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IC-Meter Public API, version 1.1

Following document is specifying the public REST API available for IC-Meter customers, in order to retrieve data form the IC-Meter server. The API is password protected which also limits the access to data only from own boxes, and boxes shared with the user. Authentication is handled by applying for a valid access token to the request as described below.

URI	Method	Notes
oauth/token	GET	Retrieve API access token
api/boxlocations/1.0/list/	GET	List available IC-Meter boxes
api/measurements/1.1/days/range/	GET	Retrieve indoor data with 5 minutes measurements within specified date range.
api/weather/1.1/days/range/	GET	Retrieve weather data with measurements for specified date range
api/externaldata/1.0/meters/	GET	List available external meters
api/externaldata/1.0/measurements/range/	GET	Retrieve external meter data within specified date range

Overall description

Timestamps

Timestamps are expressed in UTC time (Zulu) e.g. "2011-11-22T22:07:22Z", which applies to both input and output.

Format

yyyy '-' mm '-' dd 'T' hh ':' MM ':' ss 'Z'

yyyy: indicates a four-digit year. It is not allowed to have preceded by 0 and 0000 is not allowed.

mm: indicates a two-digit month of the year, 01 through 12.

dd: indicates a two-digit day of that month, 01 through 31.

T: Separates date and time.

hh: refers to a zero-padded hour between 00 and 24 (where 24 is only used to denote midnight at the end of a calendar day).

mm: refers to a zero-padded minute between 00 and 59.

ss: refers to a zero-padded second between 00 and 59

Retrieve API access token (oauth/token)

Retrieving a valid access token is done via the following request, where the username and password are the ones used by the IC-Meter apps.

Format

```
https://app.ic-meter.com/icm/oauth/token \
?client_id=<client id> \
&grant_type=<granttype> \
&scope=<scope> \
&username=<username> \
&password=<password> \
```

Example request

https://app.ic-meter.com/icm/oauth/token?client_id=trusted-client&grant_type=password&scope=trust&username=demo@ic-meter.com&password=demo

where

```
client_id    =          trusted-client
grant_type   =          password
scope        =          trust
username     =          <username for app-login>
password     =          <password for app-login>
```

Example response

```
{
  "access_token": "9aeeeea5f-f609-4038-9eaf-38f27d6888c1",
  "token_type": "bearer",
  "refresh_token": "e74dd080-975b-4737-8e04-fdfc55e625d0",
  "expires_in": 43199,
  "scope": "trust"
}
```

Receive list of available boxes

Receiving a list of own and shared IC-Meter boxes available for specified user.

Format

```
https://app.ic-meter.com/icm/api/measurements/1.0/list  
&access_token=<token> \
```

Example Request

```
https://app.ic-meter.com/icm/api/boxlocations/1.0/list?access_token=ff9bf214-  
9ee8-4ad1-993e-4f6bb7454bac
```

Example response

```
{  
  "boxQR": "3706C9F5",  
  "name": "Neogrid Technologies",  
  "room": "Office",  
  "ceilingHeight": 3.5,  
  "floorArea": 32.0,  
  "timezone": "Europe/Copenhagen",  
  "fromDate": "2013-04-05T07:01:08Z",  
  "lastMeasurementDate": "2015-06-04T10:06:26Z",  
  "ownership": "owner"  
},
```

Receive Indoor data range

Following request returns indoor data with 5 minutes measurements within specified timestamp range, limited to maximum 31 days. If range is above 31 days, the returned data is truncated.

The server returns 400 (http: BAD_REQUEST), if timestamp format are incorrect or if toDate is less than fromDate. Else, the server returns 200 (http: OK).

Format

```
https://app.ic-meter.com/icm/api/measurements/1.1/days/range/<box QR> \  
?fromDate=<yyyy-MM-dd'T'HH:mm:ss'Z'> \  
&toDate=<yyyy-MM-dd'T'HH:mm:ss'Z'>  
&access_token=<token> \
```

Example Request

```
https://app.ic-meter.com/icm/api/measurements/1.1/days/range/efde07df?fromDate=2013-11-01T00:00:00Z&toDate=2013-11-02T00:00:00Z&access\_token=1d4e2270-9b36-4f12-a29f-677dfef35e85
```

Example Response

```
{  
  "cols": [{  
    "id": "realtime",
```

```

        "label": "Time",
        "type": "string",
        "pattern": ""
    },
    {
        "id": "Temperature",
        "label": "Temperature (°C)",
        "type": "number",
        "pattern": ""
    },
    {
        "id": "Humidity",
        "label": "Humidity (%)",
        "type": "number",
        "pattern": ""
    },
    {
        "id": "CO2",
        "label": "CO2 (ppm)",
        "type": "number",
        "pattern": ""
    }
}],
"rows": [{
    "c": [{
        "v": "2013-11-01T00:02:10Z"
    },
    {
        "v": 22.32
    },
    {
        "v": 45.71
    },
    {
        "v": 588.0
    }
    ]
}]
}

```

Receive Weather data range

Following request returns weather data with measurements within specified timestamp range, limited to maximum 31 days. If range is above 31 days, the returned data is truncated.

The server returns 400 (http: BAD_REQUEST), if timestamp format are incorrect or if toDate is less than fromDate. Else the server returns 200 (http: OK).

Format

```

https://app.ic-meter.com/icm/api/weather/1.1/days/range/<box QR> \
?fromDate=<yyyy-MM-dd'T'HH:mm:ss'Z'> \
&toDate=<yyyy-MM-dd'T'HH:mm:ss'Z'> \

```

&access_token=<token>

Example Request

https://app.ic-meter.com/icm/api/weather/1.1/days/range/efde07df?fromDate=2013-11-01T00:00:00Z&toDate=2013-11-02T00:00:00Z&access_token=1d4e2270-9b36-4f12-a29f-677dffe35e85

Example Response

```
{
  "cols": [{
    "id": "realtime",
    "label": "realtime",
    "type": "string",
    "pattern": ""
  },
  {
    "id": "temperature",
    "label": "temperature",
    "type": "number",
    "pattern": ""
  },
  {
    "id": "humidity",
    "label": "humidity",
    "type": "number",
    "pattern": ""
  },
  {
    "id": "solarrad_inddir",
    "label": "solarrad_inddir",
    "type": "number",
    "pattern": ""
  },
  {
    "id": "wind_speed",
    "label": "wind_speed",
    "type": "number",
    "pattern": ""
  },
  {
    "id": "solarrad_dir",
    "label": "solarrad_dir",
    "type": "number",
    "pattern": ""
  },
  {
    "id": "wind_direction",
    "label": "wind_direction",
    "type": "number",
    "pattern": ""
  },
  {
    "id": "solarrad",
    "label": "solarrad",
    "type": "number",
    "pattern": ""
  }
}
```

```

    ]],
    "rows": [{
      "c": [{
        "v": "2013-11-01T00:00:00Z"
      },
      {
        "v": 9.5
      },
      {
        "v": 93.3000030517578
      },
      {
        "v": 0.0
      },
      {
        "v": 2.48548476894934
      },
      {
        "v": 0.0
      },
      {
        "v": 209.8
      },
      {
        "v": 0.0
      }
    ]
  }
}

```

List available external meters

Following request returns a list of available external meters and their group relationship

Format

https://app.ic-meter.com/icm/icm/api/externaldata/1.0/meters \?access_token=<token>

Example Request

https://app.ic-meter.com/icm/api/externaldata/1.0/meters?access_token=ff9bf214-9ee8-4ad1-993e-4f6bb7454bac

Example Response

```

{
  {
    "groupId": null,
    "group": "Dummy Group",
    "type": "Dummy Meters",
    "grossArea": {
      "value": "100.0",
      "unit": "m2"
    }
  },

```

```

    "meters": [{
      "id": "10007",
      "meterIdentification": "dummy",
      "name": "Dummy Meter",
      "supplier": "Dummy Supplier",
      "type": "Dummy Meter",
      "unit": "Wh"
    }]
  }

```

Receive external meter data range

Following request returns external meter data with a 1 hour interval within specified timestamp range, limited to maximum 31 days. If range is above 31 days, the returned data is truncated.

The server returns 400 (http: BAD_REQUEST), if timestamp format are incorrect or if toDate is less than fromDate. Else, the server returns 200 (http: OK).

Format

```

https://app.ic-meter.com/icm/api/externaldata/1.0/measurements/range/ \
  <meter id> \
  ?fromDate=<yyyy-MM-dd'T'HH:mm:ss'Z'> \
  &toDate=<yyyy-MM-dd'T'HH:mm:ss'Z'> \
  &access_token=<token> \

```

Example Request

http://app.ic-meter.com/icm/api/externaldata/1.0/measurements/range/10007?fromDate=2014-08-31T22:00:00Z&toDate=2014-09-30T22:00:00Z&access_token=52862a4e-c09d-4702-8455-ef8b3a9574b5

Example Response

```

{
  "cols": [{
    "id": "realtime",
    "label": "realtime",
    "type": "string",
    "pattern": ""
  },
  {
    "id": "value (Wh)",
    "label": "value (Wh)",
    "type": "number",
    "pattern": ""
  }
  ],
  "rows": [{
    "c": [{
      "v": "2014-08-31T22:00:00Z"
    }],
    {
      "v": 2000.0
    }
  ]
}

```

```

    }],
    {
      "c": [{
        "v": "2014-08-31T23:00:00Z"
      },
      {
        "v": 0.0
      }
    ]
  },
  {
    "c": [{
      "v": "2014-09-01T00:00:00Z"
    },
    {
      "v": 0.0
    }
  ]
}
}

```

Revision history

Version	Date	Author	Description
1.0	12-11-2013	Neogrid Technologies/hls	Initial release
1.1	19-03-2014	Neogrid Technologies/hls	Box identification changed to QR code
1.1.1	23-5-2014	Neogrid Technologies/hls	Enabled https for REST api
1.1.2	22-09-2014	Neogrid Technologies/hls	Example of parameters for login URL added
1.1.3	05-06-2015	Neogrid Technologies/hls	Box list and external meters added