Developers Manual

Bionova Exchange & Exchange+

Introduction

Bionova Exchange & Bionova Exchange+ APIs allow the request of information stored in the Bionova Cloud environment from an external source via HTTP standard commands.

In the present document the following topics will be discussed:

Section 1: Bionova Cloud & Bionova Exchange fundamentals.

Section 2: Bionova exchange request based scheme.

Section 3: Bionova exchange notification based scheme.

Is the intent of this document to provide all necessary information for interfacing with Bionova Exchange APIs from a Third-party source. Therefore, the document will provide specifications of the communication protocol used by the Bionova Exchange APIs, available commands, message structure, and handled data types.

To dive in to a python implementation of an example interface, please refer to our publicly available Google Colab Jupyter Notebook

Google Colab Jupyter Notebook LINK

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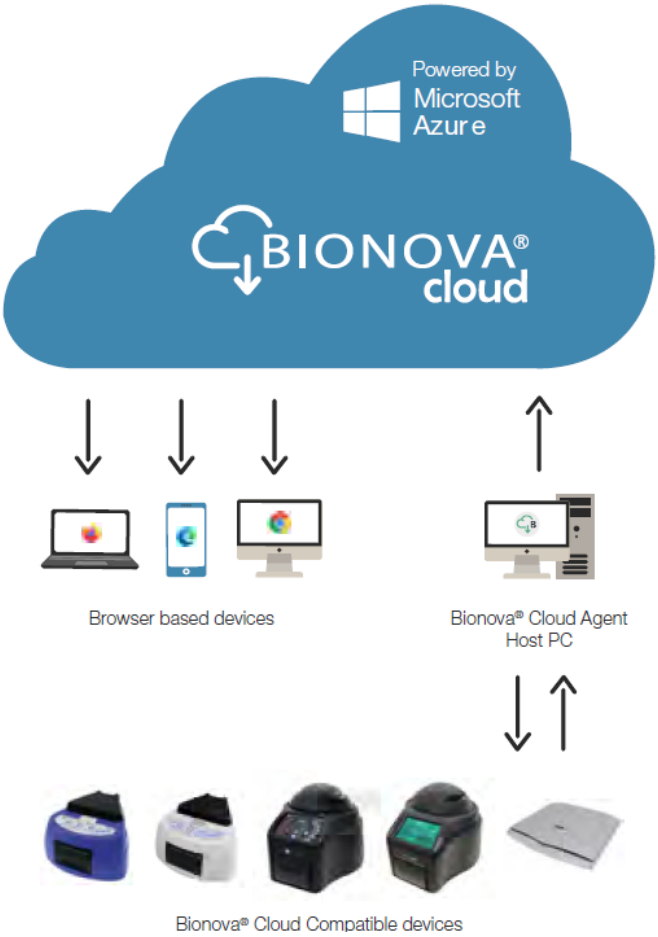
Section 1 – Background

About Bionova Cloud

Bionova® Cloud environment is a Cloud based solution that integrates the information generated by Terragene® electronic devices with a Cloud platform.

Bionova® Cloud environment is composed by two main components: The Bionova® Cloud Traceability Software which is a Web Based application (with its own frontend and backend), and the Bionova® Cloud Agent which is a Microsoft™ Windows App that acts as an interface between the Terragene® compatible devices and the web based application.

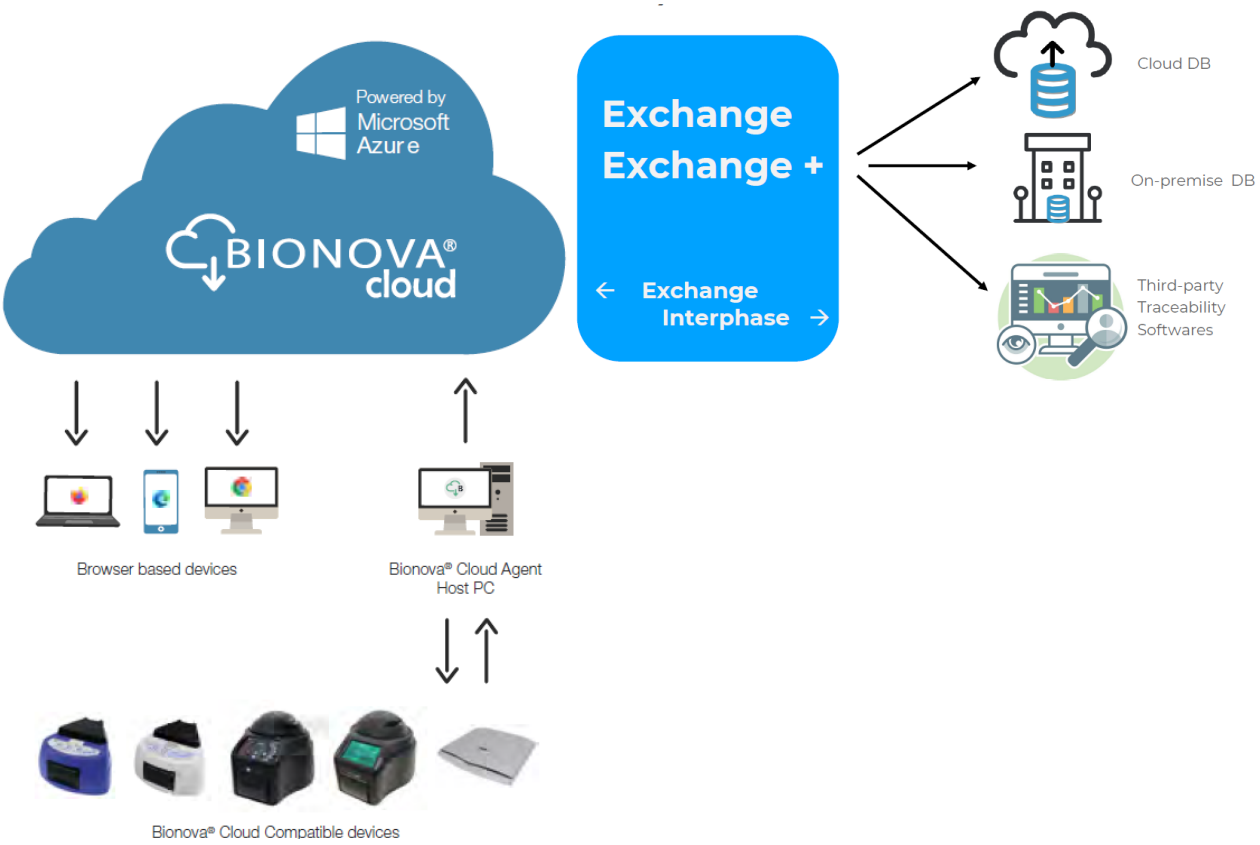


Once the information is on the cloud, the user can access the information either by using Bionova Cloud Web-interface (through a web-browser). Or by using the Bionova Exchange API.

Create a free account for your company on https://bionovacloud.com/

About Bionova Exchange API

Bionova Exchange API allows the user to send and receive HTTP comands to obtain information stored on the Bionova Cloud Database. Such information includes saved readout results of Biological Indicators (Sterilization and Disinfection), Chemical indicators (Sterilization and Disinfection), or Protein Pen indicators (Washing).



Bionova Exchange API allows two different connectivity schemes.

- A Request based scheme: Where HTTP commands must be sent from a third-party source to the Exchange API to request information.
- A Notification based Scheme: Where HTTP commands are sent by the Exchange API to a configured third-party public endpoint.

Section 2 – Request based scheme

Request based scheme works by the third-party source sending HTTP requests to retrieve information as detailed on following sections.

This strategy allows for asynchronous synchronization of Bionova Cloud data and the third-party source. In this scheme, request scripts can be run on a set schedule (eg. once a day, once each hour, once a couple of minutes, etc.)

Implementing this strategy allows the readout information to be pulled from Bionova Cloud at regular times. Allowing an asynchronous linkage between the Bionova Cloud environment and the Third-party source.

Available endpoints on Bionova Cloud

Bionova Cloud has two sets of endpoints that can be pointed to when Requesting readout result information.

- Production endpoints.
- Testing endpoints.

Production endpoints allow the Request of real life data of a Bionova Cloud Account. These endpoints require the credentials of a real account for authentication.

Testing endpoints allow to Request test information from a test Account. These endpoints are available for software development teams only. These endpoints require the credentials of a testing account for authentication.

It is a good practice to make requests from testing endpoints while developing the interface. And when the interface is ready, you can switch to the production endpoints.

Testing account credentials

Testing endpoints allow Authentication using the credentials of a testing account.

E-mail: MockBionovaExchange@gmail.com

Password: MockExchange123

These credentials grant access to a set of pre-loaded mock data that can be used to develop and test integrations to any program or system without having to create an account.

	Production Endpoints	Testing Endpoints
Main Domain	https://bionovacloudexchange.azurewebsites.net	https://bionovacloudexchangetest.azurewebsites.net
Token Authorization	https://bionovacloudexchange.azurewebsites.net/api/login/login	https://bionovacloudexchangetest.azurewebsites.net/api/login/login
Biological indicators of sterilization:	https://bionovacloudexchange.azurewebsites.net/api/Reading/GetBiSterilizationResults	https://bionovacloudexchangetest.azurewebsites.net/api/Reading/GetBiSterilizationResults
Biological indicators of disinfection:	https://bionovacloudexchange.azurewebsites.net/api/Reading/GetBiDisinfectionResults	https://bionovacloudexchangetest.azurewebsites.net/api/Reading/GetBiDisinfectionResults
Protein indicators:	https://bionovacloudexchange.azurewebsites.net/api/Reading/GetProResults	https://bionovacloudexchangetest.azurewebsites.net/api/Reading/GetProResults
Washing Chemical Indicators	https://bionovacloudexchange.azurewebsites.net/api/Reading/GetWasherResults	https://bionovacloudexchangetest.azurewebsites.net/api/Reading/GetWasherResults
Sterilization Chemical Indicators	https://bionovacloudexchange.azurewebsites.net/api/Reading/GetSterilizerResults	https://bionovacloudexchangetest.azurewebsites.net/api/Reading/GetSterilizerResults

Please Note

The examples described on this document show screenshots of HTTP requests carried out using the popular POSTMAN APP for convenience. www.postman.com

To dive in to a python implementation of an example interface, please refer to our publicly available Google Colab Jupyter Notebook

Google Colab Jupyter Notebook LINK (Python)

Token Authentication.

To be able to send an information Request to Bionova Exchange. You must first need to be authenticated.

Authentication on Bionova Cloud implements a "Token Bearer" strategy. Once a token is obtained for an account, the token must be attached to each GET Request header.

To obtain an authentication token for an Account, first you must send a POST request containing the username, password and domain of your Bionova Cloud Account.

Obtaining a token (Using Postman & Test endpoint):

1.1 Select POST method.

1.2 Enter the request URL of testing endpoint: https://bionovacloudexchangetest.azurewebsites.net/api/login/login

1.3 In the Authorization tab, select the type: "Inherit auth from parent".

1.4 In the Body tab, select the raw option, and then the JSON format. Below you must enter your Email, Password and Domain in JSON format:

```
{
"Email": "MockBionovaExchange@gmail.com",
"Password": "MockExchange123",
"DomainDist": "https://bionovatestapp.azurewebsites.net"
}
```

Parameter reference:

"Email": It refers to the email of the user to which you want to generate the token. (Test account in this case)

"Password": It refers to the password corresponding to the email entered. (Test account in this case)

"DomainDist": It refers to the domain to be used. (Test endpoint in this case). For more information refer to section *Available endpoints on Bionova Cloud*

1.5 Click on Send and you will get the response from Bionova Exchange containing an Access Token.

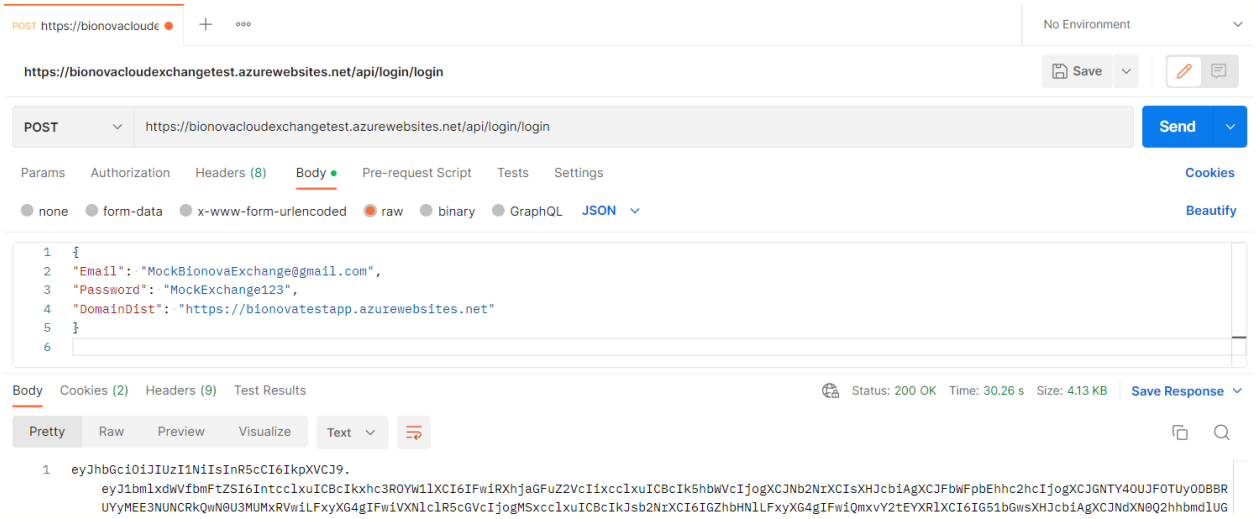


Figure: Postman response example

How to send a Request for Result Information

Once you have a valid access token, you can send a GET request for requesting readout results.

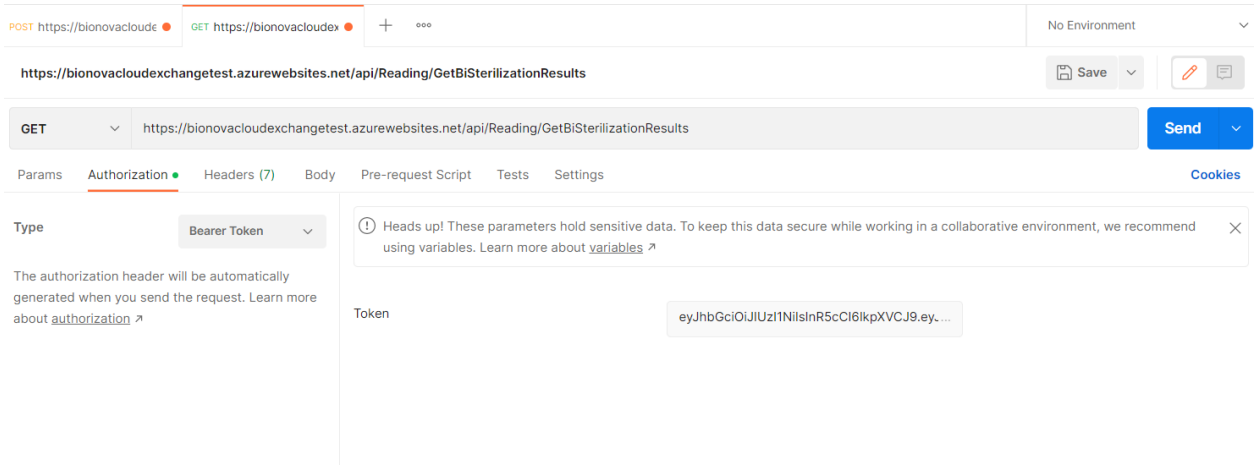
NOTE: Tokens must be refreshed once a week.

Requesting information (Using Postman & Test endpoint):

1. Select the GET method.
2. Enter the URL of endpoint that will provide you with the information you need.

   For example, for retrieving readout results of Biological Indicators for sterilization, this endpoint should be used
   https://bionovacloudexchangetest.azurewebsites.net/api/Reading/GetBiSterilizationResults

3. In the Authorization tab, select the type “Bearer Token” and paste your access token in the box that says Token.



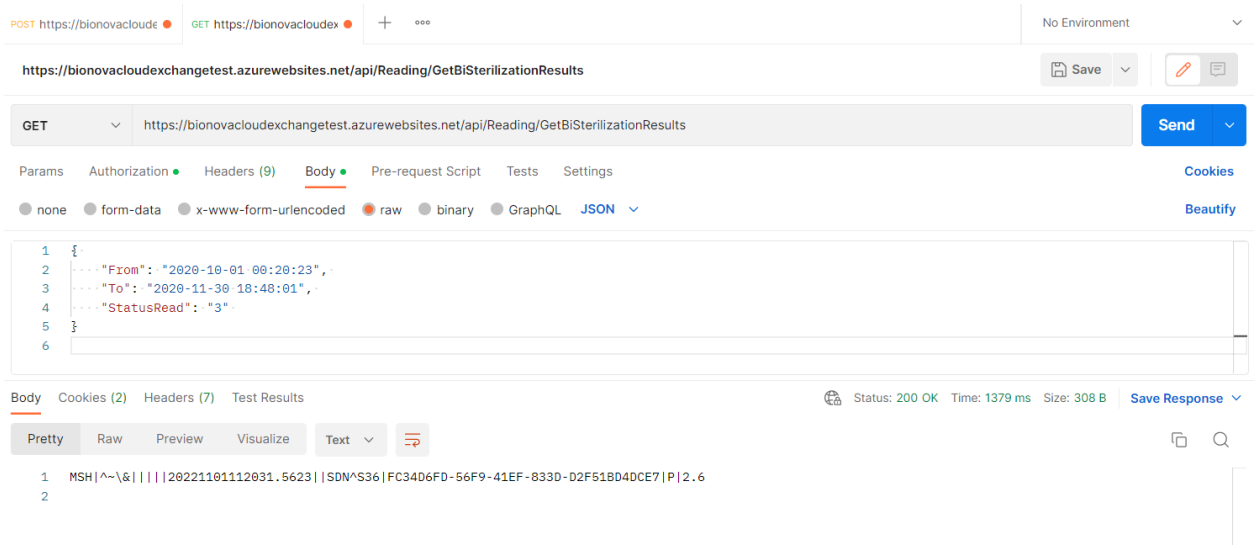
3.1 In the Body tab, select the raw option, and then the JSON format. Finally type-in your information request in a JSON text with the following format:

```
{
   "From": "2020-10-01 00:20:23",
   "To": "2020-11-30 18:48:01",
   "StatusRead": "3"
}
```

Parameter reference:

- "From": It refers to the date and time from where the results will be searched.
  Format: “yyyy-MM-dd HH:mm:ss”.
- "To": Refers to the date and time to which the results will be searched.
  Format: “yyyy-MM-dd HH:mm:ss”.
- "StatusRead": Determines the type of result to query.
  If you enter **3**, it shows readouts on FINISHED state.
  If you enter **2**, it shows readouts on SAVED state.

3.2 Click on Send and you will get the response from Bionova Exchange.



IMPORTANT:

The contents of the response will be sent on plain JSON text format.

The file is formatted according the HL7 protocol. Following section will describe fields and data types of the response. Please check our Colab Jupyter Notebook for tips for parsing the data.

Reference sheet: Response Dataframe

The response is sent on plain text JSON but with an HL7 formatting.

HL7 Version: v2.6.

Type: SDN/ACK - Notification of Anti-Microbial Device Data (Event S36).

Segments:

- SDD - Sterilization Device Data Segment.
- SCD - Anti-Microbial Cycle Data Segment.

HL7 Reference: http://www.hl7.eu/HL7v2x/v26/std26/ch17.html#Heading160

Reference for Biological indicators (Sterilization) response:

Note: this reference sheet is valid when requesting information from the endpoint of Biological indicators of sterilization.

Segment	Property	DataType	Values	Description
SDD-1.1	Position Number	(integer)	1 to quantity of incubation wells, e.g. 1 to 12 in IC1020FR model.	Number of the well of the incubator where the BI is being incubated and read.
SDD-2.1	Sterilizer Serial	(string)		Serial number of the sterilizer used to process the BI.
SDD-3	Sterilizer Name	(string)		Description of the sterilizer used to process the BI.
SDD-6	D Value	(real)	e.g.: 0.2 = 2 Minutes.	Provides information about the resistance of the BI batch
SDD-7	UserName, UserLastName	(string)		Name of the user that was logged in during the incubation.
SCD-5	Ticket Number	(integer)	1 - 9999999	Indicates the ticket number emitted by the incubator.
SCD-10.2	Result	(string)	POSITIVE NEGATIVE CANCELED	Actual result given by the incubator.
SCD-10.5	Process	(string)	NONE STEAM_121 STEAM_132 STEAM_134 STEAM_135 EO FORM VH2O2	Conditions for calculation of the D-Value.
SCD-10.7	ConditionSCIB	(string)	POSITIVE EXPOSED	Condition of the incubated BI: Non-

				exposed or Exposed to the sterilization cycle.
SCD-10.8	Load Number	(string)		Load number of the day.
SCD-10.9	Program Number	(string)		Program of the sterilizer used for that cycle.
SCD-11	Started Time	(DateTime)	yyyyMMddHHmmss	Gives the exact date and time of the beginning of the incubation.
SCD-15.1	Average Temperature	(float)		Average temperature during the incubation period of the BI.
SCD-16	ResultDate	(Time)	HHmmss	Gives the exact time of the finalization of the incubation.
SCD-25.1	Incubator Serial Number	(string)	MIN: 1 - MAX: 999	Serial number of the incubator.
SCD-25.2.1	Product Name	(string)		Product name of the BI.
SCD-25.2.2	Product Lot	(string)		Batch number of the BI.
SCD-25.2.3	Product Brand	(string)		Brand of the BI.
SCD-25.3	Incubator Name	(string)		Incubator model name
SCD-28.2	Cycle	(integer)		Cycle number, provided in the sterilizer screen and/or ticket.

Reference for Biological indicators (Disinfection) response:

Note: this reference sheet is valid when requesting information from the endpoint of Biological indicators of disinfection.

Segment	Property	DataType	Values	Description
SDD-1.1	Position Number	(integer)	1 to quantity of incubation wells, e.g. 1 to 12 in IC1020FR model.	Number of the well of the incubator where the BI is being incubated and read.
SDD-2.1	Disinfector Serial	(string)		Serial number of the disinfector used to process the BI.
SDD-3	Disinfector Name	(string)		Description of the disinfector used to process the BI.
SDD-6	Peroxide Concentration	(integer)		It is the concentration of hydrogen peroxide that was used to disinfect the environment.
SDD-7	UserName, UserLastName.	(string)		Name of the user that was logged in during the incubation.
SCD-5	Ticket Number	(integer)	1 - 9999999	Indicates the ticket number emitted by the incubator.
SCD-10.2	Result	(string)	POSITIVE NEGATIVE CANCELED	Actual result given by the incubator.
SCD-10.5	Process	(string)	NONE STEAM_121	Conditions for calculation of the D-

			STEAM_132 STEAM_134 STEAM_135 EO FORM VH2O2	Value.
SCD-10.7	ConditionSCIB	(string)	POSITIVE EXPOSED	Condition of the incubated BI: Non-exposed or Exposed to the sterilization cycle.
SCD-10.8	Room Id	(string)		It is the identification of the environment that was disinfected.
SCD-10.9	Room Volume	(integer)		It is the volume of the environment that was disinfected.
SCD-11	Started Time	(DateTime)	yyyyMMddHHmmss	Gives the exact date and time of the beginning of the incubation.
SCD-15.1	Average Temperature	(float)		Average temperature during the incubation period of the BI.
SCD-16	ResultDate	(Time)	HHmmss	Gives the exact time of the finalization of the incubation.
SCD-25.1	Incubator Seri Number	(string)	MIN: 1 - MAX: 999	Serial number of the incubator.
SCD-25.2.1	Product Name	(string)		Product name of the BI.

SCD-25.2.2	Product Lot	(string)		Batch number of the BI.
SCD-25.2.3	Product Brand	(string)		Brand of the BI.
SCD-25.3	Incubator Name	(string)		Incubator model name.

Reference for Protein Pen indicators response:

Note: this reference sheet is valid when requesting information from the endpoint of protein indicators.

Segment	Property	DataType	Values	Description
SDD-1.1	Position Number	(integer)	1 to quantity of incubation wells, e.g. 1 to 3 in MINIPRO model.	Shows the number position on the incubator in which the protein incubation process was performed.
SDD-2.1	Washer Serial	(string)		Serial number of the washer
SDD-3	Washer Name	(string)		Washer's name
SDD-6	Protein	(string)	>10 1,00 ~ 9,90 <1 0	Quantitative Protein test result according to the incubator's information. This result is given in micrograms (µg) of protein.
SDD-7	UserName, UserLastName	(string)		Name of the user that was logged in during the incubation.

SCD-5	Ticket Number	(integer)	1 - 9999999	Indicates the ticket number emitted by the incubator.
SCD-10.2	Result	(string)	CANCELLED NEGATIVE POSITIVE NO_RESULT NEGATIVE_WITHOU T_ PENCIL PEN_NOT_VALID PEN PULLED OUT	Protein test result according to the incubator´s information.
SCD-10.8	Surface	(string)		Refers to the surface that was swabbed.
SCD-10.9	Program Number	(string)		Program used for the washing cycle.
SCD-11	Started Time	(DateTim e)	yyyyMMddHHmmss	Gives the exact date and time of the beginning of the incubation.
SCD-15.1	Average Temperature	(float)		Average temperature during the incubation period of the Protein Pen.
SCD-16	ResultDate	(time)	HHmmss	Gives the exact time of the finalization of the incubation.
SCD-25.1	Incubator Serial Number	(string)	Serial number of the incubator	Serial number of the incubator.
SCD-25.2.1	Product Name	(string)		Product name of the Protein Pen
SCD-	Lote Product	(string)		Batch number of

25.2.2				the Protein Pen.
SCD-25.2.3	Product Brand	(string)		Brand of the Protein Pen
SCD-25.3	Incubator Name	(string)		Incubator model name.
SCD-28.2	Cycle	(integer)		Cycle number, provided in the washer screen and/or ticket.

Reference for Chemical indicators (Sterilization) response:

Note: this reference sheet is valid when requesting information from the endpoint of Sterilization chemical indicators.

Segment	Property	DataType	Values	Description
SDD-1.1	Manufacture Indicator	(float)		Manufacturer of the indicator.
SDD-2.1	Serial Sterilizer	(string)		Serial number of the sterilizer used to process the Chemical Indicator
SDD-3	Brand Sterilizer	(string)		Brand of the sterilizer used to process the Chemical Indicator.
SDD-7	UserName, UserLastName	(string)		Name of the user that was logged in when the indicator was scanned.
SCD-1	Manufacture Date	(DateTime)	yyyyMMddHHmmss	Manufacture date of the

				indicator.
SCD-7.1	Exposure Time	(float)		Time that the indicator was exposed to the sterilization process.
SCD-10.2	Result	(string)	ACCEPTED REJECTED UNSAFE SAFE	Analysis results according to the reader´s information.
SCD-10.5	Concentration	(integer)		Percentage of concentration of the sterilization agent used in the sterilization processes.
SCD-10.7	Relative Dampness	(float)		Relative humidity condition, given in percentage, at the moment the sterilization process was made.
SCD-10.8	Package Number	(integer)		The number of the packet which contained the chemical indicator during the sterilization process.
SCD-10.9	Program	(string)		Number of the program that the sterilizer uses for that cycle.
SCD-11	Creation Test	(DateTime	yyyyMMddHHm	Give the exact

		)	mss	date and time this result was generated.
SCD-15.1	Temperature	(string)		Temperature of the sterilization cycle.
SCD-16	ExpirationDate	(DateTime)	yyyyMMddHHmmss	Expiration date of the indicator.
SCD-25.1	Serial Number Scanner	(string)		Serial Number of the Trazanto reader used.
SCD-25.2.1	Name Product	(string)		Product name of the indicator.
SCD-25.2.2	Lote Product	(string)		Batch number of the Chemical Indicator.
SCD-25.2.3	Brand	(string)		Brand of the Chemical Indicator.
SCD-28.2	Cycle	(integer)		Cycle number of the sterilization process.

Reference for chemical indicators (Washing/Disinfection) response:

Note: this reference sheet is valid when requesting information from the endpoint of Washing chemical indicators.

Segment	Property	DataType	Values	Description
SDD-1.1	Manufacture Indicator	(float)		Manufacturer of the indicator.
SDD-2.1	Serial Washer	(string)		Serial number of

				the Cleaning machine used in the process.
SDD-3	Brand Washer	(string)		Brand of the Cleaning machine used in the process.
SDD-7	UserName, UserLastName	(string)		Name of the user that was logged in when the indicator was scanned.
SCD-1	Manufacture Date	(DateTime)	yyyyMMddHHmmss	Manufacture date of the indicator.
SCD-7.1	WashingTime	(integer)		Time that the indicator was exposed to the cleaning process.
SCD-10.2	Result	(string)	ACCEPTED REJECTED UNSAFE SAFE	Analysis results according to the reader´s information.
SCD-10.5	Detergent Type	(string)	Enzymatic Alkaline Non-Ionic	The type of detergent utilized at the cleaning process.
SCD-10.7	Detergent Concentration	(integer)		Percentage of concentration of the detergent utilized at the cleaning processes.
SCD-10.8	Location	(string)		Location of the chemical indicator inside the cleaning machine.
SCD-10.9	Program	(string)		Number of the program that the machine uses for that cycle.
SCD-11	Creation Test	(DateTime)	yyyyMMddHHmmss	Give the exact date and time this result

				was generated.
SCD-15.1	Temperature	(string)		Temperature of the cleaning cycle.
SCD-16	ExpirationDate	(DateTime)	yyyyMMddHHmmss	Expiration date of the indicator.
SCD-25.1	Serial Number Scanner	(string)		Serial Number of the Trazanto reader used.
SCD-25.2.1	Product name	(string)		Product name of the indicator.
SCD-25.2.2	Lot Product	(string)		Batch number of the Chemical Indicator.
SCD-25.2.3	Brand	(string)		Brand of the Chemical Indicator.
SCD-28.2	Cycle	(integer)		Cycle number of the cleaning process.
SCD-30.2.1	Water Pressure	(float)		Pressure of the water utilized at the cleaning cycle.
SCD-30.2.2	WaterHardness	(float)		Parameter that defines the quality of the water utilized at the cleaning cycle.

Section 3 – Notification based comunication scheme

Notification based scheme works by the Exchange API sending HTTP commands to a configured third-party endpoint as detailed on following sections.

This strategy allows for real-time synchronization of Bionova Cloud and Third-party software.

The Notification service allows specifying an external endpoint where a POST notification will be sent by bionova cloud each time a result:

- Is saved manually by the user on Bionova Cloud (Exchange subscription).
- Is synced on Bionova Cloud by Bionova Cloud Agent (Exchange+ subscription).

External endpoints must be defined on Bionova Cloud Web Interface by the Company Administrator on the screen Configuration -> Subscription.

IMPORTANT 1: To subscribe and enpoint to the notification service, you will need a valid **public** endpoint to which Bionova Cloud will send a POST command with each readout information.

Bionova Exchange Licenses Types

Exchange subscription (Normal subscription):

Notifications will be sent when the result is *saved* to the dashboard from the *finished* state.

Exchange+ subscription (Plus subscription):

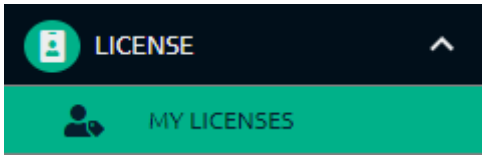
Notifications will be sent as soon a readout result is synked on the Bionova cloud user account.

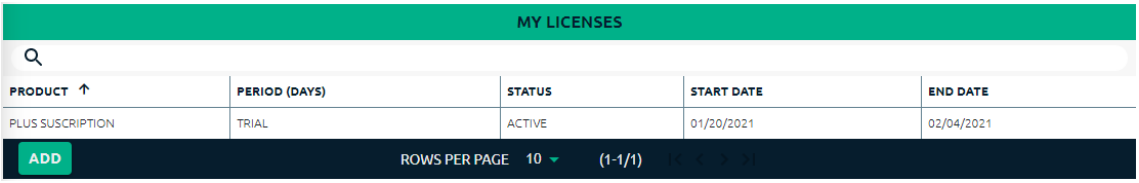
Exchange+ subscription allows the user to not interact at all with Bionova Cloud Web-APP but ath the same time, to have the readout result information available on the cloud to be requested by a thrid-party source.

Important: Syncronization of results from a Terragene device to Bionova Cloud servers is carried out by Bionova Cloud Agent. The Agent will take te information from the devices, and upload it to the user Bionova Cloud Account.

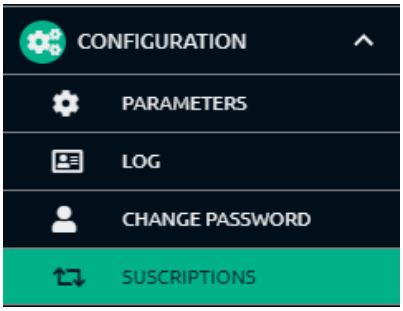
How to suscribe an external endpoint

To activate the Exchange or Exchange+ subscription. Go to Licences -> My Licences screen on the web-APP and select the type of licence suitable for your aplication.

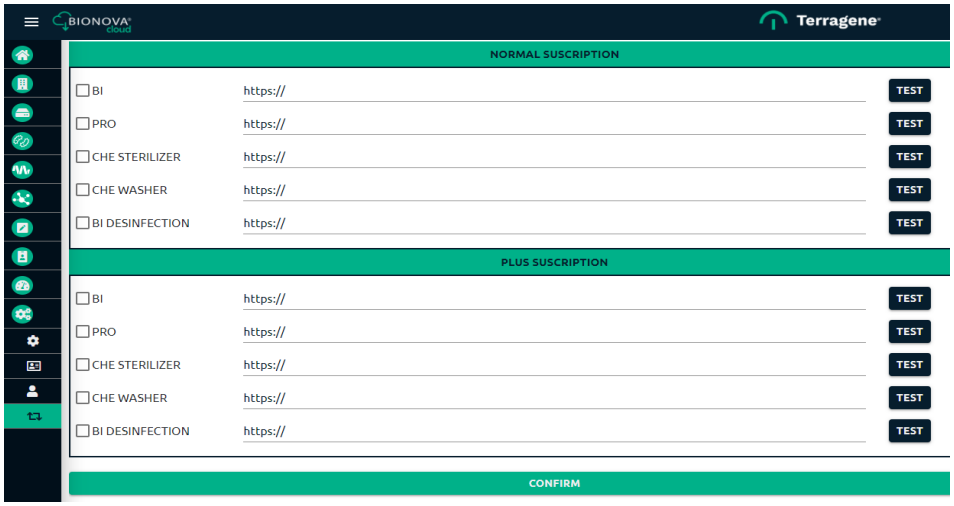




Afterwards, Using the sidebar menu enter the subscriptions screen



Fill in the external endpoints URLs to which Bionova Exchange will send the POST comands containing a single readout result when the results are saved or created (depending on the selected subscription).



Reference sheet: Notifications Dataframe

Reference for Biological indicators (Sterilization) notifications:


```
[
  {
    "PositionNumber": "int",
    "StartedTime": "datetime: nullable",
    "ResultDate": "datetime: nullable",
    "ProductName": "string",
    "ProductBrand": "string",
    "ProgramName": "string",
    "ProgramTime": "string",
    "ProgramTemperature": "string",
    "ProcessDescription": "string",
    "ValueD": "float: nullable",
    "Status": "int",
    "StatusDescription": "string",
    "ConditionSCIBDescription": "string",
    "Result": "int",
    "ResultDescription": "string",
    "AverageTemperature": "float: nullable",
    "AverageTemperatureFormat": "string",
    "VisualResult": "int",
    "VisualResultDescription": "string",
    "BookNumber": "string",
    "PageNumber": "string",
    "Cycle": "string",
    "SterilizerName": "string",
    "SterilizerBrand": "string",
    "SterilizerSerialNumber": "string",
    "IncubatorName": "string",
    "IncubatorSerialNumber": "string",
    "IncubatorLot": "string",
    "ProgramNumber": "string",
    "LoadNumber": "string",
    "Notes": "string",
    "TicketNumber": "int: nullable",
    "ReadNumber": "int: nullable",
    "SectorName": "string",
    "CompanyName": "string",
    "Operator": "string"
  }
]
```


Property	DataType	Values/Format		Description
PositionNumber	INTEGER	MIN=1	MAX= 12	Position of the incubator where the BI is being incubated and read.
StartedTime	DATETIME (nullable)	YYYY-MM-DDThh:mm:ssZ		Gives the exact date and time of beginning of the incubation [1]

[1] All dates in UTC-0

ResultDate	DATETIME (nullable)	YYYY-MM-DDThh:mm:ssZ	Gives the exact date and time of finalization of readout [1]
ProductBrand	STRING (MAX)		Brand of the BI
ProductName	STRING (MAX)		Product name of the BI
ProgramName*	STRING (MAX)	1 hs. 2 hs. 3 hs. 4 hs. 1/2 hs. 15 min. Ultra Instant Hyper	Program name of the incubator
ProgramTime*	STRING (MAX)	2 4 3 1 0.5 0.25 0.33 0.0055 0.083	Program time set in the incubator in hours
ProgramTemperature*	STRING (MAX)	37 60	Program temperature set in the incubator in celsius
ProcessDescription	STRING	STEAM (121) STEAM (128) STEAM (132) STEAM (134) STEAM (135) EO (30) EO (54)	Conditions for calculation of the D-Value

		FORM (60) VH2O2 (27) VH2O2 (45) VH2O2 (50)	
ValueD	FLOAT (.7) (nullable)	#.########	Provides information about the resistance of that BI batch
Status	INDEX (INTEGER)	2 (SAVED) 3 (FINISHED)	Status index of the reading 2 -> SAVED 3 -> FINISHED
StatusDescription	STRING	SAVED FINISHED	Status description of the reading
ConditionSCIBDescription	STRING	Positive Exposed	"Positive" (positive control, non-exposed) "Exposed" (to the sterilization cycle).
Result	INDEX (INTEGER)	0 1 2	Actual result given by the incubator 0 -> Positive 1 -> Negative 2 -> Cancelled
ResultDescription	STRING	Positive Negative Cancelled	Result description given by the incubator
AverageTemperature	FLOAT (.7) (nullable)	#.########	Average temperature during the incubation period of that BI
AverageTemperatureFormat	STRING	#.# °C	Average temperature formatted
VisualResult	INDEX (INTEGER)	0 1	It is the result observed by a operator 0 -> Positive 1 -> Negative
VisualResultDescription	STRING	POSITIVE NEGATIVE	It is the result observed by a operator
BookNumber	STRING (MAX)		Logbook information (book where you keep your records, including the incubator´s printed ticket)
PageNumber	STRING (MAX)		Complete with logbook page number corresponding to the sterilization process.
Cycle	STRING(300)		Cycle number, provided in the sterilizer screen and/or ticket
SterilizerName	STRING (MAX)		Descriptive name of the sterilizer used for the process

SterilizerBrand	STRING (MAX)		Brand of the sterilizer
SterilizerSerialNumber	STRING (MAX)		Serial number of the sterilizer, in case you have 2 or more of the same brand
IncubatorName	STRING (MAX)		Model name of the incubator responsible for reading
IncubatorSerialNumber	STRING (MAX)		Serial number of the incubator responsible for reading
IncubatorLot	STRING (MAX)		Batch of the incubator responsible for reading
ProgramNumber	STRING (MAX)		Program of the sterilizer used for that cycle.
LoadNumber	STRING (MAX)		Load number of the day.
Notes	STRING(300)		You can fill this box with any information you consider relevant and it is not already considered in the other fields
TicketNumber	INTEGER (nullable)	#	Indicates the ticket number of the unit.
ReadNumber	INTEGER (nullable)	#	Indicates the read number giving by the incubator
SectorName	STRING (MAX)		Indicates the name of the operator's Sector responsible for the reading
CompanyName	STRING (MAX)		Indicates the name of the Company to which the operator belong
Operator	STRING (16)		Name of user that was logged in during incubation of this BI

* Program associations across Name, Time and Temperature.

Name	Time [hours]	Temperature °C
2 hs.	2	60
2 hs.	2	60
4 hs.	4	37
3 hs.	3	60
1 hs.	1	60
1 hs.	1	60
1/2 hs.	0.5	60

15 min.	0.25	60
1 hs.	1	60
15 min.	0.25	60
1/2 hs.	0.5	60
Ultra	0.33	60
Instant	0.0055	60
Hyper	0.083	60
1 HS.	1	60

Reference for Biological indicators (Disinfection) notifications:

```
[
  {
    "PositionNumber": "int",
    "StartedTime": "datetime: nullable",
    "ResultDate": "datetime: nullable",
    "ProductBrand": "string",
    "ProductName": "string",
    "ProgramName": "string",
    "ProgramTime": "string",
    "ProgramTemperature": "string",
    "Status": "int",
    "StatusDescription": "string",
    "ConditionSCIBDescription": "string",
    "Result": "int",
    "ResultDescription": "string",
    "AverageTemperature": "float: nullable",
    "AverageTemperatureFormat": "string",
    "VisualResult": "int",
    "VisualResultDescription": "string",
    "BookNumber": "string",
    "PageNumber": "string",
    "DisinfectorName": "string",
    "DisinfectorBrand": "string",
    "DisinfectorSerialNumber": "string",
    "IncubatorName": "string",
    "IncubatorSerialNumber": "string",
    "IncubatorLot": "string",
    "ProgramNumber": "string",
    "Notes": "string",
    "TicketNumber": "int: nullable",
    "ReadNumber": "int: nullable",
    "SectorName": "string",
    "CompanyName": "string",
    "PeroxideConcentration": "int: nullable",
    "RoomId": "string",
    "RoomVolume": "int: nullable",
    "Operator": "string"
  }
]
```

Property	DataType	Values/Format		Description
PositionNumber	INTEGER	MIN=1	MAX= 12	Position of the incubator where the BI is being incubated and read.
StartedTime	DATETIME (nullable)	YYYY-MM-DDThh:mm:ssZ		Gives the exact date and time of beginning of the incubation [2]
ResultDate	DATETIME (nullable)	YYYY-MM-DDThh:mm:ssZ		Gives the exact date and time of finalization of readout [1]
ProductBrand	STRING (MAX)			Brand of the BI
ProductName	STRING (MAX)			Product name of the BI
ProgramName*	STRING (MAX)	1 hs. 2 hs. 3 hs. 4 hs. 1/2 hs. 15 min. Ultra Instant Hyper		Program name of the incubator
ProgramTime*	STRING (MAX)	2 4 3 1 0.5 0.25 0.33 0.0055 0.083		Program time set in the incubator in hours
ProgramTemperature*	STRING (MAX)	37 60		Program temperature set in the incubator in celsius
Status	INDEX (INTEGER)	2 3		Status index of the reading 2 -> SAVED 3 -> FINISHED
StatusDescription	STRING	SAVED FINISHED		Status description of the reading

[2] All dates in UTC-0

ConditionSCIBDescription	STRING	Positive Expuesto	"Positive" (positive control, non-exposed) "Exposed" (to the sterilization cycle).
Result	INDEX (INTEGER)	0 1 2	Actual result given by the incubator 0 -> Positive 1 -> Negative 2 -> Cancelled
ResultDescription	STRING	Positive Negative Cancelled	Result description given by the incubator
AverageTemperature	FLOAT (.7) (nullable)	#.#######	Average temperature during the incubation period of that BI
AverageTemperatureFormat	STRING	#.# °C	Average temperature formatted
VisualResult	INDEX (INTEGER)	0 1	It is the result observed by a operator 0 -> Positive 1 -> Negative
VisualResultDescription	STRING	POSITIVE NEGATIVE	It is the result observed by a operator
BookNumber	STRING (MAX)		Logbook information (book where you keep your records, including the incubator´s printed ticket)
PageNumber	STRING (MAX)		Complete with logbook page number corresponding to the sterilization process.
DisinfectorName	STRING (MAX)		Descriptive name of the disinfector used for the process
DisinfectorBrand	STRING (MAX)		Brand of the disinfector
DisinfectorSerialNumber	STRING (MAX)		Serial number of the disinfector, in case you have 2 or more of the same brand
IncubatorName	STRING (MAX)		Model name of the incubator responsible for reading
IncubatorSerialNumber	STRING (MAX)		Serial number of the incubator responsible for reading
IncubatorLot	STRING (MAX)		Batch of the incubator responsible for reading
ProgramNumber	STRING (MAX)		Program of the sterilizer used for that cycle.

Notes	STRING (300)		You can fill this box with any information you consider relevant and it is not already considered in the other fields
TicketNumber	INTEGER (nullable)	#	Indicates the ticket number of the unit.
ReadNumber	INTEGER (nullable)	#	Indicates the read number giving by the incubator
SectorName	STRING (MAX)		Indicates the name of the operator's Sector responsible for the reading
CompanyName	STRING (MAX)		Indicates the name of the Company to which the operator belong
PeroxideConcentration	INTEGER (nullable)		It is the concentration of hydrogen peroxide that was used to disinfect the environment.
RoomId	STRING (300)		It is the identification of the environment that was disinfected.
RoomVolume	INTEGER (nullable)		It is the volume of the environment that was disinfected
Operator	STRING (16)		Name of user that was logged in during incubation of this indicator

Reference for Protein Pen indicators notifications:

```
[
  {
    "PositionNumber": "int",
    "StartedTime": "datetime: nullable",
    "ResultDate": "datetime: nullable",
    "ProductBrand": "string",
    "ProductName": "string",
    "ProgramName": "string",
    "ProgramTime": "string",
    "ProgramTemperature": "string"
    "Status": "int",
    "StatusDescription": "string",
    "Result": "int",
    "ResultDescription": "string",
    "CuantitativeResult": "float: nullable",
    "CuantitativeResultFormat": "string",
    "AverageTemperature": "float: nullable",
    "AverageTemperatureFormat": "string",
    "Tool": "string",
    "VisualResult": "int",
    "VisualResultDescription": "string",
    "Protein": "float: nullable",
    "ProteinFormat": "string",
    "BookNumber": "string",
    "PageNumber": "string",
    "WasherName": "string",
    "WasherBrand": "string",
    "WasherSerialNumber": "string",
    "IncubatorName": "string",
    "IncubatorSerialNumber": "string",
```

```
    "IncubatorLot": "string",
    "ProgramNumber": "string",
    "Notes": "string",
    "TicketNumber": "int: nullable",
    "ReadNumber": "int: nullable",
    "Cycle": "string",
    "SectorName": "string",
    "CompanyName": "string",
    "Operator": "string"
  }
]
```


Property	DataType	Values/Format		Description
PositionNumber	INTEGER	MIN=1	MAX= 12	Position of the incubator where the BI is being incubated and read.
StartedTime	DATETIME (nullable)	YYYY-MM-DDThh:mm:ssZ		Gives the exact date and time of beginning of the incubation [3]
ResultDate	DATETIME (nullable)	YYYY-MM-DDThh:mm:ssZ		Gives the exact date and time of finalization of readout [1]
ProductBrand	STRING (MAX)			Brand of the PRO Indicator
ProductName	STRING (MAX)			Product name of the PRO Indicator
ProgramName	STRING (MAX)	1 hs. 2 hs. 3 hs. 4 hs. 1/2 hs. 15 min. Ultra Instant Hyper		Program name of the incubator
ProgramTime	STRING (MAX)	2 4 3 1 0.5 0.25 0.33		Program time set in the incubator in hours

[3] All dates in UTC-0

		0.0055 0.083	
ProgramTemperature	STRING (MAX)	37 60	Program temperature set in the incubator in celsius
Status	INDEX (INTEGER)	2 SAVED 3 FINISHED	Status index of the reading 2 -> SAVED 3 -> FINISHED
StatusDescription	STRING	SAVED FINISHED	Status description of the reading
Result	INDEX (INTEGER)	0 1 2	Actual result given by the incubator 0 -> Positive 1 -> Negative 2 -> Cancelled
ResultDescription	STRING	Positive Negative Cancelled	Result description given by the incubator
CuantitativeResult	FLOAT (.7) (nullable)	#.#######	Amount of protein detected by the incubator
CuantitativeResultFormat	STRING (MAX)	#.#######ug.	Amount of protein detected by the incubator formatted
AverageTemperature	FLOAT (.7) (nullable)	#.#######	Average temperature during the incubation period of that BI
AverageTemperatureFormat	STRING	#.# °C	Average temperature formatted
Tool	STRING (MAX)		Superficie que fue hisopada por el lápiz de proteínas
VisualResult	INDEX (INTEGER)	0 1	It is the result observed by a operator 0 -> POSITIVE 1 -> NEGATIVE
VisualResultDescription	STRING (MAX)	POSITIVE NEGATIVE	It is the description result observed by a operator
Protein	FLOAT (.7) (nullable)		Protein threshold
ProteinFormat	STRING (MAX)	#.####### ug.	Protein threshold formatted
BookNumber	STRING (MAX)		Logbook information (book where you keep your records, including the incubator´s printed ticket)

PageNumber	STRING (MAX)		Complete with logbook page number corresponding to the sterilization process.
WasherName	STRING (MAX)		Descriptive name of the washer used for the process
WasherBrand	STRING (MAX)		Brand of the washer
WasherSerialNumber	STRING (MAX)		Serial number of the washer, in case you have 2 or more of the same brand
IncubatorName	STRING (MAX)		Model name of the incubator responsible for reading
IncubatorSerialNumber	STRING (MAX)		Serial number of the incubator responsible for reading
IncubatorLot	STRING (MAX)		Batch of the incubator responsible for reading
ProgramNumber	STRING (MAX)		Program of the sterilizer used for that cycle.
Notes	STRING(300)		You can fill this box with any information you consider relevant and it is not already considered in the other fields
TicketNumber	INTEGER (nullable)	#	Indicates the ticket number of the unit.
ReadNumber	INTEGER (nullable)	#	Indicates the read number giving by the incubator
Cycle	STRING (300)		Cycle number, provided in the sterilizer screen and/or ticket
SectorName	STRING (MAX)		Indicates the name of the operator's Sector responsible for the reading
CompanyName	STRING (MAX)		Indicates the name of the Company to which the operator belong
Operator	STRING (16)		Name of user that was logged in during incubation of this indicator

Reference for Chemical indicators (Sterilization) notifications:

```
[
  {
    "CreationTest": "datetime",
    "ManufactureIndicator": "TERRAGENE",
    "ManufactureDate": "datetime: nullable",
    "ExpirationDate": "datetime",
    "Result": "int: nullable",
    "ResultDescription": "string",
    "Notes": "string",
    "SerialNumberScanner": "string",
    "Temperature": "float: nullable",
    "SterilizerName": "string",
    "SterilizerBrand": "string",
    "SterilizerSerialNumber": "string",
    "PackageNumber": "int: nullable",
    "Concentration": "int: nullable",
    "RelativeDampness": "float: nullable",
    "ExposureTime": "float: nullable",
    "VisualResult": "int",
    "VisualResultDescription": "string",
    "ReadNumber": "int: nullable",
    "SectorName": "string",
    "ProductName": "string",
    "ProductBrand": "string",
    "ProductLot": "string",
    "Status": "int: nullable",
    "StatusDescription": "string",
    "BookNumber": "string",
    "PageNumber": "string",
    "Cycle": "int: nullable",
    "ProgramNumber": "string",
    "Operator": "string",
    "Image": "string"
  }
]
```

Property	DataType	Values/Format	Description
CreationTest	DATETIME	YYYY-MM-DDThh:mm:ssZ	This is the date the scan was performed
ManufactureIndicator	STRING (MAX)		Manufacturer of the Chemical Indicator
ManufactureDate (nullable)	DATETIME	YYYY-MM-DDThh:mm:ssZ	Manufacture date of the Chemical Indicator
ExpirationDate	DATETIME	YYYY-MM-DDThh:mm:ssZ	Expiration date of the Chemical Indicator

Result	INTEGER (nullable)	0 1	Analysis result according to the reader´s information 0 -> SAFE 1 -> UNSAFE
ResultDescription	STRING (MAX)	SAFE UNSAFE	Description of analysis result according to the reader´s information
Notes	STRING (MAX)		Any relevant information that has not been considered in other fields
SerialNumberScanner	STRING (MAX)		Serial Number of the Trazanto reader used
Temperature	STRING (MAX)		Temperature of the sterilization cycle
SterilizerName	STRING (MAX)		Descriptive name of the sterilizer machine used in the process
SterilizerBrand	STRING (MAX)		Brand of the sterilizer machine used in the process
SterilizerSerialNumber	STRING (MAX)		Serial number of the sterilizer machine used in the process
PackageNumber	INTEGER (nullable)		The number of the packet which contained chemical indicator during the sterilization proces
Concentration	INTEGER (nullable)		Percentage of concentration of the sterilizat agent used in the sterilization processes
RelativeDampness	FLOAT(.7)	#.#######	Relative humidity condition, given in percentage the moment the sterilization process was made.
ExposureTime	FLOAT(.7)	#.#######	Time that the indicator was exposed to sterilization process
VisualResult	INDEX (INTEGER)	0 1	User Evaluation of the result suggested by the reader

			0 -> AGREED 1 -> DISAGREED
VisualResultDescription	STRING (MAX)	AGREED DISAGREED	User Evaluation of the result suggested by the reader
ReadNumber	INTEGER (nullable)		Indicates the read number giving by the incubator
SectorName	STRING (MAX)		Indicates the name of the operator's Sector responsible for the reading
ProductName	STRING (MAX)		Product code of the Chemical Indicator
ProductBrand	STRING (MAX)		Brand of the Chemical Indicator
ProductLot	STRING (MAX)		Batch number of the Chemical Indicator
Status	INDEX (INTEGER)	2 3	Status index of the reading 2 -> SAVED 3 -> FINISHED
StatusDescription	STRING (MAX)	SAVED FINISHED	Status description of the reading
BookNumber	STRING (MAX)		Number of the log book corresponding to the process.
PageNumber	STRING (MAX)		Number of the log page corresponding to the process.
Cycle	INTEGER (nullable)		Cycle number of the sterilization process.
ProgramNumber	STRING (MAX)		Program number of the sterilizer for the cycle.
Operator	STRING (16)		Name of user that was logged in during incubation of this indicator
Image	STRING(Base64)		Base64 formatted image of chemical indicator

Reference for chemical indicators (Washing/Disinfection) notifications:


```
[
  {
    "CreationTest": "datetime",
    "ManufactureIndicator": "TERRAGENE",
    "ManufactureDate": "datetime: nullable",
    "ExpirationDate": "datetime",
    "Result": "int: nullable",
    "ResultDescription": "string",
    "Notes": "string",
    "SerialNumberScanner": "string",
    "Temperature": "float: nullable",
    "WasherName": "string",
    "WasherBrand": "string",
    "WasherSerialNumber": "string",
    "Location": "string",
    "WashingTime": "int: nullable",
    "DetergentType": "int: nullable",
    "DetergentTypeDescription": "string",
    "PackageNumber": "int: nullable",
    "DetergentConcentration": "int: nullable",
    "WaterPressure": "float: nullable",
    "WaterHardness": "float: nullable",
    "VisualResult": "int",
    "VisualResultDescription": "string",
    "ReadNumber": "int: nullable",
    "SectorName": "string",
    "ProductName": "string",
    "ProductBrand": "string",
    "ProductLot": "string",
    "Status": "int: nullable",
    "StatusDescription": "string",
    "BookNumber": "string",
    "PageNumber": "string",
    "Cycle": "int: nullable",
    "ProgramNumber": "string",
    "Operator": "string",
    "Image": "string"
  }
]
```


Property	DataType	Values/Format	Description
CreationTest	DATETIME	YYYY-MM-DDThh:mm:ssZ	This is the date the scan was performed
ManufactureIndicator	STRING (MAX)		Manufacturer of the Chemical Indicator
ManufactureDate	DATETIME (nullable)	YYYY-MM-DDThh:mm:ssZ	Manufacture date of the Chemical Indicator

ExpirationDate	DATETIME	YYYY-MM-DDThh:mm:ssZ	Expiration date of the Chemical Indicator
Result	INTEGER (nullable)	0 1	Analysis result according to the reader´s information 0 -> SAFE 1 -> UNSAFE
ResultDescription	STRING (MAX)	SAFE UNSAFE	Description of analysis result according to the reader´s information
Notes	STRING (MAX)		Any relevant information that has not been considered in other fields
SerialNumberScanner	STRING (MAX)		Serial Number of the Trazanto reader used
Temperature	STRING (MAX)		Temperature of the sterilization cycle
WasherName	STRING (MAX)		Descriptive name of the washer machine used in the process
WasherBrand	STRING (MAX)		Brand of the washer machine used in the process
WasherSerialNumber	STRING (MAX)		Serial number of the washer machine used in the process
Location	STRING (MAX)		Location of the chemical indicator inside the cleaning machine.
WashingTime	INTEGER (nullable)		Time that the indicator was exposed to the cleaning process
DetergentType	INTEGER (nullable)		The type of detergent utilized at the cleaning proc
DetergentTypeDescription	STRING (MAX)		The type of detergent utilized at the cleaning proc formatted
PackageNumber	INTEGER (nullable)		The number of the packet which contained the chemical indicator during the sterilization process

DetergentConcentration	INTEGER (nullable)		Percentage of concentration of the detergent utilized at the cleaning processes
WaterPressure	FLOAT(.7) (nullable)	#.#######	Pressure of the water utilized at the cleaning cycl
WaterHardness	FLOAT(.7) (nullable)	#.#######	Parameter that defines the quality of the wa utilized at the cleaning cycle.
VisualResult	INDEX (INTEGER)	0 1	User Evaluation of the result suggested by the reader 0 -> AGREED 1 -> DISAGREED
VisualResultDescription	STRING (MAX)	AGREED DISAGREED	User Evaluation of the result suggested by the reader
ReadNumber	INTEGER (nullable)		Indicates the read number giving by the incubator
SectorName	STRING (MAX)		Indicates the name of the operator's Sector responsible for the reading
ProductName	STRING (MAX)		Product code of the Chemical Indicator
ProductBrand	STRING (MAX)		Brand of the Chemical Indicator
ProductLot	STRING (MAX)		Batch number of the Chemical Indicator
Status	INDEX (INTEGER)	2 3	Status index of the reading 2 -> SAVED 3 -> FINISHED
StatusDescription	STRING (MAX)	SAVED FINISHED	Status description of the reading
BookNumber	STRING (MAX)		Number of the log book corresponding to the process.
PageNumber	STRING (MAX)		Number of the log page corresponding to the process.

Cycle	INTEGER (nullable)		Cycle number of the sterilization process.
ProgramNumber	STRING (MAX)		Program number of the sterilizer for the cycle.
Operator	STRING (16)		Name of user that was logged in during incubation of this indicator
Image	STRING(Base64)		Base64 formatted image of chemical indicator