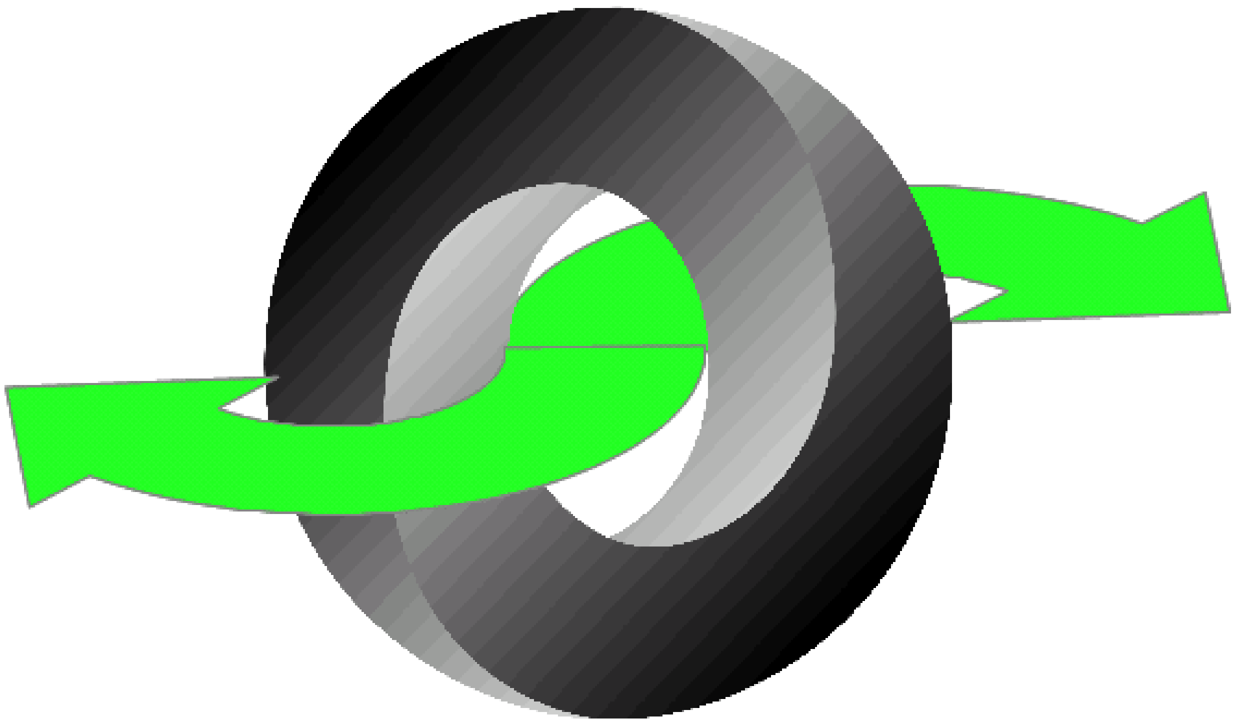
ProMoS JSON Data Exchange



Version 1.2
03.03.2015

ProMoS JSON Data Exchange

Printed: März 2015 in Belp, Switzerland

Publisher

MST Systemtechnik AG

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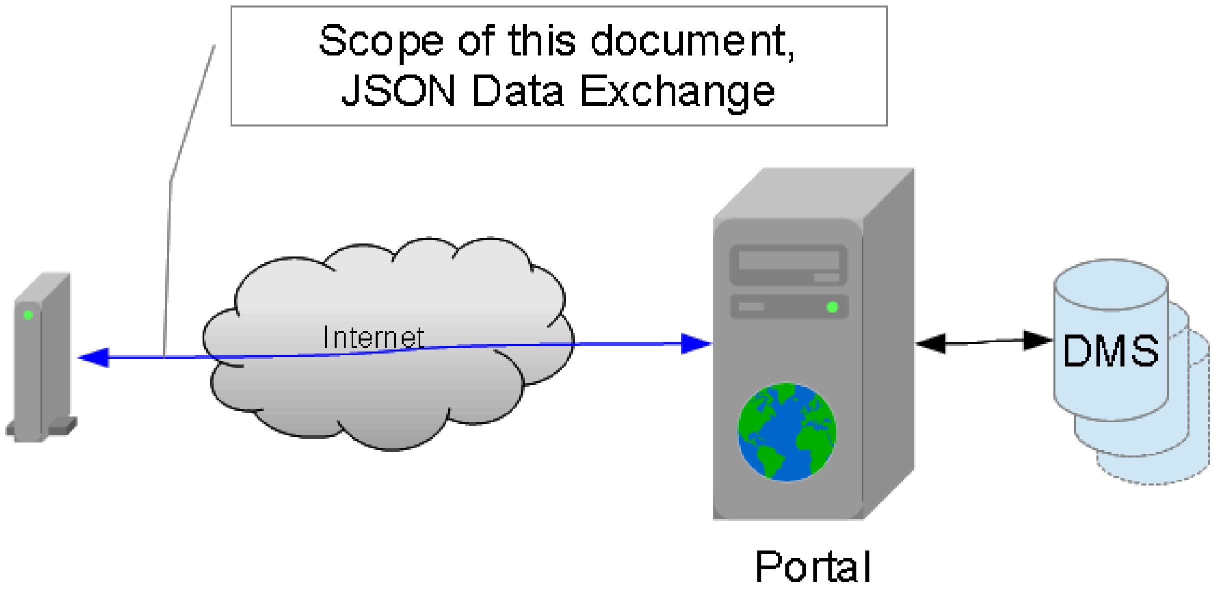
1 Introduction

This document describes the data exchange between an external device and the ProMoS Data Management System (DMS).



1.1 History

Version	Who	Date	Remark
1.0	mst_frem	26.02.2015	Draft
1.1	mst_henh	28.02.2015	API description
1.2	mst_frem	03.03.2015	Added code "error" on read data response

2 Configuration

The configuration can be done on the Portal (Web-GUI), with 2 lists (read / read/write data points).
Only allowed users can change the configuration.

3 Data Exchange

3.1 Used Technologies

The whole API is HTTP POST based, see http://en.wikipedia.org/wiki/POST_(HTTP)

For the post body JSON will be used.
We use JSON body for request (instead of the standard URL encoded request) to have the same encoding for request and response.
http://en.wikipedia.org/wiki/JSON

3.2 Authentication

The authentication is Pre Shared Key based.
Each pushing component needs to be registered in the portal configuration.
The portal will generate a 32 character alpha numeric key.

Additionally the access can be limited by client ip(s).

3.3 Error Messages

You will get an HTTP status code 401, with Content-type: text/plain and a plain text error message in body in case of a invalid auth key or invalid client ip.

If the authentication was successful, you will get a http status code 200.

3.3.1 Example

```
HTTP/1.1 401 OK
Date: Fri, 27 Feb 2015 13:37:08 GMT
Expires: Thu, 19 Nov 1981 08:52:00 GMT
Cache-Control: no-store, no-cache, must-revalidate, post-check=0, pre-check=0
Pragma: no-cache
Transfer-Encoding: chunked
Content-Type: text/plain

You are not permitted to send data.
```

3.4 Read Data

You can request as much data points as you want with 1 single request.
But it's recommend to not request more then 10`000 at once, because the API needs ~2sec per 1000 data points.

The system will check if the portal owner permitted you read access for this data point(s) and deliver the current value(s) of this data point(s).
The sequence of the data points in the response may not have the same order as in the request.

3.4.1 Example

Request:

```
POST /component/control-system-get-value/api_key/F2E1101D72EA1A3327136EB6AFEB4C81
HTTP/1.1
Host: example.edl.ch
Connection: keep-alive
Content-Type: application/json
Content-Length: 38299

{
  "get": [
    {"path":"EXAMPLE001:T11:MN:003:Vis:VMC_energy1"},
    {"path":"EXAMPLE001:T11:MN:003:Vis:VEnergy1V"},
    {"path":"EXAMPLE001:T11:MN:003:Vis:VMC_power"},
    {"path":"EXAMPLE001:not:existing"}
  ]
}
```

Response::

```
HTTP/1.1 200 OK
Date: Fri, 27 Feb 2015 13:37:08 GMT
Server: Apache
Expires: Thu, 19 Nov 1981 08:52:00 GMT
Cache-Control: no-store, no-cache, must-revalidate, post-check=0, pre-check=0
Pragma: no-cache
Keep-Alive: timeout=5, max=100
Connection: Keep-Alive
Transfer-Encoding: chunked
Content-Type: application/json; charset=utf-8

{
  "get": [
    {
      "code":"ok",
      "path":"EXAMPLE001:T11:MN:003:Vis:VMC_energy1",
      "value":3.165,
      "type":"double",
      "stamp":"2015-02-27T08:17:51"
    },
    {
      "code":"ok",
      "path":"EXAMPLE001:T11:MN:003:Vis:VEnergy1V",
      "value":0.14,
      "type":"double",
      "stamp":"2015-02-27T08:17:51"
    },
    {
      "code":"no perm",
      "path":"EXAMPLE001:T11:MN:003:Vis:VEnergy1V",
    },
    {
      "code":"not found",
      "path":"EXAMPLE001:not:existing",
      "message":"Data point doesn't exist"
    }
  ]
}
```

Response in case of fatal error:

```
HTTP/1.1 200 OK
Date: Fri, 27 Feb 2015 13:37:08 GMT
Server: Apache
Expires: Thu, 19 Nov 1981 08:52:00 GMT
Cache-Control: no-store, no-cache, must-revalidate, post-check=0, pre-check=0
Pragma: no-cache
Keep-Alive: timeout=5, max=100
Connection: Keep-Alive
Transfer-Encoding: chunked
Content-Type: application/json; charset=utf-8

{
  "get": [
    {
      "code":"error",
      "message":"Expected JSON encoded HTTP PUSH, but got something else."
    }
  ]
}
```

```
HTTP/1.1 200 OK
Date: Fri, 27 Feb 2015 13:37:08 GMT
Server: Apache
Expires: Thu, 19 Nov 1981 08:52:00 GMT
Cache-Control: no-store, no-cache, must-revalidate, post-check=0, pre-check=0
Pragma: no-cache
Keep-Alive: timeout=5, max=100
Connection: Keep-Alive
Transfer-Encoding: chunked
Content-Type: application/json; charset=utf-8

{
  "get": [
    {
      "code":"error",
      "message":"Missing \"path\" in get[33]"
    }
  ]
}
```

3.4.2 Request Fields

- **"path"**
  The path of the data point you want to read.
  A required string field.

3.4.3 Response Fields

- **"code"**
  The code can be:
  - "ok": On success.
  - "no perm": The portal owner has not permitted you to read this data point.
  - "not found": You are permitted for this data point, but it doesn't exist on the system.
  - "error":In case of a fatal error.
  The field always appears.

- **"path"**
  The path of the requested data point.
  It appears as long as there is no fatal error.

- **"value"**
  The value contains the current value of the data point.
  It appears only for code "ok".

- **"type"**
  This field is the data type of this data point.
  The type can be "int", "double" (a floating point number), "string" or "bool".
  It appears only for code "ok".

- **"stamp"**
  This field can be NULL.
  If set, it contains a string with the time stamp of the last change of this data point.
  The date is ISO 8601 formatted. but without time zone indication, Because the API just forwards the time stamp just from the control system.
  If the control system is a ProMoS 1.x the time is the local time zone of the object, mostly Europe/Zurich.
  It appears only for code "ok".

- **"message"**
  This field contains an human readable error message in English.
  It appears for code other than "ok".

3.4.4 JSON schema

Request:

```
{
    "$schema": "http://json-schema.org/draft-04/schema#",
    "title": "Read Request",
    "description": "Reading one or more data points",
    "type": "array",
    "items": {
        "title": "Data point definition",
        "type": "object",
        "properties": {
            "path": {
                "description": "The DMS path to the data point",
                "type": "string"
            }
        },
        "additionalProperties": false,
        "required": ["path"]
    },
    "minItems": 1
}
```

Response::

```
{
    "$schema": "http://json-schema.org/draft-04/schema#",
    "title": "Read Response",
    "description": "Information about one or more data points",
    "type": "array",
    "items": {
        "title": "Data point value",
        "type": "object",
        "properties": {
            "code": {
                "description": "The result code",
                "type": "string",
                "enum": [ "ok", "no perm", "not found" ]
            },
            "path": {
                "description": "The DMS path to the data point",
                "type": "string"
            },
            "value": {
                "description": "The value of the data point",
                "type": ["number", "string", "boolean"]
            },
            "type": {
                "description": "The value type",
                "type": "string",
                "enum": [ "int", "double", "string", "bool" ]
            },
            "stamp": {
                "description": "The timestamp of the last change of the value, ISO
8601",
                "type": ["string", "null"]
            },
            "message": {
                "description": "Human readable error message",
                "type": "string"
            }
        },
        "required": ["code"]
    },
    "minItems": 1
}
```

3.5 Write Data

You can write as much data points as you want with 1 single request.
But it's recommend to not write more then 10`000 at once, because the API needs ~5sec per 1000 data points.

The system will check if the portal owner permitted you write access for this data point(s).
The sequence of the data points in the response may not have the same order as in the request.

3.5.1 Example

Request:

```
POST /component/controll-system-set-value/api_key/F2E1101D72EA1A3327136EB6AFEB4C81
HTTP/1.1
Host: example.edl.ch
Connection: keep-alive
Content-Type: application/json
Content-Length: 38299

{
  "set": [
    {
      "path":"EXAMPLE001:T11:MN:003:Vis:VMC_energy1",
      "value":4.4565467567867,
      "type":"double"
    },
    {
      "path":"EXAMPLE001:T11:MN:003:Vis:VEnergy1V",
      "value":-1,
      "type":"double"
    },
    {
      "path":"EXAMPLE001:TEST:BOOLEAN",
      "value":true,
      "type":"bool"
    },
    {
      "path":"EXAMPLE001:TEST:INT",
      "value":44,
      "type":"int"
    },
    {
      "path":"EXAMPLE001:TEST:STRING",
      "value":"some long example message",
      "type":"string"
    }
  ]
}
```

Response::

```
HTTP/1.1 200 OK
Date: Fri, 27 Feb 2015 13:37:08 GMT
Server: Apache
Expires: Thu, 19 Nov 1981 08:52:00 GMT
Cache-Control: no-store, no-cache, must-revalidate, post-check=0, pre-check=0
Pragma: no-cache
Keep-Alive: timeout=5, max=100
Connection: Keep-Alive
Transfer-Encoding: chunked
Content-Type: application/json; charset=utf-8

{
  "get": [
    {
      "code":"ok",
      "path":"EXAMPLE001:T11:MN:003:Vis:VMC_energy1",
      "value":3,
      "type":"double"
    },
    {
      "code":"ok",
      "path":"EXAMPLE001:T11:MN:003:Vis:VEnergy1V",
      "value":0,
      "type":"double"
    },
    {
      "code":"no perm",
      "path":"EXAMPLE001:TEST:BOOLEAN",
    },
    {
      "code":"error",
      "path":"EXAMPLE001:TEST:INT",
      "message":"Data point doesn't exist"
    },
    {
      "code":"error",
      "path":"EXAMPLE001:TEST:STRING",
      "message":"Data type doesn't match"
    }
  ]
}
```

3.5.2 Request Fields

- **"path"**
  The path of the data point to write.
  A required string field.

- **"value"**
  The value to write.
  It is recommended to use real json data types, because for bool fields - a string "FALSE" will be TRUE!
  A required mixed value field.

- **"type"**
  The type of the value.
  The API will check it the value type on control system if it matches.
  The type can be "int", "double" (a floating point number), "string", "bool".
  A required string field.

3.5.3 Response Fields

- **"code"**
  The code can be:
  - "ok": On success.
  - "no perm": The portal owner has not permitted you to write this data point.
  - "not found": You are permitted for this data point, but it doesn't exist on the system.
  - "error": Something went wrong while writing to the control system.
  The field always appears.

- **"path"**
  The path of the written data point.
  It appears as long as there is no fatal error.

- **"value"**
  The value that you have set.
  It appears only for code "ok".

- **"type"**
  This field is the data type of this data point.
  You can use it if you want double check it.
  It appears only for code "ok"

- **"message"**
  This field contains an human readable error message in English.
  It appears for code other than "ok".

3.5.4 JSON schema

Request:

```
{
    "$schema": "http://json-schema.org/draft-04/schema#",
    "title": "Write Request",
    "description": "Writing one or more data points",
    "type": "array",
    "items": {
        "title": "Data point write data",
        "type": "object",
        "properties": {
            "path": {
                "description": "The DMS path to the data point",
                "type": "string"
            },
            "value": {
                "description": "The new value of the data point",
                "type": ["number", "string", "boolean"]
            },
            "type": {
                "description": "The value type",
                "type": "string",
                "enum": [ "int", "double", "string", "bool" ]
            }
        },
        "additionalProperties": false,
        "required": ["path", "value", "type"]
    },
    "minItems": 1
}
```

Response:

```
{
    "$schema": "http://json-schema.org/draft-04/schema#",
    "title": "Write Response",
    "description": "Information about writing one or more data points",
    "type": "array",
    "items": {
        "title": "Data point write information",
        "type": "object",
        "properties": {
            "code": {
                "description": "The result code",
                "type": "string",
                "enum": [ "ok", "no perm", "not found", "error" ]
            },
            "path": {
                "description": "The DMS path to the data point",
                "type": "string"
            },
            "value": {
                "description": "The value of the data point",
                "type": ["number", "string", "boolean"]
            },
            "type": {
                "description": "The value type",
                "type": "string",
                "enum": [ "int", "double", "string", "bool" ]
            },
            "message": {
                "description": "Human readable error message",
                "type": "string"
            }
        },
        "required": ["code"]
    },
    "minItems": 1
}
```