

DeltaCube API quick start guide

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Measurement API endpoints

The following API endpoints are available to retrieve measurement data:

https://dashboard.deltacube.nl/api/projects/project_id/measurements/daily/v2

https://dashboard.deltacube.nl/api/projects/project_id/measurements/v3

- Which API should be used depends on the type of project. For most projects the daily API is recommended
- If there are multiple measurements in 1 day (per alias), the daily API will return only the average value of the measurements. The default API will return all measurements
- The examples in this document are done with the daily API and can be exchanged with the default API

Retrieve measurements data

```
curl --header "accept: /" --header "Authorization: api_key"
```

```
https://dashboard.deltacube.nl/api/projects/project_id/measurements/daily/v2?pagesize=50&pagenumber=0
```

- 'api_key' must be replaced with the valid key
- 'project_id' must be replaced with the valid id
- 'pagesize' indicates how many data points you get per request. If the page size is not filled in a default value of 50 is used.
- 'pagenumber' tells you which group of the total

So if you want to have data points 300 to 400: `pagesize=100&pagenumber=3`

Example data

An example project is available that can be used to test the API. Please note, this is fictitious data and cannot be considered as qualitative measurements. The API key in the example below can be used.

```
curl --header "accept: /" --header "Authorization: PxtSmBwNc2waOPfcoOw6K2d3MHEY07QGB9o9CKLQp3A=" https://dashboard.deltacube.nl/api/projects/59/measurements/daily/v2?pagesize=50&pagenumber=0
```

If postman is used, the complete curl request can be imported by choosing import and copying the whole curl request above, with api key inside and without enters after copying.

```
{
  "location": 151,
  "timestamp": "2021-11-22T17:00:00",
  "device": "DIOT00153",
  "alias": "zakbaak_02",
  "notes": "",
  "x": 145876.06,
  "y": 417134.88,
  "z": 4.2591543,
  "lat": 51.741306,
  "lon": 5.25376,
  "lidar": 1.828741,
  "heightOffset": 8,
  "baseHeight": -3.8288455,
  "sandHeight": 2.3504133,
  "thickness": 6.179259,
  "gpsHeight": 4.1711545,
  "stdX": 0.0037909627,
  "stdY": 0.00079116755,
  "stdZ": 0.004541876,
  "stdLidar": 0.009028204,
  "dBaseHeight0": 0,
  "dBaseHeight": 0,
  "dSandHeight0": 0,
  "dSandHeight": 0,
  "dThickness0": 0,
  "dThickness": 0
},
```

Data explanation

location	Location ID of the alias
epoch	Date/time of the measurement
device	DeltaCube attached to the alias
alias	Settlement plate reference ID, given by the customer. This value is unique within a project
notes	Not used
x, y, z	Coordinate of the device*
lat, lon	Coordinate of the device in LAT/LON
lidar	Measured distance from device to ground level
heightOffset	Distance in meters between the bottom of the pole and the top of the pole, due to extensions
baseHeight	Calculated height* of the base of the settlement plate (bottom of the pole)
sandHeight	Calculated height* of the top layer of the sand
thickness	Calculated thickness of the sand layer, calculated from base height up to top layer of the sand
gpsHeight	Calculated height* of the top of the settlement plate / bottom of sensor. Always 88mm below 'z'
stdX, stdY, stdZ, stdLidar	Calculated standard deviation of the measurements
dBaseHeight0	Difference of base height between the current and the first measurement
dBbaseHeight	Difference of base height between the current and the previous measurement
dSandHeight0	Difference of sand height between the current and the first measurement
dSandHeight	Difference of sand height between the current and the previous measurement
dThickness0	Difference of sand thickness between the current and the first measurement
dThickness	Difference of sand thickness between the current and the previous measurement

* Coordinate system used depends on the project. In Netherlands this would normally be RD-NAP.

Data organization

- Data is returned in json format
- The data is sent in order of settlement plate reference ID ('alias'). The order of aliases is alphabetic. After order of aliases, the result is in order of epoch (date/time)
- Epoch is in UTC time
- It is possible that there are multiple devices on one alias. One device can also be on multiple aliases. For the customer, the alias is usually relevant

Filters

The following filters can be applied:

- alias
Settlement plate reference ID. Only data points of the given alias is shown
- start
Time. Only data points starting from the given time are shown
- end
Time. Only data points before the given time are shown

Example:

https://dashboard.deltacube.nl/api/projects/project_id/measurements/daily/v2?pagesize=50&pagenumber=0&alias=zakbaak-02&start=2022-06-02T17:00:00&end=2022-08-13T17:00:00

Null values

Incorrect measurements may be filtered out (for example when it rains hard and the lidar measurement becomes unreliable). In case of an incorrect measurement, the x, y, z or lidar values can be set to null. As a result, other values (for example "sandHeight") may also be null.

Data synchronization

It is necessary to sync all data from time to time. It may happen that data changes (for example when the extension of a pole is adjusted retroactively).

Suggested synchronization schedule:

- 1x per month: sync all data
- 1x per day: sync data from last 2 weeks

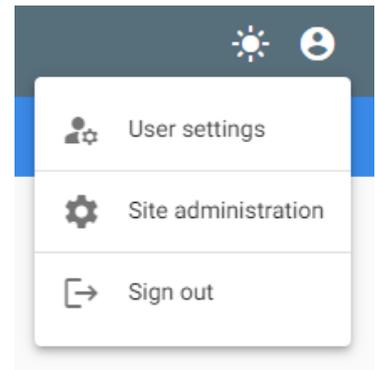
Alternative synchronization schedule:

- 1x per month: sync all data
- 1x per week: sync data from last 2 weeks
- 1x per day: sync data from last 2 days

API key

An API key can be generated from the dashboard (<https://dashboard.deltacube.nl/>).

- After logging in with the API user, choose 'User settings'
- Choose 'API' and choose 'Add key'
- After creating the key, a pop-up will appear with the API key. It is shown once and you have to write it down



Meta data

Meta data is send along with the response of the API:

"first":	First page number
"last":	Last page number
"previous":	Previous page number
"next":	Next page number
"total":	Total number of data points
"count":	Requested page size

Additional API endpoints

Projects overview

With the request below, a list is shown with all projects that can be retrieved with the given API key.

```
{  
  "name": "DeltaIoT Example Project",  
  "id": 59  
}
```

```
https://dashboard.deltacube.nl/api/projects/names
```

Example:

```
curl --header "accept: /" --header "Authorization:  
PxtSmBwNc2waOPfcoOw6K2d3MHEY07QGB9o9CKLQp3A="   
https://dashboard.deltacube.nl/api/projects/names
```

- Pagesize and pagenumber cannot be set.

Devices overview

With the request below, a list of all devices (DeltaCubes) of a project can be retrieved.

```
https://dashboard.deltacube.nl/api/projects/project_id/devices
```

Example:

```
curl --header "accept: /" --header "Authorization:  
PxtSmBwNc2waOPfcoOw6K2d3MHEY07QGB9o9CKLQp3A="   
https://dashboard.deltacube.nl/api/projects/59/devices?  
pagesize=50&pagenumber=0
```

```
{  
  "alias": "zakbaak-01",  
  "device": "DIOT00168"  
},  
{  
  "alias": "zakbaak-02",  
  "device": "DIOT00162"  
},  
{  
  "alias": "zakbaak-03",  
  "device": null  
},
```

- Pagesize and pagenumber should be set.
- "Device": null means that no device is attached to the alias.

Aliases overview

With the request below, a list with all aliases (settlement plate reference ID) of a project can be retrieved.

```
https://dashboard.deltacube.nl/api/projects/project_id/beacons
```

Example:

```
curl --header "accept: /" --header "Authorization:  
PxtSmBwNc2waOPfcoOw6K2d3MHEY07QGB9o9CKLQp3A="   
https://dashboard.deltacube.nl/api/projects/59/beacons?  
pagesize=50&pagenumber=0
```

```
{  
  "location": 1,  
  "alias": "zakbaak-01"  
},  
{  
  "location": 2,  
  "alias": "zakbaak-02"  
},  
{  
  "location": 3,  
  "alias": "zakbaak-03"  
},
```

- Pagesize and pagenumber should be set.

API history

Default

[https://dashboard.deltacube.nl/api/projects/\[projectID\]/measurements/\[version\]](https://dashboard.deltacube.nl/api/projects/[projectID]/measurements/[version])

V3

- Remove inconsistencies between default-v2 and daily-v2
 - 'timestamp' changed to 'epoch'
 - Data is returned in alphabetic order of alias. After order of aliases, the result is in order of epoch (date/time).

In previous versions the data was returned in order of alias based on the order in the database: the alias that is added last is shown last in the result. After order of aliases, the result is in order of epoch (date/time).

V2

- Meta data added

Daily

[https://dashboard.deltacube.nl/api/projects/\[projectID\]/measurements/daily/\[version\]](https://dashboard.deltacube.nl/api/projects/[projectID]/measurements/daily/[version])