

# MEM-G86 User Manual





# Content

MEM-G86	User Manual 1
1. Overview	
1.1. Brief	introduction3
1.2. Prod	uct feature3
1.3. Hard	ware introduction 4
1.4.	2G/3G/4G Band5
2. Product Fu	nctions 6
2.1. Insta	ll procedure
2.2. APN	7
2.2.1	Create a VPN client
2.3. Netv	vorking mode
2.3.1	WAN+LAN+4G
2.3.2	2. LAN+LAN+4G9
2.4. Com	mon functions9
2.4.1	4G interface9
	2.4.2. LAN interface10
2.4.2	2.1. DHCP Function
	2.4.3. WAN interface11
	2.4.4. WLAN interface
	2.4.5. Network Diagnosis
	2.4.6. Module Name and Time Zone14
2.5. Basic	Functions15
2.5.1	Web Server Password
2.5.2	2. Restore
2.5.3	8. Upgrade Firmware Version16
2.5.4	. Reset16
3. Web Serve	r17
4. Disclaimer	
5. Updated H	istory



# 1. Overview





# 1.1. Brief introduction

MEM-G86 Industrial 4G LTE router supports WAN, LAN, WLAN and 4G interface. User can access to 3G/4G network by WLAN interface or Ethernet interface.

# 1.2. Product feature

- 1 wired LAN ports, 1 wired WAN ports (WAN ports can be switched to LAN ports).
- 2.4G WIFI wireless 802.11 b/g/n
- LED communication indicators
- Configure device by webpage
- Support one button to restore factory settings.
- The wired net ports support 10/100Mbps rate.
- Support VPN Client (PPTP/L2TP/IPSEC/GRE/OPENVPN/SSTP) and supports VPN encryption and static IP functions.
- Support APN automatic checking network, 2/3/4G system switching, SIM information display, support APN/VPDN special network card.
- Support for wired wireless multi network simultaneous online and multi network intelligent switching backup function.
- Support remote upgrade and remote monitoring.
- Support Dynamic Domain Name System (DDNS), Static Routing, PPPOE, DHCP, Static IP Function



- Support mandatory portal (WIFIDOG), this function needs to be customized accodeing to customer needs.
- Support the firewall, NAT, DMZ host, access control black-and-white list, IP speed limit, NTP, MAC speed limit.
- Support SMS AT command
- Support external hardware watchdog design to ensure system stability.

# 1.3. Hardware introduction



Figure 1 LED

LED	Function			
RSSI	The more green LEDs lighten, the signal is stronger.			
2G	2G:On 3G:Off	2G network accessing		
	2G:Off 3G:On	3G network accessing		
3G	2G:On 3G:On	4G network accessing		
WLAN	On: Wi-Fi enabled	Off: Wi-Fi disabled		
LAN	Blink: LAN port working	Off: LAN port not working		
WAN	Blink: WAN/LAN port working	Off: WAN/LAN port not working		
PWR	On: Power on	Off: Power off		
Button	FL	inction		
WPS	Re	Reserved		
Reload	Restore d	Restore default settings		

#### **Figure 3 LED functions**





**Figure 4 Interface** 

# 1.4. 2G/3G/4G Band

MEM-G86 has different band model to support different area. To check if the MEM-G86 works in specific country, please check which 3G/4G technology and band is used in this country and operator. Then please contrast our form of different model.

Model	Carrier/Region	2G/3G/4G Bands
	Europe/International (EMEA, Korea Thailand,India)	FDD:B1/2/3/5/7/8/20 TDD:B38/40/41
MEM-G86	(HongKong)	HSPA/UMTS: B1/2/5/8 GSM/EDGE: B2/3/5/8
MEM-G86	Southeast Asia	FDD:B1/2/3/5/7/8/20 TDD:B38/40/41
		HSPA/UMTS: B1/2/5/8 GSM/EDGE: B2/3/5/8
	Australia	FDD:B1/2/3/5/7/8/28
MEM-G86AU	Taiwan	TDD:B38/40/41
	New Zeland	HSPA/UMTS: B1/2/5/8
	Latin America	GSM/EDGE: B2/3/5/8
MEM-G86-A	AT&T,T-Mobile/North America	FDD:B2/4/12 WCDM:B2/4/5



# 2. Product Functions

This chapter introduces the functions of MEM-G86, as the following diagram shown, you can get an overall knowledge of it.





# 2.1. Install procedure

- Connect the 4G antenna and Wi-Fi antenna to the router. (Longer one is 3G/4G antenna and Shorter one is Wi-Fi antenna.)
- Plug the SIM card in socket.
- Power on the module by power adaptor and check the LED status.
- Connect PC or mobile to the MEM-G86 router via LAN interface or Wi-Fi interface.
- Log in Web Server of router. (Default IP address of router is 192.168.1.1, either the username and password is "root".)
- Configure APN parameters according to SIM card. Some SIM card APN can be recognized automatically.(Network->APNSET)
- Configure other parameters according to user applications.



# 2.2. APN

APN configuration by Web Server as follow:

	APN Settings
> Status	Settings for APN address, username and password, if you goning to use an APN card, please fill in the form correctly
> Services	Configuration
✓ Network	
Interfaces	APN LTE Config SIM Info
APNSET	APNAddress CMIOTAHC.BJ
Wifi DHCP and DNS	Username
Hostnames	Password
Static Routes	AuthType PAP •
Diagnostics QoS	Check Registered 30 (Seconds)
> Firewall	WAN Priority wanfirst
PhyMode	Reference Mode Custom •
> System > Logout	Reference Address(Can only enter the IP)
	N N
	Save & Apply

Figure 13 APN configuration

To choose the network type, please configure the LTE configuration.

Mode(Please Select 2/3/4G,When selecting	AUTO 🔻	
uto, default 4G>3G>2G)		
Priority(When selecting	AUTO 🔻	
uto, default 4G>3G>2G)		

Figure 14 LTE configuration



## 2.2.1. Create a VPN client



User can set VPN client configuration by Web Server as follow:

# 2.3. Networking mode

#### 2.3.1. WAN+LAN+4G

In this networking mode, user can access internet through WAN interface and 4G interface. WAN interface has higher priority than 4G interface to ensure communication and save 4G flows. When WAN interface occurs problems, router can change to 4G interface to connect internet. In this mode, user can also connect to router through WIFI.

To achieve this mode, user don't need to change the router's parameters. Just connect the cable to router and insert SIM card, then power the router.



#### Figure 16 WAN+LAN+4G networking



### 2.3.2. LAN+LAN+4G

In this networking mode, two devices can connect to router through LAN and access the Internet by 4G network. User can achieve this by Web Server as follow:

	Phy Mode
Ctatue	Setting the Work Mode of Ethernet Port 1(WAN/LAN);Restart to take effect!
> Services	Configuration
> Network	Connymouth
> Firewall	Mode of Ethernet Port 1
✓ PhyMode	WAN/LAN LAN •
Setup_phymode	
> System	
> Logout	Save & Apply



LAN PC1 IPAD PC2

# 2.4. Common functions

#### 2.4.1. 4G interface

MEM-G86 supports one 4G interface to access internet. Functional diagram as follow:

Application diagram as follow:







User can configure 4G interface by Web Server as follow:

MEM-G86	Interfaces	Interfaces			
	Interface Overview	Interface Overview			
Status	Network	Status	Actions		
Services	12	1	2 Connect Step		
Network	58 pptp-12	RX: 0.00 B (0 Picts.) TX: 0.00 B (0 Picts.)	🗭 Edit 🧯 Delete		
APNSET		Uptime: 0h 24m 58s			
IPSECSET	2# (2***)	RX: 646.60 K8 (74.99 PMts) TX: 784.10 KB (3575 Pkts) IPv4: 192.168.1.1/24 IPv4: 192.168.1.1/24	Connect Stop		
Wifi	br-lan		🗹 Edit 🧧 Delete		
DHCP and DNS	WAN,4G	Uptime: Oh Om Os	St Connect A Stor		
Hostnames Static Routes	all, eth1	MAC-Address: 60:A0:C5:00:00:00 RX: 10.45 KB (114 Pkts.) TX: 15.70 KB (144 Pkts.)	g Edt		
Diagnostics	WAN_WIRED	Uptime: On Om Os	S Connect Stop		
QoS	27 eth0.2	MAC-Address: D8/80/4C/D1/21/C1 RX: 0.00 B (0 Pkts.)	Z Edit Belete		
Firewall		TAL AVENUE AD (240 Late)			

#### Figure 20 4G interface

### 2.4.2. LAN interface

G86 supports two LAN interface (one is WAN/LAN interface).

Default settings: One LAN interface (WAN/LAN used as WAN interface; IP address: 192.168.1.1; Subnet mask: 255.255.255.0; Open DHCP function).

User can configure LAN interface by Web Server as follow:



MEM-G86	Interfaces		
> Status	Interface Overview	N	
> Services	Network	Status	Actions
Network  Interfaces  APNSET	12 Pptp-12	<b>RX</b> : 0.00 B (0 Pkts.) <b>TX</b> : 0.00 B (0 Pkts.)	<pre>   Connect</pre>
IPSECSET Wifi DHCP and DNS	LAN 愛 <sup>p</sup> (空声魚) br-lan	Uptime: 0h 30m 18s MAC-Address: D8:80:4C:D1:21:C1 RX: 799.38 KB (9006 Pkts.) TX: 1.13 MB (4725 Pkts.) IPvd: 192.168.1.1/24 IPvd: FD82:408:C8:B0:00:00:1/60	<pre>@ Connect @ Stop  @ Edit</pre>
Hostnames Static Routes Diagnostics	WAN_4G	Uptime: 0h 0m 0s MAC-Address: 00:A0:C6:00:00:00 RX: 0.00 B (0 Pkts.) TX: 530.00 B (3 Pkts.)	Connect Stop       Connect       C       Edit       Delete
QoS > Firewall	WAN_WIRED	Uptime: 0h 0m 0s MAC-Address: 08:80:4C:D1:21:C1 RX: 0.00 B (0 Pkts.) TX: 208.78 KB (658 Pkts.)	<pre>   Connect   Stop   Connect   Delete </pre>

#### Figure 21 LAN interface

#### 2.4.2.1. DHCP Function

DHCP default range of distribution is from 192.168.1.100 to 192.168.1.250 and default address lease time is 12 hours. Address range and lease time can be changed.

After you enter Web Server LAN interface, you can find 'DHCP Server' on Web Server as follow:

MEM-G86		
DHCP Server		
General Setup		
Ignore interface	Disable DHCP	for this interface.
Start	100	
Start	Lowest leased add	Iress as offset from the network address.
Limit	150	
	Maximum number	of leased addresses.
Leasetime	12h	
	Expiry time of lease	ed addresses, minimum is 2 minutes (2m).
		Save & Apply



#### 2.4.3. WAN interface

G86 supports one WAN interface and WAN interface can switch between WAN/LAN interface. WAN interface supports DHCP and Static IP, and default setting is DHCP

User can configure WAN interface by Web Server as follow:



<u>^</u>	Interface Overview		
	Network	Status	Actions
	12	BV 0.00 B (0.01+ )	🖉 Connect 🛛 🕲 Stop
	pptp-12	TX: 0.00 B (0 Pkts.)	🗭 Edit 🧰 Delete
	LAN	Uptime: 0h 34m 42s	
	br-lan	TX:         1.38 MB (5445 Pkts.)           IPv4:         192.168.1.1/24	<ul> <li>Connect</li> <li>Stop</li> <li>Edit</li> <li>Delete</li> </ul>
	WAN 4G	Uptime: 0h 0m 0s	
	eth1	MAC-Address: 00:A0:C6:00:00:00 RX: 0.00 B (0 Pkts.) TX: 530.00 B (3 Pkts.)	Connect   Stop     Edit   Delete
	WAN_WIRED	Uptime: Oh Om Os	🥂 Connect 🛛 👰 Ston
	eth0.2	MAC-Address: D8:B0:4C:D1:21:C1 RX: 0.00 B (0 Pkts.)	Edit
	6002	IX: 239.25 KB (755 Pkts.)	
	🔂 Add new interface		

Figure 23 WAN interface

#### 2.4.4. WLAN interface

G86 supports at most 24 STA device connection.

Default parameters as follows:

SSID	MEM-G86-XXXX(XXXX is MAC)
Channel	Auto
Bandwidth	40MHz
Encryption Mode	WPA2-PSK

#### Figure 24 WALN default parameters

#### WLAN interface on Web Server as follow:

MEM-G86	Wireless Overview	
> Status	802.11 b/g/n Wireless Controller	🔂 Add
Services	Channel: 10   Bitrate: 150 Mbit/s	
✓ Network	SSID: MEM-G86-21C1   Mode: Master BSSID: D8:B0:4C:D1:21:C0   Encryption: -	🗹 Edit 🛛 🛅 Remove
Interfaces		
APNSET		
IPSECSET		
Wifi		
DHCP and DNS		
Hostnames		
Static Routes		
Diagnostics		
QoS		
Firewall		

#### Figure 25 WLAN interface

After clicking "Edit" and entering WLAN interface configuration web, user can change follow parameters.

User can configure SSID on Web Server as follow:

MEM-G86	
	Interface Configuration
Status	General Setup Wireless Security
lervices	ESSID MEM-G86-21C1
ork	
wall	Mode Access Point *
hyMode	Network 🕢 Ian: 💯 👷
em	🔲 wan_4g: 🦉
ut	wan_wired: 📰
	Choose the network(s) you want to attach to this wireless interface or fill out the create field to define a new network.
	Hide ESSID
	Save & Apply

Figure 26 Configure SSID

#### User can configure password on Web Server as follow:

	Radio on/off	on <b>v</b>
INIEINI-080	Network Mode	802.11b/g/n 💌
> Status	Channel	auto 🔻
> Services	Band Width	40MHz •
> Network		
> Firewall	Interface Configuration	
> PhyMode	Congred Fotun	Country
> System	General Setup	
> Logout	Encryption	WPA2-PSK T
	Cipher	Force CCMP (AES)
	Кеу	
		Save & Apply

#### Figure 27 Configure password

#### Other settings on Web Server as follow:

IEM-G86	Master * MEM - G86-21C1 * (ra0)
Status     Services     The Device Configuration     are shared among all defit mode are grouped in the	section covers physical settings of the radio hardware such as channel, transmit power or antenna selection which ned wireless networks (if the radio hardware is multi-SSID capable). Per network settings like encryption or operation Interface Configuration.
Network Device Configuration	
> PhyMode Adva	nced Settings
> System Statu > Logout	s Mode: Master   SSID: MEM -686-21C1 BSSID: D8:80:4C:D1:21:C0 Channel: 10   Bitrate: 150.0 Mbit/s
Radio on/of	ff on •
Network Mod	e 802.11b/g/n •
Channe	al auto 🔻
Band Widtl	h 40MHz V

#### Figure 28 Other settings

User can close WLAN interface by changing 'Radio on/off' into off.



#### 2.4.5. Network Diagnosis

MEM C96	<u>^</u>				
MEM-GOO		Diagnostics			
Status		Network Utilities			
> Services					
<ul> <li>Vetwork</li> </ul>		IPv4 🔻 🔟 Ping	I Traceroute	Nslookup	
Interfaces					
APNSET					
IPSECSET					
Wifi					
DHCP and DNS					
Hostnames					
Static Routes					
Diagnostics					
QoS					
> Firewall					

User can use network diagnosis function by Web Server as follow:

Figure 29 Network diagnosis

- > Ping: User can do PING test to a specific address in G86.
- > Traceroute: Can acquire routing path to visit a specific address.
- Nslookup: Can analyse DNS into IP address

#### 2.4.6. Module Name and Time Zone

G86 default module name is MEM-G86 and default Time Zone is Beijing time zone.

User can configure module name and Time Zone by Web Server as follow:

MEM-G86	System
) Status	Here you can configure the basic aspects of your device like its hostname or the timezone.
> Services	System Properties
> Network	
> Firewall	General Settings Logging Language and Style
> PhyMode	Local Time Fri Aug 4 17:20:23 2017 📵 Sync with browser
∨ System	Hesterne MEM-696
System	
Administration	Timezone Asia/Beijing 🔻
Scheduled Tasks	
Backup / Flash Firmware	Time Synchronization
Reboot	Time Synemonization
> Logout	Enable NTP client 🛛
	Provide NTP server





# 2.5. Basic Functions

#### 2.5.1. Web Server Password

Default password is root, this password is used to enter Web Server

User can change password by Web Server as follow:

	Changes the administrator password for acce	ssing the device
Status		Sang the device
ervices		
Network	Password	22
Firewall	Confirmation	8
hyMode		
System		
System		Save & Apply
ministration		
duled Tasks		
) / Flash Firmware		
t		
gout		



#### 2.5.2. Restore

Hardware restore: Press Reload button over 5 seconds and release, G806 will restore default settings and reset.

User can restore default settings by Web Server as follow:

MEM-G86	Flash operations
> Status	Actions
<ul> <li>&gt; Services</li> <li>&gt; Network</li> </ul>	Backup / Restore
> Firewall	Click "Generate archive" to download a tar archive of the current configuration files. To reset the firmware to its initial state, click "Perform reset".
> PhyMode <ul> <li>System</li> </ul>	Download backup: I Generate archive Reset to defaults: Perform
Administration	To restore configuration files, you can upload a previously generated backup archive here.
Scheduled Tasks Backup / Flash Firmware Reboot	Restore backup:
> Logout	Flash new firmware image Upload a proper image here to replace the running firmware. Check "Keep settings" to retain the current configuration. Keep settings:





## 2.5.3. Upgrade Firmware Version

Upgrade by Web Server as follow:

MFM-G86	Backup / Restore
	Click "Generate archive" to download a tar archive of the current configuration files. To reset the firmware to its initial state, click "Perform reset".
> Status	Download backup: 🔲 Generate archive
> Services	Beset to defaults:
> Network	
> Firewall	To restore configuration files, you can upload a previously generated backup archive here.
> PhyMode	Restore backup: 选择文件 未选择任何文件 🔲 Upload archive
∨ System	Choose firmware file
System	
Administration	Flash new firmware image
Scheduled Tasks	Upload a proper image here to replace the running firmware. Check "Keep settings" to retain the current configuration.
Backup / Flash Firmware	Keep settings:
Reboot	Image: 选择文件 未选择任何文件 II Flash image
N 10 10 10 10 10 10 10 10 10 10 10 10 10	

#### Figure 33 Upgrade firmware version

Note:

- > The whole upgrade process will last about 1 minute, user can enter Web Server after about 1 minute.
- User can choose saving settings.
- ▶ User should keep powering up and LAN/WIFI connection during the whole upgrade process.

#### 2.5.4. Reset

Reset time is about 40~60 seconds. Reset by Web Server as follow:

	<u>.</u>
	Status
>	Services
>	Network
>	Firewall
>	PhyMode
	✓ System
	System
	Administration
	Scheduled Tasks
	Backup / Flash Firmware
	Reboot
>	Logout

#### Figure 34 Reset module



# 3. Web Server

When user need to configure the G86, user can connect PC to USR-G86 through LAN interface or WLAN, then open Web Server

Default parameters of G86 as follows:

SSID	MEM-G86-XXXX
IP Address	192.168.1.1
User name	root
Password	root

#### Figure 35 Default parameters

Take default parameters as example: User can connect PC to SSID USR-G806-XXXX. Then open browser and enter 192.168.1.1, log in with User name and Password(both are root), user can enter Web Server.

Authorization Required
Please enter your username and password.
Username: root
Password:
Login Reset

#### Figure 36 Web Server login web

User can change the language between Chinese/English in the top right corner.

# 4. Disclaimer

This document provides the information of MEM-G86 products, it hasn't been granted any intellectual property license by forbidding speak or other ways either explicitly or implicitly. Except the duty declared in sales terms and conditions, we don't take any other responsibilities. We don't warrant the products sales and use explicitly or implicitly, including particular purpose merchant-ability and marketability, the tort liability of any other patent right, copyright, intellectual property right. We may modify specification and description at any time without prior notice.



# **5. Updated History**

2017-08-02 V1.0.4.1 established based on Chinese version V1.0.4.

2017-11-09 V1.0.4.2 updated. Modified some words to standards and corrected spelling/grammatical mistakes.

Optimized whole manual arrangement. Changed related pictures to new G86 pictures.

2018-01-05 V1.0.4.3 updated. Changed related pictures to normal G86 version pictures.

Optimized whole manual

arrangement. Divided G86 user manual into normal version and G86 version.

2019-06-10 V1.0.4.4 updated. Modify band frequency.