



IP Module
Interface
Documentation
v 1.5

1 Index

1	Data interface	3
2	REST API.....	3
2.1	Reading and writing parameters.....	4
2.1.1	GET request.....	4
2.1.2	POST request.....	4
2.2	Read-only values.....	5
2.3	Read/Write parameters	5
3	MQTT.....	6
3.1	MQTT settings.....	6
3.2	Readable values	7
3.3	Writeable parameters	7
4	Long polling.....	8
5	BACnet	8
5.1	Supported services.....	8
5.2	Supported object types.....	8
5.3	Objects and properties.....	9
5.3.1	Device object.....	9
5.3.2	Binary inputs	10
5.3.3	Analog inputs.....	10
5.3.4	Analog values	10
6	Changelog	11

1 Data interface

Sensor data are available at five interfaces: web, MQTT, BACnet, REST API and Long-Polling REST API. [See the property/sensor cross reference table.](#)

2 REST API

REST APIs are accessible using https protocol (TCP port 443). It uses the GET request for parameter reading and the POST request for parameter setup. Root endpoint is available at URL `https://###/rest/` (where ### is IP address of the STEINEL IP Interface) and contains URLs of all available lower endpoints.

The example of the root node. Details depend on connected sensor.

```
{
  "Device": {
    "Partnumber": "https://192.168.1.200/rest/device/Partnumber"
  },
  "Sensor": {
    "SensorName": "https://192.168.1.200/rest/sensor/SensorName",
    "DetectorFWVersion":
      "https://192.168.1.200/rest/sensor/DetectorFWVersion",
    "Motion1": "https://192.168.1.200/rest/sensor/Motion1",
    "Presence1": "https://192.168.1.200/rest/sensor/Presence1"
  },
  "SensorSettings": {
    "Motion1COV": "https://192.168.1.200/rest/sensorsettings Motion1COV",
    "Presence1COV":
      "https://192.168.1.200/rest/sensorsettings/Presence1COV",
    "Brightness1COV":
      "https://192.168.1.200/rest/sensorsettings/Brightness1COV",
    "Sensitivity1": "https://192.168.1.200/rest/sensorsettings Sensitivity1"
  }
}
```

2.1 Reading and writing parameters

For parameter reading you have to use GET request according to the HTTP protocol.

For parameter setup modify values in the JSON which you got in the GET request and send it as POST body.

Both requests need valid authentication. Use the basic password. See examples below.

2.1.1 GET request

HTTP request:

GET rest/sensor/Brightness1 HTTP/1.1

Authorization: Basic OnBhc3N3b3Jk==

OnBhc3N3b3Jk means BASE64 encoded user name and password in format username:password. User name is blank and password is the administrator or user password to the STEINEL IP Interface. E.g. BASE64(":password")

HTTP response:

HTTP/1.1 200 OK

Content-Type: application/json

Connection: close

Content-length: 20

{"Brightness1": 123}

2.1.2 POST request

For testing purpose you can use CURL (<https://curl.se/>)

Command example:

```
curl -v -d '{"Sensitivity1":100}' -H "Content-Type: application/json" -X POST  
http://192.168.1.200/rest/SensorSettings/Sensitivity1 -u :password
```

HTTP request:

POST /rest/SensorSettings/Sensitivity1 HTTP/1.1

Host: 192.168.1.200

Authorization: Basic OmJhc2ljcGFzcw==

User-Agent: curl/7.58.0

Accept: */*

Content-Type: application/json

Content-Length: 21

{"Sensitivity1": 100}

OmJhc2ljcGFzcw== means BASE64 encoded user name and password in format username:password. User name is blank and password is the 'administrator' password to the STEINEL IP Interface. Eg.
BASE64(":adminpass")

Successful response returns JSON with new value:

{"Sensitivity": 100}

Unsuccessful response returns:

{"err":1}

2.2 Read-only values

For getting read-only values use /rest/sensor/{property_name}

2.3 Read/Write parameters

For getting and setting r/w values use /rest/sensorsettings/{property_name}

3 MQTT

3.1 MQTT settings

Enable MQTT – enable / disable MQTT.

Broker address – IP address or hostname of MQTT broker. For correct function of MQTT hostname, DNS server must be set correctly.

Broker port – MQTT broker port number.

Following port numbers are default on most systems:

- 1883 - non encrypted
- 8883 - with TLS/SSL

Username – Username of the broker.

Password – Password of the broker.

Client ID – Client identifier.

Topic – Every measured value is published to Topic/[value_name].

Setup topic – Name of the topic for parameter settings. If empty, parameter settings over MQTT is not available.

QoS – Quality of Service – agreement level between the sender of a message and the receiver of a message that defines the guarantee of delivery for a specific message.

Publish interval [ms] – Interval for publishing data to the topic. If 0 is set, data are not periodically published. Maximal allowed value is 30,000 milliseconds (30 seconds).

Publish on change – If the parameter value changes by a threshold value set in the Data sending settings on the Home page, this value is immediately published.

Enable TLS – Enable / disable encryption.

DER Certificate file + DER Certificate key file – Client certificate and certificate key in DER format. These files are valid only if TLS is enabled.

3.2 Readable values

All measured values are published to topic `Topic/{property_name}`.
Property names come from sensor reference table.

One message sent for each property/value.

Messages are in following JSON format:

```
{"Motion1":false,"clientIp":"192.168.1.201","clientMac":"cc:bd:35:00:00:ef","clientId":"steinel_0000ef"}
```

`clientIp`, `clientMac`, `clientId` are optional and depends on MQTT settings.

Without that the message payload is:

```
{"Motion1":false}
```

3.3 Writeable parameters

Setup of sensor parameters is similar to readable values.

Used is topic which is set as setup topic: `Setup_Topic/{property_name}`.

One value per message in JSON format.

Example:

used topic: `mySetupTopic/Sensitivity1`

payload: `{"Sensitivity1":50}`

4 Long polling

Long polling is available at URL `https://###/lprest/` (where `###` is IP address of the STEINEL IP Interface). For correct function it is necessary to set at least one parameter of COV (Change of value) settings.

Client creates a connection with STEINEL IP Interface and keep this connection open until timeout expires or value changes (e.g. motion was detected, temperature changed by specified threshold and so on). If timeout expires or change of value is detected, all parameters with enabled COV are sent.

Timeout is set to fixed value of 60 sec.

If client connects to STEINEL IP Interface for the first time, a response with all enabled COV parameters is received immediately. Value change evaluation is based on last sent value. E.g. If last sent value of temperature was 23 °C and COV is set to 1 °C, response is sent when temperature increases to 24 °C or decreases to 22 °C or if timeout expires.

5 BACnet

For details see product PICS file.

5.1 Supported services

- I-Am
- Read Property
- Read Property Multiple
- Write Property
- Write Property Multiple
- Who-Is

5.2 Supported object types

- Device
- Analog Input
- Binary Input
- Analog Value
- Binary Value

5.3 Objects and properties

5.3.1 Device object

Property identifier	Data type	Value	Notes	Access
APDU_Timeout	Unsigned	3000		R
Application_Software_Version	CharacterString	"1.0"		R
Database_Revision	Unsigned	1		R
Device_Address_Binding	List of BACnetAddressBinding			R
Firmware_Revision	CharacterString	"1.0.0"		R
Max_APDU_Length_Accepted	Unsigned	1476		R
Model_Name	CharacterString	"PoE ceiling/wall"		R
Number_Of_APDU_Retries	Unsigned	3		R
Object_Identifier	BACnetObjectIdentifier	DEVICE:1	changeable via web interface	R
Object_List	BACnetARRAY[N] of BACnetObjectIdentifier	[]	sensor dependent	R
Object_Name	CharacterString	"PoE module"	changeable via web interface	R
Object_Type	BACnetObjectType	DEVICE (8)		R
Protocol_Object_Types_Supported	BACnetObjectTypes Supported (Bit-String)	Device, Analog Input, Binary Input		R
Protocol_Revision	Unsigned	19		R
Protocol_Services_Supported	BACnetProtocolServices Supported (Bit-String)	Read Property, Read Property Multiple, Write Property, Write Property Multiple, Who-Is		R
Protocol_Version	Unsigned	1		R
Segmentation_Supported	BACnetSegmentation (Enum.)	None		R
System_Status	BACnetDeviceStatus (Enum.)	Operational		R
Vendor_Identifier	Unsigned16	1128		R
Vendor_Name	CharacterString	"Steinel GmbH"		R

5.3.2 Binary inputs

All read only boolean values presented in cross reference table mentioned above are BACnet binary inputs.

5.3.3 Analog inputs

All read only numerical values presented in cross reference table mentioned above are BACnet analog inputs.

5.3.4 Analog values

All writable numerical values presented in cross reference table mentioned above are BACnet analog values. Ones with *COV suffix are not used here because BACnet has it's own change of value reporting.

6 Changelog

v1.5

- improved performance
- updated default HTTPS certificate
- new BACnet BinaryValue object
- MQTT JWT (token based authentication)
- MQTT certificates can be set and used
- adjusted automatic web logout
- support keep noise map, init sensor for TP sensors
- verification of sensor version to display the right parameters (parameters which are only for this version)
- local help for parameters
- support for CAPSTONE
- larger number of supported cipher suites in TLS

v1.4

- fixed problem with ARP flooding
- import and export of configuration
- improved web performance
- added new sensors
- control of Bluetooth interface
- minor bug fixes
- MQTT last will and birth message

v1.3

- new supported sensors
- fixed MQTT TLS connection
- hold timeout for Presence1 and Presence2
- MQTT publish interval increased to 3600 s
- IPv4 settings available via sensor BT

v1.2

- strong passwords required
- imunity against brutal force attack on password
- settings parameters over BACnet
- BACnet COV notifications
- IP and MAC address can be included in MQTT payload
- reboot, reset IP module, factory reset, reset of sensor buttons
- dhcp as default

- hostname based on MAC address (eg. CC:BD:35:xx:yy:zz => steinel_xxyyzz.local)
- page title contains sensor name
- partial implementation of IPv6
- new Multisensor types
- IAQ and CO2 for HPD3

v1.1

- fixed bugs

v1.0

- initial release