



User Guide

H30

Product Overview

■ 1.1 Production profile.

Vehicle 4G Dual band router H-30 is a multi-purpose router product for industry applications. Powerful processing capabilities, rich wireless resources, and stable performance enable it to meet a variety of scenarios in the industry.

■ 1.2 Features and Specification.

◆ 1.2.1 Features

Processor model and capabilities :

- ◆ CPU : QCA9531 , Frequency 650MHz
- ◆ 2.4G : Speed 300Mbps
- ◆ 5G: MiNi-PCIE interface to expansion.

Memory :

- ◆ Memory : DDR2 512Mbit 64MB
- ◆ Flash : SPI 128Mbit 16MB

Interface

- ◆ 5 x 100Mbps RJ45 Port 1WAN+4LAN
- ◆ 1 x UART interface, including : RS232/RS485 signal
- ◆ 1 x DC Charge interface , MAX 36V
- ◆ 1 x Default button
- ◆ 1 x Built in mini-PCIE interface, connect 4G modules
- ◆ 1 x Built in mini-PCIE interface, connect 5G wifi module
- ◆ 10 x LED status indicator.

Firmware

- ◆ Support OpenWrt
- ◆ Support Management online (customization)

◆ 1.2.2 Specification

- Support IEEE802.3b/ IEEE802.3g/ IEEE802.3n/ IEEE802.3a/ IEEE802.3ac/ IEEE802.3u/ IEEE802.3 Standard
- Support TCP/IP、DHCP、ICMP protocol
- Support auto-negotiation and auto MID/MIDX
- Support Status indicators. 12V-36V/ 1A DC input
- Working temperature : -20°C- 80°C
- Humidity : 10% - 95%, RH non-condensing

Hardware

■ 2.1 Panel Layout

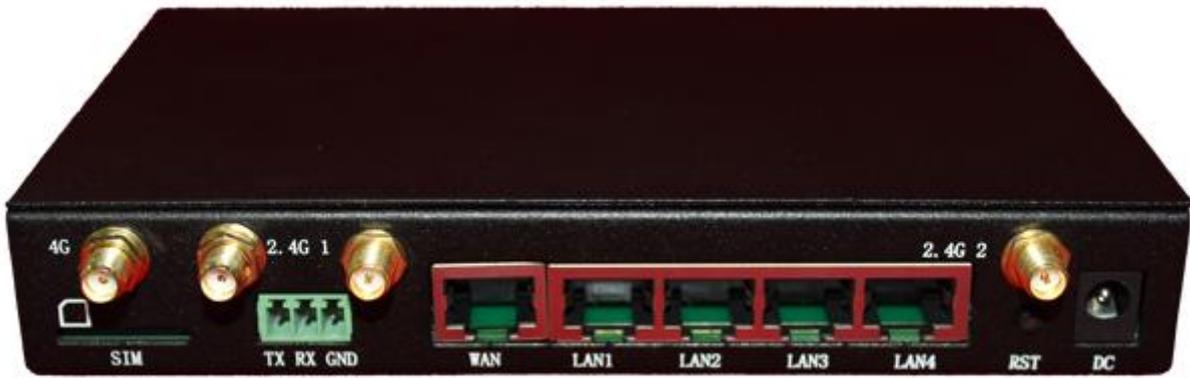
◆ 2.1.1 Front panel



Picture 2-1 Front panel

Indicators	Description	Function
Power	Power LED	Keep on-Power in Keep off-No power
System	System indicator	Flash slowly-Running well.
Signal	4G Signal indicator	Keep on- Strong Signal Flash slowly-Weak Signal
Cell	Network indicator	Keep on-4G Network connected Flash slowly-3G Network connected Keep off-No Network
WLAN	WIFI indicator	Keep off-not enable wifi Flash-Enable WIFI
LAN1-LAN4	Lan indicator	Keep on-The relevant port connected Keep off-The relevant port not connected Flash-Data transmission on relevant port

◆ 2.1.2 Back Panel



Picture 2-2 Back Panel

Port	Description	Function
SIM	Sim slot	Insert sim card
UART	UART interface	RS232 or RS485 signal is optional
WAN	WAN Port (RJ45)	Connect to the WAN device, data exchange with the internet
LAN1-LAN4	LAN Port (RJ45)	Connect to the devices in the LAN, such as HUB, switches or PC
RST	RESET Button	Reset to factory default settings
DC	Power Port	Connect Power Adapter.
4G	2 External omni antenna port (5dbi)	Transceiver 4g signal
2.4G	2 external omni antenna port (5dbi)	Transceiver 2.4G wifi signal

■ 2.2 Reset

If you want to rest to the factory default settings, please refer to below steps

- 1) Connect Power adapter
- 2) When device works normally, press the reset button for 5 seconds
- 3) After 5 seconds release it, all routers' LED indicator goes off and then on again, wait until it works normally.

NOTES : Please do not cut off power, before finishing all steps. Or it will fail to reset factory default settings.

■ 2.3 System Requirement

- Network card and Ethernet cable ;
- TCP/IP net software (Windows XP/7/8/10 pre-installed) ;
- Internet Explorer/Chrome/Firefox etc browser ;

■ 2.4 Install Condition

When you install the router, please refer the below

- Put the device horizontally
- Keep away from any heat device
- Do not put it in some place which is too dirty or too humidity.

NOTE : The environment will effect the transfer distance , recommend using environment: Temperature: -20°C~80°C ,Humidity: 10%~95% RH

TCP/IP Configuration

Before using the device, you need to configure the network correctly, this manual is based on the Windows XP, the IP of the device is 192.168.1.1 , subnet mask is 255.255.255.0 . Firstly, connect your PC to the LAN port, and then you can configure the IP of your PC in 2 ways:

Method 1、 Set IP Address Manually

Set the IP address as 192.168.1.xxx (xxx belongs to range 2-254) , subnet mask is 255.255.255.0; Default gateway is 192.168.1.1 , DNS server is 192.168.1.1.

Method 2、 Auto set the IP by the DHCP server.

Set the TCP/IP to "automatically get IP address" , after setting , you could use "Ping command" to check if the device has connected to PC. For example, in Windows xp, run the cmd.exe , and then enter ping 192.168.1.1 If the screen shows as below, means OK, the device connected to the PC.

```
Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time<10ms TTL=64

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

If it shows as below, it means fail

```
Pinging 192.168.1.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

If fail, please check follow below steps :

1) : If the hardware connect in right way ?

>>The relevant led to the PC and Network card led must be on

2) : If your PC' s TCP/IP sets right

>> if IP of device is 192.168.1.1, your PC' s IP must be 192.168.1.xxx
(xxx should be 2~253), and default gateway is 192.168.1.1

Configuration Guide

■ 4.1 Start and Login

The router provide the UI based on IE explorer, this solution could work on any MS Windows, Macintosh or UNIX system . Run the browser, unabled the VPN (if the VPN is working) , and then input "http://192.168.1.1" in browser. After doing that, you will see the login page, you should enter it as the administrator, which means you should enter the username: root /Password: admin , and then click the "log in" button.

用户名

密码

Powered by LuCI 0.11.1 Release (0.11.1) QSDK AOP147 QCA9531

Picture 4-1 login interface

After login, the browser will show as picture 4-2 . There are several tag, such as Status, system, service, network, logout, click someone, you could configure relevant function settings.

路由型号	Qualcomm Atheros AP147 reference board
固件版本	QSDK AOP147 QCA9531 / LuCI 0.11.1 Release (0.11.1)
内核版本	3.3.8
本地时间	Thu Sep 7 09:49:02 2017
运行时间	0h 4m 21s
平均负载	0.25, 0.38, 0.18

内存	
可用数	
空闲数	
已缓存	
已缓冲	

Picture 4-2

■ 4.2 Status

◆ 4.2.1 Overview

Click Status - Overview You could check the running information, including system information, Memory, network, DHCP leases, wireless and associate stations, as 4.2.1

Picture 4.2.1 status

- System : System name , Router model , Firmware version , Kernel version , Local time , Uptime and Load average.
- Memory : Total available , Free, Caches, Buffered.
- Network : Signal strength , Network mode , Network connection status.
- DHCP Leases : Show the IP address ,MAC, and the Lease time.
- Wireless : Wireless status , will included SSID, Mode, Work Channel, Bitrates,the MAC of the wireless interface , the Encryption of the transmission.
- Associate : Shows the status of all the device connect to the router via Wireless.

◆ 4.2.2 Firewall

Click Status - firewall, you could check the firewall status of the device

表: Filter

链 INPUT (策略: ACCEPT, 数据包: 0, 流量: 0.00 B)										
规则 #	数据包	流量	目标	协议	标识	入口	出口	源地址	目标地址	选项
1	650	75.46 KB	ACCEPT	all	--	*	*	0.0.0.0/0	0.0.0.0/0	ctstate RELATED,ESTABLISHED
2	56	3.72 KB	ACCEPT	all	--	lo	*	0.0.0.0/0	0.0.0.0/0	-
3	98	4.98 KB	syn_flood	tcp	--	*	*	0.0.0.0/0	0.0.0.0/0	tcp flags:0x17/0x02
4	818	60.93 KB	input_rule	all	--	*	*	0.0.0.0/0	0.0.0.0/0	-
5	818	60.93 KB	input	all	--	*	*	0.0.0.0/0	0.0.0.0/0	-

链 FORWARD (策略: DROP, 数据包: 0, 流量: 0.00 B)

Picture 4.2.2

◆ 4.2.3 Routing List

Click the status-routes, you could check the current routing list of the device, including ARP and Active Ipv4-Routes, refer to picture 4.2.3

ARP

IPv4 地址	MAC 地址	接口
192.168.1.10	14:cf:92:d5:82:7d	br-lan
10.172.122.162	00:a0:c6:00:00:01	wwan0

活动的IPv4-链路

网络	目标	IPv4-网关	跃点数
wan	0.0.0.0/0	10.172.122.162	0
wan	10.172.122.160/30	0.0.0.0	0
lan	192.168.1.0/24	0.0.0.0	0

Picture 4.2.3

◆ 4.2.4 System Log

Click Status-System log, you can check running status and operation history, refer to picture 4.2.4

```
Sep 7 01:40:24 Harvilon kern.warn kernel: [ 34.220000] Scan in progress.. Cancelling it
Sep 7 01:40:24 Harvilon kern.info kernel: [ 34.320000] br-lan: port 3(ath0) entered disabled state
Sep 7 01:40:24 Harvilon kern.warn kernel: [ 34.320000] DEVICE IS DOWN ifname=ath0
Sep 7 01:40:24 Harvilon kern.warn kernel: [ 34.330000] DEVICE IS DOWN ifname=ath0
Sep 7 01:40:24 Harvilon kern.info kernel: [ 34.720000] br-lan: port 3(ath0) entered forwarding state
Sep 7 01:40:24 Harvilon kern.info kernel: [ 34.730000] br-lan: port 3(ath0) entered forwarding state
Sep 7 01:40:24 Harvilon kern.info kernel: [ 34.740000] 8021q: adding VLAN 0 to HW filter on device ath0
Sep 7 01:40:25 Harvilon daemon.err watchquagga[1241]: Forked background command [pid 1416]: /usr/sbin/quagga.init watchrestart zebra
Sep 7 01:40:25 Harvilon user.info sysinit: Loading defaults
Sep 7 01:40:25 Harvilon daemon.warn watchquagga[1241]: restart zebra process 1416 exited with non-zero status 2
Sep 7 01:40:26 Harvilon user.info sysinit: Loading synflood protection
Sep 7 01:40:26 Harvilon user.info sysinit: Adding custom chains
Sep 7 01:40:26 Harvilon kern.info kernel: [ 36.730000] br-lan: port 3(ath0) entered forwarding state
Sep 7 01:40:27 Harvilon user.info sysinit: Loading zones
Sep 7 01:40:28 Harvilon user.info sysinit: Loading forwardings
Sep 7 01:40:28 Harvilon user.info sysinit: Loading rules
Sep 7 01:40:28 Harvilon user.info sysinit: Loading redirects
Sep 7 01:40:28 Harvilon user.info sysinit: Loading includes
Sep 7 01:40:28 Harvilon user.info sysinit: Optimizing conntrack
Sep 7 01:40:28 Harvilon user.info sysinit: Loading interfaces
Sep 7 01:40:29 Harvilon user.info firewall: adding lan (br-lan) to zone lan
Sep 7 01:40:30 Harvilon authpriv.info dropbear[1675]: Running in background
Sep 7 01:40:33 Harvilon user.notice dnsmasq: DNS rebinding protection is active, will discard upstream RFC1918 responses!
Sep 7 01:40:33 Harvilon user.notice dnsmasq: Allowing 127.0.0.0/8 responses
Sep 7 01:40:36 Harvilon daemon.info dnsmasq[1813]: started, version 2.62 cachesize 150
Sep 7 01:40:36 Harvilon daemon.info dnsmasq[1813]: compile time options: IPv6 GNU-getopt no-DBus no-i18n no-IDN DHCP DHCPv6 no-Lua TFTP no-contract
Sep 7 01:40:36 Harvilon daemon.info dnsmasq-dhcp[1813]: DHCP, IP range 192.168.1.100 - 192.168.1.249, lease time 12h
Sep 7 01:40:36 Harvilon daemon.info dnsmasq[1813]: using local addresses only for domain lan
Sep 7 01:40:36 Harvilon daemon.warn dnsmasq[1813]: no servers found in /tmp/resolv.conf.auto, will retry
Sep 7 01:40:36 Harvilon daemon.info dnsmasq[1813]: read /etc/hosts - 1 addresses
```

Picture 4.2.4

◆ 4.2.5 Kernel Log

Click Status - Kernel Log , you could check some information about device system activity. Picture 4.2.5

```
[ 0.000000] Linux version 3.3.8 (rd@ubuntu) (gcc version 4.6.3 20120201 (prerelease) (Linaro GCC 4.6-2012.02) ) #3 Wed Sep 6 06:48:04 PDT 2017
[ 0.000000] MyLoader: sysp=0000ffff, boardp=0000ffff, parts=0000ffff
[ 0.000000] bootconsole [early0] enabled
[ 0.000000] CPU revision is: 00019374 (MIPS 24Kc)
[ 0.000000] SoC: Qualcomm Atheros QCA9531 rev 2
[ 0.000000] Clocks: CPU:550.000MHz, DDR:400.000MHz, AHB:200.000MHz, Ref:25.000MHz
[ 0.000000] Determined physical RAM map:
[ 0.000000] memory: 04000000 @ 00000000 (usable)
[ 0.000000] Initrd not found or empty - disabling initrd
[ 0.000000] Zone PFN ranges:
[ 0.000000] Normal 0x00000000 -> 0x00004000
[ 0.000000] Movable zone start PFN for each node
[ 0.000000] Early memory PFN ranges
[ 0.000000] 0: 0x00000000 -> 0x00004000
[ 0.000000] On node 0 totalpages: 16384
[ 0.000000] free_area_init_node: node 0, pgdat 80337360, node_mem_map 81000000
[ 0.000000] Normal zone: 128 pages used for memmap
[ 0.000000] Normal zone: 0 pages reserved
[ 0.000000] Normal zone: 16256 pages, LIFO batch:3
[ 0.000000] pcpu-alloc: s0 r0 d32768 u32768 alloc=1*32768
[ 0.000000] pcpu-alloc: [0] 0
[ 0.000000] Built 1 zonelists in Zone order, mobility grouping on. Total pages: 16256
[ 0.000000] Kernel command line: board=AP147 console=ttyS0,115200 mtdparts=spi0.0:256k(u-boot)ro,64k(u-boot-env)ro,14528k(rootfs),1472k(kernel),64k(art)
[ 0.000000] PID hash table entries: 256 (order: -2, 1024 bytes)
[ 0.000000] Dentry cache hash table entries: 8192 (order: 3, 32768 bytes)
[ 0.000000] Inode-cache hash table entries: 4096 (order: 2, 16384 bytes)
[ 0.000000] Primary instruction cache 64kB, VIPT, 4-way, linesize 32 bytes.
[ 0.000000] Primary data cache 32kB, 4-way, VIPT, cache aliases, linesize 32 bytes
[ 0.000000] Writing ErrCtl register=00040001
[ 0.000000] Readback ErrCtl register=00040001
```

◆ 4.2.6 Processes

Click Status-Processes, you could check an overview over currently running system processes and their status, including CPU usage, Memory Usage. You could hang up, terminate or even kill the program, depends on your requirements. As Picture 4.2.6

PID	用户名	进程命令	CPU使用率 (%)	内存使用率 (%)	挂起	关闭	强制关闭
1	root	init	0%	2%			
2	root	[kthreadd]	0%	0%			
3	root	[ksoftirqd/0]	0%	0%			
5	root	[kworker/u:0]	0%	0%			
6	root	[khelper]	0%	0%			
7	root	[kworker/u:1]	0%	0%			
20	root	[irq/10-ath79-gp]	0%	0%			
66	root	[sync_supers]	0%	0%			

Picture 4.2.6

◆ 4.2.7 Realtime Graphs

Click Status-Realtime Graphs ,you could check the load, traffic, wireless and connection of the device. As picture 4.2.7



Picture 4.2.7

■ 4.3 System

◆ 4.3.1 System

Click System-System, you can configure the basic aspects, like Time Synchronization, Local time, Hostname, Timezone and so on. As picture 4.3.1

时间同步

启用NTP客户端

NTP服务器

候选NTP服务器

0.openwrt.pool.ntp.org	
1.openwrt.pool.ntp.org	

Picture 4.3.1

◆ 4.3.2 System - Administration

You can edit the administrator password for accessing the device. as picture 4.3.2

密码

确认密码

SSH

Dropbear

Dropbear设置

接口

lan: 

wan: 

未指定

 监听指定的接口；未指定则监听全部

删除

◆ 4.3.3 Software

Click software page, download and install the package , do not operate it without a professional engineer.

◆ 4.3.4 Startup

Click to Startup page, You can enable or disable installed init scripts here. Changes will applied after a device reboot, do not operate it without a professional engineer

◆ 4.3.5 Schedule Tasks

This is the system crontab in which scheduled tasks can be defined. do not operate it without a professional engineer

◆ 4.3.6 Mount Points, LED Configuration

Do some edition about the system , do not operate it without professional engineer

◆ 4.3.7 Backup/Flash Firmware

You could upgrde the firmware or backup it in this page, as below Picture 4.3.7



Picture 4.3.7

- **Backup/Restore:** You can backup, reset to default and upload backup. Click "Generate Archive" button to download a tar archive of the current configuration files; click "Perform reset" to reset the firmware to its initial state. Restore Backup, click Browsing to upload configuration files to set device quickly as your requirement.
- **Flash New Firmware :** Click Browsing, select correct firmware, click Flash image to upgrade firmware.

◆ 4.3.8 Reboot

When click the Reboot tag, the device will reboot.

■ 4.4 Network

◆ 4.4.1 Interface

Click Network-Interface, you could check the wired port' s status and configuration. As picture 4.4.1



网络	状态	动作
LAN br-lan	运行时间: 0h 19m 22s MAC-地址: F2:EF:B1:43:AB:35 接收: 435.56 KB (4796 数据包) 发送: 964.80 KB (1705 数据包) IPv4: 192.168.1.1/24	连接 关闭 修改 删除
WAN wwan0	运行时间: 0h 18m 55s MAC-地址: 00:A0:C6:00:00:00 接收: 6.98 KB (98 数据包) 发送: 18.01 KB (197 数据包) IPv4: 10.172.122.161/30	连接 关闭 修改 删除

添加新接口...

Powered by LuCI 0.11.1 Release (0.11.1) QSDK AOP147 QCA9531

Picture 4.4.1

- Network : LAN and WAN Port.
- Status : LAN & WAN Ports' information, including Uptime, MAC Address, Rx,Tx, and so on.
- Actions : You can configure LAN and WAN port by actions.
 - Connect : Reconnect ports for refresh
 - Stop : After stopping, the relevant port will not communicate.
 - Edit : Edit configuration of LAN&WAN port, such as WAN port protocol (DHCP client, PPPOE, etc.), LAN port protocol, IP address, subnet mask, etc.

◆ 4.4.2 Wireless

Click the Network-Wifi, you could check the wireless port' s status and and configuration, as picture 4.4.2



Picture 4.4.2

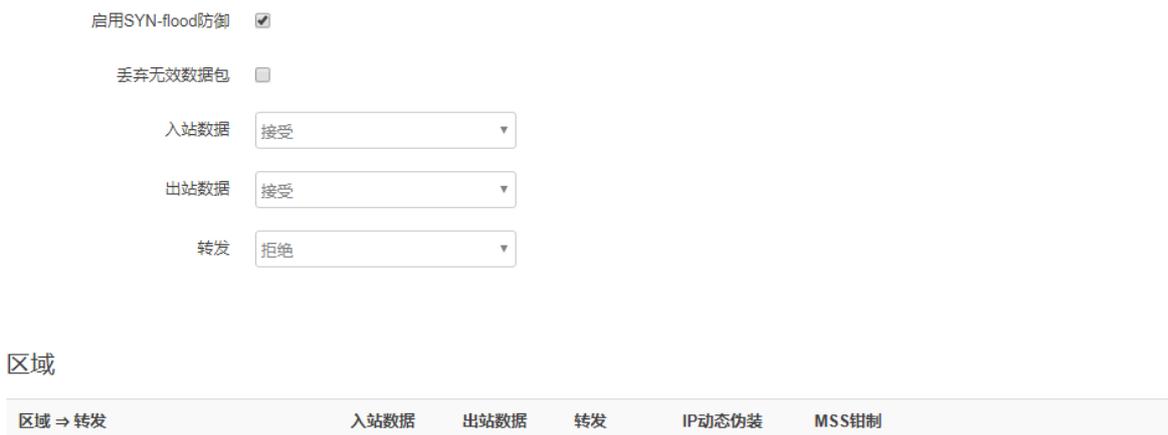
- Disable : stop the wireless function.
- Edit : Edit wireless configuration, such as switch, channel, transmit power, SSID mode etc.

◆ 4.4.3 DHCP/DNS、Hostname、Static Routes、Diagnosis

You could edit settings in relevant pages. do not operate it without a professional engineer.

◆ 4.4.4 Firewall

Select Firewall, you can filter the network devices connected to the router, and manage online behaviors. Refer to picture 4.5.4



Picture 4.5.4

Including Basic setting, Port forwarding, Communication rules, custom rules.

◆ 4.4.5 LTE 4G

Set Network type, PIN code, APN. As below picture.

LTE 4G
LTE allows that your router can be internet via a LTE Module.

LTE

网络类型

PIN

APN

Powered by LuCI 0.11.1 Release (0.11.1) QSDK AOP147 QCA9531

Picture 4.5.5

◆ 4.4.6 QOS

Select firewall, you can sort traffic packets based on network address, port or service

■ 4.5 Logout

Select Logout, you will log out administrator website.

FAQ

1、LAN LED OFF.

It is about the hardware connection issue, you could check follow below steps :

- To check if the Ethernet cable plug into the port firmly
- To check if the network device is power on
- To Make sure if ethernet cable work well.

2、The device work normally after setting . But the link will become unsteady after working some time, such as delay and package dropping.

It means there are some interference in the work environment, you could follow the below steps to solve such problem

- To check if each part of the connection are steady

- If the signal strength are too weak, you can try to change the work channel, in order to reduce the reference ;
 - Reboot the device ;
 - Reset to the factory default setting ;
- After all steps, the problm is still here, pleae contact us freely.

