meteocontrol Import Interface

Data import specification

Version 2.2.4 May 2025

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1   Document revision

Date	Rev.	Changes	Author
2015/04/24	2.0.0	init	E. Heinrich
2015/08/12	2.0.1	Tracker added	E. Heinrich
2015/10/27	2.0.2	Extract abbreviations to Excel sheets	P. Haggenmüller
2016/10/11	2.0.5	Power management events	E. Heinrich
2016/10/12	2.0.8	FTP as new transfer method added	E. Heinrich
2018/05/08	2.0.9	Genset device	E. Heinrich
2018/12/11	2.0.10	Layout and structural changes Standard interval of 300 added Changed min transmission interval to 5min Changed preferred transfer method to HTTPS Added missing HTTP error codes (404, 408) Updated fetch and import frequency to 5min	P. Wegner
2019/10/15	2.0.11	Replace alert instead of event	A.Wang
2020/07/23	2.1.0	Introduce CSV format	A.Wang
2021/02/24	2.1.1	Improve CSV format document	D.Hsueh
2021/03/31	2.1.2	Add status device	D.Hsueh
2021/08/31	2.1.3	Add power-plant-controller device	H.Lai
2021/12/21	2.2.0	Updated screenshots and clarification of some wordings	M. Leierseder
2022/10/20	2.2.1	Add SFTP	A.Wang
2023/05/09	2.2.2	Deprecated power management device	D.Hsueh
2024/11/28	2.2.3	Adjust name and address	De.Chen
2025/05/16	2.2.4	Add file size limit description to FTP	D.Hsueh

2 Introduction

The meteocontrol portal mainly processes data of PV-systems. Locally installed data loggers send measurement and event data to the portal. Data is usually transferred with files in XML/CSV format. In addition, error messages of the local monitoring system can also be sent directly to the server. They will be displayed in the error log of the appropriate system.

This document describes the import interface.
Main criteria are:
- General requirements
- Transfer format
- Transfer method

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3 Terms

3.1 Data logger identification

For each data logger a globally unique identifier is needed. This could be a manually configured customer id or a serial number, in conjunction with the vendor of the data logger. With this identifier we assign the incoming data to the configured system in the portal. Also, if data is transferred from different sources, they all must contain the same serial number. In case there is more than one data logger in use, each data logger still needs a unique serial number.

3.2 Devices

The device is a local component, such as a meter, inverter or stringbox, whose monitored data points are collected periodically by a data logger and transmitted to a host for long term storage and processing.

Supported devices

- Inverter
- meter
- meteo (weather station)
- stringbox
- battery
- tracker
- genset
- status
- power-plant-controller

3.3 Interval for measurement data

- Standard interval for measurement data is 300 or 900 seconds. Allowed intervals are 300, 600, 900, and 3600 seconds.
- Transferred measurement values are expected as interval values. In the VCOM portal energy values are expected as interval values. Cumulative values are only optional.
- Changes of the measuring interval are not recommended.
- A transmission interval of less than 5 minutes is not allowed.
- **Note**: The measuring interval is not the same as the transmission interval. You can log your data with a measuring interval of 900s and transfer the data 3600s (hourly) or 86400s (daily).

3.4 Interval for event data

Events have no intervals. Data loggers record the values to the second exactly.

3.5 Timestamp

The data points must have normalized timestamps. Timestamps shall be formatted as a subset of IETF RFC 3339. All timestamps shall be based on UTC/Universal time, with or without the "Z" marker.
Example: "2015-01-14T10:00:00Z" or "2015-01-14T10:00:00+00:00".

4   General

- It is possible to transfer the same data again. Existing data will be overwritten
- It is possible to transfer the data of one single device, which is part of a system (not preferred). Preferred is one file with the data of all devices.
- To avoid redundant data import and to reduce the amount of transferred data, the data is expected as a "delta transmission". Only logged data since the last transmission should be transferred. Example: If you plan an hourly transmission, the transferred data at 11:00 contains the data from 10:00 to 11:00. The transferred data at 12:00 contains the data from 11:00 to 12:00.

5 XML file format

5.1 Requirements

The expected data format to transmit measurement values and events is XML. The example used in this chapter contains data for a single inverter for one single timestamp. Only monitored data should be transferred. Every XML must contain a configuration node which uniquely identifies a datalogger, and describes its configuration and attached devices. The base for every XML must look like this:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<mii version="2.0" targetNamespace="http://api.sspcdn.com/mii" xmlns="http://api.sspcdn.com/mii">
  <datalogger>
    <configuration xmlns="http://api.sspcdn.com/mii/datalogger/configuration"...>
  </datalogger>
</mii>
```

Additionally, data points and or events are expected to be part of the transferred XML and should be located below the configuration node.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<mii version="2.0" targetNamespace="http://api.sspcdn.com/mii" xmlns="http://api.sspcdn.com/mii">
  <datalogger>
    <configuration xmlns="http://api.sspcdn.com/mii/datalogger/configuration"...>
    <datapoints xmlns="http://api.sspcdn.com/mii/datalogger/datapoints"...>
    <events xmlns="http://api.sspcdn.com/mii/datalogger/events"...>
  </datalogger>
</mii>
```

5.2 Configuration

5.2.1 <configuration …> node example

```xml
1  <configuration xmlns="http://api.sspcdn.com/mii/datalogger/configuration">
2    <uuid>
3      <vendor>meteocontrol</vendor>
4      <serial>123-456-789</serial>
5    </uuid>
6    <name>Sample Logger</name>
7    <firmware>1.1.3 (Build 152.721.528d)</firmware>
8    <next-scheduled-transfer>2016-10-22T15:15:00Z</next-scheduled-transfer>
9    <devices>
10     <device type="inverter" id="inverter-1">
11       <uid>INV216d6340</uid>
12       <name>INVERTER-1-1</name>
13       <address>192.168.77.10</address>
14       <serial>XMA123456</serial>
```

```
15        <vendor>xma</vendor>
16        <model>x3000</model>
17        <firmware>v.1.0.34</firmware>
18      </device>
19    </devices>
20  </configuration>
```

5.2.2   Explanation

Line	Required	Explanation
1	Yes	Configuration node which describes the datalogger
2	Yes	Node containing vendor and serial to uniquely identify a datalogger
3	Yes	Datalogger vendor name
4	Yes	Datalogger serial
6	No	Name of the datalogger
7	No	On the datalogger installed firmware version
8	No	RFC 3339 timestamp describing the datalogger's next scheduled transfer datetime
9	Yes	Collection of 1-n devices attached to the datalogger
10	Yes	Every device has a type and within the XML a unique device ID which is later used to connect transferred data points to devices within the XML
11	Yes	Unique id of the device attached to the datalogger
12	No	Device name
13	No	Device address
14	No	Device serial
15	No	Device vendor
16	No	Device Model
17	No	Device firmware

5.3   Data points

5.3.1   <datapoints...> node example

```
1  <datapoints xmlns="http://api.sspcdn.com/mii/datalogger/datapoints">
2    <datapoint interval="900" timestamp="2015-10-22T15:00:00Z">
3      <device id="inverter-1">
4        <mv t="E_INT" v="0.0767"/>
5        <mv t="COS_PHI" v="56"/>
6        <mv t="COS_PHI_LOAD" v="765"/>
7      </device>
8    </datapoint>
9  </datapoints>
```

5.3.2 Explanation

Line	Required	Explanation
1	Yes	Collection of 1-n data points
2	Yes	Data point containing the measurement interval and a RFC3339 UTC timestamp
3	Yes	Device with an ID which matches a before declared device in the configuration block
4-6	Yes	1-n tags describing the measurement and its value

5.4 Events

If the XML has an events block at least one event must be defined.

5.4.1 <events ...> node example

```
1   <events xmlns="http://api.sspcdn.com/mii/datalogger/events">
2     <event timestamp="2018-12-06T06:55:34Z" device-id="inverter-1">
3       <uid>1544079335564</uid>
4       <state>on</state>
5       <severity>critical</severity>
6       <code>05310</code>
7       <short-description>
          I_EVENT_AC_VOLTAGE_HIGH, S/N: 27244482
        </short-description>
8       <long-description>
          I_EVENT_AC_VOLTAGE_HIGH, S/N: 27244482 (Inv-22)
        </long-description>
9     </event>


10  </events>
```

5.4.2 Events explanation

Line	Required	Explanation
1	Yes	Collection of 1-n events
2	No	Event containing a timestamp and a device-id from the configuration block
3	Yes	Unique ID of the event for that device and datalogger
4	Yes	State on or off which denotes the start or the end of the event
5	Yes	Severity of the event
6	Yes	Event error code

7	Yes	Short description of the event
8	Yes	Long description of the event

5.5 Measurement values

Descriptions of all supported device types and their measurement values are located in a separate overview as described below.

5.5.1 Inverter data

For details please refer to: *devices/inverter.xlsx*

5.5.2 Meteorological data (meteo)

For details please refer to: *devices/meteo.xlsx*

5.5.3 Meter data

For details please refer to: *devices/meter.xlsx*

5.5.4 Stringbox data

For details please refer to: *devices/stringbox.xlsx*

5.5.5 Battery data

For details please refer to: *devices/battery.xlsx*

5.5.6 Tracker data

For details please refer to: *devices/tracker.xlsx*

5.5.7 Genset data

For details please refer to: *devices/genset.xlsx*

5.5.8 Status data

For details please refer to: devices/status.xlsx

5.5.9 Power-plant-controller data

For details please refer to: devices/power-plant-controller.xlsx

6 CSV file format

6.1 Requirements

The expected data format to transmit measurement values is CSV with a comma (,) as delimiter and a dot (.) as decimal point. The CSV format is a subset of XML format which supports measurement data only, not including event data. The base for every CSV file must look like this:

datalogger	\<datalogger-serial-number\>			
type	inverter	inverter	inverter	meteo
name	east	east	west	irradiancesensor
serial	A1611022251	A1611022251	A1611022252	meteo-1
uid	1	1	2	1
abbreviation	P_AC	STATE	P_AC	SRAD
unit	W		W	W/m²
2016-10-30T05:00:00+09:00	100	0	97	601
2016-10-30T05:05:00+09:00	101	0	106	641

Additionally, there are four required headers:

- datalogger

- type

- uid

- abbreviation

The order of the headers is not fixed, for example, you can put device serials above device names.

6.2 Explanation

Line	Required	Explanation
1	Yes	Datalogger serial
2	Yes	Device type, must be one of the supported devices
3	No	Device name
4	No	Device serial
5	Yes	Unique id of the device attached to the datalogger
6	Yes	Abbreviation of measurement value
7	No	Unit of measurement value, if not present, the default unit will be used
8..n	Yes	Timestamp and measurement values

6.2.1 Device

Need to fill device uid (serial/name) to be the same for every column of the same device, can't leave blank.

Device uid is a unique id of this device, can be equal to device serial, must be unique value of attached datalogger.

6.2.2 Timestamp

The data points must have normalized timestamps. Timestamps shall be formatted as a subset of IETF RFC 3339. The following two formats are allowed

Timestamp shall be based on time-offset

yyyy-MM-dd'T'HH:mm:ssZ

[date-fullyear, 4DIGIT]-[date-month, 2DIGIT]-[date-mday, 2DIGIT]T[time-hour, 2DIGIT]:[time-minute, 2DIGIT]:[time-second, 2DIGIT][(+ / -)time-numoffset]

e.g.

2021-01-14T10:00:00+01:00

Timestamp shall be based on UTC/Universal time and include the "Z" marker.

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

[date-fullyear, 4DIGIT]-[date-month, 2DIGIT]-[date-mday, 2DIGIT]T[time-hour, 2DIGIT]:[time-minute, 2DIGIT]:[time-second, 2DIGIT]Z

e.g.

2021-01-14T09:00:00Z

6.2.3 Measurement values
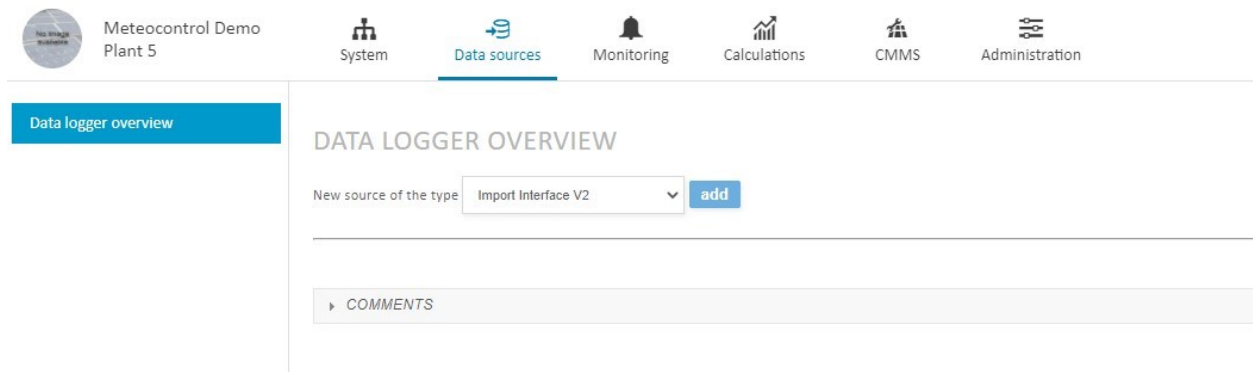
Only numeric values are supported in the measurement values.

For details please refer to: example/sample.csv

7   System integration (shortened)

In the portal it is necessary to at least configure the system identification.

During the system configuration, the data logger type has to be defined and the system identification has to be entered.
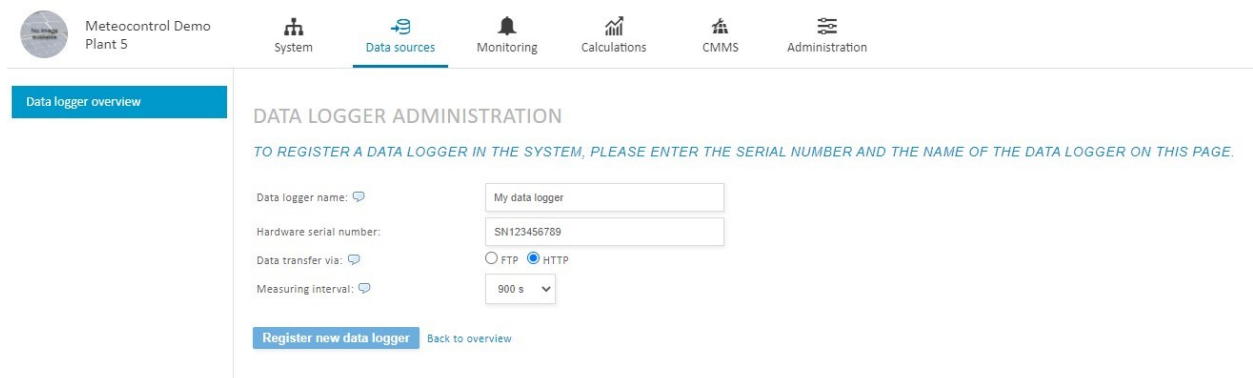
After the type is selected, the data logger can be registered. This is done by entering the identification of the data logger. This can be for example a (unique) serial number.

Here you can also select how the data should be transferred, FTP or HTTP.

8 Data Transfer

The data should be transferred with the following method
- HTTPS
- FTP
- SFTP

HTTPS is the preferred transfer method as the file will be processed immediately after arrival, while for both FTP as SFTP it might take up to ten minutes for the file to be processed.

8.1 HTTPS – Hypertext Transfer Protocol Secure

Simple one-way API to deliver the data files specified in this document. Currently the supported file types are XML and CSV. To use the simple HTTPS API an API-key is required. This key is provided by meteocontrol during implementation.

Note: The transmission interval must not be less than 5 minutes.

Import endpoint:
- XML format
  https://mii.meteocontrol.de/v2/?apiKey=xyz
- CSV format
  https://mii-csv.meteocontrol.de/v2
  Request Header:
  - **api-key: xyz**

Validation endpoint:
- XML format
  https://mii.meteocontrol.de/v2-validation/
- CSV format
  https://mii-csv.meteocontrol.de/v2-validation/

Data format:
- The data is expected as a POST-Request
- content-type: application/xml or text/csv
- encoding: UTF-8
- HTTP-Protocol: HTTP 1.1
- API-Key: [api-key provided by meteocontrol]

Return values:
The expected Result Status Code is 202.

Status	HTTP Status Code	Summary/Reason
ACCEPTED	202	The request has been accepted for processing, but the processing has not been completed
INVALID_MESSAGE	400	Message is either badly formed or has invalid content or content-type

LIMIT_EXCEEDED	400		Upload limit of 5 MByte reached
INVALID_CREDENTIALS	401		Access to system denied
NOT_FOUND	404		Requested page does not exist
TIMEOUT	408		Request timed out
UNEXPECTED_EXCEPTION	500		Error occurred during processing
SYSTEM_MAINTENANCE	503		System is currently unavailable

8.2   FTP – File Transfer Protocol

There is an individual account for each data logger, no general ftp-access. The logger transfers their data in the root directory. Do not use subdirectories.

Currently the supported file types are XML and CSV. The files can also be compressed as gz, zlib or bz2 format. The name of the data file must be unique.
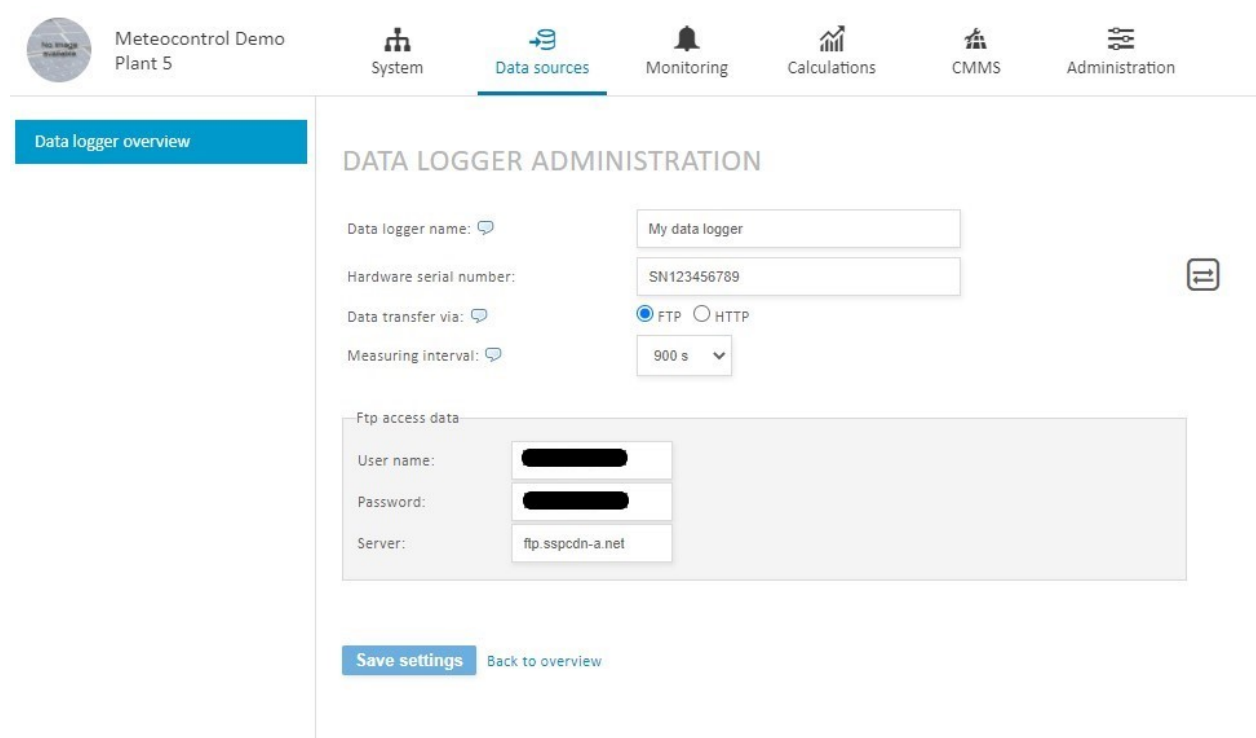
File name example:
20160525_121500_3412240043.xml
20160525_121500_3412240043.xml.gz
20160525_121500_3412240043.xml.zlib
20160525_121500_3412240043.xml.bz2
20160525_121500_3412240043.csv
20160525_121500_3412240043.csv.gz
20160525_121500_3412240043.csv.zlib
20160525_121500_3412240043.csv.bz2

The maximum acceptable file size after decompression is 5 MByte.
Files over the limit will be marked as 'invalid' and consequently won't be imported.

The files are fetched and imported from the server every 5 minutes. The system deletes the data files automatically when the data import was successful.

The ftp credentials are provided in the portal after the registration of the new data logger and the choice of transmission as FTP.

8.3　SFTP – SSH File Transfer Protocol (Secret File Transfer Protocol)

Meteocontrol also supports SFTP, all credential and host connection information is identical with FTP protocol, just use the SFTP protocol with port 2222 in your client settings.