

Security - Authentication and authorization

All queries are made over HTTPS to our server at data.earthsense.co.uk, using our EV SSL certificate.

Each query contains the user name and user key in the URL. These are validated against credentials stored in our database.

HTTPS ensures that the user name and user key are encrypted during the request.

Data will be returned only if the user name and user keys match *and* if the Zephyr is owned by the user.

Data access API

Overview

All endpoints (EPs) are either supported, deprecated or obsolete.

Supported endpoints

ID	Name	Description
1	Get list of Zephyrs	Returns list of Zephyrs owned by user
4	Get averaged Zephyr data – v3	As EP3, but returns averaged data
5	Get API version	Returns the current API version

Deprecated endpoints

ID Name		Description
2	Get Zephyr data – v1	Returns data from a single slot
3	Get Zephyr data – v2	As EP2, returns data from either or both slots

Obsolete endpoints

ID	Name	Description	

Details and examples

Extra data may be added to the JSON responses as improvements are made.

1. Get list of Zephyrs

URI: https://data.earthsense.co.uk/zephyrsForUser/[userName]/[user key]

Fields:

Field	Format / valid	Notes
	values	
user name		As supplied to customer
user key		As supplied to customer

Response (JSON format):

```
Root object:
   "userName": STRING,
   "query": STRING,
   "usersZephyrs":
      "ZEPHYRINTERNALID1": ZEPHYRDESCRIPTION,
      "ZEPHYRINTERNALID2": ZEPHYRDESCRIPTION,
      "ZEPHYRINTERNALIDN": ZEPHYRDESCRIPTION
   }
ZEPHYRDESCRIPTION:
   "connection": CONNECTIONINFO,
   "zNumber": INTEGER,
   "location": LOCATIONDESCRIPTION
CONNECTIONINFO:
   {
"lastDT": STRING (ISO DATETIME FORMAT)
   }
LOCATIONDESCRIPTION:
   "desc": STRING,
   "since": STRING (ISO DATETIME FORMAT),
   "lng": STRING,
   "lat": STRING
   }
Notes:
In the "usersZephyrs" object, ZEPHYRINTERNALIDn is the internal database ID of the Zephyr,
```

Example URI: https://data.earthsense.co.uk/zephyrsForUser/ExampleUser/ABCD-EFGH-JKLM-PQRST-UVWX

not the number marked on the Zephyr case.

Example JSON response:

```
},
"299": {
    "connection": {
        "lastDT": ""2018-09-03 16:43:56"
}
    "zNumber": 36,
    "location": {
        "desc": "OTS or Transit",
        "since": "2018-04-13 13:59:42",
        "lng": "None",
        "lat": "None"
}
},
"295": {
    "connection": {
        "lastDT": ""2018-09-03 16:41:33"
}
    "zNumber": 40,
    "location": {
        "desc": "Upper Easton, Bristol",
        "since": "2018-05-10 10:00:00",
        "lng": "-2.554876000",
        "lat": "51.460890000"
}
}
}
}
```

2. [Deprecated] Get Zephyr data - V1

Deprecated.

Using endpoint "3.Get Zephr data – v2" with "slots" field set to "S" will return the same data as this endpoint.

URI: <a href="https://data.earthsense.co.uk/dataForView/[user name]/[user key]/[Zephyr ID]/[start_datetime]/[end_datetime]/[view]/[format]/[target]

Fields:

Field	Format / valid	Notes
	values	
user name		As supplied to customer
user key		As supplied to customer
Zephyr ID		Significant digits of the number as shown on
		the Zephyr case e.g. for "Z000034", use "34"
start datetime	YYYYMMDDhhmm	Time is in UTC
end datetime	YYYYMMDDhhmm	Time is in UTC
view	def	
format	json	Returns data in JSON format
	CSV	Returns the data in CSV format
target	api	Returns the data as a standard HTTP response
	download	Returns the data as an attachment

View is case sensitive.

Format and target are case insensitive.

Response (JSON format):

```
Root object:
   {
"queryInfo":
          "userName": STRING,
          "startDT": STRING (DATETIME IN URL FORMAT),
          "userKey": STRING,
          "view": STRING ("def" is the only supported value),
          "ZephyrID": STRING,
          "endDT": STRING (DATETIME IN URL FORMAT)
          },
   "describedData":
          "LISTNAME1": DESCRIBEDDATALIST,
          "LISTNAME2": DESCRIBEDDATALIST,
          "LISTNAMEn": DESCRIBEDDATALIST,
   "errorDesc": STRING
DESCRIBEDDATALIST:
{
```

```
"header":
    {
      "CSVOrder": INTEGER,
      "HTMLLabel": STRING,
      "label": STRING,
      "key": STRING,
      "key": STRING
      },
"data":
      [
      DATATYPE,
      DATATYPE
      ]
}
```

The possible DESCRIBEDDATALIST objects are::

LISTNAME	DATATYPE(FORMAT)	Units	Notes
dateTime	STR(ISOFORMAT)		e.g. "2018-05-24T13:38:40"
UTS	INT		Unix time stamp equivalent
			of datetime
tempC	INT	degrees C	
Humidity	INT	% RH	
NO2	INT	μg/m³	
03	INT	μg/m³	
PM	INT	μg/m³	
latitude	FLOAT	degrees	
longitude	FLOAT	degrees	

Response (CSV format):

Not yet publically supported

Example URI: https://data.earthsense.co.uk/dataForView/ExampleUser/ABCD-EFGH-JKLM-PQRST-UVWX/34/201805241338/201805241538/def/JSON/api

Example response:

```
"queryInfo": {
    "userName": "ExampleUser",
    "startDT": "201805241338",
    "userKey": "ABCD-EFGH-JKLM-PQRST-UVWX",
    "view": "def",
    "ZephyrID": "34",
    "endDT": "201805241348"
},
"describedData": {
    "03": {
        "header": {
            "CSVOrder": 5,
            "HTMLLabel": "03",
            "label": "03",
            "units": "ug/m3",
            "key": "03"
```

```
"data": [ 83, 82, 83, 84, 76, 83, 81, 82, 87, 103 ]
     },
     "tempC": {
       "header": {
         "CSVOrder": 2,
          "HTMLLabel": "Temp",
         "label": "Temp",
"units": "C",
"key": "tempC"
       "data": [ 24, 24, 24, 24, 24, 24, 24, 24, 24, 24]
     },
     "NO2": {
       "header": {
          "CSVOrder": 4,
          "HTMLLabel": "NO2",
          "label": "NO2",
          "units": "ug/m3",
"key": "NO2"
        'data": [ 22, 22, 19, 19, 24, 20, 20, 19, 20, 19 ]
     },
     "dateTime": {
       "header": {
          "CSVOrder": 0,
          "HTMLLabel": "Timestamp",
          "label": "Timestamp",
          "units": " ",
          "key": "dateTime"
       },
"data": [ "2018-05-24T13:38:40", "2018-05-24T13:39:40", "2018-05-24T13:40:40", "2018-05-24T13:41:40", "2018-05-24T13:42:40", "2018-05-24T13:43:40", "2018-05-24T13:44:40", "2018-05-24T13:45:40", "2018-05-24T13:46:40", "2018-05-24T13:47:40" ]
     },
     "UTS": {
       "header": {
          "CSVOrder": 1,
"HTMLLabel": "Timestamp-UTS",
          "label": "Timestamp-UTS",
          "units": " "
          "key": "UTS"
       },
        "data": [ 1527169120, 1527169180, 1527169240, 1527169300,
1527169360, 1527169420, 1527169480, 1527169540, 1527169600, 1527169660 ]
     },
     "humidity": {
       "header": {
          "CSVOrder": 3,
          "HTMLLabel": "Humidity",
          "label": "Humidity",
          "units": "%RH",
          "key": "humidity"
       "data": [ 42, 42, 42, 42, 41, 41, 40, 41, 41, 40 ]
     "PM": {
       "header": {
          "CSVOrder": 7,
"HTMLLabel": "PM2.5",
          "label": "PM2.5",
```

```
"units": "ug/m3", 
"key": "PM"
       "data": [ 11, 7, 8, 9, 6, 7, 9, 9, 9, 5 ]
    },
"latitude": {
       "header": {
         "CSVOrder": 9,
         "HTMLLabel": "Latitude",
         "label": "Latitude",
"units": "degrees",
"key": "latitude"
       },
"data": [ 53.481725, 53.481727, 53.481727, 53.481725, 53.481725, 53.481718 ]
53.481725, 53.481723, 53.481722, 53.48172, 53.481718 ]
    "header": {
    "CSVOrder": 10,
         "HTMLLabel": "Longitude",
         "label": "Longitude",
"units": "degrees",
"key": "longitude"
       },
"data": [ -2.117775, -2.11778, -2.117778, -2.117777, -2.117778, -
2.117778, -2.117778, -2.11777, -2.11777 ]
    }
  },
  "errorDesc": null
```

3. Get Zephyr data – v2

URI: <a href="https://data.earthsense.co.uk/dataForViewBySlots/[user name]/[user key]/[Zephyr ID]/[start datetime]/[enddatetime]/[slots]/[view]/[format]/[target]

Fields:

Field Format / valid		Notes
	values	
user name		As supplied to customer
user key		As supplied to customer
Zephyr ID		Significant digits of the number as shown on
		the Zephyr case e.g. for "Z000034", use "34"
start datetime	YYYYMMDDhhmm	Time is in UTC
end datetime	YYYYMMDDhhmm	Time is in UTC
slots A		Return data for just slot A
	В	Return data for just slot B
	AB	Return data for both slots A and B
	S	Return data for a single slot in the "Get Zephyr
		data – V1 format" (see above)
view	def	
format	json	Returns data in JSON format
	CSV	Returns the data in CSV format
target	api	Returns the data as a standard HTTP response
	download	Returns the data as an attachment

View is case sensitive.

Format and target are case insensitive.

Response (JSON format):

```
Root object:
   {
"queryInfo":
          "userName": STRING,
          "startDT": STRING (DATETIME IN URL FORMAT),
          "userKey": STRING,
          "view": STRING ("def" is the only supported value),
          "ZephyrID": STRING,
          "endDT": STRING (DATETIME IN URL FORMAT)
   },
"slotA": SLOTDATA,
   "slotB": SLOTDATA,
   "errorDesc": STRING
   }
SLOTDATA:
Where there is valid data for a slot:
   "LISTNAME1": DESCRIBEDDATALIST,
   "LISTNAME2": DESCRIBEDDATALIST,
```

```
"LISTNAMEn": DESCRIBEDDATALIST,
Where there is no valid data for a slot:
   null
Where no data was requested:
   The member is not present (i.e. if only slot A data was requested, there will be no key "slotB")
DESCRIBEDDATALIST:
{
"header":
   {
"CSVOrder": INTEGER,
   "HTMLLabel": STRING,
   "label": STRING,
"units": STRING,
"key": STRING
},
"data":
   [
   DATATYPE,
   DATATYPE,
   DATATYPE
"data_hash": STRING
```

The possible DESCRIBEDDATALIST objects are:

LISTNAME	DATATYPE(FORMAT)	Units	Notes
dateTime	STR(ISOFORMAT)		e.g. "2018-05-24T13:38:40"
UTS	INT		Unix time stamp equivalent
			of datetime
tempC	INT	degrees C	Sensor temperature
Humidity	INT	% RH	Sensor humidity
NO2	INT	μg/m³	
O3	INT	μg/m³	
PM	INT	μg/m³	Data from units with
			Shinyei PM sensor
R1PM1	INT	μg/m³	PM₁ data from units with
			Alphasense R1 PM sensor
R1PM25	INT	μg/m³	PM _{2.5} data from units with
			Alphasense R1 PM sensor
R1PM10	INT	μg/m³	PM ₁₀ data from units with
			Alphasense R1 PM sensor
latitude	FLOAT	degrees	
longitude	FLOAT	degrees	
particulatePM1	INT	μg/m³	PM₁ data from units with
			PM sensor
particulatePM25	INT	μg/m³	PM _{2.5} data from units with
			PM sensor
particulatePM10	INT	μg/m³	PM ₁₀ data from units with
			PM sensor
ambTempC	INT	degrees C	Ambient temperature
ambHumidity	INT	% RH	Ambient humidity
ambPressure	INT	Pa	Ambient pressure

Element data_hash is the last 8 chars of the hex string of the md5 hash of the contents of the data element, including the [, and] characters, but no line returns.

Response (CSV format):

Not yet publically supported

Example URI: https://data.earthsense.co.uk/dataForViewBySlots/ExampleUser/ABCD-EFGH-JKLM-PQRST-

UVWX/34/201805241338/201805241538/AB/def/JSON/api

Example response:

```
"queryInfo": {
  "userName": "ExampleUser",
  "startDT": "201805241338",
  "userKey": "ABCD-EFGH-JKLM-PQRST-UVWX",
  "view": "def",
"ZephyrID": "34",
  "endDT": "201805241348"
"03": {
    "header": {
       "CSVOrder": 5,
      "HTMLLabel": "03",
      "label": "03",
      "units": "ug/m3",
      "key": "03"
     "data": [ 83, 82, 83, 84, 76, 83, 81, 82, 87, 103 ]
  },
  "tempC": {
     "header": {
      "CSVOrder": 2,
      "HTMLLabel": "Temp",
      "label": "Temp",
      "units": "C",
      "key": "tempC"
    },
     "data": [ 24, 24, 24, 24, 24, 24, 24, 24, 24, 24]
  },
   "NO2": {
     "header": {
      "CSVOrder": 4,
      "HTMLLabel": "NO2",
      "label": "NO2",
      "units": "ug/m3",
       "key": "NO2"
     "data": [ 22, 22, 19, 19, 24, 20, 20, 19, 20, 19 ]
  },
   "dateTime": {
     "header": {
      "CSVOrder": 0,
       "HTMLLabel": "Timestamp",
      "label": "Timestamp",
"units": " ",
       "key": "dateTime"
    },
```

```
"data": [ "2018-05-24T13:38:40", "2018-05-24T13:39:40", "2018-05-24T13:40:40", "2018-05-24T13:41:40", "2018-05-24T13:42:40", "2018-05-24T13:43:40", "2018-05-24T13:44:40", "2018-05-24T13:45:40", "2018-05-24T13:46:40", "2018-05-24T13:47:40" ]
    },
     "UTS": {
       "header": {
         "CSVOrder": 1,
         "HTMLLabel": "Timestamp-UTS",
         "label": "Timestamp-UTS", "units": " ",
         "key": "UTS"
       "data": [ 1527169120, 1527169180, 1527169240, 1527169300,
1527169360, 1527169420, 1527169480, 1527169540, 1527169660, 1527169660 ]
     "humidity": {
       "header": {
         "CSVOrder": 3,
         "HTMLLabel": "Humidity",
         "label": "Humidity",
         "units": "%RH",
         "key": "humidity"
       "data": [ 42, 42, 42, 42, 41, 41, 40, 41, 41, 40 ]
    },
     "PM": {
       "header": {
         "CSVOrder": 7,
         "HTMLLabel": "PM2.5",
         "label": "PM2.5",
         "units": "ug/m3",
         "kev": "PM"
       },
       "data": [ 11, 7, 8, 9, 6, 7, 9, 9, 9, 5 ]
     "latitude": {
       "header": {
         "CSVOrder": 9,
         "HTMLLabel": "Latitude",
         "label": "Latitude",
         "units": "degrees",
         "key": "latitude"
       },
       "data": [ 53.481725, 53.481727, 53.481727, 53.481725, 53.481725,
53.481725, 53.481723, 53.481722, 53.48172, 53.481718 ]
    },
     "Longitude": {
       "header": {
         "CSVOrder": 10,
         "HTMLLabel": "Longitude",
         "label": "Longitude",
         "units": "degrees",
         "key": "longitude"
       "data": [ -2.117775, -2.117778, -2.117778, -2.117777, -2.117778, -
2.117778, -2.117778, -2.11777, -2.11777, -2.11777 ]
    }
  "slotB": {
    "03": {
       "header": {
```

```
"CSVOrder": 5,
         "HTMLLabel": "03",
         "label": "03",
         "units": "ug/m3",
         "key": "03"
       "data": [ 83, 82, 83, 84, 76, 83, 81, 82, 87, 103 ]
     },
     "tempC": {
       "header": {
         "CSVOrder": 2,
         "HTMLLabel": "Temp",
         "label": "Temp",
         "units": "C",
         "key": "tempC"
       },
       "data": [ 24, 24, 24, 24, 24, 24, 24, 24, 24, 24]
     },
     "NO2": {
       "header": {
         "CSVOrder": 4,
         "HTMLLabel": "NO2",
         "label": "NO2",
         "units": "ug/m3",
"key": "NO2"
       },
       "data": [ 22, 22, 19, 19, 24, 20, 20, 19, 20, 19 ]
     },
     "dateTime": {
       "header": {
         "CSVOrder": 0,
         "HTMLLabel": "Timestamp",
         "label": "Timestamp",
         "units": " ",
         "key": "dateTime"
       },
"data": [ "2018-05-24T13:38:40", "2018-05-24T13:39:40", "2018-05-24T13:40:40", "2018-05-24T13:41:40", "2018-05-24T13:42:40", "2018-05-24T13:43:40", "2018-05-24T13:44:40", "2018-05-24T13:45:40", "2018-05-24T13:46:40", "2018-05-24T13:47:40" ]
    },
"UTS": {
       "header": {
         "CSVOrder": 1,
         "HTMLLabel": "Timestamp-UTS",
         "label": "Timestamp-UTS",
         "units": " ",
         "key": "UTS"
       "data": [ 1527169120, 1527169180, 1527169240, 1527169300,
1527169360, 1527169420, 1527169480, 1527169540, 1527169600, 1527169660 ]
     "humidity": {
       "header": {
         "CSVOrder": 3,
         "HTMLLabel": "Humidity",
         "label": "Humidity",
         "units": "%RH",
         "key": "humidity"
       },
       "data": [ 42, 42, 42, 42, 41, 41, 40, 41, 41, 40 ]
     },
```

```
"PM": {
      "header": {
         "CSVOrder": 7,
"HTMLLabel": "PM2.5",
         "label": "PM2.5",
"units": "ug/m3",
"key": "PM"
      },
       "data": [ 11, 7, 8, 9, 6, 7, 9, 9, 9, 5 ]
    "header": {
         "CSVOrder": 9,
         "HTMLLabel": "Latitude",
         "label": "Latitude",
"units": "degrees",
"key": "latitude"
      },
"data": [ 53.481725, 53.481727, 53.481727, 53.481725, 53.481725,
53.481725, 53.481723, 53.481722, 53.48172, 53.481718 ]
    },
"Longitude": {
       "header": {
         "CSVOrder": 10,
         "HTMLLabel": "Longitude",
         "label": "Longitude",
         "units": "degrees",
"key": "longitude"
       "data": [ -2.117775, -2.11778, -2.117778, -2.117777, -2.117778, -
2.117778, -2.117778, -2.11777, -2.11777, -2.11777 ]
  "errorDesc": null
```

4. Get averaged Zephyr data – v3

URI:

https://data.earthsense.co.uk/dataForViewBySlotsAveraged/<userName>/<userKey>/<ZNu mber>/<startDT>/<endDT>/<slots>/<view>/<averagingChainId>/<format>/<response>

Fields:

Field	Format / valid	Notes
	values	
user name		As supplied to customer
user key		As supplied to customer
Zephyr ID		Significant digits of the number as shown on
		the Zephyr case e.g. for "Z000034", use "34"
start datetime	YYYYMMDDhhmm	Time is in UTC
end datetime	YYYYMMDDhhmm	Time is in UTC
slots	Α	Return data for just slot A
	В	Return data for just slot B
	AB	Return data for both slots A and B
	S	Return data for a single slot in the "Get Zephyr
		data – V1 format" (see above)
view	def	
averagingChainID	0	Unaveraged
	1	Hourly average on the hour
	2	Daily average at midnight
	3	15 min average on the quarter hours
	4	Twin outputs: "Hourly average on the hour"
		plus "Unaveraged"
format	json	Returns data in JSON format
	CSV	Returns the data in CSV format
target	api	Returns the data as a standard HTTP response
	download	Returns the data as an attachment

View is case sensitive.

Format and target are case insensitive.

Response: The format mimics endpoint "3. Get Zephyr data -v2" with the exception of the root object structure. All other object type definitions are the same.

```
Root object:
    {
     "queryInfo":
        {
            "userName": STRING,
            "startDT": STRING (DATETIME IN URL FORMAT),
            "userKey": STRING,
            "view": STRING ("def" is the only supported value),
```

```
"ZephyrID": STRING,
"endDT": STRING (DATETIME IN URL FORMAT)
},
"data": {
    "Averaged data output 1": SLOTDATA,
    "Averaged data output 2": SLOTDATA,
    ...
},
"errorDesc": STRING
}
```

Example URI: https://data.earthsense.co.uk/ dataForViewBySlotsAveraged /ExampleUser/ABCD-EFGH-JKLM-PQRST-UVWX/34/201805241338/201805241538/AB/def/4/JSON/api

Example response – truncated to highlight the difference from endpoint "3. Get Zephyr data – v2"

```
"queryInfo": {
  "userName": "ExampleUser",
  "startDT": "201805241338",
  "userKey": "ABCD-EFGH-JKLM-PQRST-UVWX",
  "view": def",
  "ZephyrID": "34",
  "endDT": "201805241348"
"Unaveraged": {
           "slotA": {
             "03": {
                "header": {
                  "CSVOrder": 5,
"HTMLLabel": "03",
                  "label": "03",
                  "units": "ug/m3",
                  "key": "03"
                "data": [ 83, 82, 83, 84, 76, 83, 81, 82, 87, 103 ]
           },
            "slotB": {
             "03": {
                "header": {
                  "CSVOrder": 5,
                  "HTMLLabel": "03",
                  "label": "03",
"units": "ug/m3",
                  "key": "03"
                "data": [ 83, 82, 83, 84, 76, 83, 81, 82, 87, 103 ]
           },
    Hourly average on the hour ": {
    "slotA": {
             "03": {
                "header": {
                  "CSVOrder": 5,
"HTMLLabel": "03",
                  "label": "03",
```

5. Get API version

Revision history

API	Document	Author	Date	Notes
Version	revision			
1.0		RTB	21/02/18	
2.0		RTB	07/06/18	
3.0		RTB	24/08/18	Restructuring the JSON output grammar for precision and clarity
3.1		RTB	12/09/18	Adding connection information
3.2		RTB	12/09/18	Added lat/Ing information
3.3		RTB	10/12/18	Supporting access to both slots.
3.4	0.0	RTB	19/02/19	Added data hash.
				Typo corrected in example URI for "3. Get Zephyr data – v2".
				API - version call added.
				Plantower PMS5003 data returned.
3.5	0.0	RTB	04/03/19	API – format and target no longer case sensitive.
				Case sensitivity of view, format and target parameters described.
3.6DEV	0.1	RTB	13/03/19	Averaging API documented.
	0.2	RTB	19/03/19	PM references corrected
	0.3	RTB	03/04/19	Endpoint 2 marked as deprecated.
				API 3.6 – averaging chains can now return multiple averaged data
				outputs (ADOs)
				Endpoint overview revised. Supported/deprecated endpoints
				introduced.
	0.4	RTB	13/05/19	New NL PM output.
3.6	0.0	RTB	16/05/19	Public release.
3.7.2	0.0	RTB	27/06/19	Public release.
				Ambient temp, humidity and pressure returned. DESCRIBEDDATALIST
				object updated to reflect changes.