

Wireless Data Connectivity for Industrial applications

4G Wireless Industrial Router



Provide data wireless access internet acquisition control With AI/DI/DO, supports Modbus to TCP/MQTT/PLC protocol **4G Industrial VPN Router R40**

KING PIGEON



4G Wireless Router User Manual

Ver 1.4

Date Issued: 2021-09-30 King Pigeon Hi-Tech. Co., Ltd.

www.iot-solution.com



Table of contents

1. Descrij	otion	4
1. 1	Brief Introduction	4
1.2	Typically Applications	5
1.3	Safety Directions	9
1.4	Standard Packing List	10
1.5	Main Features	. 10
1.6	Technical Parameters	12
2. Hardw	are Description	
2.1	Size	16
2.2	Indicator light	16
2.3	Reset	17
2.4	SIM Card	17
2.5	Connect External Antenna	. 18
2.6	Router GND	. 18
2.7	Installation	. 19
3. Start u	ρ	
	Switch on	
3.2	System running status	20
3.3	SIM Card Operation	20
3.4	Serial Port Instructions	21
3.5	Digital output Instructions	22
3.6	Digital input Instructions	23
3.7	Analog input Instructions	24
4. Prepai	ation before configuration	
4.1	Wired Connection	25
4.2	Wifi Connection	. 29
4.3.	Factory Default Settings	31
4.4.	Enter Web Settings	31
5. Router	Settings	
5.1	Status	32
5.2.	System	33

KING PIGEON

4G Wireless Industrial Router Wireless Data Connectivity

	5.3.	Service	37
	5.4	Network	42
	5.5	VPN	64
	5.6	Serial Port	69
	5.7	RTU IO	73
	5.8	Logical Operation	78
	5.9	Cloud Platform	79
	5.10	Logout	85
6.	Comr	nunication Protocol	85
	6.1	Modbus RTU Protocol	85
	6.2	MQTT Protocol	96
7.		Command List	
8.	Warr	anty	101

UPGRADE HISTORY

DATE	FIRMWARE VERSION	HARDWARE VERSION	DESCRIPTION
2020.03.13	V 1.0	V 1.0	First edition
2020.09.30	V1.1	V1.0	Modify some configuration instructions
2021.2.25	V1.2	V1.0	Added link to Huawei Cloud IO platform
2021.03.18	V1.3	V1.0	Add device mapping register address from
			64-127 to 64-256
2021.09.30	V1.4	V1.0	(1) MQTT increases the release of only
			changing data;
			(2) Cellular network increase enable switch
			(3) Support MQTT custom release data
			format
			(4) The collection period and response
			timeout time of modbus master station are
			increased
			(5) Cycle timer to increase the start and en
			time and cycle times Settings
			(6) Add LAN/WAN switching function in
			network Settings
			(7) Add mount points and sharing function



Model	Serial Port	WAN	LAN	WIFI	Digital input	Digital output	Analog input	Extend function
R40	1RS485,1RS232	1	3	\checkmark	2	2	х	Modbus slave/MQTT
R40A	1RS485,1RS232	1	3	\checkmark	2	2	х	Modbus master/slave/MQTT
R40B	1RS485,1RS232	1	3	\checkmark	2	2	4	Modbus master/slave/MQTT

1. Description

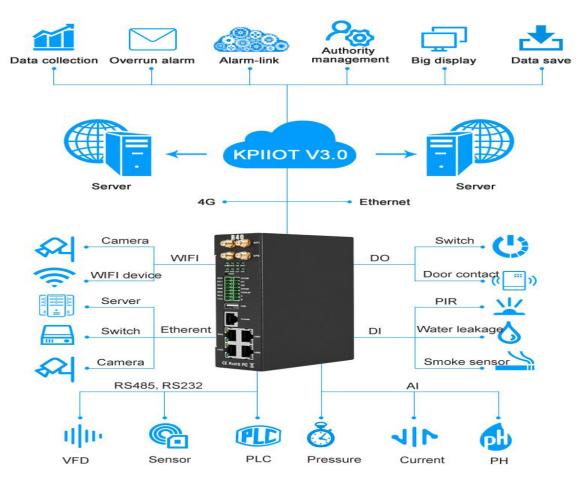
1.1 Brief Introduction

Router industrial router is an industrial IoT high-speed router, compatible with 4G/3.5G/3G/2.5G network, flagship

configuration, VPN link, industrial protection, wide temperature, wide voltage design, easy to set up high speed, stable The wireless transmission network uses the public LTE network to provide users with wireless long-distance data transmission, It is with 4 AI+2DI+2DO for options, can be used in multiple industrial applications.

It is an industrial-grade multifunctional Internet of Things terminal device that supports POE power supply, comes with IO input and output, with 2 serial ports, supports transparent transmission, Modbus Master protocol for expanding IO and connecting PLC and other devices. It adopts dual SIM card redundancy design to ensure stable and reliable data transmission, supports MQTT protocol and Modbus protocol, and is compatible with most PLC protocols, greatly simplifying on-site wiring construction costs and reducing operation and maintenance costs.

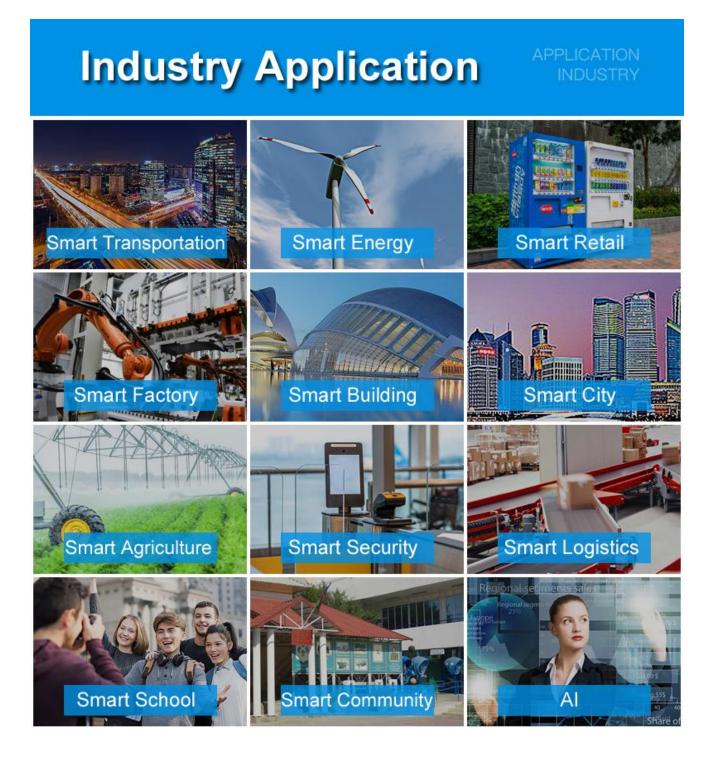
High-performance industrial-grade cellular router adopts 32-bit processor, developed based on Linux system, supports GSM/2G/3G/4G/GPRS/EDGE/WCDMA/HSPA+/LTE network, provides high-speed wireless network bandwidth for the device through wireless connection, and has automatic detection of network disconnection, automatic restart of dial-up failure, and scheduled restart to ensure network Stable connection.





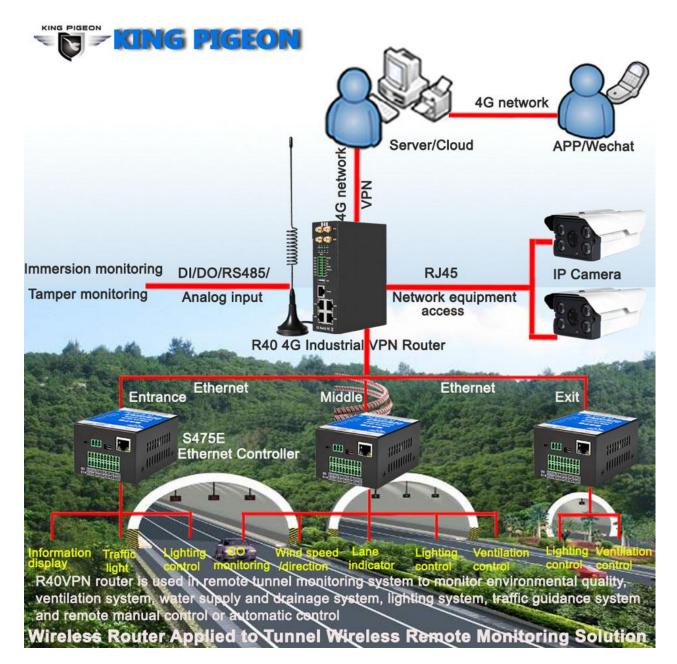
1.2 Typically Applications

BTS Monitoring, Security Alarm System applications, Supervision and monitoring alarm systems, Automatic monitoring system, Vending Machines security protection, Pumping Stations, Tanks, Oil or Water levels, Buildings and Real Estate, Weather Stations, River Monitoring and Flood Control, Oil and gas pipelines, Corrosion protection, Temperatures, water leakage applications, Wellheads, boat, vehicle, Energy saving, street lights control system, Valve controls, Transformer stations, Unmanned machine rooms, Control room application, Automation System, M2M, etc.



1.2.1 Tunnel wireless remote monitoring solution

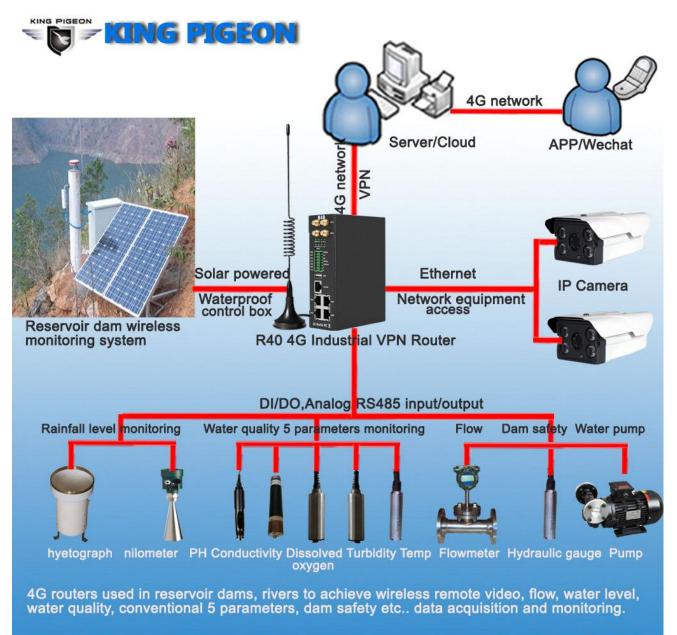
R40 4G industrial VPN wireless router is used in tunnel remote monitoring system to monitor environmental quality, ventilation system, water supply and drainage fire protection system, lighting system, traffic guidance system monitoring and remote manual control or automatic control.





1.2.2 Water Conservancy Wireless Monitoring Solution

R40 4G industrial VPN wireless router is used in reservoir dams, canals, rivers to achieve wireless remote video, flow, rainfall, water level, water quality routine 5 parameters, dam safety, water pumps and other data collection and control.

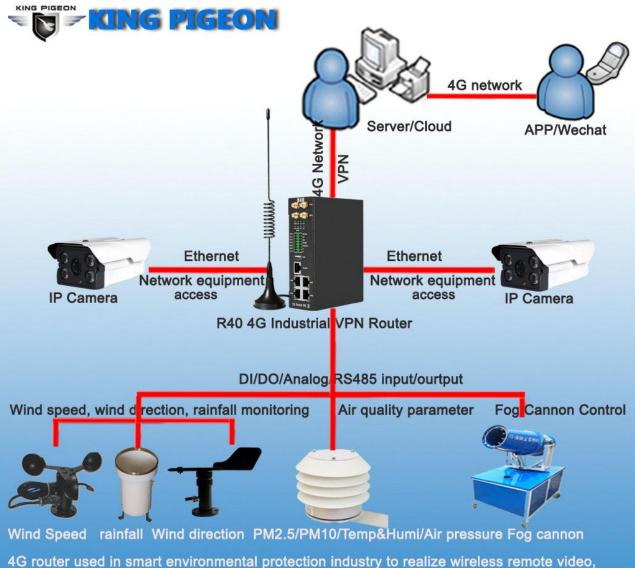


4G VPN Router Applied to Water Conservancy Wireless Monitoring Solution



1.2.3 Smart Environmental Protection Wireless Monitoring Solution

R40 4G industrial VPN wireless router is used in the smart environmental protection industry to realize wireless remote video, rainfall, wind speed, wind direction, PM2.5, PM10, temperature and humidity, air pressure and other data collection and automatic or remote control fog cannon.



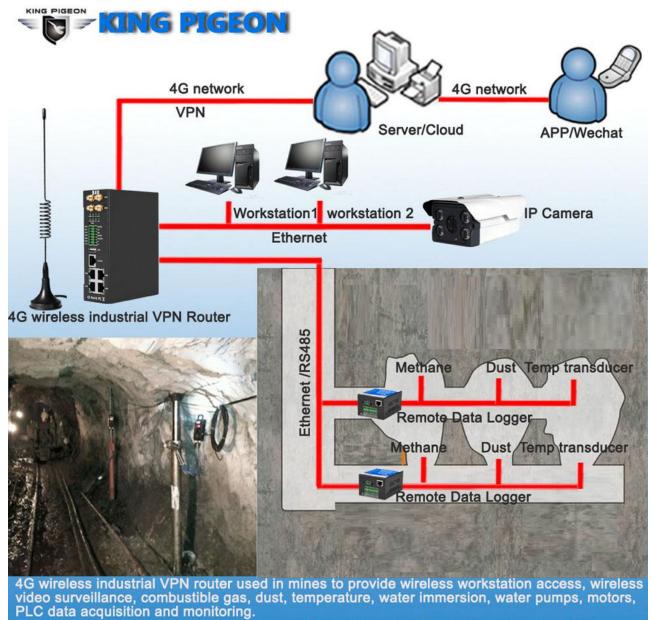
rainfall, wind speed, wind direction, PM2.5, PM10, temp & humi, air pressure,etc.data acquisition and fog cannon automatic or remote control.

4G Router for Smart Environmental Protection Wireless Monitoring Solution



1.2.4 Mine Wireless Networking & Monitoring System Solution

R40 4G industrial VPN wireless router is used in mines to provide data collection and control of wireless workstation network access, wireless video surveillance, combustible gases, dust, temperature, water immersion, water pumps, motors, motors, PLCs, etc.



R40 4G Router for Mine Wireless Networking & Monitoring System Solution

1.3 Safety Directions



Safe Start up

Do not use the unit when using GSM/3G/4G equipment is prohibited or might bring disturbance or danger.

Interference

All wireless equipment might interfere network signals of the unit and influence its performance.



1.4 Standard Packing List

Router R40 X1, Power adaptor*1, GSM/3G/4G Antenna X1, 2.4G WIFI Antenna X3, User Manual X1, Wall-mounted snap kit x 2, 35mm Standard DIN rail fixed Bracket*1.



Note: The package does not include any SIM card.

1.5 Main Features

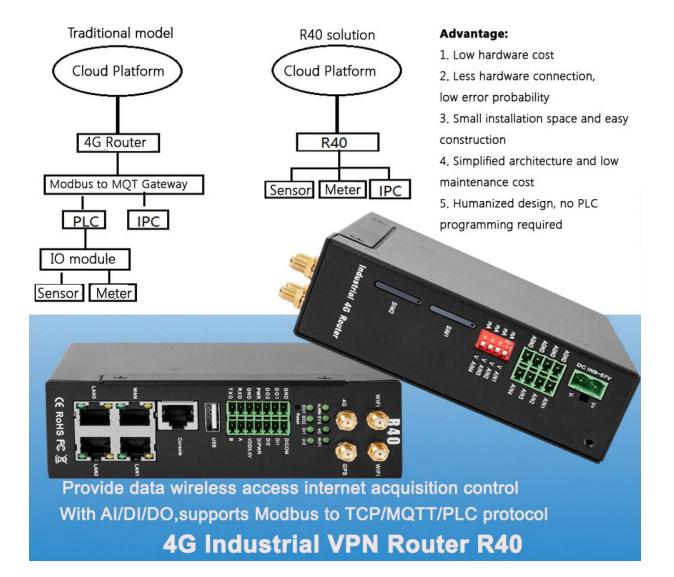
- DIN(2 channel) :Support NO/NC/counting input, frequency<100, can set counting threshold, support alarm trigger.</p>
- > DO(2 channel): can be set according to the trigger condition.
- > AIN(4 channel): Support 0-5V, 0-20mA, 4-20mA, can set threshold value, support alarm trigger.
- Support SMS to query DI/DO/AI status and value, and set DO status;
- Support 4G wireless Internet access function, can set APN and other parameters;
- Two SIM card slots, support dual card switching;
- Support GPS, positioning data can be released through MQTT;
- > VPN: Support L2TP, IPSEC, OPENVPN and other VPN protocols.
- Interface: Support RS485 and RS232 serial port transparent transmission and MODBUS RTU to TCP, Support MODBUS master, can regularly read MODBUS slave node data through RS485, RS232 and Ethernet.

KING PIGEON

4G Wireless Industrial Router Wireless Data Connectivity

- Support address mapping, mapping RS485, RS232 and Ethernet access device addresses to router local addresses.
- Support monitoring the online status of network devices connected to the LAN port, which can be reported to the platform through MODBUS or MQTT.
- Link switching: Support WAN port and 4G network connection switching, preferentially use WAN port wired network.
- > Platform connection: Support MODBUS and MQTT protocols, MQTT supports SSL encryption.
- > Alarm:Supports SMS and e-mail alarm.
- Timer:Support one-time timer and period timer.
- Upgrade:Support remote upgrade through webpage





1.6 Technical Parameters

ltem	Parameters	Description
	Input voltage	9~57VDC
Power	Input current	Normal:240mA@12V,max:800mA@12V
Supply	Connection	5.08mm terminals
	Protection	Anti-reverse connection Protection
	Qty	1
	Interface Spec	RJ45,10/100Mbps,Automatically adapted to MDI/MDIX
WAN		ESD $\pm 30 kV$ (contact) , $\pm 30 kV$ (air)
	Protection	EFT 40A (5/50ns)
		Lightning strike 24A (8/20µs)
	Qty	3
	Interface Spec	RJ45,10/100Mbps,Automatically adapted to MDI/MDIX
		Supports 3 POE power output
		compatible IEEE802.3at/af
LAN (POE)	POE(optional)	Single POE maximum output power 30W
		With power management function
		Voltage range 48 \sim 57V
		ESD \pm 30kV (contact) , \pm 30kV (air)
	Protection	EFT 40A (5/50ns)
		Lightning strike 24A $(8/20\mu s)$
	Qty	2
	Туре	1 RS485,1 RS232
	Baudrate	1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600,
	Bauurate	115200, 230400
	Data Bit	5, 6, 7, 8
Serial Port	Parity	None, Even, Odd
Senarron	Stop Bit	1,2
	Working mode	Data transparent transmit, Modbus RTU to TCP, Modbus master
		ESD (contact) : 8KV Surge: 4KV (8/20us)
	Protection	ESD $\pm 8 \text{kV}$ (contact) , $\pm 15 \text{kV}$ (air)
		EFT 4KV, 40A (5/50ns)
	Qty	1
	Туре	CONSOLE
Console	Interface Spec	RJ45
	Protection	ESD: $\pm 8kV$ (contact) , $\pm 15kV$ (air)
	Qty	1
USB	Туре	USB2.0 (HOST)
(Reserved)	Protection	ESD \pm 8kV (contact) , \pm 15kV (air)
	Antenna qty	2
	Antenna type	SMA
WIFI	protocol	802.11a/b/g/n (mixed)
	mode	AP mode,client mode
	1	

	Frequency	2.4G
	Channel	Channel 1 - 13
	Security	Open,WPA,WPA2
	Encryption	AES,TKIP,TKIPAES
	Connection number	16 (Max)
	Speed	300Mbps (Max)
	Transmit Distance	Outdoor non-blocking/opening, covering up to 20 meters
	SSID	
	Broadcast Switch	support
	Antenna Port Qty	1
	Antenna Port Type	SMA
		GSM/EDGE: 900,1800MHz
		WCDMA: B1,B5,B8
	4G (L-E)	FDD: B1,B3,B5,B7,B8,B20
		TDD: B38,B40,B41
		GSM/EDGE: 850,900,1800MHz
	4G (L- AU)	WCDMA: B1,B2,B5,B8
		FDD: B1,B2,B3,B4,B5,B7,B8,B28
Cellular		TDD: B40
Network	4G (L-A)	WCDMA: B2,B4,B5
		FDD: B2,B4,B12
	4G (L-V)	FDD: B4,B13
		WCDMA: B1,B3,B8,B18,B19, B26
	4G (L-J)	FDD: B2,B4,B12
		TDD: B41
		GSM/EDGE: 900,1800MHz
		WCDMA: B1,B8
	4G (L-CE)	TD-SCDMA: B34,B39
		FDD: B1,B3,B8
		TDD: B38,B39,B40,B41
	Qty	2
SIM	Interface Spec	Drawer interface, supports 1.8V/3V SIM/UIM ‡ (NANO)
	Protection	In-built 15KV ESD Protection
	Antenna qty	1
CDC	Antenna type	SMA
GPS	Tracking Sensitivity	> -148 dBm
(optional)	Horizontal Accuracy	2.5m
	Protocol	NMEA-0183 V2.3
	Qty	2
	Туре	Switch contact signal (dry node) or level signal (wet node)
		1:High level, 5~30VDC, close signal ;0:low level 0~1VDC ope
Digital input	range	signal
	Pulse frequency	Max 100Hz
	Protection	Isolation voltage 3750Vrms
D'-ital	Qty	2
Digital		

4G Wireless Industrial Router Wireless Data Connectivity

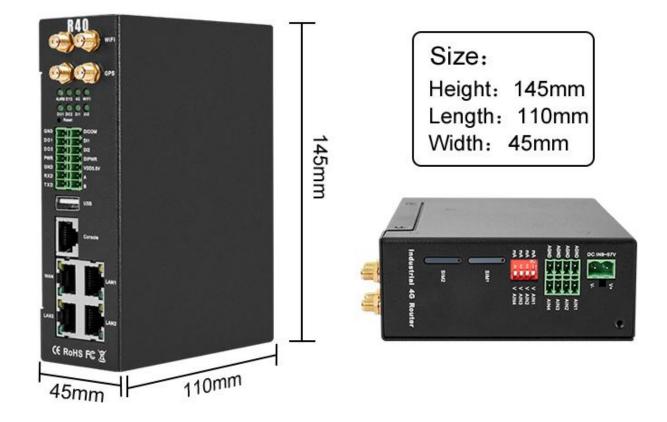
	Load voltage	Max 50VDC	
	Load current	500mA (single), 625mW	
	Protection	EFT: 40A(5/50ns)	
	Qty	4	
	Туре	0~5V, 4~20mA, 0~20mA	
Analog input	ADCResolution	16bit	
	Protection	EFT: 40A(5/50ns)	
	ALARM	Alarm indicator light	
	SYS	System running status indicator	
Indicator	4G	4G status indicator	
light	WiFi	WiFi status indicator	
	DO1,DO2	Digital output indicator light	
	DI1,DI2	Digital input indicator light	
	CPU	MIPS CPU,Clock Speed 580Mhz	
System	Storage	16MB (Scalable to 32MB)	
	RAM	128MB (Scalable to 256MB)	
		PPP, PPPoE, TCP, UDP,DHCP, ICMP,NAT,	
	Network Portocol	HTTP, HTTPs,DNS, ARP, NTP,SMTP,SSH2,DDNS etc.	
	VPN	Ipsec,OpenVPN,L2TP	
	Firewall	DMZ,DoS defense,IP packet, Domain name and MAC address	
Software		filtering, port mapping, access control	
	Remote Management	Support web remote configuration	
	System Log	support	
	Firmware Upgrade	Support serial port local TFTP/web firmware upgrade	
	EMI	EN 55022: 2006/A1: 2007	
		IEC(EN)61000-4-2(ESD)	
		IEC(EN)61000-4-3(RS)	
Cantificate	ENAC	IEC(EN)61000-4-4(EFT)	
Certificate	EMS	IEC(EN)61000-4-5(Surge)	
		IEC(EN)61000-4-6(CS)	
		IEC(EN)61000-4-8	
	Others	CE,FCC,ROHS,3C	
	Working temperature	-40∼85℃	
Working	Storge temperature	-40~105°C	
Enviorment	Humidity	5~95%RH	
	Enclosure	Metal	
	Size	H145mm * L110mm * W45mm	
Others	IP level	IP30	
	Net weight	790g	

2. Hardware Description

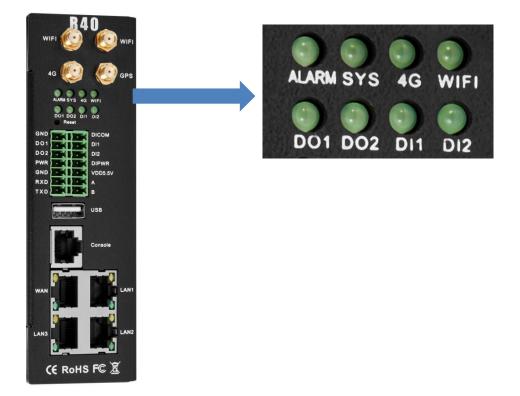




2.1 Size



2.2 Indicator light





LED Indicator light							
	Name	status	Description				
ALARM			DI or AI trigger alarm				
ALARIVI	Alarm indicator light	OFF	normal				
		flicks	normal				
SYS	System running status indicator	slowly	normai				
		OFF	abnormal				
		flicks	Signal normal				
4G	4G status indicator	fast	Signal normal				
		OFF	abnormal				
WIFI	WiFi status indicator	ON	WiFi normal				
VVIFI	WIFI Status Indicator	OFF	abnormal				
DO1	Digital output 1 indicator light	ON	DO1 close				
001		OFF	DO1 open				
DO2	Digital output 2 indicator light	ON	DO2 close				
		OFF	DO2 open				
DI1	Digital input 1 indicator light	ON	DI1 close				
		OFF	DI1 open				
DI2	Digital input 2 indicator light	ON	DI2 close				

2.3 Reset

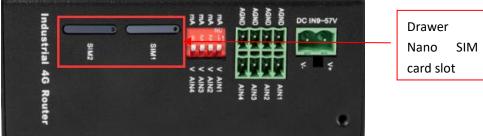
After the router runs normally, use a pointed stick to continue to hold down the Reset button for about 10 seconds until the WAN port indicator flashes slowly. At this time, restart the router to restore the factory default settings.



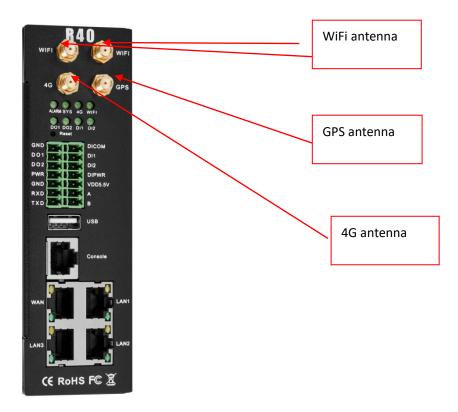
2.4 SIM Card

When inserting/removing the SIM card, first make sure that the device is turned off, insert the card take-out pin into the small hole of the card slot, press it slightly to push the card slot out.





2.5 Connect External Antenna



2.6 Router GND

The router ground wire helps prevent the effects of electromagnetic interference. Before connecting the device, ground the device through the ground screw connection. Note: This product should be installed on a well-grounded device surface, such as a metal plate.

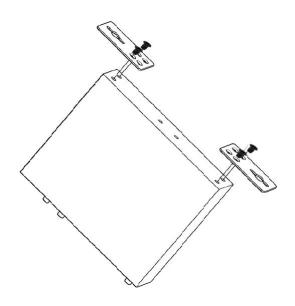




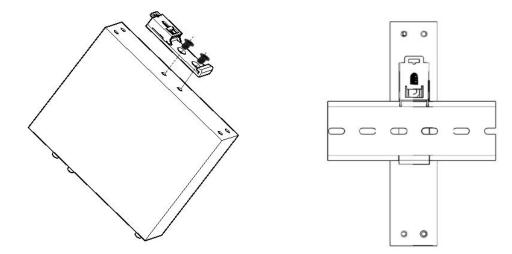
2.7 Installation

This device supports horizontal desktop placement, wall mounting and rail mounting.

2.7.1 Wall-mounted installation



2.7.1 Rail mounting



3. Start up

3.1 Switch on

Power input port: R40 uses 9 ~ 57V DC voltage for power supply. If you need POE power supply





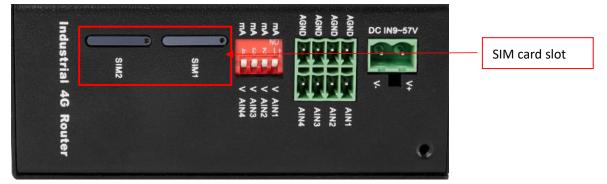
3.2 System running status

Observe the system running status indicator -SYS, slow blinking indicates that the device starts normally.



3.3 SIM Card Operation

The device supports dual SIM cards (only supports NANO SIM cards). When installing the card, please disconnect the power of the device, remove the card holder with the card take-out pin, install the NANO SIM card into the card holder according to the position, and then insert the card holder back into the card slot, then power on the device again.



After the device is powered on, enter the router configuration interface-network-cellular network, you can view the cellular network registration status.

4G cellular network dial-up networking defaults to use SIM card 1, if you need to use SIM card 2, you need to enter the cellular network configuration interface, select card 2 in the column of selecting a phone card, save and apply to switch.

The dual card redundancy design of R40 can automatically switch to another SIM card for communication when the current SIM card network communication is abnormal (one minute).

For detailed configuration, please refer to 5.4.1.4.4G interface and 5.4.3 cellular network.

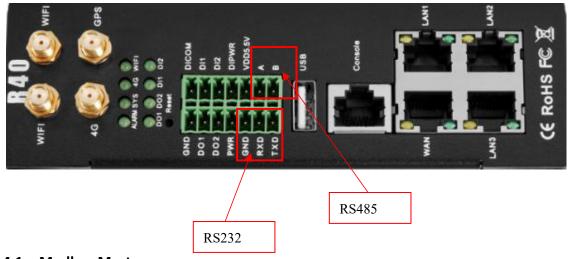


🖶 🖅 💽 R40B - 蜂窝网 - LuCl	× + ~		-		×
\leftarrow \rightarrow \heartsuit \textcircled{O}	92.168.3.1/cgi-bin/luci/admin/network/cell	□ ☆	t≡ <i>l</i> L	, Ŀ	
R40B 状态 - 系统 -	服务 + 网络 + VPN + I/O + 接□ + 退出				^
信号强度	21,55				
固件版本	EC25AUGCR06A02M1G				
IMSI	460007790314217				
IMEI	861585042306033				1
选择电话卡	₹1				
大1号码	*2				
卡1 APN					
卡1用户名					
卡1密码					
启用GPS					
告警电话号码	+				
	接收短信的移动电话号码				
短信语言	中文 (Chinese) ~				
	· 保存	并应用	府 复		
Powered by KingPigeon Technol	ogy Co., Ltd. (v1.09) / 2020-05-13 01:40:25				~

3.4 Serial Port Instructions

The device has an RS485 and an RS232 communication interface, which can be used for Modbus master station (optional model to support), Modbus slave station, transparent transmission, Modbus RTU to TCP and other communications.

Note: Only one of the functions can be selected for the same serial port at the same time, and it cannot be reused. If it is found that the serial port cannot be selected on the configuration page, it means that the serial port has been set on the other function configuration page; different serial ports do not affect each other.



3.4.1 Modbus Master

Modbus master : Used as Modbus master, the serial port connected to Modbus slave equipment, through

KING PIGEON

4G Wireless Industrial Router Wireless Data Connectivity

configuration Page <u>5.6.3</u>. Modbus maste configures slave register and serial port parameters, the host collect slaves data through Modbus RTU protocol, and store the slave data in the local mapping register, can query the slave data directly on the configuration page, or you can <u>6.1.1</u>. Cloud connection settings: Configure Modbus protocol or MQTT protocol to upload slave data to the server to realize Modbus RTU protocol to MQTT protocol.

When the RS485 or RS232 selected as the "Modbus RTU master", or the corresponding slave IP is set on the Ethernet, the device will actively poll the slave device in accordance with the Modbus RTU or Modbus TCP protocol, and put the slave device in The value of the register is read into the device's mapping area for storage. In this way, the registers in the slave are mapped to the device, and reading and writing the mapped registers of the device will be directly transmitted to the slave device through the RS485 serial port, RS232 serial port or network port. There is a one-to-one correspondence between the slave register address and the mapped register address in this device. This is the mapping register list.

Users can connect various slaves through RS485 serial port, RS232 serial port or Ethernet port, supporting up to 48 slave devices, so as to realize the function of adding I/O ports and reading and writing smart meters and smart devices. For example, connect to the remote I/O modules of the Mxxx series to expand the number of DIN, DO, AIN, AO, PT100 input ports, or connect the power parameter monitoring module to read the current, voltage, power of the three-phase electricity, or connect to the UPS power supply for Parameter monitoring, etc. Or the combination of the above various smart devices, etc., can meet the functional requirements of most applications.

3.4.2 Modbus Slave

Modbus slave function: When used as Modbus slave , the serial port will be connected to the Modbus master device. Configure the serial port parameters through the configuration page <u>6.1</u>. Modbus slave, the master device will be able to collect the local I/O data through Modbus RTU or TCP protocol.

3.4.3 Transparent transmission

The device used as a data transfer station between the server and the slave device, through the configuration page 5.7.4. It transparently transmits the data uploaded from the slave to the server, and sends the data to the server Transparent transmission to the slave, without processing the data content, only forwarding data, to achieve data transparent transmission function.

3.4.4 Modbus RTU to TCP

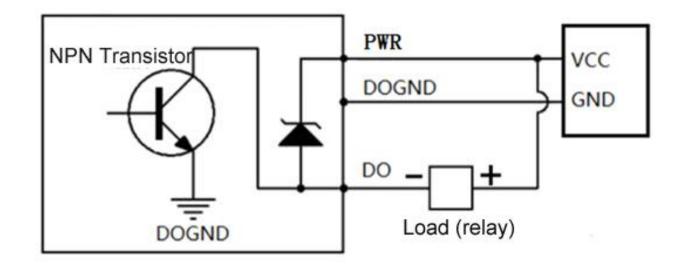
Master communicate with slave via Modbus RTU protocol, master communicate with slave via Modbus TCP protocol, through the <u>configuration page 5.6.</u>

The device automatically converts Modbus TCP commands issued by the server into Modbus RTU commands and sends them to the slave, and then converts the Modbus RTU commands returned from the slave into Modbus TCP commands and replies to the server, so that the Modbus RTU slave device and the Modbus TCP server can be realized communication.

3.5 Digital output Instructions

3.5.1 Wiring





3.5.2 DO instruction:

	qty	2	
	type	SINK output	
Digital output	Load voltage	Max 50VDC	
	Load current	500mA (single) ,625mW	
	protection	EFT: 40A (5/50ns)	

1. DO1~DO2 are two-way NPN transistor open-collector output, and PWR is the clamp protection for the external power supply of the common terminal.

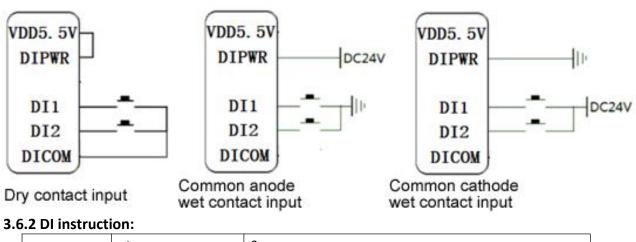
2. Digital output setting: Enter the router configuration interface-RTU I/O-digital input and output, and you can enable/disable or query and set the digital output status at the digital output port.

3. Trigger setting: According to the state of DI digital input or AIN analog input, you can set the trigger condition and control the DO digital output operation (the confirmation time is X seconds after the trigger condition is reached).

4. For detailed configuration, please refer to 5.7.2. Digital input and output.

3.6 Digital input Instructions

3.6.1 Wiring



Digital input	qty	2
	type	Dry contact, wet contact



		_
Range	High level (digital 1) 5~30VDC, low level (digital 0) 0~1VDC	
Pulse frequency	<100Hz	
protection	Isolation voltage 3750Vrms]

1. DI1~DI2 are two digital inputs. The default is wet contact input. Short-circuit VDD5.5V and DIPWR to switch to dry contact input.

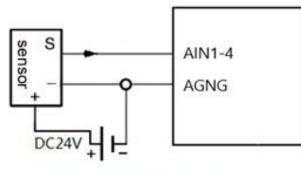
2. Digital input setting: enter the router configuration interface-RTU I/O-digital input and output, and you can enable/disable or query the digital input status and pulse count value at the digital input port.

3. Trigger setting: The trigger condition can be set according to the DI digital input state to control DO digital output, restart and other operations (the confirmation time is X seconds after the trigger condition is reached).

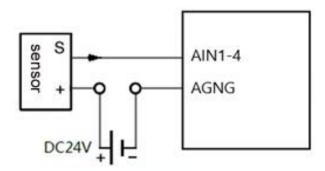
4. For detailed configuration, please refer to 5.7.2. Digital input and output.

3.7 Analog input Instructions

3.7.1 Wiring



3 wire current/voltage sensor



2 wire current sensor

3.7.2 AI instruction:

	qty	4
	type	0~5V,4~20mA,0~20mA
Analog input	ADC resolution	16 bit
	Pulse frequency	<100Hz
	protection	EFT: 40A (5/50ns)

1. AI-AI4 is a four-way analog input, the default is 0~5V voltage type analog input, you can switch to current type analog input by turning the dial switch to mA. The four-way dial switch AI1~AI4 is Four analog inputs correspond one to one, V corresponds to voltage type, and mA corresponds to current type.

2. Analog input setting: enter the router configuration interface-RTU I/O-analog input, in the mode you can select voltage 0~5V, current 4~20mA, current 0~20mA (note that the DIP switch should also be selected Corresponding mode), set the range in the minimum and maximum values, you can see the actual measured value in the current value.

Trigger settings: The trigger conditions can be set according to the AIN status to control DO digital output, restart and other operations (the confirmation time is X seconds after the trigger condition is reached).
 For detailed configuration, please refer to 5.7.3. Analog input

4. Preparation before configuration

The router supports web page configuration. There are two ways to connect the router. One is to connect the computer to any LAN port of the router through a wired connection; the other is to connect to the router through WIFI. The computer can automatically obtain IP through DHCP, or you can set a static IP on the same

KING PIGEON

4G Wireless Industrial Router Wireless Data Connectivity

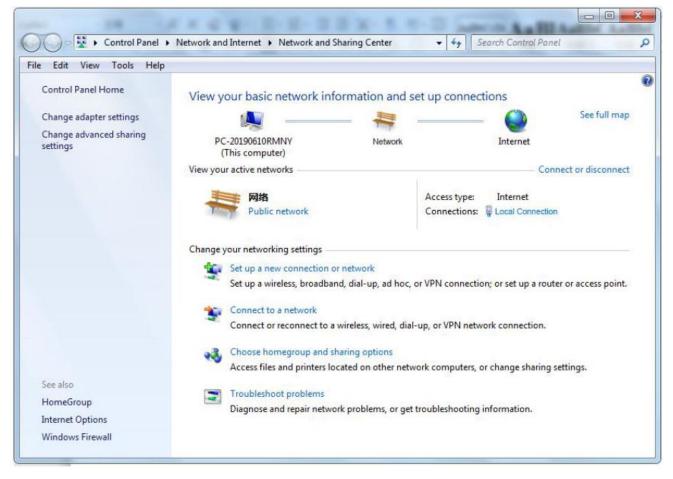
network segment as the router. After the connection is established, enter the router's default login address 192.168.3.1 on the computer browser to enter the router's WEB login interface. The default login The user name is admin and the password is blank.

4.1 Wired Connection

There are two ways to configure its IP address on PC, one is to enable automatic IP address acquisition on the local connection of the PC, and the other is to configure a static IP address on the same subnet as the router on the local connection of the PC.

Setting on Windows 7 as an example:

1. Click "Start> Control Panel> Network and Sharing Center", double-click "Local Area Connection" in the window.



5. In the "Local Connection Status" window, click Properties.



IPv4 Connectiv	ity:	Internet
IPv6 Connectiv	ity:	No Internet access
Media State:		Enabled
Duration:		07:35:18
Speed:		100.0 Mbps
Details)	
	Sent — 📖	Received
	Sent —	Received
	Sent — 102,166,751	Received 833,590,410

3. Select "Internet Protocol Version 4 (TCP/IPv4)" and click "Properties".



	bE Family Controller #2	
		Configure
his connection uses t	he following items:	
Client for Micr		
Shrew Soft Li	등은 Y 1996 X 1997 등 2019 1997 등 수가 있다.	
QoS Packet :	er Sharing for Microsoft	Networks
	col Version 6 (TCP/IPv	
and the second se	col Version 4 (TCP/IPv	
	pology Discovery Map	
🗹 🔺 Link-Layer To	pology Discovery Resp	oonder
Install	Uninstall	Properties
Description		
Transmission Contro	I Protocol/Internet Prot protocol that provides c	

4. Two ways to configure the IP address:

Obtain an IP address automatically from the DHCP server and click "Obtain an IP address automatically";



General	Alternate Configuration				
this cap	n get IP settings assigned au bability. Otherwise, you need appropriate IP settings.				
0	btain an IP address automati	cally			
O U:	se the following IP address:				
IP a	ddress:	•			
Subr	net mask:			•	
Defa	ult gateway:				
0	btain DNS server address au	tomatically			
O U:	se the following DNS server a	addresses:			
Pref	erred DNS server:			4	
Alter	nate DNS server:		,		
V	alidate settings upon exit			Adv	anced

Manually configure the PC with a static IP address on the same subnet as the router address, click and configure"Use the following IP address".



General	
	d automatically if your network supports need to ask your network administrator
Obtain an IP address auto	matically
OUSE the following IP addre	ss:
IP address:	192 . 168 . 3 . 2
Subnet mask:	255.255.255.0
Default gateway:	192.168.3.1
Obtain DNS server address	s automatically
() Use the following DNS serv	ver addresses:
Preferred DNS server:	192 . 168 . 3 . 1
Alternate DNS server:	• • •
Validate settings upon exi	t Advanced

5. Click "OK" to complete the configuration.

4.2 Wifi Connection

Step1: Search wireless network: The network name default is King-xxxxxx, no password.



Dial-up and VPN	^	1
Broadband Connection		1
Wireless Network Connection	^	
KINGPIGEON	lite.	
niuren	1000	
ChinaNet-DFxQ	1100	
mazentop	110-	
King-xxxxx	dir.	
Connect automatically	Connect	
DIRECT-11-HP DeskJet 3630 series	100	

Step2: Click "connect" to establish a connection.



Currently connected to:	+3	*
King-xxxxxx Internet access		ш
Dial-up and VPN	~	
Broadband connection		
Wireless internet connection	^	
King-xxxxx	Connected	
niuren	lite.	
KINGPIGEON	line.	
ChinaNet-DFxQ	liter	
mazentop	llee	
DIRECT-11-HP DeskJet 3630 series		-

4.3. Factory Default Settings

Before logging the configuration page, please check the default settings as below:

Item	Description
Login IP address	192.168.3.1
User name	admin
Password	none
DHCPserver	open
WIFI	SSID: King-xxxxx
	KEY : No encryption (open network)

4.4. Enter Web Settings

(1).Open a browser, such as IE, Google, etc. and enter IP address: http://192.168.3.1

(2).Enter username and password, user name: admin Password: admin



http://192.10	58.3 .1			
Your connec	tion to this	site is not p	rivate	
Use <mark>rna</mark> me	admin			
Password				

5. Router Settings

5.1 Status

(••) R40B - Overview - LuCl	× +		-	٥	×
\leftrightarrow \rightarrow C A Not secure	192.168.3.1/cgi-bin/luci/		☆	θ	:
🏥 Apps 峰 翻译 🎯 金鴿物联	网云V3.0				
R4	40B Status - System - Services - N	letwork + VPN + Serial Port + RTU I/O + Logical operation + Cloud platform + Logout (Auto REFRESH ON			^
Si	tatus				1
Sy	/stem				
н	lostname	R40B			
М	lodel	Mediatek MT7628AN evaluation board			
A	architecture	MediaTek MT7628AN ver:1 eco:2			
F	irmware Version	KingPigeon Technology Co., Ltd. v1.18			
к	Cernel Version	4.14.162			
L	ocal Time	2020-10-23 05:02:05			
U	Jptime	0h 5m 28s			
L	oad Average	1.25, 1.10, 0.54			
Me	emory				
Т	otal Available	63.86 MB / 121.79 MB (52%)			
F	ree	74 29 MB / 121.79 MB (60%)			
В	luffered	5.55 MB / 121.79 MB (4%)			
С	Cached	17.49 MB / 121.79 MB (14%)			*

In the status, it provides an overview, firewall, routing table, system log, kernel log, real-time information, etc., which is convenient for viewing the running status information of the router.



5.2. System

5.2.1 System Properties

(**) R40B - System Settings - LuCl × +		- 0	×
← → C ▲ Not secure 192.168.3.1/cgi-bin/luci/admin/system/system		☆	e :
🗰 Apps 💁 翻译 🍛 金錦物联网云V3.0			
R40B Status - System - Services - Network -	VPN ▼ Serial Port ▼ RTU I/O ▼ Logical operation ▼ Cloud platform ▼ Logout		
	AUTO REFRESH ON		
System Here you can configure the basic aspects of your device like its ho System Properties General settings Logging Time Synchronization Language			
Local Time 10/23/2020, 1:02:59 PM	Sync with browser Sync with NTP-Server		
Hostname R40B			
Same as product Type(Can	not modify)		
Timezone	~		
Please restart the router to	take effect		
	Save & Apply Save Reset		
Powered by KingPigeon Technology Co., Ltd. (v1.18) / 2020-10-16	â		

Configure basic information , such as host name or time zone

	System Properties		
Item		Description	
General	Local time	Set router time, can synchronize browser time or synchronize NTP server time	
setting	Hostname	Default is the router model, cannot be modified	
	Timezone	Please select your region	
Logging		Log properties, it is not recommended to modify	
Time synchro	nization	Set NTP server for time synchronization	
Language and style		Language optional automatic (according to browser language changes, only recognize Chinese and English), Chinese, English;The theme cannot be modified.	
Product type		Product model, factory cured, cannot be modified	



5.2.2 Management Rights

(**) R40B - Router Password - LuCI × +	- ø ×
← → C ▲ Not secure 192.168.3.1/cgi-bin/luci/admin/system/admin	☆ \varTheta :
🚻 Apps 🥾 翻译 🥪 金錫物联网云V3.0	
R40B Status + System + Services + Network + VPN + Serial Port + RTU I/O + Logical operation + Cloud platform + Logout	
Router Password SSH Access SSH-Keys	
Router Password	
Changes the administrator password for accessing the device	
Password *	
Confirmation *	
Save	
Powered by KingPigeon Technology Co., Ltd. (v1.18) / 2020-10-16	

Management Rights				
Item	Description			
Password	Change the administrator password to access the device			
SSH access	Provides SSH access and SCP services			
SSH keys	Compared with the use of ordinary passwords, the public key allows passwordless SSH login with higher security. To upload the new key to the device, paste the OpenSSH compatible public key line or drag the .pub file into the input field.			

5.2.3 Software Package

(••) R40B - Software - LuCI	× +				- 0 :
\leftrightarrow \rightarrow C \land Not secure	192.168.3.1/cgi-bin/luci/admir	n/system/opkg			☆ 0
🚻 Apps 💁 翻译 🍛 金錦物联	网云V3.0				
F	R40B Status - System -	Services - Network - VPN -	Serial Port - RTU I/O - Log	ical operation - Cloud platform - Logout	
	Software				
F	ree space:	04	% (7.7 MB)		
-	ilter:	Download and install packag			
		Clear Package name or URL	OK Update lists.	Upload Package Configure opkg	
4	Available Installed Updates				
	æ	N	o packages	»	
	Package name	Version	Size (.ipk)	Description	
	No information available				
P	owered by KingPigeon Technology Co	., Ltd. (v1.18) / 2020-10-16			

Software installation, clear, and upgrade. (Note: This function is for professionals!)



5.2.4 Backup/Upgrade

(*) R40B - Backup / Flash Firmwar × +	- 0	×
← → C ▲ Not secure 192.168.3.1/cgi-bin/luci/admin/system/flash	÷ 8) :
👖 Apps 🍓 翻译 🚽 金錦物餅网云V3.0		
R40B Status * System * Services * Network * VPN * Serial Port * RTU I/O * Logical operation * Cloud platform * Logout		Â
Flash operations		- 1
Actions Configuration		
Backup		
Click "Generate archive" to download a tar archive of the current configuration files.		- 1
Download backup Generate archive		
Restore		
To restore configuration files, you can upload a previously generated backup archive here. To reset the firmware to its initial state, click "Perform reset" (only possible with squashfs images).		
Reset to defaults Perform reset		
Restore backup Upload archive		- 1
② Custom files (certificates, scripts) may remain on the system. To prevent this, perform a factory-reset first.		
Save mtdblock contents		
Click "Save mtdblock" to download specified mtdblock file. (NOTE: THIS FEATURE IS FOR PROFESSIONALS!)		
Choose mtdblock u-boot ~		
Download mtdblock Save mtdblock		
		-

Backup/Upgrade							
Item Description							
Backup	Click "Generate Backup" to download the tar archive of the current configuration file.						
Restore	Upload a backup archive to restore the configuration. To restore the firmware to its initial state, click "Perform Reset" (only squashfs format firmware is valid)						
Save mtdblock content	Click "Save mtdblock" to download the specified mtdblock file. (Note: This function is for professionals!)						
Flash new firmware	Upload a sysupgrade compatible image from here to update the running firmware						

KING PIGEON

4G Wireless Industrial Router Wireless Data Connectivity

5.2.5 Mount Point

Mount Point is used to connect external storage devices like USB drive, portable hard disk etc. Click Build Configuration and Mount the Connected Devices to show storage device partition in the system directory/mnt. For example, USB drive has 2 partitions sda1 and sda2. After mounting, the 2 partition information is shown in the system directory /mnt/sda1 and /mnt/sda2. Click Service-Network Sharing to share the directory for access through the shared directory.

Storage devices support NTFS, EXT4 and FAT32 formats. It must be partitioned and formatted before usage

R408	B state ≁ system	n - service - The in	itemet ~ VPN	 application 	- RTU I/O -	logic operation -	cloud platform	r≁ quit	
Moi	unt point								
	al Settings								
	Build configuration			es on the current	system, and g	enerate and replace exis	ting configurat	tions based o	n the
Mou	nt the connected device	Mount the connect		nt point for the co	nnected device	1			
unco	Automatically moun nfigured swap partition:	t ⁵ ⁹ ⁹ ⁹ ⁹ ⁹ ⁹ ⁹ ⁹	unt swap partitio	ns <mark>t</mark> hat are not sp	pecifically confi	gured			
unc	Automatically moun configured disk partitions		unt partitions that are not specifically configured for mount points						
Au	utomatically mount swap	 Automatically mo 	unt swap partitio	n through hotplug	J				
	Auto mount dist	k 🗹 🔞 Mount the disk at	utomatically via h	otplug					
Che	ck the file system before mounting	e Automatically che	eck for file syster	n errors before <mark>m</mark>	ounting				
Mour	nted file system								
File s	ystem	Mount point	A	vailable		used	Unmount p	artition	
/dev/r	oot	/rom	0 B	/ 8.50 MB	1	00.00% (8.50 MB)	-		
tmpfs		/tmp	37.13 N	1B / 60.89 MB	3	9.03% (23.77 MB)	5		
/dev/r	ntdblock6	/overlay	5.23 N	1B / 5.81 MB	9	95% (592.00 KB)	-		
overla	ayfs:/overlay	7	5.23 N	1B / 5.81 MB	9	95% (592.00 KB)	-		
tmpfs	i.	/dev	512.00 k	(B / 512.00 KB		0.00% (0 B)	-		
npfs	/tr	np	37.13 ME	3 / 60.89 MB	5	89.03% (23.77 MB)	-		
ev/mtdblo	ck6 /o	verlay	5.23 ME	3 / 5.81 MB	10	9.95% (592.00 KB)	72		
verlayfs:/o	verlay /		5.23 ME	3 / 5.81 MB		9.95% (592.00 KB)	-		
mpfs	/d	ev	512.00 KE	3 / 512.00 KB		0.00% (0 B)	-		
ount po		ters of the storage devic	e mounted to t	he file system					
activated	equipment		Mount point	File system	Mount options	File system check			
5	UUID: e8f84077f840)	04652 (does not exist	/mnt/sda1	auto	defaults	no	≡	edit	delete
3	UUID: eaf6-c246 (d	loes not exist)	/mnt/sda4	auto	defaults	no	=	edit	delete
Add to									
	I memory is insufficien	nt, idle data can be auto vill be very slow, becaus					the available	e <u>RAM</u> . Ple	ase note:
activated	equipment	ni be very slow, becau.	ie ale swap dei	nee cannot be e	occosoca ar a	night falls line <u>To an</u> -			
			N	o configuration	vet				
Add to									
Add to									
						Save and	l apply 🔹	save	Reset

Provide secondary development use. (Note: This feature is for professionals!)



5.2.5 Reboot

	6 ×	
← → C 🔺 Not secure 192.168.3.1/cgi-bin/luci/admin/system/reboot	Θ:	
👖 Apps 👒 翻译 ⊌ 金綿物联网云V3.0		
R40B Status + System + Services + Network + VPN + Serial Port + RTU I/O + Logical operation + Cloud platform + Logout		
Reboot Reboots the operating system of your device		
Perform reboot		
Powered by KingPigeon Technology Co., Ltd. (v1.18) / 2020-10-16		

5.3. Service

5.3.1 Dynamic DNS

Dynamic DNS allows a fixed and accessible domain name to be configured for a host with a dynamic IP.

The overview displays a list of currently configured DDNS settings and their current status.

If you need to update the IPv4 and IPv6 addresses at the same time, you need to add two configuration items separately (for example, 'myddns_ipv4' and 'myddns_ipv6'). By default, IPv4 and IPv6 configurations have been added separately. Please click "Edit" to enter the modification of the DDNS service Detailed configuration.

Note: Before clicking "Add", you need to enter a name for identification, otherwise it cannot be added successfully.

5.3.1.1 Basic setting



(**) R40B - LuCl × +		- 0	×
← → C ▲ Not secure 192.168.3.1/cgi-bin/luci	/admin/services/ddns/detail/myddns_ipv4	© ☆ @	
R40B Status - System	n + Services + Network + VPN + Serial Port + RTU I/O + Logical operation + Cloud platform + Logout		Î
	uter can be reached with a fixed hostname while having a dynamically changing IP address. umentation DDNS Client Configuration		
Details for: myddns_ip	ov4		- 1
Configure here the details for sel	ected Dynamic DNS service.		
Basic Settings Advanced Set	tings Timer Settings Log File Viewer		
Enabled			
	If this service section is disabled it could not be started. Neither from LuCl interface nor from console		
Lookup Hostname	yourhost example.com		- 1
	Whether the state of the sta		
IP address version	● IPv4-Address ○ IPv6-Address		. 1
	Ø Defines which IP address 'IPv4/IPv6' is send to the DDNS provider		
DDNS Service provider [IPv4]	dyn.com 🗸		
Domain	yourhost example.com		
	Replaces [DOMAIN] in Update-URL		
Username	your_username		-

	DNS Basic Settings
Item	Description
enable	If the service configuration is disabled, then it cannot be started.
Lookup hostname	Hostname/FQDN verification, if IP update occurs or is necessary
IP address version	Set which IP address (IPv4 or IPv6) will be sent to the DDNS provider
DDNS service provider	Choose DDNS service provider
Domain	Enter domain name
Username	Enter username
Password	Enter password

5.3.1.2 Advanced Setting



(**) R40B - LuCI × +		- 0 ×
← → C ▲ Not secure 192.168.3.1/cgi-bin/luct	/admin/services/ddns/detail/myddns_ipv4	⊠ ☆ 8 :
R40B Status - System	r - Services - Network - VPN - Serial Port - RTU I/O - Logical operation - Cloud platform - Logout	-
	uter can be reached with a fixed hostname while having a dynamically changing IP address. umentation DDNS Client Configuration	
Details for: myddns_i	w4	
Configure here the details for set	ected Dynamic DNS service.	
Basic Settings Advanced Set	ings Timer Settings Log File Viewer	
IP address source [IPv4]	Network 🗸	
Network [IPv4]→	 Defines the source to read systems IPv4-Address from, that will be send to the DDNS provider wan 	
	Defines the network to read systems IPv4-Address from	
Force IP Version		
	OPTIONAL: Force the usage of pure IPv4/IPv6 only communication.	
DNS-Server	mydns.lan	
	OPTIONAL: Use non-default DNS-Server to detect 'Registered IP'. Format: IP or FQDN	
PROXY-Server	user:password@myproxy.lan:8080	
	OPTIONAL: Proxy-Server for detection and updates.	

DNS Advanced Setting						
Item	Description					
IP address source	Set the source of the IP address. This will be sent to the					
	DDNS provider					
Network	Read system IP address network					
Force IP version	Optional: Force to use only IPv4/IPv6 communication.					
	Optional: Use a non-default DNS server to detect					
DNS server	"registered IP addresses".					
	Format: IP or FQDN					
	Optional: Proxy server for detection and update.					
Provu sorvor	Format: [user:password@]proxyhost:port					
Proxy server	The IPv6 address must be filled in square brackets ("[]"):					
	[2001:db8::1]:8080					
	Write the log to the system log. Regardless of whether					
Log to system log	this option is enabled, error messages will always be					
	written to the system log.					
Log to file	Write detailed information to the log. The file will					
	automatically shrink.					

5.3.1.3 Timer setting



(··) R40B - LuCl × +		- 0 ×
← → C ▲ Not secure 192.168.3.1/cgi-bin/luc	i/admin/services/ddns/detail/myddns_ipv4	¤ ☆ ⊖ :
R40B Status - System	m + Services + Network + VPN + Serial Port + RTU I/O + Logical operation + Cloud platform + Logout	^
	outer can be reached with a fixed hostname while having a dynamically changing IP address. umentation DDNS Client Configuration	
Details for: myddns_i	pv4	
Configure here the details for se	lected Dynamic DNS service.	
Basic Settings Advanced Set	ttings Timer Settings Log File Viewer	
Check Interval	10 minutes V	
	Interval to check for changed IP Values below 5 minutes == 300 seconds are not supported	
Force Interval	72 hours 🗸	
	Interval to force updates send to DDNS Provider Setting this parameter to 0 will force the script to only run once Values lower 'Check Interval' except '0' are not supported	
Error Retry Counter	0	
	On Error the script will stop execution after given number of retrys The default setting of '0' will retry infinite.	
Error Retry Interval	60 seconds 🗸	
	② On Error the script will retry the failed action after given time	
Back to Overview	Save & Apply Save Reset	

Timmer Settings					
Item	Description				
Check interval	Time interval for checking whether IP has changed Values less than 5 minutes (300 seconds) are not supported				
Force interval	Mandatory time period to update DDNS to the provider Setting this parameter to 0 will make the script execute only once Values smaller than "check time period" are not supported (except 0)				
Error retry counter	When an error occurs, the script will retry the number of times before exiting The default setting "0" will retry indefinitely.				
Error retry interval	When an error occurs, the script will retry the number of failed actions				

5.3.1.4 Log File Viewer



(••) R40B - LuCI	× +	-	٥	×
← → C ▲ Not secu	re 192.168.3.1/cgi-bin/luci/admin/services/ddns/detail/myddns_ipv4	☆	Θ	:
1	R40B Status + System + Services + Network + VPN + Serial Port + RTU I/O + Logical operation + Cloud platform + Logout			*
	Dynamic DNS Dynamic DNS allows that your router can be reached with a fixed hostname while having a dynamically changing IP address. OpenWrt Wiki: DDNS Client Documentation DDNS Client Configuration Details for: myddns_ipv4 Configure here the details for selected Dynamic DNS service. Basic Settings Advanced Settings Timer Settings Log File Viewer			
	Read / Reread log file			
	031306 : ***********************************			

5.3.2 Network Sharing

If external storage device is connected to R40 USB port, online computer can access the storage device from the network shared directory. Click Interface to select access router through WAN or LAN. The directory is the same one/mnt set through System-Mount Point. The name is shared directory with computer access.

Smbd: 3.0	0.1 Kmod: 3.	0.1									
basic setting	Edit template										
	interface	not specifie	ed		•						
		Only me	onitor the	specified	interface, if r	not specified, mor	itor the lan				
	work group	WORKGR	OUP								
Shared di	describe	SMBD on	OpenWrt								
				ers to a fol Force Root	ider on the m Allow users	Allow anonymous users	Inherited owner	Hide dot files	Create permission mask	Directory permission mask	
Please add a	lirectory directory to be sha	ared. Each dire	ctory refe Read	Force	Allow	Allow anonymous		dot	permission	permission	delete
Please add a	lirectory directory to be sha	ared. Each dire Browsable	ectory refe Read only	Force Root	Allow	Allow anonymous users	owner	dot files	permission mask	permission mask	delete



🛶 🗸 🛉 🚽 🛛 网络	> 192.168.5.124 > r40_test			v	đ
4. 林涛计问	名称 ^ ^ ^	修改日期	类型	大小	
🖈 快速访问	sda1	2021/9/23 16:57	文件夹		
🔷 OneDrive	sda2	2021/9/23 16:57	文件夹		

5.4 Network

5.4.1 Interface

You can restart, close, edit, and delete existing interfaces, or add new interfaces. Default has LAN, WAN, WAN6, 4G and other interface configurations . Click "Edit" to enter the detailed configuration modification.

(••) R40B - Network Settings - LuC × +			- 0 ×
← → C ▲ Not secure 192.168.3.1/cgi-bin/luci	/admin/network/network		☆ 🖰 :
R40B Status - System	✓ Services ✓ Network ✓ VPN ✓ Serial Port		rm → Logout
			AUTO REFRESH ON
Interfaces Global network opt	ons		
Interfaces			
LAN S ⁽²⁾ (S ⁽²⁾ (S ⁽²⁾) br-lan WAN	Protocol: Static address Uptime: 0h 47m 33s MAC: 46:58 A3:D3:DA:68 RX: 4.02 MB (37066 Pkts.) TX: 2.51 MB (9636 Pkts.) IPv4: 192.168.3.1/24 IPv6: td83:tb6e:356b::1/60 Protocol: DHCP client MAC: 46:58 A3:D3:DA:69	Restart Stop Edit	Delete
eth0.2	RX: 259.14 KB (2779 Pkts.) TX: 8.27 KB (61 Pkts.)		Delete
WAN6 eth0.2	Protocol: DHCPv6 client MAC: 46:68:A3:D3:DA:69 RX: 259:14 KB (2779 Pkts.) TX: 8.27 KB (61 Pkts.)	Restart Stop Edit	Delete
AG 3g-4G Add new interface	Protocol: UMTS/GPRS/EV-DO RX: 0 B (0 Pkts.) TX: 0 B (0 Pkts.)	Restart Stop Edit	Delete
And new indefidue		Save & Apply + S	ave Reset

5.4.1.1 LAN port



٥ ×

(**) R40B - Network Settings - LuC × +

→ C A Not secure | 192.168.3.1/cgi-bin/luci/admin/network/network 4

← → C ▲ Not secure 192.168.3.1/cgi-bin/luci/adm	n/network/network	☆	θ	:
R40B Status + System +	Services + Network + VPN + Serial Port + RTU I/O + Logical operation + Cloud platform + Logout			^
	AUTO REFRESH ON			
Interfaces » LAN				
Ir General settings Advanced Set	ttings Physical Settings Firewall Settings DHCP Server			
Status	(b) ² Device: br-lan Uptime: (bh 48m 4s) MAC: 4456 (83:03): 03:04:68 BX: 4:06 (BK (37:443) Pkts.) TX: 2:57 (BH (6883) Pkts.) IPv4: 192:168:3.1/24 IPv4: 192:168:3.1/24 IPv6: td83:1/b6:35eb::1/160			l
Protocol	Static address 🗸			
Bring up on boot				
IPv4 address	192.168.3.1			
IPv4 netmask	255.255.255.0			
IPv4 gateway				P
IPv4 broadcast	192.168.3.255			
Use custom DNS servers	*			
IPv6 assignment length	60 • @ Assign a part of given length of every public IPv6-prefix to this interface			

LAN Port		
Item		Description
		Device: br-lan
		Running time: 8h 57m 16s
		MAC: E2:2F:C4:54:93:BA
	Status	Receive: 18.81 MB (149126 data pack)
		Send: 99.87 MB (132321 data pack)
		IPv4: 192.168.3.1/24
		IPv6: fdb2:428b:ddbe::1/60
	Protocol	Static address
	Bring up on boot	Default enable
		Default 192.168.3.1, modify this setting
	IPv4 address	to change the network segment that
Basic Setting		DHCP assigns IP to LAN port
basic setting	IPv4 netmask	Default 255.255.255.0
		Default is empty, when multiple IPv4
	IPv4 gateway	addresses are set, the gateway address
		needs to be specified
	IPv4 broadcast	Default 192.168.3.255
	Use custom DNS server	Default is empty
		Assign a given length part of each
	IPv6 allocation length	public IPv6 prefix to this interface,
		default 60
	IPv6 assignment tips	Assign this hexadecimal sub-ID prefix to
		this interface
	IPv6 suffix	Optional, allowed values: "eui64",



	Use built-in		"random" and other fixed values (for example: "::1" or "::1:2"). When the IPv6 prefix (such as "a:b:c:d::") is obtained from the authorization server, use the suffix (such as "::1") to synthesize an IPv6 address ("a:b:c:d::1") Assigned to this interface.
	IPv6 manag		Default enable
Advanced settings	Mandatory link		Regardless of the link status of the interface, always use the application settings (if checked, the link status change will no longer trigger hotplug event processing). default is enable.
	Reset MAC	address	Modify MAC address
	Reset MTU		Default 1500
	Use Gatewa	ау Нор	Default 0
	Bridge interface		Create a bridge for the specified interface, default is enable.
	Enable STP		Enable spanning tree protocol on this bridge, default is disable.
Physical settings	Enable IGMP sniffing		Enable IGMP snooping on this bridge, default is disable
	Interface		Switch VLAN: "eth0.1" (lan), wireless network: Master "King-xxxxx" (lan), set the physical interface using the LAN port, generally do not need to be modified
Firewall settings	Create/Assign firewall zone		Assign the firewall area to which this interface belongs, select Unspecified to move the interface out of the associated area, or fill in the creation field to create a new area and associate the current interface with it.
		Ignore this interface	DHCP service is not provided on this interface, default is disable
DHCP server	Basic Setting	Start Customers	Start network address, default is 100.Maximum number of addressassignments. The default is 150.
		Lease term	The expiration time of the leased address is at least 2 minutes (2m). The default is 12h.
	Advanced settings	DHCP	Provide DHCP service for all clients. If disabled, only customers with static leases will be served. default is enable.
		Forcibly	Even if another server is detected, it is



1018			
			mandatory to use DHCP on this network, default is disable.
		IPv4 Subnet mask	Reset the subnet mask sent to the client.
			Set additional options for DHCP, for example, setting "6,192.168.2.1,192.168.2.2" means to announce different DNS servers to clients.
		Route Advertisement Service	Default server mode
		DHCPv6 server	Default server mode
		HDP proxy	Default disable
	IPv6	DHCPv6 mode	The default is stateless + stateful
	setting	Always	Even if there is no public network prefix
	setting	advertise the	available, it still advertises itself as the
		default route	default route, default is disable
		Advertised DNS server	Default is empty
			Default is empty

5.4.1.2 WAN port

(**) R40B - Network Settings - LuC × +		- 0	×
← → C ▲ Not secure 192.168.3.1/cgi-bin/luci/adm	in/network/network	☆ 8	
R40B Status - System -	Services * Network * VPN * Serial Port * RTU I/O * Logical operation * Cloud platform * Logout	i i i	^
	AUTO REFRESH ON		
Interfaces » WAN			
General settings Advanced S	ettings Physical Settings Firewall Settings		
Status			
Protocol	DHCP client 🗸		
Bring up on boot			
Hostname to send when requesting DHCP	R40B		
	Dismiss Save		
etto.2	TX: 8.27 KB (61 Pkts.)		
	Protocol: UMTS/GPRS/EV-DO RX: 0 B (0 Pkts.) TX: 0 B (0 Pkts.) Error: Network device is not present		
	Save & Apply		

WAN Port	
Item Description	



	Status	Device: eth0.2 Running time: 9h 37m 16s MAC: E2:2F:C4:54:93:BB Receive: 113.65 MB (290226 data pack) Send: 19.02 MB (137282 data pack) IPv4: 192.168.1.173/24
General Setting	Protocol	Default DHCP client; if the network connected to the WAN requires an account and password to log in, please select PPPoE protocol or other corresponding protocol
	Bring up on boot	Default is enable
	Hostname sent when requesting DHCP	Default is product model
	Use built-in IPv6 management	Default is enable
	Mandatory link	Regardless of the link status of the interface, always use the application settings (if checked, the link status change will no longer trigger hotplug event processing). Default is disable.
	Use broadcast tags	Needed by some ISPs, for example: coaxial network DOCSIS 3, default is disable.
Advanced settings	Default gateway	Leave blank to not configure the default route, default is enable.
	Obtain DNS	Leave blank to ignore the advertised DNS
	server automatically	server address, default is enable.
	Use Gateway Hop	Default is empty
	Client ID sent when requesting DHCP	Default is empty
	Vendor Class option sent when requesting DHCP	Default is empty
	Reset MAC address	Modify MAC address
	Reset MTU	Default is 1500
	Bridge interface	Create a bridge for the specified interface, default is disable
Physical settings	Interface	Switch VLAN: "eth0.2" (wan, wan6), set which physical interface to use, generally do not need to be modified
Firewall settings	Create/Assign firewall zone	Assign the firewall area to which this interface belongs, select Unspecified to move the interface out of the associated area, or fill in the creation field to create a new area and associate the current interface with it.



5.4.1.3 WAN6 Port

(10) R40B - Network Settings - LuC × +		— ť	5 ×
← → C ▲ Not secure 192.168.3.1/cgi-bin/luci/adm	in/network/network	☆	Θ:
R40B Status - System -	Services * Network * VPN * Serial Port * RTU I/O * Logical operation * Cloud platform * Logout		-
	AUTO REFRESH ON		
Interfaces » WAN6			
General settings Advanced Set	tilings Physical Settings Firewall Settings		
Status			
	TX: 8.43 KB (62 Pkts.)		
Protocol	DHCPv6 client		
Bring up on boot			
Request IPv6-address	try 🗸		
Request IPv6-prefix of length	Automatic -		
	Dismiss Save		
4G 39-43	Protocol: UMTS/GPRS/EV-DO RX: 0 B (0 Pkts.) Restart Stop Edit Delete TX: 0 B (0 Pkts.)		
Add new interface			
	Save & Apply - Save Reset		

WAN6			
Item		Description	
	Status	Device: eth0.2	
		MAC: E2:2F:C4:54:93:BB	
		Receive: 115.31 MB (299495 data pack)	
		Send: 19.41 MB (140798 data pack)	
Basic Setting	Protocol	Default DHCPv6 client	
	Bring up on boot	Default is enable	
	Request IPv6 address	Default is try	
	Request IPv6 prefix of length	Default automatic	
	Use built-in	Default enable	
	IPv6 management		
	Mandatory link	Regardless of the link status of the interface, always use the application settings (if checked, the link status change will no longer trigger hotplug event processing). Default is disable.	
Advanced settings	Use default gateway	Leave blank to not configure the default route	
	Custom assigned IPv6 prefix	Default is empty	
	Obtain DNS	Leave blank to ignore the advertised DNS	
	server automatically	server address, default is enable.	
	Client ID sent when requesting	Default is empty	



	DHCP	
	Reset MAC address	Modify MAC address
	Reset MTU	Default 1500
	Dridge interface	Create a bridge for the specified
Physical settings	Bridge interface	interface, default is disable.
	Interface	Switch VLAN:"eth0.2"(wan,wan6)
		Assign the firewall area to which this
		interface belongs, select Unspecified to
Eirowall cottings	Create/Assign	move the interface out of the associated
Firewall settings	firewall zone	area, or fill in the creation field to create a
		new area and associate the current
		interface with it.

5.4.1.4 4G Port

(**) R40B - Network Settings - LuC × +		- 0 ×
← → C ▲ Not secure 192.168.3.1/cgi-bin/luci/adm	n/network/network	☆ 0 :
R40B Status + System +	Services * Network * VPN * Serial Port * RTU I/O * Logical operation * Cloud platform * Logout	Î
Interfaces » 4G	ttings Firewall Settings	
General settings Advanced Se		
Status	Device: 3g-4G RX: 0 B (0 Pkts.) TX: 0 B (0 Pkts.)	
Protocol	UMTS/GPRS/EV-DO V	
Bring up on boot		
Modem device	/dev/ttyUSB4 •	
Service Type	UMTS/GPRS ·	
APN	cmnet	
PIN		
PAP/CHAP username		
PAP/CHAP password		
Dial number	*99***1#	
	Dismiss Save	

4G			
Item		Description	
		Device: 3g-4G	
		Running time: 0h 11m 52s	
	Status	Receive: 1.06 KB (18 data pack)	
		发送: 8.50 KB (36 data pack)	
		IPv4: 10.94.92.16/32	
Desis Catting	Protocol	UMTS/GPRS/EV-DO	
Basic Setting	Bring up on boot	Default is enable	
	Modem equipment	Default/dev/ttyUSB4	
	Service type	Default UMTS/GPRS	
	APN	SIM Card Internet access point	
	PIN	SIM card PIN code	
	PAP/CHAP uername	User name for PPP authentication	



	PAP/CHAP password	Password for PPP authentication
	Dial number	SIM Card Internet dialing
	Use built-in IPv6 management	Default is enable
	Mandatory link	Regardless of the link status of the interface, always use the application settings (if checked, the link status change will no longer trigger hotplug event processing), Default is disable.
	Obtain IPv6 address	Default auto
	Modem initialization	The maximum waiting time for the modem to be
	timeout	ready (seconds), default 10
A dura na a d	Use default gateway	Leave blank to not configure the default route, default is enable.
Advanced	Use Gateway Hop	Default is empty
settings	Obtain DNS	Leave blank to ignore the advertised DNS server
	server automatically	address, default is enable.
	LCP Response failure threshold	After the specified number of LCPs respond to the fault, it is assumed that the link has been disconnected. O means ignore the fault, and the default is O.
	LCP Response interval	LCP response is sent regularly (seconds), which is only valid when the fault threshold is combined, the default is 5
	Activity timeout	Close the inactive link after a given time (seconds), 0 is to keep the connection, the default is 0
Firewall settings	Create/Assign firewall zone	Assign the firewall area to which this interface belongs, select Unspecified to move the interface out of the associated area, or fill in the creation field to create a new area and associate the current interface with it.

5.4.1.5 WAN/LAN Switch

If WAN is not used, tick Switch Wan port o LAN port and click Save and Apply

4G Wireless Industrial Router Wireless Data Connectivity

interface LAN/WAN switch Global network options	AUTO REFRESH ON
Switch WAN port to LAN port	
Powered by KingPigeon Technology Co., Ltd. (v1.20.10) / 2021-09-0	Mandatory application Save and apply Mandatory application
	To switch from WAN to LAN, you must click Force Apply and save

5.4.2 WIFI

(0) R40B - WiFi - LuCl	× +						- ø ×
\leftrightarrow \rightarrow C A Not sec	cure 192.168.3.1/cg	i-bin/luci/admin/network/wi	reless				\$ 8 :
	R40B Status		łetwork ≁ VPN ≁	Serial Port - RTU I/	O - Logical operation	n ≁ Cloud platform ≁ Logout	
						AUTO REFRESH ON	
	WiFi Settings						
	👷 radio0	MediaTek MT76x8 802. Channel: 11 (2.462 GHz) Bi			Restart	Scan Add	
	(iiiii) 0%	SSID: King-2b77b3 Mode: M BSSID: EC:0C:45:81:26:51			Disable	Edit Remove	
	Associated St	ations					
	Network	MAC-Address	Host	Signal / Noise	RX F	Rate / TX Rate	
			No infe	ormation available			
					Save	& Apply - Save Reset	
	Powered by KingPige	eon Technology Co., Ltd. (v1.18)	2020-10-16				

Supports both WLAN hotspot and WLAN client.

The wireless overview shows the current wireless status, you can click Edit to enter the detailed configuration, or restart, scan, add, disable, remove, etc.

Connected stations shows the currently connected wireless stations, which can be disconnected.

5.4.2.1 WLAN Hotspot(Wifi AP mode)



The default SSID is King-xxxxxx, no encryption method, other clients can directly search the wireless network to connect to this hotspot.

Quick configuration: Select the wireless configuration in Master mode in the wireless profile, click "Edit" to enter the configuration page, find "Interface Configuration"-"Basic Settings"-"ESSID" to modify the WiFi hotspot name, find "Interface Configuration"- -"Wireless Security"-"Encryption" can modify the encryption method to set the WiFi password.

Note: When using WiFi connection to enter the router configuration, to modify the WLAN hotspot configuration, you need to select "force application", please click the drop-down button behind "save and apply" and select "force application"

Wireless network AP hotspot device configuration			
Item		Description	
General Setup	Status	 97% Mode: Master SSID: King-ff4a8a BSSID: EE:0C:45:81:26:51 Encryption: None Channel: 6 (2.437 GHz) Transmission power: 20 dBm Signal: -42 dBm Noise: 0 dBm Transmission rate: 58.5 Mbit/s Country: 00 	
	Wireless network is enabled	Default is enable	
	Operating frequency	If there are too many devices in use at the current frequency, please change one	
	Maximum transmit	Specify the maximum transmit power.	

KING PIGEON



4G Wireless Industrial Router Wireless Data Connectivity

	1				
	power	Depending on regulatory requirements and usage, the driver may limit the actual transmit			
		power below this value.			
	Country code	Driver default			
	Allow traditional	Default is enable			
	802.11b rate				
	Distance optimization	The distance (meter) of the furthest network user. Automatic by default, automatically adjust the transmission power according to the distance			
	Fragmantation	Automatically send data when the data length			
	Fragmentation	exceeds the threshold, generally use the default			
	threshold	value			
Advanced settings	RTS/CTS Threshold	Request to send/allow sending protocol. When the data length exceeds the threshold, start the protocol to avoid signal conflicts caused by multiple terminals sending data to the AP. Usually use default value			
		Even if the auxiliary channels overlap, the 40MHz			
		channel is always used. Using this option is not			
	Force 40MHz mode	compliant with IEEE 802.11n-2009! Default is			
		disable.			
		Indicates the interval at which the wireless			
	Beacon interval	router periodically broadcasts its SSID. Usually			
		use default value.			
L		1			

Wireless network AP hotspot interface configuration			
Item		Description	
	Mode	Access Point	
	ESSID	Default King-xxxxx (xxxxxx is Random numbers	
	E33ID	or letters)	
Pacic Sotting	Network	lan	
Basic Setting	Hide ESSID	Default is disable	
		Wi-Fi Multimedia, providing different	
	WMM mode	priorities for different services	
		to ensure service quality, default is enable	
Wireless security	encryption	No encryption by default (open network)	
MAC filter	MAC address filter	Default is disable	
	Isolate the client	Forbid communication between clients,	
		default is disable	
	Interface name	Reset the default interface name	
Advanced settings	Short Preamble	Different rates need to use different Preamble	
Advanced settings	SHOLLFLEATINE	(preamble),default is enable	
	DTIM interval	As a terminal node, periodically wake up to	
		send traffic indication message interval	
	Interval for	Temporary key (GTK), Use default	



re-encrypting GTK	
Disable inactive	Defeult is dischle
polling	Default is disable
Inactive site	Default is among
restrictions	Default is empty
Max allowed	Default is among
listening interval	Default is empty
Disconnect on low	Allow AP mode to disconnect wireless terminal
Ack response	under low ACK, default is enable.

5.4.2.2 WLAN Client

Signal	SSID	Channel	Mode	BSSID	Encryption	
48%	jingekeji	1	Master	24:69:68:82:3C:96	mixed WPA/WPA2 PSK (CCMP)	Join Network
37%	DIRECT-58-HP DeskJet 3630 series	6	Master	40:B0:34:63:EB:59	WPA2 PSK (CCMP)	Join Network
34%	King-e4f82b	11	Master	EC:0C:45:81:26:54	None	Join Network
30%	BioLock	6	Master	60:3A:7C:0D:00:16	mixed WPA/WPA2 PSK (CCMP)	Join Network
						Dismiss
					Save & Apply + Save Rese	
	Powered by KingPigeon Technology Co.,	Ltd. (v1.18) / 2020-1				

Please click "Scan" to search the wireless network, select "Join Network" to enter the quick configuration page, if a password is required, enter the WiFi password in "WPA Key", then click "Submit" to enter the detailed configuration page, and finally click "Save".

		Device Configuration
ltem		Description
Basic Setting	Status	 100% Mode: Client SSID: jingekeji BSSID: EC:0C:45:81:26:51 Encryption: WPA2 PSK (CCMP) Channel: 6 (2.437 GHz) Transmission power: 20 dBm Signal: -38 dBm Noise: 0 dBm Transmission rate: 1.0 Mbit/s Country: 00
	Wireless network is enabled	Default is enable



1002		
	Working	If there are too many devices in use at the current
	frequency	frequency, please change one
	Max	Specify the maximum transmit power. Depending on
	transmission	regulatory requirements and usage, the driver may limit
	power	the actual transmit power below this value.
	Country code	Driver default
	Allow traditional 802.11b rate	Default is enable
	Distance	The distance (meter) of the furthest network user. By default, the transmission power is automatically adjusted
	optimization	according to the distance
	Fragmentation	Automatically send data when the data length exceeds
Advanced	threshold	the threshold, usually use default value.
settings	RTS/CTS Threshold	Request to send/allow to send protocol. When the data length exceeds the threshold, start the protocol to avoid signal collision caused by multiple terminals sending data to the AP, usually use default value.
	Force 40MHz mode	Even if the auxiliary channels overlap, the 40MHz channel is always used. Using this option is not compliant with IEEE 802.11n-2009! default is disable.
	Beacon interval	Indicates the interval at which the wireless router periodically broadcasts its SSID, usually use default value.

Interface configuration						
Item		Description				
	Mode	Client				
Pacie Sotting	ESSID	Wireless network name				
Basic Setting	BSSID	none				
	Network	Wwan,no need modify it				
	Encryption	WPA2-PSK (Strong security)				
	Algorithm	auto				
	Password	Wireless network password				
	802.11w Management Frame Protection	Requires the full version of wpad/hostapd, and WiFi driver support, default is disabled				
	Interface name	Reset the default interface name				
Wireless security	Short Preamble	Different rates require different Preambl (preamble), default is enable				
	DTIM interval	As a terminal node, periodically wake up to send traffic indication message interval				
	Re-encrypt GTK	Temporary key (GTK)				
	time interval	Use default value				
	Disable inactive polling	Default is disable				
	Inactive site	Default is empty				



restr	ictions		
Maxir	num allowed	Default is empty	
listen	ing interval		
Disco	nnect on low	Allow AP mode to disconnect wireless terminal	
Ack re	esponse	under low ACK, default is enable	

5.4.3 Cellular Network

Firmware version NA IMSI NA	A A	צאסן	AVED CONFIGURATION 12
Cellular network Image: Cellular network Image: Cellular network Image: Cellular network Na Registration status Na Operator Na Signal strength Na Na Firmware version Na Na IMSI Na Na	A A A		
Enable cellular network Registration status NA Operator NA Signal strength NA Firmware version NA IMSI NA	A A A		
Registration status NA Operator NA Signal strength NA Firmware version NA IMSI NA	A A A		
Operator NA Signal strength NA Firmware version NA IMSI NA	A		
Signal strength NA Signal strength NA Signal strength NA IMSI NA	4		
Firmware version NA			
Firmware version NA IMSI NA	Signal value normal range 14-31		
IMSI NA			
intoi	A		
	A		
IMEI NA	A		
SIM card ID NA	A		
Choose a calling card Car	ard 2 🗸		
Card 2 number			
Card 2 APN			
Card 2 username			
Card 2 password			
Enable GPS			
SIM card switch automatically			
Automatic network switching 🔽			

Cellular Network			
Item	Description		
Register status	Registered		
Operator	N/A		
Signal	Normally is 14-31		
Firmware version	EC25AUGCR06A02M1G		
IMSI	SIM card IMSI number		
IMEI	Device IMEI number		
SIM card ID	SIM card ICCID number		
Card select	Card 1, Card 2, this selection as the preferred SIM card, When the preferred SIM card cannot be connected to the network, it will automatically switch to another card to try to connect to the network		
Card 1 /2 number	Enter sim card 1 number		
SIM card 1/2 APN	Enter APN		
SIM card 1/2 username	Enter username		
SIM card 1/2 passwrod	Enter password		
Enable GPS	Default is disable, when choosing a module with GPS		

4G Wireless Industrial Router Wireless Data Connectivity

		function, please select enable, GPS data will be uploaded
		through MQTT protocol
Automatic	network	Check to enable the function
switching		

5.4.4 DHCP/DNS

(w) R40B - DHCP and DNS - LuCI × +	– o ×
← → C ▲ Not secure 192.168.3.1/cgi-bin/luci/admin/network/dhcp	☆ \varTheta :
R40B Status * System * Services * Network * VPN * Serial Port * RTU I/O * Logical operation * Cloud platt	iorm → Logout
	AUTO REFRESH ON
DHCP and DNS Dnsmasq is a combined <u>DHCP</u> -Server and <u>DNS</u> -Forwarder for <u>NAT</u> firewalls	
Server Settings	
General settings Resolv and Hosts Files TFTP Settings Advanced Settings Static Leases	
Static leases are used to assign fixed IP addresses and symbolic hostnames to DHCP clients. They are also required for non-dynamic interfa where only hosts with a corresponding lease are served. Use the <i>Add</i> Button to add a new lease entry. The <i>MAC-Address</i> identifies the host, the <i>IPv4-Address</i> specifies the fixed address to use, and assigned as a symbolic name to the requesting host. The optional <i>Lease time</i> can be used to set non-standard host-specific lease time, e.g.	the Hostname is
Hostname MAC-Address IPv4-Address Lease time DUID IPv6-Suffix (here)	x)
This section contains no values yet	
Add	
Active DHCP Leases	
Hostname IPv4-Address MAC-Address Leasetime remaining	
There are no active leases	
Active DHCPv6 Leases	
Host IPv6-Address DUID Lea	setime remaining

Dnsmasq provides an integrated DHCP server and DNS forwarder for the NAT firewall

	Server Settings			
Item		Description		
	Ignore empty domain name resolution	Do not forward resolution requests without DNS names, checked by default		
	Unique authorization	This is the only DHCP server in the local network, default is enable		
	Local server	Local domain rules. Names matching this domain are never forwarded, only resolved from DHCP or HOSTS files		
General Setting	Local domain name	The local domain name suffix will be added to the DHCP and HOSTS file entries		
	Record query log	Write received DNS request to system log, defaule is disable		
	DNS forward	List of DNS servers to which requests are forwarded		
	Rebinding protection	Discard RFC1918 upstream response data, default is enable		
	Allow local	Allow upstream response within 127.0.0.0/8 loopback range, for example: RBL service, default is enable.		

	Domain name whitelist	List of domain names that allow RFC1918 to respond		
	Local service only	DNS service is only provided in the subnet to which the network card belongs, default is enable.		
	Not all addresses	Dynamically bind to interface instead of wildcard address (recommended as linux default), default is enablee		
	Listening interface	Only listen to these interfaces and loopback interfaces.		
	Exclude interface	Do not listen to these interfaces.		
	use /etc/ethers	Configure DHCP server according to		
	Configuration	/etc/ethers,default is enable.		
	Lease documents	The file used to store the assigned DHCP lease, default is :/tmp/dhcp.leases		
the file	Ignore parsing file	Default is disable		
	Ignore /etc/hosts	Default is disable		
	Additional HOSTS file	Default is empty		
TFTP setting	Enable TFTP server	Default is disable		
	No log	Does not record general operation logs of these protocols, default is disable.		
	Sequential	IP addresses are assigned sequentially starting from		
	allocation IP	the lowest available address, default is disable.		
	Filter local	Reverse queries without forwarding the local		
	packages	network,default is enable.		
	Filter useless	Do not forward requests that the public domain		
	packets	name server cannot respond, default is disable		
	Localized query	If multiple IPs are available, the host name is localized according to the subnet from which the request originated, default is enable		
Advanced	Expand the host suffix in the HOSTS file	Add the local domain name suffix to the domain name in the HOSTS file, default is enable		
	Disable invalid information cache	Do not cache useless responses, for example: domain names that do not exist, default is disable		
	Additional SERVERS file	This file may contain formats such as "server=/domain/1.2.3.4" or "server=1.2.3.4" .The former specifies a DNS server for a specific domain, while the latter does not limit the resolution range of the server.		
	Strict order	Query DNS server in the order of "parse file", default		
,	checking	is disable.		
	All server	Query all available upstream DNS servers, default is disable.		
	All server Ignore fake empty	• •		

KING PIGEON



4G Wireless Industrial Router Wireless Data Connectivity

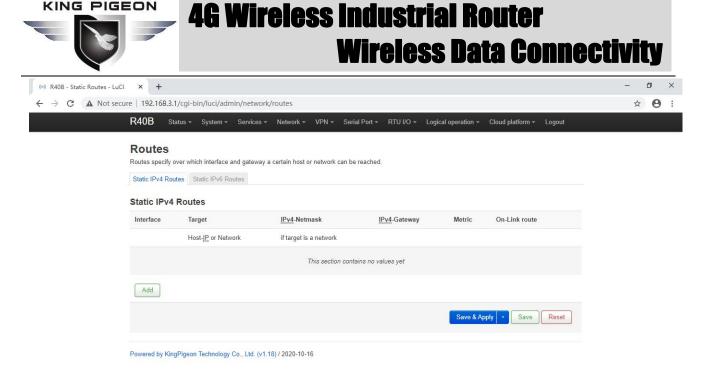
	resolution	
	DNS server port	Inbound DNS query port
	DNS query port	Specified DNS query source port
	Max DHCP leases No.	Maximum number of DHCP leases allowed
	Max EDNS0 data pack size	Allowed max EDNS.0 UDP data pack size
	Maximum concurrent queries number	Maximum number of concurrent DNS queries allowed
	DNS Query cache size	Cached DNS entries numbers (maximum 10000, 0 means no cache)
Static address assignment		Static leases are used to assign fixed IP addresses and host IDs to DHCP clients. Only the specified host can be connected, and the interface must be non-dynamically configured. Use the Add button to add a new lease entry. The values of the IPv4 address and host name fields will be fixedly assigned to the hosts identified by the MAC address field. The lease period is an optional field, and the length of the DHCP lease period can be set separately for each host, for example: 12h, 3d, infinite, Respectively 12 hours, 3 days, permanent.

5.4.5 Host names

(1) R40B - Hostnames - LuCl X	+	- 0 ×
← → C ▲ Not secure	92.168.3.1/cgi-bin/luci/admin/network/hosts	☆ \varTheta :
R4	0B Status + System + Services + Network + VPN + Serial Port + RTU I/O + Logical operation + Cloud platform + Logout	
	estnames st entries	
Но	stname IP address	
	This section contains no values yet	
	Add	
	Save & Apply - Save Reset	
Pow	ared by KingPigeon Technology Co., Ltd. (v1.18) / 2020-10-16	

After adding the host mapping, you can access the specified IP address by accessing the host name

5.4.6 Routes



The routing table describes the reachable path of the packet

		Routes
Item		Description
	interface	Select setting interface
	Target	Host IP or network, requires valid IP or network
Basic Setting	IP Subnet	If the object is a network, a valid IP or network is
	mask	required
	IP gateway	Need valid IP or network
	Hops	0
	MTU	1500
	Туре	unicast
Advanced settings	Routing table	main(254)
	Source address	Auto
	On-Link	Default is disable
	Routing	Default is disable

5.4.7 Diagnosis

	4 G Wire		ustrial Ro eless Data		tivity
(••) R40B - Diagnostics - LuCl × +					- 0 ×
← → C ▲ Not secure 192.168.3.1/	'cgi-bin/luci/admin/network/diag	nostics			☆ 🛛 :
R40B Stat	us + System + Services + Ne	twork - VPN - Serial Port -	RTU I/O - Logical operation - Clo	oud platform 👻 Logout	
Diagnost Network Util openwrt.org IPv4 v Ping Powered by Kingf	ities	openwrt.org IPv4 V Traceroute 020-10-16	openwrt.org Nslookup		

Three commands are provided here: Ping, Traceroute, and Nslookup, which can perform simple diagnosis on the network.

5.4.8 Firewall

5.4.8.1 Zone settings

(**) R40B - General settings - LuCl × +	- ø ×
← → C ▲ Not secure 192.168.3.1/cgl-bin/luci/admin/network/firewall	☆ \varTheta :
R40B Status + System + Services + Network + VPN + Serial Port + RTU I/O + Logical operation + Cloud platform + Logout	A
General settings Port Forwards Traffic Rules Custom Rules	_
Firewall - Zone Settings	
The firewall creates zones over your network interfaces to control network traffic flow.	
General settings	
Enable SYN-flood protection	
Drop invalid packets	
Input accept ~	
Output accept ~	
Forward accept V	
Routing/NAT Offloading	
Experimental feature. Not fully compatible with QoS/SQM.	
Software flow offloading	
g Soliwale based oliologulig for found/index.	
Zones	
Zone ⇒ Forwardings Input Output Forward Masquerading	
Ian ⇒ wan accept ✓ accept ✓ □ Edit Delete	•

The firewall controls network traffic by creating zones on network interfaces.

		Firewall-Zone Settings
Item		Description
General	This section defin	es the general properties of "lan". The inbound data and

Setting	outbound data options are used to set the default strategy for inbound and outbound traffic in this area, and the forwarding options describe the traffic forwarding strategy between different networks in the area. The covered		
		es the networks belonging to this area.	
	Name	lan	
	Input	Default is accept	
	Output	Default is accept	
	Forward	Default is accept	
		The LAN port does not need to be set, and the WAN port	
	IP Dynamic	address may change during dynamic allocation. You need	
	camouflage	to set up dynamic disguise to connect to the external	
		network	
	MSS Clamp	Automatically adjust MSS according to MTU	
	Covered networks	lan	
	Allow		
	forwarding to	wan	
	target area		
	Allow		
	forwarding from	unspecified	
	source area		
	(lan) and other a lan. The forward areas whose dest example, forward	tions control the forwarding strategy between this area reas. The target area receives the forwarded traffic from ing traffic matching the source area comes from other ination is lan. The role of forwarding rules is one-way. For ing traffic from lan to wan does not mean allowing reverse if c from wan to lan.	
	Covered equipment	This option can classify regional traffic on original, non-UCI-hosted network devices.	
	Subnets covered	This option can classify regional traffic by source or destination subnet instead of network or device.	
Advanced settings	Restricted address	IPv4,IPv6	
	To restrict the source subnet of IP dynamic masquerading	Default is empty	
	Target subnets to restrict IP dynamic masquerading	Default is empty	
	Enable logging in this area	Default is disable	
Conntrack setting	Allow "invalid traffic"	Do not install additional rules to deny forwarded traffic with conntrack status invalid. This may be a necessary setting for complex asymmetric routing, default is disable	



	Automatic assistant assignment	Automatically assign conntrack assistant according to traffic protocol and port, default is enable.
Additional	classification rule the interface or s	otables parameter to the source and destination traffic s, you can match packets based on other conditions than ubnet. Use these options with extreme caution, as invalid the firewall rule set and expose all services to the outside
iptables parameter	Additional source parameters Additional target	Additional iptables parameters are used to classify regional inflows. For example: -p tcpsport 443 only matches inbound HTTPS traffic. Additional iptables parameters are used to classify regional outgoing traffic. For example: -p tcpdport 443
	parameters	only matches outbound HTTPS traffic.

5.4.8.2 Port forwards

(••) R40B - Port Forwards - LuC	- × +						-	ð	×
← → C ▲ Not secu	ure 192.168.3.1/cgi-bin/luc	i/admin/network/firewall/fo	orwards				☆	Θ	:
	R40B Status - Syst	em - Services - Network -	- VPN - Serial Port -	RTU I/O + Logical op	eration - Cloud platform -	Logout			
	General settings Port Forw	ards Traffic Rules Custom F	Rules						
	Firewall - Port F Port forwarding allows remote	orwards computers on the Internet to con	nect to a specific computer or	service within the private	LAN.				
	Port Forwards								
	Name	Match	Forward to		Enable				
			This section contains no valu	es yet					
	Add								
	Save & Apply - Save Reset								
Powered by KingPigeon Technology Co., Ltd. (v1.18) / 2020-10-16									

Port forwarding allows remote computers on the Internet to connect to specific computers or services on the internal network.

Firewall-Port Forwarding				
Item		Description		
	Name	Forward naming		
	Protocol	TCP+UDP,TCP,UDP,ICMP optional		
	Source area	wan		
Conoral Sotting		Match inbound traffic to the specified		
General Setting	External port	target port or target port range on this		
		host		
	Target area	lan		
	Internal IP address	Redirect matching inbound traffic to the		



		specified internal host				
	Internal port	Redirect matching inbound traffic to the				
		port of the internal host				
	Source MAC address	Match only inbound traffic from these				
		MACs				
	Source IP address	Only match inbound traffic from this IP or				
		IP range				
	Source port	Only match inbound traffic originating				
Advanced settings		from a given source port or source port				
Auvanceu settings		range on the client host				
	External IP address	Only match inbound traffic for the				
	External iP address	specified destination IP address				
	Enable NAT loopback	Default is enable				
	Additional parameters	Extra parameters passed to iptables. use				
	Additional parameters	caution!				

5.4.8.3 Traffic rules

(••) R40B - Traffic Rules - LuCI × +				- 0 >
\leftrightarrow \rightarrow C A Not secure 192.16	58.3.1/cgi-bin/luci/admin/network/firewall/rules			☆ 😶
R40B	Status - System - Services - Network - VPN - Serial Port - RT	'U I/O ≁ Logical ope	eration - Cloud platform - Logout	
General set	tings Port Forwards Traffic Rules Custom Rules			
	II - Traffic Rules			
Traffic rules	define policies for packets traveling between different zones, for example to reject tr	affic between certain h	nosts or to open WAN ports on the router.	
Traffic R	ules			
Name	Match	Action	Enable	
Allow- DHCP- Renew	IPv4-UDP From any host in wan To any router IP at port 68 on this device	Accept input	✓ Edit Delete	
Allow- Ping	IPv4-ICMP with type echo-request From any host in wan To any router IP on this device	Accept input	✓ Ξ Edit Delete	
Allow- IGMP	IPv4-IGMP From any host in wan To any router IP on this device	Accept input	✓ Ξ Edit Delete	
Allow- DHCPv6	IPv6-UDP From IP <i>fc00:1/6</i> in wan To IP <i>fc00:1/6</i> at port <i>546</i> on <i>this device</i>	Accept input	Edit Delete	
Allow- MLD	IPv6-ICMP with types 130/0, 131/0, 132/0, 143/0 From IP fe80://10 in wan To any router IP on this device	Accept input	✓ Edit Delete	
Allow- ICMPv6- Input	IPv6-ICMP with types echo-request, echo-reply, destination-unreachable, packet-too-big, time-exceeded, bad-header, unknown-header-type, router-solicitation, neighbour- solicitation, router-advertisement, neighbour-advertisement From any host in wan	Accept input and limit to 1000 pkts. per second	✓	

Traffic rules define policies for packets traceling between different zones, for example to reject traffic between certain hosts or to open WAN ports on the router.

5.4.8.3 Custom rules

	4G Wireless	Industria	I Router	
		Wireless	Data Conne	ectivity
(0) R40B - Traffic Rules - LuCI ×	+			- o ×
← → C ▲ Not secure 192	2.168.3.1/cgi-bin/luci/admin/network/firewall/rules			☆ \varTheta :
R40B	Status + System + Services + Network + VPN + Se	rial Port - RTU I/O - Logical ope	ration - Cloud platform - Logout	^
General	settings Port Forwards Traffic Rules Custom Rules			
	vall - Traffic Rules les define policies for packets traveling between different zones, for exa	mple to reject traffic between certain h	osts or to open WAN ports on the router.	
Traffic	Rules			
Name	Match	Action	Enable	
Allow- DHCP- Renew	IPv4-UDP From any host in wan To any router IP at port 68 on this device	Accept input	✓ Edit Delete	
Allow- Ping	IPv4-ICMP with type echo-request From any host in wan To any router IP on this device	Accept input	✓ Edit Delete	
Allow- IGMP	IPv4-IGMP From any host in wan To any router IP on this device	Accept input	✓ Edit Delete	
Allow- DHCPv	IPv6-UDP 6 From IP /c00∵/6 in wan To IP /c00∵/6 at port 546 on this device	Accept input	✓ Edit Delete	
Allow- MLD	IPv6-ICMP with types 130/0, 131/0, 132/0, 143/0 From IP /e80:://0 in wan To any router IP on this device	Accept input	✓ Edit Delete	
Allow- ICMPvi	IPv6-ICMP with types echo-request, echo-reply, destination-unreachable time-exceeded, bad-header, unknown-header-type, router-solicitation, ni 5- solicitation, router-advertisement, neighbour-advertisement From any host In wan		✓ Edit Delete	Ţ

Custom rules allow you to execute any iptables command that is not part of the firewall framework. Each time the firewall is restarted, these commands will be executed immediately after the default rules are run.

5.5 VPN

5.5.1 IPSec

(10) R40B - IPSec - LuCI	× +					- 0 ×
← → C ▲ Not see	cure 192.168.3	.1/cgi-bin/luci/admin/vpn/ipsec#	ŧ			☆ ⊖ :
	R40B s	tatus - System - Services -	Network - VPN - Serial Port - F	TU I/O - Logical oper	ration - Cloud platform - Logout	
	IPSec Security A	lliance				
	Name	Tunnel ends		State	Running time	
			This section contains no value	s yet		
	Security P Below is a list o	olicy f configured IPSec instances and thei	r current state			
	Name	Remote Gateway	Remote Subnet	Local Subnet	Enable	
			This section contains no value	s yet		
		Add				
					Save & Apply Save Reset	
	Powered by Kir	ngPigeon Technology Co., Ltd. (v1.18)	/ 2020-10-16			

IPSec is an open network layer security framework protocol formulated by the Internet Engineering Task Force (IETF). It is not a single protocol, but a collection of protocols and services that provide security for IP networks. IPSec mainly includes security protocols AH (Authentication Header) and

KING PIGEON

4G Wireless Industrial Router Wireless Data Connectivity

ESP (Encapsulating Security Payload), key management exchange protocol IKE (Internet Key Exchange) and some algorithms used for network authentication and encryption.

IPSec mainly provides security services for IP data packets through encryption and authentication. The security services that IPSec can provide include:

(1) User data encryption provides data privacy through user data encryption.

(2) Data integrity verification Through data integrity verification to ensure that data has not been tampered with on the transmission path.

(3) Data source verification By authenticating the source of the sent data, the data is guaranteed to come from the real sender.

(4) Prevent data replay by rejecting duplicate data packets at the receiver to prevent malicious users from attacking by repeatedly sending the captured data packets.

IPSec					
ltem		Description			
	enable	Tick to enable			
IPSec	Package type	Optional tunnel mode, transmission mode. Tunnel mode means host-to-host, host-to-subnet or subnet-to-subnet tunnel. The transmission mode indicates the transmission method from the host to the host.			
	Peer gateway	Peer gateway which connect with IPSEC			
Configuration	Local subnet IP/mask	In the tunnel mode, the tunnel from the subnet to the subnet needs to specify the local and opposite terminal network ranges			
	Peer Subnet	In the tunnel mode, the tunnel from the subnet to the subnet			
	IP/Mask	needs to specify the local and opposite terminal network ranges			
	Pre-shared key	Default authenticate using pre-shared key			
Phase 1 settings		Phase 1 mainly negotiates encryption parameters, exchanges key information, and verifies device identity			
IKE Encryption A	lgorithm	Specify IKE (Internet Key Exchange) negotiation message encryption algorithm			
Authentication	algorithm	Specify the digital signature authentication algorithm for encrypted messages			
DH group		Specify which key group to use for DH (DiffieHellman) key exchange			
IKE version		IKEv1 or IKEv2			
IKE version Exchange mode		Main mode or brutal mode. The main mode is more secure than the brutal mode, and the brutal mode is faster. If the responde (server) cannot know the address of the initiator (end user) in advance, or the address of the initiator is always changing, and both parties want to use the pre-shared key authentication method to create an IKE SA, Brutal mode can be used at this time			
Negotiation mo	de	Responder or initiator, the initiator is equivalent to the end user, and the responder is equivalent to the server			
Local ID		Can be IP address, standard domain name, email address or proper name, default is local IP			
Peer ID		Can be IP address, standard domain name, email address or			

	proper name, default is peer IP				
IKE live time	Re-negotiate the key time				
Phase 2 setting	The purpose of Phase 2 is to establish an IPSec security association for data transmission				
ESP Encryption Algorithm Specify the algorithm used for data encryption					
Authentication algorithm	Specify digital signature authentication algorithm for encrypted data				
PFS group	PFS (Perfect Forward Secrecy), which means that a key is cracked and does not affect the security of other keys				
Survive time	How long should it take from the negotiation to the connection instance				
DPD detection cycle	DPD (Dead Peer Detect), When no traffic occurs for a period of time, the local end sends a DPD message to check the status of the peer before sending traffic				

5.5.2 L2TP

L2TP (Layer 2 Tunneling Protocol, Layer 2 Tunneling Protocol) is a type of VPDN (Virtual Private Dial-up Network, Virtual Private Dial-up Network) tunneling protocol.

VPDN (Virtual Private Dial Network) refers to the use of public network (such as ISDN and PSTN) dial-up function and access network to achieve a virtual private network, providing access services for enterprises, small ISPs, and mobile office personnel.

VPDN uses a dedicated network encryption communication protocol to establish a secure virtual private network for enterprises on public networks. Enterprises abroad and business personnel can remotely connect to the corporate headquarters through a virtual encrypted tunnel through a public network, while other users on the public network cannot access resources inside the corporate network through the virtual tunnel. There are many VPDN tunneling protocols, and the most widely used is L2TP (Layer Two Tunneling Protocol).

The PPP protocol defines a encapsulation technology that can transmit multiple protocol data packets on a layer-2 point-to-point link. At this time, PPP runs between the user and the NAS (Network Access Server) network access server. The L2TP protocol provides tunnel transmission support for PPP link layer data packets, allows Layer 2 link endpoints and PPP session points to reside on different devices, and uses packet exchange technology for information exchange, thereby expanding the PPP model.

The L2TP function can be simply described as establishing a point-to-point PPP session connection on a non-point-to-point network. The L2TP protocol combines the advantages of the L2F (Layer 2 Forwarding) protocol and the PPTP (Point-to-Point Tunneling protocol) protocol, and has become the IETF industry standard for Layer 2 tunneling protocols.



) R40B - L2TP - LuCI	× +							- 0	>	<
\rightarrow C A Not secu	re 192.168.	3.1/cgi-bin/luci/admin/v	pn/l2tp					☆	0	:
	R40B	Status - System - Sei	rvices - Network - VF	PN - Serial Port - RTU I/(0 - Logical operation -	Cloud platform - Lo	gout			
	L2TP L2TP inst Below is a list	ances of configured L2TP instance	es and their current state							
	Name	User Name	Server/Client	IPSec Encryption	State	Enable				
			This s	section contains no values yet						
		Add]							
					Save &	Apply Save R	leset			
	Powered by K	ingPigeon Technology Co., I	.td. (v1.18) / 2020-10-16							

	L2TP				
Item	Description				
Enable	Tick to enable				
Username	User name for PPP authentication				
Password	Password for PPP authentication				
Server/client	Server, client optional				
Server address	LNS (L2TP Network Server, L2TP network server) address				
IPSec encryption	You can choose whether to use IPSec encryption or not, and choose to use the default IPSec security policy during encryption. You do not need to manually configure IPSec. When you choose to use a security policy, you need to configure the IPSec policy in advance				
Pre-shared key	When selecting encryption, you need to set the IPSec pre-shared key				
Security strategy	Configured IPSce security policy				

5.5.3 OpenVPN

OpenVPN is an application layer VPN implementation based on the OpenSSL library. It is a type of SSL VPN. It uses a virtual network card to establish a connection to transmit data, and uses SSL to encrypt and verify.

The virtual network card is a driver software implemented using the underlying network programming technology, and can be configured like other network cards. If the application accesses a remote virtual address (belongs to the address series used by the virtual network card, which is different from the real address), the operating system will send data packets (TUN mode) or data frames (TAP mode) to the virtual network card through the routing mechanism. After the service program receives the data and performs corresponding processing, it is sent from the external network through SOCKET, and the remote service program receives the data from the

KING PIGEON

4G Wireless Industrial Router Wireless Data Connectivity

external network through SOCKET, and after corresponding processing, it is sent to the virtual network card, and the application software can receive At this point, a one-way transmission process is completed, and vice versa. OpenVPN provides two virtual network interfaces: universal Tun/Tap driver, through which you can establish a layer 3 IP tunnel or a virtual layer 2 Ethernet. The latter can transmit any type of layer 2 Ethernet data, and the transmitted data can be passed through the LZO algorithm compression.

The SSL protocol (Secure Socket Layer) mainly uses the public key system and X.509 digital certificate technology to protect the confidentiality and integrity of information transmission. It includes: server authentication, client authentication (optional), SSL chain Data integrity on the road and data confidentiality on the SSL link. The SSL protocol is independent of the application layer protocol. High-level application layer protocols (such as HTTP, FTP, Telnet, etc.) can be transparently built on the SSL protocol. The SSL protocol has completed the encryption algorithm, communication key negotiation and server authentication before the application layer protocol communication. After that, the data transmitted by the application layer protocol will be encrypted to ensure the privacy of the communication.

(••) R40B - OpenVPN - LuCI	× +							- 0 ×
← → C ▲ Not secu	re 192.168.3.1/cgi-b	in/luci/admin/vpr	n/openvpn					☆ 🛛 :
	R40B Status -	System - Servi	ces - Network - VPN	✓ Serial Port	- RTU I/O - Logi	cal operation - Cloud	i platform → Logout	
	OpenVPN OpenVPN instan		ices and their current state					
	Below is a list of configured OpenVPN instances and their current state Name Mode Protocol Remote Address Port TUN/TAP device Connected Enable							
			This sec	ction contains no	values yet			
		Add						
						Save & Apply	Save Reset	
	Powered by KingPigeon Technology Co., Ltd. (v1.18) / 2020-10-16							

OpenVPN					
Item	Description				
Enable	Tick to enable				
Configure client mode	Tick to client mode				
VPN Subnet IP address/mask	TAP mode, as a server, it can transmit from host to subnet				
Server address	Server address which establish VPN connect with client				
Port	The TCP/UDP port provided by the server for establishing a connection, default is 1194				
Protocol	UDP,TCP-Server,TCP-Client,default is UDP.				
TUN/TAP device	TUN mode establishes a three-layer tunnel to achieve point-to-point transmission. TAP mode establishes a Layer 2 tunnel, which can realize the transparent transmission of IP packets				
Username/passwrod When security certificate authentication is not applicable, u					

	name/password authentication can be used
Encryption Algorithm	Choose data encryption algorithm
Authentication and	Coloct file upload root cortificate provided by conver
authorization (root certificate)	Select file upload, root certificate provided by server
Local certificate	Select file upload, the client certificate generated by the user based
	on the root certificate
Local private key	Select the file upload, the key corresponding to the client certificate
DI Kov ovebange parameters	Used for key exchange, can be generated by openssl dhparam -out
DH Key exchange parameters	dh2048.pem 2048
Compression algorithm	LZO,LZ4
Keepalive interval (seconds)	The interval at which the server sends a probe message to the client
Kaanaliya timaayt (sacanda)	If the server does not receive a response to the probe message at
Keepalive timeout (seconds)	this time, it restarts the connection

Note: When uploading the certificate file, you need to find the directory where the file is saved after you click to select the file, and then select the file after the upload is complete.

5.6 Serial Port

5.6.1 Serial Port settings

Serial Port Settings							
Item		Description					
Modbus Device ID		Range 1~247, default is 1					
	Baud rate	1200,2400,4800,9600,14400,19200,38400,57600,					
	Bauurale	115200,230400 optional					
R\$485	Data bit	5,6,7,8					
	Parity	None, Even and Odd optional					
	Stop Bit	1,2 optional					
	Baud rate	1200,2400,4800,9600,14400,19200,38400,57600,					
	Bauurale	115200 optional					
RS232	Data bit	5,6,7,8 optional					
	Parity	None, Even and Odd optional					
	Stop Bit	1,2 optional					

5.6.2 Serial Port Application



46 Wireless Industrial Router Wireless Data Connectivity

(11) R40B - Serial Port Application	on × +							- 0	×
← → C ▲ Not secur	re 192.168.3	.1/cgi-bin/luci/a	admin/serial/ser2ne	t				* 6	• •
	R40B s	Status - System	- Services - Ne	twork - VPN - Ser	ial Port - RTU I/O -	Logical operation -	Cloud platform - Logout		
	Serial P Serial State	ort							
	Index	Serial Name	Serial Type	Received By	tes Transi	nitted Bytes	Clear Statictis		
				This section con	tains no values yet				
	Parameter	Setting							
	Device	Baudrate	Usage Mode	Net Protocol type	Host IP or Doma	in Port			
							Edit Delete		
							Edit Delete		
	Add								
						Save 8	Apply Save Reset		

Powered by KingPigeon Technology Co., Ltd. (v1.18) / 2020-10-16

Serial Port Application					
Item	Description				
Enable	Tick to enable				
Device	RS485 or RS232				
Mode	transparent transmission, Modbus RTU to TCP、 Modbus slave				
Modbus Device ID	Set when mode is modbus slave, default is 1, please modify in the serial				
	port settings				
Network Protocol	TCP server,TCP client,UDP server,UDP client				
Host IP or domain name	Select the client to be visible, set the connection server address here				
Dort	Set the connection server port when the client is selected, and set the				
Port	local listening port when the server is selected				
Login Message	Server register handshake protocol package				
Heartbeat Message	Heartbeat content to avoid network offline				
Heartbeat ACK Message	The server responds to the heartbeat packet				
Heartbeat Interval(s)	Network keep online heartbeat interval time, default is 60s				
Retransmission Times(s)	if server no response, the times which server will send data				

5.6.3 Modbus Master

4G Wireless Industrial Router Wireless Data Connectivity

(••) R40B - Modbus Master - LuCI	× +	-										-	٥	×
← → C ▲ Not secure	192.16	58.3.1/cg	gi-bin/luci/ad	min/serial/m	odbus							☆	Θ	:
R	40B	Status	- System -	Services -	Network -	VPN - Serial Por	t - RTU I/O -	Logical operation	n - Cloud	l platform	- Logout			
		us M s Setti	laster ^{ng}								NSAVED CHANGES: 1			
Ν	Name		Slave Address	Register Type	Function Code	Register Start Address	Data Number	Mapping Address	Enable	Query	Detail Settings			
					ji I	This section contains n	o values yet							
				Add										
								Sa	ive & Apply	Save	Reset			
Po	owered b	y KingPig	jeon Technolog	y Co., Ltd. (v1.1	8) / 2020-10-1	6								

ot secure 192.168							1144-11-12-12-12-12-12-1		☆ 0
R40B s	Status - System -	Services -	Network -	VPN - Serial Port -	RTU I/O 👻 🛛	Logical operation 👻	Cloud platform -	Logout	
Config	Detail						UNSAV	ED CHANGES: 13	
Config De									
Mapping Address	Alias	Data Type	Input Type	Confirm time(s)	Enable alarm	Action	Hold time(s)	Publish	
64		Bool	Open	•		None 🗸			
65		Bool	Open	•		None 🗸			
66		Bool	Open	•		None 🗸			
67		Bool	Open	•		None 🗸			
68		Bool	Open	~		None 🗸			
69		Bool	Open	~		None 🗸			
70		Bool	Open	•		None 🗸			
71		Bool	Open	•		None 🗸			
72		Bool	Open	•		None 🗸			
73		Bool	Open	~		None 🗸			

Note: Modbus master settings need to be selected device model to support this function will be displayed.

Modbus Master					
Item	Description				
Enable	Tick to enable				
	Slave Modbus device ID, If the cloud connection setting				
Slave address	selects Modbus protocol, please set an address different				
	from the local Modbus device ID				
Register type	Boolean,16-bit, 32-bit, 64-bit				
Function code	01,02,03,04;				
	01/02 Function codes apply to Boolean data types, 03/04				

KING PIGEON



4G Wireless Industrial Router Wireless Data Connectivity

		Function codes apply to 16/32/64 bit data type;			
		01 function code supports 05/15 function code at the same			
		time, 03 function code supports 06/16 function code at the			
		same time.			
Register start address		Set according to slave register address			
Data number		Set according to the number of slave registers			
Mapping address assigr	nment	Automatic / manual			
		Select Manual Assignment Visible;			
		Boolean type mapping register address 64~256,			
Mapping start address		16 bit type mapping register address 20000~20127,			
		32 bit type mapping register address 20128~20254,			
		64 bit type mapping register address 20256~20508			
Timed reading cycle (se	conds)	Data collection cycle			
		RS485,RS232,Ethernet			
Slave interface		If RS485 or RS232 is already connected as a serial device,			
		this is not visible here			
Slave IP address		Visible when selecting Ethernet			
Port		Visible when selecting Ethernet			
	Can be set when slav	e interface select RS485 or RS232			
	Device	RS485 or RS232			
		1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600,			
Serial setting	Baud rate	115200, 230400, 460800			
	Data bits	5,6,7,8			
	Parity Bit	None, Even and Odd optional			
	Stop Bit	1,2			
	Mapping address	Slave register address			
	Data type	Slave register data type			
	Input type	Boolean data type is visible			
		16/32/64 bit data type is visible, ratio coefficient between			
	Coefficient	register value and real value			
		16/32/64 bit data type is visible,			
Detailed configuration	Confirm time (s)	Over-threshold confirmation trigger time			
	High threshold	16/32/64 bit data type is visible			
	Low threshold	16/32/64 bit data type is visible			
	Action	Linkage local DO close or open			
	Hold time	Do action time			
	Publish	Tick to publish data via MQTT			
<u>.</u>					



5.7 RTU IO

5.7.1 E-mail & SMS

(*) R40B - Email&SMS Setting - L × +	- o ×
← → C ▲ Not secure 192.168.3.1/cgi-bin/luci/admin/io/email	☆ ⊖ :
R40B Status + System + Services + Network + VPN + Serial Port + RTU I/O + Lo	gical operation - Cloud platform - Logout
Email	UN SAVED CHARGES (19)
Email Setting	
Enable send email	
Email Server smtp.xxx.com	
Port 25	
Recipient name recipient@xxx.com	
Sender name sender@xxx.com	
User Name user name	
Password *	
SMS Setting	
This section contains no values yet	
	Save & Apply Save Reset

Powered by KingPigeon Technology Co., Ltd. (v1.18) / 2020-10-16

E-mail setting						
Item	Description					
Enable send mail	Tick to allow send e-mail					
Mail Server	Enter the SMTP mail server address					
Port Enter the SMTP mail server port number						
Recipient name	Enter mail receiving address, you can add multiple, enter an address and click the "+" on the right to save, at the same time the second input box will appear below, you can continue to add or leave blank to no longer add					
Sender name	Enter the email sending account address					
User name	Enter the email sending account username					
Password	Enter the email sending account address password					

Note: The mail server needs to be enabled with the SMTP service. If the mail is not sent successfully, please make sure that the SMTP service is enabled in the mailbox settings and the account password is entered correctly.

5.7.2 Digital input/output

	3.3.1/cgi-bin/luci/adı							
R40B	Status - System -	Services - Netw	vork + VPN + 3	Serial Port - RTU	U I/O 👻 Logical	operation - Cloud	platform → Logout	
DIDO							UNSAVED CHANGES 15	
DI								
Index	In Name	Mode	State	Count	Clean	Enable/Disable		
1	DI1	in	Low	0	Clean	Enabled		
2	DI2	in	Low	0	Clean	Enabled		
DO								
Index	In Name	Mode	State	Set State	Enable/Disable			
1	DO1	out	Low	Set High	Enabled			
2	DO2	out	Low	Set High	Enabled			
Trigger Se	etting							
In Name	Trigger Condition	Threshold Value	Confirm Time	e(s) Action	Hold Time(s) Triggering		
DI1	DI Low	0	44	Reboot		Not trigger	Edit Delete	
DI2	DI Low	0	1	DO2Close	5	Not trigger	Edit Delete	
Add								

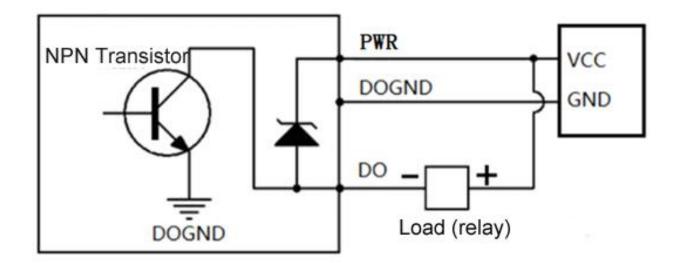
You can view the current status of DI and DO, the DI count value, set the type of DO normally open and normally closed, enable and disable the operation of DI and DO, and trigger settings can add DI trigger conditions.

	Trigger Setting
Item	Description
Input	DI1,DI2
Trigger conditions	NO,NC,Counting over threshold, Recovery
Threshold value	The threshold value should be entered when the condition
	selection count exceeds the threshold
Confirmation time (seconds)	The condition will reach the set time will confirm the trigger
Action	Linkage action: No,DO1,DO2,all DO, Reboot
DO status	Open, close, When the action selects DO, the execution state
	should be selected
Hold time (seconds)	DO action time
Trriggering	Tick to enable alarm

Digital output Instructions

Wiring





instruction:

	qty	2		
	type	SINK output		
Digital output	Load voltage	Max 50VDC		
	Load current	500mA (single) ,625mW		
	protection	EFT: 40A (5/50ns)		

5.7.3 Analog input

R40B State	us - System - Services		r Serial Port + F	₹TU I/O + Lo	gical operat	tion - Cloud plati	form - Logout	
AIN							UNSAVELLCHANGES 15	
AIN Seting								
In Name	Mode		Min Value	Max Va	alue	Curent Value	Unit	
AIN1	Voltage 0-5V		•			0.005609		
AIN2	Voltage 0-5V		~			0.004327		
AIN3	Voltage 0-5V		•			0.007372		
AIN4	Voltage 0-5V		•			0.004648		
Trigger Setti	ing							
In Trigg Name Con	ger Threshold dition Value	Resume Threshold	Confirm Time(s)		Hold Fime(s)	Triggering		
							Edit Delete	
Add								
						Save & Apply	Save Reset	

You can view the current AI value and set the mode: voltage 0~5V, current 4~20mA. Current 0~20mA, set the minimum value and unit of the range, trigger setting can add AI trigger condition.

Trigger



4G Wireless Industrial Router Wireless Data Connectivity

Item	Description
Input	AIN1,AIN2,AIN3,AIN4
Triggor condition	Analog input is greater than the threshold, analog input is less
Trigger condition	than the threshold
Threshold value	The condition will be triggered when the set value is reached
Resume threshold	When the set value is reached, it will be regarded as recovery
Confirm time (seconds)	Confirm the trigger when condition reach the set time
Action	Linkage action: No,DO1,DO2,all DO, Reboot
DO status	Open, close, When the action selects DO, the execution state
DO status	should be selected
Hold time (seconds)	DO action time
Trriggering	Tick to enable alarm

5.7.4 Device Monitor

(••) R40B - Device Monitor&Al	arm × +							- 0 ×
← → C ▲ Not sect	ure 192.168.3.1/cgi-bi	in/luci/admin/io/monito	r					☆ \varTheta :
	R40B Status -	System - Services -	Network + VPN + Se	rial Port - RTU I/C	- Logical	operation - Clou	id platform → Logout	
	Device Moni Device Monitor	tor					UN SAVED CHANGES: 15	
	Register Address	In Name Status	Device IP Address	Ping Times	Action	Hold time(s)	Enable setting	
			This section cor	tains no values yet				
	Add							
						Save & Apply	Save	
	Powered by KingPigeon	Technology Co., Ltd. (v1.18) / 2020-10-16					

Device Monitor							
Item	Description						
Register address	Range 2~63						
In name	DI3~DI64, Automatically generated according to the register						
In name	address, MQTT report data identifier						
Device IP address	Detect IP						
	According to the set value PING how many times, if there is no						
PING times	PING, then the detection equipment is disconnected from the						
	network						



Action	Linkage DO close or open	
Hold time (seconds)	DO action time	
Trriggering	Tick to enable alarm	

5.7.5 Event and Alarm

(••) R40B - Alarm Setting - LuCl	× +						- 0 ×
\leftrightarrow \rightarrow C A Not secure	192.168.3.1/cgi-bi	in/luci/admin/io/alarm					* 0 :
F	R40B Status -	System - Services -	Network - VPN - Seria	al Port + RTU I/O +	Logical operation - Cloud platforn	ı - Logout	
	vent And A	arm			U	NSAVED CHANGES: 15	
	-vent And A	IdIIII					
	Index	Alarm Name	Alarm Descrip	otion	Alarm Time		
			This section conta	ains no values yet			
A	dd Alarm						
	Alarm Name	Send SMS	Short Message Content	Send Email	Email Content		
	DI1:open	✓ 🗹				Delete	
	DI1:open	~ ☑				Delete	
	DI1:open	✓				Delete	
	Add						
					Save & Apply Sav	e Reset	
P	owered by KingPigeon	Technology Co., Ltd. (v1.1	8) / 2020-10-16				

When the trigger conditions are set in the Modbus master, digital input and output, analog input, network disconnection detection and alarm related settings and the alarm is enabled, the related alarm events can be seen here. You can set related alarm messages and content of email.

5.7.6 Timer

(••) R40B - Timer - LuCI	x +	- o ×
← → C ▲ Not secu	ture 192.168.3.1/cgi-bin/luci/admin/io/timer	☆ 🛛 :
	R40B Status + System + Services + Network + VPN + Serial Port + RTU I/O + Logical operation + Cloud platform + Logout	
	IDNSAVED CHANGES: 15	
	Timer Please make sure that the time set is consistent with your time zone	
	Cycle Timer	
	Week day Hour Minute Action Enable	
	This section contains no values yet	
	Add	
	Once Timer	
	Month Day Hour Minute Action Enable	
	This section contains no values yet	
	Add	
	Save & Apply Save Reset	
	Powered by KingPigeon Technology Co., Ltd. (v1.18) / 2020-10-16	



Timer					
Timer setting					
Alias	CCC				
Time interval	1				
time unit	minute	~			
action	All DO	~			
DO status	closure	~			
Hold time (seconds)	30				
Start/stop time	every day	~			
Start time (hours)	14	~			
Start time (minutes)	[11	~			
Stop condition	Cycles	~			
Cycles	8		1		

Timed task: can choose to close or open DO, send mail, and restart.

Cycle timer: can be executed daily or weekly.

Once timer: can be executed regularly according to the specified date

Timer Setting: Set cycles or duration for certain actions

5.8 Logical Operation

(*) R408 - Logical operation - LuC X +	- 0	×
← → C ▲ Not secure 192.168.3.1/cgi-bin/luci/admin/logic/logic	☆ 8) :
R40B Status - System - Services - Network - VPN - Serial Port - RTU I/O - Logical operation - Cloud platform - Logout		Â
Logical operation		
Bool input		
Name Input1 Condition Relationship Input2 Condition Output Address Output Value Logic Value		
1 REG64 Open LogicAnd DI1 Open REG64 Open 1 Edit Delete		
Add		
Numberical input		
Name Input1 Condition Threshold Relationship Input2 Condition Threshold Output Address Output Value Logic Value		
This section contains no values yet		
Add		
Combined input		
Name Input1 Condition Relationship Input2 Condition Output Address Output Value Logic Value		
This section contains no values yet		
Add		•

Provides powerful local logic operation function, and can freely set various combinations between local I/O (digital input and output, analog input) and slave I/O (slave register set by Modbus master) Linkage.



5.9 Cloud Platform

5.9.1 Private Cloud

(**) R40B - Custom Cloud - LuCI × +		- 0 ×
← → C ▲ Not secure 192.168.3.1/cgi-bin/luci/a	dmin/cloud/host_set	☆ \varTheta :
R40B Status - System	Services * Network * VPN * Serial Port * RTU I/O * Logical operation * Cloud platform * Logout	
	UNSAVED CHANGES 15	
Cloud connection	n settings	
Cloud connection sett	ngs	
Enable setting		
Cloud platform	King Pigeon IIoT V2	
Link Protocol	MODBUS RTU 🗸	
Modbus Device ID	1 a Modbus device ID is set in Serial Port Settings	
Register Packet		
Heartbeat Packet		
Heartbeat Response Packet		
Heartbeat Period(s)	60	
Host Silence Time(s)	600	
	Save & Apply Save Reset	
Powered by KingPigeon Technolo	gy Co., Ltd. (v1.18) / 2020-10-16	

Cloud Platform

Customized Cloud (MQTT protocol supports customized data format)

R40B state - system	- service - The	internet - VPN -	application -	rtu I/o 🛩	logic operation -	cloud platform ~	quit	
Cloud connectio								
cloud platform	Other cloud platfor	rms 🗸						
Cloud platform name			-					
Host IP or domain name	modbus.dtuip.com	I D						
port	6651							
Link Agreement	MQTT	~						
MQTT client ID								
username	MQTT							
password	•••••	*						
encryption	Not encrypted	~						
Release data format	Custom data forma							
Subscribe to topics	Custom data form							
Release period (seconds)								
Posted by QOS	0-at most once	~						
Custom data format								



Г	Data format example		
	Custom data format	"使用\$7月用本机或MODBUS缺射寄存器地址" {	í
		、"主题1";{ "燿住1";{ "泼妮娟1";\$DO1",	
		"数据2":"\$REG20128" },	
		"厪性2"("数据1""SDI1"。 "数据2""SGPS"	
),), "主题2";{	
		"	
		}, "屋性2": {	
		"数据1":"\$Al1", "数据2":"\$TIME"	

	Cloud Connection Settings					
Item		Description				
Enable setting		Tick to enable				
Cloud Platform		King Pigeon IIOT V2,IIOT V3,others				
Host IP or domair	name	Connect Server Port				
Port		Connect to other cloud platform server ports				
Link Protocol		Modbus RTU, Modbus TCP , MQTT				
	Modbus Device ID	Default is 1				
	Register packet	Server register handshake protocol package,if need contact salesman				
Modbu	Heartbeat packet	Heartbeat content to avoid network offline				
Protocol Parameters	Heartbeat response packet	The server responds to the heartbeat packet				
Farameters	Heartbeat period (s)	Network keep online heartbeat interval time				
	Host Silence time (s)	The server sends silent time without data, and will reconnect if it times out				
	MQTT Client ID	The client identifier used in the MQTT connection message, the server uses the client identifier to identify the client, and each client connected to the server has a unique client identifier.				
MOTT Protocol	Username	The user name used in the MQTT connection message, which can be used by the server for authentication and authorization.				
MQTT Protocol Parameters	Password	The password used in the MQTT connection message, which can be used by the server for authentication and authorization.				
	Publish topic	The subject name used in the MQTT publish message. The subject name is used to identify the information channel to which the payload data should be published. The subject name in the publish message cannot contain wildcards.				



Subscribe topic	The topic name used in MQTT subscription messages. After the subscription, the server can send publish messages to the client to achieve control.			
Publish Period (seconds)	MQTT data timing publish interval			
Publisher QOS	Service quality level guarantee for application message distribution: 0-at most once, 1-at least once, 2-only once			
Encryption	Optional unencrypted, encrypted (root certificate), encrypted (self-signed)			
Authentication and authorization (root certificate)	Choose file upload			
Local certificate	Choose file upload			
Local private key	Choose file upload			
Enable data transfer	Enable to work			
Data packing	Send multiple data in one message			
Customize the MQTT protocol	Custom MQTT protocol supports user-defined data formats,			

5.9.2 Ali Cloud

(**) R40B - Ali Cloud - LuCl × +		– ø ×
← → C ▲ Not secure 192.168.3.1/cgi-b	in/luci/admin/cloud/ali_cloud	☆ \varTheta :
R40B Status -	System + Services + Network + VPN + Serial Port + RTU I/O + Logical operation + Cloud platform + Logout	
Cloud conne	ection settings	
Cloud connection		
Enable	setting	
Authentication	nethod Device Serect 🗸	
Product Key(Prod	ictKey)	
Device Name(Device	Name)	
Device Serect(Device	Serect)	
Re	gion ID Please choose •	
Publish P	riod(s) > 60	
	Save & Apply Save Reset	

Powered by KingPigeon Technology Co., Ltd. (v1.18) / 2020-10-16

Ali Cloud Connection Settings				
Item	Description			
Enable setting	Tick to enable			
Authenticatioin method	Device secret key, X509 certificate			
Product Key	Set the product key on Alibaba Cloud			
Device Name	Set the device name on Alibaba Cloud			
Device Serect	Set the device key on Alibaba Cloud			
Region ID	Ali cloud region			

4G Wireless Industrial Router Wireless Data Connectivity

Publish period (seconds)	>60
Certification authority (root certificate)	Choose file upload
Local certificate	Choose file upload
Local key	Choose file upload

5.9.3 AWS Cloud

(*) R40B - Aws Cloud - LuCl × +					- 0 ×
← → C ▲ Not secure 192.168.3.1/cgi-bin/luci	admin/cloud/aws_cloud				☆ 🛛 :
R40B Status - System	✓ Services ✓ Network ✓	VPN - Serial Port - R	TU I/O 👻 Logical operation 👻	Cloud platform - Logout	
Cloud connection	n settings			UNSAVED CHANGES: 1	6
Cloud connection setti					
Enable setting					
Host(EndPoint)					
Client ID					
Thing Name					
Publish Topic					
Publish Period(s)	>= 60				
Certificate authority	Select file				
	/etc/mqtt/root.crt				
Local certificate	Select file				
	(etc/mqtt/local.crt)				
Local private key	Select file				
	/etc/mqtt/private.key				

AWS Cloud Connection Settings				
Item	Description			
Enable setting	Tick to enable			
Host (Endpoint)	Set End point			
	The client identifier used in the MQTT connection message, the			
Clint ID	server uses the client identifier to identify the client, and each			
	client connected to the server has a unique client identifier.			
Thing name	Set thing name			
	The subject name used by MQTT to publish messages. The subject			
Dublish topic	name is used to identify which information channel the payload			
Publish topic	data should be published to. The subject name in the published			
	message cannot contain wildcards.			
Publish period (seconds)	>60			
Certification authority (root certificate)	Choose file upload			
Local certificate	Choose file upload			
Local key	Choose file upload			



5.9.4 Huaweicloud

HUAWEI CLOUD supports access to the cloud platform in two ways: device secret key and authentication

certifi	cate:
---------	-------

💁 Google 翻译 🛛 🗙 (**) R40B - Huawei Cloud	I-LuCI X +	- 0 ×
← → C ▲ 不安全 192.168.3.1/cgi-bin/luci/admin	n/cloud/hw_cloud	☆ \varTheta :
🥪 金錦物联网云V3.0 🔤 Google 翻译 🛭 🥪 金錦准生产		
R40B Status - System	Services Network VPN Application RTU I/O Logical operation Cloud platform Logout	
Cloud connection	n settings	
Cloud connection sett	ngs	
Enable setting		
Authentication method	Device Serect ~	
Device ID		
Secret key	•	
Service ID		
Region ID	CN North-Beijng4 •	
Publish Period(s)	> 60	
	Save & Apply Save Reset	
Powered by KingPigeon Technolo	gy Co., Ltd. (v1.20.1) / 2021-02-03	

	Huaweicloud co	onnection settings			
Item	Description				
Enable setting	Tick to enable	Tick to enable			
Authentication method	The device secret key method and the authentication certificate method can be selected, and the authentication certificate method needs to upload the certificate				
	device,eg, R40A Offlin	le			
	Node ID	R40A			
Devicde ID	Node ID Device ID	R40A 5ee965a0496bac073bb6120d_R40A			
Devicde ID					
Devicde ID	Device ID	5ee965a0496bac073bb6120d_R40A			
Devicde ID	Device ID Registered	5ee965a0496bac073bb6120d_R40A Jun 17, 2020 08:37:57 GMT+08:00 Directly connected			



	Model Definition Online Debugging Topic Management				
	Add Service Import Library Model Import Local Profile Import from Excel				
	✓ Service ID: R40 □				
Region ID The location of the device can be queried on the					
	CLOUD platform				
Publish Period (s)	Above 60s				
	For the password entered when creating the device				
Secret key	certificate, you can refer to the HUAWEI CLOUD help				
	document to create a test certificate				
Certification authority (root certificate)	Root certificate provided by Huawei:rootcert.pem, It's included in the release version, generally don't need to upload				
	Device certificate deviceCert.pem,Upload to the /etc/conf				
Device certificate	directory and select the file, you can refer to the HUAWEI				
	CLOUD help document to create a test certificate				
	Device key/deviceCert.key,Upload to the /etc/conf directory and				
Device key	select the file, you can refer to the HUAWEI CLOUD help				
	document to create a test certificate				

For the steps of creating and registering devices on the platform, please refer to the help documents of Huawei Cloud.

5.9.5ThingsBoard Cloud

Enable settings				
Enable seturigs				
MQTT client ID				
username				
de officiality				
password		*		
Release period (seconds)				
Enable data transfer				
Only release changed data	0			
Save and apply save	reset			

ThingsBoard Cloud Connection Setting			
Item	Description		
Enable Setting	Tick it to enable ThingsBoard Cloud		

4G Wireless Industrial Router Wireless Data Connectivity

Console (terminal point)	Set terminal point		
Client ID	Client identification mark of MQTT connecting message.Server uses it to identify client. Each client connected to server has its own unique client identification mark		
Item Name	Set item name		
Publish Topic	Topic of MQTT publishing messages. It's used for identifying the information channel to send valid payload data. The topic can't include wildcard character		
Publishing Cycle (second)	Must be >=60s		
Authorization Certificate(Root Certificate)	Select file to upload it		
Local Certificate	Select file to upload it		
Local Secret Key	Select file to upload it		
Enable Data Re-transmission	Tick it to enable data re-transmission once network recovers		
Only release changed data	Tick it to upload changed data only		

5.10 Logout

After the router parameter configuration is complete, click "Logout", the device will log out and return to the login web configuration page.

6. Communication Protocol

The device supports Modbus RTU protocol, Modbus TCP protocol and MQTT protocol. For specific communication protocol, please refer to relevant materials. The following introduces the application of Modbus RTU and MQTT protocol on the device.

Modbus TCP and RTU protocol are very similar, as long as an MBAP header is added to the RTU protocol, and the two byte CRC check code of the RTU protocol can be removed.

6.1 Modbus RTU Protocol

6.1.1 Platform connection setting

	i Wirele		_		_		ctivity
(**) R40B - Custom Cloud - LuCI × +							- 0 ×
\leftarrow \rightarrow C (A Not secure 192.168.3.1/cgi-bin/luci/	admin/cloud/host_set						☆ \varTheta :
R40B Status - System	n - Services - Network -	VPN - Serial Port -	rtu I/o -	Logical operation -	Cloud platform -	Logout	
Cloud connectio	n settings				UNSA	/ED CHANGES: 15	
Cloud connection set	ings						
Enable setting							
Cloud platform	King Pigeon IIoT V2	~					
Link Protocol	MODBUS RTU	~					
Modbus Device ID	1 Ø Modbus device ID is set in S	Serial Port Settings					
Register Packet							
Heartbeat Packet							
Heartbeat Response Packet							
Heartbeat Period(s)	60						
Host Silence Time(s)	600						
				Save 8	Apply Save	Reset	
Powered by KingPigeon Technol	ogy Co., Ltd. (v1.18) / 2020-10-16						

1. Set the platform server IP and port, select Modbus RTU protocol and set the local Modbus device ID (the effective range of Modbus device ID is 1~247)

Set relevant message information according to the platform to be connected (if not, you can not set it)
 [Registrer Package]: The registration package sent by the device to the server when connected to the server.
 [Heartbeat Packet]: A heartbeat packet sent by the device to the server to maintain the connection.
 [Heartbeat period]: The heartbeat packet sending period.

[Host Silent Time]: Silent time when no data is sent from server, timeout will reconnect.

6.1.2 Read Device Register Address

6.1.2.1 DI / DO / AI DI pulse counter Register Address

Modbus Register Address(Decima I)	PLC or configuration address (Decimal)	Data Name	Data Type	Description
0	10001	DI1	Bool	Dry contact: 0: Open 1: Close
1	10002	DI2		Wet contact: 0: Low level (0~1VDC) 1: High level (5~30VDC)
2~21	10003~10022	Network disconnection detection device IP (max 20 IPs can be set)		0:offline 1:online

1) Read input Coil(Function Code 02:Read coil)

4G Wireless Industrial Router Wireless Data Connectivity

2) Read & Write Holding Coil (Function Code 01, Function Code 05, Function Code 15)

Modbus Register Address(Decima I)	PLC or configuratio n address (Decimal)	Data Name	Data Type	Description
0	00001	DO1	Deel	0: Open
1	00002	DO2	Bool	1: Close

3) Read input Register (Function Code 04:Read input register.)

Modbus Register Address(Decima I)	PLC or configuration address (Decimal)	Data Name	Data Type	Description
0~1	30001~30002	Al1		
2~3	30003~30004	AI2	(32 Bit Float)	
4~5	30005~30006	AI3	ABCD	
6~7	30007~30008	AI4		Real value = register value
8~9	30009~30010	DI1 pulse counter	32-bit	
			unsigned	
10~11	30011~30012	DI2 pulse counter	integer	
			ABCD	

6.1.2.2 Read Device Digital input Status

Master Send Data Format

Content	Byte	Data	Description
Device address	1	01H	01H Device, Range: 1-247, according to setting
			address
Function code	1	02H	02 read input coil DIN status
DIN Register address	2	00 00H	Range:0000H-0001H,stands for DI1-DI2
Read DIN register Qty	2	00 02H	Range:0001H-0002H, read qty of DIN status
16CRC verify	2	F9 CBH	CRC0 CRC1 low byte in front, high byte behind

Receiver Return Data Format

Content	Byte	Data	Description
Device address	1	01H	01H Device, according to setting address
Function code	1	02H	Read input holding coil
Return bytes Qty	1	01H	Return data length
Returning data	1	01H	Return DI data
16CRC Verify	2	6048H	CRC0 CRC1 low byte in front, high byte behind

Example: Inquiry device 2 DIN data at same time, then:

Server send: 01 02 00 00 00 02 F9 CB

01= Device address; 02= Inquiry DIN status; 00 00= DIN Starting address; 00 08= Serial reading 2 DIN status; F9 CB = CRC verify.

Device return: 01 02 01 01 60 48

01= Device address; 02= Inquiry DIN status; 01= Returning data bytes qty; 01= DIN status, each byte stands for one DIN status, 01H converter to binary 0000 0001 from low to high byte, stands for DIN1-DIN2 status,



0= Open, 1= Close.

DI2	DI1
0	1
Open	Close

60 48: 16 byte CRC verify.

If need to inquiry multi DIN status, only need to change "DIN Starting Address", "Reading DIN Register Qty", calculate CRC verify again.

6.1.2.3 Read Device Digital Output DO Status

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	01H	Read the hold coil, function code 01
Register Starting Address	2	00 00H	Range: 0000H-0001H, stands for DO1-DO2
Read Register Qty	2	00 02H	Range: 0000H-0001H
16 CRC Verify	2	BD CBH	CRC0 CRC1 low byte in front, high behind

Receiver Return Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H device, consistent with download data
Function Code	1	01H	Read the hold coil
Return Bytes Qty	1	01H	Return data length
Returning Data	1	02H	Data returned
16 CRC Verify	2	D0 49H	CRC0 CRC1 low byte in front, high behind

Example: Read 2 DO states, device address 1, then,

Server Send: 01 01 00 00 00 02 BD CB

01= Device address; 01= Read Relay DO function code;00 00= Register starting address; 00 02= Continuous reading of 2 DO data; BD CB= CRC verify.

Device Answer: 01 01 01 02 DO 49

01= Device address; 01= Read relay function code; 01=Return data bytes Qty; 02=The returned data is converted into binary: 0000 0010 from low to high byte, status value:

DO2	D01
1	0
Close	Open

D0O49: 16 byte CRC verify

If you want to read the state of a DO or several DO states, you only need to modify the "DO register start address" and "the number of read registers", then recalculate the CRC, and the returned data is parsed according to the above description.

6.1.2.4 Control Device Digital Output Status

1) Control 1 channel device DO output Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	05H	Write single holding coil type, function code 05
DO Register Address	2	00 00H	Range: 0000H-0003H
Active	2	FF 00H	This value: FF 00H or 00 00H, FF 00H= Close relay, 00 00H= Open relay
16CRC Verify	2	8C 3AH	CRC0 CRC1 low byte in front, high behind

Receiver Return Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, according to the data Master send
Function Code	1	05H	Write single holding coil type
DO Register Address	2	00 00H	Range: 0000H-0003H
Active	2	FF 00H	This value: FF 00H or 00 00H, FF 00H= Already actived close relay, 00 00H= Already actived open relay
16CRC Verify	2	8C 3AH	CRC0 CRC1 low byte in front, high behind

Example: Control relay DO1 close, then:

Server send: 01 05 00 00 FF 00 8C 3A

01=Device address;05= Control single relay command;00 00=Relay DO0 address;FF 00=DO0 close;8C 3A=CRC verify.

Device answer: 01 05 00 00 FF 00 8C 3A

01=Device address;05=Control single relay command;00 00=Relay DO0 address;FF 00= Active DO0 close; 8C 3A=CRC verify.

If single control other relay outputs, only need to change "DO Register Address" and "Active", calculate CRC verify again.

2) Multiple Control DO outputs

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	0FH	Write multi holding coil, function code 15
DO Starting Register Address	2	00 00H	Range: 0000H-0001H, stands for DO0-DO1

IG Wireless Industrial Router Wireless Data Connectivity

Control Relay Qty	2	00 02H	Range: 0000H-0001H
Write Byte Qty	1	01H	Write 1 byte, since device only 2DO, use 4 binary can do it
Writing Data	1	03H	Send status data to control DO
16CRC Verify	2	9E 96H	CRC0 CRC1 low byte in front, high behind

Receiver Return Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, according to the data Master send
Function Code	1	OFH	Write multi holding coil type
DO Register Address	1	00 00H	Range: 0000-0001, stands for DO1-DO2
Active	1	00 02H	Range:0001H-0002H, stands for already actived relays
16CRC Verify	2	D4 0AH	CRC0 CRC1 low byte in front, high behind

Example: Close device 2 DO at same time, then:

Server send: 01 0F 00 00 00 02 01 03 9E 96

01= Device address; 0F= Control multi relay; 00 00= Relay DO0 starting address; 00 02= Control 2 relays;

01= Send data qty; 03= Data sent converter to binary 0000 0011 from low to high stands for DO1-DO2 status, 0stands for open relay,1 stands for close relay:

DO2	D01
1	1
Close	Close

9E 96 CRC verify.

Device answer: 01 0F 00 00 00 02 D4 0A

01= Device address; 0F= Control multi relay; 00 00= Relay DO0 starting address; 00 02= Actived 2 relays; D4 0A CRC verify.

6.1.2.5 Read Device AIN Status and DIN Pulse counter

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	04H	Read input register, function code 04
Register Starting Address	2	00 00H	Every 2 16-bit address corresponds to 1 AI 32-bit register
Read Register Qty	2	00 OCH	A total of 12 16-bit addresses are read, each of the two 16-bit addresses is combined into a 32-bit address, a total of 6 32-bit addresses, that is, the number of read AI 4 and the DI pulse count 2

Master Send Data Format:



16 CRC Verify

FOOFH

2

CRC0 CRC1 low byte in front, high behind

Receiver Return Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H device, consistent with download data
Function Code	1	04H	Read the hold coil
Return Bytes Qty	1	18H	Return data length
Returning Data	16	3B 98 4E 40 40 80 00 00 3C 89 15 BE 3B D7 51 8B 00 00 00 03 00 00 00 06H	Return AI data,32-bit float,ABCD
16 CRC Verify	2	22 80H	CRC0 CRC1 low byte in front, high behind

Example: Inquiry device 4 AIN and 2 DIN pulse data at same time, then:

Server send: 01 04 00 00 00 0C F0 0F

01= Device address; 04= read input register; 00 00= Starting address ; 00 0C= Serial reading 12 input register value:,F0 0F= CRC verify.

 Device return:
 01 04 18 3B 98 4E 40 40 80 00 00 3C 89 15 BE 3B D7 51 8B 00 00 00 03 00 00 06 22 80

 01= Device address; 04= read input register; 18= Return data bity ; 3B 98 4E 40 40 80 00 00 3C 89 15 BE 3B D7 51 8B 00 00 00 03 00 00 00 06=return data, detail as follows:

Analog input	AI4	AI3	AI2	AI1	DI1 pulse	DI2 pulse
Receiving Data	3B D7	3C 89	40 80	3B 98	3B 98	3B 98
(32-bit floating)	51 8B	15 BE	00 00	4E 40	4E 40	4E 40
Real value	0.006571	0.016734	4	0.004648	3	6

22 80: CRC verify.

6.1.3 Read Mapping Address

6.1.3.1 Mapping Register Address

1) Boolean Slave Mapping Register Address, holding coil type (Function Code 01/02/05/15)

Modbus Register Address(Decim al)	PLC or configuration address (Decimal)	Data Name	Data Type	Description
64	00065 or 10065	Bool 64	Bool	De close trac
65	00066 or 10066	Bool 65	Bool	Boolean type,
66	00067 or 10067	Bool 66	Bool	slave mapping address, can map the slave input coil and
			Bool	
			Bool	holding coil state, 193 addresses in total.
256	00257or 10257	Bool 256	Bool	

2) 16 Bit Slave Register Assignment Table

	Read and Write Holding Register (Function Code 03,04, 06, 16)						
Modbus Register Address(Decimal)	PLC or configuration address (Decimal)	Data name	Data Type	Description			
20001	420002 or 320002	16 Bit data 20001	Sort AB, its data type according to slave mapping data type	According to configurator set mapping rules, this address will sort slave mapping data to AB, stock in this address, for cloud easy reading together, can mapping slave inputting and holding register.			
20002	420003 or 320003	16 Bit data 20002	Same as above	Same as above			
20003	420004 or 320004	16 Bit data 20003	Same as above	Same as above			
	127 data similar as above		Same as above	Same as above			
20127	420128 or 320128	16 Bit data 20127	Same as above	Same as above			

3) 32 Bit Slave Register Assignment Table

	Holding Register and input Register(Function Code 03,04, 06, 16)							
Modbus Register Address(Decim al)	PLC or configuratio n address (Decimal)	Data name	Data Type	Description				
20128	420129 or 320129	32 Bit data 20128	Sort ABCD, its data type according to slave mapping data type	According to configurator set mapping rules, this address will sort slave mapping data to ABCD, stock in this address, for cloud easy reading together, can mapping slave inputting and holding register.				
20130	420131 or 320131	32 Bit data 20130	Same as above	Same as above				
20132	420133 or 320133	32 Bit data 20132	Same as above	Same as above				
	64 data similar as above		Same as above	Same as above				
20254	420255 or 320255	32 Bit data 20254	Same as above	Same as above				



6.1.3.2 Read Boolean Mapping Address Data

Master Send Data Format:

Content	Bytes	Data	Description
Device ID	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	01H	Read holding coil type, function code 01
Boolean Register	2	00 40H	Range: 0040H-0100H, address refer to ["Slave
Starting Address	2	00 40H	Mapping Register Address"]
Read Register Qty	2	00 0AH	Range: 0001H-00C1H
16 CRC Verify	2	BD D9H	CRC0 CRC1 low byte in front, high behind

Receiver Return Data Format:

Content	Bytes	Data	Description
Device ID	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	01H	Read holding coil type
Return Data Length	1	02H	Return data length
Returning Data	2	73 01H	
16 CRC Verify	2	5D 0CH	CRC0 CRC1 low byte in front, high behind

Example: Start from address 64, read 10 Boolean mapping data value, then:

Server send: 01 01 00 40 00 0A BD D9

01= Device ID; 01 = Read holding coil; 00 40 = Read Boolean data start from address 64; 00 0A = Serial to read 10 Boolean status; BD D9 CRC Verify.

Device answer: 01 01 02 73 01 5D 0C

01= Device ID; 01 = Read holding coil; 02= Return Data byte; 73 01= Return 10 Boolean status. High byte stands for low address data, low address stands for high address. According to Modbus protocol, fix 73 01H real value to be 01 73H, converter to Binary as below:

Register mapping address	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	73	72
Value	0	0	0	0	0	0	0	1
Register mapping address	71	70	69	68	67	66	65	64
Value	0	1	1	1	0	0	1	1

The address value higher than 10 digits will be seen as invalid.

5D 0C CRC Verify.

6.1.3.3 Modify Boolean Mapping Address Data

If control slave's relay status which connected to RS485, need to add slave in salve list of configurator. Write command 15 for mapping, when mapping address value modified, will write to RS485 matched slave address.

Master Send Data Format:						
Content	Bytes	Data	Description			



Wireless Industrial Router 46 **Wireless Data Connectivity**

		(H: HEX)	
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	05H	Write single holding coil, function code 05H
Boolean Mapping	2	00 40H	Range: 00 40H-0100FH, address refer to ["
Register Address	2	00 400	Mapping Register Address"]
Write value	2	FF 00H	This value: FF 00H or 00 00H, FF 00H stands for write 1;
write value	2	FF 0011	00 00H stands for write 0
16 CRC Verify	2	8D EEH	CRC0 CRC1 low byte in front, high behind

Receiver Return Data Format:

Content	Bytes	Data (H: HEX)	Description	
Device Address	1	01H	01H Device, according to the data Master send	
Function Code	1	05H	Write single holding coil	
Boolean Mapping	2	2	00.4011	Range: 00 40H-0100FH, address refer to ["
Register Address		00 40H	Mapping Register Address"]	
Write value	2	FF 00H	This value: FF 00H or 00 00H. FF 00H stands for write	
	2	FF OUT	1,00 00H stands for write 0.	
16 CRC Verify	2	8D EEH	CRC0 CRC1 low byte in front, high behind	

Example: Modify Boolean mapping address 64 status, modify to 1, then:

Server send: 01 05 00 40 FF 00 8D EE

01= Device address; 05= Write boolean value; 00 40=The mapping address which need to revise;

FF 00 = Write 1; 8D EE CRC Verify.

Device answer: 01 05 00 40 FF 00 8D EE

01= Device address; 05= Write boolean value; 00 40= The mapping address which need to write;

FF 00= Write 1; 8D EE CRC Verify.

If need multiple modify, pls check function 15 of Modbus protocol.

6.1.3.4 Read Data Type Mapping Address Data

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	03H	Read holding register, function code 03
Mapping Register Starting Address	2	4E 20H	One address can read 2 bytes. Mapping data type address range, refer to ["Slave Mapping Register Address"] at manual bottom.
Read Mapping Register Qty	2	00 0AH	Read input register qty.
16 CRC Verify	2	82 EFH	CRC0 CRC1 low byte in front, high behind

Receiver Return Data Format:



Wireless Industrial Router **Wireless Data Connectivity**

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, according to the data Master send
Function Code	1	03H	Read holding register
Range Data Bytes	1	14H	One address can read 2 bytes
	00 14 00 28 00 32		
Returning Data	20	00 41 00 0A 00 25 00 14 00 2AH	Returning Data
16 CRC Verify	2	FB 34H	CRC0 CRC1 low byte in front, high behind

Example: Mapping address start from 20001, read 10 address data, then:

Server send: 01 03 4E 21 00 0A 82 EF

01= Device address; 03= Read holding register ; 4E 21=Mapping register starting address, current is Decimal data 20001; 00 0A = Read 10 register value; 82 EF=16 CRC Verify.

Device answer: 01 03 14 00 14 00 1E 00 28 00 32 00 4B 00 41 00 0A 00 25 00 14 00 2A FB 34

01= Device address; 03= Read holding register; 14= Returning 20 byte; 00 14 00 1E 00 28 00 32 00 4B 00 41 00 0A 00 25 00 14 00 2A = Returning data.

Register Mapping	20010	20009	20008	20007	20006	20005	20004	20003	20002	20001
Address	20010	20009	20008	20007	20000	20005	20004	20003	20002	20001
Value	00 2A	00 14	00 25	00 0A	00 41	00 4B	00 32	00 28	00 1E	00 14

FB 34=16 CRC Verify.

6.1.3.5 Modify Data Type Mapping Address Data

If need to revise slave data which RS485 connected, need to add slave in salve list of configurator. Write command 03 for mapping, when mapping address value modified, will write to RS485 matched slave address. If address 20001 mapping slave data type is Signed Int, sort AB.

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	06H	Write single holding register, function code 06
Mapping Register Address	2	4E 21H	Mapping data type address range, refer to ["Slave Mapping Register Address"]
Write Data	2	00 64H	Data writing value is Decimal data 100
16 CRC Verify	2	CF 03H	CRC0 CRC1 low byte in front, high behind

Master Send Data Format:

Receiver Return Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, according to the data Master send
Function Code	1	06H	Write single holding register
Mapping Register	2	4E 21H	Mapping data type





Address			
Write Data	2	00 64H	Write 100 successfully
16 CRC Verify	2	CF 03H	CRC0 CRC1 low byte in front, high behind

Example: If address 20001 mapping slave data type is Signed Int, sort AB, modify mapping address 20001 register to 100, then:

Server send: 01 06 4E 21 00 64 CF 03

01= Device address; 06= Modify single holding register value; 4E 20=Modify address 20001 register value; 00 64 = Write Decimal value 100; CF 03=16 CRC Verify.

Device answer: 01 06 4E 20 00 64 CF 03

01= Device address; 06= Modify single holding register value; 4E 20= R Modify address 20001 register value; 00 64= Modify to Decimal value 100, CE 03=16 CRC Verify.

If need to modify multiple data type mapping address, pls check function code 16 in Modbus protocol.

6.2 MQTT Protocol

MQTT is a client-server based message publish/subscribe transport protocol. The MQTT protocol is lightweight, simple, open, and easy to implement, and these features make it very versatile. In many cases, including restricted environments such as machine to machine (M2M) communication and the Internet of Things (IoT). It is widely used in satellite link communication sensors, occasionally dialed medical devices, smart homes, and some miniaturized devices. The MQTT protocol runs on TCP/IP or other network protocols, providing ordered, lossless, two-way connectivity.

6.2.1 MQTT Introduction

MQTT is a client-server based message publish/subscribe transport protocol. The MQTT protocol is lightweight, simple, open, and easy to implement, and these features make it very versatile. In many cases, including restricted environments such as machine to machine (M2M) communication and the Internet of Things (IoT). It is widely used in satellite link communication sensors, occasionally dialed medical devices, smart homes, and some miniaturized devices. The MQTT protocol runs on TCP/IP or other network protocols, providing ordered, lossless, two-way connectivity.

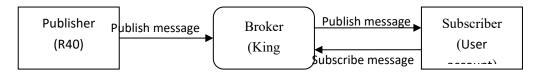
6.2.2 MQTT Principle

There are three identities in the MQTT protocol: Publisher (Publish), Broker (Server), Subscriber (Subscribe). Among them, the publisher and subscriber of the message are both clients, the message broker is the server, and the message publisher can be the subscriber at the same time.

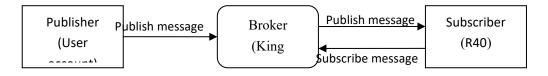
Devices use MQTT communication through only two steps. 1.Devices publish the Topic through broker;

2. Users can create a account on broker to subscribe to the device to achieve monitoring





(uploads data to Broker)



(The R40 receives the downlink message from the Broker to implement control of the R40)

6.2.3 Device Communication Application

Client configuration

1. Connect Platform: King Pigeon 2.0 or other cloud platform to enter the corresponding IP and port.

2. Connection protocol: MQTT.

3. MQTT client ID: the unique identification of the device, which can be a serial number, device ID, or IMEI code; (King Pigeon 2.0 device ID defaults is the serial number).

4. MQTT account: the account where the device publishes the theme on the proxy server (King Pigeon 2.0 defaults is MQTT).

5. MQTT password: the device's account password for publishing the theme on the proxy server (King Pigeon 2.0 defaults is MQTTPW).

6. Publish topic: refers to the topic of the device publishing uplink data to the platform, King Pigeon Cloud 2.0 is the serial number.

7. Subscription topic: refers to the topic that the device subscribes to when receiving downlink data, King Pigeon Cloud 2.0 is the cloud platform serial number/+.

8.Release cycle (seconds): MQTT data release interval, in seconds. The Golden Pigeon Cloud 2.0 cycle needs to be set to 10 seconds or more. If it is less than 10 seconds, the platform will disable the device.

9. Publisher QOS: The service quality level guarantee for application message distribution, 0-at most once, 1-at least once, 2-only once, you can choose according to your needs.

10. Encryption: You can use encryption to connect to the server according to your needs, and you can choose not to encrypt when you connect to King Pigeon Cloud 2.0.

11. Enable data retransmission: Check enable, after enabling, when reconnecting to the cloud platform, the data during the offline period will be retransmitted.

12. Data packing: After checking, send multiple data in one message, when unchecked, one message corresponds to one I/O data point.

After the configuration is complete, the client will initiate a connection to the server:

CONNECT: The client sends a CONNECT connection message request to the server;

CONNACK: The server responds with a CONNACK confirmation connection message, indicating that the connection is successful;

After the client establishes a connection, it is a long connection, and the client can publish or subscribe to the message on the server;

For example the device and the client's mobile phone as the client:

After the device publishes the topic on the proxy server, customers can view the data through subscription. That is, the device is the publisher and the customer's mobile phone is the subscriber.

Users can also publish topics through the MQTT server to control the device. That is, the user is the publisher and the device is the subscriber.

6.2.4 Publish MQTT Format

If data packing is ticked during configuration, multiple I/O data points will be sent in one message (when there are many data points, multiple messages will be sent separately, and each message contains multiple data points), if not checked, one The message only corresponds to one I/O data point, the two publishing formats are slightly different, so you need to pay attention

(1)Following is the device communication data format(Data packing):

Publish Topic Name: serial numbers // Corresponding configured topic options {
 "sensorDatas":

```
[
         {
         // switch type,
         "switcher":"1",
                                                   // Data type and value
         "flag":"DI1"
                                                  //Read and write Flag
         },
         {
         // Slave switch type
         "switcher":"0",
                                                // Data type and value
         "flag":"REG64"
                                                //Read and write Flag
         },
         {
          //value
         "value":"10.00",
         "flag":"AI1"
         },
       {
         //Slave value
         "value":"217.5",
         "flag":"REG2001"
         },
       {
         //Positioning
         "Ing":"116.3",
                                                  // longitude data
         "lat":"39.9",
                                                 // latitude data
         "spd":"0.0",
                                                 // speed data
       "dir":"0.0",
                                              // direction data
         "flag":"GPS"
         }
     ],
    "time":"1602324850"
                                          //Time , data release timestamp UTC format
         "retransmit":"enable"
      //Retransmission flag, indicating historical data (retransmission historical data only has this flag,
real-time data does not have this flag)
```

}



Note:

Each I/O point must contain three types of information when the device publish message: add Time, data type and value, read and write flag;

// Data type and value: according to the type is divided into the following:

- 1. The numeric character is "value" followed by: "data value".
- 2. The switch character is "switcher" followed by: "0"or"1" (0 is close, 1 is open).
- 3. Positioning data :

The GPS longitude character is "Ing" and the value is: "data value".

The GPS latitude character is "lat" and the value is: "data value".

The GPS speed character is "spd" and the value is: "data value".

The GPS direction character is "dir" and the value is: "data value".

Read and write Flag:

Each I/O port has a fixed flag when the device publish a message, The specific flags are as follows:

Device own I/O Port

Data name	Flag	Data type	Description
Digital output	DO1,DO2	Switcher	0 is open,1 is close
Digital input	DI1,DI2	Switcher	0 is open,1 is close
Analog input	AI1,AIN2,AIN3,AIN4	Value	The actual value = original value
Network failure	DI3~DI22	Switcher	0 is offline,1 is online
Pulse count	COUNT1,COUNT2	Value	

Extend I/O Port

Data name	Flag	Data type	Description
Boolean	REG64~256	Switcher	Defined according to slave data
16 Bit	REG20000~20127	Value	Defined according to slave data
32 Bit	REG20128~20254	Value	Defined according to slave data

Note:

//Time flag: the character is "time", followed by "specific reporting timestamp"

//Retransmission flag: the character is "retransmit", followed by "enable"

The data collected during the network offline period will be temporarily stored in the device, and will be republished when the network is restored. It is identified by the "retransmit" field to indicate historical data. (Need to check the enable data transmission on the configuration interface)

(2) The payload data format in the device release message (data unpacking)

Publish Topic: serial numbers				
{				
"switcher": "0",				
"flag": "DI1",				
"time": "1602324850"				
}				

Note: When the data is unpacking, there is a little difference except for the format. The others are exactly the same. This is an example of DI1. For other data types, please refer to the above description.

Device Subscribe MQTT Format 6.2.5

The payload data format in the device subscription message

4G Wireless Industrial Router Wireless Data Connectivity

Subscription format:serial number /+ (subscription topic needs to add the wildcard "/+" after the serial number)

```
{
    "sensorDatas":
    [
        {
                "sensorsId": 211267, // cloud platform sensor ID
                "switcher":1, // switch type data, 0 is off, 1 is closed
                "flag":"DO1" // read write flag
        }
    ],
        "down":"down" // platform downlink message
}
```

Note:

The data sent by the device control must contain three types of information: sensor ID, data type, flag, and downlink message packet.

//Sensor ID: The character is "sensorsID", and the ID is automatically generated according to the platform definition.

// Data type and value: according to the type is divided into the following:

1. The switch character is " switcher " followed by: "0"or "1",0 is open,1 is close.

2. The numeric character is " value " followed by: "data value"

//Read write flag: the character is "flag" followed by "flag"

// "down" confirmation data sent to subscribers by the platform.

7. SMS Command List

This device supports remote query and control operations through SMS commands. The following are the precautions:

1. The default password is 1234, you can edit the SMS command to modify the password;

2. The "password" in the SMS command refers to the device password, such as 1234, just enter the password directly;

3. The "+" sign in the SMS command is not used as the content of the SMS, please do not add any spaces or other characters;

4. The SMS command must be CAPITAL LETTERS, such as "PWD" instead of "pwd";

5. If the password is correct but the command is incorrect, the device will return: SMS Format Error, Please

check Caps Lock in Command! So please check the Command, or add the country code before the telephone

number or check the input is in ENGLISH INPUT METHOD and CAPS LOCK. If password incorrect then will not

any response SMS.

6. If the password is entered incorrectly, no information will be returned;

7. Once the Unit received the SMS Command, will return SMS to confirmation, if no SMS return, please check your command or resend again.

1) Modify Password, 4 digits, default is 1234

4G Wireless Industrial Router Wireless Data Connectivity

SMS Command	Return SMS Content	
Old Password + P + New Password	Password reset complete	
2) Inquiry Current Status SMS Command		
SMS Command	Return SMS Content	
password+EE	Model:xxx	
	Version:xxx	
	IMEI:xxx	
	GSM Signal Value:xxx	

3) Inquiry DIN Status

	Return SMS Content	
Inquiry Status	password+DINE	DIN1:Open/Close DIN2: Open/Close

4) Set Digital Output

	SMS Command	Return SMS Content
Switch ON DO1(Close)	password+DOC1	DO1: ON
Switch OFF DO1(Open)	password+DO1	DO1: OFF
Switch ON DO2(Close)	password+DOC2	DO2: ON
Switch OFF DO2(Open)	password+DO2	DO2: OFF
Inquiry DO Current Status	password+DOE	DO1: ON/OFF
		DO2:ON/OFF

5) Inquiry AIN Status

	SMS Command		
Inquiry Status	password+AINE	AIN1:xxx	
		AIN2: xxx	
		AIN3:xxx	
		AIN4: xxx	

6) Digital Pulse Counter

SMS Command		Return SMS Content
Inquiry Pulse Counter Value	password+PR	DI1 counter value:xxx
		DI2 counter value:xxx
Clear DI1 Pulse Counter	password+DI1CLR	DI1 clear successfully
Clear DI2 Pulse Counter	password+DI2CLR	DI2 clear successfully

8. Warranty

1) This device is warranted to be free of defects in material and workmanship for one year.

2) This warranty does not extend to any defect, malfunction or failure caused by abuse or misuse by the Operating Instructions. In no event shall the manufacturer be liable for any router altered by purchasers.

The End! Any questions please help to contact us feel free. <u>Http://www.IOT-SOLUTION.com</u>

