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Version 1 : 2024 March

- Initial release

Version 2 : 2024 June

- Added note about instance values and timestamps



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Introduction

A new REST based service is introduced in order to allow external parties (for example partners of Letsgrow.com, who have products hosted at Letsgrow.com), to manage their products. After a request data is returned formatted as JSON or XML depending of the accept header of the request.

The first release of this service will give partners management information about their products hosted on letsgrow.com (Module Templates and Module Definitions). Furthermore, regular users can retrieve information about the modules they have in their account on LetsGrow.com. In the future releases more functionality will be added eg. retrieving information about graphs, reports, menu....

The base url of the api is: "api.letsgrow.com".

For the Chinese LetsGrow platform the base-url is: "api.letsgrow.com.cn".

Item

The term item refers to a measurement like greenhouse temperature, radiation or RH.

An Item has a language specific name and a unique letter code (item code).

Module Template

A module template is a "blue print" which consists of one or more items. It is possible to extend the template with some calculations. A template is made with a specific goal for a user and/or company. A module is created based on the template. Users can order modules from our customer support department.

Module

A module is an instance from the module template with an unique module ID. The module has a name, a validity period and a collection of items. To give insight in the registered data of the module, LetsGrow.com provides graphs-, gauges- and rapport definitions. The user can use the module to collect data from a sensor, department and/or company. There need to be a connection between the device and the items from the module before the user can use the module. Making this connections is called "mapping". It is possible for the user to do this himself on the website by going to the "manage module" part in the menu of the module.

Also with the Web API it is possible to "map" a device with the items. This is only possible for items that are typed as "writable". These are items which are manual registered (natural day data) or items from a "General Device" (5 min data). The programmer need to make a mapping of the items from the concerning device with LetsGrow.com to write data with the API. To make a mapping you need to use the item ID's (also collection ID) and item codes. With the API you can easily request the needed ID's. LetsGrow.com calculates automatically a 24-hour value of the 5 min data and a day and night value based on sunrise and sunset from the device location. This value can be the average, the sum or the maximum/minimum value of the period. Which aggregation is used depends on the concerning item code.

Instances

To register data from a specific location in the greenhouse, you need to create a module-location through the WebAPI. A module-location can be a location in your greenhouse or a location of a plant. A location does have specific characteristics like Name, Path and Section. The name can be used for a description of the location, for example the ID or MAC address. Path and section are used to specify a location in the greenhouse. After creating a location, a unique instance ID will be generated. With the Instance ID and the Module ID you can make a mapping. LetsGrow.com calculates automatically 24-hour value of the 5 min data and a day and night value based on sunrise and sunset from the device location. Furthermore, the same aggregations as by a module can be done on the averages of all instances per time unit as well per instances.

Note: data from sensors can be registered both per module and per instance. When data is registered per instance, the location is known. This data can be made insightful per sensor for example with a heatmap. When the data of the sensor is registered on an item ID, the location is unknown and it can only contain the data of a single sensor. The end user will make this choice.

Note: data on multiple instances is automatically aggregated to a sum or an average on. This is done for all instance values with the same timestamp. It is therefore important that instance values that belong together are written on exactly the same timestamp.

To get a better picture, the parent/child relationship of modules, items and instances is shown below.

Module:

Name: Test Module,

ID: 12345,

Start/End Date:

Items:

Name: Greenhousetemp

ID: 67890

ItemCode: GHTEMP

Writable: Yes

Name: RH

ID: 02468

ItemCode: RHHUMMI

Writable: Yes

Instances:

Name: Sensor 1

ID: 01357

Path: 5L

Section: 5

Name: Sensor 2

ID: 13359

Path: 10L

Section: 10



Authentication

The service can be used by normal LetsGrow users and by partners of Letsgrow.com. Partners are seen as co-owners of the modules sold as part of their own products. This co-ownership gives them certain extended rights on the modules.

To get information from the service a user or the partner must log in to the service with his/her LetsGrow credentials. After a successful login a so called bearer token will be returned. The client then uses this token to access the protected resources hosted by the service. This mechanism is based on OAuth 2.0. The URL used for authentication and retrieving the token is <https://api.letsgrow.com/token>.

Available functions in the LetsGrow.com Web API

All available functions can be found at <http://api.letsgrow.com/Swagger>.

Before any information can be retrieved from the web service the user has to login on the service. The credentials that should be provided are the user name and password used on www.letsgrow.com. These credentials are communicated separately. The service returns an access token that should be used later on.

Use the function POST /token under Authentication at <http://api.letsgrow.com/Swagger> to retrieve a token. After retrieving the token, it can be entered under the green button at the top right "Authorize".

Read and write limits:

Reading more than 15000 values (or about two months of 5 minute values for one item) per 5 minutes will result in a 403 error. Lower the number of calls per 5 minutes or lower the number of values you read per call if you receive errors. In practice this involves choosing the dateTimeStart and dateTimeEnd more closely together. When reading 1 minute values, it is recommended to choose a time span of \leq 1 week. A throttling mechanism is used to restrict excessive requests.

Writing more than 15000 values per 5 minutes will result in a 403 error. Lower the number of calls per 5 minutes or lower the number of values you write per call if you receive errors. A throttling mechanism is used to restrict excessive requests

Sample timestamps and offsets:

The timestamps must be in ISO 8601 format YYYY-MM-DDTHH:MM:SS. The specified time is only important for 5 minute values. The next values will be saved on a fixed hour in the LetsGrow database: Day values will be saved at 12h UTC, Night values at 22h and Day/Night values at 23h. The type of value (night, day, daynight) depends on the ItemType of the item. It cannot be changed by the partner. Local time is assumed. When retrieving a day, night or day/night value midnight will be returned as timestamp

The time offset is in minutes. This is a required value which can be 0. If an offset is supplied this will be added to the time stamp. Further processing assumes this is the local time

Basic steps for implementing the Web API

To upload data to LetsGrow.com or retrieve data from LetsGrow.com, you need to create an account at <https://www.letsgrow.com>.

Then you purchase a module via the Web Shop or you can contact (mail) the LetsGrow.com service desk (servicedesk@letsgrow.com). They will create a module for you. After that, they will also create items that are needed for you.

- The items you want to have in your module(s) must be specified in certain formats. For example, you want to register the greenhouse temperature per 5 minutes in module “x”. Then you must state in your e-mail: **"Module name - Item name - unit - interval"**. => Module x – greenhouse temp - Celsius degrees - 5 minutes.
- For demo purposes we can create a “free” one-time module for a limited number of items.
- If you want to upload or retrieve data from one of your “partners”, then they must give “**explicitly**” rights on the module. After that, you can upload or retrieve data from their module(s)!

If everything goes well, then you will have the following structure.

- Module: X. (with unique module (definition) id, startdate, enddate etc.)
 - o Item 1: Temperature, Celsius, 5 minutes, (itemcode, unique collection rule id (colid)).
 - o Item 2: Humidity, % , 5 minutes, (itemcode, unique collection rule id (colid))
- When the items are created, they automatically receive a unique ID, so the specific item can easily be retrieved by the API. An item code is also added to this item.
- If you want to register location data, then you must create instances (instances stands for plants, locations on plats or locations in a greenhouse). Instances can only be created by Web Api method . For this one, we have a special “extended swagger API”. You can request this URL from servicedesk@letsgrow.com

If the above things are done, you can start sending (or retrieving) the data.

- Thought our REST Web API, you can then send data to these items. This information can be sent to us every x minutes. Then you can use the graphs to view these sent data. You can also retrieve the data (values) for specified timespan. LetsGrow.com uses a value per 5 minutes. Value per minute can be saved, just cannot be retrieved. Values will be aligned on the nearest 5 minute timestamp.

For retrieving/sending the data (values) using LetsGrow.com Web Api, follow the steps below.

- **Login and retrieve the token.**
- **Retrieve modules**
 - o You can see here the module id's. With this id, you can get the specific module information.
- **Retrieve the module information**
 - o This call is needed for getting the item information (such as itemcode and/or unique colid.
- **Retrieve items with values/Write items with values.**
 - o Take the colids from the module information for reading/writing the items (colid)
- ***Create module instances.**
 - o If you want to register data at a location, you must first create locations in the relevant module. You can then retrieve and/or write data using the instance ID + colid combination for that specific instance (location)

***Note:** If you want a sample code/program or have an question, you can always mail us at servicedesk@letsgrow.com.