

PLUS PIM101 IoT MODULE – RESTFul API

Technical documentation for RESTFul API

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Introduction

Technical documentation from the available REST resources on PLUS IoT Module 101.

To obtain sensor data is necessary to perform two steps. The first step is authentication, to get a valid session token. The second step is to obtain data, using the session token.

Authentication

URL	/api/login
Method	POST
Description	Login on platform. The session token (<i>accessToken</i> field) is only valid for 15 minutes.
Body Parameters	<i>username</i> : username for authentication <i>password</i> : password defined for this username login
Header Parameters	Content-Type: x-www-form-urlencoded
Answer - Success	Status 200 – Successful login

Example:

```
{
  "success": true,
  "data": {
    "id": 1,
    "admin": true,
    "accessToken": "...",
    "refreshToken": "..."
  }
}
```

Answer - Error	400 – Missing/bad parameters
-----------------------	------------------------------

Example:

```
{
  "success": false,
  "error": {
    "code": 401,
    "type": "",
    "msg": "Authentication failed. Wrong credentials."
  }
}
```

Sensors data

URL	/api/measurements/{sensor_module_id}
Method	GET
Description	<p>Obtain sensor data.</p> <ul style="list-style-type: none"> • Sensor types: <ul style="list-style-type: none"> ○ 0 – Internal temperature ○ 1 – External Temperature ○ 2 – Temperature S1 ○ 3 – Temperature S2 ○ 4 – Temperature S3 ○ 5 – Temperature S4 ○ 6 – Temperature S5 ○ 7 – Relative Humidity ○ 8 – DI State ○ 9 – CO2 ○ 10 – CO2 Average ○ 11 – Atmospheric Pressure ○ 12 – Dew Point ○ 13 – RSSI ○ 14 – Battery Voltage ○ 15 – Cycles ○ 16 – Generic ○ 17 – Status ○ 18 – Analog Input 1 ○ 19 – Analog Input 2 ○ 20 – Analog Input 3 ○ 21 – Analog Input 4 ○ 22 – Pulse Counter 1 ○ 23 – Pulse Counter 2 ○ 24 - External Temperature 2 • Types of units: <ul style="list-style-type: none"> ○ 0 – Temperature (°C) ○ 1 – Signal strength (dBm) ○ 2 – Voltage (V) ○ 3 – Percentage (%) ○ 4 – Int value ○ 5 – Parts per million (ppm) ○ 6 – Milibar (mbar)

- 7 – Seconds (s)

Header Parameters

Authentication: Bearer accessToken (obtain in /api/login).

Query string Parameters

- sensor_module_id – Modbus address from WGW420 gateway

Optional:

- sensor_hub_ids – Obtains modbus registers from the required sensor hub
- types – List of sensor types. Applies a filter to the sensor data that is only from the specified sensor types.
- timestamp_start – Timestamp in milliseconds in Unix Time format that represents the minimum date for sensor data.
- timestamp_end – Timestamp in milliseconds in Unix Time format that represents the sensor data deadline.
- order – Ordering of sensor data by timestamp.

Acceptable values for these fields:

- asc – Sort ascending
- desc – Sort descending
- limit – Limits the results to the specified number

Request example

http://<ipgateway>/api/measurements/1?sensor_hub_ids[]=1&types[]=1&types[]=7&order=asc

Answer - Success

Status 200 – Success

Example:

```
{
  "success": true,
  "data": [
    {
      "id": 29365,
      "sensor_hub_id": 1,
      "value": -18.208,
      "timestamp": 1618477315128,
      "units": 0,
      "type": 1
    },
    {
      "id": 29378,
      "sensor_hub_id": 1,
      "value": -18.932,
      "timestamp": 1618477374795,
      "units": 0,
    }
  ]
}
```

```

        "type": 1
    },
    (...)
    {
        "id": 29417,
        "sensor_hub_id": 1,
        "value": -20.536,
        "timestamp": 1618477555247,
        "units": 0,
        "type": 1
    },
    {
        "id": 29430,
        "sensor_hub_id": 1,
        "value": -20.913,
        "timestamp": 1618477615082,
        "units": 0,
        "type": 1
    }
    ]
}

```

Answer - Error 404 404 – Data not found. Occurs when there is no data to display.

Example:

```

{
  "success": false,
  "error": {
    "code": 404,
    "type": "",
    "msg": "No measurements found"
  }
}

```

Answer - Error 401 401 – Not authorized. Occurs when session token expired or is not valid.

URL api/

/api/modules/{sensor_module_id}/hubs/{sensor_hub_id}/measurements

Method GET

Description Obtains data from a specific sensor hub.

- Sensor types:

- 0 – Internal temperature
- 1 – External Temperature
- 2 – Temperature S1
- 3 – Temperature S2
- 4 – Temperature S3
- 5 – Temperature S4
- 6 – Temperature S5
- 7 – Relative Humidity
- 8 – DI State
- 9 – CO2
- 10 – CO2 Average
- 11 – Atmospheric Pressure
- 12 – Dew Point
- 13 – RSSI
- 14 – Battery Voltage
- 15 – Cycles
- 16 – Generic
- 17 – Status
- 18 – Analog Input 1
- 19 – Analog Input 2
- 20 – Analog Input 3
- 21 – Analog Input 4
- 22 – Pulse Counter 1
- 23 – Pulse Counter 2
- 24 - External Temperature 2
- Types of units:
 - 0 – Temperature (°C)
 - 1 – Signal strength (dBm)
 - 2 – Voltage (V)
 - 3 – Percentage (%)
 - 4 – Int value
 - 5 – Parts per million (ppm)
 - 6 – Milibar (mbar)
 - 7 – Seconds (s)

Header Parameters

Authentication: Bearer accessToken (obtido em /api/login).

Query string Parameters

- sensor_module_id – Modbus address from WGW420 gateway
- sensor_hub_id – Id from sensor hub

Optional:

- types – List of sensor types. Applies a filter to the sensor data that is only from the specified sensor types.
- timestamp_start – Timestamp in milliseconds in Unix Time format that represents the minimum date for sensor data.
- timestamp_end – Timestamp in milliseconds in Unix Time format that represents the sensor data deadline.
- order – Ordering of sensor data by timestamp.
Acceptable values for these fields:
 - asc – Sort ascending
 - desc – Sort descending
- limit – Limits the results to the specified number

Request example

http://<ipgateway
/api/modules/1/hubs/4/measurements?timestamp_start=1618
479665000×tamp_end=1618487010000

Answer - Success

Status 200 – Success

Example:

```
{
  "success": true,
  "data": [
    {
      "id": 302881,
      "sensor_hub_id": 4,
      "value": 0.0,
      "timestamp": 1618487000866,
      "units": 4,
      "type": 8
    },
    {
      "id": 302882,
      "sensor_hub_id": 4,
      "value": 21.875,
      "timestamp": 1618487000866,
      "units": 0,
      "type": 0
    },
    {
      "id": 302883,
      "sensor_hub_id": 4,
      "value": 3.5,
      "timestamp": 1618487000866,
      "units": 2,
      "type": 14
    }
  ]
}
```

```

    },
    {
      "id": 302884,
      "sensor_hub_id": 4,
      "value": -58.0,
      "timestamp": 1618487000866,
      "units": 1,
      "type": 13
    }
  ]
}

```

Answer - Error 404

404 – Data not found. Occurs when there is no data to display

Example:

```

{
  "success": false,
  "error": {
    "code": 404,
    "type": "",
    "msg": "No measurements found"
  }
}

```

Answer - Error 401

401 – Not authorized. Occurs when session token expired or is not valid.

Modbus

URL	/api/modbus/registers
Method	GET
Description	Obtains the existing modbus registers.
Header Parameters	Authentication: Bearer accessToken (obtained in /api/login).
Query string Parameters	Optional: <ul style="list-style-type: none"> • sensor_hub_ids – Obtains modbus registers from a specific sensor hub
Request example	http://<ipgateway>/api/modbus/registers?sensor_hub_ids[]=1&sensor_hub_ids[]=2
Answer - Success	Status 200 – Success

Example:

```
{
  "success": true,
  "data": [
    {
      "sensor_module_id": 1,
      "sensor_hub_id": 1,
      "value_description": 22,
      "address": 0,
      "modbus_type": 1,
      "value_type": 3,
      "value": 58385,
      "timestamp": 0
    },
    {
      "sensor_module_id": 1,
      "sensor_hub_id": 1,
      "value_description": 22,
      "address": 1,
      "modbus_type": 1,
      "value_type": 3,
      "value": 13781,
      "timestamp": 0
    },
    (...)
  ]
}
```

```

        "value_description": 20,
        "address": 38,
        "modbus_type": 1,
        "value_type": 2,
        "value": 1,
        "timestamp": 0
    },
    {
        "sensor_module_id": 1,
        "sensor_hub_id": 2,
        "value_description": 21,
        "address": 39,
        "modbus_type": 1,
        "value_type": 1,
        "value": 0,
        "timestamp": 0
    }
]
}

```

Answer - Error 404

404 – Data not found. Occurs when there is no data to display

Example:

```

{
  "success": false,
  "error": {
    "code": 404,
    "type": "",
    "msg": "No modbus_registers found"
  }
}

```

Answer - Error 401

401 – Not authorized. Occurs when session token expired or is not valid.

URL

/api/modbus/coils

Method

GET

Description

Obtains existing Modbus coils.

Header Parameters

Authentication: Bearer accessToken (obtido em /api/login).

Query string Parameters

Optional:

- sensor_hub_ids – Obtains modbus registers from a specific sensor hub

Request example

http://<ipgateway/api/modbus/coils?sensor_hub_ids[]=1&sensor_hub_ids[]=2

Answer - Success

Status 200 – Success

Example:

```
{
  "success": true,
  "data": [
    {
      "sensor_module_id": 1,
      "sensor_hub_id": 1,
      "value_description": 37,
      "address": 0,
      "modbus_type": 2,
      "value_type": 0,
      "value": 0,
      "timestamp": 0
    },
    {
      "sensor_module_id": 1,
      "sensor_hub_id": 1,
      "value_description": 38,
      "address": 1,
      "modbus_type": 2,
      "value_type": 0,
      "value": 0,
      "timestamp": 0
    },
    (...)
    {
      "sensor_module_id": 1,
      "sensor_hub_id": 2,
      "value_description": 51,
      "address": 30,
      "modbus_type": 2,
      "value_type": 0,
      "value": 0,
      "timestamp": 0
    },
    {
      "sensor_module_id": 1,
      "sensor_hub_id": 2,
      "value_description": 52,
      "address": 31,
```

```

        "modbus_type": 2,
        "value_type": 0,
        "value": 0,
        "timestamp": 0
    }
]
}

```

Answer - Error 404 404 – Data not found. Occurs when there is no data to display

Example:

```

{
  "success": false,
  "error": {
    "code": 404,
    "type": "",
    "msg": "No modbus_coils found"
  }
}

```

Answer - Error 401 401 – Not authorized. Occurs when session token expired or is not valid.

URL /api/modbus/analogoutputs

Method GET

Description Obtains configuration values and analog outputs values from WG420 gateway.

Header Parameters Authentication: Bearer accessToken (obtained in /api/login).

Request example http://<ipgateway>/api/modbus/analogoutputs/

Answer - Success Status 200 – Success

Example:

```

{
  "success": true,
  "data": [
    {
      "sensor_module_id": 1,
      "sensor_hub_id": null,
      "value_description": 31,

```

```

        "address": 1100,
        "modbus_type": 1,
        "value_type": 5,
        "value": 0,
        "timestamp": 0
    },
    {
        "sensor_module_id": 1,
        "sensor_hub_id": null,
        "value_description": 31,
        "address": 1101,
        "modbus_type": 1,
        "value_type": 5,
        "value": 0,
        "timestamp": 0
    },
    (...)
    {
        "sensor_module_id": 1,
        "sensor_hub_id": null,
        "value_description": 35,
        "address": 1162,
        "modbus_type": 1,
        "value_type": 2,
        "value": 147,
        "timestamp": 0
    },
    {
        "sensor_module_id": 1,
        "sensor_hub_id": null,
        "value_description": 36,
        "address": 1163,
        "modbus_type": 1,
        "value_type": 2,
        "value": 310,
        "timestamp": 0
    }
    ]
}

```

Answer - Error 404

404 – Data not found. Occurs when there is no data to display.

Example:

```

{
    "success": false,

```

```
"error": {  
  "code": 404,  
  "type": "",  
  "msg": "No modbus_analog_outputs found"  
}  
}
```

Answer - Error 401

401 – Not authorized. Occurs when session token expired or is not valid.