EDG-4508+

8-Port RS-232/422/485 to Ethernet Data Gateway with Front Wiring

EDG-4508R+

8-Port RS-232/422/485 to Ethernet Data Gateway with Rear Wiring

EDG-4516+

16-Port RS-232/422/485 to Ethernet Data Gateway with Front Wiring

EDG-4516R+

16-Port RS-232/422/485 to Ethernet Data Gateway with Rear Wiring

User Manual

Acknowledgments

IBM and PC are trademarks of International Business Machines Corporation. MS-DOS and Windows are trademarks of Microsoft Corporation. Intel and Pentium are trademarks of Intel Corporation. All other product names or trademarks are properties of their respective owners.

CE Notification

The EDG-4508(R)+ and EDG-4516(R)+ developed by Advantech Co., Ltd. has passed the CE test for environmental specifications when operated within an industrial enclosure . Therefore, in order to protect the products from being damaged by ESD (Electric Static Discharge), we strongly recommend the use of CE-compliant industrial enclosure products when using any EDG module.

This manual covers the following models:

- EDG-4508+
- EDG-4516+
- EDG-4508R+
- EDG-4516R+

Part No. 2003450842 6th Edition
Printed in Taiwan June 2007

Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Technical Support and Assistance

Step 1. Visit the Advantech web site at **www.advantech.com/support** where you can find the latest information about the product.

Step 2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version, application software, etc.)
- A complete description of the problem
- The exact wording of any error messages

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

- EDG-4508+ or EDG-4516+ or EDG-4508R+ or EDG-4516R+ x 1
- CD-ROM for driver and utility x 1
- Rack mount kit, including 2 L-shape metal plates and 12 screws
- Power Cable x 1
- 30 cm Serial Connection Cable x 1
- Rubber Spacer x 4
- Terminal Connector x 1

Contents

CHAPTER 1

Overview

Chapter 1 Overview

1.1 Introduction

This manual provides the necessary information to use EDG-4508(R)+ and EDG-4516(R)+. The Advantech Ethernet Data Gateway series (EDG series) consists of fast and cost-effective data gateways between RS-232/422/485 and Ethernet interfaces.

EDG-4508(R)+ and EDG-4516(R)+ are part of the Ethernet Data Gateway (EDG) family of multiple port modules. They provide reliable and cost-effective network connections for serial devices, allowing users to extend their limited COM ports without changing the architecture of their existing application (s). EDG immediately upgrades users' existing device to the Internet world and make it possible for your software to access serial devices anywhere over a local LAN or the Internet.

To ensure the compatibility of network software that uses the standard network API(BSD sockets or Winsock), EDG-4508(R)+ and EDG-4516(R)+ also provideTCP/UDP control and TCP/UDP data mode. These units upgrade your existing device for integration into the Internet world and makes your serial devices behave just like networking devices.

EDG-4508(R)+ and EDG-4516(R)+ provide 8 and 16 serial ports respectively, that can be easily configured. To increase the reliability of systems, EDG-4508(R)+ and EDG-4516(R)+ provide various significant functions:

- Auto-reconnection and Host Idle
- IP access control
- Support for Baud rates up to 230 kbps, meeting today's demand for high-speed data exchanges.

1.2 Features

- Supports 8/16 channels (8 Channels for EDG-4508(R)+, 16 Channels for EDG-4516(R)+).
- Supports RS-232/422/485
- Versatile socket operation modes, including TCP control mode, UDP control mode, TCP data mode, and UDP data mode.
- 4 DI/O for alarm handling
- Web-based configuration
- Auto-reconnection: automatic connection recovery to network
- LEDs for power status and all ports Tx/Rx monitoring
- Console mode configuration
- Supports front wiring access for EDG-4508+ and EDG-4516+, rear wiring access for EDG-4508R+ and EDG-4516R+
- Easy-to-use Windows Utility for mass installation and remote control

1.3 Specifications

- I/O controller: 16C654 or compatible (auto hardware flow control)
- LAN Speed: 100Base-TX (10/100 Mbps)
- Ethernet Connection: RJ-45
- Serial: RS-232, RS-422 and RS-485
- Serial Connection: RJ-48
- DI/O: programmable 4DI,4DO for extra control
- Signals: TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND(RS-232)
  TxD+, TxD-, RxD+, RxD-, GND(RS-422)
  Data+, Data-, GND(RS-485)
- Baud rate: 50 ~ 230 kbps
- Data bits: 5, 6, 7, 8
- Stop bits: 1, 1.5, 2
- Parity: none, even, odd, space, mark
- Max. Windows Virtual Port: 255
- Utility: EDG II Configuration Utility
- OS Driver support: Windows NT/2000/XP
- Power requirements: 90 V AC ~ 260 V AC, 47 ~ 63 Hz
- Power consumption: 22W(EDG-4516)
  18W(EDG-4508)
- Operating temperature: 0° ~ 55° C (32° ~ 131° F)
- Serial protection: 15,000 V ESD

1.4 Packing Checklist

- EDG-4508+ or EDG-4516+ or EDG-4508R+ or EDG-4516R+ x 1
- CD-ROM for driver and utility x 1
- Rack mount kit, include 2 L-shape metal plates and 12 screws
- Power Cable x 1
- 30cm Serial Connect Cable x 1
- Rubber Spacer x 4
- Terminal Connector x 1

CHAPTER 2

Getting Started

Chapter 2 Getting Started

This chapter includes information about installing EDG-4508(R)+ and EDG-4516(R)+ The following covered:

- Understanding the EDG-4508(R)+ and EDG-4516(R)+
- Connecting Hardware
- Configuration Utility and COM port mapping Utility installation

2.1 Understanding EDG-4508/4516(R)+ Modules

EDG-4508(R)+ and EDG-4516(R)+ are advanced Ethernet data gateway units. They extend traditional COM ports of a PC to Ethernet access. Through Ethernet networking, users can control and monitor remote serial devices and equipment over LAN or WAN. Since EDG-4508(R)+ and EDG-4516(R)+ are connected with the TCP/IP protocol, you will have to know fundamental facts about Ethernet networking to get the server setup correctly. To allow for easier configuration, we provide several system configuration methods such as Configuration Utility, Web Configuration and Console mode Configuration. More details will be available in the following chapters.

EDG -4508(R)+ and EDG-4516(R)+ come with a virtual COM driver that transmits all signals intact. Your existing COM-based applications can be preserved, without in additional modification. EDG-4508(R)+ and EDG-4516(R)+ also provide various Socket modes: TCP/UDP control mode and TCP/UDP data mode. The main different of TCP and UDP protocol is that TCP guarantees delivery of data by requiring the recipient to send and acknowledge to the sender. UDP doesn't require this verification.

Traditional serial devices use RS-232/422/485 interface to issue commands or transmits data to another one. Many of these devices will be constrained by the length of wire. With the EDG-4508(R)+ and EDG-4516(R)+, you are now able to communicate with each other via Internet. Even more, you can connect any networking device dynamically.

2.1.1 Virtual COM Port Mode

EDG series provide a virtual COM driver that works on Windows NT/ 2000/XP systems. This driver establishes a transparent connection between Host and serial devices. The driver will be installed on your computer automatically while you install COM port mapping utility. You have to use COM port mapping utility to configure the mapping between the EDG serial ports and local COM ports on the host computer.

2.1.2 Data Mode

In Data mode, EDG-4508(R)+ and EDG-4516(R)+ can establish the a TCP connection to a pre-defined host computer or device while serial data arrives. EDG-4508(R)+ and EDG-4516(R)+ will terminate the connection by the setting of Data Idle Timeout. This operation mode supports 4 simultaneous connections. The Data mode provides a certain amount of transparence and flexibility in transmitting data between devices. If you wan to transmit data to any networking device from serial device directly, data mode is a very perfect selection.

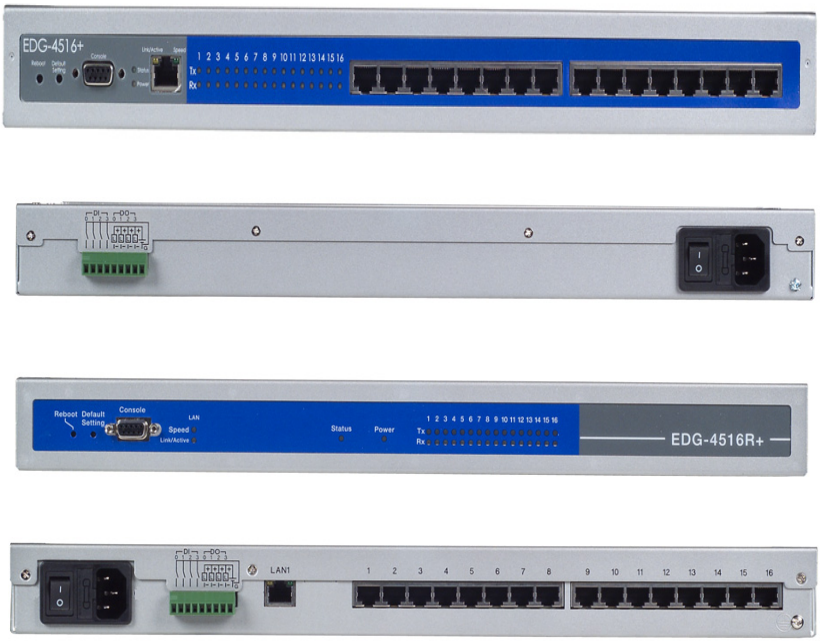
In data mode, the data from the serial port of one EDG-4508(R)+ and EDG-4516(R)+ can be automatically sent to the other networking device, without the need for an intermediate PC. Thus, serial devices will be no longer bundled with operation system and behave like network devices to send /receive data via Ethernet.

2.1.3 Control Mode

In controlling mode, the EDG-4508(R)+ and EDG-4516(R)+ presents a modem interface to the attached serial device: it accepts AT-style modem commands to connect / disconnect to other networking device. If you want serial device running application program to connect/disconnect to different devices by request, you can use controlling mode.

The controlling mode provides three modem AT-style commands. The serial devices can use these commands to control EDG-4508(R)+ and EDG-4516(R)+ to connect or disconnect to remote networking device. Thus, intelligent serial devices such as stand-alone PLC will send /receive data to/from devices one by one via Ethernet.

2.2 Panel Layout

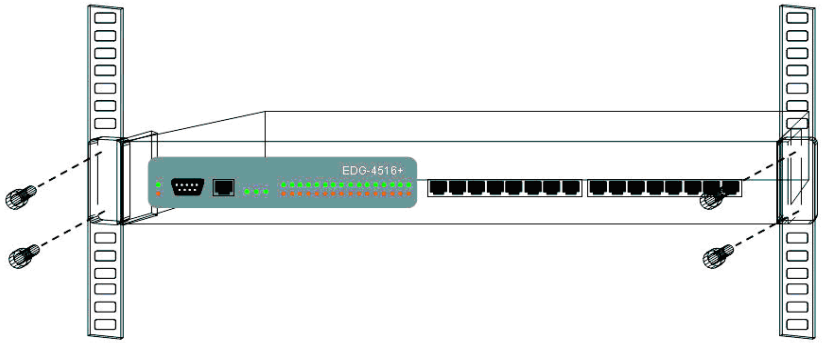


Default Setting Button: press Default Setting button continuously and press the Reset button for to load factory defaults. This will cause the status LED to blink on and off. The factory defaults will be loaded while the LED stops blinking and buzzer buzzed. You can release the Default Setting button.

2.3 Connecting Hardware

This section introduces how to connect EDG-4508(R)+ or EDG-4516(R)+ to serial devices for first time.

2.3.1 Rack Mounting



2.3.2 Network Connection

Connect the Ethernet cable to EDG-4508(R)+ or EDG-4516(R)+ Ethernet port. There are 2 LED indicator located on front panel to show the Ethernet status. If the cable is connected correctly, the LAN LED will indicate a valid connection to the Ethernet in the following ways:

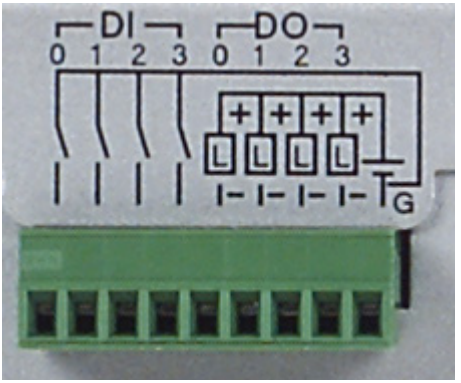
LED	Status	Description
Speed	Green	100M bps
	Off	10M bps
Link/Active	Off	No Ethernet data being received or transmitted
	Blinking	Ethernet data being received/transmitted

Note *Speed LED will keep the last status even though the Ethernet cable is disconnected. While EDG reboot or re-plug in the Ethernet cable, EDG will detect Ethernet LAN speed.*

2.3.3 Power Supply Connection

Connect EDG-4508(R)+ or EDG-4516(R)+ AC power line with its AC connector. If the power is properly supplied, you can turn on the power switch and the Power LED will show a green color.

2.3.4 DI/O Connection



2.3.5 Serial Port Connection

Connect the serial data cable, OPT1A or OPT1D, between EDG series and the serial devices.

LED	Status	Description
Tx (Port N) N= 1~8/16	Blinking	Serial port data being transmitted
	Off	No data being transmitted
Rx (Port N) N= 1~8/16	Blinking	Serial port data being received
	Off	No data being received

2.3.6 Console Port Connection

Connect to Consol port using directly cable with DB9 connector. Refer to Chapter 6 for details.

2.3.7 Ordering Information

EDG-4508+

8-port RS-232/422/485 to Ethernet Data Gateway with Front Wiring

EDG-4508R+

8-port RS-232/422/485 to Ethernet Data Gateway with Rear Wiring

EDG-4516+

16-port RS-232/422/485 to Ethernet Data Gateway with Front Wiring

EDG-4516R+

16-port RS-232/422/485 to Ethernet Data Gateway with Rear Wiring

Communication Cable RJ48 to DB9 30cm (OPT-1D)

30 cm RJ48 to DB9 M-Type RS-232/422/485 Cable

Communication Cable RJ48 to DB9 1m (OPT-1A)

1m RJ48 to DB9 M-Type RS-232/422/485 Cable

Terminal Connector (1654909900)

Terminal Connector for Test Usage

2.4 Installation

2.4.1 Configuration Utility

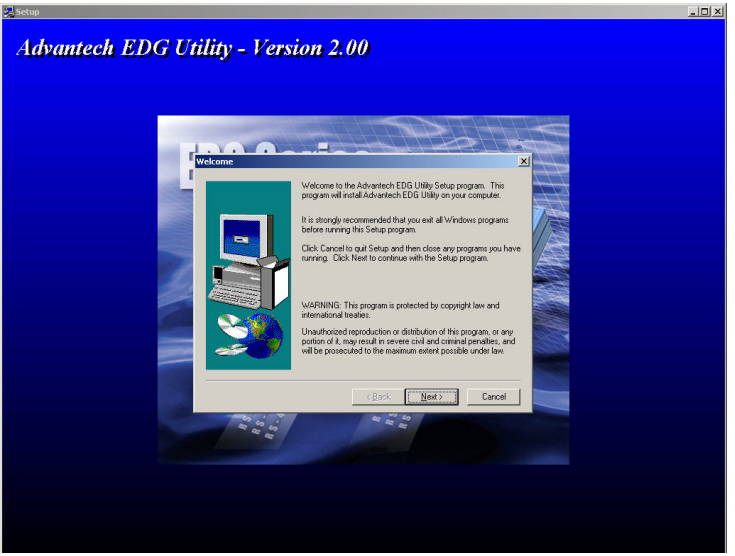
In order to use a PC and an Ethernet network to control serial devices connected to the EDG-4508(R)+ and EDG-4516(R)+, you must first have a host running Windows NT/2000/XP. This type of application also requires the host to have an Ethernet card and the TCP/IP protocol installed. The following are the required steps for EDG-4508(R)+ and EDG-4516(R)+.

1. Insert the Advantech industrial communication CD-ROM into the drive (e.g. D:\) on the host PC. Change the host computer's default drive from C: to D:

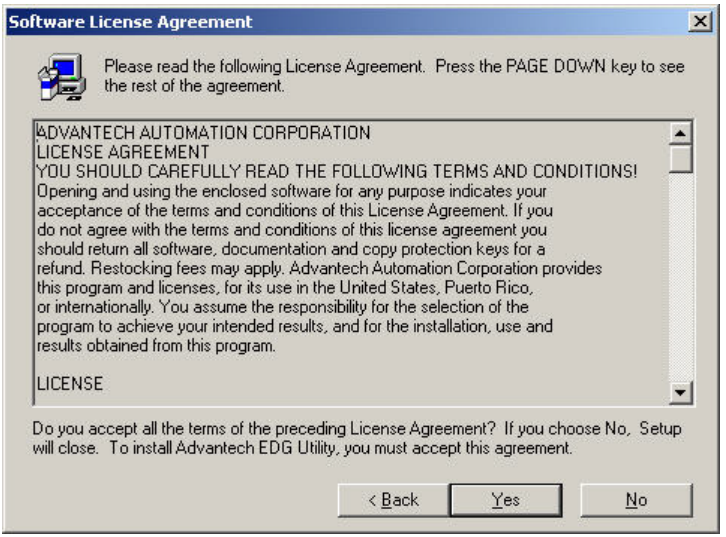
2. Use your Windows Explorer or the Windows Run command to execute the Setup program (the path for the Setup program on the CD-ROM if your default CD drive is D: should be):

D:\Device Server(EDG)\Utility&Driver\EDG COMPort Configuration Utility\V2.xx\98_NT_2000_XP v2.00 b014

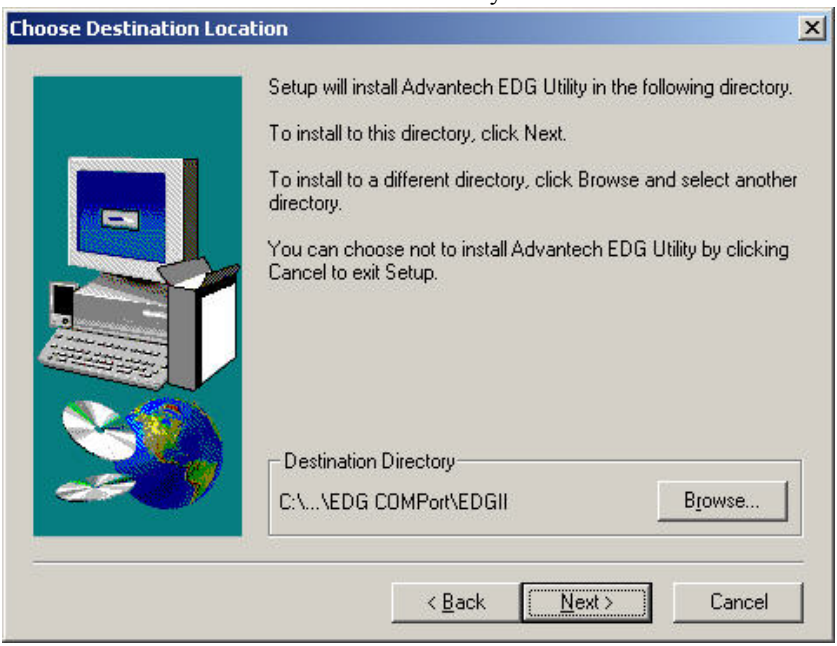
3. Upon executing the setup program, the Welcome Dialog Box will pop-up. Press the "Next" button to continue.



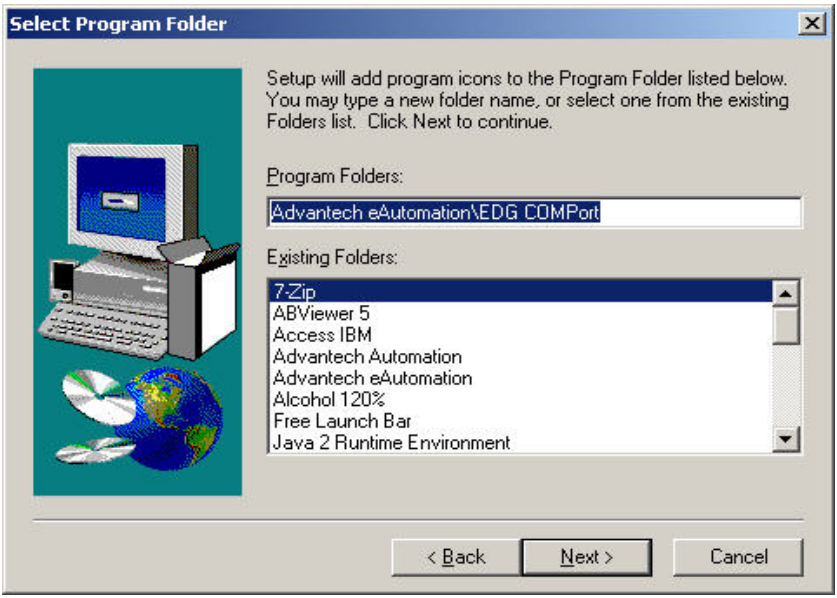
4. Carefully read the Software License Agreement, and press "Yes" to continue.



5. The Setup program will specify a default installation path, C:\Program Files\Advantech\EDG COMPort Utility.



6. In this step, you may select a specific program folder or just use the default setting and press "Next".



7. After setup has copied all program files to your computer, click the <Finish> button to finish the installation.

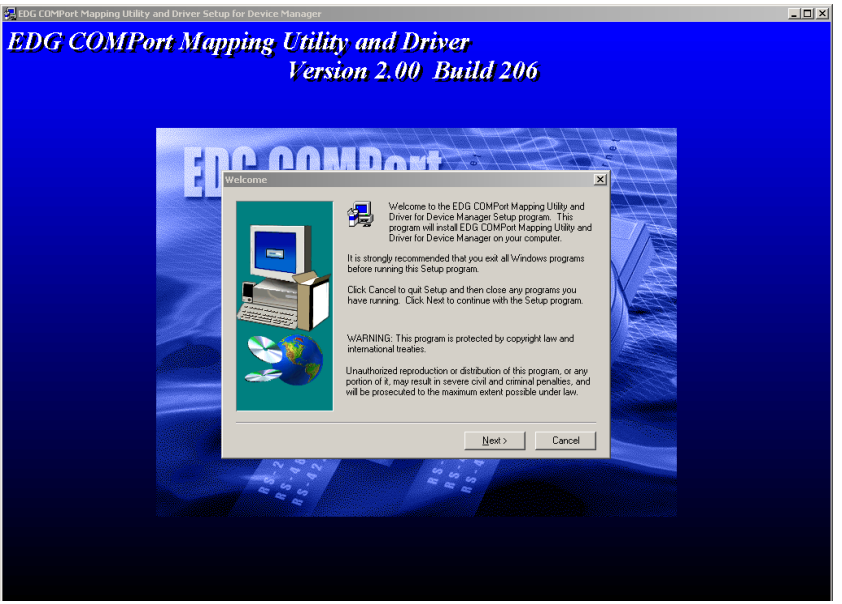
2.4.2 COM Port Mapping Utility

To setup and enable the Virtual COM on the HOST, you must install this utility on this PC. This driver is suitable for Window NT/2000/XP. This type of application also requires the host to have an Ethernet card and the TCP/IP protocol installed. The following are the required steps for installing EDG-4508(R)+ and EDG-4516(R)+.

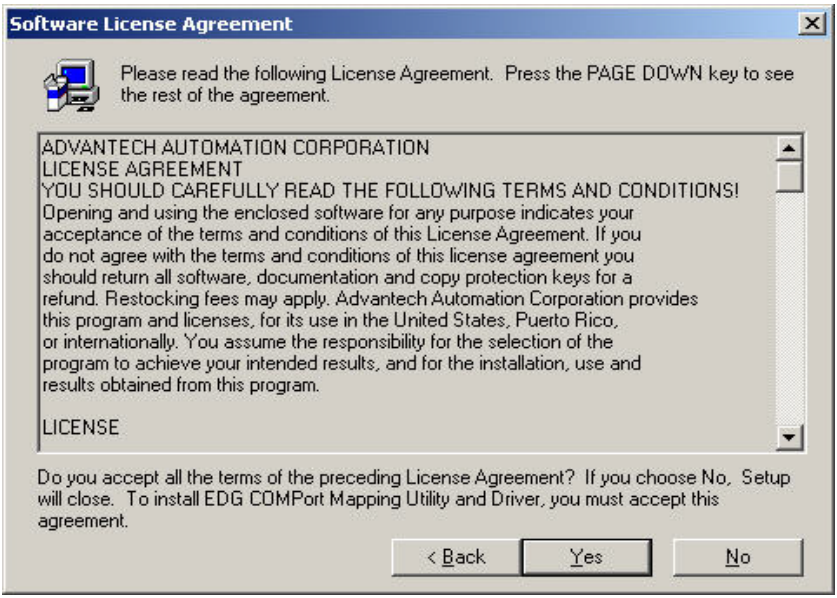
PC. Change the host computer's default drive from C: to D:

2. Use your Windows Explorer or the Windows Run command to execute the Setup program (the path for the Setup program on the CD-ROM should be D:\Device Server(EDG)\Utility&Driver\EDG COMPort Mapping Utility\2000_XP WDM v2.00 b206, if your default CD-ROM drive is D:).

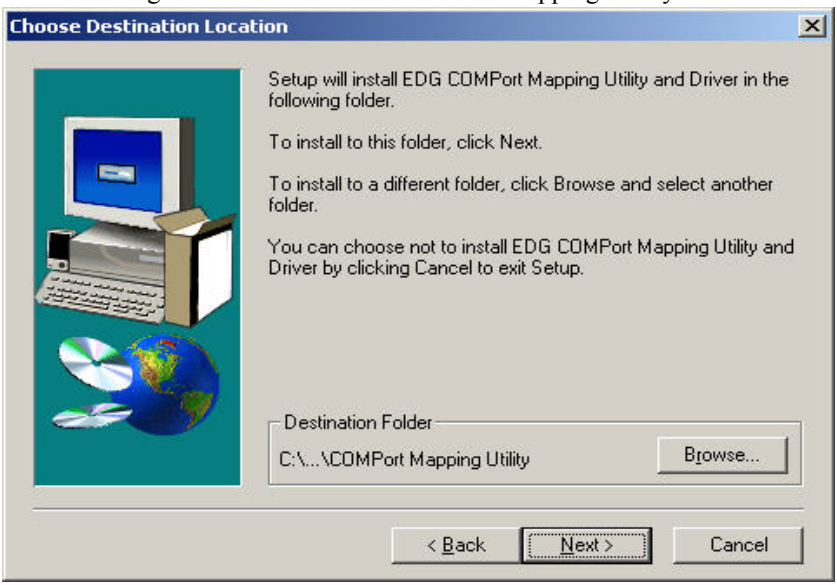
3. Upon executing the setup program, the Welcome Dialog Box will pop-up. Press the "Next" button to continue.



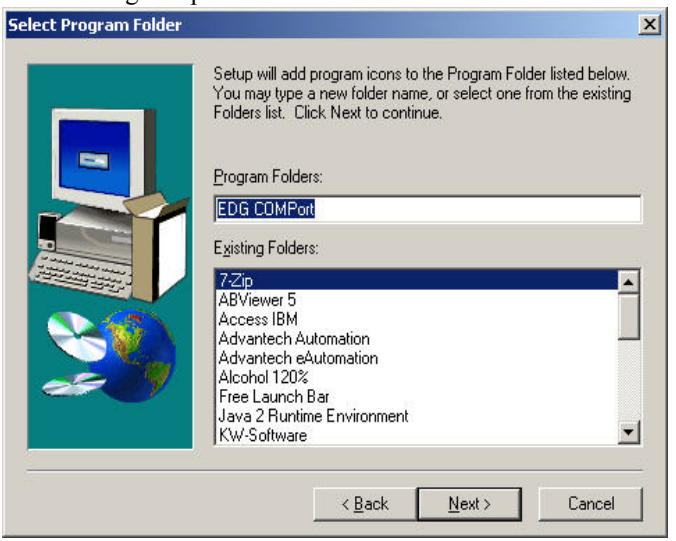
4. Carefully read the Software License Agreement, and press "Yes" to continue.



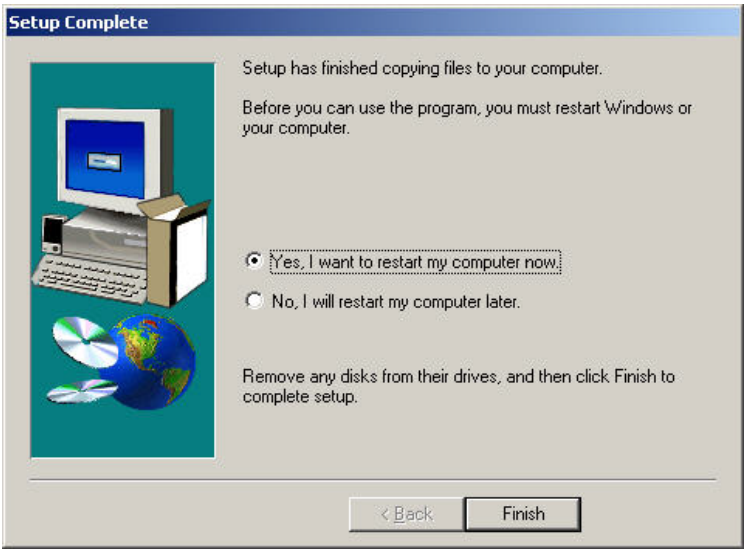
5. The Setup program will specifya default installation path, C:\Program Files\Advantech\COMPort Mapping Utility.



6. In this step, you may select a specific program folder or just use the default setting and press "Next".



7. After setup has copied all program files to your computer, click the <Finish> button to finish the installation.



CHAPTER 3

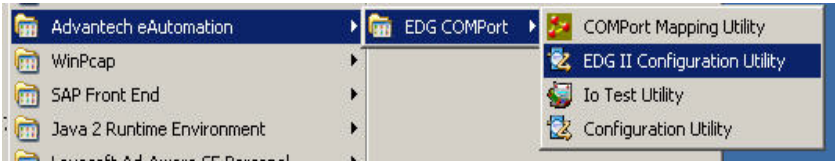
Configuration

Chapter 3 Configuration

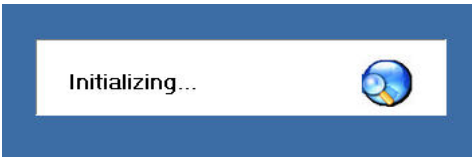
3.1 Searching EDG Modules

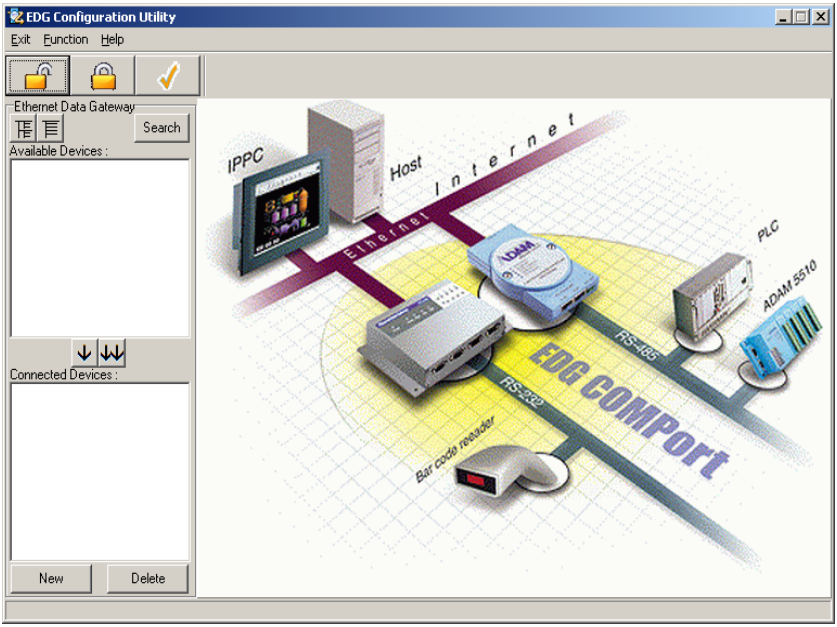
EDG-4508(R)+/4516(R)+ provides an easy-to-use configuration utility to configure your Ethernet Data Gateway Device through an Ethernet connection. The utility provides a search function to show your device(s) by simply executing the configuration utility program from the Start Menu as follows.

Start Menu -> All Program ->Advantech eAutomation -> EDG COMPort



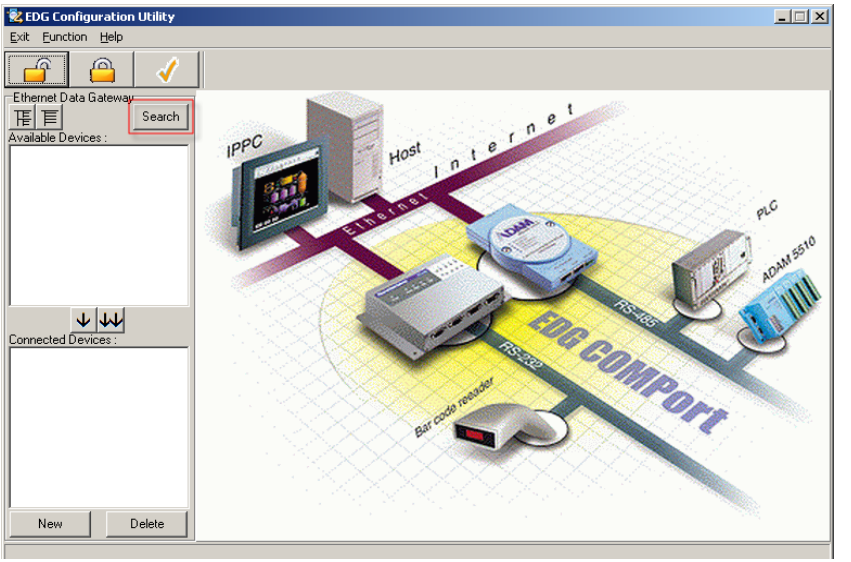
While you launch the EDG II configuration utility, the utility will load the setting.

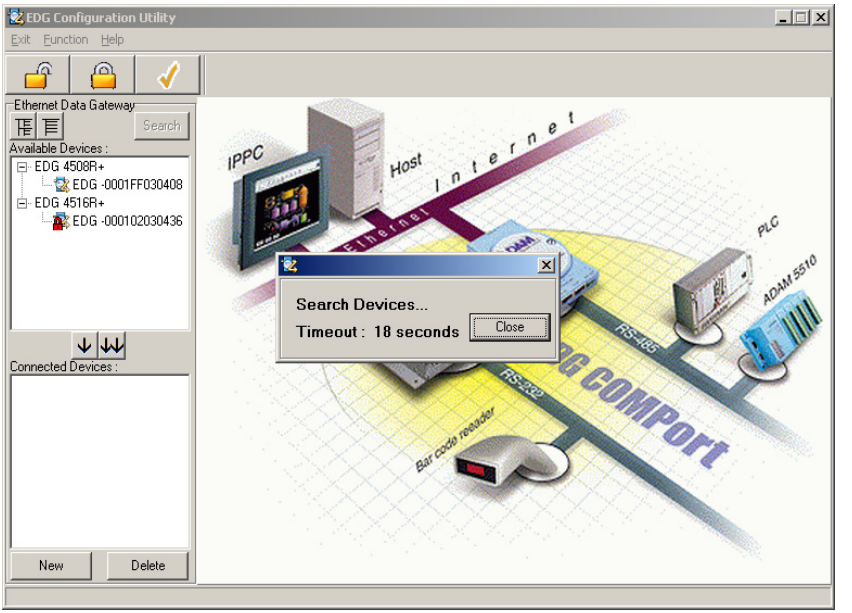




You can click the search button to search all the EDG device(s) on the network and show them on the Available Devices Tab of the utility. You can click the “Close” button to stop the search. From here you can easily configure various parameters for TCP/IP configuration.

(In this example, the system finds the Ethernet Data Gateway device EDG-4516R+ in a local network)


EDG Configuration Utility
Exit Function Help
Ethernet Data Gateway
Search
Available Devices :
Connected Devices :
New
Delete
IPPC
Host
Internet
Ethernet
PLC
ADAM 5510
RS-485
RS-232
Bar code reader
EDG COMPort


EDG Configuration Utility
Exit Function Help
Ethernet Data Gateway
Search
Available Devices :
EDG 4508R+
EDG -0001FF030408
EDG 4516R+
EDG -000102030436
Connected Devices :
New
Delete
Search Devices...
Timeout : 18 seconds
Close
IPPC
Host
Internet
Ethernet
PLC
ADAM 5510
RS-485
RS-232
Bar code reader
EDG COMPort

You can click on the device name to show the features of the specific device. Click on the "+" before the model name (e.g. EDG-4516(R)+),and the utility will expand the tree structure to show the individual device name. Click on the "-" before the model name (e.g. EDG-4516(R)+), and the utility will collapse the structure.

You may click the button, and the utility will expand all tree structure to show the individual device name. You might click button to collapse all tree structure.

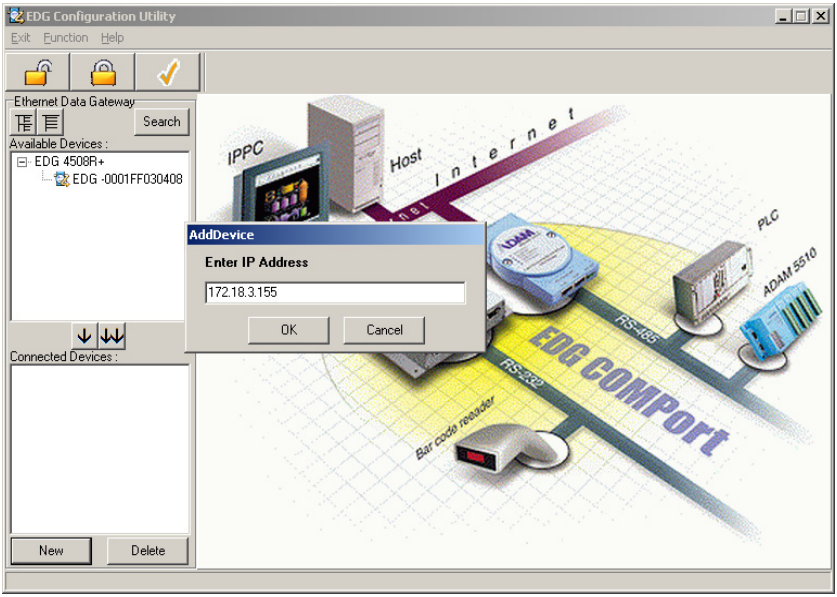
For Example, EDG Configuration Utility shows "EDG-000102FFFF06" after expanding the tree structure.

Note *The EDG series default device name is "MAC ID". In this case, the device name "EDG-000102FFFF06" means the device "MAC ID" is "00 01 20 FF FF 06".You can change the default device name in System Tag of Device Properties.*

Note *Please reserve TCP port 5202 in your network ,Configuration will use this port to communicate with EDG series.*

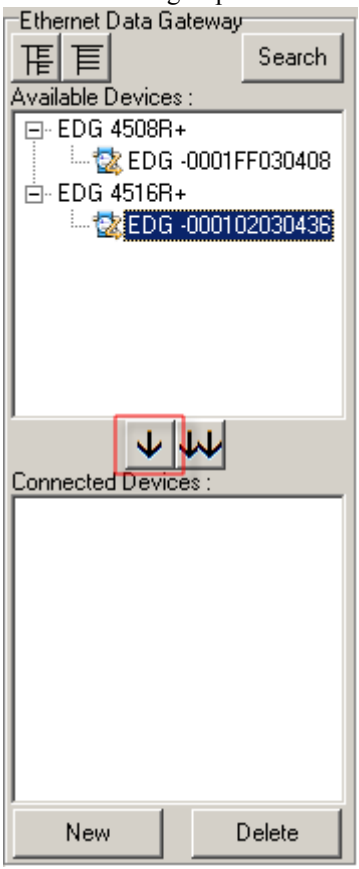
3.2 EDG Modules Connected Devices Group

This EDG II configuration utility will allow you to add a device via specifies the IP address. You can click 'New' button to add a device. And then the EDG device will be shown on the 'Connected Devices' of the utility. From here you can easily configure various parameters.

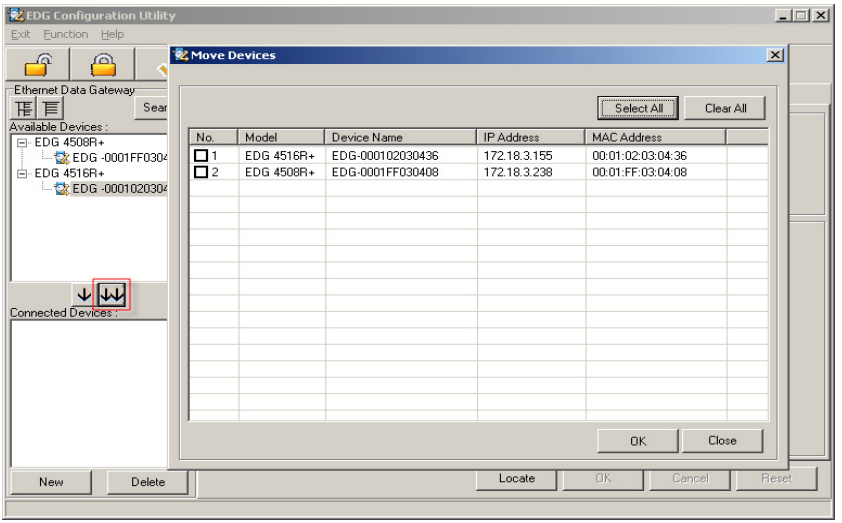


Note *The EDG II configuration utility only can search devices on the same IP domain. If you want to connect the devices on another domain, you might use this function and add the devices by yourself.*

You can select the device and click the “Append” button. The device will be moved to Connected Devices group.

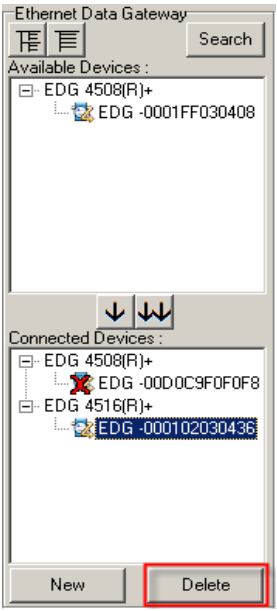


You may click the “Group Append” button. The devices on the Devices Survey panel will be showed on the selected window. You might select the devices which you want to append to the “Connected Devices group”, or click “Select All”. Click “OK” button, the selected device will be moved to “Connected Devices group”.



3.2.1 Deleting Devices

You can select the device on Connected Devices group and click “Delete” button. The device will be deleted. You may click “Search” button and find the device again.



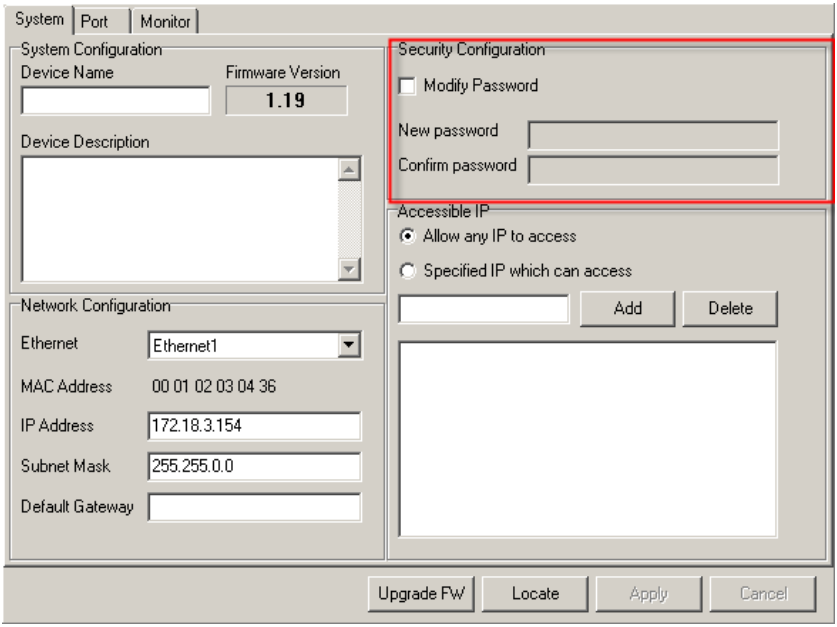
3.2.2 Connected Devices Group Functions

While you move the device(s) to Connected Devices group, you can use these functions

- Lock device
- Grouping Allocate
- Download firmware
- EDG II configuration utility check the device(s) automatically. Connected – online, Disconnected – offline
- The utility will record these devices on Connected Devices group and will connect and check these devices again while the utility will be relaunched.

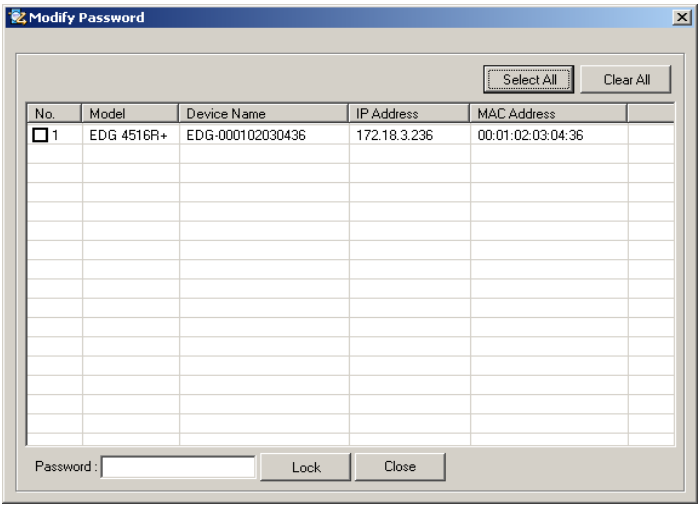
3.3 Locking & Unlocking Devices

The EDG II configuration utility provides Lock and Grouping Lock function to secure the device(s). You can modify the password one by one on the “Security Configuration” tab. There is only one password in the EDG-4516(R)+ and EDG-4508(R)+. You can use Configuration utility, Web Configuration, and Console to modify this password and disable the security control.



Note	*Don't input any character on the password field and save. The security control is disabled.*

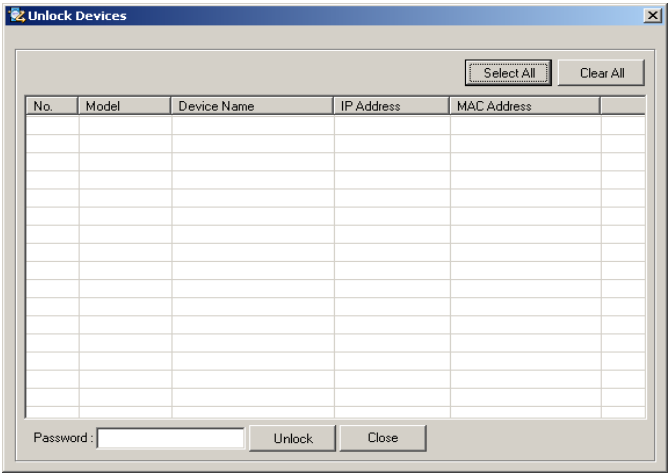
You also use the "Grouping Lock" button to modify the password while the devices are on "Connected Devices group".



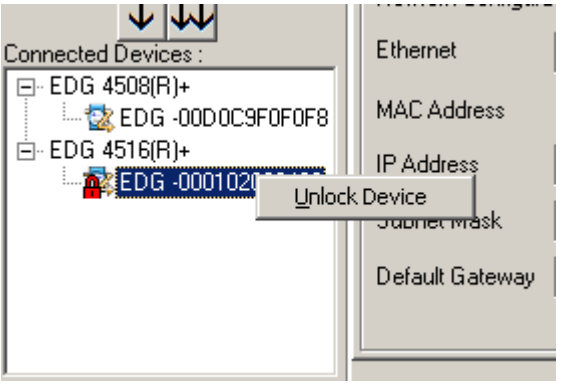
While you click “OK” button, the password will be updated to device. You should click “Reset” button, the module will move this data to Flash memory and restart.

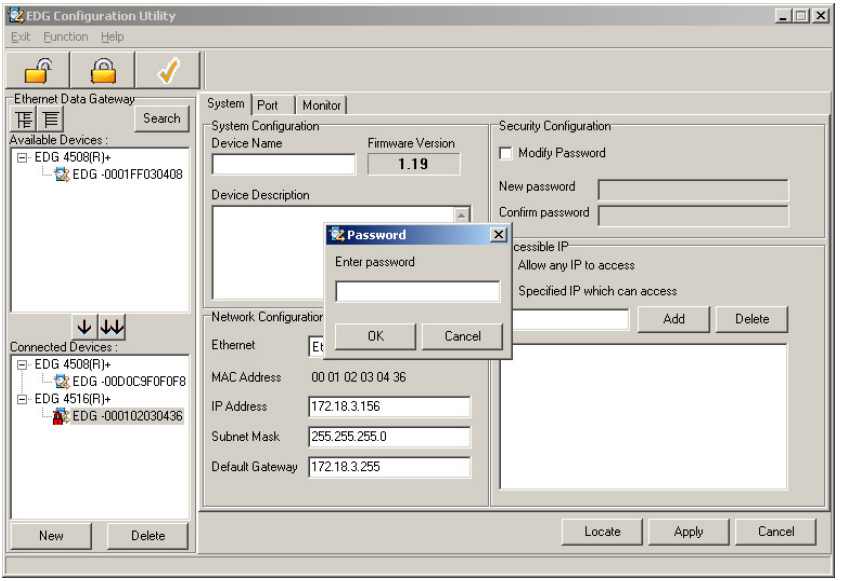
Note:	*You might finish all setting and click "Apply" to enable the modification in the moment; otherwise the setting will disappear while the device restarts.*

You can click the “Un-lock” button and select the devices you want to unlock.



You also select the device and right click “Mouse button”. Input the password and unlock the device.





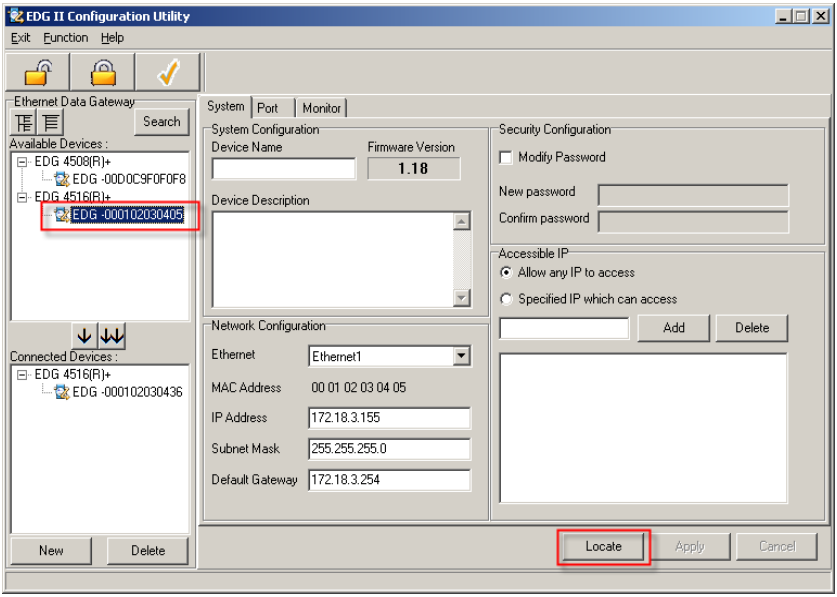
3.4 Locating the Module

The configuration utility provides a "Locate" function to assist you in finding a specific device. You can select the EDG Series as a group or just select one specific module, e.g. EDG-4508+ or EDG-4516+.

There are two different options for the Locate function

3.4.1 Locate a specific device for you

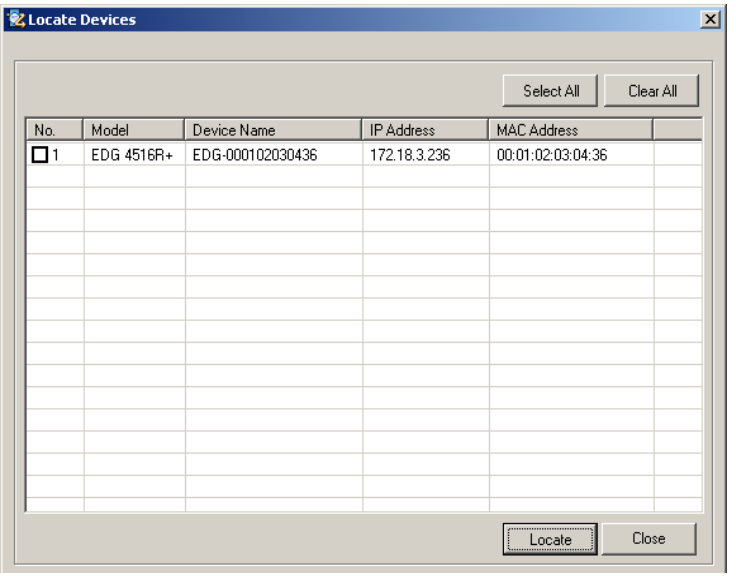
1. Click “Search” button and find all devices on the IP domain.



2. Select the device on the “Available Devices” Tab and click “Locate” button.
3. The device buzzer sound.
4. Click “Stop” to stop.

3.4.2 Grouping Locate specific devices for you

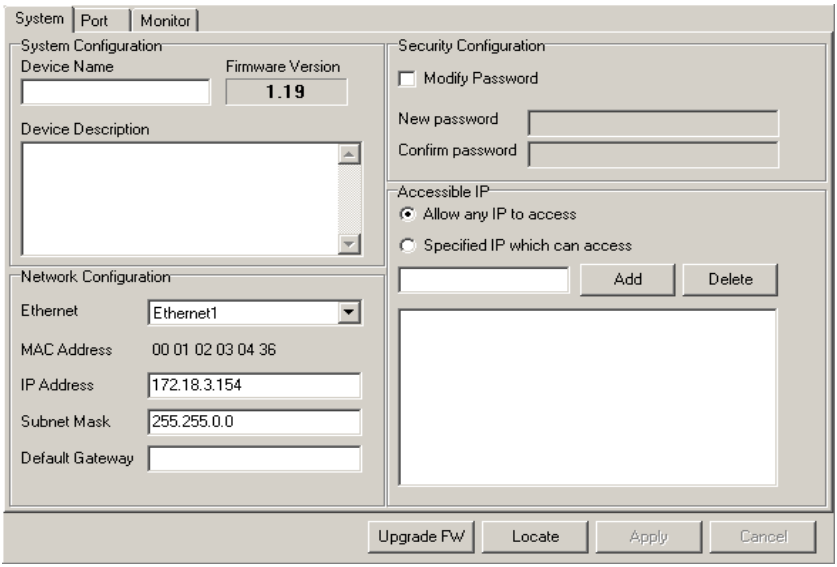
1. Click the “Locate” button



2. Select the devices which you want to locate.
3. Click the “Stop”

3.5 Device System Configuration

The EDG II configuration utility only searches for EDG-4508(R)+ and EDG-4516(R)+ on the local network, and cannot search beyond a router or gateway. Make sure that the EDG-4508(R)+ or EDG-4516(R)+ you want to monitor resides in the same local network segment as the host PC. You might use “New” function to add the device by yourself.

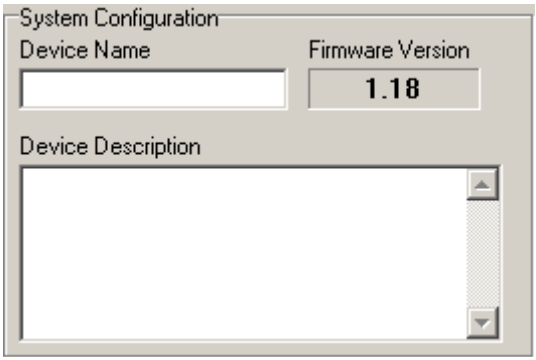


Device Name

The configuration utility provides a default name for device to distinguish a specific EDG Series from other EDG Series. You can update the default device name based on your application. Names longer than 32 characters cannot be used. It is best to choose a name you can remember.

Device Description

This field is to record the function, application and other information for each EDG Series device in more detail for easy management and maintenance. You are allowed to describe in your own words. Names longer than 127 characters cannot be used.



Firmware Version

In this field, the configuration utility represents the firmware version of the EDG Series. You might need to refer to the firmware version to determine functions available on the EDG Series device. In case of problems that might concern the firmware version, please provide the firmware version number to our Customer Service.

Network Configuration Ethernet

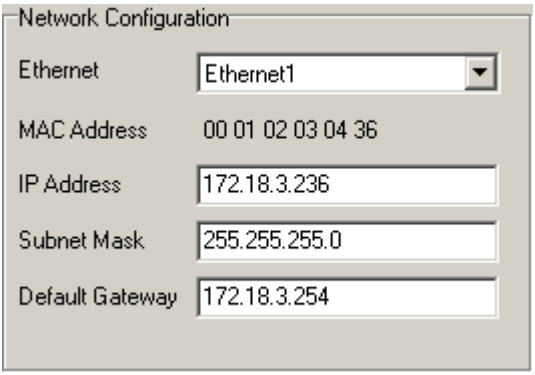
Select the Ethernet that you want to configure.

MAC Address

The MAC address is for the local system to identify and locate each EDG series. This MAC address is already set before delivery from factory, hence no need for further configuration.

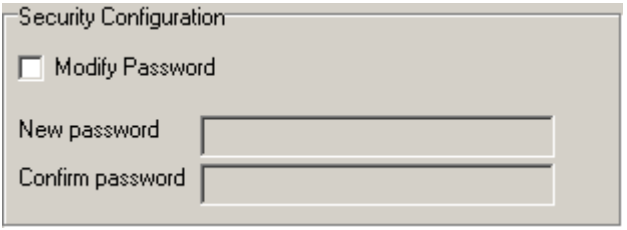
IP address, Subnet Mask, Default Gateway

The IP address identifies your EDG device on the global network. Each EDG device has the same default IP address 10.0.0.1. Obtain a specific IP address from your network administrator and then configure each EDG device with an individual IP address, related Subnet Mask and Gateway Setting.



Note	*EDG devices do not support auto IP address configured by DHCP server.*

3.5.1 Security Configuration -Password Modify



In default setting, each EDG device don't has password. You can change the password to protect all configuration settings of your EDG device. If you want to cancel the password, you can blank the New password and Confirm password.

There is only one password on the device for Console mode, Web configuration, and Utility configuration.

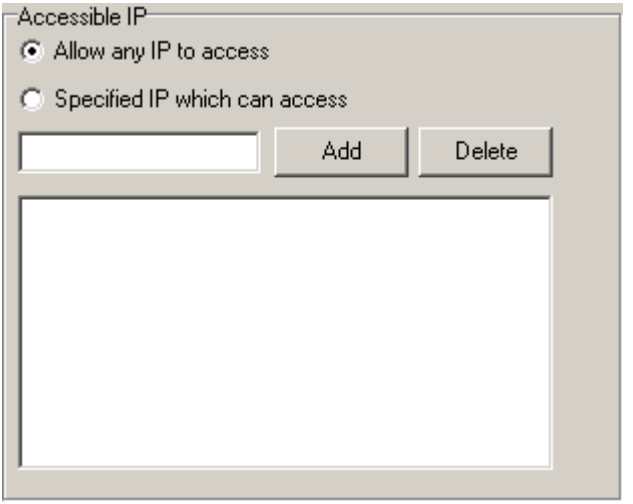
While you modify and save password, the password on the device memory will be changed immediately whether you use Console, Web configuration, or Utility configuration.

Allow any IP to access

If this option is enabled, all PC can access data from this EDG.

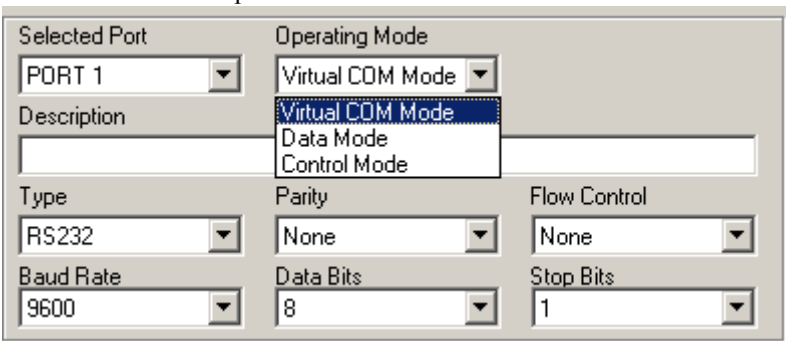
The specified IP which can access

Enabled this option, you might limit at most 32 PCs to access data from this EDG.



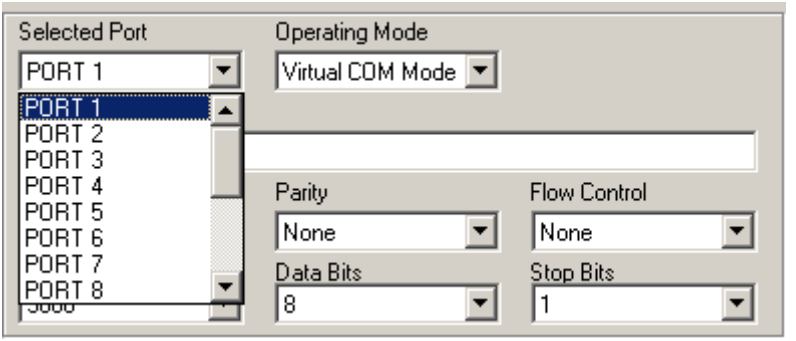
3.6 Port Configuration

There are three operation modes for EDG-4516(R)+ and EDG-4508(R)+, Virtual COM mode, Data mode, and Control mode. You can configure mode for individual ports.



Selected Port

To specify which port on the EDG Series is to be connected to the serial device.

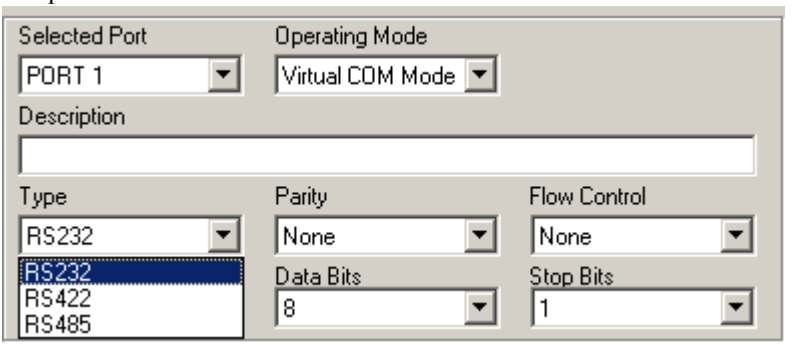


Description

User can give more detailed description of the function of the port for easy management and maintenance. Descriptions longer than 128 characters cannot be used.

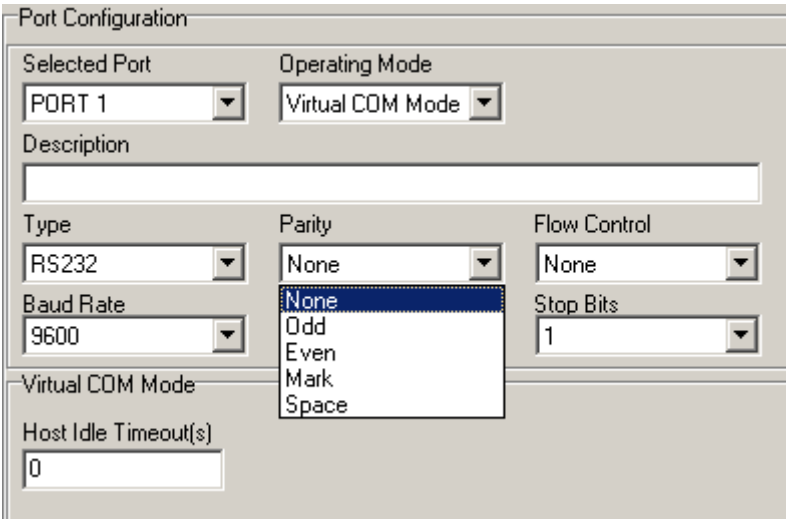
Type

EDG Series offers three kinds of serial interfaces, RS-232, RS-485 and RS-422. User can use any of the three serial interfaces according to user's requirements.



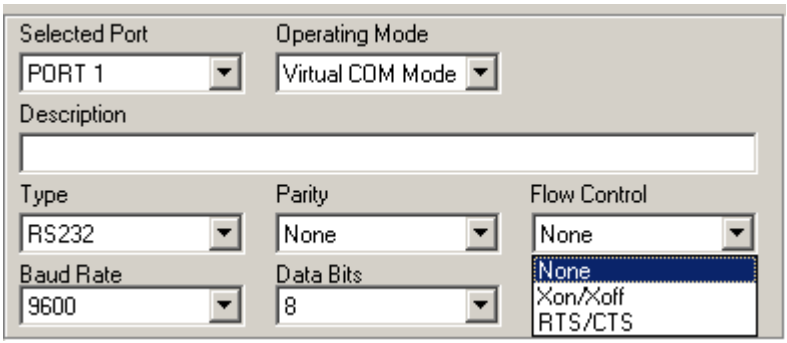
Parity

The EDG Series provides five options: None, Odd, Even, Space, Mark.



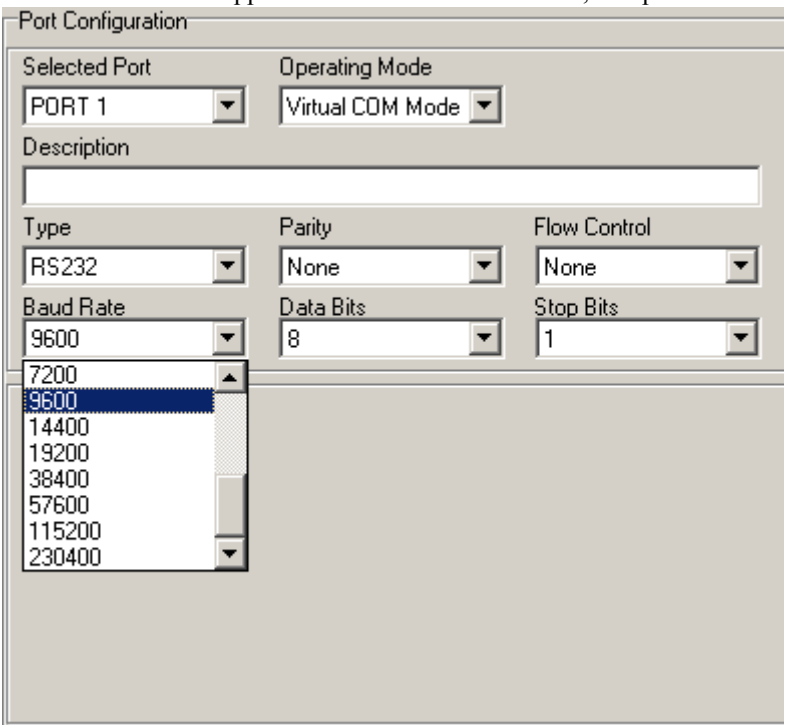
Flow Control

The EDG Series provides four options: None, Xon/Xoff, RTS/CTS, DTR/DSR.



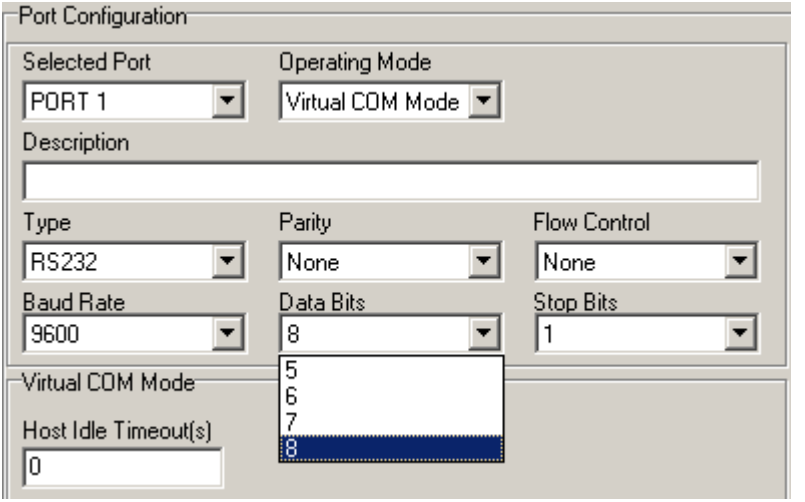
Baud Rate

The EDG Series supports baud rates from 50 to 230,400bps.



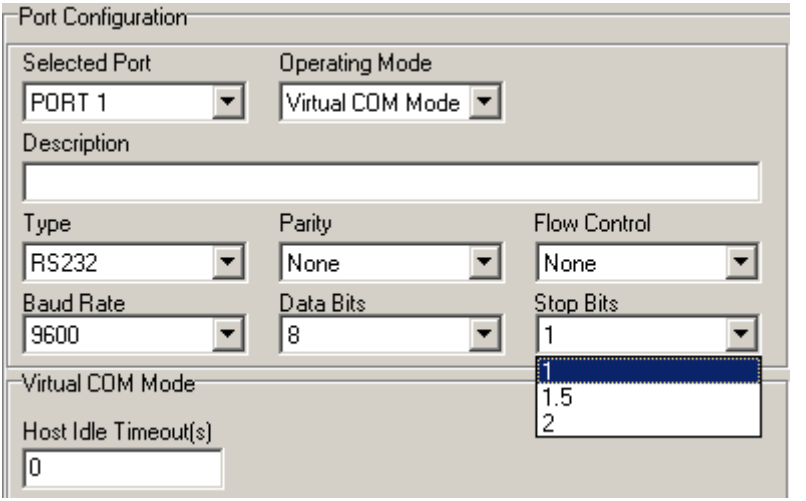
Data Bits

The EDG Series provides four options: 5, 6, 7 or 8.



Stop Bits

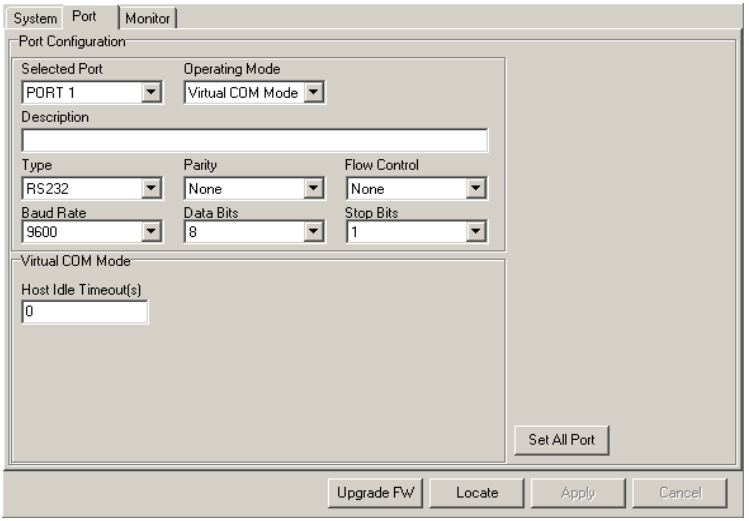
The EDG Series provides three options: 1, 1.5 or 2.



3.6.1 Virtual COM mode

The EDG device is advanced Ethernet data gateway units. It extends traditional COM ports of a PC to Ethernet access. Through Ethernet networking, users can control and monitor remote serial devices and equipment over LAN or WAN. EDG series come with a Virtual COM driver that transmits all serial signals intact. This means that your existing COM-based software can be preserved, without modifying to fulfil the needs. The Virtual COM mode allows user to continue using RS-232/422/485 serial communications software that was written for pure serial communication applications.

EDG series comes equipped with COM driver that work with Window NT/2000/XP systems. The driver establishes a transparent connection between host and serial device by mapping the IP of EDG serial port to a local COM port on the host computer.



Host Idle Timeout

The utility allows the user to set the host idle timeout value. When the idle happens and continues more than the set value, the utility will cut off the connection between EDG-4508/16 and the host automatically. User must re-connect to recover the communication. You might input value 0 to disable the Host Idle timeout option.

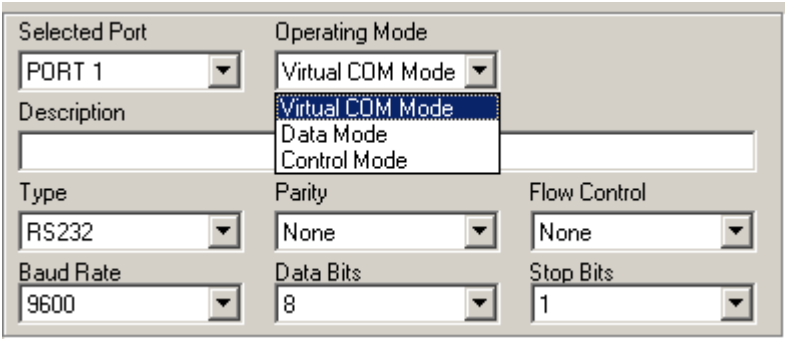
Note	*While you disable the Host Idle option, the EDG will not cut off the connection. If Host loses the connection with EDG and the Host Idle option is disabled, Host will not connect to EDG again.*

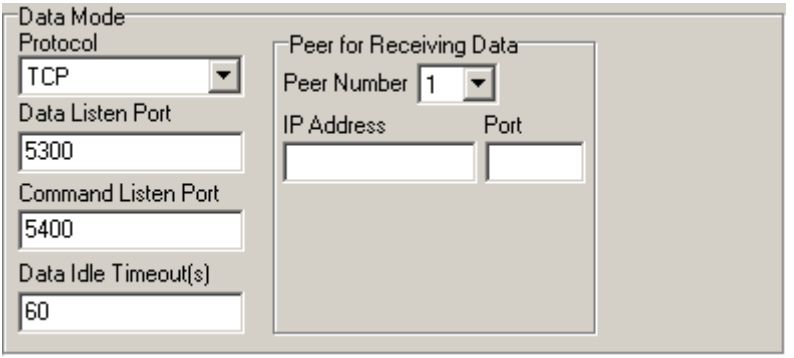
3.6.2 Data Mode

EDG-4516(R)+ and EDG-4508(R) can be Data server or Data client either. Both operations support TCP and UDP protocol. The EDG-4516(R)+ and EDG-4508(R) makes your serial devices behave just like networking devices. You can issue commands or transmit data from serial devices, which connected to EDG-4516(R)+ and EDG-4508(R), to any devices that are connected to the Internet.

EDG-4516(R)+ and EDG-4508(R)+ allows most 4 host PC accessing data simultaneously via polling networking architecture. You can use it according to your application. If you want to access the EDG-4516(R)+ and EDG-4508(R), you must ascertain your application software supports standard networking application programming interface (API) such as: WinSock Socket.

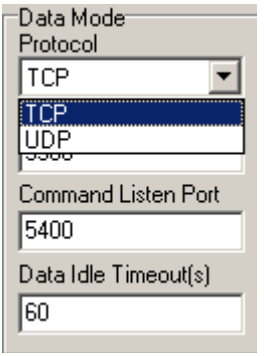
You might select Data mode and setup port attributes





Protocol

EDG-4516(R)+ and EDG-4508(R)+ provides TCP/IP and UDP two protocols. In settings, you can choose either TCP mode or UDP mode according to your application.



Data Listen Port

The TCP(UDP) port number represents the source port number , and the number is used to identify the channel for remote initiating connections. Range: 1024-65533. If an unknown caller wants to connect to the system and asks for some services, they need to define the TCP(UDP) port to carry a long-term conversation.

Each node on a TCP/IP network has an IP address, and each IP address can allow connections on one or more TCP port. The well known TCP port are those that have been defined; for example, port 23 is used for Telnet connections. There are also custom sockets that users and developers define for their specific needs. The default TCP (UDP) port of EDG-4516(R)+ and EDG-4508(R)+ is 5200. The example initial 5200 is System Port, and 5201 is Data Port. But users can adjust them by one's preference or application.

Each port has its own data listen port to accept connected request of other network device. So, the data listen port can't be set the same value. You can transmit/receive data to/from device via the data listen port.

Command Listen Port

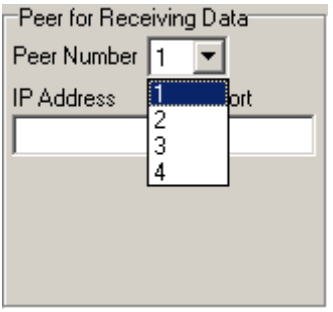
Each port has its own command listen port to accept connected request of other network device. So, the command listen port can't be set the same value. You can use 'AT command' to change the port setting via the command listen port. The Command Listen Port must be different from the Data Listen port.

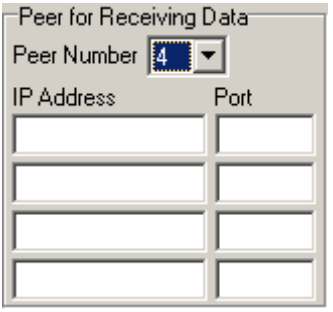
Data Idle Timeout

The default is 60 seconds. If you want to keep connection continually, you can key-in "0". Data idle Time is the time period in which the device waits for data. If the EDG-4516(R)+ and EDG-4508(R)+ does not receive data over an established idle time, the EDG-4516(R)+ and EDG-4508(R)+ will disconnect temporarily. When the data comes to the EDG-4516(R)+ and EDG-4508(R)+, it will reconnect automatically. Users do not need to reconnect.

Peer Number

Set the number of network device which you want to connect.





IP Address

IP address of network devices which you want to connect.

Port

Another TCP port of network devices which you want to connect.

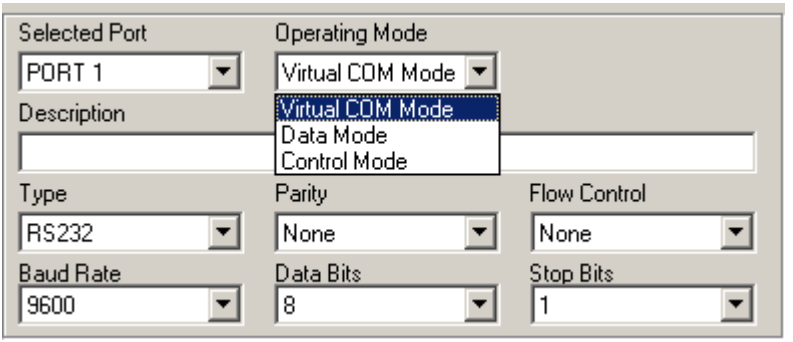
3.6.3 Control Mode

In controlling mode, the EDG-4516(R)+ and EDG-4508(R)+ present a modem interface to the attached serial device: it accepts AT-style modem commands to connect / disconnect to other networking device. If you want serial device running application program to connect/disconnect to different devices dynamically, you can use controlling mode.

The controlling mode provides three modem AT-style commands. The serial devices can use these commands to control EDG-4516(R)+ and EDG-4508(R)+ to connect/disconnect to remote networking device.

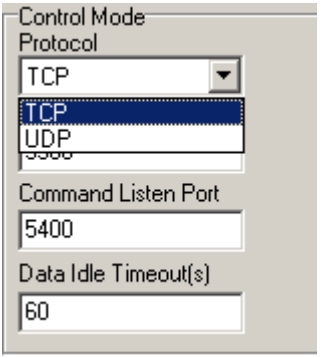
Thus, intelligent serial devices such as stand-alone PLC will send /receive data to/from devices one by one via Ethernet.

You might select Data mode and setup port attributes



Protocol

EDG-4508/16 provides TCP/IP and UDP two protocols. In settings, you can choose either TCP mode or UDP mode according to your application.



Data Listen Port

Each port has its own data listen port to accept connected request of other network device. So, the data listen port can't be set the same value. You can transmit/receive data to/from device via the data listen port.

Command Listen Port

Each port has its own command listen port to accept connected request of other network device. So, the command listen port can't be set the same value. You can use 'AT command' to change the port setting via the command listen port.

Data Idle Timeout

The default is 60 seconds. If you want to keep connection continually, you can key-in "0".

The following commands are available for EDG-4516(R)+ and EDG-4508(R)+.

Command	Function
ATDT<IP address> <TCP port> <CR>	"Forms a TCP connection to the specified host. Ex: ATDT 192.0.55.22:5201 In above example, the EDG-4516(R)+ and EDG-4508(R)+ forms a raw TCP connection to the networking device (192.0.55.22). The TCP port is 5201."
ATA <CR>	Answering an incoming call
+++<CR>	Returns the user to the command prompt when entered from the serial port during a remote host connection.

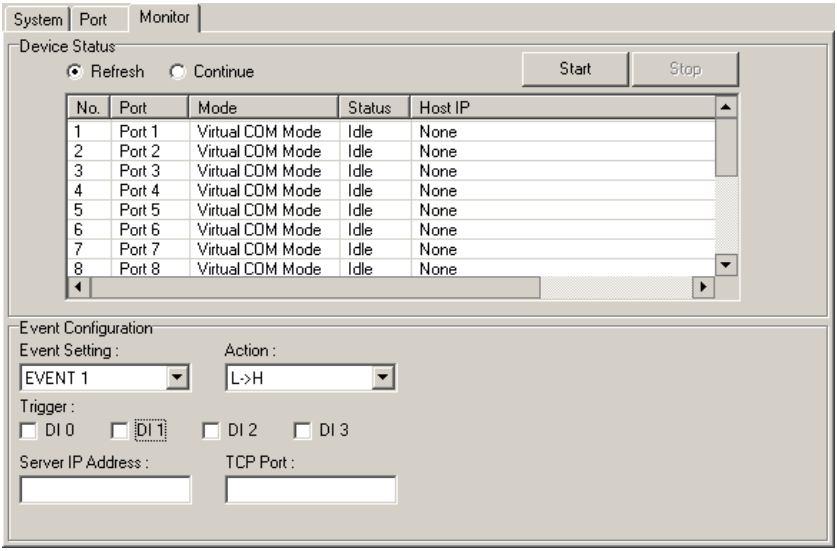
The following table illustrates the response.

Command	Function
<LF><CR> OK <LF><CR>	Commands are executed correctly
<LF><CR> CON-NECT <LF><CR>	Connect to other device
<LF><CR> RING ddd.ddd.ddd<LF>< CR>	Detect the connection requesdt from other device, which IP address is ddd.ddd.ddd.ddd.
<LF><CR> DIS-CONNECT <LF><CR>	Disconnect from other device
<LF><CR> ERROR <LF><CR>	Incorrect commands
<LF><CR> FAIL <LF><CR>	If you issu an ATDT command and can not connect to the device, it will response “FAIL”.

3.7 Monitor and Event Configuration

3.7.1 Device Status

EDG Configuration utility II provide an excellent function to monitor the virtual serial port status. User can check the serial port health.



Refresh

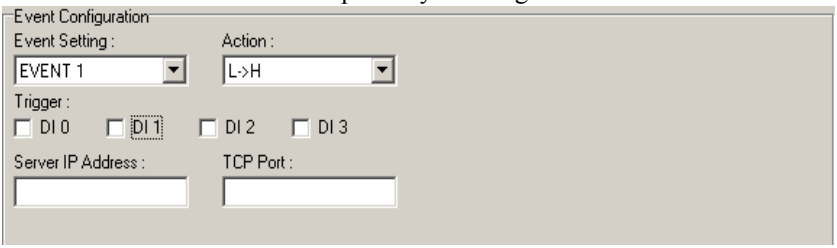
Update port status manually when you click ‘Start’ button.

Continue

Update port status automatically every 10 seconds unless you click ‘Stop’ button.

3.7.2 Event setting

EDG-4508(R)+/EDG-4516(R)+ provide 4 events with comparison and different server IP and Port. The event will be activated when any one of DI signals that you specified meets the 'Action' option. The event will be monitored on the Host and port of your assignment.



Event Setting

Specify which event of the device is to be set.

Action

There are three options: L->H, H->L or Change.

L->H: Low to High

H->L: High to Low

Change: status change

Trigger

Specify which DI you want to monitor.

Server IP Address

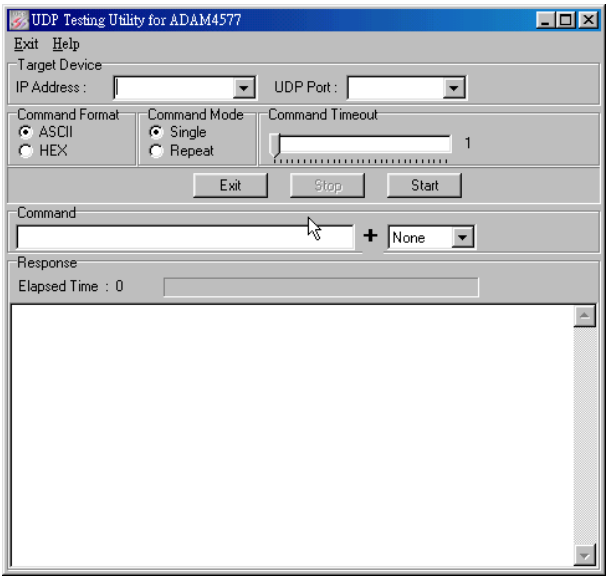
IP address of network device which you want to connect.

TCP Port

TCP port of network device which you want to connect.

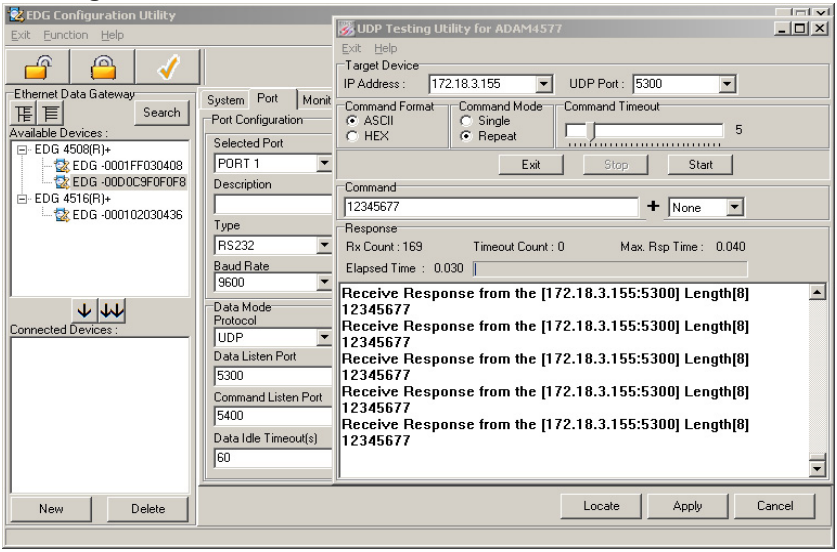
3.8 UDP Testing Utility

The utility is for testing the status of ADAM-4577 UDP mode. It is also suitable for testing the UDP Data mode of EDG-4516(R)+ and EDG-4508(R)+. By the utility, you can set Command Timeout to test the status of UDP network architecture.



In this section, we will describe the function by item in the UDP Testing Utility.

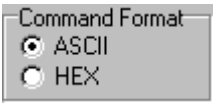
Target Device & UDP Port



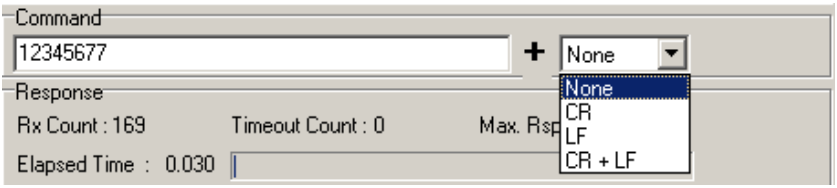
You can set Target Device IP Address according to Network IP Address in Configuration Utility. And UDP Port is depended on Setting Listen on UDP Port in Configuration Utility. “UDP Port” value is equal to “Listen on UDP Port” value plus one. For Example: If your Listen on UDP Port is setting 5300, UDP Port in UDP Testing Utility must set 5300.

Command Format

This option have two choices, one is ASCII and another is HEX. This will decide Command blank what to display.



You can choose None, CR, LF, CR+LF to test.



The command edit control can be inputted in ASCII code ast choose ASCII Command Forma, and the command edit control can be inputted in HEX format as choose HEX Coomand.

Command Mode

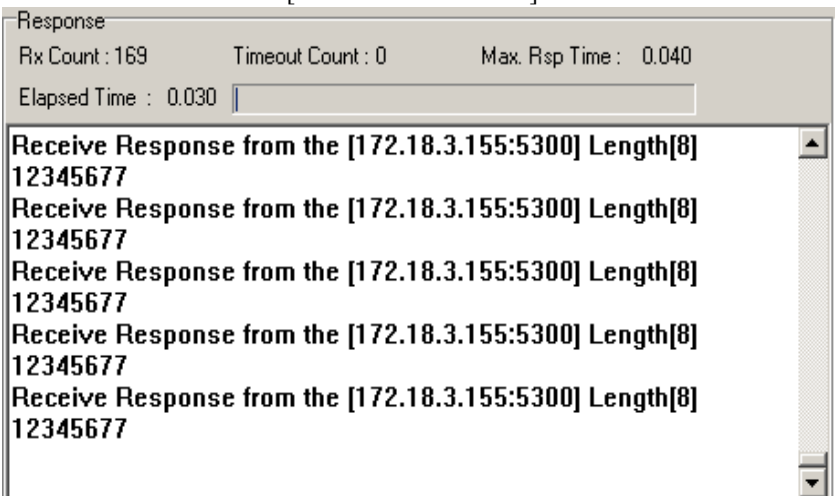
Single Mode means command is running only one time to test UDP Mode. Command is running repeatedly to test UDP Mode as you choose Repeat Mode.

Command Timeout

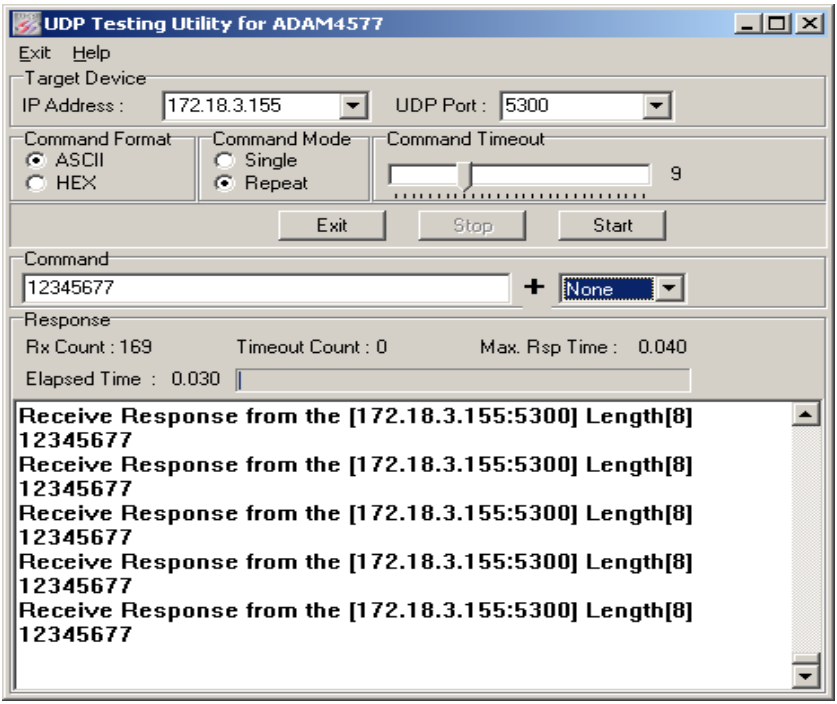
The "Timeout" is the Host PC waiting time from EDG-4508(R)+/EDG-4516(R)+, in this period Host PC doesn't receive any response from EDG-4508(R)+/EDG-4516(R)+, it will display "Timeout" as setting time is over.

For Example, if setting Command Timeout is 12 sec., Host PC will wait EDG-4508(R)+/EDG-4516(R)+ response until 12 sec. is over. As 12 sec. is over, Host PC did not receive any response from EDG-4508(R)+/EDG-4516(R)+ , it will appear the following frame :

Send Command to the [IP Address : UDP Port] Timeout



Following Frame is UDP Testing Utility is running test as UDP responses well.

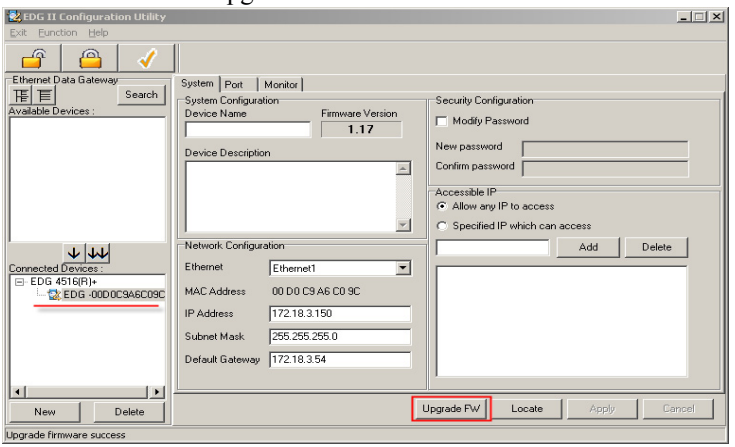


3.9 Updating EDG Firmware

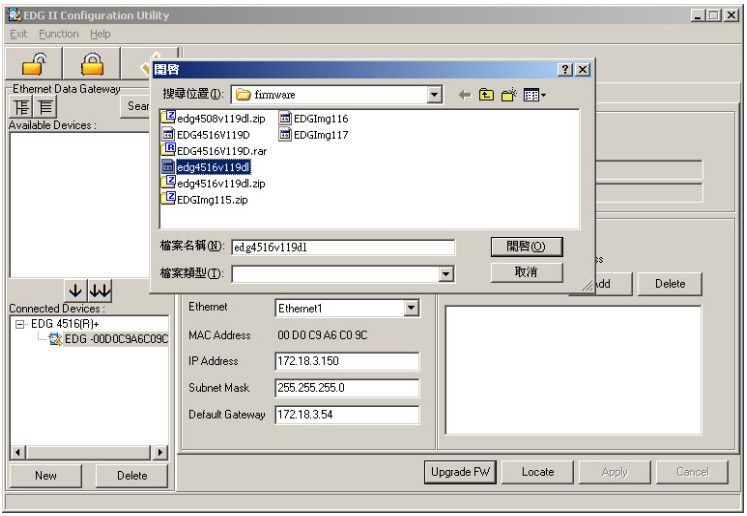
Advantech continually upgrades its firmware. You can use the download function located on the COM Port Configuration utility to carry out the upgrade procedure. Please access www.advantech.com to download the required file and then follow these instructions.

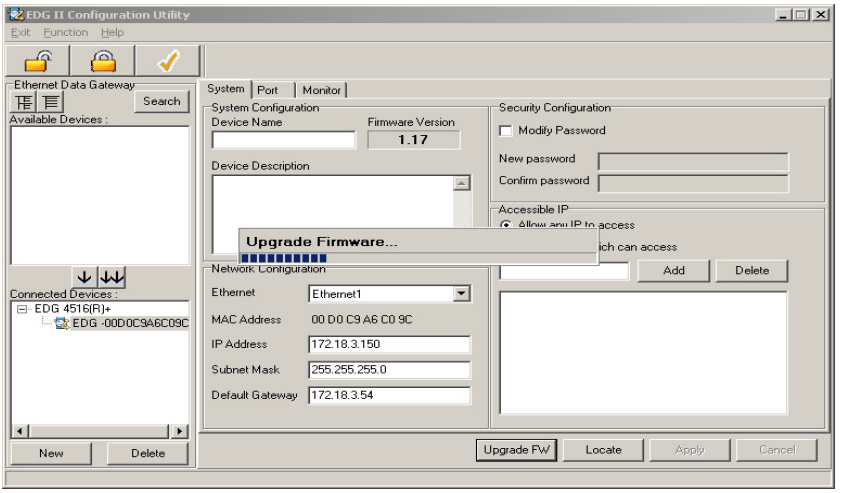
You have to move the device to Connected Device group, and then you can use download firmware function

1. Click on the Upgrade FW button

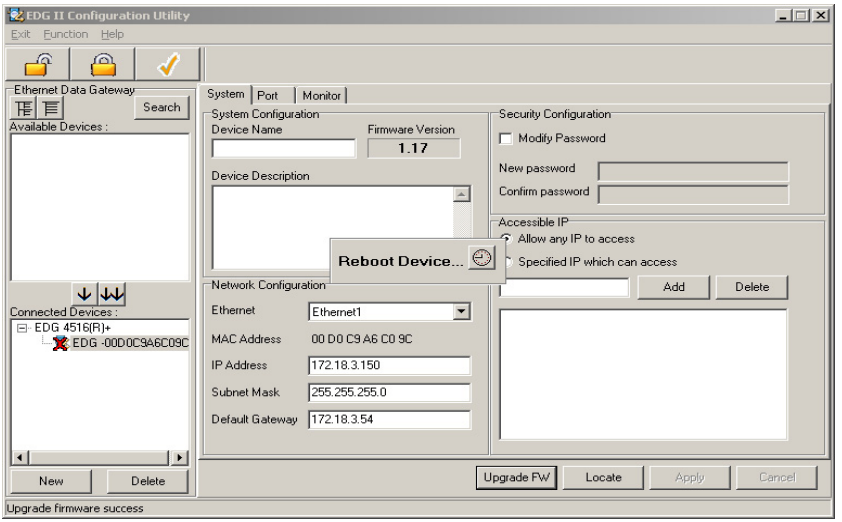


2. Locate and select the firmware that you want to download.





3. After the firmware have been downloaded into the EDG device, this device will reboot and enable the new firmware.



CHAPTER 4

Port Mapping Utility

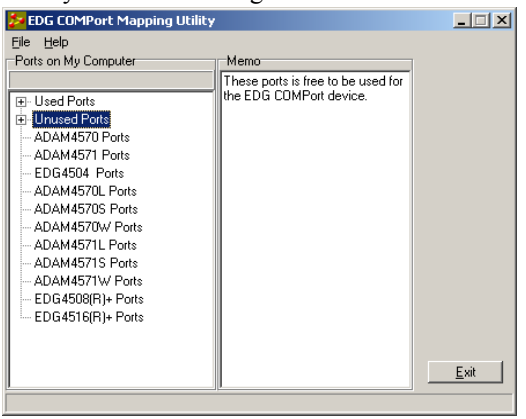
Chapter 4 Port Mapping Utility

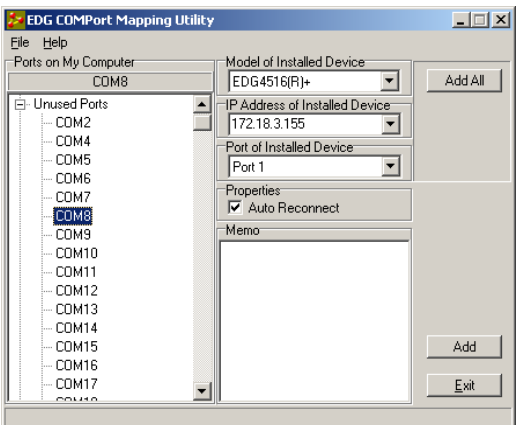
4.1 Overview

The purpose of the port mapping utility is to help you manage all ports on one Windows NT/2000/ME/XP platform. The utility displays three types of ports: used ports, unused ports and EDG ports. Please follow the Virtual COM port setting steps.

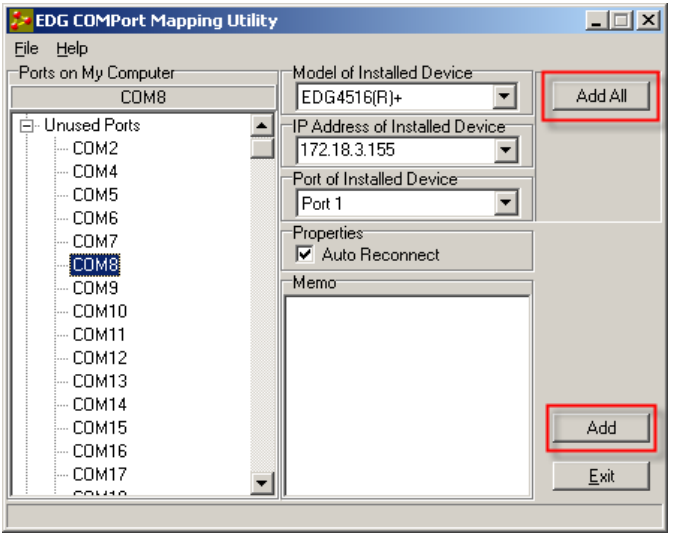
4.2 Virtual COM Port Settings

1. Click "+" at "Unused Ports" to expand the unused port lists, and select the port that you want to configure.





2. Click the 'Add' button to assign a COM port to an EDG device. You might click 'Add All' button to assign the COM ports the EDG device. The COM ports number depends on the model of installed device that you selects.



Module of Installed Device

You can choose between all connected EDG devices. In this example, EDG-4516(R)+ was chosen.

IP Address of Installed Device

Enter the IP address you assigned prior.

Port of Installed Device

Choose the port where you want to setup: 8 ports for EDG-4508(R)+ and 16 ports for EDG-4516(R)+.

Properties (Auto Reconnect Function)

Sometimes, the connection between EDG device and HOST is interrupted by network traffic or powered-off by accident. In such a situation, the host have to reconnect to EDG device.

The function "Auto-reconnect" is for this purpose, If the EDG device loses the connection to its host, the VCOM driver will try to re-establish the connection while the HOST AP access the VCOM port. The driver DO NOT re-establish the connection automatically. When the connection is working again, the host's commands will be automatically received by the EDG Series again. Reconfiguration is not necessary, so this function enhances the reliability of the system.

if the function is disabled, the connection can not be re-established again unless the VCOM driver or HOST is restarted.

Memo

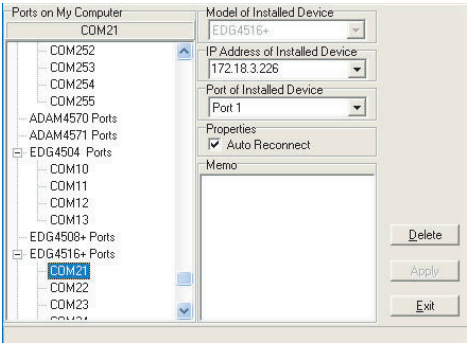
You can add a description to the port setting if necessary.

Add

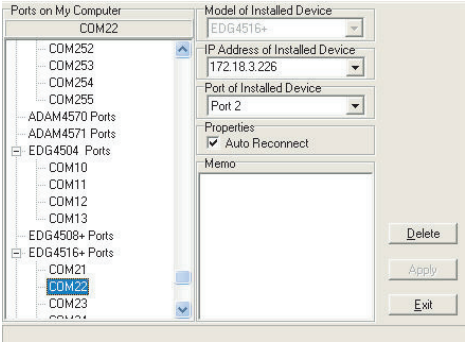
Click here to add a single port setting to your specification.

Add All

You can assign all ports to follow current settings by clicking the "Add All" button. This is more convenient than adding ports individually. For this example, we have selected COM21 and made all necessary settings for Port 1 of EDG-4516+. After clicking on the "Add All" button, the COM Port Mapping Utility will assign the COM21 ~ COM36 mapping to Port 1 ~ Port 16.

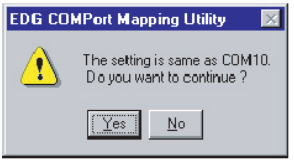


(COM21 is mapping to Port 1 of EDG-4516+)



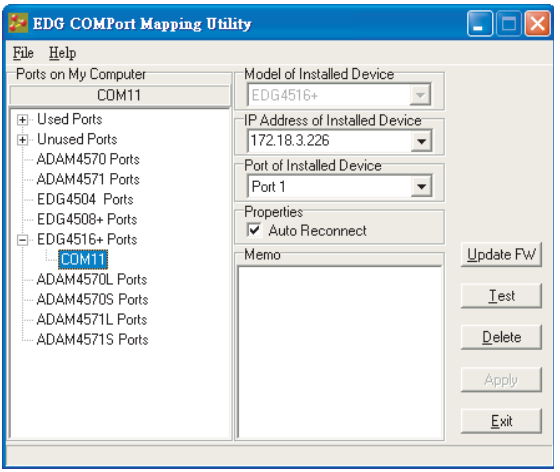
(COM22 is mapping to Port 2 of EDG-4516+)

Note *If you assigned a different COM port to the same EDG series module port, the following dialog box will remind you.*



4.3 Inquiring Virtual COM Port Setting

You can check the virtual COM port setting by clicking on the EDG device's ports. In this case, COM11 is assigned to Port 1 of EDG-4516+.

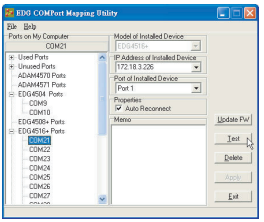


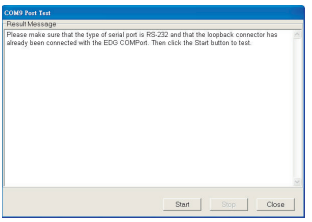
4.3.1 Self Test Function

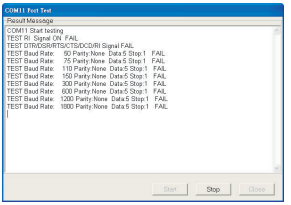
Test

The purpose of this test is to confirm that the communication from the host PC to the EDG device is OK. When the test is selected, an external test will be performed to check that the connection signal between each port is working properly. For this test, you will need to connect each port to a Loopback tester. Refer to the following chart for specifications of this Loopback tester. The Loopback test only applies to RS-232 mode. It is divided in two parts: Signal test and Communication Parameters test.

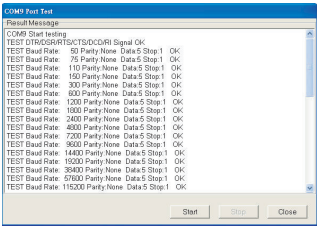
1. Click on the Test button in the Port Mapping utility. A message will confirm that the loopback connector have already been connected with the EDG COM port. If ready, click the Start button to start the test.







Test Fail (Without Loopback Connector)



Test ok

Signal Test

- RTS->CTS: Checks the RTS and CTS signals between two ports.
- DTR->RI: Checks the DTR and RI signals between two ports.
- DTR->DSR: Checks the DTR and DSR signals between two ports.
- DTR->DCD: Checks the DTR and DCD signals between two ports.

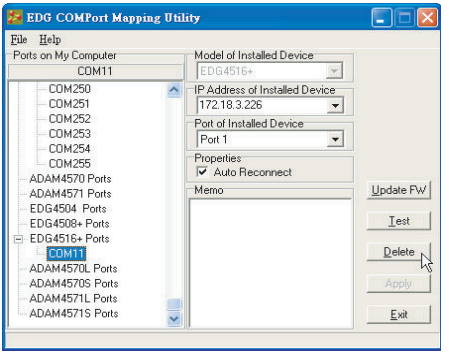
Communication Parameters Test

- Baud rate: From 50 bps to 230 kbps
- Data bits: 5, 6, 7, 8
- Stop bits: 1, 1.5, 2
- Parity: odd, even, none, space, mark

2. Click the OK button to return to the port mapping window. All the ports in the EDG Series are tested ok.

Delete

You can delete Port Mapping Setting by clicking the button.



Apply

If any changes are made, please press the button to confirm your modifications.

Exit

If you want to quit the utility, you might click < Exit > button or <X> on the right top of this window. A new enhancement is implemented from version 1.40 Build137. If any changes are made in the COM Port Mapping setting, your changes will work while you exit COM Port Mapping. Sometime, the system reboot requirement might show up.

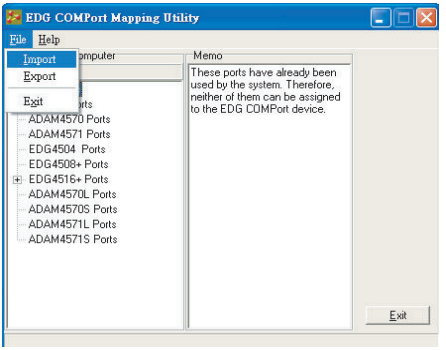
Note	*If you change the COM port setting and the COM is used by AP, the COM Port Mapping utility will crash and you might get the 'Blue Screen'. This is because the COM resource is occupied by OS system, COM port Mapping utility try to remove it and unauthorized accessing occur.*

4.3.2 Save the Configuration

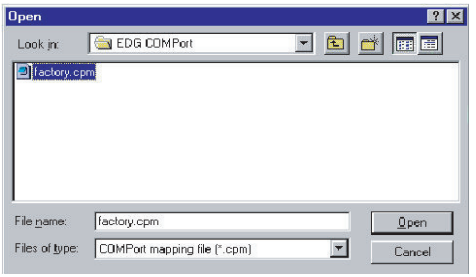
If you want to save or recover the configuration, you can select the "Import/Export" items.

1. a. Select "File"

   b. Select "Import" or "Export".



2. Save or open the configurations



CHAPTER 5

Web-Based Configuration

Chapter 5 Web-Based Configuration

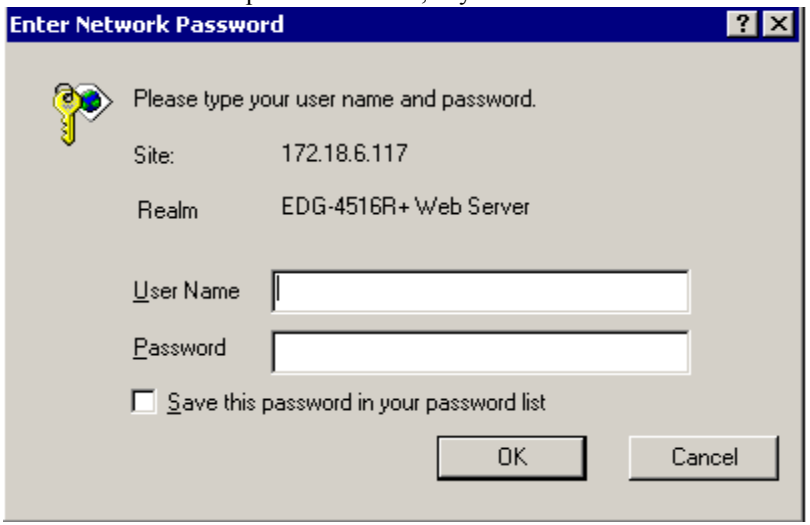
5.1 Overview

EDG devices can be configured through a web interface. By using a standard web browser, the same procedure as with the Windows configuration utility can be used. In the browser's address field, enter the IP Address of your EDG device. The default IP setting is 10.0.0.1, but you should use the IP which you have previously assigned for this device. Once the IP is entered, you will be presented with the following windows.

5.2 Access Web Page

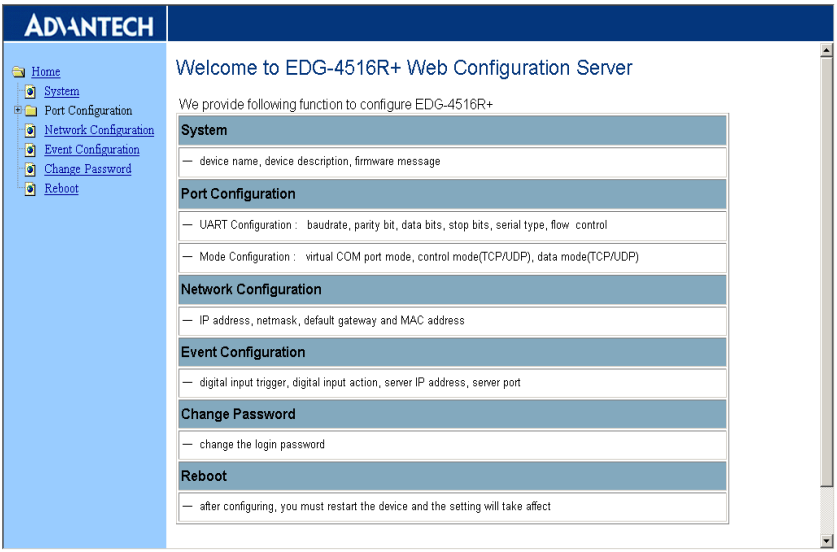
Step 1. Enter ID and Password

The default ID and password is root, key this into both fields..

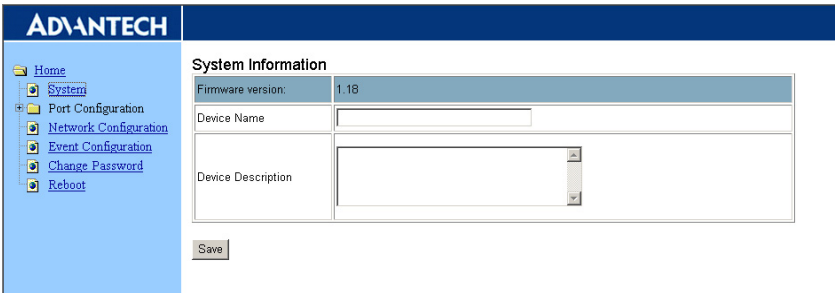


Step 2. Web Based Configuration Welcome

After authorization, the first page will be displayed.



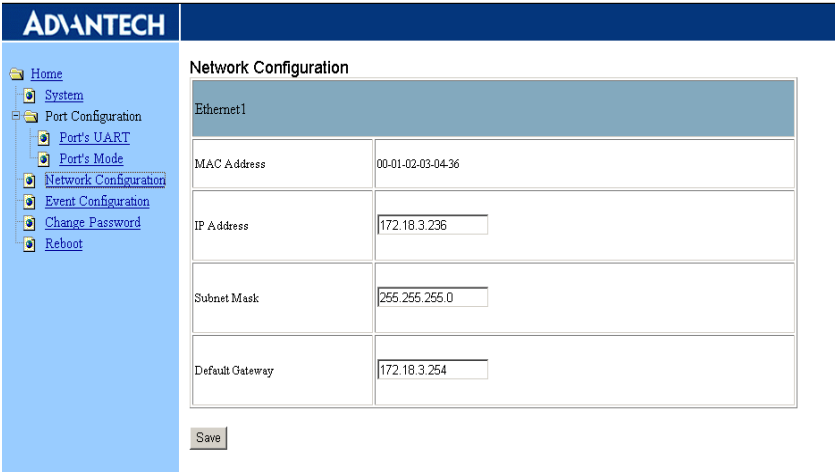
You can change the Device Name and Device Description on this page. Press 'Save' to store the settings.



5.3 Network Configuration

Click network configuration, there are: MAC address, IP Address, Subnet Mask and Default Gateway. Enter the corresponding values for your network environment.

Step 1. Enter IP Address, Subnet Mask and Default Gateway

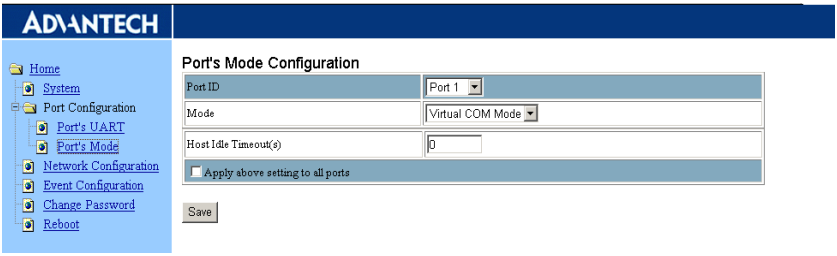


Step 2. Press 'Save' to store the settings.

Note:	*All new configurations will take effect after reset. The reset function is located on the main menu of the Web Configuration.*

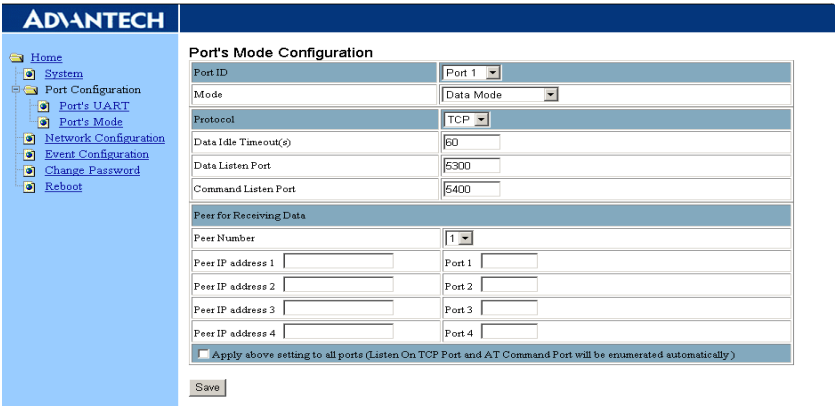
5.4 Port Configuration

Under port configuration – Port's Mode, you can setup the mode for individual ports. There are three modes Virtual COM mode, Data mode, and Control mode. While you select VCOM mode, you also setup HOST Idle option here.



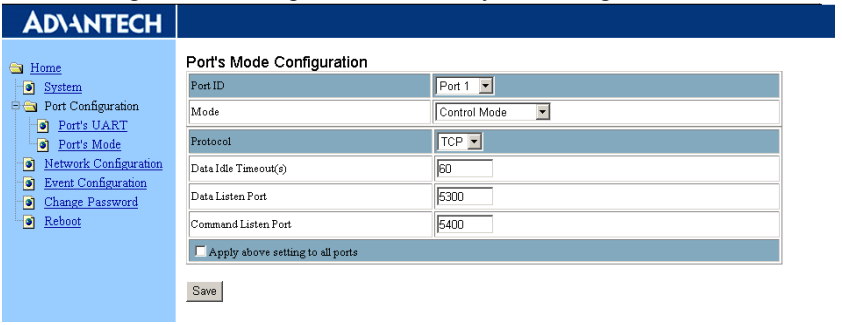
5.4.1 Data Mode

You might refer to chapter 3.6.2 to clarify the setting.



5.4.2 Control Mode

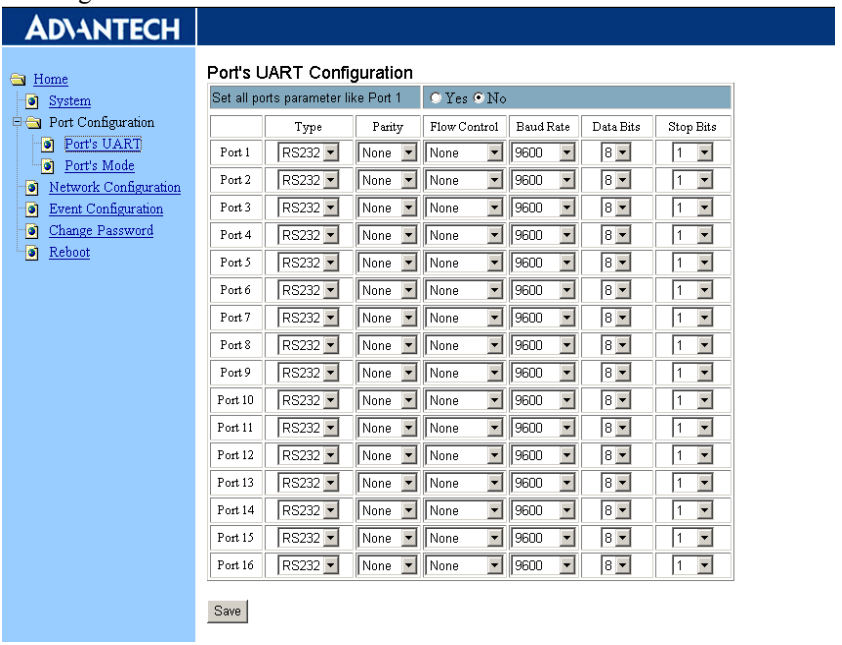
You might refer to chapter 3.6.3 to clarify the setting.



5.4.3 Port UART setting

You can as sign the Type, Parity, Flow Control, Baud Rate, Data Bits, and Stop Bits.

You might enable the 'Set all ports parameter like Port 1' and others setting will set as same as Port 1.



5.5 DI/O Event Configuration

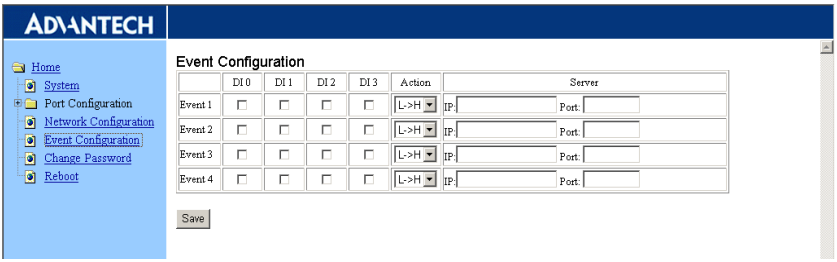
In event configuration, you can assign a DI event by enabling the check box and choosing the optimized action mode, Server IP and TCP Port for the active event. You can setup 4 events with comparison and different IP and Port. The event will be activated when any one of DI signals that you specified meets the 'Action' option. The event will be monitored on the Host and port of your assignment.

Action option:

L->H: Low to High

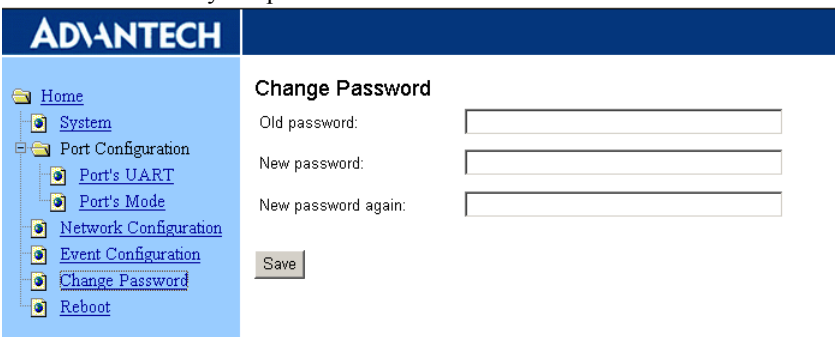
H->L: High to Low

Change: status change



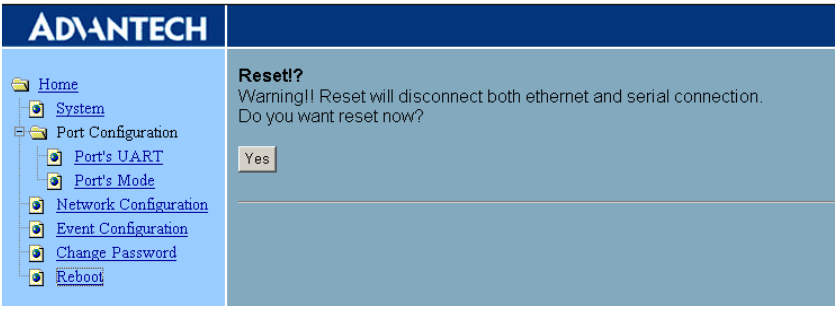
5.6 Change Password

You can modify the password.



5.7 Reset Configuration

The configuration will take effect after clicking < Save> button. But all configurations will save to flash memory after this reset step. Press the reset button and the system will give a reset response. It will take a few seconds to reconnect with the new values.



CHAPTER 6

Console Configuration

Chapter 6 Console Configuration

6.1 Overview

The purpose of the Console Configuration is to help you manage your device in console mode. One of the main functions of the console mode is to change the web configuration login password. You can use terminal software like Hyper Terminal, Telix and other related terminal software.

6.2 Hyper Terminal Connection

Step 1. Connecting the cable

You can connect to the EDG device's console port with a RS-232 DB9 M-type communication cable, with the other end connecting to the host's serial port. Make sure the connection is OK and then run the Hyper Terminal Program on your host.

Step 2. Creating a new connection

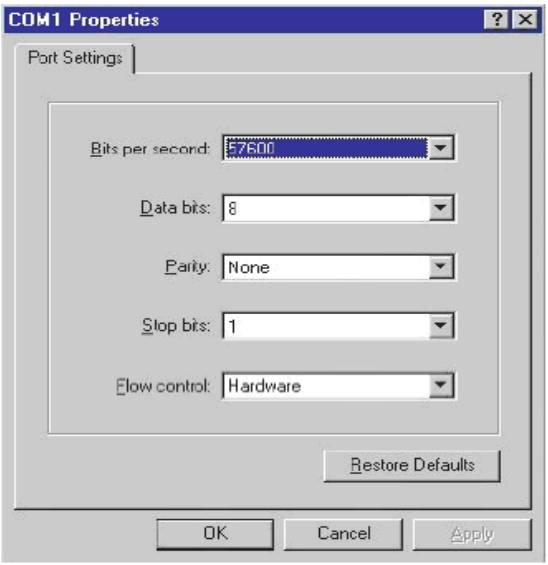
You can create a new connection and assign a connection name for the console configuration.

Step 3. Selecting a COM Port

Confirm that the console configuration works ok.

Step 4. COM Port Setting

To connect the EDG series for console configuration, the port setting should match the EDG series' default setting.



Console Configuration Default Setting

Baud Rate: 57600

Data Bits: 8

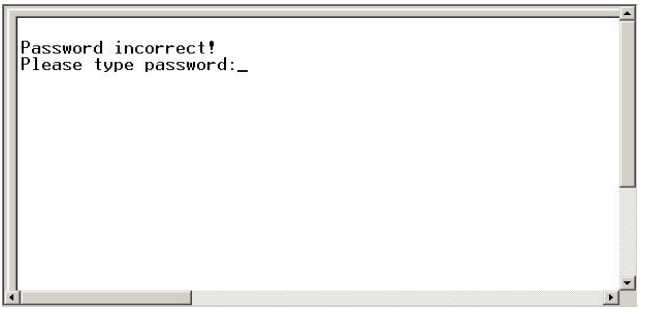
Parity: None

Stop Bits: 1

Flow Control: None

Step 5. Connecting Successfully

After connecting the device in console mode, you can simply type the password to entry the consol configuration.



6.3 Command List

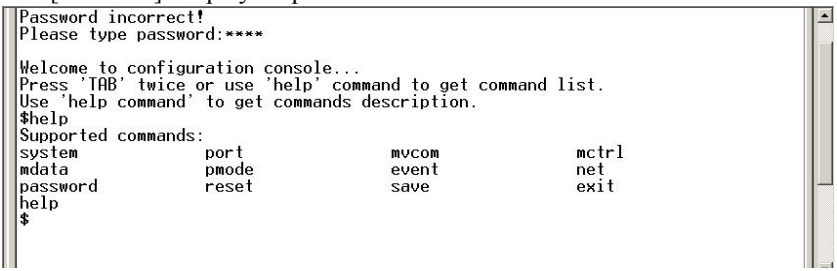
Command	Function
system	Show or configure device name and information
port	Show or configure ports information
mvcom	Show or configure all port mode and mode information
mctrl	Show or configure port mode and mode information
mdata	Show or configure port mode and mode information
pmode	Show port mode
event	Show or configure the event status and information
net	Displays or configure the net configuration
password	Set password
reboot	Write settings to flash memory and reboot the system immediately
save	Save the settings right now.
exit	Terminate shell session
help	Display help information of command list
<TAB><TAB>	Display help information of command list

Help

You might type "help" command or press <Tab> twice to show the Supported Command Lists.

[Usage] Help

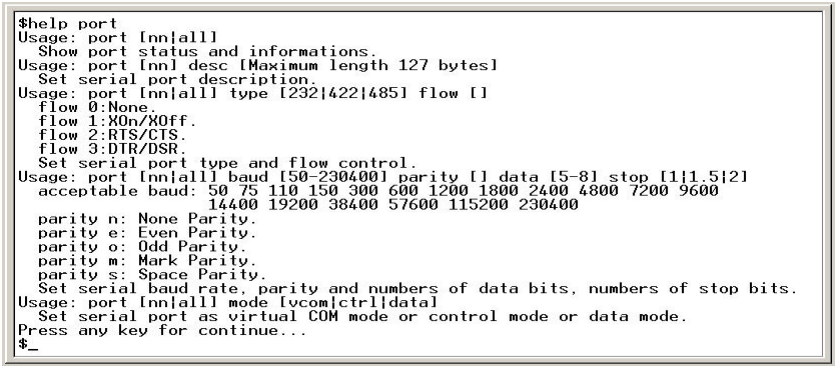
[Function] Display help information of command lit



You might use “help” command to show the usage of command.

[Usage] help command

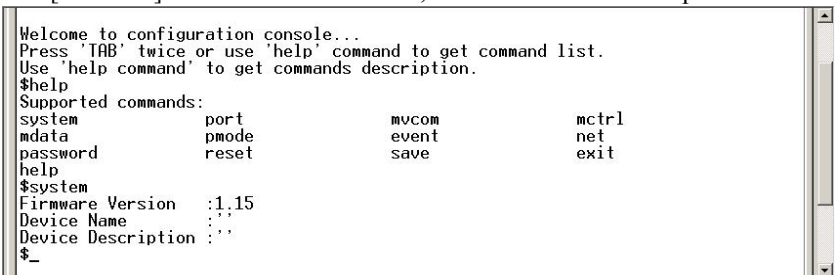
[Function] Show the usage of command.



System

[Usage] system

[Function] Show firmware version, device name and description



[Usage] system name xxxx

[Function] configure the device name [xxxx: maximum length 31 bytes]

[Usage] system desc xxxx

[Function] setup the device description [xxxx: maximum length 127 bytes]

Port

'Port' is a complex command to show port information and configure port setting.

```
$help port
Usage: port [nn|all]
  Show port status and informations.
Usage: port [nn] desc [Maximum length 127 bytes]
  Set serial port description.
Usage: port [nn|all] type [232|422|485] flow []
  flow 0:None.
  flow 1:XOn/XOff.
  flow 2:RTS/CTS.
  flow 3:DTR/DSR.
  Set serial port type and flow control.
Usage: port [nn|all] baud [50-230400] parity [] data [5-8] stop [1|1.5|2]
  acceptable baud: 50 75 110 150 300 600 1200 1800 2400 4800 7200 9600
                   14400 19200 38400 57600 115200 230400
  parity n: None Parity.
  parity e: Even Parity.
  parity o: Odd Parity.
  parity m: Mark Parity.
  parity s: Space Parity.
  Set serial baud rate, parity and numbers of data bits, numbers of stop bits.
Usage: port [nn|all] mode [vcom|ctrl|data]
  Set serial port as virtual COM mode or control mode or data mode.
Press any key for continue...
$_
```

[Usage] port nn

[Function] Show "nn"nd port or all ports information

```
$
$
$
$
$
$
$
$
$
$port
*****************************************************************
Serial Port 1 Information
Description :
Type         : RS-232          Baudrate    : 115200
Flow Control: None             Data Bits   : 8
Stop Bits    : 1               Parity      : None
Mode         : Data Mode

Data Idle TimeOut(s) : 60
Data Listen Port     : 5300
Command Listen Port  : 5400
Peer for Receive Data
Peer Number : 1
Press any key to continue...
```

[Usage] port nn desc xxxx

[Function] configure "nn"nd port description, [xxxx: maximum length 127 bytes]

[Usage] port nn type 232|422|485 flow 0|1|2|3

[Function] setup serial type and flow control

Flow 0: None

Flow 1: XOn/Xoff

Flow 2: RTS/CTS

Flow 3: DTR/DSR

[Usage] port nn baud xx parity n|e|o|m|s data 5|6|7|8 stop 1|1.5|2

[Function] setup serial baud rate, parity check, data bit, and stop bit.

Acceptable baud rate setting:

Parity n: None parity

Parity e: Even parity

Parity o: Odd parity

Parity m: Mark parity

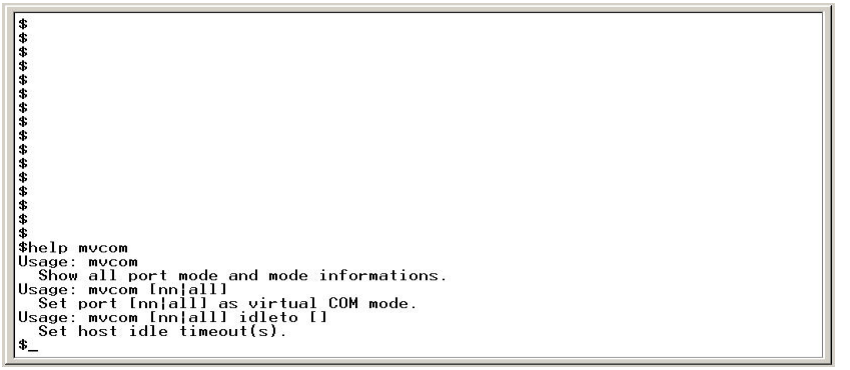
Parity s: Space parity

[Usage] port nn mode vcom|ctrl|data

[Function] configure serial port as virtual COM mode, Control mode, and Data mode.

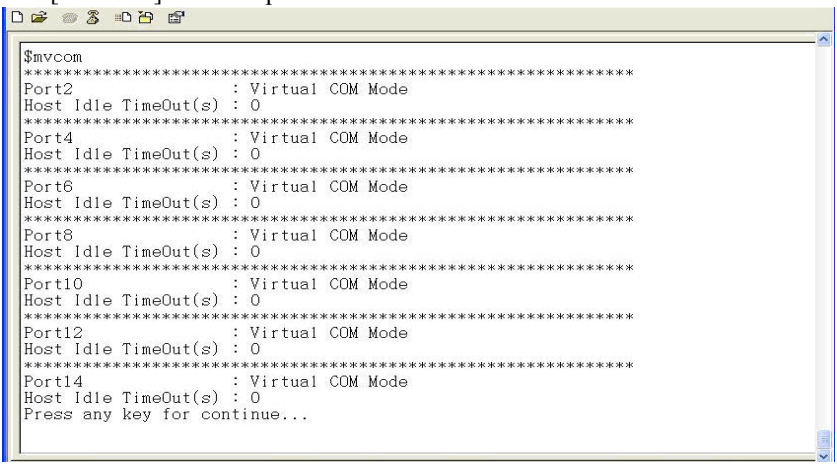
mvcom

Show and setup COM ports mode



[Usage] mvcom

[Function] show all ports



[Usage] mvcom nn|all

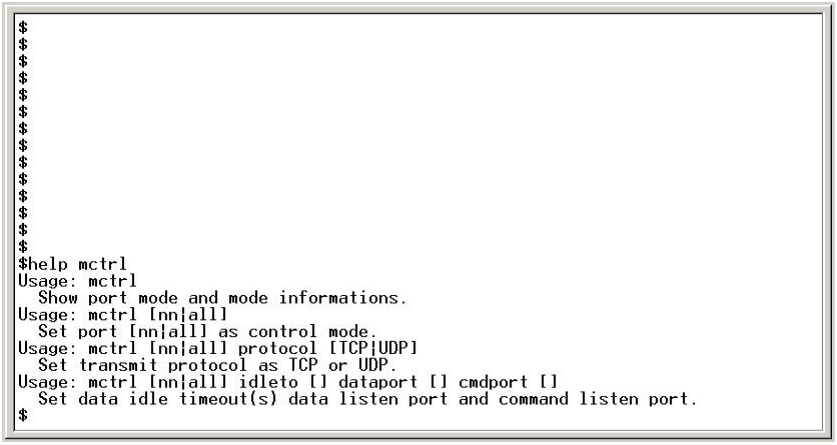
[Function] setup “nn”nd port or all ports as Virtual COM mode.

[Usage] mvcom nn|all idleto xx

[Function] configure host idle time.

mctrl

Show and setup Control mode



[Usage] mctrl

[Function] show port mode

[Usage] mctrl nn|all

[Function] setup “nn”nd port or all ports as Control mode.

[Usage] mctrl nn|all protocol TCP|UDP

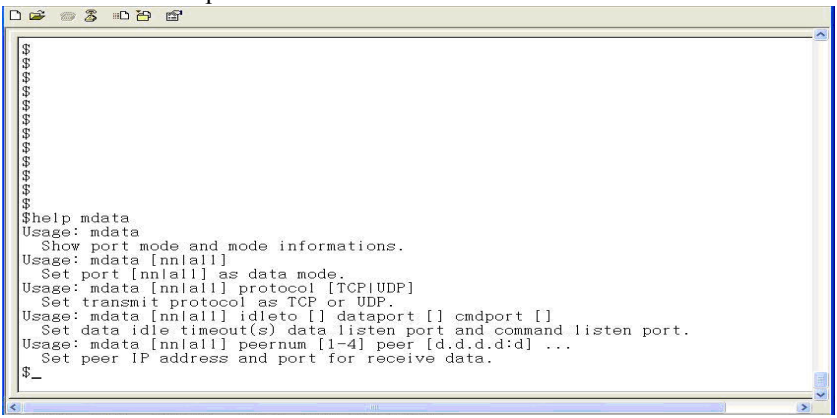
[Function] setups transmit protocol as TCP or UDP.

[Usage] mctrl nn|all idleto x data port xxxx cmdport xxxx

[Function] setup data idle timeout, data listen port and command listen port.

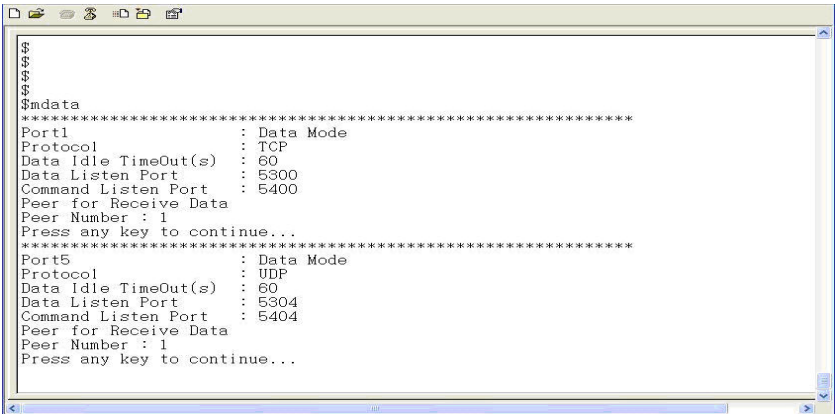
Mdata

Show and setup Data mode



[Usage] mdata

[Function] show port mode



[Usage] mdata nn|all

[Function] setup “nn”nd port or all ports as Data mode.

[Usage] mdata nn|all protocol TCP|UDP

[Function] setups transmit protocol as TCP or UDP.

[Usage] mdata nn|all idleto x data port xxxx cmdport xxxx

[Function] setup data idle timeout, data listen port and command listen port.

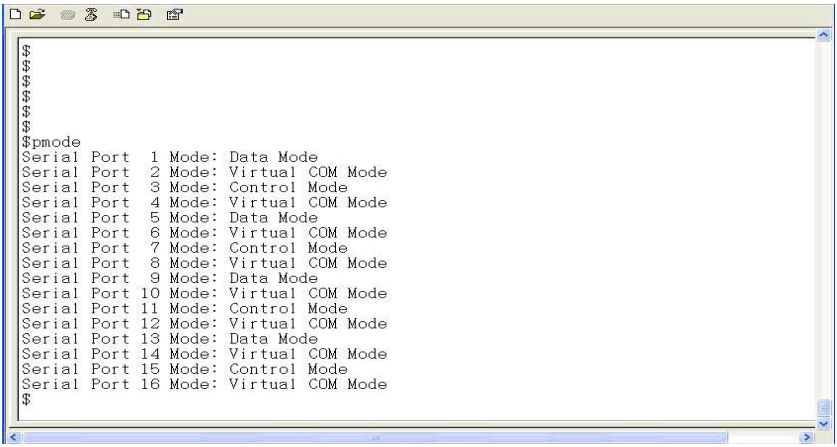
[Usage] mdata nn|all peernum 1|2|3|4 peer xxx.xxx.xxx.xxx:ppp

[Function] setup peer IP address and port for receive data.

pmode

[Usage] pmode

[Function] show port’s mode.



Event

[Usage] event

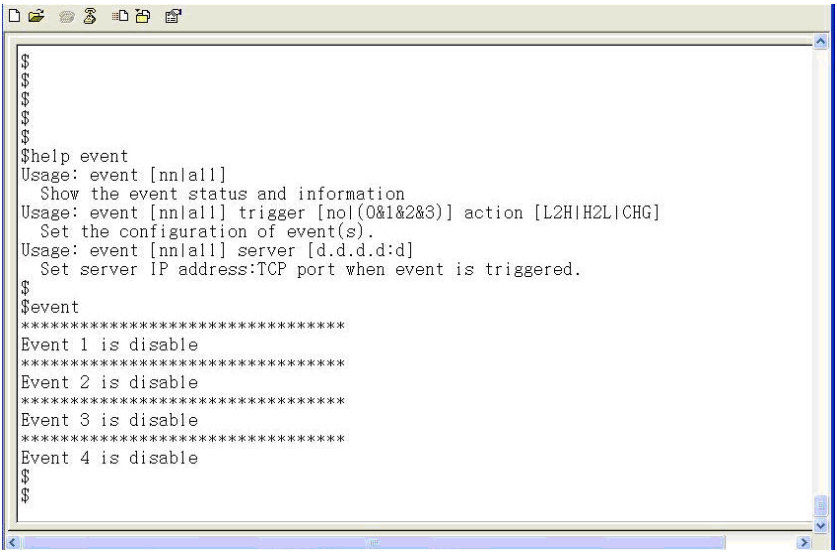
[Function] show the event's status and configuration

[Usage] event nn|all trigger no|0&1&2&3 action L2H|H2L|CHG

[Function] setup the event(s)

[Usage] event nn|all server xxx.xxx.xxx.xxx:ppp

[Function] setup server IP address and TCP port.



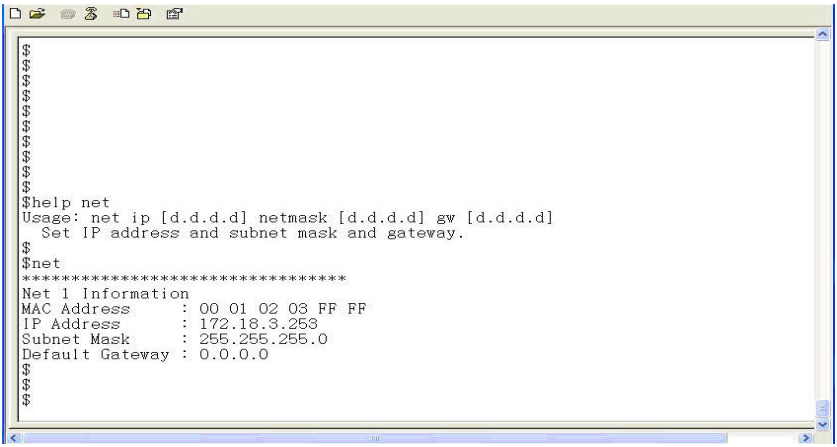
net

[Usage] net

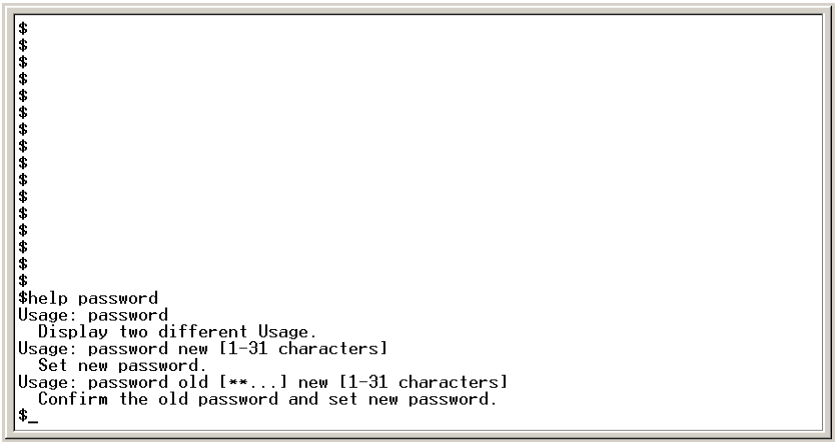
[Function] show the MAC address, IP address, Subnet Mask, and default gateway.

[Usage] net ip xxx.xxx.xxx.xxx netmask xxx,xxx,xxx,xxx gw xxx,xxx,xxx,xxx

[Function] setup IP address and subnet mask and default gateway.



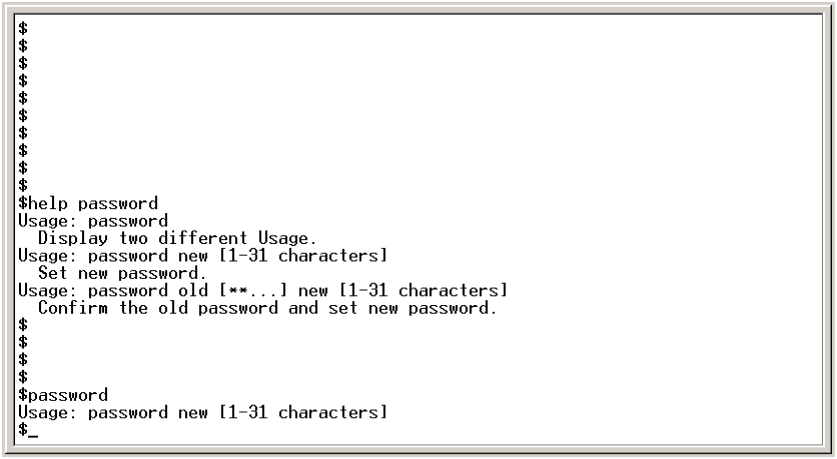
password



If the password is empty, you might input the new password.

[Usage] password new [1~31 characters]

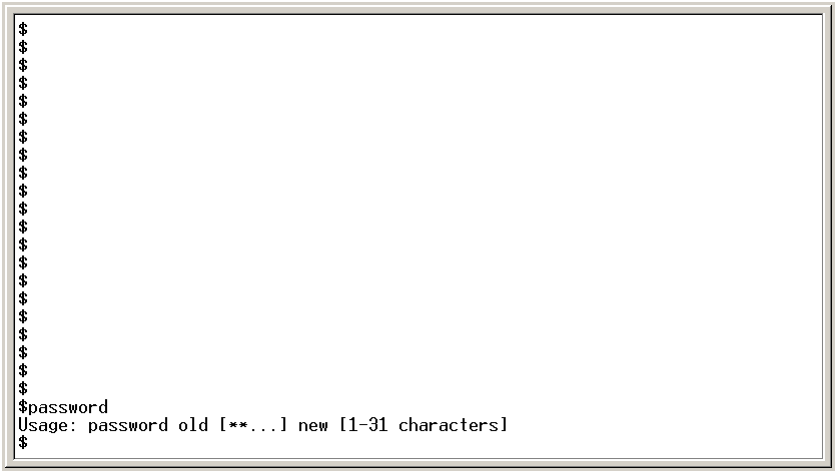
[Function] setup new password.



If the password is existed, you have to input the existed password and new password.

[Usage] password old [existed password] new [1~31 characters]

[Function] replace the existed password with new one.



CHAPTER 7

Event and DI/O Monitoring

Chapter 7 Event and DI/O Monitoring

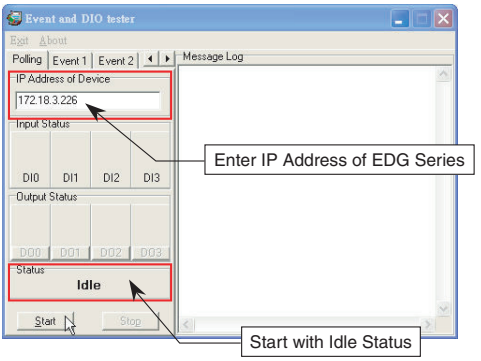
7.1 Overview

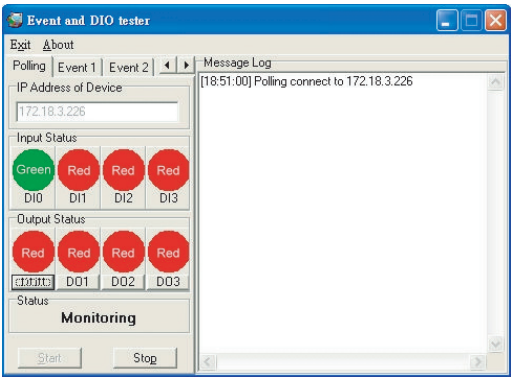
The purpose of Event and DIO Test is to help you monitor your EDG-4508(R)+/4516(R)+ DI/DO event(s). Follow these steps to test the DI/DO event(s).

7.2 Event and DI/O Monitoring

7.2.1 Polling Monitoring

The following screen will appear once the EVENT Tester Program is executed. To start monitoring the Polling, enter the IP Address and press start. The Status will change to Monitoring if you enter the correct IP of your device.

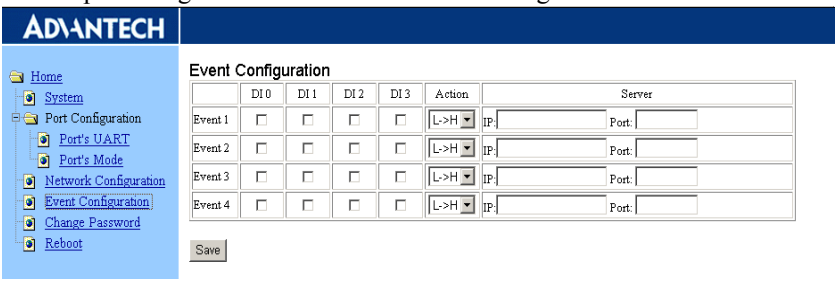




7.2.2 Event Monitoring

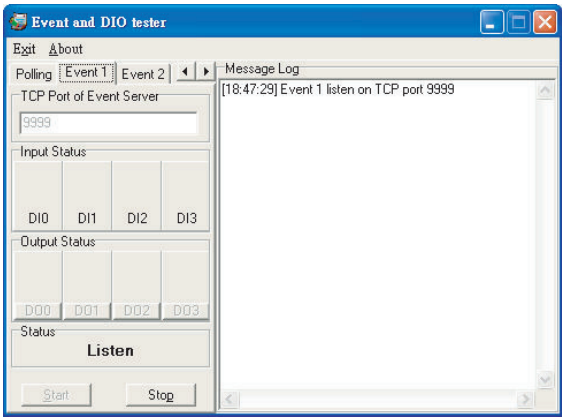
Once you have executed the steps in previous chapters you can use the tester to monitor the event status with the port and IP you have assigned before. Please follow these steps:

Step 1. Assign IP and TCP Port for monitoring



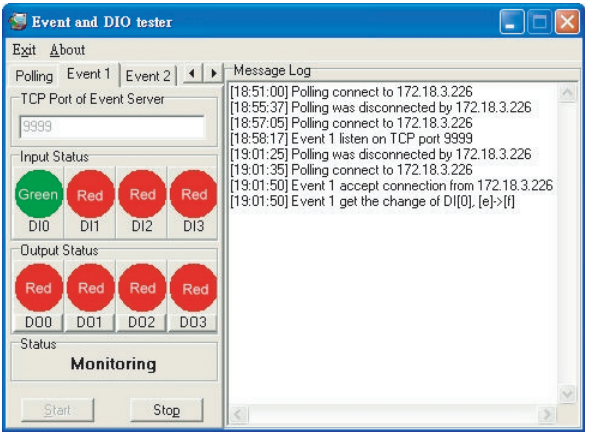
(Setting Event monitoring from Web Event Configuration)

Step 2. Assign TCP Port of Event Server and click on "Start". Event and DIO tester will change to Monitoring Mode. Red indicator in normal mode means Inactive and Green indicator means Active.



(Event Monitoring and no Event Active)

Step 3. We can activate the DI0 event; tester will show the green indicator. Message Log will show event log with timer and event description.



(DI0 Active and Event Monitor Shows Green)

7.3 Programming I/O

According the feature list, it mentioned EDG-4508+/4516+ provide the D/I AND D/O handling function. In order to help customer to create the I/O event handling environment. We provide a programmable I/O sample program for customer use. After installing the EDG COM Port Utility, the sample programs will be on the location as follow:

C:\Program Files\Advantech\EDG COMPort Utility\samples\vc\edgevtio.

How to use the sample files?

(1) The sample programs include following file and the develop environment is based on Microsoft Visual C++.
edgevtio.cpp
edgevtio.dsp
edgevtio.dsw
edgevtio.ncb
edgevtio.opt
edgevtio.plg
mbtcp.h

(2) Compiler the sample program

(3) Run the sample program
After compiler the program and run the program, the system will change to Server mode to trigger any D/I event and sent back to system to active the D/O event.

(4) You can modify the program and create your own event handling process.

(5) Sample files list and description as follow:
edgevtio.cpp : Defines the entry point for the console application.edgevtio.dsp
edgevtio.dsp : Microsoft Developer Studio Project File
edgevtio.dsw : Microsoft Developer Studio Workspace File
edgevtio.ncb : Microsoft C/C++ program database
edgevtio.opt
edgevtio.plg
mbtcp.h

In this sample files, we provide the note for the parameter for programmer use.
For example:
In edgevtio.cpp file content, line 32 to line 41

```
memset(&HostAddr, 0, sizeof(SOCKADDR_IN));
HostAddr.sin_family = AF_INET;
HostAddr.sin_addr.s_addr = INADDR_ANY;
HostAddr.sin_port = htons(5000);
//                  |
//                  +-->The TCP Port in the server application
```

It remarks the function of htons(n), the parameter n means the TCP Port in server application and It helps the programmer to make his own program easier by referencing the note we provided.

```
HostSock = socket(AF_INET, SOCK_STREAM, 0);
//         |
//         +-->Create the socket of TCP on the Host
```

It remarks the function of socket(AF_INET, SOCK_STREAM, 0), the function of socket(var1,var2,n) means to create the socket of TCP on Host. Programmer can also create the socket of TCP on the Host by himself.

edgevtio.dsp

Programmers can choose the develop tools for themselves. For example, in edgevtio.dsp file, the extension file name .dsp means Microsoft Developer Studio Project File. Programmer can open the file as a template to create their own programs.

edgevtio.dsw

File name of edgevtio means EDG Event I/O, extension name of dsw means it is a Microsoft Developer Studio Workspace file. This file is necessary when you open a Developer Studio Project and we make a warning note in file to reminder you not to modify or delete this related workspace file.

mbtcp.h

File name of mbtcp means Modbus TCP; we provide the easier definition of necessary parameter. For example,

```
#define MODBUSTCPMAXMSGLENGTH      288
#define MODBUSTCPMSGHDRLENGTH      6

typedef struct __MODBUSTCPMSG {
unsigned short wTransactionId;
unsigned short wProtocolId;
unsigned char byteMsgLenHigh;
unsigned char byteMsgLenLow;
unsigned char Data[2];
} TMODBUSTCPMSG;
```

MODBUSTCPMAXMSGLENGTH

MODBUS TCP Max Message Length

MODBUSTCPMSGHDRLENGTH

MODBUS TCP Message Header Length

* The programming I/O sample programs are for programmer's reference to make the event I/O program for their own environment. Programmers can open the file as a template file to make a new project of event.

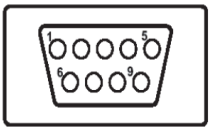
APPENDIX A

Pin Assignments

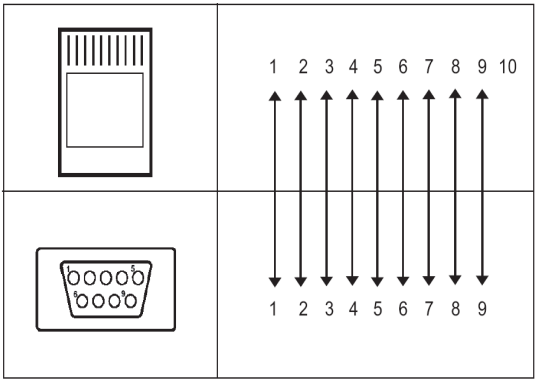
Appendix A Pin Assignments

A.1 RS-232 Pin Assignments

Pin No.	Description
Pin 1	DCD
Pin 2	Rx
Pin 3	Tx
Pin 4	DTR
Pin 5	GND
Pin 6	DSR
Pin 7	RTS
Pin 8	CTS
Pin 9	RI



A.2 RJ-48 Cable PIN Assignments



A.2.1 1. RS-422

Pin No.	Description
1	Tx-
4	Tx+
5	GND
7	Rx+
9	Rx-

A.2.2 2. RS-485

Pin No.	Description
1	Data-
4	Data+
5	GND