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1 Revision list

Revisions	Date	Note
Rev 1.0	27-09-2018	First release.
Rev 1.1	17-06-2019	Additional example (#3) has been included on Device section (paragraph 4.3)
Rev 1.2	29-10-2021	Additional description of the API request on paragraphs Device (4.3) and Variable (4.4)

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3 Introduction

This document describes the UWP3.0 REST-API.

This web service is available at the following URL: `https://<ipaddress>/engine/api/`

The web service is based on the REST paradigm; it can be used adding to the URL the related service path, for instance `https://<ipaddress>/engine/api/login/read.php`. The UWP3 service works with JSON formatted parameters, like: `{"username":"admin", "password":"admin"}`. The service response is JSON formatted too.

In order to use the web service, it is necessary to activate it and create a dedicated account connecting to the UWP3 web interface, at the specific page "API Configuration" available from the right menu "Services".

4 Web service commands

4.1 Login

It is necessary to authenticate the user with the system and obtains the token. The token is used as parameter for all the other request methods.

After 60 minutes the token expires and it is necessary to login again.

Request

Method	
<code>login/read.php</code>	
Parameter	Type
<code>username</code>	<code>string</code>
<code>password</code>	<code>string</code>

Response

Status	Response
<code>Success</code>	<code>token (string)</code>
<code>Error</code>	<code>{"error":"invalid user"}</code>

Example

Request: `192.168.1.110/engine/api/login/read.php?data={"username":"admin","password":"admin"}`

Response:

```
{
  "token":"968a250281cfb922105cafc09c8b7322"
}
```



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4.2 Location

This method returns the location tree of the system.

Request

Method	
<code>location/read.php</code>	
Parameter	Type
token	string

Response

Status	Response
Success	<u>locationsTree</u> (Please refer to Chapter 5 - "Data structures")
Error	{"error": "missing token"}
Error	{"error": "invalid token"}
Error	{"error": "expired token"}

Example

Request: 192.168.1.110/engine/api/location/read.php?data={"token": "968a250281cfb922105cafc09c8b7322"}

```
Response: [{"id": "1", "name": "Root", "children": [{"id": "671", "name": "Kitchen", "children": [{"id": "672", "name": "Wall"}]}, {"id": "673", "name": "Garden"}]}]
```



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4.3 Device

This method returns a list of all devices and functions of the system that are logged as History data or Event data into UWP30 database manager; if “withVars” is set, also the device variables (signals) are returned.

Request

Method	
<code>device/read.php</code>	
Parameter	Type
token	string
withVars	Boolean (optional) 0 → only device list 1 → device list and signal names

Response

Status	Response
Success	<code>devicesList</code> (Please refer to Chapter 5 - “Data structures”)
Error	<code>{"error": "missing token"}</code>
Error	<code>{"error": "invalid token"}</code>
Error	<code>{"error": "expired token"}</code>

Example 1:

Request: 192.168.1.110/engine/api/device/read.php?data={"token": "968a250281cfb922105cafc09c8b7322"}

```
Response: [[
    {
        "id": "8",
        "name": "K1 SH2MCG24",
        "location": "1"
    }, {
        "id": "17",
        "name": "K2 BSI-TEMANB-U",
        "location": "672"
    }, {
        "id": "102",
        "name": "K7 SHE5XLS2TEMDIS",
        "location": "671"
    }
]]
```



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Example 2:

Request: 192.168.1.110/engine/api/device/read.php?data={"token":"968a250281cfb922105cafc09c8b7322","withVars":1}

```
Response: [{"id": "17",
  "name": "K2 BSI-TEMANB-U",
  "location": "672",
  "vars": [{"id": "18",
    "name": "1: Root - Kitchen - Wall - Temp sensor K2 Temperature 1",
    "measure_unit": "°C"}
  ]
}, {"id": "102",
  "name": "K7 SHE5XLS2TEMDIS",
  "location": "671",
  "vars": [{"id": "103",
    "name": "1: Root - Kitchen - Temdis display K7 TRoom 1"}
  ]
}]
```

Example 3:

Request: 192.168.1.110/engine/api/device/read.php?data={"token":"4fa9f15f5351125e06488ed8f1d6107e","withVars":1}

```
Response: [{"id": "1400",
  "name": "K24 WM40-TCP--3P",
  "location": "1",
  "groups": [{"id": "1",
    "name": "Group3P-1",
    "vars": [{"id": "1401",
      "name": "1: Root - Modbus TCP/IP K24 Group3P-1.A L1 1",
      "measure_unit": "A"},
      {"id": "1402",
        "name": "2: Root - Modbus TCP/IP K24 Group3P-1.A L2 2",
        "measure_unit": "A"},
      {"id": "1403",
        "name": "3: Root - Modbus TCP/IP K24 Group3P-1.A L3 3",
        "measure_unit": "A"}
      ]
    }
  ]
}]
```

Note: As shown above (Example: 3), in case of Modbus devices, there is an additional parameter called “**groups**” (inside the red rectangular box) between the device and the variable ones. It cannot be used as a filter parameter for the Request web service command. It only shows how the variables are grouped together.

4.4 Variable

This method returns a list of all variables and functions of the system that are logged as History data or Event data into UWP30 database manager.

Request

Method	
variable/read.php	
Parameter	Type
token	string

Response

Status	Response
Success	<u>variablesList</u> (Please refer to Chapter 5 - "Data structures")
Error	{"error": "missing token"}
Error	{"error": "invalid token"}
Error	{"error": "expired token"}

Example

Request: 192.168.1.110/engine/api/variable/read.php?data={"token": "968a250281cfb922105cafc09c8b7322"}

```
Response: [{"id": "18",
  "name": "1: Root - Kitchen - Wall - Temp sensor K2 Temperature 1",
  "measure_unit": "°C"},
  {"id": "103",
  "name": "1: Root - Kitchen - Temdis display K7 TRoom 1"}]
```



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4.5 History

This method returns historical data in a time period, based on the specific location, device or variable parameters.

Request

Method		
<code>report/history/read.php</code>		
Parameter	Type	Description
token	string	
idlocations	array of integer	List of desired location "id"
iddevices	array of integer	List of desired device "id"
idparams	array of integer	List of desired variables "id"
start	unixepoch timestamp	timestamp of starting datetime
end	unixepoch timestamp	timestamp of ending datetime
source	Integer (optional)	1 → all logged samples are reported 2 → only daily samples are reported 3 → only monthly samples are reported
min	Boolean (optional)	0 → disabled 1 → also minimum values are reported
max	Boolean (optional)	0 → disabled 1 → also maximum values are reported
last	Boolean (optional)	0 → disabled, "start" and "end" are considered 1 → "start" and "end" parameters are not considered, only the last saved values are reported, logged within the last 86400s (1 day)

Note: it is not mandatory to use all three "idlocations", "iddevices" and "idparams" parameters, but at least one of them must be set.

Response

Status	Response	Description
Success	<code>historyDataList</code>	Please refer to Chapter 5 - "Data structures"
Error	<code>{"error":"missing date and time values"}</code>	Parameters "start" and/or "end" are missing.
Error	<code>{"error":"not well formatted data"}</code>	The request string parameters have not been properly written.

Error	{"msg":"no data"}	There are no data that refer to the specified parameters.
Error	{"error":"no valid data"}	Parameters "idlocations" and/or "iddevices" and/or "idparams" are missing.
Error	{"error":"missing token"}	The token is missing.
Error	{"error":"invalid token"}	The used token is wrong.
Error	{"error":"expired token"}	The used token is expired.

Example

Request: 192.168.1.110/engine/api/report/history/read.php?data={"token":"968a250281cfb922105cafc09c8b7322" , "idlocations":[672],"iddevices":[17],"idparams":[18],"start":1538118000,"end": 1538119201}

Response:

```
{
  "variables": [{
    "id": 18,
    "data": [{
      "timestamp": "1538118000",
      "value": "27.7"
    }, {
      "timestamp": "1538118300",
      "value": "27.084198"
    }, {
      "timestamp": "1538118600",
      "value": "27.148744"
    }, {
      "timestamp": "1538118900",
      "value": "27.239999"
    }, {
      "timestamp": "1538119200",
      "value": "27.544345"
    }
  ]
}]
```




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4.6 Events

This method returns events in a time period, based on the specific location, device or variable parameters.

Request

Method		
<code>report/events/read.php</code>		
Parameter	Type	Description
token	string	
idlocations	array of integer	List of id location
iddevices	array of integer	List of id devices
idparams	array of integer	List of id variables
start	unixepoch timestamp	timestamp of starting datetime
end	unixepoch timestamp	timestamp of ending datetime
last	Boolean (optional)	0 → disabled, “start” and “end” are considered 1 → “start” and “end” parameters are not considered, only the last saved values are reported, logged within the last 86400s (1 day).

Response

Status	Response	Description
Success	<u>eventsDataList</u>	Please refer to Chapter 5 - “Data structures”
Error	{"error": "missing date and time values"}	Parameters “start” and/or “end” are missing.
Error	{"error": "not well formatted data"}	The request string parameters have not been properly written.
Error	{"msg": "no data"}	There are no data that refer to the specified parameters.
Error	{"error": "no valid data"}	Parameters “idlocations” and/or “iddevices” and/or “idparams” are missing.
Error	{"error": "missing token"}	The token is missing.
Error	{"error": "invalid token"}	The used token is wrong.

Error

{"error": "expired token"}

The used token is expired.

Example

Request: 192.168.1.110/engine/api/report/events/read.php?data={"token": "968a250281cfb922105cafc09c8b7322" ,
"idlocations": [672], "last": 1}

```
Response: {
  "locations": [{
    "id": 672,
    "devices": [{
      "id": 59,
      "variables": [{
        "id": 60,
        "data": [{
          "timestamp": "1538146028",
          "value": "0.0",
          "event": "20"
        }
      ]
    }, {
      "id": 61,
      "data": [{
        "timestamp": "1538146032",
        "value": "0.0",
        "event": "20"
      }
    ]
    }, {
      "id": 62,
      "data": [{
        "timestamp": "1538146030",
        "value": "0.0",
        "event": "20"
      }
    ]
    }, {
      "id": 63,
      "data": [{
        "timestamp": "1538146032",
        "value": "0.0",
        "event": "20"
      }
    ]
  }
}
}
```



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5 Data structures

LocationsTree: tree of location

Location: *object*

describes the location in the system

id	<i>int</i>	location id
name	<i>string</i>	location name
children	<i>Location[]</i>	location children

example:

```
[{
  "id": "1"
  "name": "root"
  "children": [
    {
      "id": "2",
      "name": "floor1",
      "children": [
        {
          "id": "3",
          "name": "room1"
        }
      ]
    }
  ]
},
{
  "id": "4"
  "name": "floor2"
}
]
```

DevicesList: array of **Device**

Device: *object*

Describes a device (energy meter, dupline module...).

Fields:

id	<i>int</i>	<i>device</i> id
name	<i>string</i>	<i>device</i> name
location	<i>int</i>	<i>location</i> id where device is
vars	<i>variable[]</i>	array of variables

VariablesList: array of **Variable**



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Variable: object

Describe signal in system

id	<i>int</i>	<i>variable id</i>
name	<i>string</i>	<i>variable name</i>
measure_unit	<i>string</i>	<i>meausure unit</i>

HistoryDataList: object

structured object that describes the data of a datetime of some object (locations, devices, variables),

the structure depends on input data passed:

- **idlocations:** the entire structure from location to variables and data is returned
- **iddevices:** the entire structure from device to variables and data is returned
- **idparams:** the entire structure from variables to data is returned

```
{
  "locations": [
    {
      "id": 1, // id location
      "devices": [
        {
          "id": 2, // id device
          "variables": [
            {
              "id": 3, // id variable
              "data": [
                {
                  "timestamp": "123456789"
                  "value": "1.0"
                }
              ]
            }
          ]
        }
      ]
    }
  ]
}
```

id	<i>int</i>	<i>variable id</i>
data	<i>dataVariable</i>	<i>variable data</i>

dataVariable: object

timetsmap	<i>int</i>	UTC timestamp
value	<i>string</i>	<i>variable value</i>
min	<i>string</i>	<i>variable min value</i>



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max *string* *variable* max value
event *string* event type

EventsDataList: object
 see **HistoryDataList**

5.1 Event type

This table allows to decode the type of the logged event; for instance:

```
"id": 63,
  "data": [{
    "timestamp": "1538146032",
    "value": "0.0",
    "event": "20"
  }
]
```

the event "20" corresponds to "falling"(value 4) + short pulse"(value 16). In fact, "20" converted in binary is "10100", therefore bit2 and bit4 are active.

Event type	Bit index	Value
level_change	0	1
rising	1	2
falling	2	4
NOT USED	3	8
short_pulse	4	16
long_pulse	5	32
very_long_pulse	6	64
reset	7	128
NOT USED	8	256
NOT USED	9	512
NOT USED	10	1024
NOT USED	11	2048
NOT USED	12	4096
NOT USED	13	8192
NOT USED	14	16384
NOT USED	15	32768
NOT USED	16	65536
NOT USED	17	131072
NOT USED	18	262144
NOT USED	19	524288

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fx_rollover	20	1048576
fx_feedback_change	21	2097152
fx_workhour_set	22	4194304
fx_limit_reached	23	8388608
fx_limit_changed	24	16777216
fx_service_changed	25	33554432
NOT USED	26	67108864
NOT USED	27	134217728
NOT USED	28	268435456
NOT USED	29	536870912
NOT USED	30	1073741824
NOT USED	31	2147483648