

# EMpro REST API



Application note  
109455\_en\_01

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## 1 Description

The API Documentation will provide you information about the EMpro REST API of the firmware version 1.5.1 or higher. A measuring device, e.g. EEM-MB370, is connected to an Ethernet-based network with an energy monitoring application. The energy monitoring application has access to datapoints via REST programming interface.

The GET method is used to read datapoints from the device. This method is enabled by default.

The PUT method is used to write data to the device. The PUT method is deactivated by default.

If you need to send PUT requests, e.g. to reset meters or to change the tariff number, please activate the PUT method respectively during commissioning.

In the examples of the description, the name “device” stands for the IP address of the monitoring device.

The monitoring device can receive the IP address from a DHCP server or use a static IP address prior to his configuration.

The interface is accessible via the following HTTP URL  
`http://device:port/api/v1` with port: 80.

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This document is valid for all products listed in the “Ordering data” on page 2.

## 2 Ordering data

Type	Order No.	Pcs./Pkt.
EEM-MA370	2907983	1
EEM-MA371	2908307	1
EEM-MA370-R	2907980	1
EEM-MA371-R	2907985	1
EEM-MB370	2907954	1
EEM-MB371	2907955	1
EEM-MB371-24DC	1127055	1
EEM-MB370-PN	2907984	1
EEM-MB371-PN	2908308	1
EEM-MB370-EIP	2907971	1
EEM-MB371-EIP	2907976	1
EEM-MA770	2907945	1
EEM-MA771	2908286	1
EEM-MA770-R	2907944	1
EEM-MA771-R	2908285	1
EEM-MA770-PN	2907946	1
EEM-MA771-PN	2908301	1
EEM-MA770-EIP	2907953	1
EEM-MA771-EIP	2908302	1
EEM-MA370-24DC	1127059	1
EEM-MA371-24DC	1127058	1
EEM-MB370-24DC	1127061	1
EEM-MB371-24DC	1127055	1
EEM-MA770-24DC	1127052	1
EEM-MA771-24DC	1127060	1
EEM-SB370-C	1158951	1
EEM-SB371-C	1158947	1

## 3 Versioning

To support future changes of the API and maintain backwards compatibility, Phoenix Contact keeps different versions of the API available. The different versions can be distinguished by the vX (where the X is the version number) in the URL. The differences between the different versions are explained in the different sections that are dedicated to one version.

## 4 API Methods Overview

Method Name	Category	Description
GET Service Root	List	Returns a list of resources
GET Information	Group	Returns a group of device information
GET Measurements (U1)	Endpoint	Returns a single item
GET Measurements	Group	Returns a group of measurements
GET Meters	Group	Returns a group of meter readings
GET Tariff Number	Endpoint	Returns the tariff number
PUT Tariff Number	Endpoint	Change of tariff number
PUT Reset Meters	Endpoint	Reset of groups of meter readings
GET History Meters	Log	Returns a log of meter readings

## 5 GET Service Root



Do not end the URL with „/“ to avoid „Resource not found“

### 1. Resource URL

/api/v1

### 2. Parameters

-

### 3. Example

GET http://192.168.8.24/api/v1

### 4. Example Response

```
{
  "context": "/api/v1",
  "timestamp": "2020-03-02T07:39:21Z",
  "items": [
    {
      "href": "/api/v1/information",
      "description": "Device information"
    },
    {
      "href": "/api/v1/measurements",
      "description": "Instantaneous values"
    },
    {
      "href": "/api/v1/meters",
      "description": "Meter readings"
    },
    {
      "href": "/api/v1/measurement-system-control",
      "description": "Measurement control"
    },
    {
      "href": "/api/v1/history",
      "description": "Historical data access"
    }
  ]
}
```

## 6 GET Information

1. Resource URL

/api/v1/information

2. Parameters

-

3. Example

GET http://device:80/api/v1/information

## 4. Example Response

```
{
  "context": "",
  "timestamp": "2020-03-02T07:38:59Z",
  "items": [
    {
      "href": "/api/v1/information/name",
      "id": "name",
      "name": "Device",
      "value": "EEM-MA370",
      "description": "Device identifier"
    },
    {
      "href": "/api/v1/information/hw",
      "id": "hw",
      "name": "Hardware version",
      "value": "2.0",
      "description": "Hardware revision number"
    },
    {
      "href": "/api/v1/information/fw",
      "id": "fw",
      "name": "Firmware version",
      "value": "1.5.1",
      "description": "Firmware revision number"
    },
    {
      "href": "/api/v1/information/serial-number",
      "id": "serial-number",
      "name": "Serial number",
      "value": "1361394185",
      "description": "Serial number"
    },
    {
      "href": "/api/v1/information/label",
      "id": "label",
      "name": "Device label",
      "value": "Individual device label",
      "description": "Device label"
    },
    {
      "href": "/api/v1/information/metering-point",
      "id": "metering-point",
      "name": "Metering point",
      "value": "Enter your metering point",
      "description": "Metering point identification"
    },
    {
      "href": "/api/v1/information/uuid",
      "id": "uuid",
      "name": "UUID",
      "value": "534ABB89-A0E7-4129-AF3E-C41D8E8C",
      "description": "Universally Unique Identifier (UUID) consisting of 128 Bit"
    }
  ]
}
```

```
{
  "href": "/api/v1/information/mac",
  "id": "mac",
  "name": "MAC address",
  "value": "A8:74:1D:02:19:93",
  "description": "Device MAC address"
},
{
  "href": "/api/v1/information/article-number",
  "id": "article-number",
  "name": "Article number",
  "value": "2907983",
  "description": "Article number"
},
{
  "href": "/api/v1/information/vendor",
  "id": "vendor",
  "name": "Vendor name",
  "value": "Phoenix Contact GmbH & Co. KG",
  "description": "Vendor name"
},
{
  "href": "/api/v1/information/vendor-url",
  "id": "vendor-url",
  "name": "Vendor homepage",
  "value": "www.phoenixcontact.com",
  "description": "Vendor URL"
},
{
  "href": "/api/v1/information/production-date",
  "id": "production-date",
  "name": "Production date",
  "value": "2019-08-21T09:32:00Z",
  "description": "UTC production date"
},
{
  "href": "/api/v1/information/operating-hours",
  "id": "operating-hours",
  "name": "Operating hours",
  "value": 131,
  "unit": "h",
  "description": "Total operating time since commissioning"
}
]
}
```

## 5. List of information end points

#	Id	Name	Description
0	name	Device	Device identifier
1	hw	Hardware version	Hardware revision number
2	fw	Firmware version	Firmware revision number
3	serial-number	Serial number	Serial number
4	label	Device label	Device label
5	metering-point	Metering point	Metering point identification
6	uuid	UUID	Universally Unique Identifier (UUID) consisting of 128 Bit
7	mac	MAC address	Device MAC address
8	article-number	Article number	Article number
9	vendor	Vendor name	Vendor name
10	vendor-url	Vendor url	Vendor URL
11	production-date	Date of production	UTC production date
12	operating-hours	Operating hours	Total operating time since commissioning

## 7 GET Measurements as Single End Point

### 1. Resource URL

```
http://device:80/api/v1/measurements/u1
```

### 2. Parameters

#	Parameter	Category	Description
1	{u1}	Path parameter	Refers to the list of end points

### 3. Example

```
GET http://device:80/api/v1/measurements/{u1}
```

### 4. Example Response

```
{
  "context": "/api/v1/measurements/u1",
  "id": "u1",
  "timestamp": "2020-03-02T07:38:31Z",
  "name": "U1",
  "value": 229.845,
  "unit": "V",
  "description": "Effective value voltage U1"
}
```

## 8 GET Measurements

1. Resource URL

/api/v1/measurements

2. Parameters

-

3. Example

GET http://device:80/api/v1/measurements

## 4. Example Response

```
{
  "context": "/api/v1/measurements",
  "timestamp": "2020-03-02T07:38:09Z",
  "items": [
    {
      "href": "/api/v1/measurements/f",
      "id": "f",
      "name": "f",
      "value": 50.000,
      "unit": "Hz",
      "description": "Frequency"
    },
    {
      "href": "/api/v1/measurements/u1",
      "id": "u1",
      "name": "U1",
      "value": 230.042,
      "unit": "V",
      "description": "Effective value voltage U1"
    },
    {
      "href": "/api/v1/measurements/u2",
      "id": "u2",
      "name": "U2",
      "value": 229.805,
      "unit": "V",
      "description": "Effective value voltage U2"
    },
    {
      "href": "/api/v1/measurements/u3",
      "id": "u3",
      "name": "U3",
      "value": 229.853,
      "unit": "V",
      "description": "Effective value voltage U3"
    },
    {
      "href": "/api/v1/measurements/u3",
      "id": "u3",
      "name": "U3",
      "value": 229.853,
      "unit": "V",
      "description": "Effective value voltage U3"
    },
    {
      "href": "/api/v1/measurements/u12",
      "id": "u12",
      "name": "U12",
      "value": 398.237,
      "unit": "V",
      "description": "Effective value voltage U12"
    }
  ]
}
```

```
{
  "href": "/api/v1/measurements/u23",
  "id": "u23",
  "name": "U23",
  "value": 398.078,
  "unit": "V",
  "description": "Effective value voltage U23"
},
{
  "href": "/api/v1/measurements/u31",
  "id": "u31",
  "name": "U31",
  "value": 398.279,
  "unit": "V",
  "description": "Effective value voltage U31"
},
{
  "href": "/api/v1/measurements/i1",
  "id": "i1",
  "name": "I1",
  "value": 2.533,
  "unit": "A",
  "description": "Effective value current I1"
},
{
  "href": "/api/v1/measurements/i2",
  "id": "i2",
  "name": "I2",
  "value": 2.468,
  "unit": "A",
  "description": "Effective value current I2"
},
{
  "href": "/api/v1/measurements/i3",
  "id": "i3",
  "name": "I3",
  "value": 2.476,
  "unit": "A",
  "description": "Effective value current I3"
},
{
  "href": "/api/v1/measurements/in",
  "id": "in",
  "name": "IN",
  "value": 0.063,
  "unit": "A",
  "description": "Effective value current IN"
},
{
  "href": "/api/v1/measurements/p1",
  "id": "p1",
  "name": "P1",
  "value": 582.610,
  "unit": "W",
  "description": "Active power with sign on phase 1. >0: Demand <0: Delivery"
},
}
```

```
{
  "href": "/api/v1/measurements/p2",
  "id": "p2",
  "name": "P2",
  "value": 567.180,
  "unit": "W",
  "description": "Active power with sign on phase 2. >0: Demand <0: Delivery"
},
{
  "href": "/api/v1/measurements/p3",
  "id": "p3",
  "name": "P3",
  "value": 569.138,
  "unit": "W",
  "description": "Active power with sign on phase 3. >0: Demand <0: Delivery"
},
{
  "href": "/api/v1/measurements/q1",
  "id": "q1",
  "name": "Q1",
  "value": 0.000,
  "unit": "var",
  "description": "Reactive power with sign on phase 1. >0: Demand <0: Delivery"
},
{
  "href": "/api/v1/measurements/q2",
  "id": "q2",
  "name": "Q2",
  "value": 3.187,
  "unit": "var",
  "description": "Reactive power with sign on phase 2. >0: Demand <0: Delivery"
},
{
  "href": "/api/v1/measurements/q3",
  "id": "q3",
  "name": "Q3",
  "value": 0.000,
  "unit": "var",
  "description": "Reactive power with sign on phase 3. >0: Demand <0: Delivery"
},
{
  "href": "/api/v1/measurements/s1",
  "id": "s1",
  "name": "S1",
  "value": 582.610,
  "unit": "VA",
  "description": "Apparent power on phase 1 (unsigned)"
},
{
  "href": "/api/v1/measurements/s2",
  "id": "s2",
  "name": "S2",
  "value": 567.189,
  "unit": "VA",
  "description": "Apparent power on phase 2 (unsigned)"
},
}
```

```
{
  "href": "/api/v1/measurements/s3",
  "id": "s3",
  "name": "S3",
  "value": 569.138,
  "unit": "VA",
  "description": "Apparent power on phase 3 (unsigned)"
},
{
  "href": "/api/v1/measurements/pf1",
  "id": "pf1",
  "name": "PF1",
  "value": 1.000,
  "unit": " ",
  "description": "Power factor on phase 1 acc. to IEEE: with sign >0: Demand <0: Delivery acc. to IEC: unsigned"
},
{
  "href": "/api/v1/measurements/pf2",
  "id": "pf2",
  "name": "PF2",
  "value": 1.000,
  "unit": " ",
  "description": "Power factor on phase 2 acc. to IEEE: with sign >0: Demand <0: Delivery acc. to IEC: unsigned"
},
{
  "href": "/api/v1/measurements/pf3",
  "id": "pf3",
  "name": "PF3",
  "value": 1.000,
  "unit": " ",
  "description": "Power factor on phase 3 acc. to IEEE: with sign >0: Demand <0: Delivery acc. to IEC: unsigned"
},
{
  "href": "/api/v1/measurements/p",
  "id": "p",
  "name": "P",
  "value": 1718.928,
  "unit": "W",
  "description": "Sum of active power according to DIN EN 61557-12 with sign. >0: Demand <0: Delivery"
},
{
  "href": "/api/v1/measurements/q",
  "id": "q",
  "name": "Q",
  "value": 3.187,
  "unit": "var",
  "description": "Vectorial total reactive power according to DIN EN 61557-12 with sign as sum of the individual reactive powers. >0: Demand <0: Delivery"
},
}
```

```
{
  "href": "/api/v1/measurements/s",
  "id": "s",
  "name": "S",
  "value": 1718.928,
  "unit": "VA",
  "description": "Vectorial total apparent power according to DIN EN 61557-12"
},
{
  "href": "/api/v1/measurements/pf",
  "id": "pf",
  "name": "PF",
  "value": 1.000,
  "unit": " ",
  "description": "Vectorial total power factor with sign according to IEEE. >0: Inductive <0: Capacitive"
}
]
```

## 5. List of end points

#	Id	Name	Unit	Description
0	f	f	Hz	Frequency
1	u1	U1	V	Effective value voltage U1
2	u2	U2	V	Effective value voltage U2
3	u3	U3	V	Effective value voltage U3
4	u12	U12	V	Effective value voltage U12
5	u23	U23	V	Effective value voltage U23
6	u31	U31	V	Effective value voltage U31
7	i1	I1	A	Effective value current I1
8	i2	I2	A	Effective value current I2
9	i3	I3	A	Effective value current I3
10	in	IN	A	Effective value current IN
11	p1	P1	W	Active power with sign on phase 1. >0: Demand <0: Delivery
12	p2	P2	W	Active power with sign on phase 2. >0: Demand <0: Delivery
13	p3	P3	W	Active power with sign on phase 3. >0: Demand <0: Delivery
14	q1	Q1	var	Reactive power with sign on phase 1. >0: Demand <0: Delivery
15	q2	Q2	var	Reactive power with sign on phase 2. >0: Demand <0: Delivery
16	q3	Q3	var	Reactive power with sign on phase 3. >0: Demand <0: Delivery
17	s1	S1	VA	Apparent power on phase 1 (unsigned)
18	s2	S2	VA	Apparent power on phase 2 (unsigned)
19	s3	S3	VA	Apparent power on phase 3 (unsigned)
20	pf1	PF1	" "	Power factor on phase 1 acc. to IEEE: with sign >0: Demand <0: Delivery acc. to IEC: unsigned
21	pf2	PF2	" "	Power factor on phase 2 acc. to IEEE: with sign >0: Demand <0: Delivery acc. to IEC: unsigned
22	pf3	PF3	" "	Power factor on phase 3 acc. to IEEE: with sign >0: Demand <0: Delivery acc. to IEC: unsigned
23	p	P	W	Sum of active power according to DIN EN 61557-12 with sign. >0: Demand <0: Delivery
24	q	Q	var	Vectorial total reactive power according to DIN EN 61557-12 with sign as sum of the individual reactive powers. >0: Demand <0: Delivery
25	s	S	VA	Vectorial total reactive power according to DIN EN 61557-12
26	pf	PF	" "	Vectorial total power factor with sign according to IEEE. >0: Inductive <0: Capacitive

## 9 GET Meters

### 1. Resource URL

```
http://device:80/api/v1/meters
```

### 2. Parameters

```
-
```

### 3. Example

```
GET http://device:80/api/v1/meters
```

### 4. Example Response

```
{
  "context": "/api/v1/meters",
  "items": [
    {
      "href": "/api/v1/meters/ea-pos-total",
      "id": "ea-pos-total",
      "name": "Ea+",
      "value": 38721.889,
      "unit": "Wh",
      "description": "Total active energy demand"
    },
    {
      "href": "/api/v1/meters/ea-neg-total",
      "id": "ea-neg-total",
      "name": "Ea-",
      "value": 0,
      "unit": "Wh",
      "description": "Total active energy delivery"
    },
    {
      "href": "/api/v1/meters/er-pos-total",
      "id": "er-pos-total",
      "name": "Er+",
      "value": 0,
      "unit": "varh",
      "description": "Total reactive energy demand"
    },
    {
      "href": "/api/v1/meters/er-neg-total",
      "id": "er-neg-total",
      "name": "Er-",
      "value": 0,
      "unit": "varh",
      "description": "Total reactive energy delivery"
    },
    {
      "href": "/api/v1/meters/es-total",
      "id": "es-total",
      "name": "Es",
      "value": 38721.889,
      "unit": "VAh",
      "description": "Total apparent energy"
    }
  ]
}
```

```
{
  "href": "/api/v1/meters/er-total",
  "id": "er-total",
  "name": "Er",
  "value": 122893.18,
  "unit": "varh",
  "description": "Total unsigned reactive energy"
},
{
  "href": "/api/v1/meters/ea-pos",
  "id": "ea-pos",
  "name": "Ea+",
  "value": 17.597,
  "unit": "Wh",
  "description": "Active energy demand since last reset"
},
{
  "href": "/api/v1/meters/ea-neg",
  "id": "ea-neg",
  "name": "Ea-",
  "value": 0,
  "unit": "Wh",
  "description": "Active energy delivery since last reset"
},
{
  "href": "/api/v1/meters/er-pos",
  "id": "er-pos",
  "name": "Er+",
  "value": 0,
  "unit": "varh",
  "description": "Reactive energy demand since last reset"
},
{
  "href": "/api/v1/meters/er-neg",
  "id": "er-neg",
  "name": "Er-",
  "value": 0,
  "unit": "varh",
  "description": "Reactive energy delivery since last reset"
},
{
  "href": "/api/v1/meters/es",
  "id": "es",
  "name": "Es",
  "value": 17.597,
  "unit": "VAh",
  "description": "Apparent energy since last reset"
},
{
  "href": "/api/v1/meters/er",
  "id": "er",
  "name": "Er",
  "value": 122193.18,
  "unit": "varh",
  "description": "Unsigned reactive energy since last reset"
},
}
```

```
{
  "href": "/api/v1/meters/e-runtime",
  "id": "e-runtime",
  "name": "E Runtime",
  "value": 3,
  "unit": "varh",
  "description": "Runtime since last reset of energy meters",
},
{
  "href": "/api/v1/meters/t1-ea-pos",
  "id": "t1-ea-pos",
  "name": "T1 Ea+",
  "value": 7762.191,
  "unit": "Wh",
  "description": "Active energy demand since last reset in tariff 1"
},
{
  "href": "/api/v1/meters/t1-ea-neg",
  "id": "t1-ea-neg",
  "name": "T1 Ea-",
  "value": 0,
  "unit": "Wh",
  "description": "Active energy delivery since last reset in tariff 1"
},
{
  "href": "/api/v1/meters/t1-er-pos",
  "id": "t1-er-pos",
  "name": "T1 Er+",
  "value": 0,
  "unit": "varh",
  "description": "Reactive energy demand since last reset in tariff 1"
},
{
  "href": "/api/v1/meters/t1-er-neg",
  "id": "t1-er-neg",
  "name": "T1 Er-",
  "value": 0,
  "unit": "varh",
  "description": "Reactive energy delivery since last reset in tariff 1"
},
{
  "href": "/api/v1/meters/t1-es",
  "id": "t1-es",
  "name": "T1 Es",
  "value": 7762.191,
  "unit": "VAh",
  "description": "Apparent energy since last reset in tariff 1"
},
{
  "href": "/api/v1/meters/t1-er",
  "id": "t1-er",
  "name": "T1 Er",
  "value": 0,
  "unit": "varh",
  "description": "Unsigned reactive energy since last reset in tariff 1"
},
},
```

```
{
  "href": "/api/v1/meters/t1-runtime",
  "id": "t1-runtime",
  "name": "T1 Runtime",
  "value": 1320,
  "unit": "s",
  "description": "Runtime since last reset in tariff 1"
},
{
  "href": "/api/v1/meters/t2-ea-pos",
  "id": "t2-ea-pos",
  "name": "T2 Ea+",
  "value": 7749.643,
  "unit": "Wh",
  "description": "Active energy demand since last reset in tariff 2"
},
{
  "href": "/api/v1/meters/t2-ea-neg",
  "id": "t2-ea-neg",
  "name": "T2 Ea-",
  "value": 0,
  "unit": "Wh",
  "description": "Active energy delviery since last reset in tariff 2"
},
{
  "href": "/api/v1/meters/t2-er-pos",
  "id": "t2-er-pos",
  "name": "T2 Er+",
  "value": 0,
  "unit": "varh",
  "description": "Reactive energy demand since last reset in tariff 2"
},
{
  "href": "/api/v1/meters/t2-er-neg",
  "id": "t2-er-neg",
  "name": "T2 Er-",
  "value": 0,
  "unit": "varh",
  "description": "Reactive energy delivery since last reset in tariff 2"
},
{
  "href": "/api/v1/meters/t2-es",
  "id": "t2-es",
  "name": "T2 Es",
  "value": 7749.643,
  "unit": "VAh",
  "description": "Apparent energy since last reset in tariff 2"
},
{
  "href": "/api/v1/meters/t2-er",
  "id": "t2-er",
  "name": "T2 Er",
  "value": 0,
  "unit": "varh",
  "description": "Unsigned reactive energy since last reset in tariff 2"
},
}
```

```
{
  "href": "/api/v1/meters/t2-runtime",
  "id": "t2-runtime",
  "name": "T2 Runtime",
  "value": 1318,
  "unit": "s",
  "description": "Runtime since last reset in tariff 2"
},
{
  "href": "/api/v1/meters/t3-ea-pos",
  "id": "t3-ea-pos",
  "name": "T3 Ea+",
  "value": 7726.18,
  "unit": "Wh",
  "description": "Active energy demand since last reset in tariff 3"
},
{
  "href": "/api/v1/meters/t3-ea-neg",
  "id": "t3-ea-neg",
  "name": "T3 Ea-",
  "value": 0,
  "unit": "Wh",
  "description": "Active energy delviery since last reset in tariff 3"
},
{
  "href": "/api/v1/meters/t3-er-pos",
  "id": "t3-er-pos",
  "name": "T3 Er+",
  "value": 0,
  "unit": "varh",
  "description": "Reactive energy demand since last reset in tariff 3"
},
{
  "href": "/api/v1/meters/t3-er-neg",
  "id": "t3-er-neg",
  "name": "T3 Er-",
  "value": 0,
  "unit": "varh",
  "description": "Reactive energy delivery since last reset in tariff 3"
},
{
  "href": "/api/v1/meters/t3-es",
  "id": "t3-es",
  "name": "T3 Es",
  "value": 7726.18,
  "unit": "VAh",
  "description": "Apparent energy since last reset in tariff 3"
},
{
  "href": "/api/v1/meters/t3-er",
  "id": "t3-er",
  "name": "T3 Er",
  "value": 0,
  "unit": "varh",
  "description": "Unsigned reactive energy since last reset in tariff 3"
},
}
```

```
{
  "href": "/api/v1/meters/t3-runtime",
  "id": "t3-runtime",
  "name": "T3 Runtime",
  "value": 1314,
  "unit": "s",
  "description": "Runtime since last reset in tariff 3"
},
{
  "href": "/api/v1/meters/t4-ea-pos",
  "id": "t4-ea-pos",
  "name": "T4 Ea+",
  "value": 7726.845,
  "unit": "Wh",
  "description": "Active energy demand since last reset in tariff 4"
},
{
  "href": "/api/v1/meters/t4-ea-neg",
  "id": "t4-ea-neg",
  "name": "T4 Ea-",
  "value": 0,
  "unit": "Wh",
  "description": "Active energy delviery since last reset in tariff 4"
},
{
  "href": "/api/v1/meters/t4-er-pos",
  "id": "t4-er-pos",
  "name": "T4 Er+",
  "value": 0,
  "unit": "varh",
  "description": "Reactive energy demand since last reset in tariff 4"
},
{
  "href": "/api/v1/meters/t4-er-neg",
  "id": "t4-er-neg",
  "name": "T4 Er-",
  "value": 0,
  "unit": "varh",
  "description": "Reactive energy delivery since last reset in tariff 4"
},
{
  "href": "/api/v1/meters/t4-es",
  "id": "t4-es",
  "name": "T4 Es",
  "value": 7726.845,
  "unit": "VAh",
  "description": "Apparent energy since last reset in tariff 4"
},
{
  "href": "/api/v1/meters/t4-er",
  "id": "t4-er",
  "name": "T4 Er",
  "value": 0,
  "unit": "varh",
  "description": "Unsigned reactive energy since last reset in tariff 4"
},
}
```

```
{
  "href": "/api/v1/meters/t4-runtime",
  "id": "t4-runtime",
  "name": "T4 Runtime",
  "value": 1314,
  "unit": "s",
  "description": "Runtime since last reset in tariff 4"
}
]
```

## 5. List of end points of meters

#	ID	Name	Value	Description
0	ea-pos-total	Ea+	Wh	Total active energy demand
1	ea-neg-total	Ea-	Wh	Total active energy delivery
2	er-pos-total	Er+	varh	Total reactive energy demand
3	er-neg-total	Er-	varh	Total reactive energy delivery
4	es-total	Es	VAh	Total apparent energy
5	er-total	Er	varh	Total unsigned reactive energy
6	ea-pos	Ea+	Wh	Active energy demand since last reset
7	ea-neg	Ea-	Wh	Active energy delivery since last reset
8	er-pos	Er+	varh	Reactive energy demand since last reset
9	er-neg	Er-	var	Reactive energy delivery since last reset
10	es	Es	VAh	Apparent energy since last reset
11	er	Er	varth	Unsigned reactive energy since last reset
12	e-runtime	E Runtime	s	Runtime since last reset of energy meters
13	t1-ea-pos	T1 Ea+	Wh	Active energy demand since last reset in tariff 1
14	t1-ea-neg	T1 Ea-	Wh	Active energy delivery since last reset in tariff 1
15	t1-er-pos	T1 Er+	varh	Reactive energy demand since last reset in tariff 1
16	t1-er-neg	T1 Er-	varh	Reactive energy delivery since last reset in tariff 1
17	t1-es	T1 Es	VAh	Apparent energy since last reset in tariff 1
18	t1-er	T1 Er	varh	Unsigned reactive energy since last reset in tariff 1
19	t1-runtime	T1 Runtime	s	Runtime since last reset in tariff 1
20	t2-ea-pos	T2 Ea+	Wh	Active energy demand since last reset in tariff 2
21	t2-ea-neg	T2 Ea-	Wh	Active energy delivery since last reset in tariff 2
22	t2-er-pos	T2 Er+	varh	Reactive energy demand since last reset in tariff 2
23	t2-er-neg	T2 Er-	varh	Reactive energy delivery since last reset in tariff 2
24	t2-es	T2 Es	VAh	Apparent energy since last reset in tariff 2
25	t2-er	T2 Er	varh	Unsigned reactive energy since last reset in tariff 2
26	t2-runtime	T2 Runtime	s	Runtime since last reset in tariff 2
27	t3-ea-pos	T3 Ea+	Wh	Active energy demand since last reset in tariff 3
28	t3-ea-neg	T3 Ea-	Wh	Active energy delivery since last reset in tariff 3
29	t3-er-pos	T3 Er+	varh	Reactive energy demand since last reset in tariff 3
30	t3-er-neg	T3 Er-	varh	Reactive energy delivery since last reset in tariff 3
31	t3-es	T3 Es	VAh	Apparent energy since last reset in tariff 3
32	t3-er	T3 Er	varh	Unsigned reactive energy since last reset in tariff 3
33	t3-runtime	T3 Runtime	s	Runtime since last reset in tariff 3
34	t4-ea-pos	T4 Ea+	Wh	Active energy demand since last reset in tariff 4
35	t4-ea-neg	T4 Ea-	Wh	Active energy delviery since last reset in tariff 4
36	t4-er-pos	T4 Er+	varh	Reactive energy demand since last reset in tariff 4
37	t4-er-neg	T4 Er	varh	Reactive energy delivery since last reset in tariff 4
38	t4-es	T4 Es	VAh	Apparent energy since last reset in tariff 4
39	t4-er	T4 Er	varh	Unsigned reactive energy since last reset in tariff 4
40	t4-runtime	T4 Runtime	s	Runtime since last reset in tariff 4

## 10 GET Tariff Number

### 1. Resource URL

```
http://device:80/api/v1/measurement-system-control/tariff-number
```

### 2. Parameter

```
-
```

### 3. Example

```
GET http://device:80/api/v1/measurement-system-control/tariff-number
```

### 4. Example Response

```
{
  "context": "/api/v1/measurement-system-control/tariff-number",
  "id": "tariff-number",
  "timestamp": "2022-03-22T09:48:53Z",
  "name": "Tariff number",
  "value": 3,
  "description": "Selection of a tariff, 0: No tariff counter active, 1: Tariff 1, 2: Tariff 2,
3: Tariff 3, 4: Tariff 4"
}
```

## 11 PUT Tariff Number

Hint: In factory settings, the PUT method is deactivated. Before sending PUT requests to the device, please activate the PUT method in the Web-Based Management > REST API > Settings of the device or via Modbus/TCP.

### 1. Resource URL

```
http://device:80/api/v1/measurement-system-control/tariff-number
```

### 2. Parameters

#	Parameter	Category	Description
1	value	Query parameter	Selection of a tariff, 0: No tariff counter active, 1: Tariff 1, 2: Tariff 2, 3: Tariff 3, 4: Tariff 4

### 3. Example

```
PUT http://device:80/api/v1/measurement-system-control/tariff-number?value=3
```

In this example, the selected tariff number is 3. By sending this command, tariff 3 will get activated. The device responds with the http status code 200 OK. After this, tariff 3 is activated. You can check the selected tariff number by GET tariff number.

Hint: If the selected tariff number is 0, all tariffs are deactivated

```
PUT http://device:80/api/v1/measurement-system-control/tariff-number?value=0
```

Hint: If no query parameter is sent to the device, the device responds with the http status code 400 BAD REQUEST.

```
PUT http://device:80/api/v1/measurement-system-control/tariff-number
```

Hint: If the query parameter is e.g. 99, this leads to the http status code 400 BAD REQUEST.

```
PUT http://device:80/api/v1/measurement-system-control/tariff-number?value=99
```

### 4. Example Response

```
{
  "code": 200,
  "context": "/api/v1/measurement-system-control/tariff-number?value=3",
  "message": "OK"
}
```

```
{
  "code": 200,
  "context": "/api/v1/measurement-system-control/tariff-number?value=0",
  "message": "OK"
}
```

```
{
  "code": 400,
  "context": "/api/v1/measurement-system-control/tariff-number?value=99",
  "error": "Bad request"
}
```

## 12 PUT Reset Meters

### 1. Resource URL

```
http://device:80/api/v1/measurement-system-control/reset-meters
```

### 2. Parameters

#	Parameter	Category	Description
1	e	Query parameter	e: resettable energy meters
2	t1	Query parameter	t1: tariff 1
3	t2	Query parameter	t2: tariff 2
4	t3	Query parameter	t3: tariff 3
5	t4	Query parameter	t4: tariff 4

### 3. Example

By sending this example, the groups of resettable energy meters, tariff 1 and tariff 2 are getting reset. You can choose to reset one or more groups by one request.

```
PUT http://device:80/api/v1/measurement-system-control/reset-meters?e=1&t1=1&t2=1
```

By sending this example, the group of tariff 3 is getting reset.

```
PUT http://device:80/api/v1/measurement-system-control/reset-meters?t3=1
```

By sending this example, all groups of resettable energy meters, tariff 1, tariff 2, tariff 3 and tariff 4 are getting reset.

```
PUT http://device:80/api/v1/measurement-system-control/reset-meters?e=1&t1=1&t2=1&t3=1&t4=1
```

Hint: If no query parameter is sent to the device, the device responds with the http status code 400 BAD REQUEST.

Hint: If the http status code 400 BAD REQUEST appears, no group of meters got reset.

### 4. Example Response

```
{
  "code": 200,
  "context": "/api/v1/measurement-system-control/reset-meters?e=1&t1=1&t2=1",
  "message": "OK"
}
```

```
{
  "code": 400,
  "context": "/api/v1/measurement-system-control/reset-meters",
  "error": "Bad request"
}
```

## 13 GET History Meters

Hint: Please ensure Date / Time is properly configured to your needs!

The meter history is a collection of the meter readings of the resettable energy meters for the last 14-days.

In a 5-minute interval, a record is put to the history. If the reserved memory of 14-days is reached, the oldest record is removed from the collection. The history can contain 4.032 records as maximum. Each record has a “timestamp” and “values” array comprising four parameters according to the “names” array: active energy demand (Ea+), active energy delivery (Ea-), reactive energy demand (Er+) and reactive energy delivery (Er-). There is also a “units” array. Additionally, the parameter “isComplete” is true if the interval time was complete without power downs of the device. If the interval contains a power down, the parameter “isComplete” is false.

The query parameter top allows to limit the read-out of records. If the parameter is 1, only the last record from the last completed period is returned.

The query parameter period allows different aggregations of energy values. If the parameter is 5, the records contain periods that lasted 5 minutes. If the parameter is 15, the records contain periods that lasted 15 minutes. If the parameter is 60, the records contain periods that lasted 60 minutes (12x5). If the parameter is 1440, the records contain periods that lasted 1 day (5x12x24).

### 1. Resource URL

```
http://device:80/api/v1/history/meters?top=5
```

### 2. Parameters

Parameter	Category	Description
top	Query Parameter	Limit the recordings transmitted to the amount of TOP. If no top value is available, all records will be returned.
period	Query Parameter	Filter the recordings to a multiple of 5-minute period. If no period value is available, a 15-minute period will be returned.
isComplete	Response Parameter	Boolean that indicates the completeness of a measurement period.  Example 1: 09:30-09:45: “isComplete”: true  Example 2: 09:30-09:45 with interruption of the device: “isComplete”: false

### 3. Example

```
GET http://192.168.8.24/api/v1/history/meters?period=5&top=10
```

The example returns the last 10 (top = 10) records with an interval time of 5 minutes (period = 5).

```
GET http://192.168.8.24/api/v1/history/meters?period=30&top=4
```

The example returns the last 4 (top = 4) records with an interval time of 30 minutes (period = 30).

```
GET http://192.168.8.24/api/v1/history/meters?top=1
```

The example returns the last record from the last completed period of 15 minutes (if no period parameter is sent, the period parameter is assumed to be 15).

## 4. Example Response

```
{
  "context": "/api/v1/history/meters?period=5&top=10",
  "timestamp": "2022-09-02T12:35:53Z",
  "names": [
    "Ea+",
    "Ea-",
    "Er+",
    "Er-"
  ],
  "units": [
    "Wh",
    "Wh",
    "varh",
    "varh"
  ],
  "records": [
    {
      "timestamp": "2022-09-02T12:35:00Z",
      "isComplete": true,
      "values": [
        222.053,
        0.0,
        2663.031,
        0.0
      ]
    },
    {
      "timestamp": "2022-09-02T12:30:00Z",
      "isComplete": true,
      "values": [
        222.933,
        0.0,
        2648.383,
        0.0
      ]
    },
    {
      "timestamp": "2022-09-02T12:25:00Z",
      "isComplete": true,
      "values": [
        219.789,
        0.0,
        2633.62,
        0.0
      ]
    },
    {
      "timestamp": "2022-09-02T12:20:00Z",
      "isComplete": true,
      "values": [
        218.648,
        0.0,
        2618.859,
        0.0
      ]
    }
  ]
}
```

```
{
  "timestamp": "2022-09-02T12:15:00Z",
  "isComplete": true,
  "values": [
    217.508,
    0.0,
    2604.115,
    0.0
  ]
},
{
  "timestamp": "2022-09-02T12:10:00Z",
  "isComplete": true,
  "values": [
    216.357,
    0.0,
    2589.351,
    0.0
  ]
},
{
  "timestamp": "2022-09-02T12:05:00Z",
  "isComplete": true,
  "values": [
    215.188,
    0.0,
    2574.498,
    0.0
  ]
},
{
  "timestamp": "2022-09-02T12:00:00Z",
  "isComplete": true,
  "values": [
    214.029,
    0.0,
    2559.699,
    0.0
  ]
},
{
  "timestamp": "2022-09-02T11:55:00Z",
  "isComplete": true,
  "values": [
    212.883,
    0.0,
    2544.974,
    0.0
  ]
},
},
```

```
{
  "timestamp": "2022-09-02T11:50:00Z",
  "isComplete": true,
  "values": [
    211.767,
    0.0,
    2530.351,
    0.0
  ]
}
```

```
{
  "context": "/api/v1/history/meters?period=30&top=4",
  "timestamp": "2022-09-02T12:36:59Z",
  "names": [
    "Ea+",
    "Ea-",
    "Er+",
    "Er-"
  ],
  "units": [
    "Wh",
    "Wh",
    "varh",
    "varh"
  ],
  "records": [
    {
      "timestamp": "2022-09-02T12:30:00Z",
      "isComplete": true,
      "values": [
        220.933,
        0.0,
        2648.383,
        0.0
      ]
    },
    {
      "timestamp": "2022-09-02T12:00:00Z",
      "isComplete": true,
      "values": [
        214.029,
        0.0,
        2559.699,
        0.0
      ]
    },
    {
      "timestamp": "2022-09-02T11:30:00Z",
      "isComplete": true,
      "values": [
        207.262,
        0.0,
        2471.609,
        0.0
      ]
    },
    {
      "timestamp": "2022-09-02T11:00:00Z",
      "isComplete": true,
      "values": [
        200.314,
        0.0,
        2382.866,
        0.0
      ]
    }
  ]
}
```

```
{
  "context": "/api/v1/history/meters?top=1",
  "timestamp": "2022-09-02T12:35:53Z",
  "names": [
    "Ea+",
    "Ea-",
    "Er+",
    "Er-"
  ],
  "units": [
    "Wh",
    "Wh",
    "varh",
    "varh"
  ],
  "records": [
    {
      "timestamp": "2022-09-02T12:30:00Z",
      "isComplete": true,
      "values": [
        220.933,
        0.0,
        2648.383,
        0.0
      ]
    }
  ]
}
```