Wi-Fi Card

User's Manual

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1 Overview

1.1 Introduction

The Wi-Fi card will collect data from connecting inverter(s), and transmit data to online data center via wireless network. The HTTP service of data server can monitor several devices, and can store all data/events in the data server. After installing the Wi-Fi card, users can configure the communication parameters as AP mode (Access Point) or remotely accessing the inverter data through the internet as STA mode (Station Mode). Users can access inverter operation data, and analyze problems with through the web browser. This Wi-Fi card will automatically update/install the latest firmware.

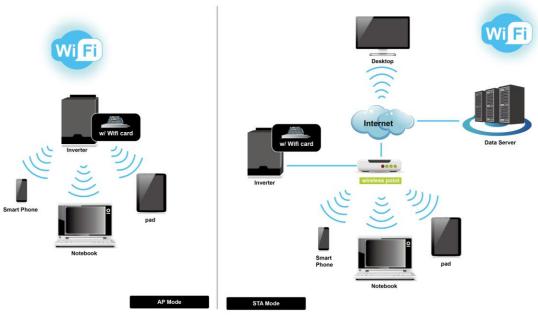
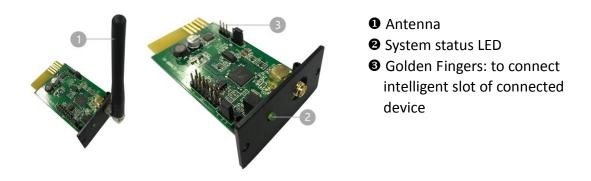


Diagram 1-1

1.2 Features

- > Upload information to data server via wireless network
- Remotely monitoring inverter(s) data through the data server at any time
- Event Notification via Email
- Built-in web server
- Automatic firmware upgrade

1.3 Product overview





System Status LED:			
LED Status	Description		
Off	Power off or internal fault		
500ms on , 500ms off	Internet is not available.		
100ms on , 2900ms off	Communication error with monitored device		
100ms on , 100ms off	In the process of uploading data to data center		
On	Wi-Fi card is operating normally.		

2 Preparation

2.1 Prerequisite

The following devices are required if you're using Wi-Fi Card or Wi-Fi Box:

For Wi-Fi Card:	For Wi-Fi Box:
1. Wi-Fi card (Diagram 2-1)	1. Wi-Fi Box
2. Wireless access point	2. Wireless access point
3. Monitored device	3. Data cable
	4. Monitored device

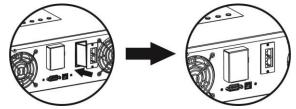
2.2 Installation

For Wi-Fi Card:

1. Attach the Antenna to Wi-Fi card.



2. Remove the Intelligent Slot cover located on the Inverter. Insert Wi-Fi card into the slot and secure it with screws.



For Wi-Fi Box:

- 1. Attach the Antenna to Wi-Fi box.
- 2. Connect DB9 terminal of data cable to the Wi-Fi Box.
- 3. Connect data cable to the Inverter.

3 Wi-Fi Card Configuration

3.1 Quick Configuration

- a) If using the Wi-Fi box, please connect it to a power adapter.
- b) Using device such as cell phones or laptops to connect to access point named "wificard". The password is "open".
- c) Open your browser. Enter "wificard.net" or "192.168.1.1" to access control panel.
- d) Click on "Application Config". Configure "Time Zone" and "Daylight saving time". Then, click "Apply" button.

Hello,WIFI Car	1!		
R System Information		Network Config	Diagnostic Tools
	(1)		
Time			
SNTP Serve	time.windows.co	om	
SNTP Serve	time-a.nist.gov		
SNTP Serve	er3: time.apple.com		
Time Zone:	UTC+08:00 V	2	
Daylight sa	ving time: Disable 🔻	3	
	Apply	1	

e) Click on "Network Config". Enter Wi-Fi card information under "Add Profile" area and click on "Add" button to save. All entered data will be listed under STA Profiles.

Hello,WIFI Card!	
R System Information	Application Config Network Config Diagnostic Tools
Add Profile	
SSID:	Enter your SSID
Security Type:	Open O WEP O WPA1 O WPA2
Security Key:	Enter your password Hexadecim al digits - any
occurry roy.	combination of 0-9, a-f and A-F
Profile Priority:	0 Choose a value 0-7 (0 = highest)
	Add
STA Profiles	
□ 1. bert	Security:WPA Priority:0
2	Security: - Priority: -

f) In Device Role area of the same page, choose "Station" in the Mode column and click on "Apply" button. Power cycled the Wi-Fi card after 5 seconds to put your setting into effect.

Network Config	
Device Role	
Mode:	Station
	Apply
*The web	server will stop, please restart manually.

3.2 Pin Configuration

Adjust the UC2 jumper pin from "1,2" to "2,3" position to restore to factory setting. After restoring to factory setting, Wi-Fi card will work in AP (Access Point) mode, SSID (Wireless Network Name) is "wificard" and the password is "open". After restoring back to factory setting, it's necessary to return the jumper to "1,2" position. Otherwise, the Wi-Fi card will be restore back to factory setting after reset.



Pin	Default position	Function
UC2	1,2	1,2: Normal operation
		2,3: Restore to factory setting

3.3 Access embedded webserver in STA (Station) mode

Enter the current IP address of Wi-Fi card in the browser to access the embedded webpage under "Station" mode.

3.4 Embedded webserver

In the web server menu, there are five main functions:

- Green R Button: restart Wi-Fi card.
- System Information: display current status of Wi-Fi card.
- > Application Config: Itemize Wi-Fi card parameters.
- > Network Config: Network configuration setting including AP and STA mode.
- > Diagnostic Tools: Ping testing tool for network connection analysis.

Hello,WIFI Card!			
R System Information App	lication Config	Network Config	Diagnostic Tools
System Information			
Status			
Upload:	V Tx:00024	Rx:00024	
UART:	📢 Tx:03430	Rx:01369	
Device			
Device Name:	wificard		
Device ID:	WIFICARDTE	ST001	
Device Mode:	Station		
System Time:	2017-10-23 1	5:50:45	
System Up Time:	0 days 00:27:	29	
Network			
MAC Address:	8C:8B:83:D3:	4E:D5	
AP SSID:	wificard		
AP Security Type:	Open		
AP Domain Name:	wificard.net		

3.4.1 System Information

System Information	
Status	
Upload:	🔇 Tx:00027 Rx:00027
UART:	🔇 Tx:04340 Rx:01732

Status: Displays upload and UART communication status

- Upload: Data upload status from Wi-Fi card to data server through http protocol. Tx represents the number of upload times from Wi-Fi card. Rx represents the number of response times from data center. It also means the number of times to successfully upload data. The number will reset to zero when it reaches 65535.
- UART: Communication status bewteen Wi-Fi card and monitored device. Tx represents the number of times data sended from Wi-Fi card. Rx represents the number of times commander received. The value of Rx may be much smaller than the value of Tx. The number will reset to zero when it reaches 65535.

Device	
Device Name:	wificard
Device ID:	WIFICARDTEST001
Device Mode:	Station
System Time:	2017-10-23 15:59:05
System Up Time:	0 days 00:35:48

Device: Displays relative information of the Wi-Fi card.

- Device ID: Wi-Fi Card serial number. It indentifies the Wi-Fi card in the data server.
- > Device Mode: Current working mode. (Access Point or Station Mode)
- System Time: Current time on the Wi-Fi card. The format is YYYY-MM-DD HH:MM:SS.
- System Up Time: Represents operational hours since initialization of the Wi-Fi card. The format is X days HH:MM:SS.

Network			
MAC Address:	8C:8B:83:D3:4E:D5		
AP SSID:	wificard		
AP Security Type:	Open		
AP Domain Name:	wificard.net		
AP IP Address:	192.168.1.1		
STA DHCP State:	Enabled		
STA IP Address:	0.0.0.0		
STA Subnet Mask:	0.0.0.0		
STA Gateway:	0.0.0.0		
STA DNS:	0.0.0.0		

Network: Shows internet configuration including AP and STA modes.

- > AP SSID: Wi-Fi Card SSID under AP mode.
- > AP Domain Name: Enter name to access the web interface under AP mode.
- STA IP Address: Enter IP address to access the web interface under STA mode. This address is only effective when STA DHCP State is disabled.

Application		
FW Version:	1.0.0	
FW Timestamp:	20171023131900	
HTML Timestamp:	20171023131900	

Application:

- FW Version: Firmware version of the Wi-Fi card.
- > FW Timestamp: Time stamp for the firmware. It could be use to verify firmware update status.
- > HTML Timestamp: Time stamp for built-in web interface.

3.4.2 Application Configuration

Application Config	
Server	
Host Name:	power-datacenter.com
Port:	80
Post URL:	/cmmq/dataCenter
Firmware URL:	/fw/wifi
	Apply

Server: Shows the related parameters for data center.

- > Host Name: Host name of data server, defaulted at power-datacenter.com
- > Port: HTTP server port of data server
- > Post URL: Data upload address for the Wi-Fi card
- Firmware URL: Address to verify and download the latest firmware.

Time	
SNTP Server1:	time.windows.com
SNTP Server2:	time-a.nist.gov
SNTP Server3:	time.apple.com
Time Zone:	UTC+08:00 V
Daylight saving time:	Disable ▼
	Apply

Time: Shows related parameter to cofigure SNTP client. Wi-Fi card is built-in with SNTP client. When Wi-Fi card is connected to the internet, it can get time upates through SNTP portocol.

- SNTP Server*: Assign SNTP server address and wifi card will get time updates via this address. Defaulted at time.windows.com.
- Time Zone: Select local time zone and Wi-Fi card will convert the local time based on the time updates from SNTP server.
- Daylight saving time: Select it if local time zone does applied Daylight Saving. The Wi-Fi card will convert the local time based on this setting.

Interval	
Post Data:	300 Seconds
Firmware Update:	24 Hours(0 means disable)
	Apply

Interval: Working cycles of the Wi-Fi Card.

- Post Data: It's the time interval that the Wi-Fi card uploads information of monitored device to the data server. The setting range is between 30 ~ 3600 seconds and defaulted at 300 seconds.
- Firmware Update: It's the time interval that the Wi-Fi card sync with the update server. The setting range is between 0 ~ 720 hours. The default setting is 24 hours and 0 represents this function being disabled.

Others	
Device ID:	WIFICARDTEST001 *No changes are recommended
Parallel data collected:	Disable •
	Apply

- Device ID: Serial number of the Wi-Fi Card and it's the only idendification means in the data server. Do not modified unless told by the server administrator.
- ➤ Parallel data collected: Collect parallel data. Default setting is "Enable".

3.4.3 Network Configuration

Network Config	
Device Role	
Mode:	Station •
	Apply
*The web server will stop, please restart manually.	

- Mode: Two operating modes, Access Point (AP) and Station Mode. The default setting is "Access Point".
- ***NOTE:** When changing this setting, be sure to restart the Wi-Fi card manually.

Access Point	
SSID:	Enter your SSID
Security Type:	Open WEP WPA
Security Key:	Enter your password Hexadecimal digits - any combination of 0-9, a-f and A-F
	Apply

- SSID: Enter the SSID under the AP mode. The default SSID is "wificard".
- Security Type: Select security standard. The default setting is "Open".
- Security Key: Enter password. The maximum length is 62 digits.

Add Profile	
SSID:	Enter your SSID
Security Type:	● Open ○ WEP ○ WPA1 ○ WPA2
Security Key:	Enter your password Hexadecimal digits - any combination of 0-9, a-f and A-F
Profile Priority:	0 Choose a value 0-7 (0 = highest)
	Add

Add Profile: Parameter setting under Station Mode. Maximum of 7 profiles could be added.

- SSID: Enter the SSID under Station Mode.
- Security Type: Select security standard. The default setting is "Open".
- Security Key: Enter password. The maximum length is 62 digits.
- Profile Priority: Set priority of the profile. The range is between 0 7. If setting is 0, it's the first priority.

STA Profiles		
🗆 1. bert	Security:WPA	Priority:0
2	Security: -	Priority: -
03	Security: -	Priority: -
4	Security: -	Priority: -
5	Security: -	Priority: -
6	Security: -	Priority: -
07	Security: -	Priority: -
	Remove	

STA Profiles: Shows all available internet profile. Users can remove individual profile by clicking checkbox and "Remove" button.

Station IP	
DHCP Client:	Disable Inable
IP Address:	0.0.0.0
Subnet Mask:	0.0.0.0
Gateway:	0.0.0.0
DNS Server:	0.0.0.0
	Apply

Station IP: Wireless configuration for Station Mode. The default setting is "Enable" for DHCP client. The DHCP Client needs to be "Disable" to manually configure the IP adress, Subnet Mask, Gateway, and DNS server to connect to the data server.

3.4.4 Diagnostic Tools

Ping Test: To help users to check the status of the Wi-Fi card connectivity.

Diagnostic Tools	
Ping test	
IP Address:	Enter your IP address
Packet Size:	32 bytes (32-1472)
Number Of Pings:	4
	Start To Ping
Ping Result	
IP Address:	
Packet Size:	32
Number Of Pings:	4
Total Sent:	0
Successful Sent:	0
	Stop To Ping

4 Monitor

If the Wi-Fi Card operates normally, it will transmit data via wireless network to the data server <u>http://power-datacenter.com</u>. Users have to register in order to monitor the operating status and bind the serial number of the monitored device with the registered account.

Data Center
Home / System login
System login
User name
Enter user name
Password
Enter password
Language
English •
Login
There is no account? register now

In order to optimize the user's experience, you are suggested to view the information via suggested browser including: Chrome 6+, IE10+, Firefox 4.0+, Safari. As well as smart phones and tablets browers.

4.1 Registration

1. Click on "register now" below the Login button to start the registration process.

Data Center
Home / Create account
Create account
* User name
* Password
* Confirm password
* Company/Name
Address
Contact
Telephone
* E-mail
Confirm

- ▶ User name : Please enter user name and remember it for further use.
- > Password : It contains 6 ASCII characters, including letters and numbers and it

is case sensitive.

Confirm password : Re-enter the password from the step above.

2. Click on

button to complete the registration

4.2 Login

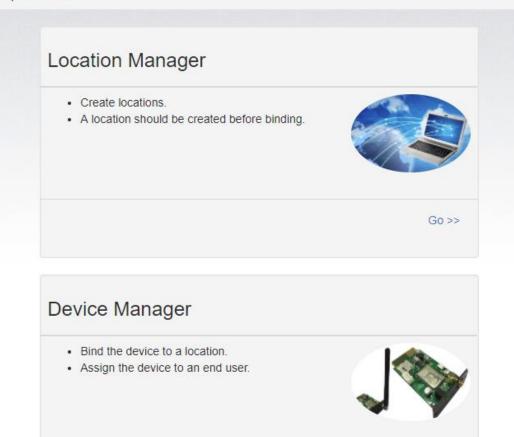
After registration, you can log in to the data server. The login page is shown below:

ome / System login System login	
User name	
Enter user name	
Password	
Enter password	
Language	
English	
Login	

After log in, the main page of data server will be shown as illustrated below:

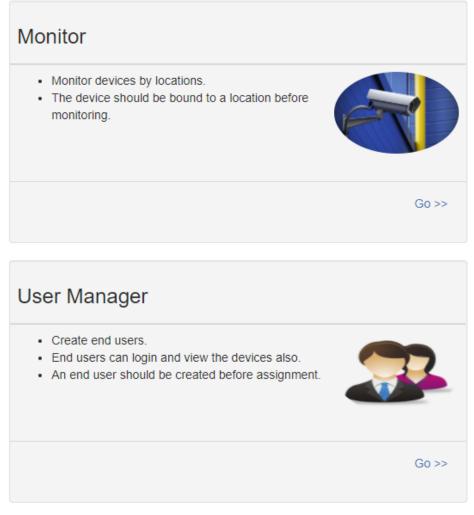
Data Center

Help for GPRS



- ✤ Location Manager: The users can monitor all device in various locations.
- Device Manager: The users can bind device(s) to designated location and assign to users.

Go >>



- Monitor: It is grouped by location, and all devices with assigned location will be listed.
- > User Manager: Where you create additional users for the account.

4.3 Location Manager

/ Location Manage	ier					
Loodion manag	,					
ocation list						
					Create	Brows
Location name	Address	Contact	Telephone	E-mail		
Location name	Address	Contact	Telephone	E-mail	Delete	Edit

- 1. Users can create, delete and edit locations.
- 2. After registration, the system will assigned the user an "undefined" location, which can be deleted or edited.

3. Click on Create

Create to start a new location as illustrated below.

					Create Br	ows
	*Location name	TestLocation				
	*Address	TestAddress				
	*Contact	TestContact				
	Telephone	1234567890				
	E-mail	test@test.com				
		Crea	ate Close			
Location nar	ne Address	Contact	Telephone	E-mail		
undefined					Delete	Ed
5#4F	reginAddress	reginContact	reginPhone	reginmail@mail.com	Delete	Ed

5. Click on

Close to terminate creation.

4.4 Device Manager

Bind device	Assign device			
Device	92931312100028	Device name	Inverter 5KVA	
Device type	Hybrid Inverter	• Location name	5#4F	,
		Browse Bind		
List				

- 1. Bind Device: Assign device to the location.
 - Device: Fill in the serial numbers of the monitored device. (Serial number label is on the monitored device).
 - Device name: Assign a name so that the users can directly identify which card or device it is.
 - > Device type: Select the type of monitoring device.
 - > Location name: Select the bound location of monitored device.

Click	Bind	to complete the assignment.

to list the information of bound device.

2. Assign device

Click

Please refer to section 4.6 under User management for detail instruction.

4.5 Monitor

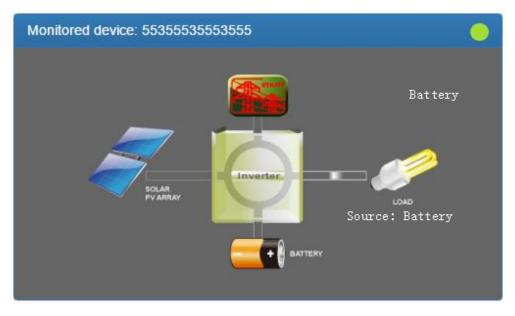
	Card ID SN	12344678 553555355	53555	
WIFI				
2016/1	1/15 09:51:48			0 minutes aç
	PV input	: power	0	Ŵ
	Grid vo	oltage	0	V
	Battery o	capacity	100	%
Brow	se			Delete

- 1. It's grouped by locations, and all device in that location will be listed.
- 2. The message will be updated once every 5 minutes.

3. Click on Brow	to show de	etail information on a new page.	
			Close
Monitor			
Status			
Data			
Event log			
Click on	Close	to close the window.	

- Status: Current operational status of the monitored device.
- Status Display:

It shows the status of the monitored device in a graphical representation. The serial number is shown on the top of the window and operational status indicator is shown as a color dot to the right.



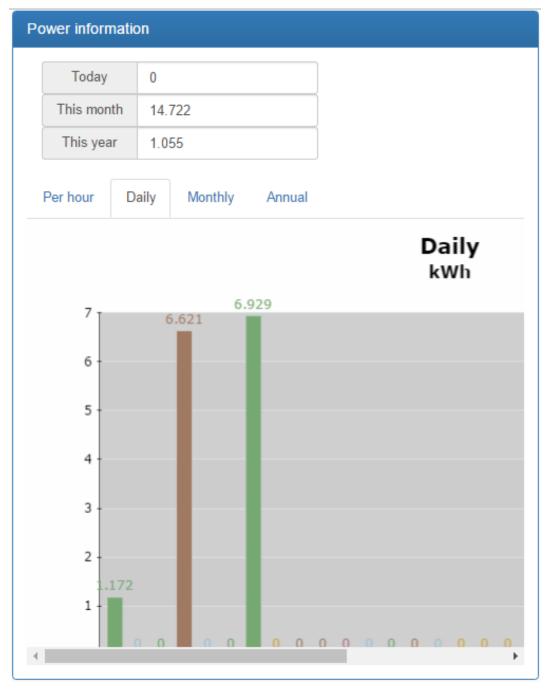
a) Basic information:

It displays basic information including the voltage, current, loading, temperature, etc.

Basic information		
PV input voltage	0	V
Battery voltage	55.6	V
Charging current	0.0	A
Grid voltage	0	V
Grid output voltage	230	V
AC output apparent power	0	VA
Output load percent	0	%
Total AC output apparent power	0	VA
Total output load percent	0	%

b) Power Information:

It displays power generation statistics separated into "per hour," "Daily," "Monthly," "Annual" basis.



c) Rated information:

It shows the nominal rated information including input voltage, output voltage, frequency, battery voltage, etc.

Rated information

Nominal AC voltage	230	V
Nominal output voltage	230	V
Nominal output frequency	50	Hz
Nominal output apparent power	5000	VA
Nominal AC current	21.7	A
Nominal output current	21.7	A
Nominal output active power	4000	W
	48	V

d) Product Information

It shows the product information including model type, Main CPU processor version, voltage, etc.

Stand alone
00012.30
Transformerless
00000.00

> Data: Historical data of currently monitored device.

		Begin time	End time
Year	2016	2016/11/15	2016/11/15
Per page	15 🗢	00:00	23:59
			Browse

	Device mode	Time	PV input voltage	PV input power	Grid voltage	Grid frequency	Battery voltage	Bat capa
1	Battery	2016/11/15 09:56:57	0.0	0	0.0	0.0	55.6	1(
2	Battery	2016/11/15 09:51:48	0.0	0	0.0	0.0	55.6	1(
3	Battery	2016/11/15 09:46:45	0.0	0	0.0	0.0	55.5	1(

> Event log: Historical events of currently monitored device.

		Begin time	End time
Year	2016	2016/11/15	2016/11/15
Per page	15	00:00	23:59
			Browse

	Level	Time	Event	
1	A	2016/11/15 09:46:45	LINE_FAIL	Delete

> Power generation data log: Power generation data of currently monitored device.

Period N	IO. Year Browse Delete
Time	Output power
2016/11/01	1.172
2016/11/02	0.0
2016/11/03	0.0
2016/11/04	6.621
2016/11/05	0.0
2016/11/06	0.0

4.6 User Manager

Users can creat additional logins and assign specific Wi-Fi card to a particular login. The end-user can monitor the device by logging into the data server via assigned Wi-Fi cards.

1. Create User

User list				C	Create	Br	owse
User name	Company/Name	Address	Contact	Telephone	E- mail	Role	Creat time
		There ar	e no recor	ds.			
4							Þ
 Click or 	Create	how the lo	ogin creat	ion window.			

	Create	Browse
*User name	end-user	
Role	View •	
*Password		
* Company/Name	end-user-company	
Address	end-user-address	
Contact	end-user-contact	
Telephone	end-user-tel	
*E-mail	end-user-email	
	Create Close	

						Create	Brow
Company/Name	Address	Contact	Telephone	E- mail	Role	Create time	
end-user- company	end- user- address	end- user- contact	end-user- tel	end- user- email	View	2016/11/14 21:32:46	Dele
(end-user-	end-user- end- company user-	end-user- company user- user-	company user- user- tel	Company/NameAddressContactTelephonemailend-user- companyend- user-end- user-end-user- telend- user-	Company/NameAddressContactTelephonemailRoleend-user- companyend- user-end- user-end-user- telend- user-View	Company/NameAddressContactTelephoneE- mailRoleCreate timeend-user- companyend- user-end- user-end-user- telend- user-end- user-2016/11/14 21:32:46

2. Assign device

The Wi-Fi card can be assigned to specific end-user/login.

Bind device	Assign device		
Device type	•	Location name	
Device	96121609100001 •	End user	
	Brow	se Assign	
List			

Device type/ Location name: The pull-down value may vary depending on different devices.

Device: Select Device.

End user: Select one of the end-users.

Click on to complete the assignment:

De	vice type	Hybi	rid Inverter	•	Locat	ion name	5#4	1F	
	Device	96121609100001		•	En	nd user er		nd-user-commpany	
				Browse	As	sign			
is	t								
_is #	t Device		Device name	Туре		Location n	ame	End user	

Click on

to unbind the Wi-Fi card assignment.

4.7 Email Notification

unassign

Users can set up e-mail notification when warning or fautls of any kind occurred in the inverter. Data server will send alarm notification(s) to specific e-mail addresses. Click on the pull-down indicator on the upper right-hand corner of the screen to begin.

	Hi, SYS -
Data Center	
	Hi, SYS -
	Home
Data Center	My profile
	Password
Home / My profile	
	Logout

Select "My profile"

It will prompt you with the following screen and please enter the email address of intended recever. Check"Email notification" box and then click on Update to

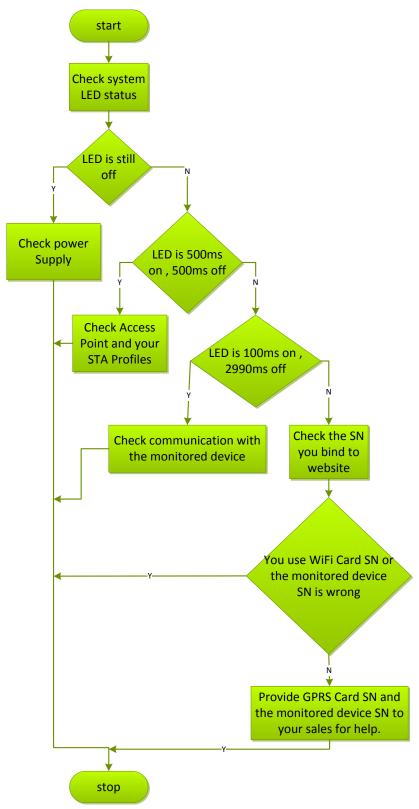
confirm your input.

E-mail	
Email notification	
Create time 2016/09/02 01:45:13	

Update

Trouble Shooting

If you have trouble with any of the step above, please consult with the flow-chart below to troubleshoot the Wi-Fi card.



5.1 Frequently Asked Questions

- Question 1: WiFi Card can not be set up in STA(Station) mode.
 Solution: Be sure that UC2 pin is in "1,2" position and at least one effective STA(Station) Profile is created or present.
- Question 2: Device Time is not correct in the data server. Solution: If monitored device is equipped with RTC (real-time clock), Wi-Fi card will apply local device time setting. Please be sure that the time setting in the monitored unit is correct. Otherwise, Wi-Fi card will apply time information via SNTP protocol.