"**, **"This Month"**, or **"This Year"**, you can use the **<Prev** and the **Next>** buttons (6) to navigate from one day, week, month, or year to the previous or next day, week, month, or year.

The temporal resolution of the three line charts depends on the selected time range:

Time range	Data resolution	Catch Count Graph	Trap Status Parameters
1 day	15 min	Raw data	Raw data
1 week	1 hour	Sum	Mean
1 month	4 hours	Sum	Mean
> 1 month	1 day	Sum	Mean



The "Catch Count" graph shows mosquito counts by default, but you can click on **"Large"** and/or **"Small"** in the graph's **legend** (7), to add the count data of large and/or small objects. By clicking on a category that is currently shown in the graph, you can remove it. The same applies for the two other graphs.

For example, you can display only the temperature, humidity, or dew point, instead of all three at the same time. Use the scrolling wheel of your mouse to zoom in and out at specific positions in the graphs.

Catch Statistics table

The Catch Statistics table shows you the statistics of the chosen Time Range: Total Count of mosquitoes, small and large objects, the mean count per day (if time range > 1 day), mean count with and without CO₂, and the time of highest mosquito activity.

Catch Statistics

Metric	Mosquito-Sized	Smaller	Larger
Total Count	8	69	0
Mean count per day	8.0	69.0	0.0
Mean with CO ₂	2.0	12.0	0.0
Mean without CO ₂	6.0	57.0	0.0
Time of highest activity	2022-09-19 07:00 +07:00		

Settings Page

The settings page can be accessed for a single trap, or for multiple traps that you select via checkboxes in the Location Table.

Go to the Dashboard and click on the check boxes at the left side of the Location Table to select the location/s that you want to change settings. A blue "View/Edit" button will appear in the top right corner of the screen. The number in brackets behind "View/Edit" indicates the number of traps that

you selected. Click this button to access the settings page. When accessing the Settings page for multiple locations, all setting changes will be applied to all selected traps at the same time. Be sure to carefully select the traps when you want to apply the same settings to multiple traps.

For a single trap you can alternatively access the settings page through the blue "View/Edit" button next to the Location Info table of the Location Summary page.

Settings: Single Location

The settings page for a single location is divided in two parts. At the left, you find the "Location Info" table, as explained above for the "Location Summary" page. You can edit some of the fields:

- **Name:** choose a name for the Location. This name will appear in the Location overview table and in the analyzer overview table.
- **Description:** You can add an additional description to this location. The description is only visible at the Location summary page.
- **Latitude and Longitude:** Here you can manually fine-adjust the trap position. You can also use the mouse to move the position pin on the map. Fine adjustment of the position is also possible when geolocation mode is set to automatic.

Location Info	
Name	Biogents Office 2
Description	
Latitude	49.014238
Longitude	12.110050
Country	Germany
State	Bavaria
City	Regensburg
IMEI	
Geolocation Mode	

Settings: Selected Locations

The settings page for selected locations looks a bit different: Instead of the location info table, there is a list (Selected Locations) of the traps that you have previously selected by using the checkboxes of the dashboard location table. All settings that you change on the Settings: Selected Locations page will apply to all of the locations that you have selected.

Changing settings for multiple traps at the same time can be very convenient if you have many traps. For example: If you want to assign 20 of your traps to the same custom group, and another 30 traps to another, you can accomplish the assignment of 50 traps in only 2 steps.

Selected Locations		
Name	↑	IMEI
Beratzhausen		86014
Biogents Office 3		86758
Chiang Mai		86705
Siem Reap		86758

Settings: Single Location & Selected Locations

The following settings can be edited for single and multiple locations: CO₂ Settings, Geo Location Tag Settings, Schedule, Mosquito Catch Settings, Communication Settings, and Ambient Light Settings.

Click on “Save” (8) to save your changes. Click on “Cancel” (9) if you want to come back to the previously saved settings.

CO₂ Settings

The field “CO₂” in the Location Table of the dashboard provides an estimate for the current fill status of the CO₂ cylinder. For the estimate to be correct, it is necessary to have a fixed schedule, and you should make sure to always indicate when the cylinder was last filled: When you replace the CO₂ cylinder, click on the blue “Fill CO₂” button (10). This will also set the field “CO₂ Last Filling”. Please note that after clicking the “Fill CO₂” button, the dashboard “CO₂ level warning” might still be visible for up to one hour.

Select the amount of CO₂ in your cylinder in the drop-down menu “Cylinder Net CO₂ Weight” (11).

Adjust the desired flow rate in the drop-down menu “Flow Rate” (12). The default setting is **50 g/h** as this is the **optimum to attract mosquitoes** while at the same time repelling other insects.

A high level of CO₂ also gives the best counting accuracy: CO₂ increases the trap’s specificity for blood-sucking insects, and it increases the overall catch rate of mosquitoes.

You can also select 10 g/h and 20 g/h; this will reduce the CO₂ flow but extends the time of CO₂ release of the tank filling. When selecting 10 or 20 g/h, the CO₂ flow is reduced by a shortened valve cycle time. Therefore, nothing needs to be changed on the pressure regulator of the CO₂ tank.

Geo Location Tag Settings

You can assign two custom geo-tags by writing it in the fields next to „Custom Group 1” and „Custom Group 2” (13). All locations with the same Custom Group geo-tag will be joined to a group. This is relevant for the Analyzer that allows you to analyze your traps based on groups. For example, you could give custom group names based on the location in a specific region (neighborhood name, strategic area, or similar), or by habitat (swamp, urban, suburban, forest). In the Analyzer, when selecting for example: Custom Group 1 = “Neighborhood A”, all locations that were assigned to “Neighborhood A” will be analyzed together (comparison of group members in a map, linechart, and table).

Mosquito Catch Settings

Set a threshold for a daily mosquito count (integer > 0). For example, if you consider up to 85 mosquitoes per day as tolerable for a certain location, insert “85” in the field next to “Mosquito Catch Index Threshold” (14). The analyzer makes use of the Mosquito Catch Index Threshold in the tables: For example, when you analyze a time range longer than 1 day, the table includes a column “N days above threshold”. The threshold map in the Analyzer section shows, which traps were above threshold. You can define different thresholds for each of your locations.

Communication Settings

This setting (15) determines how often the counter will try to connect to the website and transmit counts and other data. The default setting is 15 min. Other choices are every 1, 2, 4, and 8 hours. Independent of this setting, count data are always stored with 15-minute resolution.

The 15-minute setting is useful for diagnostics when the counter is first set up. However, during each transmission, mosquito counting stops for 15-120 seconds, depending on the cellular signal strength. This can result in a small under-counting error. To minimize this, a data connection period of 1 hour or longer is recommended for routine operation. A new setting is transmitted at the next data connection. This means that if previously the interval was set to 4 hours, and you now chose an interval of 1 hour, it may take up to 4 hours until the new setting is transmitted.

Ambient Light Settings

The BG-Counter 2 has a built-in ambient light sensor. We use this information to distinguish between day and night, so that the activity of day- and night-active mosquitoes can be visualized separately in the Analyzer.

In most cases, 0 lux (default setting) is the appropriate setting for the night. When a trap is placed at a location with a high level of nocturnal light pollution, 1 or even 2 lux might be necessary as a threshold. If you think your trap location is relatively enlightened during the night, access the Dashboard-Location Summary page and take a closer look at the Battery Voltage & Ambient Light graph. Check how many lux are registered during the night hours (check not only one, but several nights). If most of the time, your device registers 1 or 2 lux during nighttime, adjust the ambient light setting accordingly (16).

Schedule

The trap schedule (17) is used to control the operation of the trap: Here you can set a timer for the CO₂ release and the operation of the fan and the counter. For each 15-minute interval during a day, the on/off status can be selected: Click on the green, blue, or orange line at the time that you want CO₂ addition/Fan activity/Counter activity to start and pull it until the point that you want it to stop. To delete a time window, click on the green, blue or orange stripe to make it disappear.

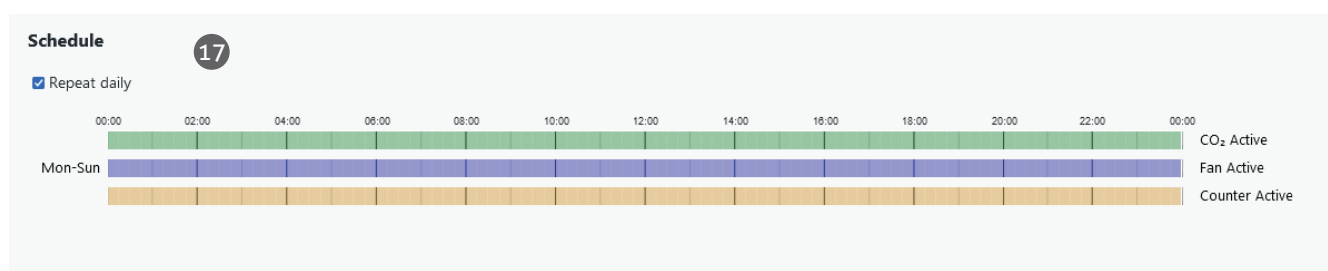
- CO₂: green = on, grey = off.
- Fan: blue = on, grey = off.
- Counter: orange = on, grey = off.

A new schedule is downloaded to the trap, and becomes effective at the time of the next data connection.

When starting a BG-Counter 2 at a new location, we recommend turning CO₂ on for 24 hours to get an idea for mosquito activity times. If you are only interested in the catch rates of mosquitoes during a specific time window, you can add CO₂ only during this time.

Please keep in mind that the catch counts from the time without CO₂ addition are less accurate and we recommend turning off counting whenever CO₂ is disabled. Also, whenever you disable the fan, make sure to also disable the counting function (otherwise you may count mosquitoes escaping the trap).

If you want to monitor the activity of mosquitoes only on certain weekdays, or when you want to have differing CO₂ schedules for different days of the week, uncheck the box next to "Repeat daily" and set up differing schedules for each day.



Save / Cancel

After making changes in your settings, be sure to click on the blue "Save" button in the upper right corner of the screen. If you don't want to save your changes, and want to come back to the previous settings, click on the blue "Cancel" button.

Analyzer

The Analyzer allows you to analyze your mosquito catch data in a more comprehensive way, than in the Dashboard:

- You can analyze single traps or compare selected traps with each other.
- Charts, tables and density maps help you to identify locations with high mosquito infestation.
- The “threshold map” shows, which of your traps collected on average more mosquitoes per day, than their specified threshold.

If you have many traps so that you have different geo-tags (“State”, “City”, “Custom Group 1”, “Custom Group 2”). You can either select one group or compare multiple groups with each other. For example: If you have the two categories “Neighborhood A” and “Neighborhood B” for the geo-tag Custom Group 1, you can compare the mean counts (Mosquitoes, small or large objects) of the two groups with each other, and compare all locations that belong to these groups with each other.

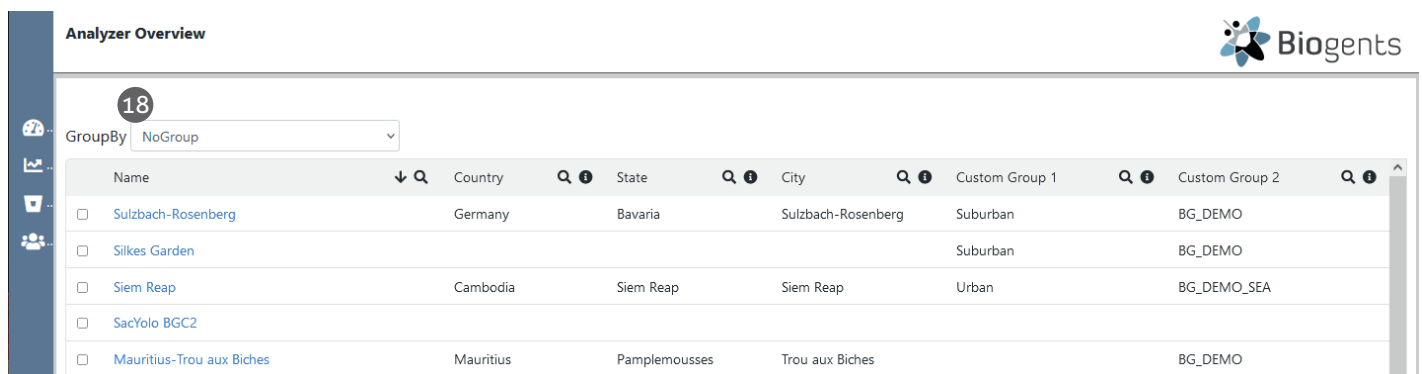
Analyzer Overview Table

When you access the Analyzer section, you see the “Analyzer Overview” table (see figure below). In this table, you choose which location(s) or group(s) you want to analyze.

Over the table, there is a drop-down menu “GroupBy” (18). In the default selection “No Group”, all of your locations are listed. The table shows, which geo-tags are assigned to each of your locations.

When you select **GroupBy = City**, you get a list of all cities, where you have traps.

By selecting **GroupBy = Custom Group 1**, you get a list of your Custom Group 1, and so on.



Name	Country	State	City	Custom Group 1	Custom Group 2
☐ Sulzbach-Rosenberg	Germany	Bavaria	Sulzbach-Rosenberg	Suburban	BG_DEMO
☐ Silkes Garden				Suburban	BG_DEMO
☐ Siem Reap	Cambodia	Siem Reap	Siem Reap	Urban	BG_DEMO_SEA
☐ SacYolo BGC2					
☐ Mauritius-Trou aux Biches	Mauritius	Pamplemousses	Trou aux Biches		BG_DEMO

Select what to analyze

Single Location

If you want to analyze a single location, the drop-down menu should be set to “No Group” (default setting). Click on the name of the location that you want to analyze to access the Single Location Analyzer.

Multiple Locations

If you want to compare two or more locations, the drop-down menu should be set to “No Group”. Check the boxes next to the location names of the traps that you want to compare. Click on the blue button “**Analyze (N)**” that appears on the top-right corner of the screen. “N” refers to the number of locations that you selected.

Single Group

Choose in the drop-down menu, which kind of group you want to analyze (Country, State, City, Custom Group 1, Custom Group 2). Click on the name of the group that you want to analyze to access the Single Group Analyzer.

Multiple Groups

Choose in the drop-down menu, to which category the groups that you want to compare belong to (Country, State, City, Custom Group 1, Custom Group 2). Check the boxes next to the names of the groups that you want to compare. Click on the blue button “**Analyze (N)**” that appears on the top-right corner of the screen. “N” refers to the number of selected groups.

Analyzer Settings

Once you have selected what you want to analyze (Single Location, Multiple Locations, Single Group or Multiple Groups), there are several global options available for your analyses. This means, that the displayed map, graph, and table change,

depending on what you choose in the analyzer settings. For example: when you select "Time Range = This Week", the line chart, the map, and the table will display the data for the present week.

Analyzer Single Custom Group 1: BG-Demo

Time Range:	Today	This Week	This Month	This Year	24h	7d	30d	180d	<Prev	Next>	Other ▼
Frequency:	15 Min	1 Day	1 Week	1 Month	Trap Day:	00:00 - 24:00		12:00 - 12:00			
Metrics:	Mosquito		Small	Large	CO ₂ Status:	All		On	Off		

Time Range

Choose the time range that you want to analyze. Default setting = Today. Further shortcut choices are "This Week", "This Month", "This Year", "24 h", "7 d", "30 d", "180 d". Click on "Other" to specify a custom day, week, month, year, or custom time range (day x – day x) in a pop-up window with drop-down menus. To make the pop-up window disappear, click again on "Other". When you chose one of the options "Today", "This Week", "This Month", or "This Year", you can use the <Prev and the Next> buttons to navigate from one day, week, month, or year to the previous or next day, week, month, or year.

Frequency

The frequency specifies, if and to what extend data points are aggregated. For example: the default frequency for "Time Range = 7 d" is "15 Min". This means that mosquito counts are displayed on the same resolution, as they are being collected (96 datapoints per day, 1 data point every 15 minutes). When you select frequency = "1 Day", the data is aggregated on a daily basis. This means that you will see 1 datapoint per day (sum of mosquitoes counted per day). The same logic applies for longer time ranges and the frequencies "1 Week" and "1 Month". Note that if your selected time range is longer than 1 month, the frequency "15 Min" cannot be selected.

Trap Day

This setting specifies how to define a day: either from mid-night to midnight (the conventional definition of a day), or from midday to midday. The latter might be of interest, if you're mainly interested in night-active mosquitoes and want to cross-reference your counter catches with other traps that you had running during the night. This setting can only be changed for Time range = Today.

Metrics

Choose what you want to analyze: "Mosquito" (=default), "Small" or "Large" objects. Note that in the single location analyzer, you can select up to three metrics at the same time. This is not possible when you analyze multiple locations or single and multiple groups. In that case, you can select one metric at a time.

CO₂ Status

Choose between "All", "On" and "Off". When you choose "On", only data points that were collected while CO₂ was "On" in your CO₂ schedule settings, are considered. Note that you must make sure, that your trap is supplied with CO₂. The trap has no sensor that determines if CO₂ was released when it was supposed to do so according to your schedule.

Analyzer Charts and Tables

Depending on what you choose to analyze, there are slightly different charts and tables available. In all charts, when hovering with the mouse over a single data point, additional information such as the time stamp and catch count appear in a pop-up window.

Under each chart, there is a table with complementary information.

The table always refers to the selected **time range**, and the displayed mean values change, according to the selected **frequency**.

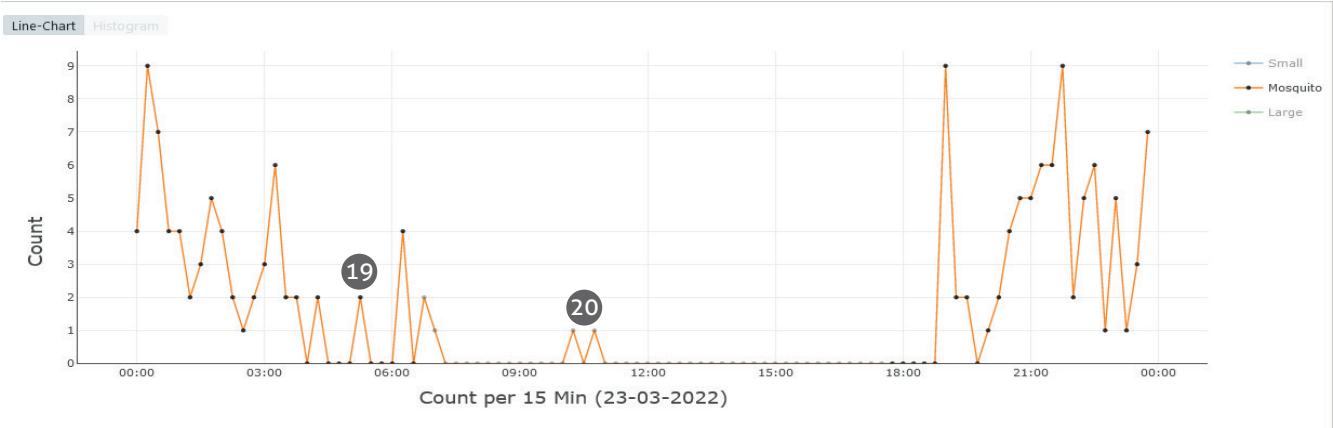
When analyzing a single location, the table below the graph always includes all three metrics.

When analyzing multiple locations or groups, the table will only display one metric at a time, and there will be one line for each location.

Single Location Analyzer

The default chart that appears once you access the Analyzer for a single location is a line chart of the current day, with a temporal resolution of 15 min. Hover over a data point and info about this data point will be displayed in a pop-up win-

dow. Black data points (19) refer to a 15 minutes time window, at which CO₂ was set "ON" in the CO₂ schedule, and grey points (20) refer to 15 min time windows, at which CO₂ was "Off", according to schedule.



When analyzing a single location, you can select multiple metrics (mosquitoes, small objects, large objects) to be displayed in the line chart at the same time. Select the metric/s that you want to be displayed in the global settings (21).

count per 15 minutes (or 1 day, 1 week, 1 month - depending on which frequency you select in the Analyzer settings) – for all data, and day-and nighttime separately. "N days above threshold" (24) indicates if / and on how many days the location was above the threshold (you can specify a mosquito catch index threshold in the settings). As it is not possible to define a threshold for small and large objects, the value in that column will always be a dash (not available). The last column indicates the day (or time) of highest activity.

Frequency: 15 Min 1 Day 1 Week 1 Month Trap Day: Midnight Midday

Metrics: Mosquito 21 Small Large CO2 Status: All On Off

Export Trap Data

Streets Outdoors Satellite Dark

Line-Chart Histogram

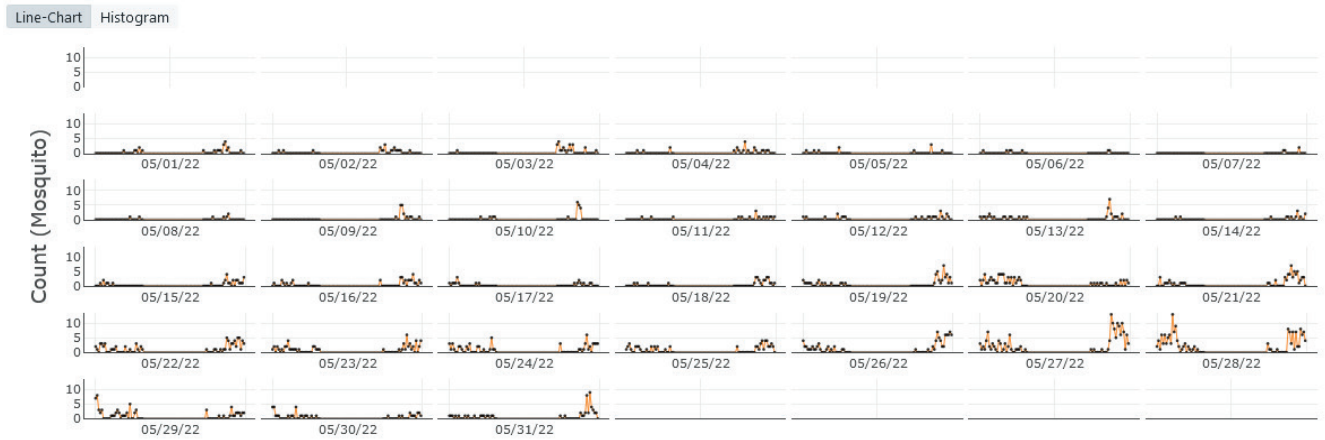
	22	23 Mean count per 15 Min			24	
Metric	Total Count	All Data	Day	Night	N days above threshold	Time of highest activity
Small	111	1.16	1.38	0.94	-	03/23/2022 13:00
Mosquito	154	1.6	0.1	3.1	1	03/22/2022 18:15
Large	1	0.01	0	0.02	-	03/23/2022 15:00
N datapoints	96	96	48	48		

15

Calendar view

When you select a time range of a month (or roughly a month, such as 30 d), and a Frequency of 15 min you get a calendar view multi panel plot of the data: every day is a little chart

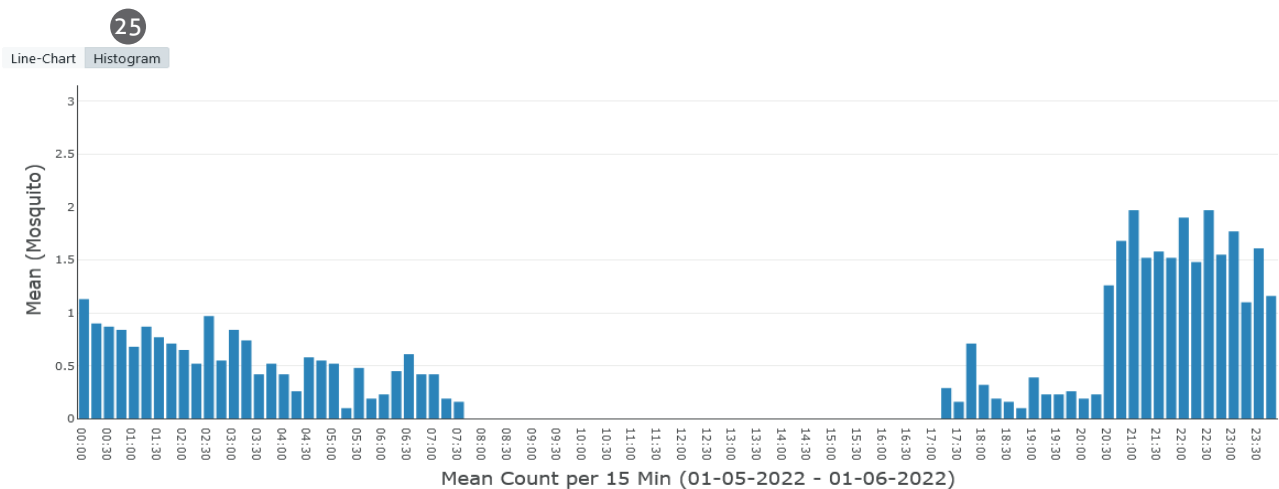
and each day's position is like in a calendar (from left to right: Sunday, Monday, ..., Saturday). The example below shows the custom time range Month = 2022-05.



Histogram

When your time range includes more than one day, and your selected frequency is 15 min, you can click on "Histogram" (25). You get a bar chart with an average count of mosquitoes at each 15 min time window. For example, when you analyze data of a 30-day time range and the trap was turned on all that time, you get for each 15 min time window the average number of mosquitoes collected at that time window (sum of

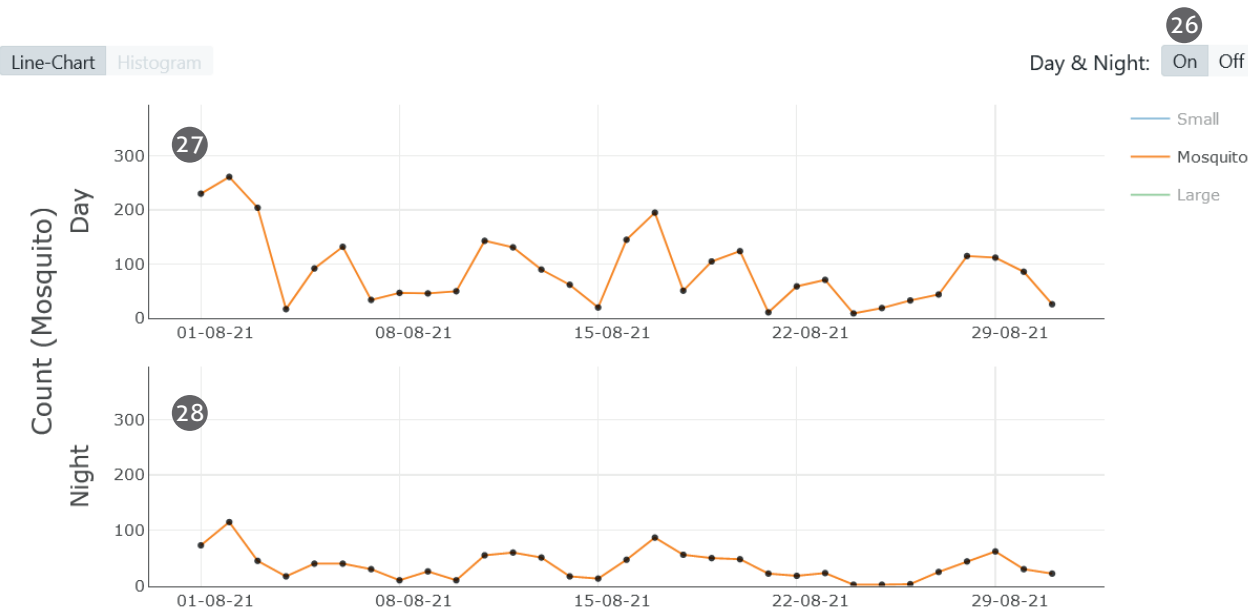
mosquitoes collected in 30 days divided by 30). In this way you can get a better idea of average activity peaks at your location. This can be helpful if you want to determine the best time for adulticide treatments, for example. The chart below shows what happens, when switching from "Line-Chart" to "Histogram" in the chart above:



Separated View of Day & Night Catches

When your selected frequency is "1 Day", "1 Week", or "1 Month", you can switch to **Day & Night = On** (26). In this case,

two graphs are displayed – one for the catches during the day (27), and one for the catches during the night (28).

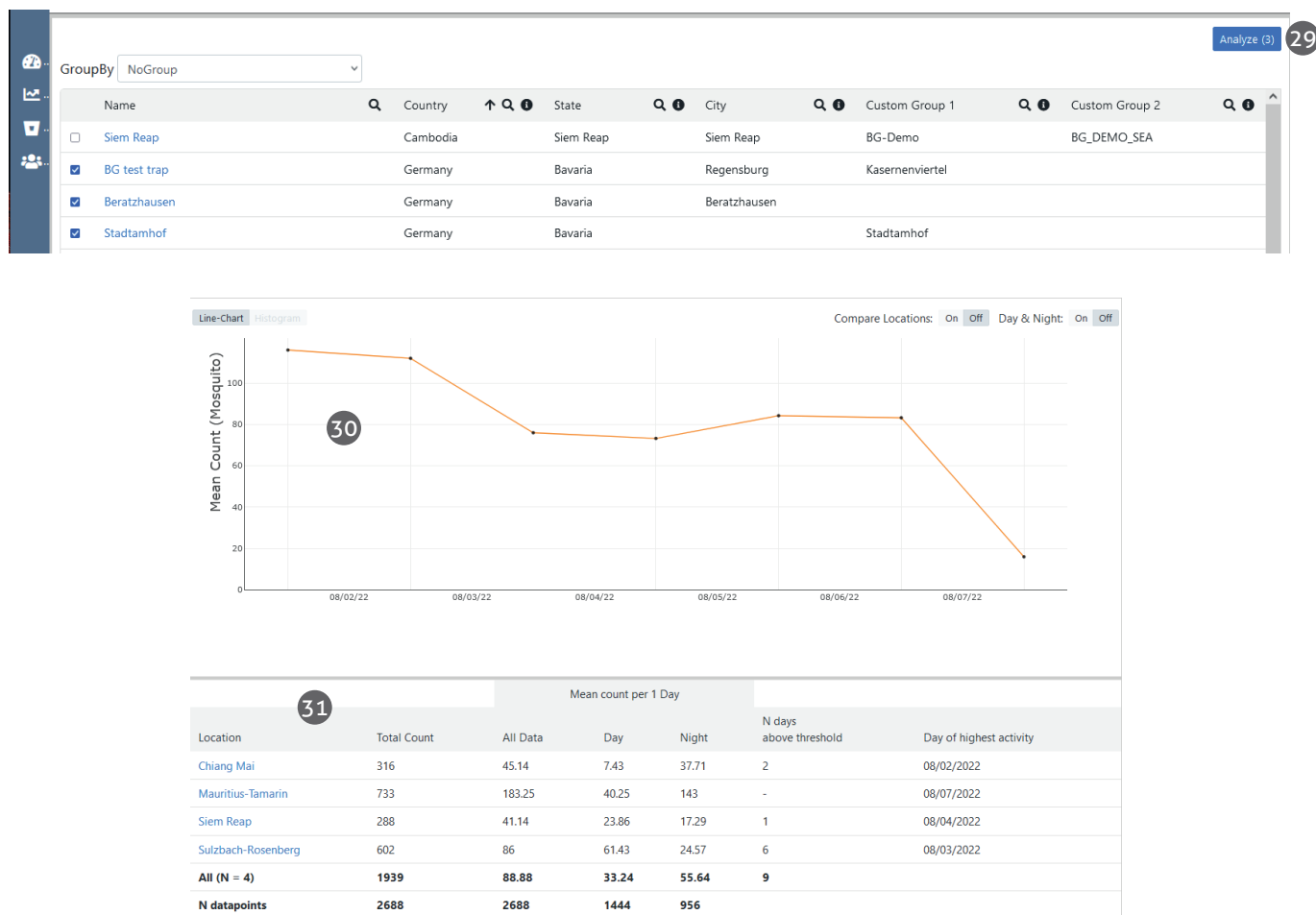


Multiple Locations Analyzer

To analyze multiple locations, go to the Analyzer Overview table, and check the boxes next to the location names of the traps that you want to compare. Click on the blue button "Analyze (N)" (29) that appears on the top right corner of the screen. "N" refers to the number of locations that you selected. The default chart (30) shows the mean number of

mosquitoes at each time point (sum of mosquitoes from all locations at the time point / number of locations that sent data for the time point).

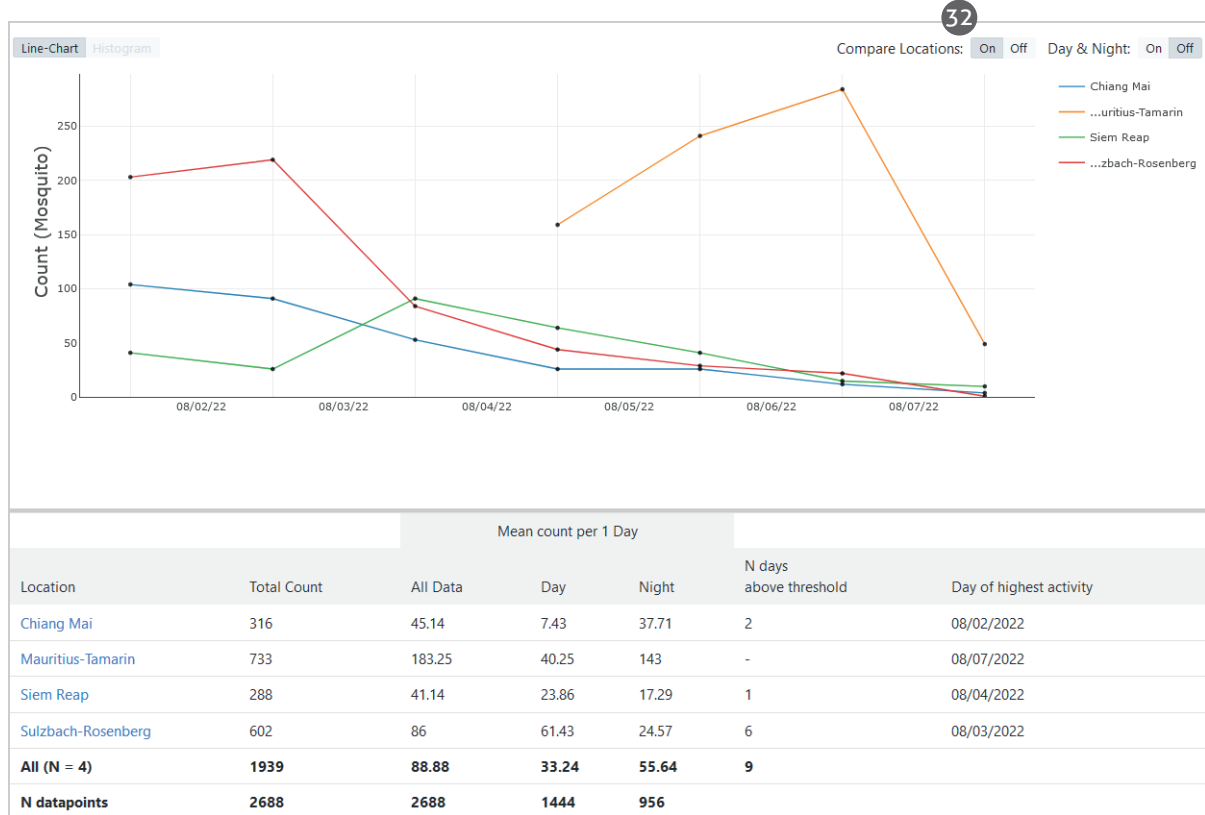
The table under the line chart includes a line for each of the selected locations (31).



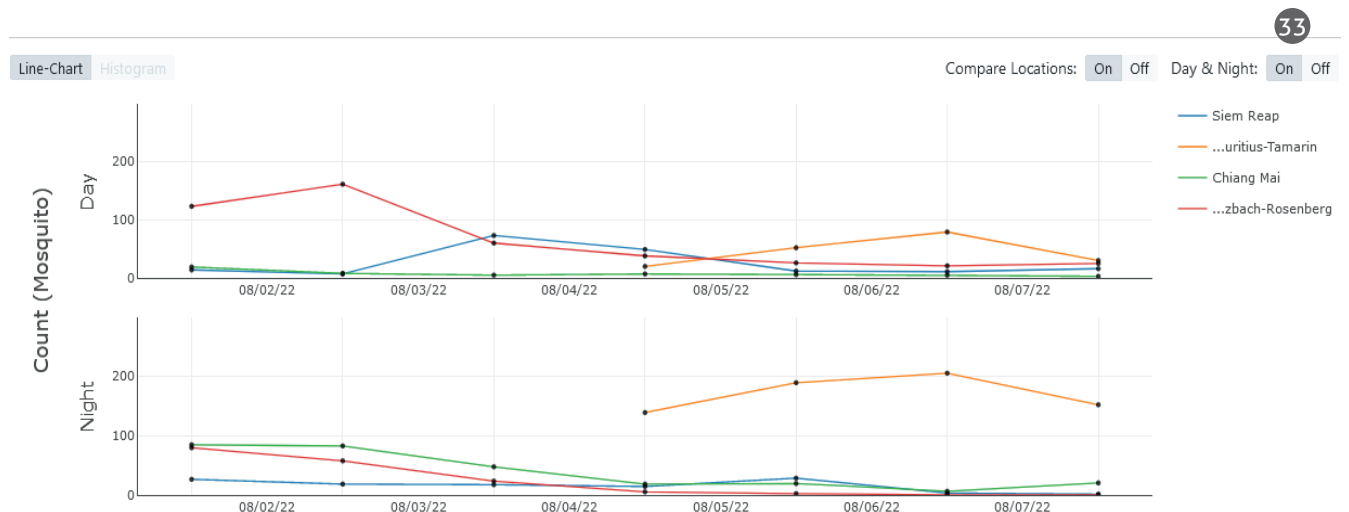
Direct Comparison of selected Locations

When analyzing a group or multiple locations, the switch "Compare Locations" appears in the top right corner of the chart. When you switch "Compare Locations" to "On" (32),

you get a chart with two or more lines (depending on the number of locations that you selected), each showing the mosquito count at each time point.



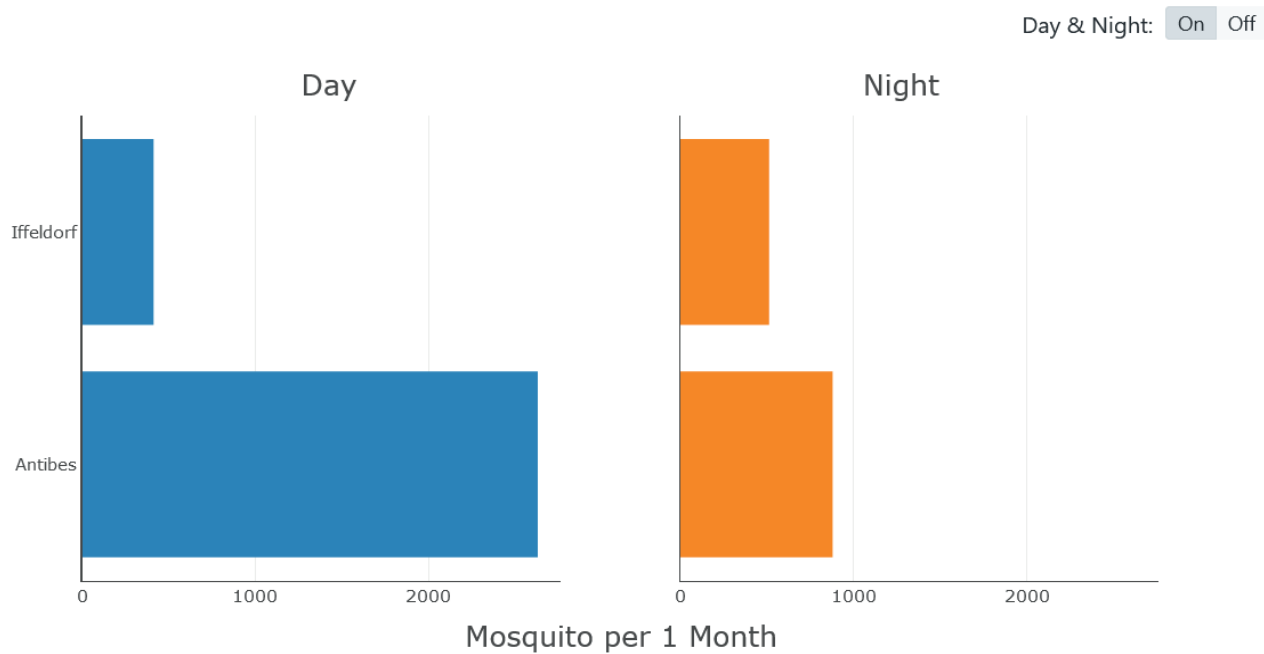
The option **Day & Night = On** (33) is also available when analyzing multiple locations. In this case you will get two charts: one for the catches during daytime, and one for the catches during the night:



Horizontal Bar Chart

For multiple locations (or groups), you can also select the same value for **Time Range** and **Frequency** in the Analyzer settings (for example: **Time Range = This Month & Frequency = 1 Month**). The result is a horizontal bar chart with the sum

of mosquitoes (or small or large objects) collected in the selected time range, for each location. The Day & Night option is also available for the horizontal bar chart.



Single Group Analyzer

The Single Group Analyzer is like a shortcut of selecting multiple locations: For example, instead of manually selecting all 10 locations that belong to a certain group, you can simply select that group:

Go to the "GroupBy" drop-down menu of the Analyzer Overview table and select the grouping factor. Then choose the group that you want to analyze, by clicking on its name. For example, **Custom Group 1 = BG-Demo**.

The four locations that were manually assigned to Custom Group 1 = "BG-Demo" will then be analyzed.

By default, you'll see a chart with the mean catch count of all locations that belong to the selected group. Like for multiple locations, you can switch "Compare Locations" to "On", to see a line for each of the locations

Analyzer Overview

GroupBy

Custom Group 1

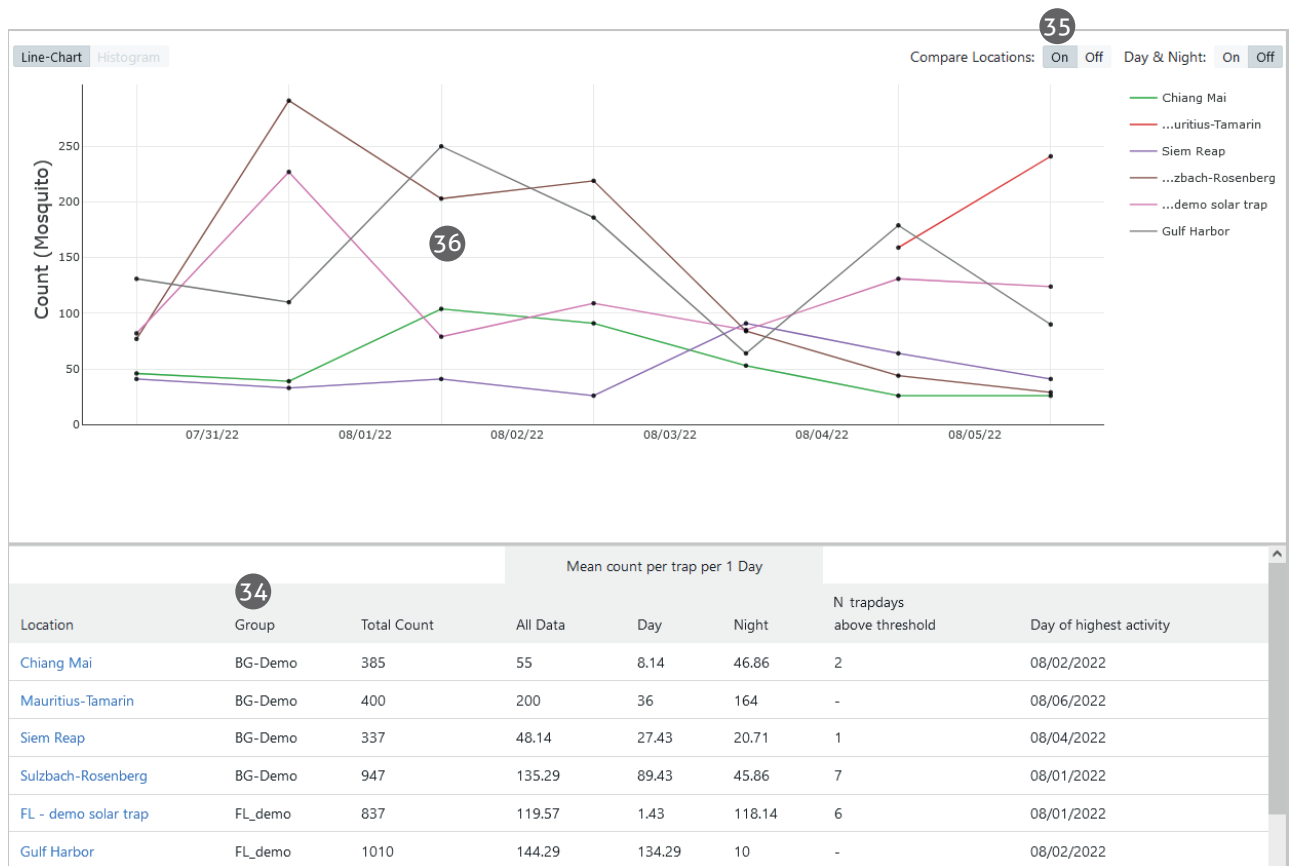
	Custom Group	↑	N Locations
☐	Beach		1
☐	BG-Demo		4
☐	FL_demo		2

Multiple Group Analyzer

The Multiple Group Analyzer is also like a shortcut of selecting multiple locations: For example, instead of manually selecting all locations that belong to two groups (with the same grouping factor), you can simply select these two groups. For example, if you want to analyze the two groups "BG-Demo" and "FL_demo" of the grouping factor **Custom Group 1**, go to the Analyzer overview table and choose "**Custom Group 1**" in the GroupBy drop-down menu. Then use the checkboxes to select "BG-Demo" and "FL_demo" and click on the blue "**Analyze (2)**" button in the top right corner of the screen. The number in brackets refers to the number of groups that you selected.

By default, you will see a chart with two lines: one line for the mean mosquito catch-count of all group members of "BG-Demo", and another line for the mean catch count of all members of "FL_demo". In the table below the chart, there is a line for all locations that are members of the two groups. The column "Group" (34) specifies to which Group each location belongs to.

Like for multiple locations, you can switch „Compare Locations" to "On" (35), to see a line for each of the locations that belong to the two groups (36).



Data Download

Data can be downloaded in their raw format. This means you will get for every location the data on a frequency resolution of 15 min. When you choose the group analyzer, the raw data for each location that is member of the group will be downloaded and there will be no data aggregation on group level. If you selected for example 3 single locations, or a group with 3 locations as group members, the downloaded excel file will contain 3 sheets: one sheet for each location.

Follow these steps to download your data:

1. Go to the Analyzer overview table and select the location/s or group/s that you want to download
2. Choose the desired time range

3. Push the blue "**Export Trap Data**" button in the top right corner of the Analyzer window

Your data will be downloaded in .xlsx format. The data for each location is stored on a separate sheet of the same excel file.

Important!

Please note that the download may take a while, when you select a long time range and/or many locations at the same time. Avoid to click the "Export Trap Data" button repeatedly for the same download request.

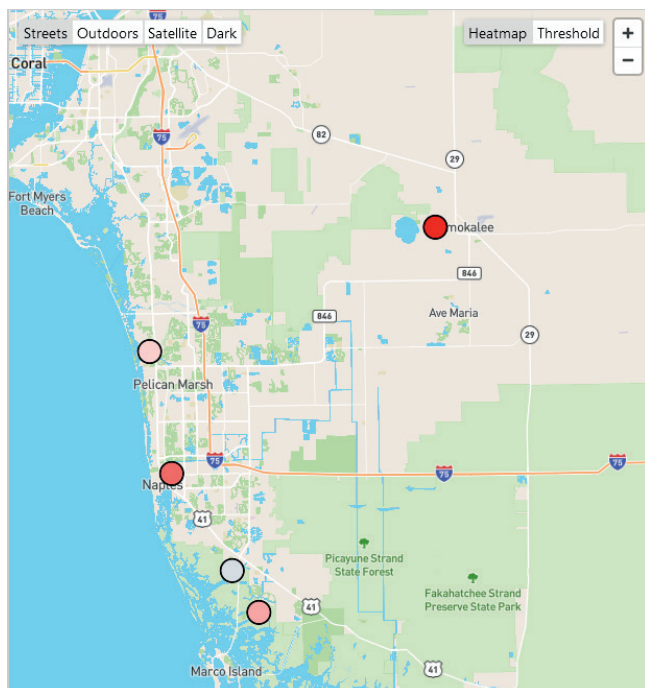
Mosquito Maps

When analyzing multiple locations, a group, or multiple groups, the mosquito **heatmap** and the **threshold map** complement your analysis by showing you the locations with high (or low) catch counts, or the locations with a catch count above threshold.

Heatmap

The heatmap is a map that shows the relative density of mosquitoes at each location. The map works for all time ranges and shows the **mean number of mosquitoes per day** for each location.

When selecting multiple locations, a group, or multiple groups in the Analyzer overview table, you'll automatically see this heatmap additionally to the line chart and the table.



The heatmap is available for mosquitoes, small objects, and large objects.

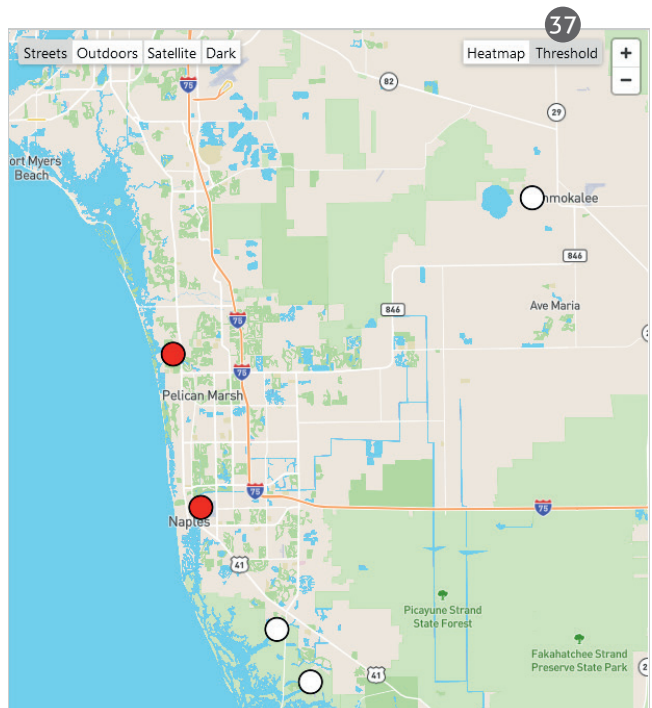
- **Red circles** (in different shades of red): Mosquitoes were collected at the location. The darker red the circle, the more mosquitoes were counted.
- **White circles** refer to zero mosquitoes.
- **Grey circles** appear, when there is no data available for a certain locations during the selected time range. This happens for example, when the BG-Counter was turned off, or moved to another location.

Threshold map

To access the threshold map, you have to click on **"Threshold"** (37) in the top right corner of the heatmap.

The threshold map shows, which of your locations are **above threshold**. This map also works for all time ranges.

When the selected time range is longer than 1 day, a location is considered as "above threshold", when the mean catch per day is above the defined mosquito catch index threshold.



The threshold map is only available for mosquitoes.

- **Red circles** refer to a location **above threshold**.
- **White circles** indicate a location **below threshold**.
- **Grey circles** indicate that there is **no data available**. That can happen when there is no threshold defined for this location, when the BG-Counter was turned off during the selected time range, or when there is currently no BG-Counter on this position.

To set a threshold for your locations go to the settings page that you can reach through the dashboard.

Traps

The traps page is where you go to when you want to register a BG-Counter. It also includes a list of your traps with a variety of information. The objective is to give you a comprehensive

overview of details for each BG-Counter (as defined by IMEI). As each counter can be assigned to more than one Location, the "Trap Management" table can include less items, than the "Location Table" from the dashboard.

Trap Management table

The Trap Management table includes the following columns:

- **IMEI:** International Mobile Equipment Identity (Serial Number). This is the number that you must type in, when registering a new BG-Counter. You find this 15-digits number on the sticker at the side of each BG-Counter.
- **Subscription:** Status as of current day: "InUse", "ExpiresSoon" (expiration of subscription within 60 days), or "Expired". Please contact your Biogents representative or distributor if the status is on "Expiring Soon" or "Expired", and you wish to continue your subscription.
- **Device:** Status of your device.
 - » "Active": The device is activated, has a location based on geofencing, or was assigned to a fixed location.
 - » "Standby": Initial status after adding a new trap to the account.
 - » "Inactive": Subscription is expired.
- **Geolocation:** Select between "Auto" and "Fixed" in the drop-down menu.
 - » "Auto": Default setting. GPS geofencing is used to either find an existing location, or to create a new location. This is only possible if the counter is outdoors and has an unobstructed view of the sky.

- » "Fixed": Use this setting to assign the trap to an existing location. This is required when a reliable GPS fix cannot be obtained or if the GPS fix has errors or drift. When you have two locations with less than 100 m between each other, it is also necessary to use the "Fixed" setting. Geofencing only determines two locations as different, if they are at least 100 m apart from each other.
- **Current Location:** Select one of your existing locations, when Geolocation is set on "fixed". In this way, you can for example assign the IMEI of a replacement trap to the Location of a defective trap.
- **Last Connection:** The time at which the trap last connected with the server successfully.
- **Transmitted Coordinates:** Last reported coordinates as measured by the built-in GPS device, unless otherwise indicated.
- **Expiration:** Subscription expiration date.
- **ICCID:** SIM Card serial number.
- **Transmissions:** Number of 15-min reports in the database. A small number means the counter has not been used much.

New Trap

To add one or multiple new traps, click on the blue "New Trap" Button. Enter one or multiple IMEIs in the field. If you enter multiple traps, separate the IMEIs with a comma. Click the blue "Assign" button to register your BG-Counters.

Automatic geolocation

After registering a new BG-Counter, you might want to turn it in on in your office to make sure that it works properly.

Please note the "time-fence" rule for geofencing: If the time span between turning off the BG-Counter in your office, and turning it on in the field is **less than 2 h**, a new location won't be automatically created (field data would be assigned to the office location). If you have to activate the field location after < 2 hours, make sure to manually create the location: Go to "Dashboard"-> Location table-> "New Location" and set the Location manually with the help of the map. Then go to "Traps", set the geofence mode to "Fixed" (Geolocation column), and assign the newly created location to this trap (Current Location column).

Users

This section is only available for Administrators and Operators. You can invite new users by clicking on the blue "New User" button. Enter the e-mail address, choose the desired role (Administrator, Operator or Observer) in the drop-down

menu and click the blue "Save" button in the top right corner of the screen. If a newly invited user does not appear in the user list, click the refresh button of your browser. **Assign locations to users:** open the drop-down menu of the "Assigned Locations" column and select the locations that you want to assign to the user (check boxes).

Administration Roles and their Rights

Administrator

- Registers BG-Counters
- Can change trap settings in the dashboard
- Invites Administrators, Operators and Observers (and can delete them)
- Assigns users to selected BG-Counters (if applicable)

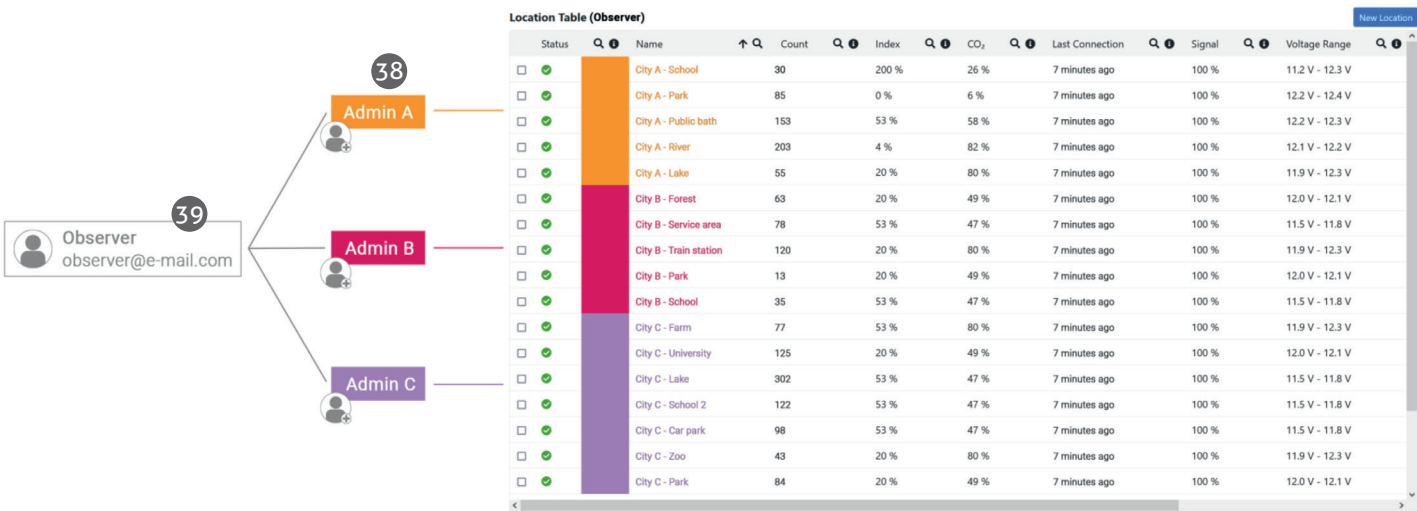
Observer

- Restricted access to the app. The Observer cannot
 - » change settings
 - » add traps, register traps
 - » create locations
 - » invite users
- Visualization of BG-Counters that he/she was given access to.

Operator

- Can change trap settings in the dashboard
- Visualization and control of BG-Counters that he/she was given access to by an Administrator

An Observer can be invited by Admins of different sets of traps (38). This means, that if the observer got invitations of Admin A, Admin B and Admin C, who oversee different sets of traps, the Observer will be able to see the traps of these Admins with one login, if all invitations are based on the same e-mail (39).



Profile

- Change your password:** Click on the blue "Change Password" button, then select "Password" in the menu of the Keycloak page. Set a new password in the field "New Password" and type again the same new password in the field "Confirmation".
- Update Information of your Organisation:** Complete or adapt the Organisation Information table by fulfilling the respective fields.
- Save:** Click on the blue "Save" button to save the changes you made.

Profile

Change Password

Organisation Information

Organisation Name: Test Customer

Contact First Name:

Contact Last Name:

Contact Email:

Street:

City:

State:

ZipCode:

Country:

Technical Contact Name:

Technical Contact Email:

Technical Contact Phone:

Billing Contact Name:

Billing Contact Email:

Billing Contact Phone:

Cancel Save Biogents

Links

» www.youtube.com/watch?v=BVgKV_2PXD0

This Video explains the BG-Counter App in four chapters:

- Data storage based on location
- Structure of the app
- The Dashboard
- The Analyzer

» <https://eu.biogents.com/bg-counter>

Webpage with resources about the BG-Counter, including the newest version of the manual, customer stories, publications and many more.

Contact

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