Growatt Power station monitoring

OpenAPI Protocol standards

Version	Updated	Update description
0.0.1	2016-08-26	Document publishing
0.0.2	2016-08-30	Documentation updates，new user name and collector verification interface, improve the interface to return to the parameters that improve the structure of the document
0.0.3	2016-09-18	Documentation updates，The interface of the device part interface (last_new_data, invs_data) is updated, and two interfaces are added return parameter dataloggerSn (the SN of the inverter)
0.0.4	2016-11-30	Documentation updates， The user registers the interface(user_register) with new parameters “user_country”
1.0.1	2016-12-20	Document update，new energy storage machine detailed data, alarm data acquisition interface，parameter setting interface

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2 Open platform overview

- Growatt's OpenAPI open platform provides standardized RESTful data invocation services for authenticated users.
- Platform interface based on http protocol, using OAuth2.0 authentication mechanism.

2.1 Flow description

Other

- TOKEN validity period

  Passed Audit: Permanent (tentative)

- Causes of invalidation

  The user cancels authorization

3 Interface documentation

3.1 Overall description

- Interface support http, see the interface definition
- Use GET / POST, see interface definition, parameters for utf-8 encoding, urlencode processing
- Data are utf-8 encoding
- Support to return to json format
- Return data structure for the data: the main content, error_code: error code, error_msg: error content
- The other adapter calls in the http header in the need to add the token: TOKEN requested from Growatt
- Time format

  Date format YYYY-MM-DD，example：2015-04-08

Time format YYYY-MM-DD HH:mm:ss , example : 2015-04-03 00:01:00

4 Interface description

4.1 User

4.1.1 User Registration

Address : *http://domain/v1/user/user_register*

Interface support: http

Request method: POST

Request parameters :

Parameter	Required	Description
user_email	Yes	Register e-mail
user_password	Yes	Password
user_type	Yes	User type, available value See user_type (1 represents the end user)
user_name	Yes	Username
user_country	Yes	User Country (China or Other)
user_tel	No	User phone

Returns: supports json

Parameter	Description
c_user_id	The end user ID
error_code	0: Normal return, 10001: System error, 10002: User name or password is empty, 10003: User name already exists, 10004: User mailbox is empty, 10006: User type is empty, 10008: token is empty,10010: connection error

error_msg	Error message

4.1.2 Verify that the user name is unique

Address：*http://domain/v1/user/check_user*

Interface support：http

Request method：POST

Request parameters：

Parameter	Required	Description
user_name	Yes	Username

Returns: supports json

Parameter	Description
error_code	Error code (0: normal return, 10001: server exception, 10002: user name is empty, 10003: user name already exists)
error_msg	Specific error messages

4.1.3 Modify the user information

Address：*http://domain/v1/user/modify*

Interface support：http

Request method：POST

Request parameters：

Parameter	Required	Description
c_user_id	Yes	The end user ID
mobile	No	Phone number

Returns: supports json

Parameter	Description
error_code	0: normal return, 10001: system error, 10002: user ID is empty, 10003: user does not exist
error_msg	Error message

4.1.4 Get a list of end users under the business

Address：*http://domain/v1/user/c_user_list*

Interface Support ：http

Request method：GET

Request parameters：

Parameter	Required	Description
page	No	Page number, default 1
perpage	No	Number of pages per page, default 20, maximum 100

Returns: supports json

Parameter	Description
c_user_id	The end user ID
c_user_email	The end user registers the mailbox
c_user_regtime	End user registration date, see the date format
c_user_name	End user name
c_user_tel	End user phone
count	Total number of end users
error_code	0: Normal return, 10001: System error

error_msg	Error message

4.2 Power station

4.2.1 Obtain a list of users' power stations

Address：*http://domain/v1/plant/list*

Interface Support：http

Request method：GET

Request parameters：

Parameter	Required	Description
page	No	Page number, default 1
perpage	No	Number of pages per page, default 20, maximum 100
search_type	No	Search type, available values see attachment 1:search_type
search_keyword	No	Search for the keyword

Returns: supports json

Parameter	Description
plant_id	Plant ID
name	Name of Plant
user_id	The user ID to which the plant belongs
country	Country name
longitude	longitude
latitude	latitude
peak_power	Peak Power (kWp)

create_date	Station date, time format, see the time format
installer	Installer name
current_power	Current Power (kW)
total_energy	Cumulative power generation (kWh)
count	Total number of power stations
error_code	0: Normal return, 10001: System error
error_msg	Error message

4.2.2 Modify the power station

Address：*http://domain/v1/plant/modify*

Interface Support：http

Request method：POST

Request parameters：

Parameter	Required	Description
c_user_id	Yes	The user id to which the plant belongs
plant_id	Yes	Plant ID
name	Yes	Name of Plant
peak_power	Yes	Peak Power (kWp)
currency	No	Currency Units, Default 1, Available Values： 1 RMB
longitude	No	longitude
latitude	No	latitude
timezone_id	No	Data shows the time zone code, the default is PRC

Returns: supports json

Parameter	Description
error_code	0: Normal return, 10001: System error , 10002: The user name ID is empty, 10003: The station name is empty, 10004: The peak power is empty, 10005: The user does not exist, 10006: The station name already exists under this user, 10007: The station does not exist.
error_msg	Error message

4.2.3 Delete the plant

Address：*http://domain/v1/plant/delete*

Interface Support：http

Request method：POST

Request parameters：

Parameter	Required	Description
plant_id	Yes	Plant ID

Returns: supports json

Parameter	Description
error_code	0: normal return, 10001: system error, 10002: plant ID is empty, 10004: power plant does not exist
error_msg	Error message

4.2.4 Get the basic information of a power plant

Address：*http://domain/v1/plant/details*

Interface Support ：http

Request method：GET

Request parameters：

Parameter	Required	Description
plant_id	Yes	Plant ID

Returns: supports json

Parameter	Description
name	Name of Plant
user_id	The user ID to which the plant belongs
country	Country name
longitude	longitude
latitude	latitude
create_date	Station date, date format see time format
image_url	Picture url
peak_power	Peak Power (kWp)
currency	Currency Unit
timezone	Time zone, time zone format see time format
error_code	0: Normal return, 10001: System error, 10002: Plant does not exist, 10003: Plant ID is empty
error_msg	Error message

4.2.5 Obtain an overview of the data for a plant

Address：*http://domain/v1/plant/data*

Interface Support：http

Request method：GET

Request parameters：

Parameter	Required	Description

plant_id	Yes	Plant ID

Returns: supports json

Parameter	Description
peak_power_actual	Actual peak power (kW)
last_update_time	Last received data time, time format, see the time format
current_power	Current Power (kW)
today_energy	Electricity of the day (kWh)
monthly_energy	Monthly power generation (kWh)
yearly_energy	Current generation (kWh)
total_energy	Cumulative power generation (kWh)
carbon_offset	Equivalent reduction in CO2 emissions (ton)
timezone	Time zone, time zone format see time format
error_code	0: Normal return, 10001: System error, 10002: Plant does not exist, 10003: Plant ID is empty
error_msg	Error message

4.2.6 Obtain the historical power generation of a power plant

Address：*http://domain/v1/plant/energy*

Interface Support：http

Request method：GET

Request parameters：

Parameter	Required	Description
plant_id	Yes	Plant ID

start_date	Yes	Start date, date format see time format
end_date	Yes	End date, date format see time format
time_unit	No	Time type, the default is day, the value can be attached to attached 1: time_unit
page	No	Page number, default 1
perpage	No	Number of pages per page, default 20, maximum 100

Returns: supports json

Parameter	Description
count	The total number of records
time_unit	On request time_unit
date	Date, format, see the time format
energy	Power generation (kWh)
error_code	0: Normal return, 10001: System error, 10002: Plant does not exist, 10003: Plant ID is empty, 10004: Time format is incorrect
error_msg	Error message

4.2.7 To obtain a power plant a day of power data

Address：*http://domain/v1/plant/power*

Interface Support ：http

Request method：GET

Request parameters：

Parameter	Required	Description
plant_id	Yes	Plant ID

date	Yes	Date, date format see time format
timezone_id	No	Data shows the time zone code, the default is UTC, the value can be used to see attached 2

Returns: supports json

Parameter	Description
count	The total number of records
time	Time, time format, see time format
power	Power (W)
error_code	0: Normal return, 10001: System error, 10002: Plant does not exist, 10003: Plant ID is empty or time format is incorrect
error_msg	Error message

4.2.8 Add the power plant

Address：*http://domain/v1/plant/add*

Interface Support：http

Request method：POST

Request parameters：

Parameter	Required	Description
c_user_id	Yes	The end user ID to which the plant belongs
name	Yes	Name of Plant
peak_power	Yes	Peak Power (kWp)
currency	No	Currency Units, Default 1, Available Values:1 RMB
longitude	No	longitude

latitude	No	latitude
timezone_id	No	Data shows the time zone code, the default is PRC

Returns: supports json

Parameter	Description
plant_id	Plant ID
error_code	0: normal return, 10001: system error, 10002: user ID is empty, 10003: The station name is empty, 10004: The peak power is empty, 10005: The user does not exist, 10006: The station name already exists under this user.
error_msg	Error message

4.2.9 Obtain a list of the users' power stations

Address：*http://domain/v1/plant/user_plant_list*

Interface Support：http

Request method：POST

Request parameters：

Parameter	Required	Description
page	No	Page number, default 1
perpage	No	Number of pages per page, default 20, maximum 100
user_name	Yes	User account

Returns: supports json

Parameter	Description

plant_id	Power plant ID
name	Name of plant
user_id	The user ID to which the plant belongs
country	Country name
longitude	latitude
latitude	Longitude
peak_power	Peak power (kWp)
create_date	Station date, time format, see the time format
installer	Installer name
current_power	Current power (kW)
total_energy	Cumulative power generation (kWh)
count	Total number of power stations
error_code	0: Normal return, 10001: System error
error_msg	Error message

4.3 Euipment

4.3.1 Obtain a list of collectors for a plant

Address：*http://domain/v1/device/datalogger/list*

Interface Support ：http

Request method：GET

Request parameters：

Parameter	Required	Description
plant_id	Yes	Plant ID
page	No	Page number, default 1

perpage	No	Number of pages per page, default 20, maximum 100

Returns: supports json

Parameter	Description
count	Total number of collectors
sn	Collector SN
manufacturer	Collector manufacturers
type	Collector type, available value see attached 1: type
last_update_time	Last received data time, time format, see the time format
error_code	0: Normal return, 10001: System error, 10002: Plant ID is empty, 10003: Plant does not exist
error_msg	Error message

4.3.2 Add a collector

Address：*http://domain/v1/device/datalogger/add*

Interface Support ：http

Request method：POST

Request parameters：

Parameter	Required	Description
plant_id	Yes	Plant ID
sn	Yes	Collector SN
c_user_id	Yes	The user id

Returns: supports json

Parameter	Description
error_code	0: normal return, 10001: system error, 10002: power station ID is empty or the collector serial number is wrong, 10003: Collector already exists, 10004: Power station does not exist, 10005: User does not exist, 10006: User ID is empty.
error_msg	Error message

4.3.3 Delete the collector

Address：*http://domain/v1/device/datalogger/delete*

Interface Support ：http

Request method：POST

Request parameters：

Parameter	Required	Description
plant_id	Yes	Plant ID
sn	Yes	Collector SN

Returns: supports json

Parameter	Description
error_code	0: normal return, 10001: system error, 10002: power station id is empty or the collector serial number is wrong, 10004: collector does not exist, 10003: power station does not exist
error_msg	Error message

4.3.4 Obtain a list of devices for a plant

Address：*http://domain/v1/device/list*

Interface Support ：http

Request method：GET

Request parameters：

Parameter	Required	Description
plant_id	Yes	Plant ID
page	No	Page number, default 1
perpage	No	Number of pages per page, default 20, maximum 100

Returns: supports json

Parameter	Description
count	The total number of devices
device_id	The device unique ID
datalogger_sn	Equipment corresponding to the collector SN
device_sn	Equipment SN
manufacturer	Equipment manufacturers
model	Device model
type	Device type (1: inverter, 2: energy storage, 3: other equipment)
last_update_time	Last received data time, time format, see the time format
lost	Whether the device is online or not (0:Online， 1: Disconnect)
status	Device status，if the device is 1 (Inverter)，then status(0: disconnect, 1:online, 2:standby, 3:malfunction) ,if the device is 2(Storage)，then status(0:standby, 1:charge, 2:discharge, 3: malfunction, 4:burn)
error_code	0: normal return, 10001: system error, 10002: plant ID is empty, 10003: power plant does not exist
error_msg	Error message

4.3.5 Obtains the historical data of an inverter

Address：*http://domain/v1/device/inverter/data*

Interface Support ：http

Request method：GET

Request parameters：

Parameter	Required	Description
device_id	Yes	The device unique ID
start_date	Yes	Start date, date format see time format
end_date	Yes	End date, date format see time format, start / end time up to an interval of 7 days
timezone_id	No	Data shows the time zone code, the default is UTC, the value can be used to see attached 2
perpage	No	Number of pages per page, default 20, maximum 1000

Returns: supports json

Parameter	Description
datalogger_sn	Equipment corresponding to the collector SN
next_page_start_id	Next Start ID
sn	Equipment SN
ipv1	Input current 1 channel (A)
ipv2	Input current 2-way (A)
vpv1	Input voltage 1 channel (V)
vpv2	Input voltage 2-way (V)
iac1	Output current 1 channel (A)

iac2	Output current 2 way (A)
iac3	Output current 3-way (A)
vac1	Output voltage 1 channel (V)
vac2	Output voltage 2-way (V)
vac3	Output voltage 3-way (V)
power	Output power (W)
today_energy	Electricity of the day (kWh)
total_energy	Cumulative power generation (kWh)
temperature	Temperature (℃)
fac	Frequency (Hz)
power_factor	Power Factor
time	Data time, time format, see time format
error_code	0: normal return, 10001: system error, 10002: device serial number error, 10003: date format error, 10004: date interval more than seven days
error_msg	Error message

4.3.6 Obtains the alarm data of a certain inverter

Address：*http://domain/v1 device/inverter/alarm*

Interface Support ：http

Request method：GET

Request parameters：

Parameter	Required	Description
device_id	Yes	The device unique ID
page	No	Page number, default 1

perpage	No	Number of pages per page, default 20, maximum 100

Returns: supports json

Parameter	Description
count	The total number of alarms
sn	Equipment SN
alarm_code	Alarm code
alarm_message	alarm information
start_time	Alarm start time, time format see time format
end_time	Alarm end time, time format see time format
error_code	0: normal return, 10001: system error, 10002: device serial number error
error_msg	Error message

4.3.7 Inverter parameter setting

Address：*http://domain/v1/inverterSet*

Interface Support ：http

Request method：POST

Request parameters：

Parameter	Required	Type of data	Description
device_sn	Yes	String	Inverter SN
paramId	Yes	String	The parameter Id
command_1	Yes	String	Parameter value 1
command_2	Yes	String	Parameter value 2, with the value of the need to pass the value, the value

			of the transmission of empty string ""

Description： Basic settings

The parameter Id	Parameter value 1	Parameter value 2	Parameter name
pv_on_off	"0000": shutdown and the next does not automatically and network "0101": power on and the next automatic grid		Set the inverter switch
pv_pf_cmd_memory_state	“1”：on “0”：off		Sets whether the PF command is stored
pv_active_p_rate	0~100(%)		Set the active power
pv_reactive_p_rate	0~100(%)	"Over": capacitive "Under": Inductive	Set the reactive power
pv_power_factor	-0.8~-1/0.8~1		Set the PF value
pf_sys_year	Format：2016-01-03 12:00:00		Set the inverter time
pv_grid_voltage_high	Such as：240.7(up to one decimal)		Set the mains voltage limit
set_any_reg	See the table below for details		Register Settings (Advanced Settings)

Advanced Settings Description：

Parameter	Register address	Value	Precautions

Mains voltage lower limit	19	185-285	The register settings for the engineering mode require a 10-fold value, such as 221.5V, for input 2215
Mains voltage upper limit	20	185-285	The register settings for the engineering mode require a 10-fold value, such as 221.5V, for input 2215
Mains frequency lower limit	21	40-65	The register setting for the engineering mode requires a value of 100, such as 50.15Hz, and 5015 for input
Mains frequency upper limit	22	40-65	The register setting for the engineering mode requires a value of 100, such as 50.15Hz, and 5015 for input
Inverter communication address	30	1-250	
Switch	0		0 shutdown, 257 boot
Set the active power	3	0-100	Percentage of rated power

Returns: supports json

Parameter	Description
error_code	0: normal return, 10001: system error, 10002: inverter server error, 10003: inverter dropped, 10004: Collector serial number is empty, 10005: Collector dropped, 10006: set the parameter type does not exist, 10007: parameter value is empty, 10008: Parameter value is out of range. 10009: DateTime format is incorrect
error_msg	Error message

4.3.8 Access to the latest real-time data inverter

Address：*http://domain/v1/ device/inverter/last_new_data*

Interface Support ：http

Request method：GET

Request parameters：

Parameter	Required	Description
device_sn	Yes	Inverter SN

Returns: supports json

Parameter	Description
device_sn	Equipment SN
inverterId	Equipment SN
dataloggerSn	The collector of the inverter SN
status	Inverter status (0: Waiting, 1: Normal, 3: Fault)
ipv1	Input current 1 channel (A)
ipv2	Input current 2-way (A)

vpv1	Input voltage 1 channel (V)
vpv2	Input voltage 2-way (V)
ppv1	Input power 1 channel (W)
ppv2	Input power 2 way (W)
iacr	Output current 1 channel (A)
iacs	Output current 2 way (A)
iact	Output current 3-way (A)
vacr	Output voltage 1 channel (V)
vacs	Output voltage 2-way (V)
vact	Output voltage 3-way (V)
pacr	Output power 1 channel (W)
pacs	Output power 2 way (W)
pact	Output Power 3 Way (W)
ppv	Input PV power (W)
pac	Output power (W)
powerToday	Electricity of the day (kWh)
powerTotal	Cumulative power generation (kWh)
temperature	Temperature (℃)
fac	Frequency (Hz)
pf	Power Factor
time	Data time, time format, see time format
faultType	Error code
timeTotal	Operation hours
ipmTemperature	IPM temperature

epv1Today	Input 1-day power generation (kWh)
epv1Total	Input 1 Road Total Power Generation (kWh)
epv2Today	Input 2-day power generation (kWh)
epv2Total	Input 2-channel total power generation (kWh)
epvTotal	Input Total Power Generation (kWh)
eRacToday	Reactive power of the day (kWh)
eRacTotal	Total Reactive Power (kWh)
pBusVoltage	P BUS Voltage (V)
nBusVoltage	N BUS Voltage (V)
dwStringWarningValue1	dwStringWarn Alarm
wStringStatusValue	wStringStatusValue Error code
wPIDFaultValue	wPIDFaultValue Error code
vPidPvape	PID PVAPE Volt
iPidPvape	PID PVAPE Curr
pidStatus	PID Status
vPidPvbpe	PID PVBPE Volt
iPidPvbpe	PID PVBPE Curr
strFault	PID strFault
vString1	First voltage (V)
vString2	Second voltage (V)
vString3	Third voltage (V)
vString4	Fourth voltage (V)
vString5	Fifth voltage (V)

vString6	Sixth voltage (V)
vString7	Seventh road voltage (V)
vString8	Eighth voltage (V)
currentString1	First current (A)
currentString2	Second current (A)
currentString3	Third current (A)
currentString4	Fourth current (A)
currentString5	Fifth current (A)
currentString6	Sixth current (A)
currentString7	Seventh current (A)
currentString8	Eighth current (A)
warnCode	Alarm code
error_code	0: Normal return, 10001: System error
error_msg	Error message

4.3.9 Batch access to the latest real-time data inverter

Address：*http://domain/v1/ device/inverter/invs_data*

Interface Support ：http

Request method：POST

Request parameters：

Parameter	Required	Description
pageNum	Yes	The maximum number of pages
inverters	Yes	Inverter serial number (SN) array, up to 100

Returns: supports json

Parameter	Description
inverters	Returns an array of inverter serial numbers for the current query in the inverter array
pageNum	current page
inverterId	Equipment SN
dataloggerSn	The collector of the inverter SN
status	Inverter state（0：Waiting，1：Normal，3：Fault）
ipv1	Input current 1 channel (A)
ipv2	Input current 2-way (A)
vpv1	Input voltage 1 channel (V)
vpv2	Input voltage 2-way (V)
ppv1	Input power 1 channel (W)
ppv2	Input power 2 way (W)
iacr	Output current 1 channel (A)
iacs	Output current 2 way (A)
iact	Output current 3-way (A)
vacr	Output voltage 1 channel (V)
vacs	Output voltage 2-way (V)
vact	Output voltage 3-way (V)
pacr	Output power 1 channel (W)
pacs	Output power 2 way (W)
pact	Output Power 3 Way (W)
ppv	Input PV power (W)

pac	Output power (W)
powerToday	Electricity of the day (kWh)
powerTotal	Cumulative power generation (kWh)
temperature	Temperature (℃)
fac	Frequency (Hz)
pf	Power factor
time	Data time, time format, see time format
faultType	Error code
timeTotal	Operation hours
ipmTemperature	IPM temperature
epv1Today	Input 1-day power generation (kWh)
epv1Total	Input 1 Road Total Power Generation (kWh)
epv2Today	Input 2-day power generation (kWh)
epv2Total	Input 2-channel total power generation (kWh)
epvTotal	Input Total Power Generation (kWh)
eRacToday	Reactive power of the day (kWh)
eRacTotal	Total Reactive Power (kWh)
pBusVoltage	P BUS Voltage (V)
nBusVoltage	N BUS Voltage (V)
dwStringWarningValue1	dwStringWarn alarm
wStringStatusValue	wStringStatusValue error code
wPIDFaultValue	wPIDFaultValue error code
vPidPvape	PID PVAPE Volt

iPidPvape	PID PVAPE Curr
pidStatus	PID Status
vPidPvbpe	PID PVBPE Volt
iPidPvbpe	PID PVBPE Curr
strFault	PID strFault
vString1	First voltage (V)
vString2	Second voltage (V)
vString3	Third voltage (V)
vString4	Fourth voltage (V)
vString5	Fifth voltage (V)
vString6	Sixth voltage (V)
vString7	Seventh voltage (V)
vString8	Eighth voltage (V)
currentString1	Frst current (A)
currentString2	Second current (A)
currentString3	Third current (A)
currentString4	Fourth current (A)
currentString5	Fifth current (A)
currentString6	Sixth current (A)
currentString7	Seventh current (A)
currentString8	Eighth current (A)
warnCode	Alarm code
error_code	0: Normal return, 10001: System error
error_msg	Error message

4.3.10 Check the collector SN and check code is qualified

Address：*http://domain/v1/device/datalogger/validate*

Interface Support ：http

Request method：POST

Request parameters：

Parameter	Required	Description
datalogSn	Yes	Collector SN
valiCode	Yes	Verification Code

Returns: supports json

Parameter	Description
dataloggerSn	Collector SN
valiCode	Verification Code
plant_id	When the collector exists, the plant ID to which the collector belongs, if the collector does not exist, there is no return parameter
user_id	When the collector exists, the user ID to which the collector belongs, if the collector does not exist, there is no return parameter
datalogger_sn	When the collector exists, the collector SN, if the collector does not exist, there is no return parameter
error_code	Error code (0: Normal return, 10001: Collector serial number is empty or wrong length, 10002: Collector serial number and check code do not match,10003: Collector serial number is exist.

error_msg	Specific error messages

4.3.11 Access to a storage energy of the alarm data

Address:*http://domain/v1 device/storage/ alarm_data*

Interface Support:http

Request method:POST

Request parameters:

Parameter	Required	Description
storage_sn	Yes	Device unique SN
date	Yes	A date，date format：See time format
page	No	Page number，default 1
perpage	No	Quantity per page，default 20，maximum100

Returns: supports json

Parameters	Description
count	The total number of alarms
storage_sn	Energy storage equipment SN
alarm_code	Alarm code
alarm_message	Alarm information
start_time	Alarm start time，date format：See time format
end_time	Alarm end time，date format：See time format
error_code	0：Normal return，10001：System error,10002：Device serial number is incorrect ,10003：Date format is incorrect，10005：Energy storage machine does not exist
error_msg	Error message

4.3.12 Energy storage machine parameter setting

Address:*http://domain/v1/storageSet*

Interface Support:http

Request method:POST

Request parameters:

Parameters	Required	Type of data	Description
storage_sn	Yes	String	Energy storage machine SN
type	Yes	String	Parameter type Id
param1	Yes	String	Parameter value 1
param2	Yes	String	Parameter value 2, there is a need to pass value ,an empty pass-through string " "
param3	Yes	String	Parameter value 3, there is a need to pass value ,an empty pass-through string " "
param4	Yes	String	Parameter value 4, there is a need to pass value ,an empty pass-through string " "

Description： Basic settings

Parameter type Id	Parameter value 1	Parameter value 2	Parameter value 3	Parameter value 4	parameter name
storage_cmd_on_off	0000：Shutdown and the next does not automatic grid 0101：Shutdown and the next automatic grid				Energy storage machine set switch machine
storage_c	1：Free mode				System

md_mode	0：Standard mode				mode
storage_cmd_forced_discharge_enable	0：Enable 1：Prohibited				Forced discharge enabled
storage_lithium_battery	0-10				Lithium battery SOC lower limit setting
storage_fdt_open_voltage	Open circuit voltage：300V-500V	MPP voltage：Open circuit voltage 0.55-0.9			SP Group-series voltage
storage_cmd_forced_discharge_time1	0-24	0-59	0-24	0-59	Forced discharge period
storage_cmd_sys_year	Format：2016-01-03 12:00				Set the energy storage time
storage_ac_charge_enable_disenable	0：Prohibited 1：Enable				Charge enable
storage_ac_charge_hour_start	0-24	0-59	0-24	0-59	Charging time period
storage_ac_charge_soc_limit	10-80（%）				Rechargeable battery SOC setting（percenta

					ge）

Returns: supports json

Parameters	Description
error_code	0：Normal return，10001：System error ，10002：Storage machine server error，10003：Storage machine dropped，10004：The energy storage machine serial number is empty ,10005 :Collector dropped ,10006 :The set parameter type does not exist，10007：The parameter value is null，10008 :The parameter value is not in the range ,10009 :The date and time format is incorrect，10012：Energy storage machine does not exist，10013：The end time can not be less than the start time
error_msg	Error message

4.3.13 Access to the latest energy storage machine real-time data

Address:*http://domain/v1/ device/storage/storage_last_data*

Interface Support:http

Request method:POST

Request parameters:

Parameters	Required	Description
storage_sn	Yes	Energy storage machine only SN

Returns: supports json

Parameters	Description
storage_sn	Energy storage equipment SN
dataloggerSn	Energy storage machine belongs to the collector SN

status	Energy storage machine state（0：Operating，1：Charge，2：Discharge，3：Fault，4：Flash）
deviceType	Type of energy storage（0：SP2000,1：SP3000）
pCharge	Charging power（W）
pDischarge	Discharge power（W）
vpv	Enter the PV voltage（V）
ipv	Enter the PV current（A）
iCharge	PV-side charging current（A）
iDischarge	PV-side discharge current（A）
ppv	Panel input power（W）
vBuck	vBuk（A）
vac	Grid voltage（V）
iacToUser	User-side current（A）
pacToUser	User-side power（V）
iacToGrid	Grid side current（A）
pacToGrid	Grid side power（W）
vBat	Battery voltage（V）
capacity	Battery capacity（百分比）
ipmTemperature	IPM temperature（℃）
epvToday	Day panel charge（kWh）
epvTotal	Total panel charge（kWh）
temperature	Temperature（℃）
eChargeToday	Charge energy on that day（kWh）
eChargeTotal	Total charge energy（kWh）

time	Data time，date format：See time format
eDischargeToday	Discharge energy on that day（kWh）
eDischargeTotal	Total discharge energy（kWh）
eToUserToday	How much electricity is on that day (grid-user)（kWh）
eToUserTotal	Total (grid - user) how much electricity（kWh）
eToGridToday	The day (user - grid) how much electricity（kWh）
eToGridTotal	Total (user - grid) how much power（kWh）
faultCode	Error code
vpv2	SP3000 Enter the PV voltage（V）
ppv2	SP3000 Panel input power（W）
pCharge2	SP3000 Charging power（W）
pDischarge2	SP3000 Discharge power（W）
vBuck2	vBuck2（A）
epvToday2	SP3000 Day panel charge（kWh）
epvTotal2	SP3000 Panel cumulative power（kWh）
eChargeToday2	SP3000 Charge today（kWh）
eChargeTotal2	SP3000 Accumulated charge power（kWh）
eDischargeToday2	SP3000 Discharge today（kWh）
eDischargeTotal2	SP3000 Cumulative discharge（kWh）
normalPower	Current power（W）
errorCode	Error code
warnCode	Alarm code
error_code	0：Normal return，10001：System error ，10002：Energy storage machine does not exist，10003： Device SN error

error_msg	Error message

4.3.14 Obtain historical data of an energy storage machine

Address:*http://domain/v1/device/storage/storage_data*

Interface Support:http

Request method:POST

Request parameters:

Parameters	Required	Description
storage_sn	Yes	Energy storage equipment SN
start_date	Yes	The start date，date format：See time format
end_date	Yes	The end date，date format：See time format，the start / end time can be up to 7 days apart
timezone_id	No	The time zone code for the data display，the default is UTC，Available values see attached 2
perpage	No	Quantity per page，default 20，maximum 1000

Returns: supports json

Parameters	Description
storage_sn	Energy storage equipment SN
next_page_start_id	Next page starts ID
datalogger_sn	Device corresponding to the collector SN
status	Energy storage machine state（0：Operating，1：Charge，

	2：Discharge，3：Fault，4：Flash）
deviceType	Type of energy storage（0：SP2000,1：SP3000）
pCharge	Charging power（W）
pDischarge	Discharge power（W）
vpv	Enter the PV voltage（V）
ipv	Enter the PV current（A）
iCharge	PV-side charging current（A）
iDischarge	PV-side discharge current（A）
ppv	Panel input power（W）
vBuck	vBuk（A）
vac	Grid voltage（V）
iacToUser	User-side current（A）
pacToUser	User-side power（V）
iacToGrid	Grid side current（A）
pacToGrid	Grid side power（W）
vBat	Battery voltage（V）
capacity	Battery capacity（百分比）
ipmTemperature	IPM temperature（℃）
epvToday	Day panel charge（kWh）
epvTotal	Total panel charge（kWh）
temperature	Temperature（℃）
eChargeToday	Charge energy on that day（kWh）
eChargeTotal	Total charge energy（kWh）
time	Data time，date format：See time format

eDischargeToday	Discharge energy on that day（kWh）
eDischargeTotal	Total discharge energy（kWh）
eToUserToday	How much electricity is on that day (grid-user)（kWh）
eToUserTotal	Total (grid - user) how much electricity（kWh）
eToGridToday	The day (user - grid) how much electricity（kWh）
eToGridTotal	Total (user - grid) how much power（kWh）
faultCode	Error code
vpv2	SP3000 Enter the PV voltage（V）
ppv2	SP3000 Panel input power（W）
pCharge2	SP3000 Charging power（W）
pDischarge2	SP3000 Discharge power（W）
vBuck2	vBuck2（A）
epvToday2	SP3000 Day panel charge（kWh）
epvTotal2	SP3000 Panel cumulative power（kWh）
eChargeToday2	SP3000 Charge today（kWh）
eChargeTotal2	SP3000 Accumulated charge power（kWh）
eDischargeToday2	SP3000 Discharge today（kWh）
eDischargeTotal2	SP3000 Cumulative discharge（kWh）
normalPower	Current power（W）
errorCode	Error code
warnCode	Alarm code
error_code	0：Normal return，10001：System error,10002：Device serial number is incorrect， 10003：Date format is incorrect，10004 :The date interval is more than 7 days ,10005 :Energy

	storage machine does not exist
error_msg	Error message

4.3.15 Get the inverter basic information

Address:*http://domain/v1/device/inverter/inv_data_info*

Interface Support:http

Request method:GET

Request parameters:

Parameters	Required	Description
device_sn	Yes	Inverter SN

Returns: supports json

Parameters	Description
device_sn	Device SN
serialNum	Device SN
dataloggerSn	The collector of the inverter SN
status	Inverter state（0：Waiting，1：Normal，3：Fault）
lost	Whether the device is online or not (0:Online， 1: Disconnect)
status	Device status，status(0:Disconnect, 1:Online, 2:Standby, 3:Malfunction, others are dropped)
alias	Alias
location	Address
dataLogSn	The serial number of the collector
nominalPower	Rated power
power	Current power

eToday	Electricity production today
eTotal	Total power generation
lastUpdateTime	Last updated
tcpServerIp	Server address
fwVersion	Inverter version
error_code	0：Normal return，10001：System error
error_msg	Error message

5 Error code

0	Normal (Universal)
10011	Permission denied (Universal)

6 Appendix 1: Available values

- locale：language

  en-US：English

  zh-Hans：Simplified Chinese

- search_type：Search type

  name:Name of Plant

- time_unit：Time type

  day: By day

  month:By month

  year:By year

- type：type of facility

1: inverter

- user_type：user type

1: the end user