

ER-800 3G Router User Manual



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1. Product Introduction

This chapter mainly introduces the outlook, accessories, specifications and mechanism of ER-800.

- 1. Brief Introduction
- 2. Product Outlook
- 3. Accessories
- 4. Dimension
- 5. Working Mechanism
- 6. Specifications
- 7. Technical Advantages
- 8. Typical Usecases

1.1 Brief Introduction

ER-800 is a high speed WCDMA 3G router. It works in China Unicom's WCDMA network, can access internet and transfer video and data with high speed.

Comparing with eTung's MR-900W 3G routers, ER-800 has extended 4 Ethernet interfaces, and can connect 4 PCs via Ethernet cable at the same time. Thus when customers have multiple PCs at the spot that need to access the internet, they do not have to deploy additional hub or wireless communication devices. This can reduce device procurement cost and maintenance cost as well.

ER-800 has WIFI functionality as well, and supports 802.11b/g/n protocol. In theory the highest speed can be 150Mbps. Either mobile phones, PCs or other devices that has WIFI functionality, can bind ER-800's WIFI access point and share Internet access via ER-800. This greatly extends the number of devices that can connect with ER-800 at the same time. Meanwhile, with ER-800's WIFI and extended Ethernet interfaces, customers can build a small local area network, and all devices that connect to ER-800 via WIFI or physical Ethernet cable are in the same local area network, and can communicate each other freely.

ER-800 has built-in WEB configuration interface, and is easy to use.



ER-800 supports static routing, DMZ host, port forwarding and VPN, and has performance tuning function for high speed wireless applications as well. It can work stably and reliably in unattended environment.

In theory the uplink speed of data transfer is 5.76Mbps, and downlink speed is 21Mbps. ER-800 can connect quickly with web camera, video server, PLC and IPC, and transfer data from the customer device that connects with ER-800 to a host in the internet, so as to transfer data remotely and transparently. ER-800 can be widely used in industries such as banking, road transportation, power system, environment protection and industrial controlling.

1.2 Product Outlook



Figure 1-3: ER-800 side view 2



1.3 Standard Accessories



Figure 1-4: 3G all frequency sucking antenna



Figure 1-5: WIFI antenna







Figure 1-7: Power supply

1.4 Dimension



Bottom View





Currently, ER-800 has two optional installation accessories: orbit type and flat type, as shown below.



Figure 1-9: Orbit type installation accessory



Figure 1-10: Flat type installation accessory

Using orbit type installation accessory: fix the orbit type installation accessory on ER-800's two installation holes with screws, and then install ER-800 on the orbit of machine room with orbit type accessory.



Figure 1-11: Effect diagram of orbit type installation

Using flat type installation accessory: fix the flat type installation accessory on ER-800's two installation holes with screws, and then install ER-800 with the four installation holes on the installation accessory.



Figure 1-12: Dimension of flat type installation accessory



Figure 1-13: Effect diagram of flat type installation



1.5 Working Mechanism



Figure 1-14: ER-800 working mechanism

PC connects to one of ER-800's Ethernet interfaces with a cross cable. After power on it dials via 3G wireless network and connects to the internet, then PCs can share the internet via ER-800, and access the application server. At the same time, using ER-800's WIFI functionality, PCs (or other devices that support WIFI) can connect to ER-800's WIFI access point, instead of connecting with Ethernet cable, to share the Internet access. Meanwhile, ER-800 can be used to build remote virtual LAN with Virhub or VPN, monitor video remotely, and publish programs remotely on LED color screens, etc.

1.6 Specifications

1.6.1 Technical Parameters

- Basic Parameters
 - ♦ Power Supply: +9 ~ +36V wide range of voltage input
 - Power Connector: inner(+) outer(-)
 - ♦ Data Interface: 4 RJ45 Ethernet interfaces
 - ♦ Network: GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA/WIFI
 - ♦ Memory: RAM 64M FLASH 4M
 - ♦ Frequency: UMTS/HSDPA/HSDPA850/900/1900/2100MHz Quad-BandGSM850/900/1800/1900MHz WIFI 802.11 b/g/n 2.4GHz



- ♦ Max Current: 700mA@+5V DC, 300mA@+12V DC
- ♦ Standby Current: 560mA@+5V DC, 180mA@+12V DC
- ♦ Temperature: -30°C ~ +70°C
- ♦ Humidity: $95\%@+40^{\circ}C$
- ♦ Dimension: 165*108*33mm
- Basic Functions
 - ♦ Support NAT
 - ♦ Support DHCP server
 - ♦ Support DNS Proxy
 - ♦ Support port forwarding
 - Support DMZ host(IP address mapping)
 - ♦ Support VPN
 - ♦ Support dynamic domain auto-registration
 - ♦ Support configuring static route table
 - ♦ Support real-time speed display of wireless network
 - ♦ Support configuring with telnet and web interface
 - ♦ Support flow wakeup, phone wakeup and SMS wakeup

1.6.2 Indicator Light Description

LED Indicator Light	Color	Status	Description
Power light	Dod	Always light	Device is working
(PWR)	Red	Extinguished	Device is not working
Online light	Croop	Always light	Connected to 3G network
(STS)	Green	Extinguished	No connection to 3G network
Module light	Dod	Flashing	Module is working
(MST)	кеа	Extinguished	Module is not working
Signal light	Green		Signal is excellent
(SIG)	Yellow	Always light	Signal is good
	Red		Signal is bad
	N/A	Extinguished	No signal
WIFI	Green	Always light	WIFI enabled
		Extinguished	WIFI disabled
Ethernet light		Always light	Ethernet connection OK
(LANO-LAN3)	Red	Flashing	Data transferring
		Extinguished	Ethernet connection not OK

Table 1-1 ER-800 indicator light description

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1.7 Technical Advantages

eTung 3G router takes the leading role in the industry not only from hardware industrialization, design rationality, software convenience and usage flexibility, but also from its reliability. Its technical advantages are easy to see:

- Support dynamic domain auto-registration, domain resolving software is not needed;
- ♦ Support Telnet and web configuration;

♦ Support 4 RJ45 Ethernet interfaces, at most 4 PCs(devices) can connect with it via Ethernet cable;

♦ Support WIFI access point, devices supporting WIFI can connect with it quickly to build a small LAN;

- ♦ Support VPN to build virtual LAN, and simply change fixed line to wireless line;
- Support configuring 3G router remotely via SMS and from server side;
- ♦ Support soft and hard watch dog, keep alive all the time;
- Support APN name auto adaption, adaptive universally with default configuration;
- ♦ Support LBS location function to check device location at any time;
- ♦ Support "eYun" platform, server building not needed and plug-and-play.

1.8 Typical Usecases



Figure 1-15: Access Internet via 3G router



Figure 1-16: Implement virtual LAN via ER-800's Virhub functionality



Figure 1-17: Use ER-800 to access LAN remotely via VPN

2. Device Configurations

This chapter introduces how to use ER-800 and related parameters.

- 1. Configurations
- 2. Parameters
- 3. Restore to default
- 4. Firmware Update
- 5. Remote Configurations

2.1 Configurations

2.1.1 Preparation

- ♦ One cross Ethernet cable used to connect ER-800 with PC or customer device;
- ♦ One 3G all frequency sucking antenna;
- \diamond One power supply;
- ♦ One USIM card (for example China Unicom wo), that can access internet.

2.1.2 Configuring ER-800

- Connect PC with one of ER-800's Ethernet interfaces via a cross Ethernet cable;
- Boot PC, and set IP address as "Automatically obtain IP address";

🕮 Net Device PV [Driver	<u>C</u> onfigure
nis c <u>o</u> nnection uses tl	he following items:	
🗹 🔜 Client for Micro	osoft Networks	
🗆 🛃 Network Load	Balancing	
File and Printe	r Sharing for Microsof	t Networks
I <u>n</u> stall	<u>U</u> ninstall	Properties
Description		1
Transmission Contro wide area network p across diverse interc	Protocol/Internet Pro rotocol that provides o connected networks.	tocol. The default communication
Chow icon in polific	ation area when conr	vented
SHOW ICON IN NOUNC	auon alea when conn	lecteu

etung 。 _{驿唐科技}

net Protocol (TCP/IP) Prope	rties				
ieral Alternate Configuration					
u can get IP settings assigned a is capability. Otherwise, you nee r the appropriate IP settings.	utomatica d to ask y	ly if y our r	your n networ	etwork s k admin	support: istrator
Obtain an IP address automa	tically				
O Use the following IP address:					
IP address:		25	2	- 55	
Sybnet mask:			e.	- 0	Ĩ
Default gateway:		а С	17	10	-
 Obtain DNS server address a Use the following DNS server Breferred DNS server: 	utomatica addresse	I <u>γ</u> s:	,		
Alternate DNS server:			1	0	-
				Adya	anced

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Figure 2-1: Set IP address as "Automatically obtain IP address"

- Open IE browser, input address "http://192.168.1.1" and press Enter;
- ♦ Input "root" as username and "1234" as password, select language as "ENGLISH", then press Enter to login web configuration interface and configure the device.

ER-80	eTung.	
用户名 (username):	root	
用户密码 (passwd):	••••	
语言 (language):	ENGLISH 💌	
	_ 登陆(login)]	

Figure 2-2: Login router configuration interface

eTung . Frank ∻ It is clear to see each configuration item in the router configuration interface. To change some parameter, click it, modify and then save it, then reboot the router. Keep the default configurations if the router is used only to access internet.

eTung.	3G ROUTER	[中 文 English] Warning. Setting effect after reboot!
 Status Wireless Net LAN WIFI NAT Rule Router DDNS VFN DTU Function Virhub System Tools Reboot System 	Status: IMEI: Version: Now: Manufacture Model: Status: Connection Status: Network:	240305003030560 ER-800U-1.2.2-01/05/16 2016/01/06 10:57:52 sr:Huawei Technologies Co., Ltd. MU609 Module detected, SIM card detected Wireless Connected to network, IP:10.28.160.102 Not connected to DC. Virhub not connected. HSPA Signal:
	[For more informa	ation please visit: Etung Technology]

Figure 2-3: Router's current status

2.2 Configuration Parameters

Each configuration menu has multiple parameters, and some of them have sub-menus. Details are described below.

Configuratio	n Menu Item	Description			
Current statu	2	Show device information, connection			
		and data transfer status.			
		Set user information about dialing into			
Wireless Net	Simple Cfg	internet and SMS function, normally			
WITCIC55 NCT		with default value			
	Advanced Cfg Check network debugging infor				
LAN		Set the router IP of LAN and set the			
		DHCP function			
		Configure WIFI parameters, normally			
WIFI		with default values (Enable WIFI, SSID			
		is "ER-800", enable security and with			
	1	PSK PIN "12345678").			
	NAT	Whether the device connected with			
		router can access internet via NAT.			
		Use pre-defined port to forward data			
NAT RUIE	Port Mapping	from internet to some inner IPS			
		dedicated port.			
	DMZ Host	Forward data from internet directly to			
		Some miler iF.			
Router					
		Domain resolving function configure			
		the router to have a static domain to be			
DDNS		easily accessed			
		Login with username and password to			
	PPTP&L2TP	connect VPN			
VPN		Set routing data encapsulation mode,			
	GRE Set	normally with default value.			
	Simple Cfa	Set master data center address and			
	Simple Cig	serial port parameters			
	Advanced Cfg	Set standby data center address and			
DTU	Advanced Cig	data format			
Function	Link Management	Set heart beat parameters, normally			
		with default values			
	Embedded DC	Set embedded data center function			
	Proxy Client	Set proxy client address			
Virhub		Set server address for Virhub function,			
VIIIIGO		with eYun platform as default			

eTung.	驿唐科技	ER-800 User Manual		
	System Set	Set router's communication parameters, normally with default values		
	SNMP Set	Set SNMP parameters, normally with default values		
	System Log	Show router's connection and communication logs		
System	DTU Log	Show router's data transfer logs with DTU function		
Tools	Restore Set	Restore to initial default settings with one key		
	Upgrade Firmware	Update router's firmware		
	Change Password	Change password logging router(1234 by default)		
	Import/Export config	Import parameter file saved before/Export current configurations to file		
Reboot Syste	m	Reboot router		

Table 2-1: Details of configuration parameters

2.3 Restore to Default

According to the description of "Configuring ER-800", after entering ER-800 configuration interface, select "System Tools" and then "Restore Set".

eTung.	3G ROUTER	[中 文 English] Warning: Setting effect after reboot!
 Status Wireless Net LAN WIFI NAT Rule Router DDNS VPN DTU Function Virhub System Tools System Set SNMP Set System Log 	Restore Set Click this but Restore Set	tton to revert to factory settings!
• DTU Log • Restore Set Upgrade		

Figure 2-4: Restore to default

This can also be done by using the button "Reset to default" on ER-800. After ER-800 is started, hold the button "Reset to default" with a sharp object, do not release the button until "Online light" flashes two or three times and then always lights, that means the router has been reset to default and is rebooting automatically.

2.4 Firmware Update

- ♦ Ask eTung for firmware software
- ♦ According to the description of "Configuring ER-800", connect ER-800 with PC via a cross Ethernet cable, input username and password (by default username is root and password is 1234), and login router configuration interface.
- Select "System Tools" and then "Upgrade Firmware", click "Browse", select the file (.img) to update, and click "Open", then click "Upload".

eTùng.	3G ROUTER		(中 文)Engi Warning Setting effec	ish] :t after reboot!	
- Status + Wireless Net - LAN - WIFI + NAT Rule	 · 通序要 · · ·	Upgrade Firmwan Nax size 助歌的文件	re of upload file is 2M.	(Miles)	
• Router • DDNS		 WuMingY 新建文件夹 	u • Doc • Firmware	• 4 使罪 Firmware	P 10
 VPN DTU Function Virbub System Tools System Set SWMP Set 	第章 图 20 2 2 4 日 日 	15週 - 15日 15日 15日 15日 15日 15日 15日 15日 15日 15日	≤is:	様改日期 2015/2/16 16:39 2014/4/23 11:08 2015/6/17 15:05 2015/6/24 14:22	类型 ▲ 加用程 · · · · · · · · · · · · · · · · · · ·
 System Log DTU Log Restore Set Upgrade 	1 iti 2 4 3 a 4	算机 5地磁盘 (C:) ※	er701w-1.0.0 er800u-1.2.2 LED300NC1_468.bin Led328_148.bin	2015/6/25 11:51 2016/1/6 9:49 2014/9/9 13:59 2015/2/27 11:33	光盘映 光盘映 BIN 文 BIN 文
Fireware Change Password Import or - Export config	 (%) 1931 	寄 • 文件名	Led328_160.bin	2015/2/27 11:15 2015/2/27 11:14 ▼ 所有文件(*.*)	
完成			()	打开(O) 取	調査の目

Figure 2-5: Select file to update

Click "Update" after upload is complete. (It's better to select "Delete the Former File")

```
eTung。 <sub>驿唐科技</sub>
```

```
Upgrade Firmware
Please choose wether to delete the configuration:
```

◎Keep the Former File	e 💿 Delete the Former File
Upload File Path:	er800u-1.2.2.img
Upload File Size:	1998928Bytes
Old Version:	ER-800U-1.2.2-01/05/16
New Version:	ER-800U-1.2.2-01/05/16
Make sure and then pres	ss Update button.
Upload Success.	
ate	

Figure 2-6: Firmware Update

♦ After update is complete the device will reboot automatically, and it will show as in the figure below.

Upgrade Firmware



Figure 2-7: Update complete

2.5 Remote Configurations

SMS commands and remote AT commands can be used on ER-800 to modify configuration parameters remotely. Details are described below:

- 1. Modify configuration parameters remotely via SMS The SMS to configure ER-800 parameters should follow the format below: SMS password; AT commands
 - SMS password is the "SMS wakeup password" as shown in wireless network settings of the web configuration interface, with "1234" by default. This password is used to filter rubbish SMS. Long SMS is not supported.
 - 2) There can be multiple AT commands, and ";" is used between SMS and AT command, and between AT commands. If there are more than one AT command and some command fails, the following commands will not be executed. If a command is unknown, an ERROR will return. The commands will take effect after system reboot. This can be done by putting a command "AT+REBOOT" in the end of SMS commands, or sending a separate SMS with command "AT+REBOOT".
 - 3) AT command must be capitalized, but the parameters in the command do not have this limit.
 - 4) If there are multiple parameters in the command, just write those that need to change and you do not have to write all of them. If some item does not need to change, write two continuous colons, and if some item needs to clean, write a space. For example:

AT+WN=3gnet (configure onely APN, and other parameters keep unchanged)

AT+DC=,,user (the first two items keep unchanged, and change username only)



For remote SMS configuration, the contents of SMS must be English charactes or digits in single byte, and can not be in double byte.

AT commands that can be used via SMS are listed and described below:

1) AT+WN=apn,user,passwd,net_mode

Configure parameters related to dialling, with reply OK or ERROR. apn: Access point name, this parameter is unused for EVDO device and can be null. write "auto" to ask to select APN automatically. user: dialling account, the dialing password must be changed together with dialling account. passwd: dialling password, the dialing account must be changed together with dialling password.

net_mode: network mode: 1(GSM only), 2(WCDMA only), 3(GSM/WCDMA auto selection, WCDMA preferred)

 AT+DC=addr,port,user,mode Configure data center parameters, with reply OK or ERROR. addr: data center address, either IP or domain port: data center port user: username mode: TCP or UDP

3) AT+PWD=passwd

Set new SMS password, with at most 8 characters, exluding ",",":", "=", etc. It is adviced to use digits and English characters only. The reply is OK or ERROR.

- 4) AT+VIRHUB=0/1
 Set whether to enabe Virhub or not, with reply OK or ERROR.
 0: disable Virhub, 1: enable Virhub
- 5) AT+RESTORE Restore to default settings, with reply OK.
- AT+REBOOT Reboot the device, with reply OK.
- 7) AT+STATUS?

Check current status, with reply below: OK:connection status, signal quality, IP address, net_mode connection status: 0: dialling not successful, 1: dialling successful signal quality: 0-31, bigger value means better quality IP address: IP address obtained after dialling is successful, invalid if dialling is not successful. net_mode:GPRS/EDGE/WCDMA/HSDPA/HSUPA/HSPA/HSPA+

AT+WN?
 Check wireless network settings, with reply below:
 OK:addr,port,user,mode
 Refer the first command for parameters description

9) AT+DC?

Check data center parameters, with reply below: OK:addr,port,user,mode Refer the second command for parameters description

10) AT+PWD?

Check SMS password, with reply below: OK: passwd

11) AT+INFO?

Check device information. with reply below: OK: IMEI, version, IP address at Ethernet interface

12) AT+VIRHUB?

Check status of Virhub, with reply below: OK:0/1

0: Virhub is disabled, 1: Virhub is enabled.

13) AT+UPDATE=url

Update firmware, with reply OK or ERROR. The reply OK does not mean update is complete, but the command has been received and the update will start. To check whether update is successful, send AT+INFO? after 5 minutes and check whether the firmware version is changed.

url: download URL of the new firmware, beginning with "<u>http://</u>". Make sure the device can access this url, for example it should not be a public URL if the device has a private net card.

14) AT+UPDATEALL=url

Update firmware and restore to default settings, with reply OK or ERROR.

url: download URL of the new firmware, beginning with "<u>http://</u>". Make sure the device can access this url.

15) AT+SMSZHUANFA=txt,info_src,dest

Ask the router to send an SMS to info_src first with content "txt" (only in English characters and digits), and then forward the reply to dest. dest can be omitted, and if then the reply will be forwarded the the mobile that sends this AT command. If the reply SMS has more than one message, the router will forward the messages one by one.

For example: AT+SMSZHUANFA=CXLL,10086,13801234567, means to send an SMS to 10086 to query traffic and then forward the reply to 13801234567.

- 2. Change configuration parameters via remote AT commands
 - 1) This method can be used only when enabliing DTU function or virhub function, and ER-800 is shown online in mServer.
 - 2) Method: choose the router in mServer's console, right-click it and

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choose "Remote Control", in the popped-up dialog, input AT commands in "CMD List" on the left side.

For example, input the following command to change the data center's address and port:

AT+MSERVER=3g.etungtech.com,8080

Click "Send" afterwards, and if successful, a "OK" will show in "CMD Response" on the right side. Then ER-800 will be offline from the original mServer, and connect to the new data center and port.

Remote Control							
mDevice Name: DTU3023327							
CMD List:	CMD Response:						
AT+MSERVER=3g. etungtech. com, 8080	*	^					
	-	-					
	Send						
Import List Save List							

Remote AT commands are listed below:

- 1) AT
- AT+MSERVER=addr, port Change data center address and port, with reply OK or ERROR. addr: data center address, either IP address or domain port: data center port
- AT+USER=user
 Change DTU username, with reply OK or ERROR.
 user: username
- AT+CSQ Query signal strength and network mode, with the following reply:

OK:sig_quality,net_mode sig_quality: 0-31, bigger value means better signal quality net_mode: GPRS/EDGE/WCDMA/HSDPA/HSUPA/HSPA/HSPA+

- 5) AT+REBOOT Reboot the router, with reply OK.
- 6) AT+UPDATE=url,md5

Update firmware, with reply OK or ERROR. The reply OK does not mean update is complete, but the command has been received and the update will start. To check whether update is successful, send AT+INFO? after 5 minutes and check whether the firmware version is changed.

url: download URL of the new firmware, beginning with "http://". Make sure the device can access this url, for example it should not be a public URL if the device has a private net card.

- AT+UPDATEALL=url,md5
 Update firmware and restore to default settings, with reply OK or ERROR.
 url: download URL of the new firmware, beginning with "http://". Make sure the device can access this url.
- AT+DTU&IMEI? Query the router's IMEI number, with the following reply: OK: IMEI
- 9) AT+DTU&VER? Query the router's version, with the following reply: OK:ver
- 10) AT+CM&TYPE? Query protocol type, with the following reply: OK:prot Prot: TCP, UDP or ETCP
- 11) AT+CM&HBI? Query heartbeat interval, with the following reply: OK: interval

Heartbeat interval is in seconds.

12) AT+CM&HBT?

Query heartbeat timeout, with the following reply: OK:timeout Heartbeat timeout is in seconds.

13) AT+SER&BAUD?

Query user serial port baud rate, with the following reply:

OK: baud Baud: 2400/4800/9600/19200/38400/57600/115200 14) AT+SER&SIZE? Query user serial port data bits, with the following reply: OK: size size: 8/7/6/5 15) AT+SER&PAR? Query user serial port parity, with the following reply: OK:par Par: N: no parity, O: odd parity, E: even parity 16) AT+VIRHUB&ENABLED? Query whether virhub function is enabled, with the following reply: OK:0/1 0: disable virhub function, 1: enable virhub function 17) AT+CM&TYPE=prot Set protocol type, with reply OK. prot: TCP、UDP、ETCP 18) AT+CM&HBI=interval Set heartbeat interval in seconds, with reply OK. 19) AT+CM&HBT=timeout Set heartbeat timeout in seconds, with reply OK. 20) AT+SER&BAUD=baud Set user serial port baud rate, with reply OK. Baud: 2400/4800/9600/19200/38400/57600/115200 21) AT+SER&SIZE=size Set user serial port data bit, with reply OK. Size: 8/7/6/5 22) AT + SER&PAR = par Set user serial port parity, with reply OK. par: N: no parity, O: odd parity, E: even parity 23) AT+VIRHUB&ENABLED=0/1 Enable/disable virhub function, with reply OK. 24) AT+SMSPING=PHONE_NUM Ask the router to send an SMS to PHONE_NUM, and the content is the router's IMEI number, with reply OK.

25) AT+SMSZHUANFA=txt,info_src,dest Ask the router to send an SMS to info_src first with content "txt" (only in English characters and digits), and then forward the reply to dest. dest can be omitted, and if then the reply will be forwarded to the mobile that sends this AT command. If the reply SMS has more than one message, the router will forward the messages one by one.

For example: AT+SMSZHUANFA=CXLL,10086,13801234567, means to send an SMS to 10086 to query traffic and then forward the reply to 13801234567.

26) AT+VIRHUB&TAP_IP?

Check the remote access IP address via Virhub, with reply: $\mathsf{OK}{:}x{.}x{.}x{.}x{.}x$

- 27) AT + VIRHUB&TAP_MASK? Check the remote access netmask via Virhub, with reply: OK:x.x.x.x
- 28) AT+VIRHUB&TAP_IP=x.x.x.x Set the remote access IP address via Virhub, with reply OK.
- 29) AT+VIRHUB&TAP_MASK=x.x.x.x Set the remote access netmask via Virhub, with reply OK.



Appendix 1: Configure ER-800 for

High-Speed Internet Connection

PC can be directly connected to one of ER-800's Ethernet interfaces to access internet wirelessly, and mobile phones or other devices that has enabled WIFI can connect to ER-800 via WIFI, and share the Internet access.



Figure Appendix 1-1: PC accesses internet via ER-800

Steps:

- (1) Connect PC with one of ER-800's Ethernet interfaces via a cross Ethernet cable;
- (2) Configure IP on PC as "Automatically obtain IP address": Click "Control Panel"->"Network Connection"->"Local Connection", then right-click "Local Connection" and select "Properties"



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You can get IP settings assigned automatically if your network sup this capability. Otherwise, you need to ask your network administr for the appropriate IP settings. • Obtain an IP address automatically • Use the following IP address: IP address: IP address: Subnet mask: Default gateway: Obtain DNS server address automatically • Use the following DNS server addresses: Preferred DNS server:	ports ator
Obtain an IP address automatically Use the following IP address: IP address: Subnet mask: Default gateway: Obtain DNS server address automatically Obtain DNS server address automatically Default gateway: INS server address automatically	
Uge the following IP address: IP address: Subnet mask: Default gateway: Obtain DNS server address automatically Use the following DNS server addresses: Preferred DNS server:	
IP address; Subnet mask: Default gateway: Obtain DNS server address automatically Outsin DNS server address automatically Preferred DNS server;	
Subnet mask: Default gateway: © Obtain DNS server address automatically © Use the following DNS server addresses: Preferred DNS server:	
Default gateway: Obtain DNS server address automatically Use the following DNS server addresses: Preferred DNS server:	
Obtain DNS server address automatically Use the following DNS server addresses: Preferred DNS server:	
Preferred DNS server:	
Alternate DNS server:	
Advanc	:ed

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Figure Appendix 1-2: Configure to obtain IP address automatically

Or: you can configure a static IP address. Pay attention, the default gateway of ER-800 is 192.168.1.1, the IP address set manually should be in the same range (192.168.1.2~192.168.1.254), for example, 192.168.1.20 as shown below:

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ou can get IP settings assigned au his capability. Otherwise, you need or the appropriate IP settings.	utomatically if your network supports d to ask your network administrator tically
C Obtain an IP address automat	tically
	,
• Use the following IP address:	
IP address:	192 . 168 . 1 . 20
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	192.168.1.1
C Obtain DN5 server address at Use the following DN5 server Preferred DN5 server: Alternate DN5 server:	utomatically addresses: 192 . 168 . 1 . 1

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Figure Appendix 1-3: Configure a static IP address manually

(3) Plug a WCDMA card into ER-800, then after power on, ER-800 will dial automatically; and after dialing is successful, you can browse webpage, and send/receive emails via PC. The dialing status of ER-800 can be checked in the web interface. Just input http://192.168.1.1(ER-800's default gateway is 192.168.1.1) in IE, then input default username root, and password 1234, you can then check the working status, as well as current connection speed and flow of ER-800.

eTùng 🖌	3G ROU	TER		[中 文 Er Warning: Setting ef	nglish] fect after reboot!	
• Status	Sta	tus:				
I AN		IMRI:	240305003030	560		
- UTET		Version:	ER-800U-1.2.	2-01/05/16		
· WIT D J		Now:	2016/01/06 1	0:57:52		
+ NAI KUIE						
• Router		Manufacture	er:Huawei Techr	ologies Co., Ltd.		
 DDNS 		Model:	MU609			
+ VPN		Status:	Module detec	ted, SIM card det	ected	
+ DTU Function			Virele:	s Connected to ne	etwork,	
• Virhub		Connection	IP:10.:	28.160.102		
+ System Tools		Status:	Not com	nnected to DC.		
• Reboot System			Virhub	not connected.		
		Network:	HSPA	Signal:	Tatl	

Figure Appendix 1-4: 3G router's network connection status

ER-800 wireless router has functions such as port forwarding, DMZ host, and DHCP service, so customers can define data forwarding rules on ER-800 as on a generic router.



Appendix 2: eYun Virhub Testing

Case

1. Apply eYun account

Access website <u>http://3g.etungtech.com</u>, apply a Virhub eYun account, and then contact technical support to open this account.

27777777777777777777777		C remption C removed
e-Cloud ung M2M Manangement System	and the second	
1. Martines		
m		
CUSTOMER LOSTN		
		400 ·
Name		
Name:	Equat2	
Name - Password	Forget?	900-
Name : Password : Verification 2	Forget?	
Name: Password: Verification:	Forget2	
Name : Password : Verification :	Forget?	Download:
Name Password Verification 2	Change	Download: vircon.v4.2
Name Password Verification	Change	Download: vinom v4.2 vinhub v1.7

Figure Appendix 2-1: Apply eYun account

2. Configure Virhub parameters

Refer chapter 2 Configuration, enter Virhub configuration menu, and select Virhub; input the username applied above, and click "Save", then reboot the router.

This Page: Enable or disable virb	ub function.
VIRTUAL HUB:	OFF -
Main DC IP(Or Dnsname):	OFF -
Main DC Port:	OFF -
Transfer Protocol:	8080 (1~65535)
Account:	UDP -
Remote Access IP:	gengfang
Remote Access Mask:	192.168.168.1
Note :	255.255.255.0

Figure Appendix 2-2: Enable Virhub function

3. Install Virhub software

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Ask wireless Virhub v5.x installation package from eTung, install it according to Virhub's installation guide.

4. Login in Virhub and start data transfer

1) Run Virhub and click "Settings", input the username and password applied before.

Set	ttings	×	
	mServer List:	3g.etungtech.com ▼	
	mServer Addr:	3g. etungtech. com	
	mServer Port:	8081 <u>Register</u>	
	🔽 Need Author:	ization	
	Account:	gengfang	
	Password:	****	
'	Loopback Adapte	er IP Settings	
	IP1 192.168	. 1 .200 Mask1 255 .255 . 0	
	IP2 192.168	.168.200 Mask2 255.255.255.0	
	IP3 .	Mask3	
		OK Cancel	

Figure Appendix 2-3: Login Virhub



2) Configure Microsoft Loopback adapter's IP address: in the "Settings" dialog, we can set Loopback adapter's IP address in "Loopback Adapter IP Settings". IP1 is used to build a virtual LAN with the front-end device (i.e. the Webcam), and it has to be in the same IP range as the front-end device's IP, for example, 192.168.1.*.

Settings	X
mServer List:	3g.etungtech.com ▼
mServer Addr:	3g.etungtech.com
mServer Port:	8081 <u>Register</u>
🔽 Need Author	rization
Account:	gengfang
Password:	*****
Loopback Adapt	er IP Settings
IP1 192.168	3.1.200 Mask1 255.255.255.0
IP2 192.168	3.168.200 Mask2 255.255.0
IP3 .	Mask3
	OK Cancel

Figure Appendix 2-4: Configure Loopback adapter's IP address

 $\ensuremath{\mathsf{Press}}$ "OK" after configuration, the software will set the IP address to the Loopback adapter.

3) Find the device to be tested based on IMEI, click "Add" to add user PC to the virtual LAN of "Customer Device - ER-800 - User PC", then the user PC can communicate directly with the customer device.

刭 Virhub							
<u>C</u> ontrol <u>H</u> elp							
Add Mapping	Del Mapping Co	nfigure	Refresh E	D xit			
Name	IMEI	Status	Logon Time	Sent	Received	Mapped To	Traced
DTU3023327	240305003023327	Online	2014/10/08 15:17:18	0	0	*	
DTU3023328	240305003023328	Online	2014/10/08 15:23:35	0	0		

Figure Appendix 2-5: Add Virhub PC to virtual LAN

5. Access the wireless router remotely via Virhub

ER-800 V1.0.6 or higher version has functionality of accessing the wireless router remotely via Virhub. Normally, the router dials up into the wireless network and gets an inner IP address, and it cannot be accessed from the internet via this inner IP. eTung's Virhub solution can solve the problem. First, enable Virhub function on the router, and set a remote access IP; the



remote access IP is dedicated to access the router remotely when Virhub is enabled on the router. Then run Virhub software on the far-end PC, and configure an IP address on the Loopback adapter; this IP must be in the same range as the remote access IP on the router. This way, we can access the router remotely on the far-end PC via the remote access IP, to perform configuration, system monitoring, etc. Below are the details about the configuration procedure.

1) Configure the router's remote access IP

According to "2. Configure Virhub Parameters", go to the router's Virhub configuration, enable Virhub and configure username, then there are two parameters: "Remote Access IP" and "Remote Access Mask", with default values: 192.168.168.1 and 255.255.255.0.

OFF - OFF - 8080 (1~85535)
0N OFF 8080 (1~65535)
8080 (1~65535)
UDP 👻
gengfang
192. 168. 168. 1
255. 255. 255. 0

Figure Appendix 2-6: Configure the router's remote access IP

Normally set the two parameters with default values, and they can also be changed on demand. Press "Save" after configuration, then reboot the router. These two parameters can also be changed/checked via remote AT commands, please refer "2.5 Remote Configurations".

 Configure the Loopback adapter's IP address to access the router remotely

Run Virhub software, click button "Configure", and on the popped up "Settings" dialog, set the Loopback adapter's IP address in "Loopback Adapter IP Settings" part. IP2 is the IP address set on the Loopback adapter to access the router remotely via Virhub, and this IP must be in the same range as the "Remote Access IP" (192.168.168.1 by default) set on the router in step 1), for example, 192.168.168.*.

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	Settings	×
	mServer List: 3g.etungtech.com 💌	
	mServer Addr: 3g. etungtech. com	
	mServer Port: 8081 <u>Register</u>	
	🔽 Need Authorization	
	Account: gengfang	
	Password: ******	
	Loopback Adapter IP Settings	
	IP1 192.168.1 .200 Maski 255.255	5.255.0
	IP2 192.168.168.200 Mask2 255.255	5.255.0
	IP3 Mask3	
	OK Cancel]

Figure Appendix 2-7: Configure the Loopback adapter's IP address to access the router remotely

Click "OK" after configuration is complete, the software will then set the IP address on the Loopback adapter.

3) Access the router remotely

.

Open browser, and input the router's remote access IP (192.168.168.1 by default), and then the router's web configuration page shows.

÷	e http://192.168.168.1	×5⊠ + Q €	<i>i</i> ER- 800 ×
File	Edit View Favorites Tools	Help	2

ER-80	0 eTung.
用户名 (username):	root
用户密码 (passwd):	••••
语言 (language):	ENGLISH 💌
Ī	登陆(login)

Figure Appendix 2-8: Access the router's Web configuration page remotely

Then we can login the web page to change the router's parameters remotely, just as the router is directly connected locally.



Appendix 3: APN Network Testing

Case

APN is the abbreviation of Access Point Name. It is used in operators' core network to identify the external data network, for example, enterprise intranet, Internet, WAP website and enterprise' internal networks. Using the APN SIM card, the terminal dials up into a dedicated network predefined from the operator side, and normally gets an internal IP address to access the network, this IP address cannot be accessed from the internet. But the terminals that dial into the same dedicated network can access each other. So we can easily implement the interconnection between wireless terminals with operator's APN networks, it's very convenient and can greatly reduce network access cost. There are two kinds of solutions to use APN networks, and below are details for each of them.

Solution 1: Embedded Data Center with APN Network

eTung's wireless routers support APN SIM card, and has embedded data center function. For those small-scale projects with few terminals, use one router as the data center, and dial into APN network; at the same time, all other terminals that connect to devices at the far end dial into the same APN network, then from the router's data center we can access the terminals at the far end, thus implement remote control of devices at the far end. This solution is cost-efficient, and can be easily deployed; it's flexible and convenient, and can be used especially in small-scale (No. of terminals <=100) device control projects.



Figure Appendix 3-1: Embedded data center and APN network solution Below we will illustrate how to deploy this solution, and use MD-609G as an



example for terminals at the far end.

First of all, please order APN SIM cards from operator, and parameters include APN name, PPP username and password, and for the SIM card used by the router there should be a static IP address assigned as well.

 Configure APN parameters in the router According to the description of "2.1 Configurations", login in the configuration web page, Choose "Wireless Net"->"Simple Cfg", and then select "Manual Set" for APN Mode, configure APN name, and PPP username and password if required. click "Save" and then reboot the router to apply the change.

APN Mode	Manual Set 👻
APN:	3gnet
Service Code:	*99#
Select Network Manually:	
PPP User Name:	ctnet@mycdma.cn
PPP User Password:	•••••
ICMP Host:	
Net Standard:	Auto Switch 👻
Dial Mode:	Start_up 🔻
<pre>Idle Time/Duration(m):</pre>	5
Wake Number:	
Wake Passwd:	1234
Note : Generally do not ha	we to set up, use the default

Figure Appendix 3-2: Configure APN parameters in the router

 Configure Embedded Data Center in the router Login the router's configuration web page, choose "DTU Function"->"Embedded DC", enable embedded DC, set transport protocol as TCP, center port as 9000, and set the maximum number of terminals as required, at most 100, and then click "Save" and reboot the router.

Embedded DC	
Change to the embedded DC acco	ording to the configuration.
Embedded DC:	ON V
Center Transfer Protocol:	TCP V
Center Port:	9000 (1~65535)
Max Client Number:	10 (1~100)
Note :	
Save	

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Figure Appendix 3-3: Configure embedded DC in the router

After the router reboots and dials up into the APN network, in configuration web page "Status", we can check the IP address assigned by APN network.

Status:	
IMEI:	240305003030560
Version:	ER-800U-1.2.2-01/05/16
Now:	2016/01/06 11:43:50
Manufacture	r:Huawei Technologies Co., Ltd.
Model:	MU609
Status:	Module detected, SIM card detected
Connection	Connected to wirelessnet, IP:10.8.224.81
Status:	No device connect to DCEMBD.
Network:	HSPA Signal:

Figure Appendix 3-4: Check the IP address acquired from APN network

3. Configure data center address and APN parameters in DTU Run wireless configuration software dtucfg.exe, power on DTU according to the prompt and then enter the configuration menu. For the 1st item: mServer DN/IP Addr, set as the static IP address acquired by the router from APN network, for example, 10.8.224.81; for the 2nd item: mServer Port, set as 9000; for the 4th item: APN, set as the APN name; for the 5th item: Protocol, set as TCP that is the same as the transport protocol configured in the embedded data center; then press Enter until Dial Account and Password, set as PPP username and password of the APN SIM card as required.



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Figure Appendix 3-5: Configure DC address and APN parameters in DTU

After that press Enter until the serial port parameters: baud rate, data bits, parity, stop bits and flow control, the values for these parameters must be the same as those set in the serial device that DTU connects to; and if they are not the same, we can modify the values here in DTU to make sure they are the same.







Figure Appendix 3-6: Configure DTU serial port parameters

After configuration is finished, reboot DTU to dial up into APN network, it will then automatically connect to the router's embedded data center; in the router's status page, we can see that one device has connected the embedded data center.

Status:	
IMEI:	240305003030560
Version:	ER-800U-1.2.2-01/05/16
Now:	2016/01/06 13:33:34
Manufacture	::Huawei Technologies Co., Ltd.
Model:	MU609
Status:	Module detected, SIM card detected
Connection Status:	Connected to wirelessnet, IP:10.8.224.81 No.device connect to DCEMED:1
Network:	HSPA Signal:

Figure Appendix 3-7: Status shows DTU has connected to embedded DC

4. Device at the front end receives/sends data via serial port



After configuring router and DTU at the far end, both dial up into the APN network, and DTU connects to the embedded data center running in the router; then we can receive data from the serial device at the far end via the router's user serial port, and at the same time device at the front end can send data to the device at the far end via the router's user serial port. Pay attention, the front-end device broadcast data to all the far-end devices, so there should be identity in the data packets sent/received between front-end and far-end devices to distinguish from/to whom the packets are received/sent.

Solution 2: mServer Connects the Router and with APN Network

For large-scale projects with lots of terminals, this solution: mServer connects the router and with APN network can be used. As shown in the figure below, eTung's wireless router dials into operator's APN network, and the data center at the back end connects to the router with Ethernet cable; at the same time configure DMZ host on the router, then terminals at the far end dial into the same APN network and can connect to the data center at the back end. Compared to solution 1, this solution can also be easily deployed and cost-efficient; at the same time since the data center is running in a dedicated server, compared to embedded data center solution, it allows more terminals to connect to the data center, and there can be more flexible configurations, for example, map a virtual serial port for each terminal, make point-to-point mapping between two terminals, etc.



Figure Appendix 3-8: mServer connects to the router and with APN network

Below we will illustrate how to deploy this solution, and use MD-609G as an example for terminals at the far end.

First of all, please order APN SIM cards from operator, and parameters include APN name, PPP username and password, and for the SIM card used by the router there should be a static IP address assigned as well.

 Install and run mServer in the data center server Ask eTung for mServer installer, and install mServer according the user manual. Make sure the firewall software allows accessing mServer from outside.



After mServer is installed, double-click mServer's icon on the desktop to run mServer console, choose "System Settings", in tab "Service Settings", choose TCP for link mode, and set listen port as 9000.

System Settings
-Service Settings
Link Mode: C UDP • TCP C ETCP
Listen Port: 9000
Interface Settings Allow DCC Connection Link Mode: TCP
MaxLink: 100 (0-1000)
Local Port: 9001
Need Authentication
admin Passwd:
Passwd again:
Automatically start mServer when PC boots
OK Cancel

Figure Appendix 3-9: Configure mServer

- 2. Configure APN parameters in the router As step 1 in solution one shows, configure APN parameters in the router's configuration web page.
- 3. Configure DMZ host in the router First, connect data center server to the router with Ethernet cable. Then, set static IP address in the data center server, and the IP address must be in the same IP range as the IP address of the router's Ethernet interface, for example, 192.168.1.*. The figure below shows the server's static IP address is set to 192,168.1.100, and gateway and DNS are set to 192.168.1.1.

ieneral Advanced			
Connect using:			
Net Device PV	Driver		Configure
This connection uses	the following items:		
Client for Mic Ident for Mic	rosoft Networks d Balancing er Sharing for Micros bcol (TCP/IP)	oft Network	ks
, I <u>n</u> stall	<u>U</u> ninstall	F	operties
Description			
Transmission Contro wide area network across diverse inter	ol Protocol/Internet F protocol that provide connected networks	^p rotocol. Tł is communi s.	ne default cation
		OK	Cancel
		ОК	Cancel
rnet Protocol (TCP/I	P) Properties	ОК	Cancel
ernet Protocol (TCP/I	P) Properties	OK	Cancel
ernet Protocol (TCP/I eneral) /ou can get IP settings a his capability. Otherwise for the appropriate IP se © Obtain an IP addre	P) Properties issigned automatically a, you need to ask you ttings. ss automatically	OK if your netw ir network a	Cancel ? vork supports dministrator
ernet Protocol (TCP/I eneral /ou can get IP settings a this capability. Otherwise for the appropriate IP se © Obtain an IP addre —© Use the following IP	P) Properties assigned automatically a, you need to ask you ttings. ss automatically ² address:	OK if your netw ır network a	Cancel ? vork supports dministrator
ernet Protocol (TCP/I eneral /ou can get IP settings a this capability. Otherwise for the appropriate IP se © Obtain an IP addre © Use the following IF IP address:	P) Properties assigned automatically e, you need to ask you ttings. ss automatically P address: 192 .	OK if your netw ir network a	Cancel ? vork supports dministrator
ernet Protocol (TCP/I eneral /ou can get IP settings a this capability. Otherwise for the appropriate IP se © Obtain an IP addre —© Use the following IP IP address: Subnet mask:	P) Properties assigned automatically a, you need to ask you ttings. ss automatically address: 192 . 255 .	OK if your netw r network a 168 , 1 255 , 255	Cancel Concel Co
ernet Protocol (TCP/I eneral /ou can get IP settings a this capability. Otherwise for the appropriate IP se © Obtain an IP addre © Obtain an IP addre © Use the following IF IP address: Subnet mask: Default gateway:	P) Properties assigned automatically a, you need to ask you ttings. ss automatically address: 192 . 255 . 192 .	OK if your netw r network a 168 . 1 255 . 255 168 . 1	Cancel ? vork supports dministrator
ernet Protocol (TCP/I eneral /ou can get IP settings a his capability. Otherwise for the appropriate IP se © Obtain an IP addre —• Uge the following If IP address: Subnet mask: Default gateway: © Obtain DN5 server	P) Properties assigned automatically a, you need to ask you ttings. ss automatically address: [192]. [255]. [192]. [192].	OK if your netw ir network a 168 - 1 255 - 255 168 - 1	Cancel Concel ? vork supports dministrator . 100 . 0 . 1
ernet Protocol (TCP/I eneral) /ou can get IP settings a this capability. Otherwise for the appropriate IP se C Obtain an IP addre - O Use the following IF IP address: Subnet mask: Default gateway: C Obtain DNS server - Obtain DNS server	P) Properties assigned automatically a, you need to ask you ttings. ss automatically address: 192 . 255 . 192 . address automatically NS server addresses:	OK if your netw r network a 168 . 1 255 . 255 168 . 1	Cancel Pork supports dministrator 100 1
ernet Protocol (TCP/I eneral) /ou can get IP settings a his capability. Otherwise for the appropriate IP se © Obtain an IP addre —• Use the following IF IP address: Subnet mask: Default gateway: © Obtain DNS server —• Use the following D Preferred DNS server:	P) Properties assigned automatically a, you need to ask you ttings. ss automatically address: 192 . 255 . 192 . address automatically NS server addresses: 192 .	OK if your netw r network a 168 . 1 255 . 255 168 . 1	Cancel Concel ? vork supports dministrator . 100 . 1
ernet Protocol (TCP/I eneral /ou can get IP settings a this capability. Otherwise for the appropriate IP se C Obtain an IP addre - Use the following IP IP address: Subnet mask: Default gateway: C Obtain DN5 server - Use the following D Preferred DN5 server: Alternate DN5 server:	P) Properties assigned automatically b, you need to ask you ttings. ss automatically address: address automatically NS server addresses: 192	OK if your netw r network a 168 . 1 168 . 1	Cancel Concel Concel

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Figure Appendix 3-10: Set static IP address

OK

Cancel

Login the router's web configuration page, choose "NAT Rule"->"DMZ Host", then configure DMZ Host IP as the static IP address of the data center server, for example, 192.168.1.100 as configured above.

eTu	们 。 驿唐科技	ER-800 User Manual
	DMZ Host	
	This Page:	
	DMZ Host IP:	192.168.1.100
	Note :	
	Save Revert	

Figure Appendix 3-11: Configure DMZ host

Click "Save", and then reboot the router. Then data packets received by the router from the outside network will be forwarded to the data center server.

4. Configure data center address and APN parameters in DTU Configure data center address and APN parameters as shown in step 3 of solution one. Set data center IP address to the IP address acquired by the router after dialing into the network, and data center port as mServer's listening port, i.e. 9000 as shown in figure appendix 5-9.

After configuration is complete, reboot DTU, it will dial into APN network, and then connect to mServer; in mServer's console we can see that this terminal is already online.

\$	mServer C	Console							X
(Control(<u>C</u>)	mDevice	Management	(<u>M</u>) Set	tings(<u>S</u>) Test	t(<u>T</u>) Log Manag	gement(<u>L</u>) He	р(<u>Н</u>)	
	Start Service	ce Sto	Service	Add m	Device Dele	te mDevice Mo	odifv mDevice	Service Set	tinas
L	IMEI		Alias Name	Status	Account	Logon Time	Logof	f Time	Sent
	2403050030	024230	DTU3024230	Online		2015/02/11 11	:51:52		0
L									
L									
	•		111						•
		ear Log	Save Log Ch	neck Log	mDevice	Number: 1	OnLine Nu	umber: 1	
	Steel of the o	0 11 11.1	- 0-						A
	<u>~</u> 2015-0	2-11 11:	03:31 mSe	rver Me:	ssage mDevice	e Service start	tea, mode: ICP	, port: 900	
L	E 2015-0	2-11 11:	53:31 mSe	rver Me	ssage DCC int	erface is enab	oled, mode: TC	P, port: 90)(≡
	.× ▲								-
	▼								
L									

Figure Appendix 3-12: DTU is online in mServer's console



ER-800 User Manual

After DTU connects to the data center, the application software at the front end will then be able to communicate with the devices at the far end via virtual serial port (or other ways).



Appendix 4: Use ER-800 to Access

LAN Remotely via VPN

ER-800 can be used to extend and access the corporate virtual LAN remotely with VPN function, for example, the user can use ER-800 to dial into corporate LAN. But the router in user's corporate LAN should support VPN in this way. We will illustrate below how to implement this kind of network connection with VPN.

1. System Architecture



Figure Appendix 4-1: Use ER-800 to access LAN remotely via VPN

2. Preparations

- 1) One router with VPN function(use PPTP protocol as an example), a LAN is attached to this router and can access internet;
- 2) One ER-800(including accessories)
- 3) One USIM card with internet service (for example China Unicom wo)
- 4) One PC

3. Steps

1) Configure to use PPTP when accessing the router

Here we use router RV042 from Linksys as an example. First, this router supports VPN and PPTP protocol. Login this Linksys router. and click "VPN"->"PPTP", enable PPTP server and set the IP range for VPN connection, then create username and password used for VPN connection, as shown in the figure below:

System Summary	Setup	DHCP	System Management	Po Manag	ert Fir	rewall V	PN Log) Wizard
Summary	Gateway t	o Gateway	Client to Ga	teway	VPN Client Ax	ocess	VPN Pass Th	rough
			🗹 Ena	ble PPTP S	erver	Enable	PPTP Serv	er
			Range Start : Range End :	192.168 192.168	0.206	Set up 1	the IP rang	e of VPN
		Us	ser Name : etung	-bi1				
	Con	llew P firm llew P	assword : •••• assword : ••••	late this user			Set up the and pass the VPN o	e user name word for connection
		etung-bj1						

Figure Appendix 4-2: Configure router's VPN function

Actually different routers have different configuration interface and options, we can configure it accordingly.

2) Configure ER-800 Login ER-800's configuration interface, click "VPN function" and configure it as shown in the figure below:

eTung. 3g Rou	ER [⊕ 文 [English.] Warning: Setting effect after reboot!
 Status Wireless Net LAN HIFI MAT Rule Router CONS VPN PPTPALOTP CAE Set DTU Function Virhub System Tools Reboot System 	PPTPALZPP This Page: VPM settings VPM Connected Status: VPM: VPM:
	[For more information please visit: Etung Technology]

Figure Appendix 4-3: Configure account for VPN function



Type -- PPTP or L2TP

VPN server IP or domain -- the IP address on corporate LAN side, if the IP address is not static, we recommend to apply a domain free of charge from Oray or Gnway, then input the domain here, ER-800 supports domain resolving.

Username -- the username configured in the router at corporate LAN side, i.e. the username configured in Linksys router before;

Password -- the password configured in the router at corporate LAN side, i.e. the password configured in Linksys router before;

VPN function -- ON, to enable VPN connection.

After all settings are complete, reboot ER-800.

3) Check dialing status

Login ER-800 to check dialing status, as shown in the figure below:

• Status	PPTP&L2TP		
+ Wireless Net	This Page		
• LAN	This Lage.		
• WIFI	VPN Connected Status:	<u> </u>	IP: 192.168.0.207
• NAT Rule	VPN:	ON -	
• Router	TYPE:	PPTP -	
DDNS	VPN Server Address:	etung, gnway, net	
- VPN	Account:	etung-bji	
- DDTD41 OTD	Password:		
• FFIF@L2IF	SetIP:		
• GRE Set	DistanceIP:		
+ DTU Function	DistanceIPMask:		
• Virhub	Channel Password:		
+ System Tools	Enable MPPE:	OFF -	
• Reboot System	User=defined Action:	*	
		-	
	Save Revert		

Figure Appendix 4-4: ER-800 status of accessing LAN

At this time, ER-800 is connected to the corporate LAN, and visiting <u>http://192.168.0.207</u> inside the corporate LAN can see ER-800's web login interface, and at the same time ER-800 can access resources inside the corporate LAN.

If we connect a video server to ER-800, and configure port forwarding or DMZ host on ER-800, we can then access <u>http://192.168.0.207</u> inside the



corporate LAN and then access the video monitoring interface.

Notes:

- 1) The IP address used by PC or video server that is connected to ER-800 must not be in the same range as those IP addresses at the corporate LAN side. For example, if the IP range at the corporate LAN side is 192.168.0.*, then ER-800 should be in other IP range, for example 192.168.1.*.
- 2) ER-800 and the PC or video server that connects to it should be in the same IP range. ER-800's default gateway is 192.168.1.1, and if the IP range of the PC or video server that connects to ER-800 need to be 192.168.0.*, then change ER-800's gateway to the same range, for example 192.168.0.1.



Appendix 5: Send/Receive SMS

with the Router and SMS Format

ER-800 supports sending/receiving SMSs via Ethernet interface. The method is described below:

First, establish a TCP connection with the router's Ethernet IP (192.168.1.1 by default) and port: 8888; then use command AT+SMS or AT+SMSA to send SMSs. For example, use TCP Test Tool to send SMS as shown below:

ile Edit Clear Help Router's listening	
Ulent port Server	2250 Listenin - en
192.168.1.1	Listening on 127.0.0.1/12345
Elaps Time Router's IP address O0:01:05 Reset Connected Connected	Set Listening Port 12345 Bind
Edit/Send Data	
AT+SMS=13812345678,1,4,31323334	*
SMS, ending with CR	
· · · · · · · · · · · · · · · · · · ·	+
ASCII C Hex □ Line Feed □ Carriage Return Auto Send Auto Send	🗖 Line Feed 🗖 Carriage Return
Send every 1 sec. Clear Send	sec. Clear Send
Edit/Data Log	
	-
Display data as: ASCII C Binary C Decimal C Hex Display data as: AS	CIIO Binary O Decimal O Hex
HEX Data Log	
→ {192.168.1.1} 41 54 2B 53 4D 53 3D 31 33 39 31 31 36 35	
<- {192.168.1.1/8888} 4F 4B 0D 0A	
Display Date Clear Log Time Date Date	Sound Enabled Clear Log
Bytes Sent: 33 Bytes Received: 4 2014/9/4 9:49:56 Bytes	s Sent: 0 Bytes Received: 0

Figure Appendix 5-1: Send SMS via router's Ethernet interface

1) In the left part "Client", input router's Ethernet IP address "192.168.1.1" in "IP Address/Name", and router's listening port "8888" in "Port", then click



"Connect" to establish TCP connection with the router; if "Connected" is shown Connection Status, that means TCP Test Tool has connected to the router's listening port.

2) Input AT+SMS or AT+SMSA command in box "Edit/Send Data", and pay attention to end with CR, then click "send"; if "OK" is shown in box "Edit/Data Log", that means the command has been sent successfully.

NOTE:

- 1) Currently only ER-800 v1.0.3 or higher version supports sending/receiving SMSs via Ethernet interface.
- 2) Currently receiving long SMSs is supported, but sending long SMSs is not supported, i.e. the length of messages in English cannot exceed 160 characters, and the length of messages in Chinese cannot exceed 70 words.
- 3) AT commands must end with CR (0x0d), expressed below as "\r".
- 1. Using AT command to send short messages
 - 1) Special AT command for sending short messages with ASCII encoding via serial port:

AT+SMSA=<target number>,<data length>,<data>\r

DTU will send the following reply: \r\nOK\r\n Or: \r\nERROR\r\n Target Number: Phone number to receive the short message Data Length: The actual data length behind Data: The data to be sent, MUST with ASCII encoding.

Examples: Send "1234" with ASCII encoding to 13812345678: AT+SMSA=13812345678,4,1234\r

2) General AT command for sending short messages via serial port: AT+SMS=<target number>,<encoding format>,<data length>,<data>\r DTU will send the following reply: \r\nOK\r\n Or: \r\nERROR\r\n Target Number: Phone number to receive the short message Encoding Format: 1:ASCII encoding, 2:8bit encoding, 3:Unicode encoding Data Length: The actual data length behind Data: The data to be sent, each byte should be formatted to a 2-byte hexadecimal number, for instance "1234" should be written as"31323334".

Examples: Send "1234" with ASCII encoding to 13812345678: AT+SMS=13812345678,1,4,31323334\r



Use 8bit encoding to send "1234"to 13812345678: AT+SMS=13812345678,2,4,31323334\r Use Unicode encoding to send "你好" to 13812345678: AT+SMS=13812345678,3,4,4F60597D\r

2. The received SMS messages will be output via the serial port in the format below:

\r\n+SMS: <phone< th=""><th>number>,<encoding< th=""><th>format>,<data< th=""></data<></th></encoding<></th></phone<>	number>, <encoding< th=""><th>format>,<data< th=""></data<></th></encoding<>	format>, <data< th=""></data<>
length>, <data>\r\n</data>		

Examples:

"1234" received from 13812345678 in ASCII format: \r\n+SMS:13812345678,1,4,31323334\r\n "1234" received from 13812345678 in 8bit encoding: \r\n+SMS:13812345678,2,4,31323334\r\n "你好" received from 13812345678 in Unicode encoding: \r\n+SMS:13812345678,3,4,4F60597D\r\n

If the received SMS has more than one message, the format is as below: \r\n+SMSL: <identifier>, <total>, <sequence number>, <phone number>, <encoding format>, <data length>, <data>\r\n The messages with the same identifier can be assembled into one long SMS. For example, a long SMS is received from 10001, with identifier 05000376,

total 4 messages, and below is the fourth message: \r\n+SMSL:05000376,4,4,10001,3,6,007600793002



Appendix 6: AT Commands on the

Router's Ethernet Interface

eTung's wireless routers support AT commands directly coming from Ethernet interface, to query status, modify parameters, send/receive SMS, etc. The AT commands that a router supports can be different based on different models and different firmware versions. Below are the AT commands on the Ethernet interface that ER-800 V1.0.4 or higher versions support.

Attention: the AT commands MUST be in uppercase, and MUST end with CR(0x0d), as shown in "r" below.

For the following commands, please refer the descriptions of AT commands via SMS in "2.5 Remote Configurations"

- 1. AT+WN=apn,user,passwd,net_mode\r
- 2. $AT + DC = addr, port, user, mode \ r$
- 3. AT+PWD=passwd\r
- 4. AT+VIRHUB=0/1\r
- 5. AT+RESTORE\r
- 6. AT+REBOOT\r
- 7. AT+STATUS? \r
- 8. AT+WN? \r
- 9. AT+DC? \r
- 10. AT+INFO? \r
- 11. AT+VIRHUB? \r
- 12. AT+UPDATE=url\r
- 13. AT+UPDATEALL=url\r

Following are the AT commands used to send SMS, for details please refer "Appendix 5: Send/Receive SMS with the Router and SMS Format".

- 14. AT+SMS=<target number>,<encoding format>,<data length>,<data>\r
- 15. AT+SMSA=<target number>,<data length>,<data>\r

Following are the AT commands that can be used only on Ethernet interface, and currently cannot be used via SMS.

- 16. AT+UPTIME\r
- Get the system's running time, and the return value is in seconds.
- 17. AT+DISCCOUNT=YYYYMMDD\r



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Get the disconnection times in the specified date, the date format is YYYYMDD, and the reply is the times of disconnection during that day.

FCC Warning

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE 1: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- -Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- -Consult the dealer or an experienced radio/TV technician for help.

NOTE 2: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The transmitter must not be co-located or operated in conjunction with any other antenna or transmitter. This equipment complies with the FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and any part of your body.