



Installation and Configuration Quick Guide R3000

Industrial Dual SIM Cellular VPN Router

2 Eth + 1 RS-232 + 1 RS-485 + 1 USB Host

Package Contents

Before installing your R3000 Router, verify the kit contents as following.

- 1 x Robustel R3000 Industrial Dual SIM Cellular VPN Router (GPS/WiFi optional)
- 1 x 3-pin 5 mm male terminal block with lock for power supply
- 1 x 7-pin 3.5 mm male terminal block with lock for serial port, I/O and console port
- 1 x Quick Start Guide with download link of other documents or tools

Optional Accessories (sold separately)

- 3G/4G SMA cellular antenna (stubby/magnet optional)
- RP-SMA WiFi antenna (stubby/magnet optional)
- Wall mounting kit
- 35 mm DIN rail mounting kit
- Ethernet cable
- AC/DC power adapter (12V DC, 1.5 A; EU/US/UK/AU plug optional)

Note: If any of the above items is missing or damaged, please contact your Robustel sales representative.

Environmental Requirements

- Input voltage: 9 to 60V DC
- Power consumption: 100 mA@12 V in idle state, 400 mA (peak) @12 V in communication state
- Operating temperature: -40 to +75 °C
- Relative humidity: 5 to 95% RH

Hardware Introduction

1. Overview



3. PIN Assignment

CR CT GND TX RX RTS CTS

V+

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0	PIN	Power	DI/DO	RS-485	Direction
	8	Positive			
"The	9	Negative			
Ĩ	10	GND			
	11		Input 1		Router \leftarrow Device
	12		Input 2		Router \leftarrow Device
In1	13		Output 1		Router \rightarrow Device
In1 In2	14		Output 2		Router \rightarrow Device
0UT1 0UT2	15		GND		
GND	16			Data+(A)	Router \leftrightarrow Device
A B	17			Data- (B)	Router \leftrightarrow Device

2. Dimensions



4. LED Indicators

Name	Color	Status	Description
RUN	Green	On, fast blinking	Router is powered on
		(250 mSec blink time)	(System is initializing)
		On, blinking	Router starts operating
		(500 mSec blink time)	
		Off	Router is powered off
РРР	Green	On, solid	Link connection is working
		Off	Link connection is not working
USR-	Green	On, solid	OpenVPN connection is
OpenVPN			established
		Off	OpenVPN connection is not
			established
USR-	Green	On, solid	IPsec connection is established
IPsec		Off	IPsec connection is not
			established
USR-	Green	On, solid	WiFi is enabled and working
WiFi			properly
		Off	WiFi is disabled or not working
			properly
- 2 0	Green	On, solid	High Signal strength (21-31) is
••••			available
	Yellow	On, solid	Medium Signal strength (11-20
			is available
	Red	On, solid	Low Signal strength (1-10) is
			available
		Off	No signal
NET	Green	On, solid	Connection to 4G network is
			established
	Yellow	On, solid	Connection to 3G network is
			established
	Red	On, solid	Connection to 2G network is
			established
		Off	Connection to network is not
			established or establishing

Name	Color	Status	Description
SIM	Green	On, blinking	Backup card is being used
		Off	Main card is being used

5. USB Interface

Function	Operation
Firmware upgrade	USB interface is used for batch firmware upgrading, but cannot be used for sending or receiving data from slave devices which connected to it. You can insert a USB storage device into the router's USB interface, such as a U disk or a hard disk. If there have a supported configuration file or a router firmware in this USB storage device, the
	router will automatically update the configuration file or the firmware.

6. Reset Button

Function	Operation
Reboot	Press and hold the RST button for at least 5 seconds
	under the operating status.
Restore to factory	Wait for 5 seconds after powering up the router, press
default settings	and hold the RST button until all six LEDs start blinking
	one by one, and release the button to return the router
	to factory defaults.

7. Ethernet Ports

There are two Ethernet ports on R3000 Router, including ETH0 and ETH1. Each Ethernet port has two LED indicators. The yellow one is a link indicator, while the green one is a speed indicator. For details about status, see the table below.

Indicator	State	Description
Link indicator	On, solid	Connection is established
	On, blinking	Data is being transferred
	Off	Connection is not established
Speed indicator	On, solid	100 Mbps mode
	Off	10 Mbps mode

Hardware Installation

1. Insert or Remove SIM Card/Micro SD Card

• Insert SIM card/Micro SD card

- 1. Make sure router is powered off.
- 2. To remove slot cover, loosen the screws associated with the cover by using a screwdriver and then find the SIM card slot/SD card slot.
- 3. To insert SIM card/Micro SD card, press the card with finger until you hear a click and then tighten the screws associated with the cover by using a screwdriver.
- 4. To put back the cover and tighten the screws associated with the cover by using a screwdriver.
- Remove SIM card or Micro SD card
- 1. Make sure router is powered off.
- 2. To remove slot cover, loosen the screws associated with the cover by using a screwdriver and then find the SIM card slot/SD card slot.
- 3. To remove SIM card/Micro SD card, press the card with finger until it pops out and then take out the card.
- 4. To put back the cover and tighten the screws associated with the cover by using a screwdriver.

Note:

- 1. Recommended torque for inserting is 0.5 N.m, and the maximum allowed is 0.7 N.m.
- Use the specific card when the device is working in extreme temperature (temperature exceeding 40 °C), because the regular card for long-time working in harsh environment will be disconnected frequently.

- 3. Do not forget to twist the cover tightly to avoid being stolen.
- 4. Do not touch the metal of the card surface in case information in the card will lose or be destroyed.
- 5. Do not bend or scratch the card.
- 6. Keep the card away from electricity and magnetism.
- 7. Make sure router is powered off before inserting or removing the card.

2. Attach External Antenna (SMA Type)

Attach an external SMA antenna to the router's antenna connector and twist tightly. Make sure the antenna is within the correct frequency range provided by the ISP and with 50 Ohm impedance. **Note:** Recommended torque for tightening is 0.35 N.m.

3. Ground the Router

Router grounding helps prevent the noise effect due to electromagnetic interference (EMI). Connect the router to the site ground wire by the ground screw before powering on.

Note: This product is appropriate to be mounted on a sound grounded device surface, such as a metal panel.

4. Connect the Router to a Computer

Connect an Ethernet cable to a port marked ETH0 or ETH1 at the front of the R3000, and connect the other end of the cable to your computer.



5. Mount the Router

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The router can be placed on a desktop or mounted to a wall or a 35 mm DIN rail.

Two methods for mounting the router

• <u>Wall mounting</u> (measured in mm)



Use 3 pcs of M3*4 flat head Phillips screws to fix the wall mounting kit to the router, and then use 2 pcs of M3 drywall screws to mount the router associated with the wall mounting kit on the wall.

DIN rail mounting (measured in mm) Use 3 pcs of M3*6 flat head Phillips screws to fix the DIN rail to the router, and then hang the DIN rail on the bracket. It is necessary to choose a standard bracket.



Note: Recommended torque for mounting is 1.0 N.m, and the maximum allowed is 1.2 N.m.

6. Power Supply



R3000 Router supports reverse polarity protection, but always refers to the figure above to connect the power adapter correctly. There are two cables associated with the power adapter. Following to the color of the head, connect the cable marked red to the positive pole through a terminal block, and connect the yellow one to the negative in the same way. The last step is to plug the power adapter into your socket.

Note: The range of power voltage is 9 to 60V DC.

PC Configuration

There are two methods to get IP address for the PC. One is to obtain an IP address automatically from "Local Area Connection", and another is to configure a static IP address manually within the same subnet of the router. Please refer to the steps below.

Here take Windows 7 as example, and the configuration for windows system is similar.

 Click Start > Control panel, double-click Network and Sharing Center, and then double-click Local Area Connection.

Organize 🕶	Start this	connection	Help Rename this o	connection	»	85	FIL	
	ocal Area Conn 络 14 theros AR8162/	ection 8166/8168 PCI-I		Disabled	work Adapter VI ual Ethernet Ada			

4. Two ways for configuring the IP address of PC **Obtain an IP address automatically:**

General	Alternate Configuration				
this cap	n get IP settings assigned a bability. Otherwise, you nee appropriate IP settings.				
	btain an IP address automa	tically			
OU	se the following IP address:				
IP a	ddress:				
Sub	net mask:				
Defa	sult gateway:		4C		
	btain DNS server address a	utomatically			
OU	se the following DNS server	addresses:			
Pref	erred DNS server:				
Alter	mate DNS server:		10	4	
	alidate settings upon exit			Adv	anced
			OK		Cancel

2. Click **Properties** in the window of **Local Area Connection Status**.

Local Area Connect	ion Status		×
General			
Connection			
IPv4 Connectivity:		Intern	et
IPv6 Connectivity:		No Internet acces	ss
Media State:		Enable	ed
Duration:		02:21:	13
Speed:		100.0 Mb	ps
Details			
Activity			
	Sent —	Receive —	d
Bytes:	6,736,534	56,885,69	92
Properties	💮 Disable 📃	Diagnose	
			se

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

etworking Sharing	3	
Connect using:		
Atheros AR8	162/8166/8168 PCI-E Fa	st Ethernet Controlk
		Configure
This connection use	es the following items:	
Client for M	Acrosoft Networks	
🗹 📙 Liebao Wif	fi Package Filter	
VMware Br	ridge Protocol	
QoS Pack	et Scheduler	-
	inter Sharing for Microsoft	
	otocol Version 6 (TCP/IP)	
M - Internet Pri	otocol Version 4 (TCP/IP)	(4)
< [
Instal	Uninstall	Properties
	Uninstal	Properties
Description		
Description Transmission Cor	Uninstall	tocol. The default
Description Transmission Cor wide area networ	ntrol Protocol/Internet Pro	tocol. The default

Use the following IP address

(Configured a static IP address manually within the

same subnet of the router)



5. Click **OK** to finish the configuration.

Router Configuration

1. Log in the Router

To log in to the management page and view the configuration status of your router, please follow the steps below.

- 1. On your PC, open a web browser such as Internet Explorer, Google or Firefox etc.
- From your web browser, type the IP address of the router into the address bar and press enter. The default IP address of the router is <u>192.168.0.1</u>, though the actual address may vary.



3. In the login page, enter the username and password, choose language and then click **LOGIN**. The default username and password are "admin".



Note: If enter the wrong username or password over six times, the login web will be locked for 5 minutes.

4. After logging in, the home page of the R3000 Router's web interface is displayed, for example.

obuste	A I is strongly recom	mendail to charge the	daladt password.	
1	Status			
Status	A System Information			
Interface		Device Model	8,3000	
Network		System Optime	0 days. 00:40:21	
VEN		System Time	Mon Feb 27 09:32:32 2017	
		RAN Diage	79H Free/128H Total	
Services		Firmware Version	3.6.0	
System		Hardware Version	1.2	
		Kernel Version	4.1.0	
		Serial Number	201612221052	
	A Internet Status			
		Active Link	anavara.	
		Uptime	0 days, 60:39:31	
		IP Address	10.122.74.11/255.255.255.248	
		Gateway	10.122.74.8	
		DNS	210 21 4 130 221 5 88 88	
	~ LAN Status			
1		101 L X 8		

Note: To configure parameters should follow this order "modify parameter 1 > Submit > modify parameter 2 > Submit > Save & Apply".

2. Configure the Cellular Connection

Click Interface > Link Manager > Link Manager > General Settings, choose "WWAN1" as the primary link and "WWAN2" as the backup link, and set "Cold Backup" as the backup mode, then click "Submit". Note: Link Settings allows you to configure the parameters of link connection, including WWAN1/WWAN2, WAN and WLAN. It is recommended to enable Ping detection to keep the router always online. The Ping detection increases the reliability and also costs the data traffic.



Link S	Type	Description	Connection Type	
1	WWAN1		DHCP	
2	WWAN2		DHCP	
3	WAN		DHCP	
4	WLAN		DHCP	

Click Con the right-most of WWAN1 to enter the configuration window.

Link Manager	
∧ General Settings	
Index	1
Туре	WWAN1
Description	

The window is displayed as below when enabling the "Automatic APN Selection" option.

∧ WWAN Settings					
Automatic APN Selection	ON OFF				
Dialup Number	*99***1#				
Authentication Type	Auto				
Switch SIM By Data Allowance	ON OFF 7				
Data Allowance	0 7				
Billing Day					

The window is displayed as below when enabling the "Ping Detection" option.

Ping Detection Settings	
Enable	ON OFF
Primary Server	8.8.8.8
Secondary Server	114.114.114
Interval	300
Retry Interval	5
Timeout	3
Max Ping Tries	3

∧ Advanced Settings	
NAT Enable	ON OFF
Upload Bandwidth	10000 🧷
Download Bandwidth	10000
Overrided Primary DNS	
Overrided Secondary DNS	
Debug Enable	ON DEF
Verbose Debug Enable	OM OFF

When finished, click **Submit > Save & Apply** for the configuration to take effect.

3. Check the Cellular Connection Status

Click Interface > Cellular > Status to view the status of the cellular connection, and click the row of status, the details status information will be displayed under the row.

C1-1				
Status			THO	De cichertier
Index	Modem Status	Modem Model	IMSI	Registration
1	Ready	ME909s-120	460066559097705	Registered to home network
Status Index	Modem Status Modem Model	IMSI	Registration	
1 1	Ready ME909s-120		gistered to home network	
1000	Index	1	and the second se	
	Modem Status	Ready		
	Modem Model	ME909s-120		
	Current SIM	SIM1		
	Phone Number	5011		
	IMSI	460066559097705		
	ICCID	89860616090062456452		
	Registration	Registered to home netwo	rk	
	Network Provider	CHN-UNICOM		
	Network Type	LTE		
	Signal Strength	25 (-63dBm)		
	Bit Error Rate	99		
	PLMN ID	46001		
	Local Area Code	2507		
	Cell ID	06074702		
	IMEI	867377020253088		
	Firmware Version	11.617.01.00.00		

4. Configure the IP of the Router

There are two Ethernet ports on R3000 Router, including ETH0 and ETH1. The ETH0 on the router can be configured as either a WAN or a LAN port, while ETH1 can only be configured as a LAN port. By default, ETH0 and ETH1 are lan0, and their IP are 192.168.0.1/255.255.255.0. Since lan0 must be assigned to one port and WAN port must be assigned to the ETH0, there are four configurations. You can choose the appropriate configuration to fit your current needs. The specific port configurations are shown below.

Port Se	ettings		
Index	Port	Port Assignment	
1	eth0	lan0	
2	eth1	lan0	
Port Se	ettings		
Index	Port	Port Assignment	
1	eth0	lan0	
-	Curro		
2	eth1	lan1	
2 Port Se	eth1		
2 Port Se	eth1	lan1	
2 Port Se Index	eth1 ettings Port	lan1 Port Assignment	
2 Port Se Index 1 2	eth1 ettings Port eth0 eth1	lan1 Port Assignment lan1	
2 Port Se Index 1 2 Port Se	eth1 ettings Port eth0 eth1	lan1 Port Assignment lan1	
2 Port Se Index 1	eth1 ettings Port eth0 eth1 ettings	lan1 Port Assignment lan1 lan0	

Configure lan0

Click Interface > LAN > LAN, click lan0's edit button to configure its configuration, and modify its IPv4 address and Netmask.

LAN	4 - E	Multiple IP	VLAN Trunk	Status	
^ Netwo	ork Setting	ıs			?
Index	Interface	IP Address	Netmask		+
1	lan0	172.16.24.24	255.255.0.0		X

LAN		
 General Settings 		
	Index	1
	Interface	lan0 v
	IP Address	172.16.24.24
	Netmask	255.255.0.0
	мти	1500

When finished, click **Submit > Save & Apply** for the configuration to take effect.

• Configure lan1

Click **Interface > Ethernet > Ports**, click eth0's edit button, choose lan1 as the assigned port, and click "Submit".

Note: By default, there is a LAN port (lan0) in the list. To begin adding a new LAN port (lan1), please configure eth0 or eth1 as lan1 first in Ethernet > Ports > Port Settings. Otherwise, the operation will be prompted as "List is full".

∧ Port Se	ettings		0
Index	Port	Port Assignment	
1	eth0	lan0	
2	eth1	lan0	
and the second			
Ports			



Click **Interface > LAN** in the homepage, and click the add button.

LAN	4	Multiple IP	VLAN Trunk	Status	
^ Netwo	ork Setting	ıs			7
Index	Interface	IP Address	Netmask		+
1	lan0	172.16.24.24	255.255.0.0		X X

Choose lan1 as the interface, and configure its IPv4 address and Netmask.

LAN	
∧ General Settings	
Index	2
Interface	lan1 v
IP Address	192.168.0.1
Netmask	255.255.255.0
мти	1500

When finished, click **Submit > Save & Apply** for the configuration to take effect.

• Configure Multiple IP

Click Interface > LAN > Multiple IP, and click the edit button of lan0.

LAN	4	Multiple IP	VLAN Trunk	Status	
∧ Multip	le IP Setti	ngs			
Index	Interface	IP Address	Netmask		+
1	lan0	172.16.24.24	255.255.0.0		X X

Note: You may click or edit the multiple IP of the LAN port, or click to delete the multiple IP of the LAN port. Now, click to add a multiple IP to the LAN port.

Multiple IP	
∧ IP Settings	
Index	1
Interface	lan0 v
IP Address	172.16.24.24
Netmask	255.255.0.0

When finished, click **Submit > Save & Apply** for the configuration to take effect.

• Configure WAN

Click **Interface > Ethernet > Ports**, click the edit button of eth0, choose "wan" as the port assignment, and click "Submit";

Ports	
∧ Port Settings	
Index	1
Port	eth0 v
Port Assignment	wan v

Click Interface > Link Manager > General Settings, choose "WAN" as the primary link, and choose "None" as the backup link.

Link Manager	Status	
∧ General Setti	ngs	
	Primary Link	WAN Y
	Backup Link	None
	Emergency Reboot	ON OFF ?

Click the edit button of WAN to enter its configuration window.

Index	Туре	Description	Connection Type	
1	WWAN1		DHCP	
2	WWAN2		DHCP	
3	WAN		DHCP	
4	WLAN		DHCP	

Configure WAN's related parameters as below.

∧ General Settings	
Index	3
Туре	WAN
Description	
Connection Type	DHCP V

The window is displayed as below when enabling the "Ping Detection" option.

Enable	ON OFF	
Primary Server	8.8.8.8	
Secondary Server	114.114.114	
Interval	300	0
Retry Interval	5	0
Timeout	3	0
Max Ping Tries	3	0
dvanced Settings NAT Enable	ON OFF	
NAT Enable		- -
-	ON OH 1500] @
NAT Enable MTU	1500]] Ø]
NAT Enable MTU Upload Bandwidth	1500 10000]] @]
MTU Upload Bandwidth Download Bandwidth	1500 10000]] Ø]]
NAT Enable MTU Upload Bandwidth Download Bandwidth Overrided Primary DNS	1500 10000]] ⑦]]

take effect.



Guangzhou Robustel LTD

Add: 3rd Floor, Building F, Kehui Park, No.95 Daguan Road, Guangzhou, China 510660

Tel: 86-20-29019902

Email: info@robustel.com

Web: <u>www.robustel.com</u>