LabCollector

"Your Laboratory management solution"

User's guide

Web Service API

Version 2.0 – November 2021

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1- INTRODUCTION

The LabCollector Web Service Application Programming Interface (API) allows third-party applications to interact with LabCollector's database (modules) and add-ons (ELN and LSM).

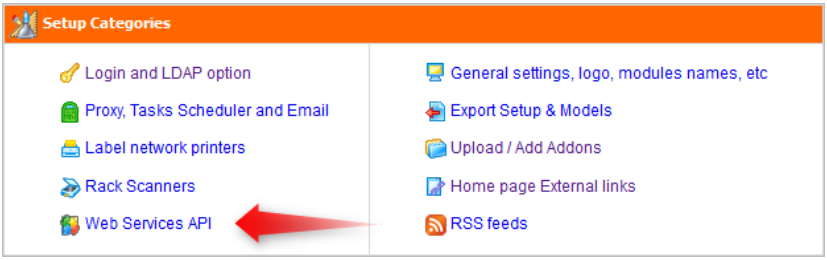
The API is based on a Representational State Transfer (REST) architecture allowing access to resources through Uniform Resource Identifier (URI) and actions on them.

Note: Since June 2017 API v1 was discontinued and all new evolutions are in API v2.

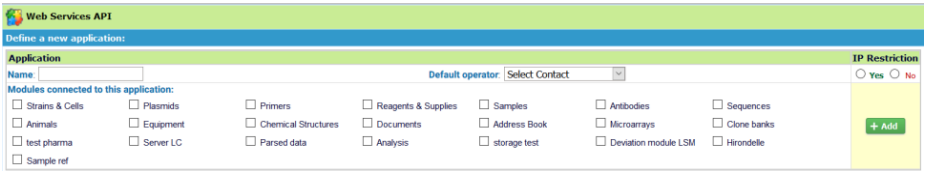
2- LABCOLLECTOR API

2-1. API setup

First of all, you have to declare your application in your LabCollector software.
To access the application declaration setup form, log-in to LabCollector with super-administrator rights and go to **Admin > Setup** page. Then select the Web Service API link.

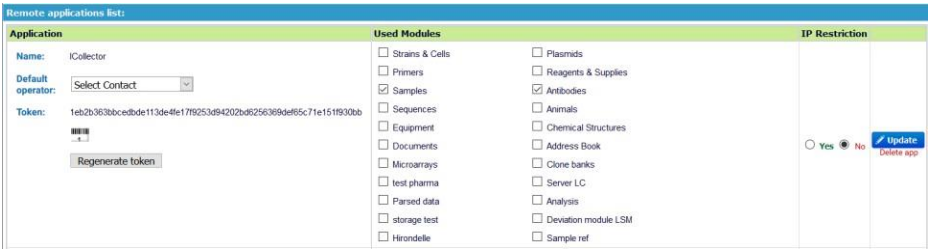


You are now on the Web Service API applications management page. To declare a new application, simply complete this form:



- **Name**: name of your application.
- **Modules connected to this application**: select modules in which the application can access.
- **Default operator**: select the contact that will be the default operator if you don't want to insert this information in each request.
- **IP Restriction**: security option that allows you to declare a list of IP addresses, which will be allowed to perform requests on the API.

The **Application list** shows all the applications for your LabCollector and you can, at any time, modify their scope.
You have also access to the Token which is necessary to identify your application during requests to the API.



Note: To use this feature, you need to activate Curl on your PHP preferences.
In Linux, install the PHP-Curl package.
On windows and with our automatic installer, edit PHP.ini and uncomment extensions for Curl (extension=php_curl.dll).

2-2. Requests

The dialog between third-party applications and the LabCollector web service API is based on the HTTP 1.1 protocol.

2-2-1. API Method

You can send HTTP or HTTPS requests to the web service with a method to act on a resource.

- **GET** method for reading a resource
- **POST** method to create a new resource
- **PUT** method to modify a resource
- **DELETE** method to delete a resource

2-2-2. Headers

A request to the API requires some specific HTTP/HTTPS headers:

- The **Accept** header defines the desired response format of your request, text/xml or application/json.

- The **X-LC-APP-Auth** header where you put your application token which is necessary to authorize your request to the API.

- The **X-LC-APP-Charset** header defines the character encoding of your application. It allows the API to send back the response with the appropriate

encoding and to correctly convert your POST and PUT requests to the LabCollector's character encoding (ISO 8859-1).

2-2-3. Tool

You can try to retrieve data from or send data to the API with some software app as Postman (https://www.getpostman.com/).

2-3. Uniform Resource Identifier (URI)

2-3-1. GET method

General

Each LabCollector module data is identified by a unique URI (see annex for a complete list of module's URI):

```
[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]
```

This request replies the list of all data in a module.

You can do searching into module data by adding parameters to your URI. You can pass a parameter with a keyword matching a field value, like:

```
[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]?name=[KEYWORD]
```

e.g.
`[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]?name=First%20Record`

This request returns the records where their name value contains the "First Record" keyword.

They are some custom parameters that the API uses to perform searching and filtering actions.

Custom parameters

- The **record_id** parameter to specify data by its ID:

```
[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]?record_id=[RECORD_ID]
```

e.g. `[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]?record_id=1,19`

This request returns records with ID 1 and ID 19. You can specify multiple IDs by separating them with a comma.

- The **by_keywords** parameter performs a keyword search:

```
[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]?by_keywords=[KEYWORD]
```

e.g. `[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]?by_keywords=cell`

This request performs a search into all fields of all records and returns matching cell. You can specify multiple keywords by separating them with a comma.

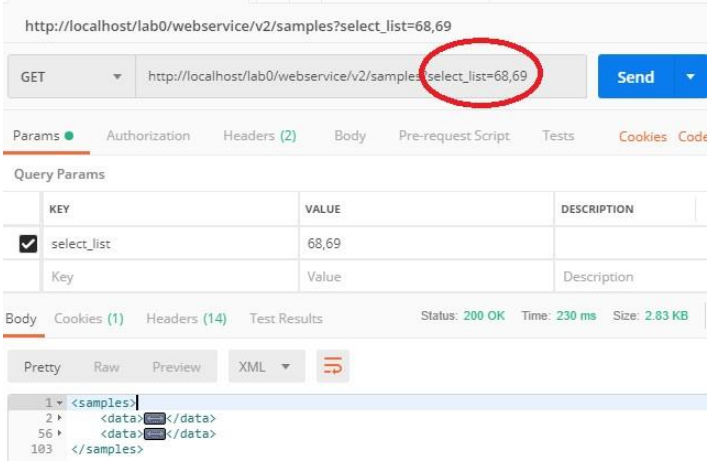
- The **fields** parameters, If you want to retrieve only some fields values in the API response:

```
[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]?fields=[FIELD1],[FIELD2]
```

e.g. `[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]?fields=count,name`

This request returns all records from the module but with only count and name fields. You can specify multiple fields by separating them with a comma.

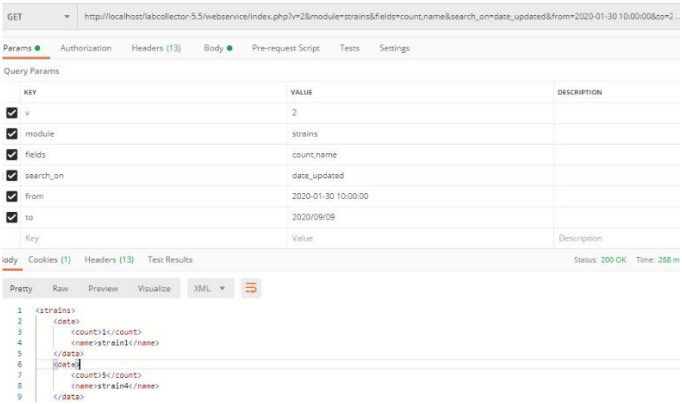
The request accepts now multiple values separated by a comma, for custom fields of type "select"



- The search_on parameter allows you to search for data. And you can use it to search by date range as follow:

```
[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]&
search_on=date_field&from=XXXXXX&to=ZZZZZZ
```

If you only use FROM, the result will give all dates bigger than the FROM date. If you only use TO, it will return all the value until this date.



- The **sort_by** parameter allows you to sort your search:

[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]?sort_by=[FIELD1]_DESC

e.g. [PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]?sort_by=name_DESC

This request returns all records sorted in descending order on the name field. You can specify multiple sort_by separating them with a comma and specified order ascendant "_ASC" or descendant "_DESC" for each field.

- The **limit_to** parameter allows you to limit the number of results:

[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]?limit_to=0,10

This request returns 10 records beginning at index 0. If you do not specify the index, only the number of results indicated is returned.

The API also returns two custom fields in the header response, "X-LC-QUERY-RESULT" containing the number of results returned in the body response and "X-LC-QUERY-TOTAL" containing the total of records matching your search.

Each record also has a unique URI:

[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]/[DATA_ID]

This request replies a unique record. [DATA_ID] must match the unique ID of the record you want to retrieve.

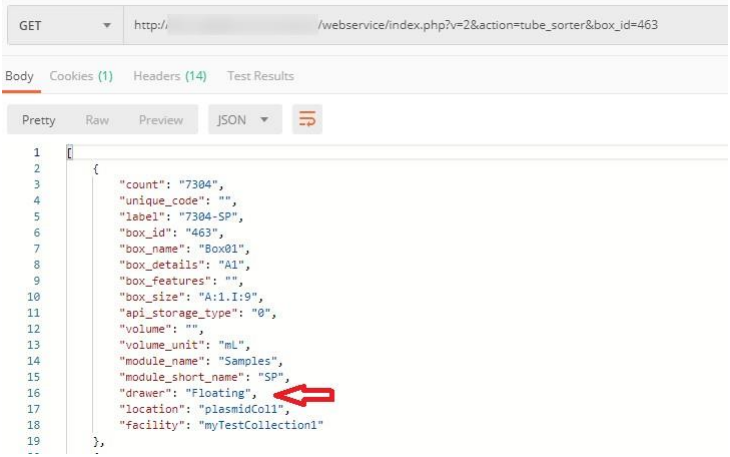
Storage

You also have **Tube Sorter** filtering functions for every items linked to storage:

[PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=tube_sorter&box_id=[BOX_ID]

e.g. [PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=tube_sorter&box_id=34

This request returns storage info on box ID 34 like tube sorter. You can specify multiple IDs by separating them with a comma.



[PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=tube_sorter&box_id=[BOX_ID]&record_name=[RECORD_NAME]

e.g. [PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=tube_sorter&box_id=206&record_name=ST-260

[PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=tube_sorter&record_name=[RECORD_NAME]

e.g. [PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=tube_sorter&record_name=ST-260

These requests perform filtering on record named ST-260. You can specify multiple record names by separating them with a comma. You can also specify box ID, here 206.

[PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=tube_sorter&box_name=[BOX_NAME]

e.g. [PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=tube_sorter&box_name=test-rack_06

This request performs filtering on box test-rack_06. You can specify multiple box names by separating them with a comma.

Other search parameters to action=tube_sorter can be:

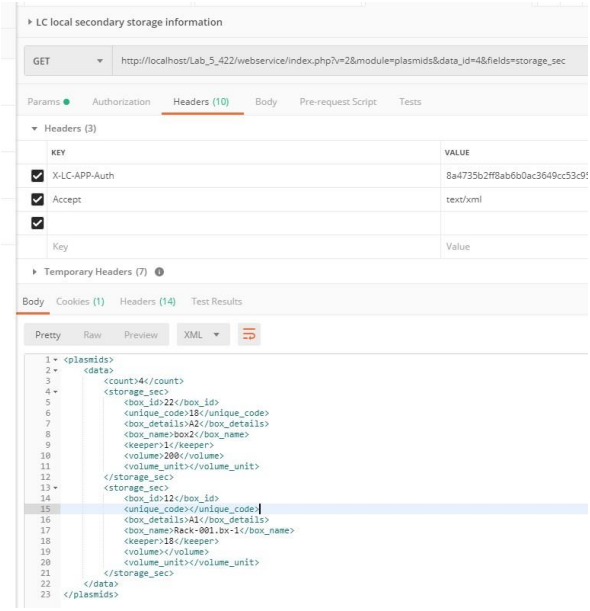
- location_id
- location_name
- facility_id

- facility_name

It will return empty boxes as well.

- The **storage_sec** parameter allows retrieving information about secondary storage.

```
[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]&data_id=[DATA_ID]&
fields=storage_sec
```



Product lot

- The **action getLot** allows retrieving lot and reagent info

```
[PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=getLot
[PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=getLot&lo
t_id=1/LT
[PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=getLot&ch
em_id=2
```

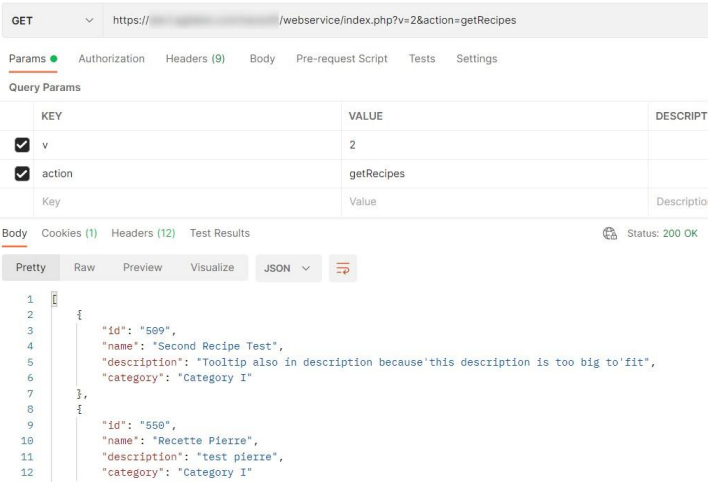
Optional parameters are lot_id (in format 1 or 1/LT) and chem_id. If it doesn't receive parameters, then it retrieves all active lots.

Recipe

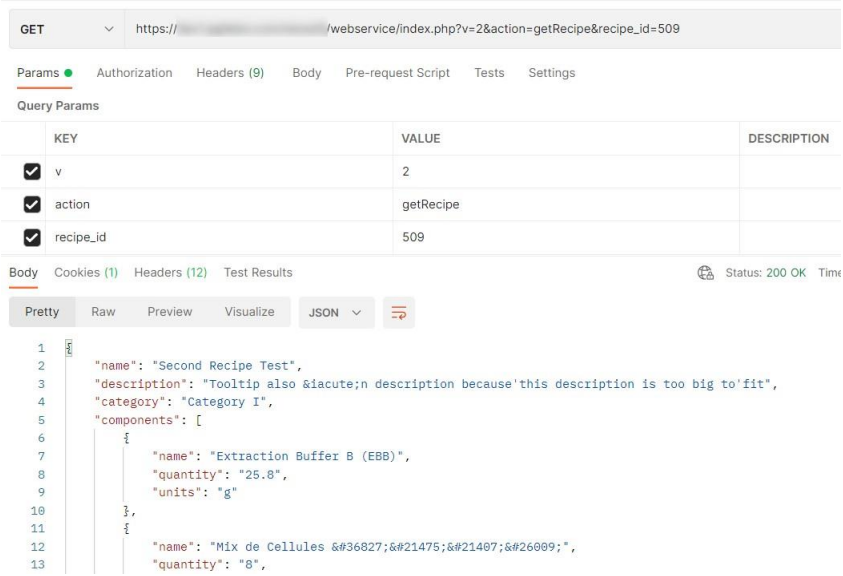
```
[PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=getRecipes

[PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=getRecipe&recipe_id=[record_id]

e.g. [PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=getRecipe&recipe_id=509

[PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=getRecipeLogs

[PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=getRecipeReport&log_id=[record_id]

e.g. [PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=getRecipeReport&log_id=1218
```

IDs are examples but are mandatory in these calls.

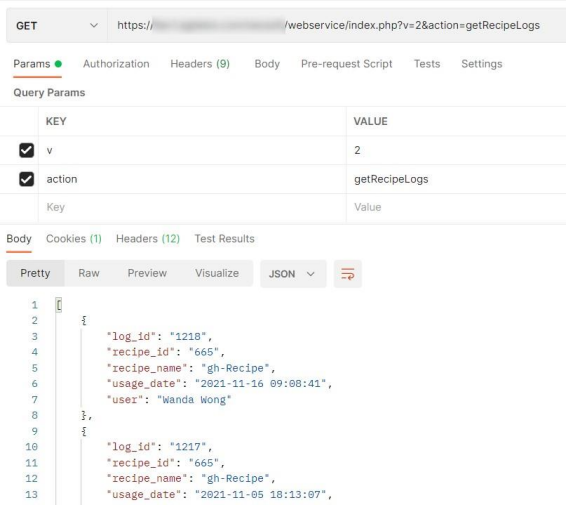
getRecipes prints the following info: id, name, description, category



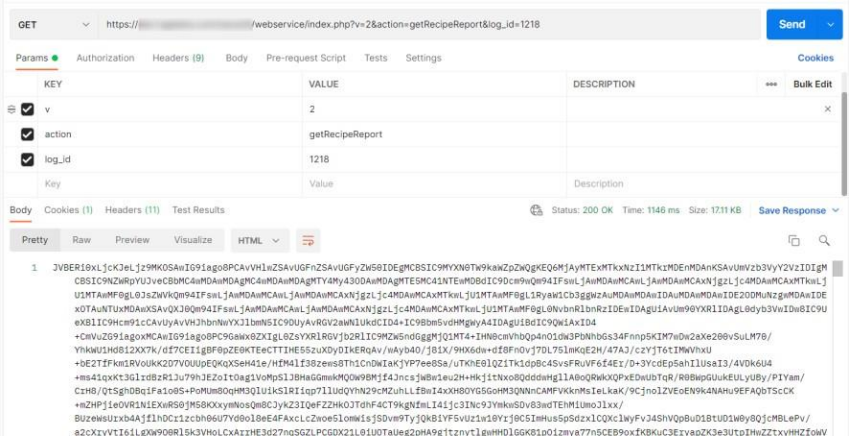
getRecipes prints the following info for that recipe_id: id, name, description, category and then the components



getRecipeLogs prints the following info: id, name, description, category



getRecipeReport prints the report PDF for that log_id under the format base64 that can be decoded into PDF.



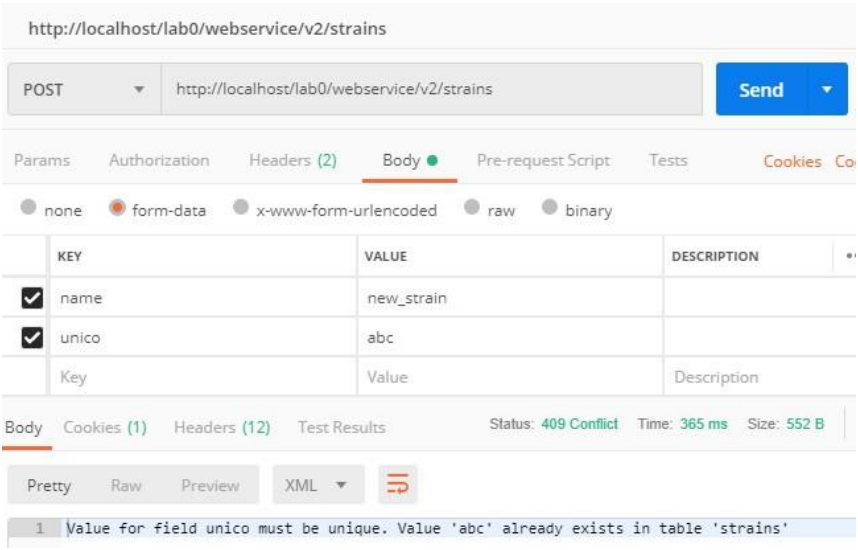
2-3-2. POST method

To create a new resource, simply send a request with the POST method to the desired module URI:

```
[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]
```

Your parameter keys have to match the field's name.

Check for uniqueness fields have been added, when creating new records (POST) or update (PUT)
If exists a different record with the same value for a field Uniqueness, API will not complete the action and will return code 409 (Conflict), and the text: Value for field 'XXX' must be unique. Value 'YYY' already exists in table 'ZZZ'. (see screenshot)



Note: project_code field can be use in POST and PUT and it expects text (not id). You can now create a new project code if it does not exists and if the operator has permissions enough (administrator or super-administrator).

- The **action addBox** allows you to create a box

```
[PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&action=    addBox
```

- Required parameters:
  - `name`
  - `type` (must be a valid type: box, box_nogrid, plate, microplate, visotube, bag, shelfpart)
  - `equipment` (supports `id` or `name` and must exist in LabCollector storage).
  - `size` (depends on the type of box: should be numeric for a visotube, and the format (A:1.H:8) for a box, a plate, and a microplate)
- Optional parameters:
  - `description`
  - `rack`
  - `keeper`

2-3-3. PUT method

To modify a resource, simply send a request with the PUT method to the desired record URI:

```
[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]/[DATA_ID]
```

Your parameter keys have to match the field's name you want to modify.

For the following actions, note that for PUT request, parameters must be on the body (not in URL).
The URL is `[PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2`
The headers are: X-LC-APP-Auth, Accept.

- **Remove Volume**

- Parameters:
  - `removeVolume` (mandatory)
  - `barcode`, `unique_code` or `aliquot_barcode` (one of them must be present)
  - `quantity` (mandatory)
- Response: OK

- **Remove Storage**

- Parameters:
  - `removeStorage` (mandatory)
  - `barcode`, `unique_code` or `aliquot_barcode` (one of them must be present)
- Response: OK

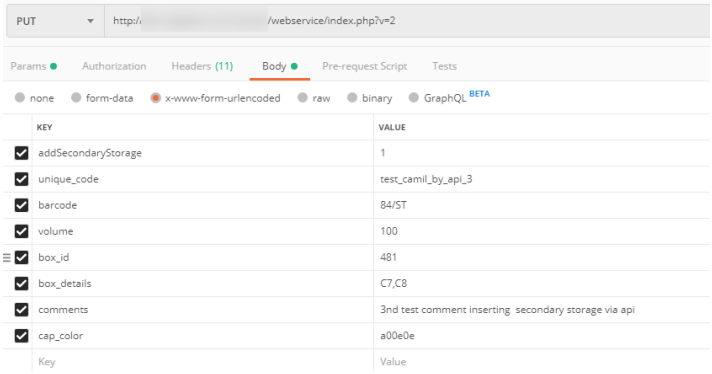
- **Add Registry Book**

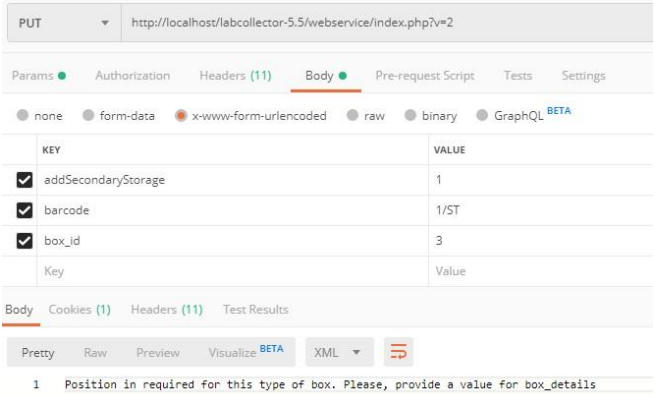
- URL: `[PATH_TO_LABCOLLECTOR]/webservice/index.php?v=2&module=[module]`
- Parameters:
  - `addRegistryBook` (mandatory)
  - `record_id` (mandatory)
  - `date` (mandatory, format yyyy/mm/dd or yyyy-mm-dd)
  - `comments` (mandatory)
  - `operator` (optional, if it does not send the API default operator will be used)
  - `action` (optional, must be a valid 'Storage Action Type' defined in **LC >Admin >Preferences > Process & Actions Type**)
- Response: OK

- **Add Secondary storage**

- Parameters:
  - addSecondaryStorage (mandatory)
  - barcode (mandatory)
  - box_id (mandatory)
  - box_details (mandatory only for the box with grid divider, tube tray, and microplate. If the box is without grid, a bag, a visotube or a shelf part, it is not required)
  - unique_code (optional)
  - volume (optional)
  - comments (optional)
  - cap_color (optional)

Note: An error message is returned if mandatory parameters are not present; if the barcode does not exist; if the unique_code is present, but it isn't unique; and, if the color is present but it doesn't exist.
If the parameter box_details is not received and the type of box needs position (box with grid, tube tray, or microplate), an error message is returned.





Note: project_code field can be use in POST and PUT and it expects text (not id). You can now create a new project code if it does not exists and if the operator has permissions enough (administrator or super-administrator).

2-3-4. DELETE method

To delete a resource, simply send a request with the DELETE method to the desired record URI:

```
[PATH_TO_LABCOLLECTOR]/webservice/v2/[MODULE]/[DATA_ID]
```

3- API ERROR MESSAGES

Message	Response code	Description
'Requires application authentication to access the Web Service'	401 Unauthorized	The request either does not have the header parameter X-LC-APP-Auth or does not have a valid value
'Invalid Action xxx'	400 Bad Request	Parameter action has a different value to 'tube_sorter' or 'getBackup'
Missing Search Parameters!	400 Bad Request	The request contains the parameter Action=tube_sorter but it is missing at least one of the following parameters: box_id, box_name, record_name, unique_code, barcode, aliquot_barcode
'Module "XXX" does not exist!'	400 Bad Request	The value of the parameter 'module' is not a LabCollector module
'Module "XXX" does not share this data!'	403 Forbidden	The value of the parameter 'module' is not checked on LabCollector > Admin > Setup > Web service
'The format of the request is not accepted!'	415 Unsupported Media Type	The parameter Accept is used, but the value is not one of the accepted values: application/XML or application/JSON
(Empty)	406 Not Acceptable	The method must be one of the following: GET, POST, PUT, DELETE
'No data found.'	404 Not Found	No data found with this request's parameters
'OK.'	200 OK	Record updated successfully

'Conflict.'	409 Conflict	The record could not be updated because there is a conflict in data
'No organisms value for this module'	404 Not Found	Only the modules "strains", "samples" and "microarrays" have an organism value – you have chosen an incorrect module
'No categories value for this module'	404 Not Found	Only the module 'docs' has categories – you have chosen an incorrect module
'Webservice requires user authentication'	401 Unauthorized	Deprecated
'Your IP is not allowed to access this Web Service'	401 Unauthorized	The client IP is not in the list of authorized IPs for this webservice (LC > Admin > Setup > Web service)
'Error during your request, the following information is mandatory to create a new record: X, Y, Z '	400 Bad Request	Attempt to post new data without mandatory fields X, Y, Z
'An error has occurred during your request, the following information is mandatory to remove volume: unique_code or barcode or aliquot_barcode, quantity, quantity'	400 Bad Request	Attempt to remove volume without mandatory parameters: unique_code or barcode or aliquot_barcode, quantity
'An error has occurred during your request, the following information is mandatory to remove storage: unique_code or barcode or aliquot_barcode, quantity '	400 Bad Request	Attempt to remove storage without a mandatory parameter: unique_code or barcode or aliquot_barcode
''	200 OK	Data requested was returned successfully

4- LABCOLLECTOR WEB SERVICE API - ANNEX

The URI system of the API uses a simple and clean URL. Be sure to enable the rewrite engine from Apache to use the URI referenced in the following table.
If the LabCollector server does not support the rewrite engine please use the full URL pattern for your request (secondary URL of each line).

URI		Module	Description
webservice/v2/strains webservice/index.php?v=2&module=strains	**GET** **POST**	Strains & Cells	List of all records
webservice/v2/strains/[DATA_ID] webservice/index.php?v=2&module=strains&data_id=[DATA_ID]	**GET** **PUT**	Strains & Cells	Unique record
webservice/v2/strains/customfields webservice/index.php?v=2&module=strains&getModuleCustomFields=1	**GET**	Strains & Cells	List of custom fields
webservice/v2/strains/organisms webservice/index.php?v=2&module=strains&getModuleOrganisms=1	**GET**	Strains & Cells	List of organisms
webservice/v2/plasmids webservice/index.php?v=2&module=plasmids	**GET** **POST**	Plasmids	List of all records
webservice/v2/plasmids/[DATA_ID] webservice/index.php?v=2&module=plasmids&data_id=[DATA_ID]	**GET** **PUT**	Plasmids	Unique record
webservice/v2/plasmids/customfields webservice/index.php?v=2&module=plasmids&getModuleCustomFields=1	**GET**	Plasmids	List of custom fields
webservice/v2/primers webservice/index.php?v=2&module=primers	**GET** **POST**	Primers	List of all records
webservice/v2/primers/[DATA_ID] webservice/index.php?v=2&module=primers&data_id=[DATA_ID]	**GET** **PUT**	Primers	Unique record
webservice/v2/primers/customfields	**GET**	Primers	List of custom fields

webservice/index.php?v=2&module=primers&getModuleCustomFields=1			
webservice/v2/chemicals webservice/index.php?v=2&module=chemicals	**GET** **POST**	Reagents & Supplies	List of all records
webservice/v2/chemicals/[DATA_ID] webservice/index.php?v=2&module=chemicals&data_id=[DATA_ID]	**GET** **PUT**	Reagents & Supplies	Unique record
webservice/v2/chemicals/customfields webservice/index.php?v=2&module=chemicals&getModuleCustomFields=1	**GET**	Reagents & Supplies	List of custom fields
webservice/v2/samples webservice/index.php?v=2&module=samples	**GET** **POST**	Samples	List of all records
webservice/v2/samples/[DATA_ID] webservice/index.php?v=2&module=samples&data_id=[DATA_ID]	**GET** **PUT**	Samples	Unique record
webservice/v2/samples/customfields webservice/index.php?v=2&module=samples&getModuleCustomFields=1	**GET**	Samples	List of custom fields
webservice/v2/samples/organisms webservice/index.php?v=2&module=samples&getModuleOrganisms=1	**GET**	Samples	List of organisms
webservice/v2/samples/types webservice/index.php?v=2&module=samples&getModuleTypes=1	**GET**	Samples	List of sample types
webservice/v2/antibodies webservice/index.php?v=2&module=antibodies	**GET** **POST**	Antibodies	List of all records
webservice/v2/antibodies/[DATA_ID] webservice/index.php?v=2&module=antibodies&data_id=[DATA_ID]	**GET** **PUT**	Antibodies	Unique record
webservice/v2/antibodies/customfields webservice/index.php?v=2&module=antibodies&getModuleCustomFields=1	**GET**	Antibodies	List of custom fields
webservice/v2/sequences webservice/index.php?v=2&module=sequences	**GET** **POST**	Sequences	List of all records

webservice/v2/sequences/[DATA_ID] webservice/index.php?v=2&module=sequences&data_id=[DATA_ID]	**GET** **PUT**	Sequences	Unique record
webservice/v2/sequences/customfields webservice/index.php?v=2&module=sequences&getModuleCustomFields=1	**GET**	Sequences	List of custom fields
webservice/v2/animals webservice/index.php?v=2&module=animals	**GET** **POST**	Animals	List of all records
webservice/v2/animals/[DATA_ID] webservice/index.php?v=2&module=animals&data_id=[DATA_ID]	**GET** **PUT**	Animals	Unique record
webservice/v2/animals/customfields webservice/index.php?v=2&module=animals&getModuleCustomFields=1	**GET**	Animals	List of custom fields
webservice/v2/equipments webservice/index.php?v=2&module=equipments	**GET** **POST**	Equipment	List of all records
webservice/v2/equipments/[DATA_ID] webservice/index.php?v=2&module=equipments&data_id=[DATA_ID]	**GET** **PUT**	Equipment	Unique record
webservice/v2/equipments/customfields webservice/index.php?v=2&module=equipments&getModuleCustomFields=1	**GET**	Equipment	List of custom fields
webservice/v2/structures webservice/index.php?v=2&module=structures	**GET** **POST**	Chemical Structures	List of all records
webservice/v2/structures/[DATA_ID] webservice/index.php?v=2&module=structures&data_id=[DATA_ID]	**GET** **PUT**	Chemical Structures	Unique record
webservice/v2/structures/customfields webservice/index.php?v=2&module=structures&getModuleCustomFields=1	**GET**	Chemical Structures	List of custom fields
webservice/v2/docs webservice/index.php?v=2&module=docs	**GET** **POST**	Documents	List of all records
webservice/v2/docs/[DATA_ID] webservice/index.php?v=2&module=docs&data_id=[DATA_ID]	**GET** **PUT**	Documents	Unique record

webservice/v2/docs/customfields webservice/index.php?v=2&module=docs&getModuleCustomFields=1	**GET**	Documents	List of custom fields
webservice/v2/docs/categories webservice/index.php?v=2&module=docs&getModuleCategories=1	**GET**	Documents	List of categories
webservice/v2/abook webservice/index.php?v=2&module=abook	**GET** **POST**	Address Book	List of all records
webservice/v2/abook/[DATA_ID] webservice/index.php?v=2&module=abook&data_id=[DATA_ID]	**GET** **PUT**	Address Book	Unique record
webservice/v2/abook/customfields webservice/index.php?v=2&module=abook&getModuleCustomFields=1	**GET**	Address Book	List of custom fields
webservice/v2/abook/categories webservice/index.php?v=2&module=abook&getModuleCategories=1	**GET**	Address Book	List of categories
webservice/v2/microarrays webservice/index.php?v=2&module=microarrays	**GET** **POST**	Microarrays	List of all records
webservice/v2/microarrays/[DATA_ID] webservice/index.php?v=2&module=microarrays&data_id=[DATA_ID]	**GET** **PUT**	Microarrays	Unique record
webservice/v2/microarrays/customfields webservice/index.php?v=2&module=microarrays&getModuleCustomFields=1	**GET**	Microarrays	List of custom fields
webservice/v2/microarrays/organisms webservice/index.php?v=2&module=microarrays&getModuleOrganisms=1	**GET**	Microarrays	List of organisms
webservice/v2/[CUSTOM_MODULE_NAME] webservice/index.php?v=2&module=[CUSTOM_MODULE_NAME]	**GET** **POST**	Custom Module	List of all records
webservice/v2/[CUSTOM_MODULE_NAME]/[DATA_ID] webservice/index.php?v=2&module=[CUSTOM_MODULE_NAME]&data_id=[DATA_ID]	**GET** **PUT**	Custom Module	Unique record

webservice/v2/[CUSTOM_MODULE_NAME]/customfields webservice/index.php?v=2&module=[CUSTOM_MODULE_NAME]&getModuleCustomFields=1	**GET**	Custom Module	List of custom fields

http://www.labcollector.com
sales@agilebio.com

AgileBio USA
5473 Kearny Villa Road Suite 255
San Diego, CA 92123
USA
Tel: 347 368 1315
Fax: (800) 453 9128

http://www.agilebio.com

AgileBio Headquarters
75 rue de Lourmel
75015 Paris
FRANCE
Tel: 01 41 79 15 85
Fax: 01 72 70 40 22