
SimPal-S460 MQTT Platform communication protocol
(V1.1)

Contents

Framework:	3
1 Message composition	4
1.1 Message Structure	4
1.2 Message header	4
2 Login authentication	5
2.1 Authentication is initiated by the device: authentic	5
2.2 Platform authentication response: authentication-resp	6
3 Messages from device	7
3.1 Status reporting: report	7
3.2 Device response : set_resp	9
3.3 Terminal information query response : device-resp	10
3.4 Power status query response : status-resp	11
4 Messages from server	12
4.1 Device SMS notification settings: set_notification	12
4.2 Device SMS notification settings: set_power	13
4.3 Set phone number: set_number	14
4.4 Terminal information query: device	15
4.5 Power status query: status	16
4.6 Device report confirmation: report_resp	18
5 Messages list	18
6 SMS commands to change settings	20

Version modification history

serial number	date	Version number	Author/Editor	Revision Notes	Reviewer
1	2026-9-9	1.0		New	
2					
3					
4					
5					
6					
7					
8					
9					
10					

Framework:

- The platform uses the MQTT protocol to access data from IoT devices.
- MQTT server address: mqtt.xxxxxx.com or IP address, port number: 1883. (plain TCP, no TLS)
- When accessing the platform, the username and password will be provided by the platform. The clientID is the device number . (Device number format is string, can be 7 digits number or 7 English characters. Default last 7 digits of IMEI.)
- After the device is connected to the platform, it must respond after successful authentication with the device number before communication can continue.
- The sending and receiving of interface data shall be uniformly encoded using the UTF-8 format.
- The data content is sent in JSON encoding.
- Subscribe and publishing topics:
Device upload topic: simpalup/s460
Device download topic: simpaldown/s460/clientID, (clientID is the device ID)
-

1 Message composition

1.1 Message Structure

{header, body,}

1.2 Message header

No	Data type	key	value example	describe
1	Command type	cmd	control	*ParameterType="string"
2	Device number	deviceno	2770308	*ParameterType=number 7-bit device number (Last 7 numbers of IMEI)
3	Message serial number	order	123	*ParameterType="number" The value increments according to the message, with a maximum of 65535 (0xFFFF). If it exceeds this value, then start from 0 again.

2 Login authentication

2.1 Authentication is initiated by the device: authentic

- After logging into the MQTT server, the device first initiates authentication. Data transmission can only continue after successful authentication.
- Encryption methods will be skipped for now and can be added later.

No	Description	key	Value example	Valve details
	Temperature	temp	23	*ParameterType="string" Range: -20 to 50 or null "null" means read temp failed

JSON example (note the type of the value):

Key /value

```
{  
  "cmd":"authentication",  
  "deviceno":"2770308",  
  "order ":23,  
  "temp":"25"  
}
```

2.2 Platform authentication response: authentication-resp

- After receiving the device's authentication request, the platform issues the device certificate.

No	Data Items	key	value example	describe
	RTC	time	20260216080000	*ParameterType="string" Year, month, day, hour, minute, second, used for system time synchronization.

JSON example:

```
{
  "cmd": "authentication-resp ",
  "deviceno": "2770308",
  "order ": 23,
  "time ": "20260216080000"
}
```

3 Messages from device

3.1 Status reporting: report

- Actively transmit data after changes in equipment status (including changes in temperature, relay output, power, etc.).
- If no confirmation is received after 10 seconds, resend (up to 3 times).
- Device can report some the data, such as it will only report power consumption every few minutes.

No	Data Items	key	value example	describe
	230 AC power status	power	connect	connect/ disconnect
	Temperature	temp	23	*ParameterType="string" Range: -20 to 50 or null "null" means read temp failed
	Output status	output	on	on/off
	Power load	load	200	Range: 0 to 3500: means 0-3500W
	Power consumption	consumption	15	Range 0 to 10000, divided by 1000. The power consumption range 0.000-10.000 kWh, The reported electricity consumption will be reset to zero, and the server needs to accumulate it. For example, 15 means 0.015 kWh
	4G network signal	signal	4G 20	It will display network type and signal value. Network type can be 2G or 4G; Signal level range 0-31 or 99
	Report reason	reason	alert	String reason: button/thermostat/schedule/delay/command/ max3500/alert

```
{  
  "cmd": "report",  
  "deviceno": "2770308",  
  "order": 23,  
  "output": "on",  
  "reason": "button"  
}
```

Server should reply message to confirm received the report data.

```
{  
  "cmd": "report_resp",  
  "deviceno": "2770308",  
  "order": 23  
}
```

3.2 Device response : set_resp

- The system receives control data from the platform for the device, executes it, and returns the result.

No	Data Items	key	value example	describe
	Command Flow	sender-order	211	*ParameterType="number" The serial number corresponding to the command issued by the platform is generally used to check the execution result of the issued command.
	result	result	succ	succ: successful fail: failed none: not support this function

JSON example (note the type of the value):

```
{  
  "cmd": "set_resp",  
  "deviceno": "2770308",  
  "order": 23,  
  "result": "succ"  
}
```

3.3 Terminal information query response : device-resp

- Response to 【Terminal information inquiry: device-resp】

No	Data Items	key	value example	describe
1	Software version	softver	260725	*ParameterType="string"
2	IMEI number	IMEI	864239040162504	*ParameterType="string"
3	SMS alert function	smsalert	on	*ParameterType="string" on/off
4	Phone number-1	number1	+861233333333	*ParameterType="string"
5	Phone number-2	number2	null	*ParameterType="string"
6	Phone number-3	number3	null	*ParameterType="string"
7	Phone number-4	number4	null	*ParameterType="string"
8	Network name	operator	Vodafone	*ParameterType="string"
9	4G signal And network type	signal	4G 15	*ParameterType="string" Network type: 2G, 3G, 4G CSQ Range: 0 to 31 or 99

JSON example (note the type of the value):

```
{  
  "cmd": "device_resp",  
  "deviceno": "2770308",
```

```

"order":234,
"softver":"260723",
"IMEI":"865100082770308",
"smsalert":"on",
"number1":"+86123444444",
"number2":"null",
"number3":"null",
"number4":"null",
"operator":"vodafone",
"signal":"4G 20",
}

```

3.4 Power status query response : status-resp

- Response to 【Terminal Status Inquiry: status-resp】

No	Data Items	key	value example	describe
1	output	output	on	*ParameterType="string" on/off
2	Power load	load	15	*ParameterType="number" Range: 0-3500
3	Temperature	temp	20	*ParameterType="string" Range: -20 to 50 or null "null" means read temp failed
4	4G network signal	signal	4G 20	It will display network type and signal value. Network type can be 2G or 4G; Signal level range 0-31 or 99

JSON example (note the type of the value and the value of the key):

```

{
"cmd":"status",

```

```
"deviceno":"2770308",  
"order":23  
}
```

The device responded with **【status_resp】** .

JSON example (note the type of the value):

```
{  
  "cmd":"status_resp",  
  "deviceno":"2770308",  
  "order":23,  
  "output":"on",  
  "load":100,  
  "temp":"30"  
  "signal":"4G 20"  
}
```

4 Messages from server

4.1 Device SMS notification settings: set_notification

- The equipment relay outputs control commands, which are actively issued by the platform.

No	Data Items	key	value example	describe
	Set SMS notification	smsalert	on	on/off
	Set device report status interval	interval	300	Time interval, range 0-6000 seconds. Default 300 seconds
	Set temperature alert	tempalert	1L-5H30	First digit is on/off, on=1; off-0, L means lower temp, H means higher temp. Temp range -30 to 100C

Set SMS notification JSON example (note the type of the value and the value of the key):

```
{
  "cmd": "set",
  "deviceno": "2770308",
  "order": 234 ,
  "smsalert": "on"
}
```

The device responded with **【set_resp】** .

JSON example (note the type of the value):

```
{
  "cmd": "set_resp",
  "deviceno": "2770308",
  "order": 234 ,
  "result": "succ"
}
```

Set device report status interval JSON example (note the type of the value and the value of the key):

```
{
  "cmd": "set",
  "deviceno": "2770308",
  "order": 234
  "interval": 100
}
```

The device responded with **【set_resp】** .

JSON example (note the type of the value):

```
{
  "cmd": "set_resp",
  "deviceno": "2770308",
  "order": 234 ,
  "result": "succ"
}
```

4.2 Device SMS notification settings: set_power

- The equipment relay outputs control commands, which are actively issued by the platform.

No	Data Items	key	value example	describe
	Turn on power output	output	on	on/off
	Set power load alarm	loadalert	1L20H2000	First digit is on/off, on=1; off-0, L means lower load, H means higher load, load range 0-3500W

Set power output ON JSON example (note the type of the value and the value of the key):

```
{
  "cmd": "set",
  "deviceno": "2770308",
  "order": 234 ,
  "ouptut": "on"
}
```

```
"loadalert":"1L5H3500"

}
```

The device responded with **【set_resp】** .

JSON example (note the type of the value):

```
{
  "cmd":"set_resp",
  "deviceno":"2770308",
  "order": 234 ,
  "result":"succ"
}
```

Set power load alert function ON, range 5-3500W JSON example (note the type of the value and the value of the key):

```
{
  "cmd":"set",
  "deviceno":"2770308",
  "order": 234 ,
  "loadalert":"1L5H3500"
}
```

The device responded with **【set_resp】** .

JSON example (note the type of the value):

```
{
  "cmd":"set_resp",
  "deviceno":"2770308",
  "order": 234 ,
  "result":"succ"
}
```

4.3 Set phone number: set_number

- The command to set phone number onto device for power lost SMS alert.
- The device responded with **【set_resp】** .

N o	Data Items	key	value example	describe
	Add phone number-1	number1	+8628888888	*ParameterType="string" Max 15 characters
	Add phone number-2	number2	+8628888888	*ParameterType="string" Max 15 characters
	Add phone number-3	number3	+8628888888	*ParameterType="string" Max 15 characters
	Add phone number-4	number4	+8628888888	*ParameterType="string" Max 15 characters
	Remove phone number-1	number1	null	*ParameterType="string" When number=null, it will delete old number
	Remove phone number-2	number2	null	*ParameterType="string" When number=null, it will delete old number
	Remove phone number-3	number3	null	*ParameterType="string" When number=null, it will delete old number
	Remove phone number-4	number4	null	*ParameterType="string" When number=null, it will delete old number

JSON example (note the type of the value and the value of the key):

```
{
  "cmd": "set",
  "deviceno": "2770308",
  "order ": 234 ,
  "number1": "+8628888888",
  "number2": "+8628883388",
  "number3": "+8628222888",
  "number4": "+86284448888"
}
```

The device responded with **【set_resp】** .

JSON example (note the type of the value):

```
{
  "cmd": "set_resp",
  "deviceno": "2770308",
  "order": 234 ,
  "result": "succ"
}
```

4.4 Terminal information query: device

- The system queries the terminal information; the message body is empty. It returns information such as the device version.
- The device responded with **【device-resp】** .

No	Data Items	key	value example	describe

JSON example (note the type of the value and the value of the key):

```
{
  "cmd": "device",
  "deviceno": "2770308",
  "order": 234
}
```

The device responded with **【device_resp】** .

JSON example (note the type of the value):

```
{
  "cmd": "device_resp",
  "deviceno": "2770308",
  "order": 234,
  "softver": "260723",
  "IMEI": "865100082770308",
}
```

```
"loadalert":"1L5H3500",
"smsalert":"on",
"interval":300,
"number1":"+86123444444",
"number2":"null",
"number3":"null",
"number4":"null",
"operator":"vodafone",
"signal":"4G 20"

}
```

4.5 Power status query: status

- The system queries the terminal status; the message body is empty. It returns information such as the device version.
- The device responded with **【device-resp】** .

N o	Data Items	key	value example	describe

JSON example (note the type of the value and the value of the key):

```
{
"cmd":"status",
"deviceno":"2770308",
"order":234,
}
```

The device responded with **【device_resp】** .

JSON example (note the type of the value):

```
{
"cmd":"status_resp",
"deviceno":"2770308",
}
```

```
"order":234,  
"output":"on",  
"load":200,  
"temp":"30",  
"signal":"4G 20"  
  
}
```

4.6 Device report confirmation: report_resp

Server receive device report message, it reply this message to device to confirm report received.

No	Data Items	key	value example	describe

```
{  
  "cmd":"report_resp",  
  "deviceno":"2770308",  
  "order":234  
}
```

5 Messages list

Functions	Device public messages	Server public messages
Log in	<pre>{ "cmd":"authentication", "deviceno":"2770308", "order ":2, "temp":"26" }</pre>	<pre>{ <u>"cmd":"authentication-resp"</u> , <u>"deviceno":"2770308"</u>, <u>"order ": 234 ,</u> <u>"time ":"20260216080000"</u> }</pre>
Power connected report	<pre>{ "cmd":"report", "deviceno":"2770308", "order":234, "power":"connect", "reason":"alert" }</pre>	<pre>{ <u>"cmd":"report_resp"</u>, <u>"deviceno":"2770308"</u>, <u>"order":234</u> }</pre>
Power disconnected report	<pre>{ "cmd":"report",</pre>	<pre>{ <u>"cmd":"report_resp"</u>,</pre>

	"deviceno": "2770308", "order": 2, "power": "disconnect", "reason": "alert" }	<u>"deviceno": "2770308",</u> <u>"order": 2</u> }
Power load alert	{ "cmd": "report", "deviceno": "2770308", "order": 234, "load": 100, "reason": "alert" }	{ <u>"cmd": "report_resp",</u> <u>"deviceno": "2770308",</u> <u>"order": 234</u> }
Power consumption report	{ "cmd": "report", "deviceno": "2770308", "order": 234, "consumption": 100, "reason": "alert" }	{ <u>"cmd": "report_resp",</u> <u>"deviceno": "2770308",</u> <u>"order": 234</u> }
Temperature alert	{ "cmd": "report", "deviceno": "2770308", "order": 235, "temp": "43" "reason": "alert" }	{ <u>"cmd": "report_resp",</u> <u>"deviceno": "2770308",</u> <u>"order": 235</u> }
Press button to turn on/off power output	{ "cmd": "report", "deviceno": "2770308", "order": 4, "output": "on" "reason": "button"} }	{ <u>"cmd": "report_resp",</u> <u>"deviceno": "2770308",</u> <u>"order": 4</u> }
Set SMS notification when power lost/restore	{ <u>"cmd": "set_resp",</u> <u>"deviceno": "2770308",</u> <u>"order": 23,</u> <u>"result": "succ"</u> }	{ "cmd": "set", "deviceno": "2770308", "order": 23 , "smsalert": "off" }
Set relay output	{ <u>"cmd": "set_resp",</u> <u>"deviceno": "2770308",</u> <u>"order": 2,</u> <u>"result": "succ",</u> }	{ "cmd": "set", "deviceno": "2770308", "order": 2, "output": "on" }

Set power load alarm -on, range 5-3500W	{ <u>"cmd": "set_resp",</u> <u>"deviceno": "2770308",</u> <u>"order": 23,</u> <u>"result": "succ"</u> }	{ "cmd": "set", "deviceno": "0083816", "order": 23, "loadalert": "1L5H3500" }
Set temperature alarm -on, range - 5 to 30C	{ <u>"cmd": "set_resp",</u> <u>"deviceno": "2770308",</u> <u>"order": 23,</u> <u>"result": "succ"</u> }	{ "cmd": "set", "deviceno": "0083816", "order": 23, "tempalert": "1L-5H30" }
Set device report status interval	{ <u>"cmd": "set_resp",</u> <u>"deviceno": "2770308",</u> <u>"order": 23,</u> <u>"result": "succ"</u> }	{ "cmd": "set", "deviceno": "2770308", "order": 23, "interval": 1800 }
Set phone number to receive SMS alarm	{ <u>"cmd": "set_resp",</u> <u>"deviceno": "2770308",</u> <u>"order": 23,</u> <u>"result": "succ"</u> }	{ "cmd": "set", "deviceno": "2770308", "order": 23, "number1": "+8613860499337", "number2": "+8613306007236", "number3": "13313860336", "number4": "15659816925" }
Check device settings	{ <u>"cmd": "device_resp",</u> <u>"deviceno": "2770308",</u> <u>"order": 234,</u> <u>"softver": "260723",</u> <u>"IMEI": "865100082770308",</u> <u>"loadalert": "1L5H3500",</u> <u>"smsalert": "on",</u> <u>"interval": 300,</u> <u>"number1": "+861234444444"</u> <u>"number2": "null",</u> <u>"number3": "null",</u> <u>"number4": "null",</u> <u>"operator": "vodafone",</u> <u>"signal": "4G 20"</u> }	{ "cmd": "device", "deviceno": "2770308", "order": 234 }
Check device status	{	{

	<u>"cmd": "status_resp",</u> <u>"deviceno": "2770308",</u> <u>"order": 234,</u> <u>"output": "on",</u> <u>"load": 100,</u> <u>"temp": "30",</u> <u>"signal": "4G 20"</u> <u>}</u>	"cmd": "status", "deviceno": "2770308", "order": 234 }
--	--	---

6 SMS commands to change settings

1. #password#27# Check network name and network type
2. #password#72#APN#User#Password# or #1234#72#APN#: Set SIM card APN
3. #password#72# Check SIM Card APN Settings
4. #password#73# Reboot device
5. #password#74#URL#port# Change MQTT server address and port number
6. #password#74# Check MQTT server address and port number
7. #password#75#user#password# Set server MQTT log in user name and password
8. #password#75# Check MQTT log in user name and password
9. #password#04#new-password# Change password