BCM-E100 User's Manual

www.bluecomm.com.tw

■文件版本

日期	版本	作者
2013-11-25	V1.0	Jacky Lee

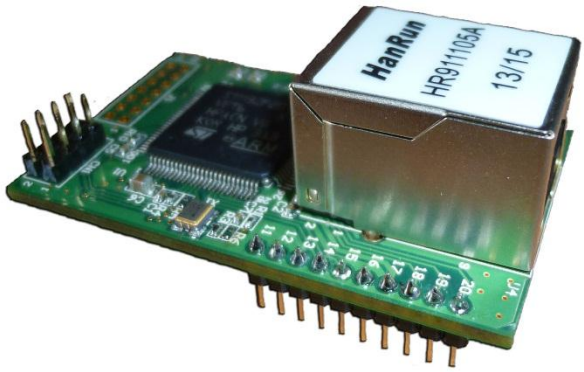
1. INTRODUCTION

1.1 DESCRIPTION

Blue-Comm 的 E100 嵌入式設備連網伺服器是特別為了串列設備能夠簡易的快速連上雲端而設計。

應用於實際產品時，可以選擇 AT Command Mode 或 MODBUS Gateway Mode,不管那種模式都只要簡易幾個步驟就可以輕易的讓原有的串列產品連上網路。藉助 Cortek-M3 系統晶片的強大運算力量，E100 支援 10/100Mbps 乙太網路、高達 230400 Kbps 的串列傳輸率、多樣化且立即可用的標準操作模式，並且只需要少量的電源。

利用 **Blue-Comm** 研究團隊創新技術，E100 可用於將任何具有標準串列介面的設備即時轉換為具備乙太網路功能。



* AT Command Mode Supported
* MODBUS Gateway Mode Supported

RoHS

1.2 FORM FACTOR

Type: Pin header module

Dimensions: 30 x 50 x 18 mm

Weight: 10 g

1.3 SYSTEM INFORMATION

CPU: 32-bit ARM Cortek-M3

RAM: 128 KB built in

Flash: 1 MB built in

MAC: built in

1.4 ETHERNET INTERFACE

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

Connector: RJ45

Magnetic Isolation Protection: 1.5 KV built-in

LED Link

1.5 SERIAL INTERFACE

Number of Ports: 1

Transmission Format: Standard TTL

1.6 SERIAL COMMUNICATION PARAMETERS

Data Bits: 8

Stop Bits: 1

Parity: None /Even /Odd

Flow Control: None

Baud rate: 2400 /4800 /9600 /19200 /38400 /57600/ 115200 /230400 Kbps

1.7 SERIAL SIGNALS

TTL: TXD, RXD, GND

TTL: RS485 direction control

1.8 DIGITAL I/O PINS

GPIO: 32 configurable I/O pins

UART *3 /SPI *1 /I2C *1 /ADC *5 /CAN *1 /GPIO

1.9 SOFTWARE

Network Protocols: ICMP, ARP, IP, TCP, UDP, DHCP, HTTP, SNMP V1, SMTP, TFTP

Configuration Options: Web Console, Device Search Windows AP

Work Mode: AT Command supported /MODBUS Gateway supported

Upgrade : Firmware /Web upgrade over Ethernet

Communication Protocol: EZ AT Command Set Supported

1.10 ENVIRONMENTAL LIMITS

Operating Temperature:

Standard Models: 0 to 55℃ (32 to 131℉)

Wide Temp. Models: -40 to 85℃ (-40 to 185℉)

Storage Temperature (package included): -40 to 60℃ (-40 to 140℉)

Ambient Relative Humidity: 5 to 95% (non-condensing)

1.11 POWER REQUIREMENTS

Input Voltage: 3.3 VDC (±5%)

Power Consumption: 50 mA @ 3.3 VDC input max.

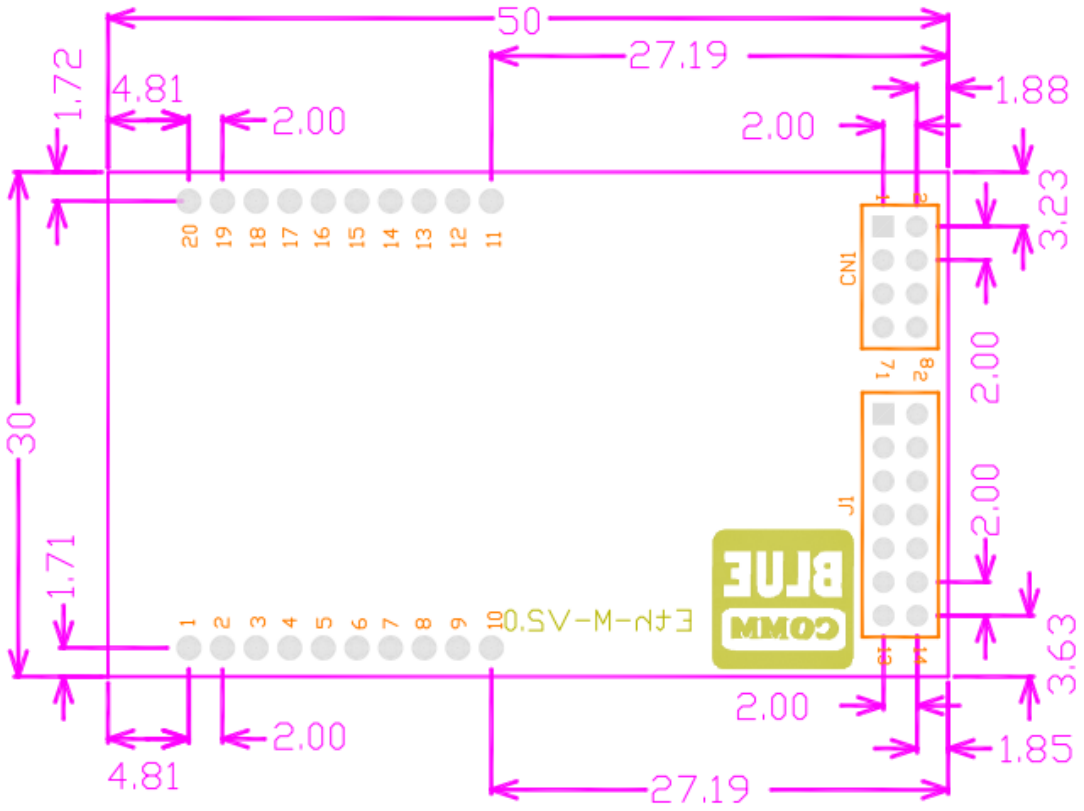
1.12 WARRANTY

Warranty Period: 1 years

Details: See www.blue-comm.com.tw

1.13 DIMENSION

Unit: mm



1.14 PIN ASSIGNMENT-1

Main Pins (20 Pins)		
Pin	Signal Name	Function
1	UART3-TX /PD8	Communication port TX
2	UART3-RX /PD9	Communication port RX
3	UART6-TX /PC6	System reserve
4	UART6-RX /PC7	System reserve
5	UART1-TX /PA9	UART /GPIO
6	UART1-RX /PA10	UART /GPIO
7	CAN1-RX /PA11	CAN /GPIO
8	CAN1-TX /PA12	CAN /GPIO
9	SPI3-MISO /PC11	SPI /GPIO
10	SPI3-MOSI /PC12	SPI /GPIO
11	SPI3-CLK /PC10	SPI /GPIO
12	I2C1-CLK /PB6	I2C/GPIO
13	I2C-SDA /PB7	I2C/GPIO
14	ADC12IN-12 /PC2	ADC /GPIO
15	ADC12IN-13 /PC3	ADC /GPIO
16	GND	GND

17	VCC	Power (+3.3Vdc)
18	ADC12IN-5 /PA5	ADC /GPIO
19	ADC12IN-6 /PA6	RS458 Direction
20	ADC12IN-8 /PB0	ADC /GPIO

1.15 PIN ASSIGNMENT-2

J1 Description (14 Pins)		
Pin	Signal Name	Function
1	PD6	GPIO
2	PD7	GPIO
3	PD4	GPIO
4	PD5	GPIO
5	PD2	GPIO
6	PD3	GPIO
7	PD0	GPIO
8	PD1	GPIO
9	PD14	GPIO
10	PD15	GPIO
11	PD12	GPIO

12	PD13	GPIO
13	PD10	GPIO
14	PD11	GPIO

1.16 PIN ASSIGNMENT-3

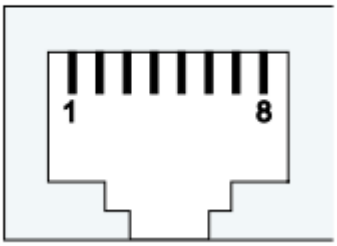
CN1 Description (8 Pins)		
Pin	Signal Name	Function
1	VCC	Power (+3.3Vdc)
2	GND	GND
3	TRST	JTAGE
4	TCK /SWCLK	JTAGE
5	TDI	JTAGE
6	TDO /SWO	JTAGE
7	TMS /SWDIO	JTAGE
8	#RESET	Reset

1.17 JP1 PIN ASSIGNMENT

System reset to default if JP1 short over 5 sec.

1.18 ETHERNET PORT PIN PIN ASSIGNMENT

RJ45

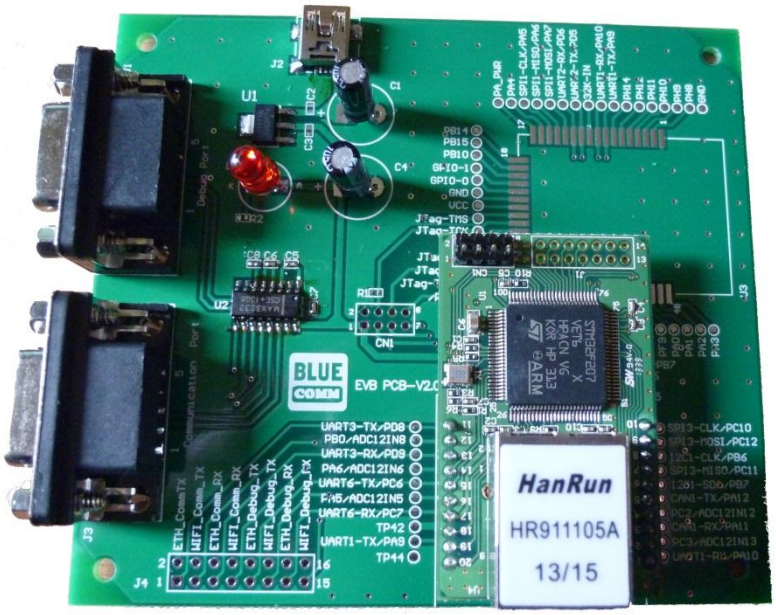


Pin	Signal
1	Tx+
2	Tx-
3	Rx+
6	Rx-

2. GETTING STARTED

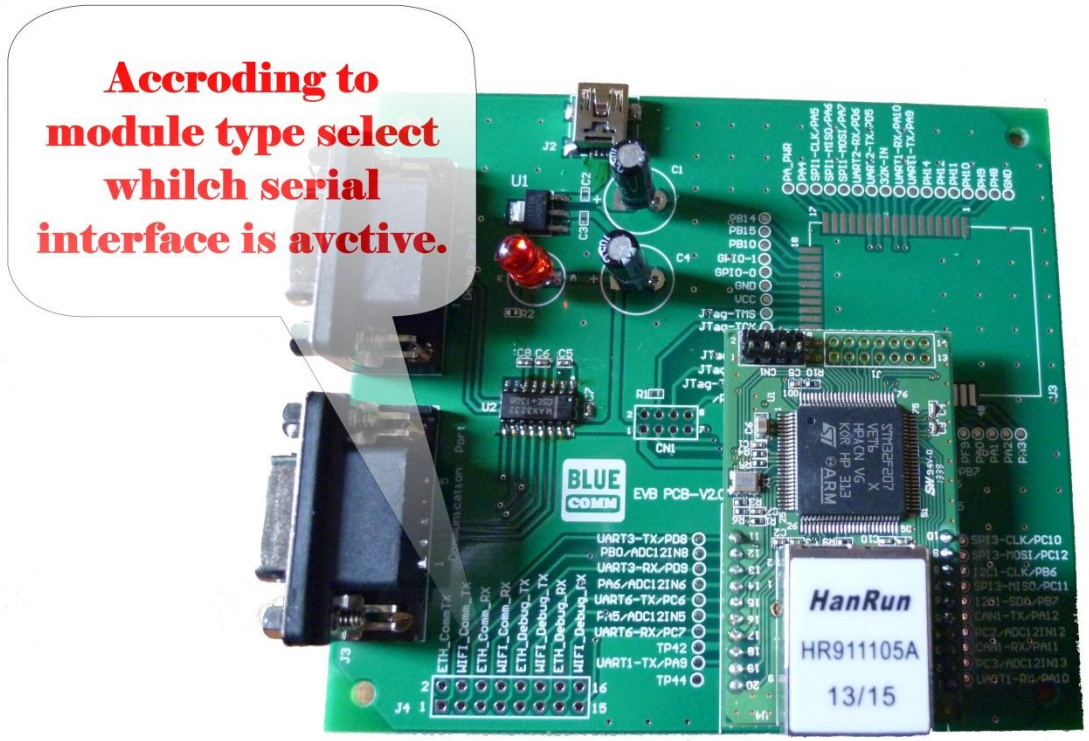
2.1 INSTALL THE E100 MODULE ONTO THE E100 EVALUATION BOARD

Before using the E100 evaluation board with the module, be sure to disconnect the power supply, network, and serial device. Please refer to the figure below. When attaching the module to the evaluation board, make sure the module is securely installed on the evaluation board. After the module is installed, connect the power supply, network, and serial device to the evaluation board.



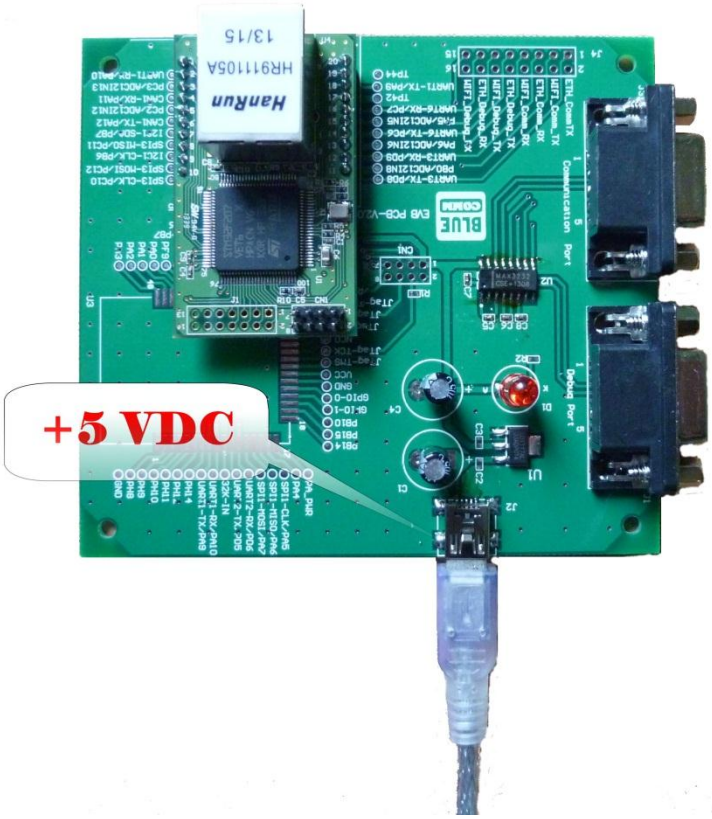
2.2 SELECTING THE SERIAL INTERFACE

The E100 module uses a standard TTL serial signal input. However, to make evaluation more convenient, the evaluation board has built-in two RS-232 interfaces. Use a 16-pin jumper to select which serial interface is active.



2.3 CONNECTING THE POWER

Connect the 5 VDC power line with the evaluation boards USB mini jack. If the power is properly supplied, the power LED on the evaluation board (D1) will show a red color until the system is ready.



2.4 CONNECTING TO THE NETWORK

To connect to the network for testing and development purposes, plug the Ethernet cable into the RJ45 jack on the evaluation board. If the cable is properly connected, the LED will indicate a valid connection to the Ethernet as follows:

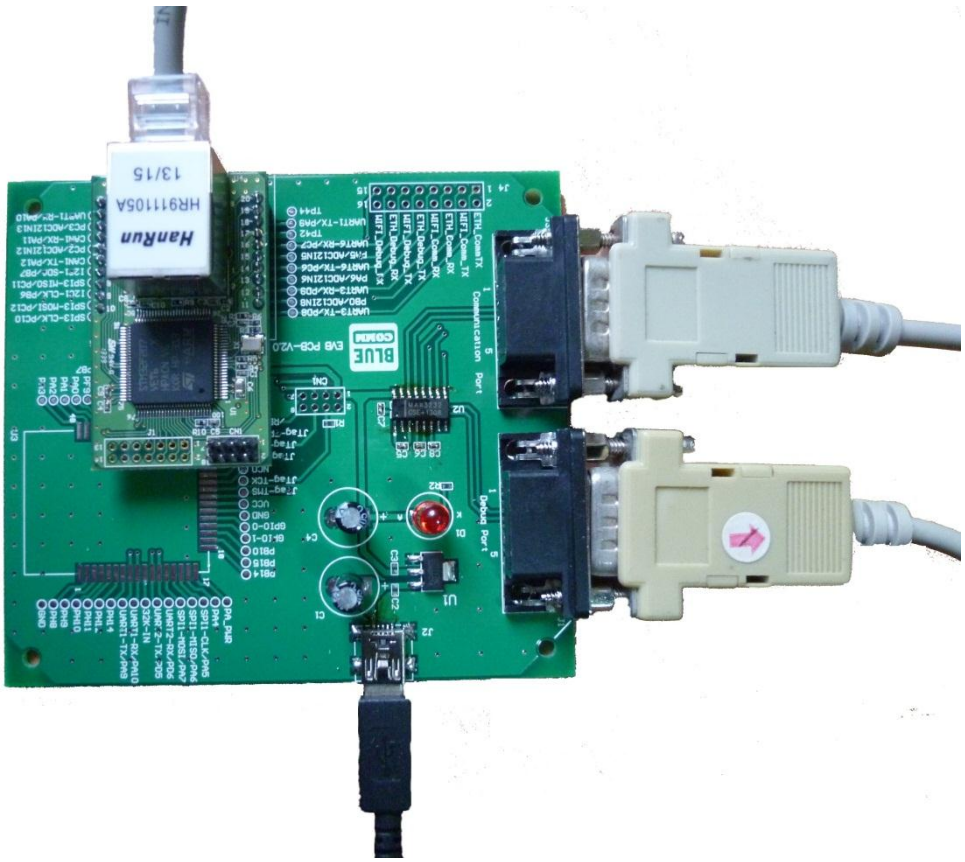
LED Color Meaning

Right Green Link Activity (does not blink when not transmitting; blinks when transmitting)

When using a private IP address (192.168.xxx.xxx), be sure the netmask and IP address are configured to allow hosts on the private network to access the module. Note that by default, the module is configured to use a private IP address.

2.5 CONNECTING TO A SERIAL DEVICE

To connect to a serial device for testing and development purposes, the module should be installed on the evaluation board. Be sure to select the serial interface you would like to use before you connect the evaluation board to the serial device. (Refer to the Selecting the Serial Interface section above when you are using jumper blocks to select the serial interface on the evaluation board.) The module's serial signals are routed to and from the RS-232 COM port on the evaluation board. Use a serial data cable to connect the serial device to the COM port on the evaluation board.



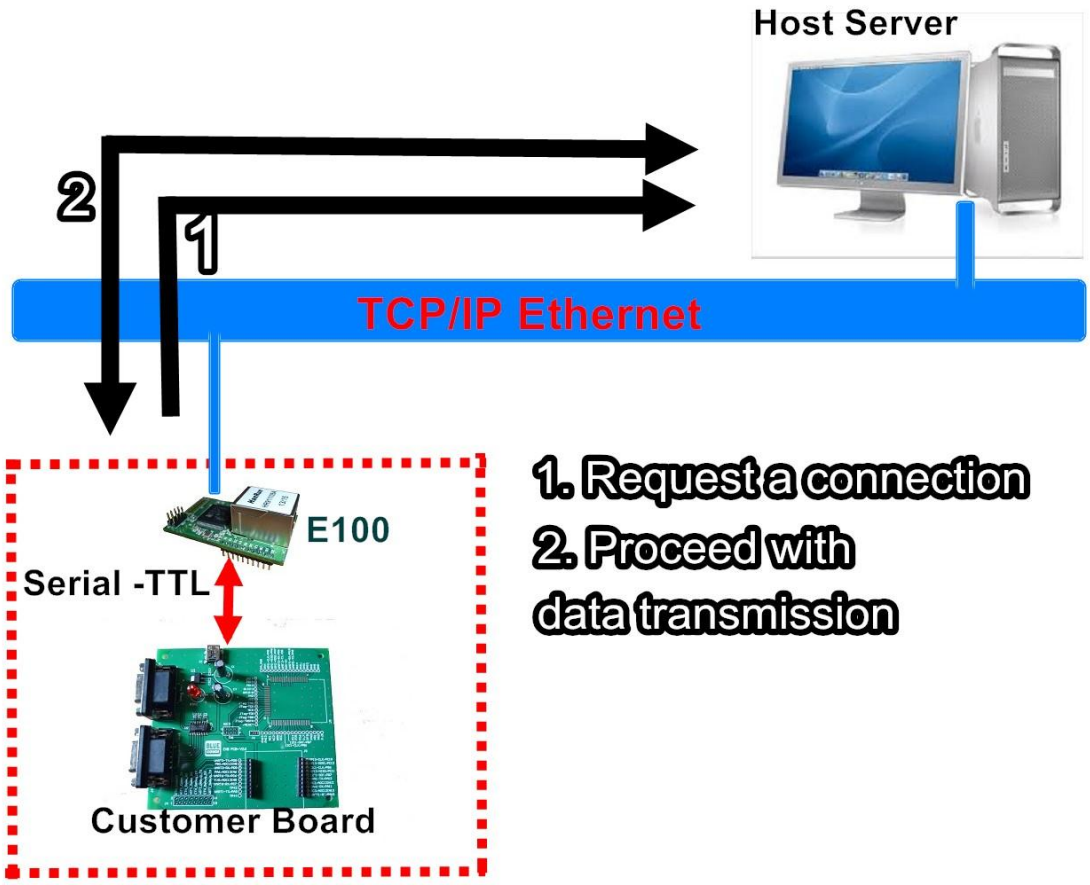
3. CHOOSING THE PROPER OPERATION MODE

The following topics are covered in this chapter:

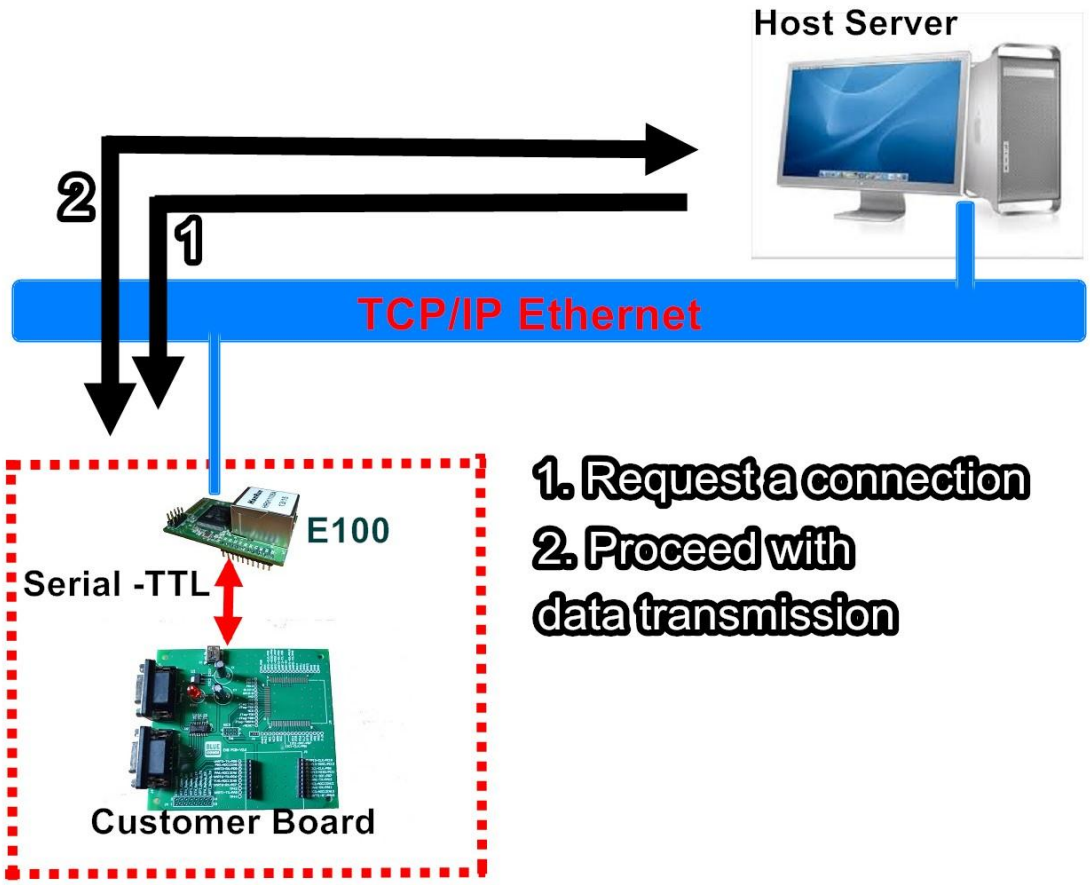
- TCP Client Mode
- MODBUS Gateway Mode

3.1 TCP CLIENT MODE

3.1.1 Using easy AT Command



3.2 MODBUS GATEWAY MODE



3.3 UDP MODE *OPTION

3.4 TCP SERVER MODE *OPTION

4. CHOOSING THE PROPER OPERATION MODE

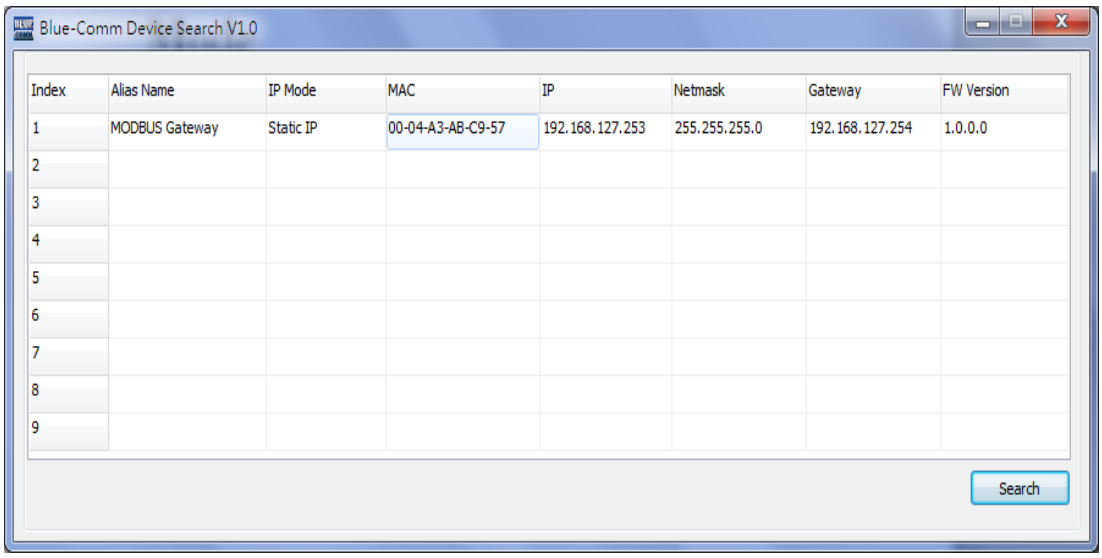
The E100 supports several tools for configuring the module. In this chapter we briefly describe the options available and appropriate situations for using those options.

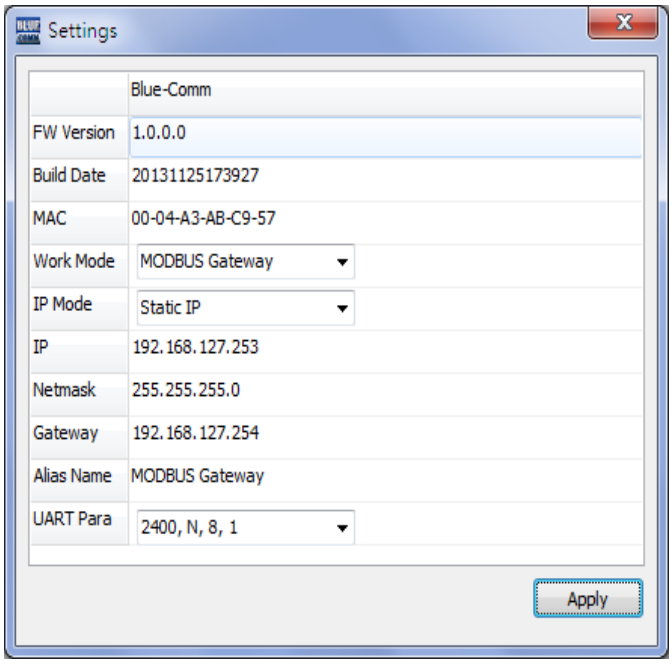
The following topics are covered in this chapter:

- Utility console
- Web console

4.1 UTILITY CONSOLE

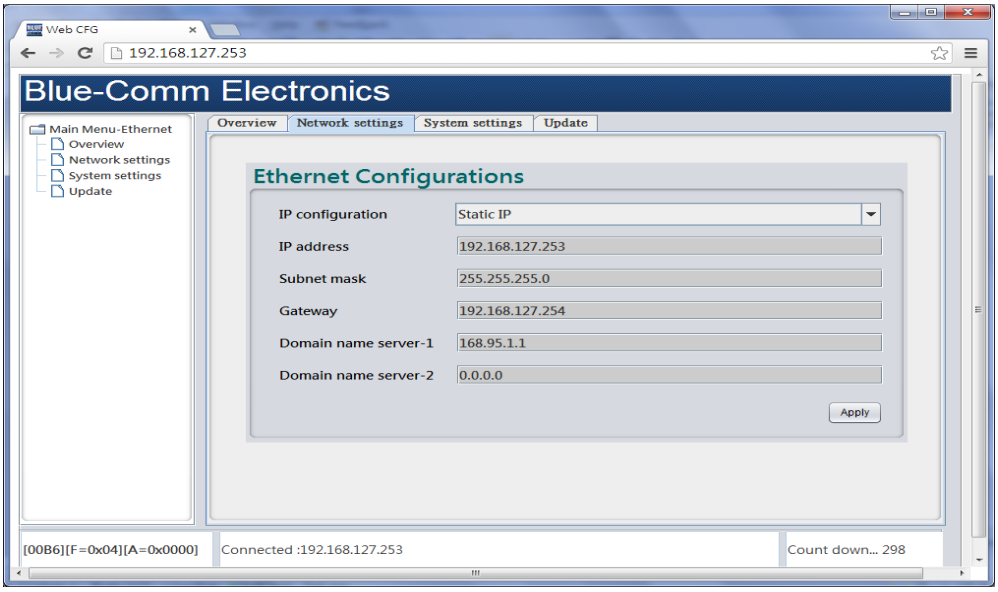
Device Search Utility is designed for Windows and is mainly used to search for the E100 modules and for assigning IP addresses.

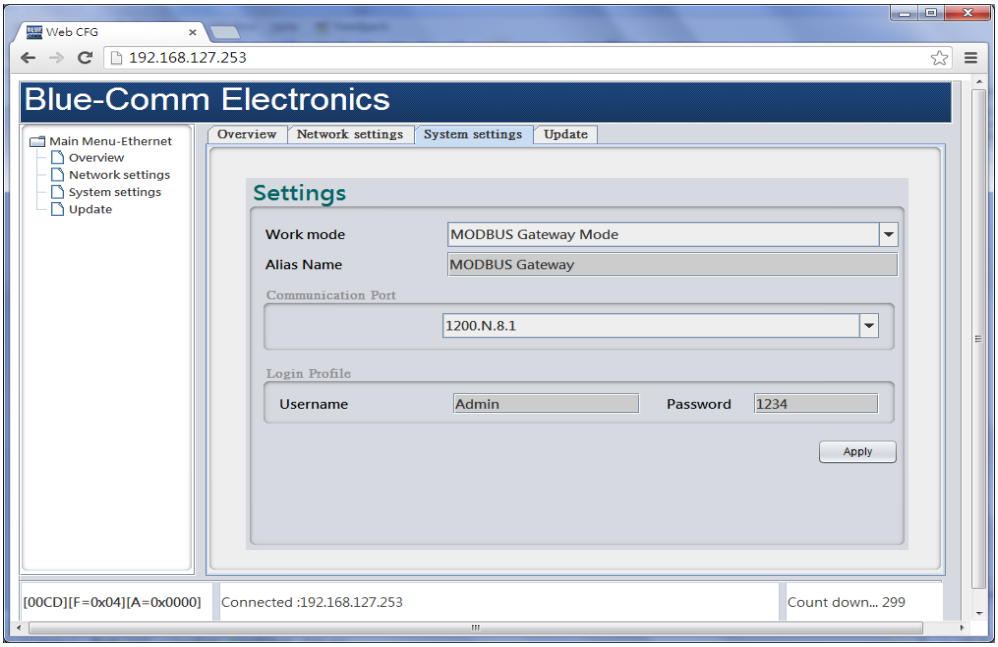




4.2 WEB CONSOLE

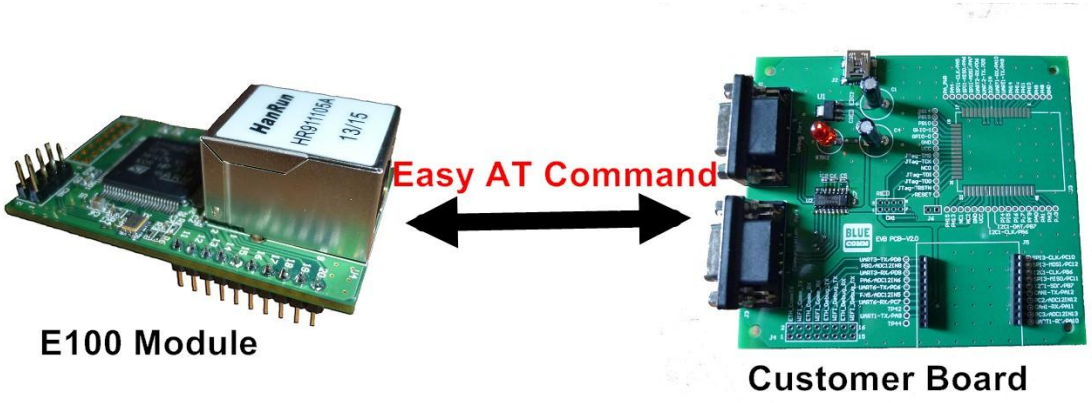
After locating a E100 with Device Search Utility, you may configure the E100 using a standard web browser.





5. AT COMMAND SET GUIDE

The E100 supports EZ-AT Command for configuring the module. In order to communication each other between E100 and customer board, we must use AT Commands. Figure 1.1 illustrates the interface.



5.1 AT COMMAND SET

After locating a E100 with Device Search Utility, you may configure the E100 using a standard web browser.

Command	Response	Description
AT	OK	UART communication test
	Illegal Command ERROR	

Command	Response	Description
AT+RESET	OK	System reset
	Illegal Command ERROR	

Command	Response	Description
AT+VER	BIOS V1.0.0.0 BIOS 20131105163020 FW V1.0.0.0 FW B20131105163000 OK	Read version and build date

Command	Response	Description
AT+DEFAULT	OK	System reset to default , and reset right now
	Illegal Command ERROR	

Command	Response	Description
AT+ECHO=1	OK	E100 echoes characters during command state.
	ERROR	
AT+ECHO=0	OK	E100 does not echo characters during command state.
	ERROR	

Command	Response	Description
AT+GET_DNS1	168.95.1.1 OK	Read DNS-1 IP address
AT+SET_DNS1=16 8.95.1.1	OK	Write DNS-1 IP address
	ERROR	

Command	Response	Description

AT+GET_DNS2	168.95.1.1 OK	Read DNS-2 IP address
AT+SET_DNS2=16 8.95.1.1	OK	Write DNS-2 IP address
	ERROR	

Command	Response	Description
AT+GET_DNS2	168.95.1.1 OK	Read DNS-2 IP address
AT+SET_DNS2=16 8.95.1.1	OK	Write DNS-2 IP address
	ERROR	

Command	Response	Description
AT+GET_NETMAS K	255.255.255.0 OK	Read subnet mask address
AT+SET_NETMASK =255.255.255.0	OK	Write subnet mask address
	ERROR	

Command	Response	Description
AT+GET_GATEWA	192.168.1.254	Read gateway address

Y	OK	
AT+SET_GATEWAY=192.168.1.254	OK	Write gateway address
	ERROR	

Command	Response	Description
AT+GET_TCP_PROFILE=x * x ={0 , 1}	x,192.168.1.100:1234 OK	Read Server IP and Port * x: TCP connection index
	ERROR	
AT+SET_TCP_PROFILE=x,192.168.1.100:502 * x ={0 , 1}	OK	Write Server IP and Port * x: TCP connection index
	ERROR	

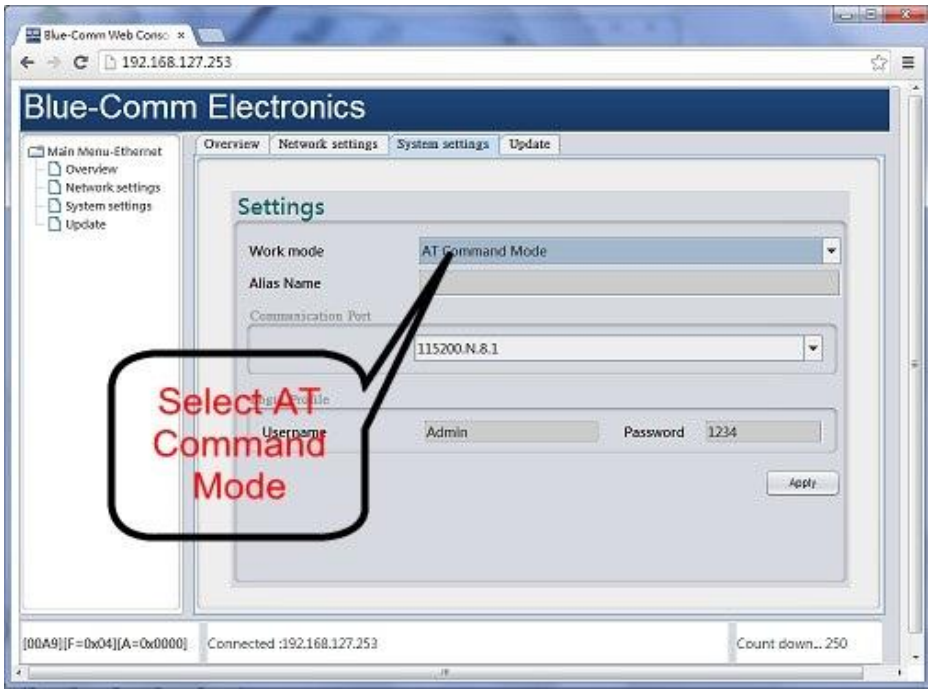
Command	Response	Description
AT+SET_TCP_CONNECT=x,y * x ={0 , 1} * y={0 ,1}	OK	When y =1 Turn on x TCP connection index When y=0 turn off x TCP connection index * x: TCP connection index * y=1 connect ,y=0 disconnect
	ERROR	

Command	Response	Description
AT+GET_TCP_STATUS=x * x ={0 , 1}	Connected OK	Read TCP connection status
	Disconnect OK	
	ERROR	

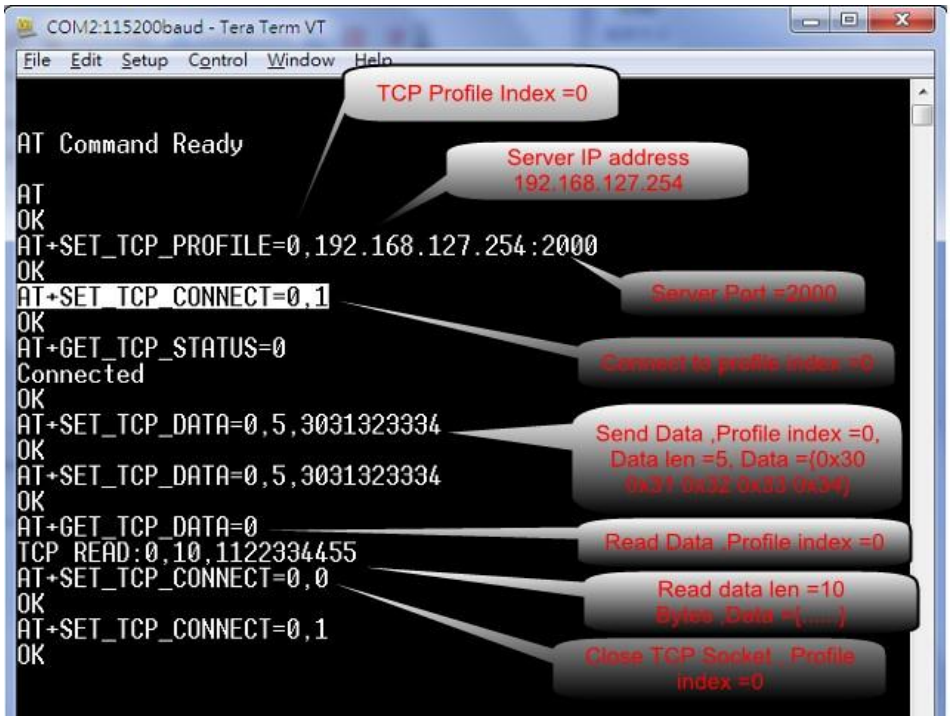
Command	Response	Description
AT+GET_TCP_DATA=x * x ={0 , 1}	TCP READ:x,0	Read TCP data length =0
	TCP READ:x,5,1122334455	Read TCP data length =5 ,Data ={0x11 0x22 0x33 0x44 0x55}
	ERROR	Syntax format error
AT+SET_TCP_DATA=x,3,ABCD EF * x ={0 , 1}	OK	Write TCP data length=3, Datt={0xAB 0xCD 0xEF}

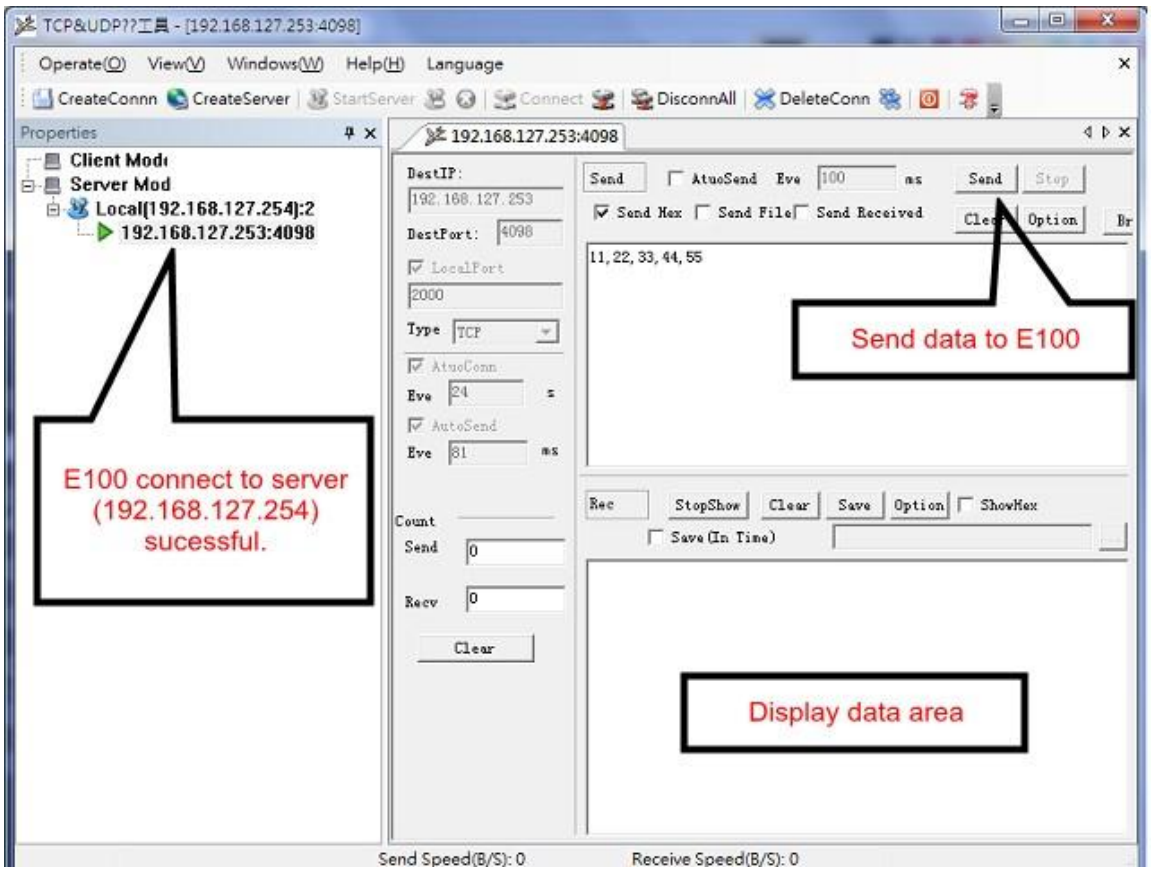
5.2 AT COMMAND EX1.

Step1. Select AT Command mode



Step2. Open a Hyper Terminal





6. TECHNICAL SUPPORT CONTACT

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APPENDIX A. WELL KNOW PORT NUMBERS

This appendix is included for your reference. Listed below are port numbers that already have a well-established use. These port numbers should be avoided when assigning a port number to your E100 module.

TCP Socket	Application Service
0	reserved
20	FTP data
21	FTP control
25	SMTP
37	Time server
53	DNS
80	HTTP
502	MODBUS server

UDP Socket	Application Service
0	reserved
53	DNS

69	TFTP
161	SNMP
162	SNMP traps
9000	Device Search