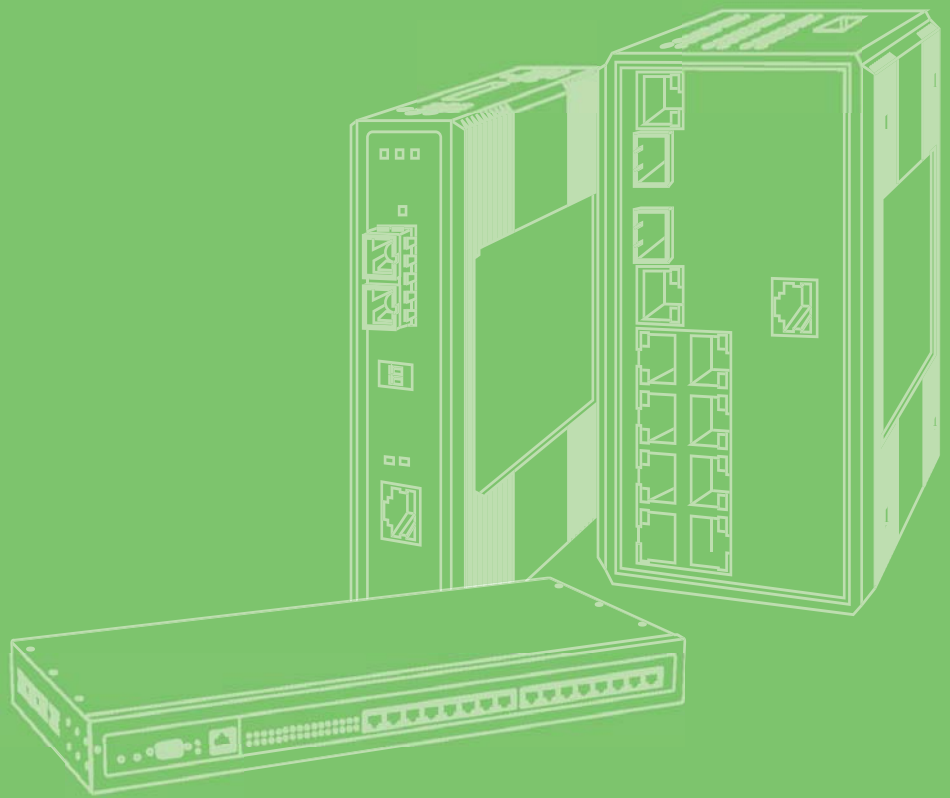# User Manual

EKI-1228-DR Series

8-port Modbus Gateway

ADVANTECH

Enabling an Intelligent Planet

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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 on screen 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 merchandise 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.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

Note: 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

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

Warnings, Cautions and Notes

Warning! *Warnings indicate conditions, which if not observed, can cause personal injury!*

Caution! *Cautions are included to help you avoid damaging hardware or losing data. e.g.*

There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Note! *Notes provide optional additional information.*

Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to: support@advantech.com

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.

- 1 x 8-port Modbus gateway
- 1 x DIN-Rail Mounting Bracket and Screws
- 1 x Wall-mounting Bracket

Safety Instructions

- Read these safety instructions carefully.
- Keep this User Manual for later reference.
- Disconnect this equipment from any DC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
- For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
- Keep this equipment away from humidity.
- Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
- The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
- Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- Position the power cord so that people cannot step on it. Do not place anything over the power cord.
- All cautions and warnings on the equipment should be noted.
- If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
- Never pour any liquid into an opening. This may cause fire or electrical shock.
- Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
- If one of the following situations arises, get the equipment checked by service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment does not work well, or you cannot get it to work according to the user's manual.
  - The equipment has been dropped and damaged.
  - The equipment has obvious signs of breakage.
- DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO -40°C (-40°F) ~ 85°C (185°F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
- The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

  DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Static electricity can cause bodily harm or damage electronic devices. To avoid damage, keep static-sensitive devices in the static-protective packaging until the installation period. The following guidelines are also recommended:

- Wear a grounded wrist or ankle strap and use gloves to prevent direct contact to the device before servicing the device. Avoid nylon gloves or work clothes, which tend to build up a charge.
- Always disconnect the power from the device before servicing it.
- Before plugging a cable into any port, discharge the voltage stored on the cable by touching the electrical contacts to the ground surface.

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Chapter 1

Introduction

1.1 Overview

The EKI-1228-DR Series Modbus gateways are bi-directional gateways for integrating new and existing Modbus/RTU and Modbus/ASCII serial devices to newer TCP/IP networked-based devices. The EKI-1228-DR Series has two independent Ethernet ports and MAC addresses to provide redundancy and reliability. They provide a simple and cost-effective way to bring remote management and data accessibility to thousands of devices that cannot connect to a network. EKI-1228-DR Series provides a feature that can allow users to select master or slave operation mode for each serial port. They not only allow an Ethernet master to control serial slaves but also allow serial masters to control Ethernet slaves.

1.2 Device Features

- Provides 2 x 10/100 Mbps Ethernet ports for LAN redundancy
- Integration of Modbus TCP and Modbus RTU/ASCII networks
- Supports up to 921.6 kbps, and any baud rate setting
- Support up to 16 connections on each serial port under Modbus Master mode and 128 sessions under Modbus Slave mode.
- Software selectable RS-232/422/485 communication (RS-422/485 for "CI" model)
- Mounts on DIN-rail and Wall mount
- Built-in 15 KV ESD protection for all serial signals
- Automatic RS-485 data flow control
- Supports surge protection for D.C. power ports with line to line 2 KV, and line to earth 4 KV; for signal ports with 4 KV
- 'I' models support a wide operating temperature
- 'CI' models support isolation and wide operating temperature

1.3 Specifications

Specifications	Description	
Interface	I/O Port	■ EKI-1228: 2 x RJ45 + 8 x RS-232/422/485 ■ EKI-1228I: 2 x RJ45 + 8 x RS-232/422/485 ■ EKI-1228CI: 2 x RJ45 + 8 x RS-422/485
	Power Connector	Terminal block
Physical	Enclosure	Metal with solid mounting hardware
	Installation	DIN-Rail and Wall mount
	Dimensions (W x H x D)	86.6 x 140 x 95 mm (3.41" x 5.51" x 3.74")
LED Display	System LED	Power 1, Power 2, Status
	Port LED	LAN: Speed, Link/Active Serial: Tx, Rx
Environment	Operating Temperature	-10°C ~ 60°C (14°F ~ 140°F) 'I & CI' models: -40°C ~ 70°C (-40°F ~ 158°F)
	Storage Temperature	-40°C ~ 85°C (-40°F ~ 185°F)
	Ambient Relative Humidity	10 ~ 95% RH
Ethernet Communications	Compatibility	IEEE 802.3, IEEE 802.3u
	Speed	10/100 Mbps
	Port Connector	8-pin RJ45
	Protection	Built-in 1.5 KV magnetic isolation
Serial Communications	Port Type	RS-232/422/485, software selectable
	Port Connector	DB9 male
	Data Bits	5, 6, 7, 8
	Stop Bits	1, 1.5, 2
	Parity	None, Odd, Even, Space, Mark
	Flow Control	XON/XOFF, RTS/CTS, DTR/DSR
	Baud Rate	50 bps ~ 921.6 kbps, any baud rate setting
	Protection	Built-in 15 KV ESD for all signals
Power	Power Consumption	■ EKI-1228: 5W ■ EKI-1228I: 5W ■ EKI-1228CI: 6W
	Power Input	12 ~ 48V_{DC}, redundant dual inputs
Software	Driver Support	32-bit/64-bit Windows XP/Vista/7/8/8.1/10, Windows Server 2003/2008/2008 R2/2012/2012 R2
	Utility	Advantech EKI Device Configuration Utility
	Operation Modes	■ Modbus RTU Master/Slave mode ■ Modbus ASCII Master/Slave mode
	Configuration	Windows Utility, Web Browser
	Protocols	ICMP, IP, TCP, UDP, BOOTP, DHCP, Auto IP, HTTP, DNS, SMTP, ARP, NTP
Regulatory Approvals	EMC	CE, FCC Part 15 Subpart B (Class A)

1.4 Dimensions
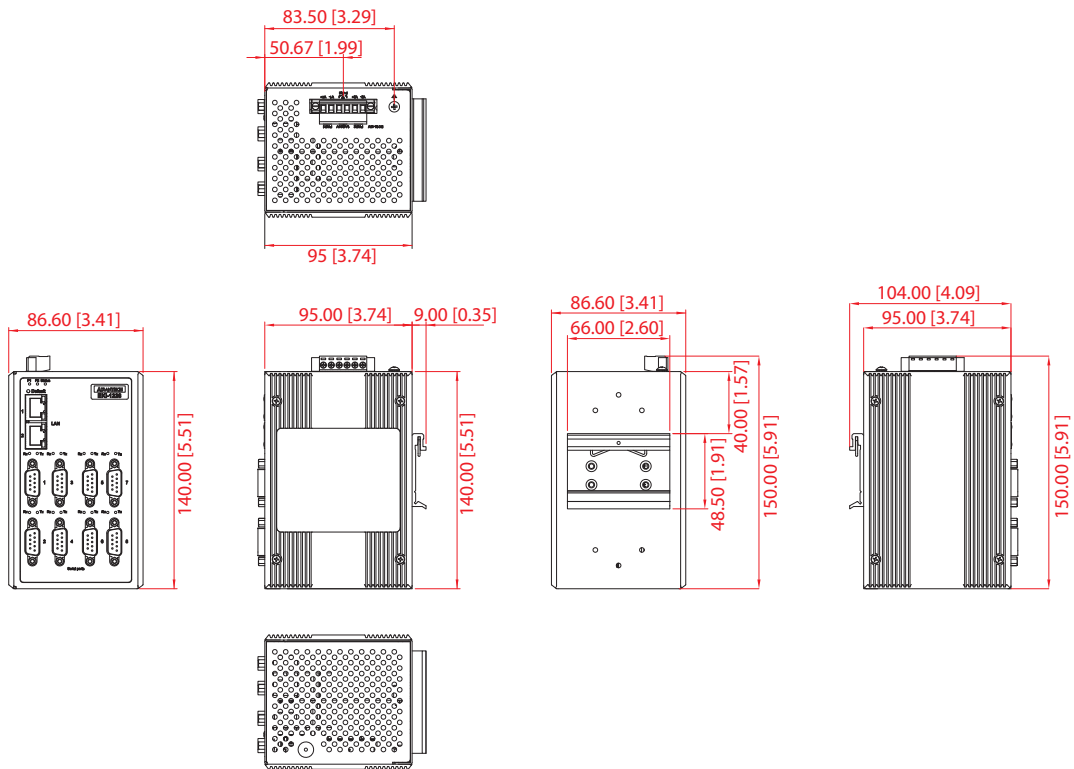
Figure 1.1 Dimensions

Chapter 2

Getting Started

2.1 Hardware

2.1.1 Front View

The following view applies to EKI-1528I and EKI-1528CI.
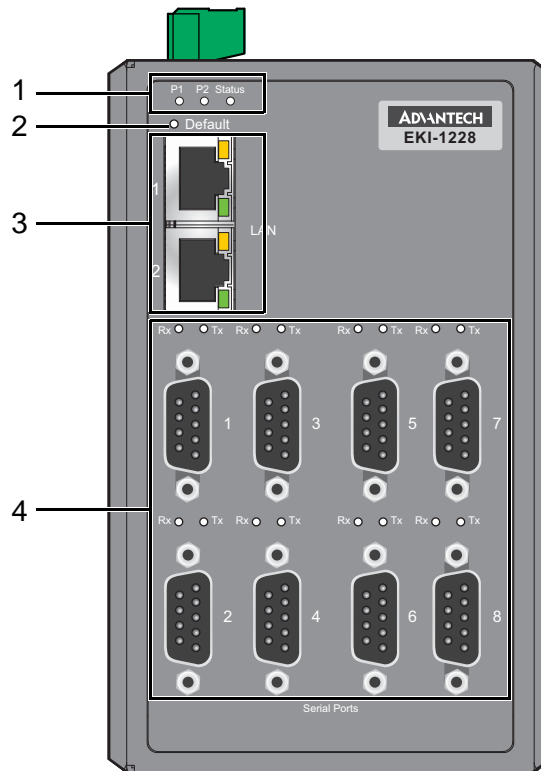
Figure 2.1 Front View

No.	Item	Description
1	System LED panel	See "LED Indicators" on page 8 for further details.
2	Default button	Press at least 10secs to reset device to default settings.
3	ETH port	RJ45 ports x 2. See "LED Indicators" on page 8 for further details.
4	Serial port	DB9 pinout, supports RS-232/422/485. See "LED Indicators" on page 8 for further details.

2.1.2 Rear View
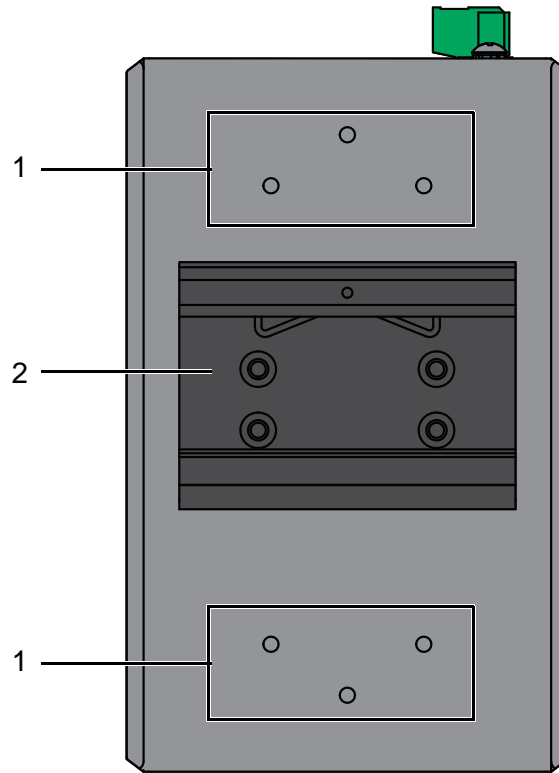
Figure 2.2 Rear View

No.	Item	Description
1	Wall mounting holes	Screw holes (x6) used in the installation of a wall mounting plate
2	DIN-Rail mounting plate	Mounting plate used for the installation to a standard DIN rail

2.1.3 Top View

Figure 2.3 Top View

No.	Item	Description
1	Terminal block	Connect cabling for power and alarm wiring
2	Ground terminal	Screw terminal used to ground chassis

2.1.4 LED Indicators
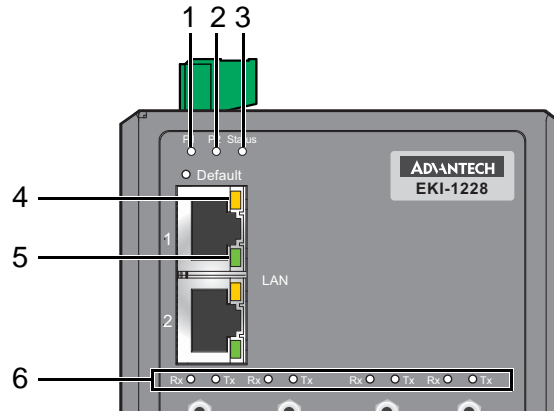
Figure 2.4 System LED Panel

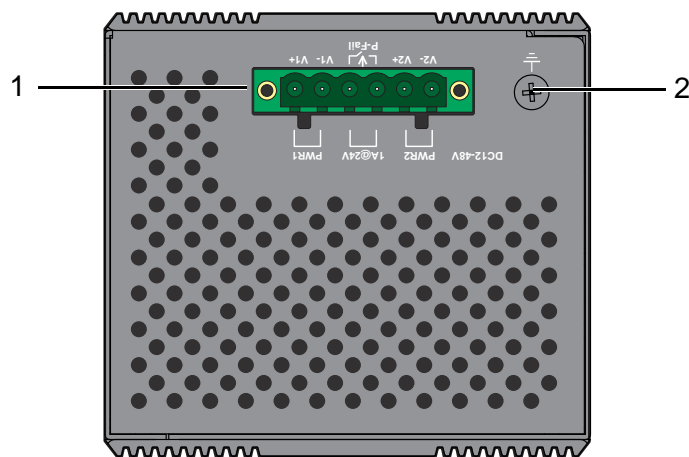| No.	LED Name	LED Color	Description
1	P1	Green	Power 1 is on
		Off	Power 1 is off, or power error condition exists
2	P2	Green	Power 2 is on
		Off	Power 2 is off, or power error condition exists
3	Status	Amber	■ Blinking: System is ready (1cycle/sec.) ■ On: The device server has been located by utility's location function
		Off	System is not working
4	NIC speed indicator	Amber	■ On: NIC is transmitting at 100Mbps Ethernet connection ■ Off: NIC is transmitting at 10Mbps Ethernet connection
5	NIC link/ activity indicator	Green	■ Blinking: Ethernet port is transmitting or receiving data ■ On: 10Mbps or 100Mbps link
6	Serial	Amber (Rx)	Serial port is receiving data
		Green (Tx)	Serial port is transmitting data
		Off	No data is being transmitted or received through the serial port

2.2 Connecting Hardware

2.2.1 DIN Rail Mounting

The DIN rail mount option is the quickest installation option. Additionally, it optimizes the use of rail space.

The metal DIN rail kit is secured to the rear of the switch. The device can be mounted onto a standard 35 mm (1.37") x 7.5 mm (0.3") height DIN rail. The devices can be mounted vertically or horizontally. Refer to the following guidelines for further information.

> **Note!** *A corrosion-free mounting rail is advisable.*
>
> *When installing, make sure to allow for enough space to properly install the cabling.*

2.2.1.1 Installing the DIN-Rail Mounting Kit

1. Position the rear panel of the switch directly in front of the DIN rail, making sure that the top of the DIN rail clip hooks over the top of the DIN rail, as shown in the following illustration.

> **Warning!** *Do not install the DIN rail under or in front of the spring mechanism on the DIN rail clip to prevent damage to the DIN rail clip or the DIN rail.*

Make sure the DIN rail is inserted behind the spring mechanism.

2. Once the DIN rail is seated correctly in the DIN rail clip, press the front of the switch to rotate the switch down and into the release tab on the DIN rail clip.

    If seated correctly, the bottom of the DIN rail should be fully inserted in the release tab.

DIN rail clip

DIN rail

DIN rail clip release tab
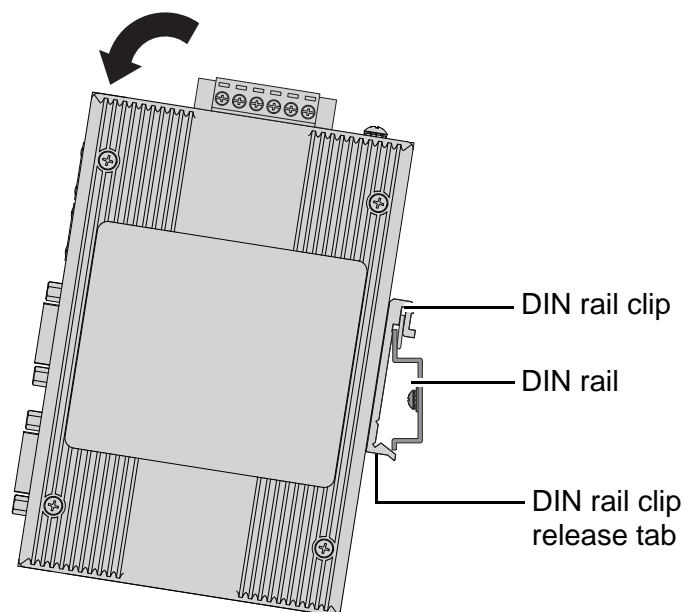
Figure 2.5 Installing the DIN-Rail Mounting Kit

See the following figure for an illustration of a completed DIN installation procedure.
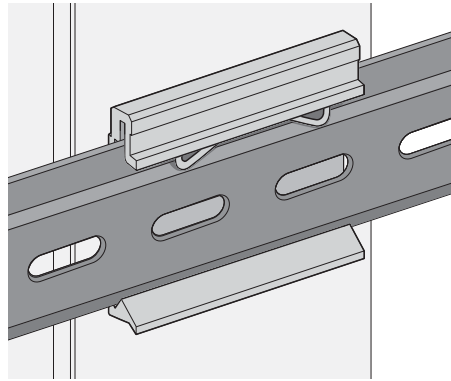
Figure 2.6 Correctly Installed DIN Rail Kit

3. Grasp the bottom of the switch and slightly rotate it upwards. If there is resistance, the switch is correctly installed. Otherwise, re-attempt the installation process from the beginning.

2.2.1.2 Removing the DIN-Rail Mounting Kit

1. Ensure that power is removed from the switch, and disconnect all cables and connectors from the front panel of the switch.

2. Push down on the top of the DIN rail clip release tab with your finger. As the clip releases, lift the bottom of the switch, as shown in the following illustration.

Figure 2.7 Removing the DIN-Rail

2.2.2 Wall-Mounting

The wall mounting option provides better shock and vibration resistance than the DIN rail vertical mount.

> **Note!** *When installing, make sure to allow for enough space to properly install the cabling.*

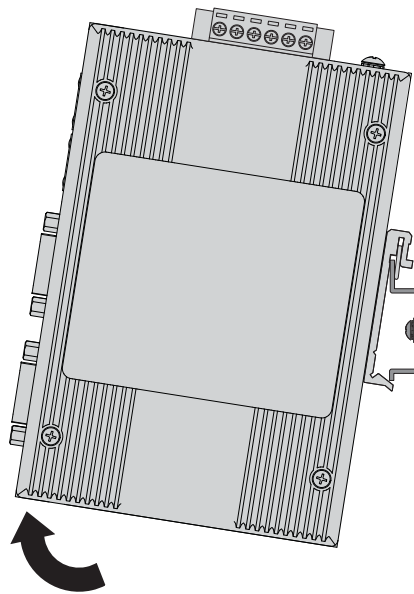Before the device can be mounted on a wall, you will need to remove the DIN rail plate.

1. Rotate the device to the rear side and locate the DIN mounting plate.
2. Remove the screws securing the DIN mounting plate to the rear panel of the switch.
3. Remove the DIN mounting plate. Store the DIN mounting plate and provided screws for later use.
4. Align the wall mounting plates on the rear side. The screw holes on the device and the mounting plates must be aligned, see the following illustration.
5. Secure the wall mount plates with M3 screws, see the following figure.
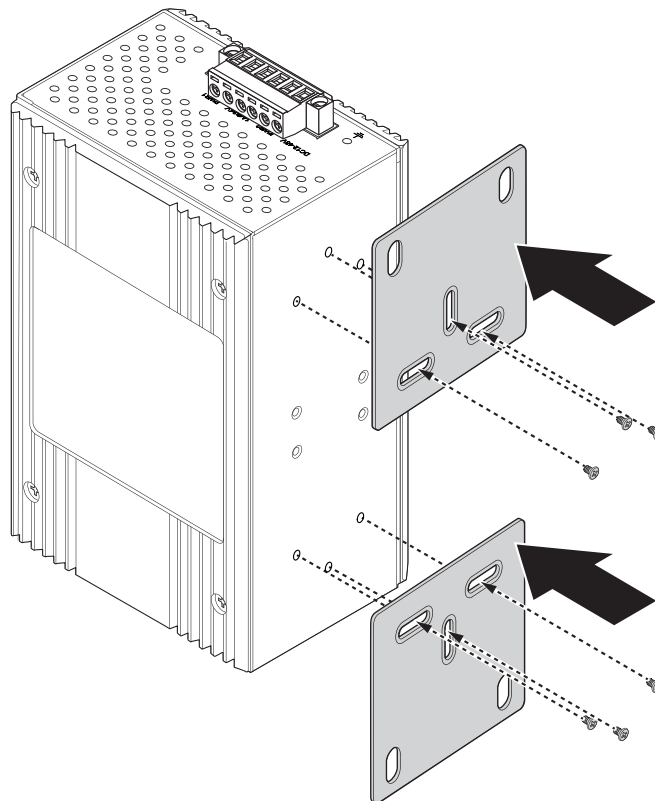
Figure 2.8 Installing Wall Mount Plates

Once the wall mounting plates are secure on the device, you will need to attach the wall screws (x4).

6. Locate the installation site and place the server against the wall, making sure it is the final installation location.
7. Use the wall mount plates as a guide to mark the locations of the screw holes.
8. Drill four holes over the four marked locations on the wall, keeping in mind that the holes must accommodate wall sinks in addition to the screws.
9. Insert the wall sinks into the walls.

10. Insert the screws into the wall sinks.

> 6 mm

3.0 mm
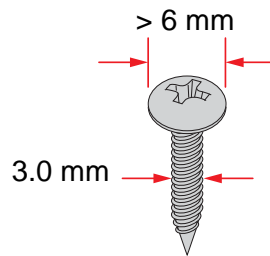
Figure 2.9 Securing Wall Mounting Screws

Note!   ■   Make sure the screws dimensions are suitable for use with the wall
            mounting plate.
         ■   Do not completely tighten the screws into the wall. A final
            adjustment may be needed before fully securing the wall mounting
            plates on the wall.

11. Align the wall mount plate over the screws on the wall.
12. Install the wall mount plate on the screws and slide it forward to lock in place,
    see the following figure.

Figure 2.10 Wall Mount Installation

13. Once the device is installed on the wall, tighten the screws to secure the device.

2.2.3 Connecting the Switch to Ethernet Ports

2.2.3.1 RJ45 Ethernet Cable Wiring

For RJ45 connectors, data-quality, twisted pair cabling (rated CAT5 or better) is recommended. The connector bodies on the RJ45 Ethernet ports 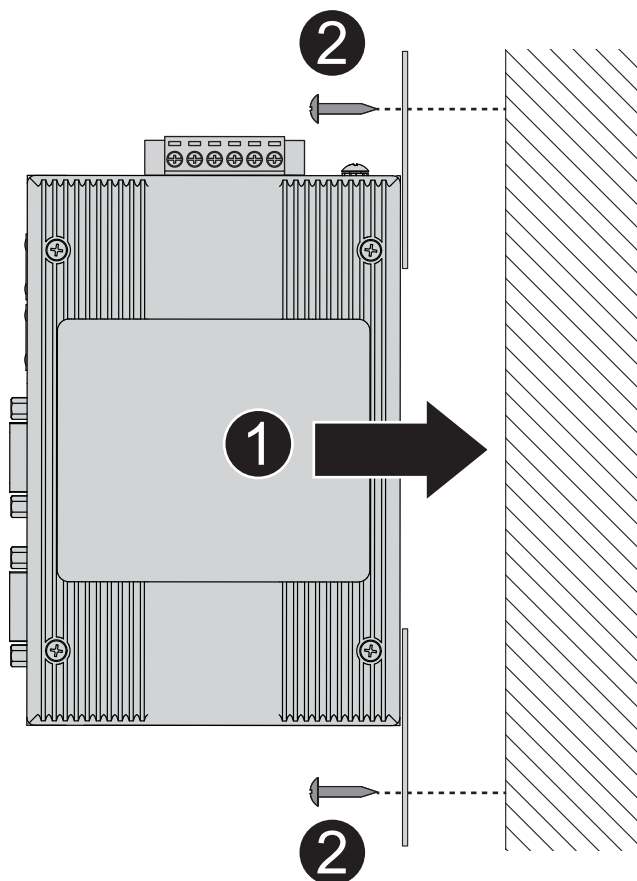are metallic and connected to the GND terminal. For best performance, use shielded cabling. Shielded cabling may be used to provide further protection.

Straight-thru Cable Wiring		Cross-over Cable Wiring	
Pin 1	Pin 1	Pin 1	Pin 3
Pin 2	Pin 2	Pin 2	Pin 6
Pin 3	Pin 3	Pin 3	Pin 1
Pin 6	Pin 6	Pin 6	Pin 2
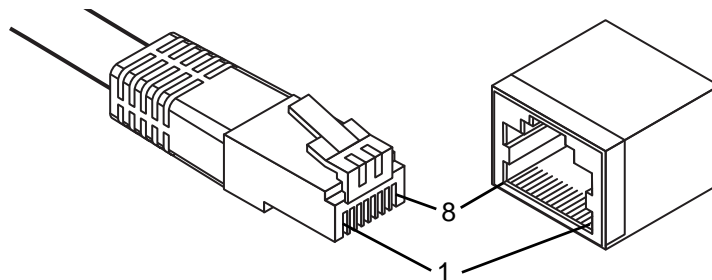
Figure 2.11 Ethernet Plug & Connector Pin Position

Maximum cable length: 100 meters (328 ft.) for 10/100BaseT.

2.2.4 Serial Connection

EKI-1228-DR Series provides up to four ports DB9 (male) connectors. RS-232/422/485 pin assignments as below:

Figure 2.12 DB9 Pin Assignment

Pin	1	2	3	4	5	6	7	8	9
RS-232	DCD	RX	TX	DTR	GND	DSR	RTS	CTS	RI
RS-422	TX-			TX+	GND		RX+		RX-
RS-485	DATA-			DATA+	GND				

2.2.5 Power Connection

2.2.6 Overview

Warning! *Power down and disconnect the power cord before servicing or wiring the switch.*

Caution! *Do not disconnect modules or cabling unless the power is first switched off.*

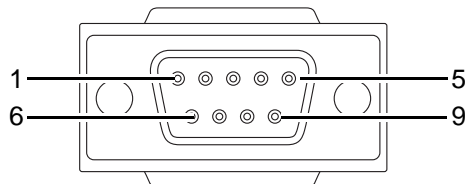*The device only supports the voltage outlined in the type plate. Do not use any other power components except those specifically designated for the switch device.*

Caution! *Disconnect the power cord before installation or cable wiring.*

The switches can be powered by using the same DC source used to power other devices. A DC voltage range of 12 to 48 V_{DC} must be applied between the V1+ terminal and the V1- terminal (PW1), see the following illustrations. The chassis ground screw terminal should be tied to the panel or chassis ground. A redundant power configuration is supported through a secondary power supply unit to reduce network downtime as a result of power loss.

EKI-1228-DR Series support 12 to 48 V_{DC}. Dual power inputs are supported and allow you to connect a backup power source.
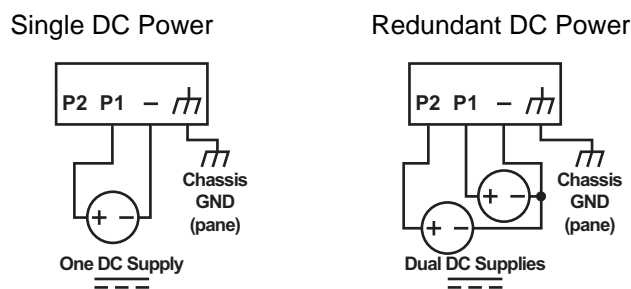
Single DC Power   Redundant DC Power

Figure 2.13 Power Wiring for EKI-1228-DR Series

2.2.7 Considerations

Take into consideration the following guidelines before wiring the device:

- The Terminal Block (CN1) is suitable for 12-24 AWG (3.31 - 0.205 mm^2). Torque value 7 lb-in.
- The cross-sectional area of the earthing conductors shall be at least 3.31 mm^2.
- Calculate the maximum possible current for each power and common wire. Make sure the power draw is within limits of local electrical code regulations.
- For best practices, route wiring for power and devices on separate paths.
- Do not bundle together wiring with similar electrical characteristics.
- Make sure to separate input and output wiring.
- Label all wiring and cabling to the various devices for more effective management and servicing.

Note! *Routing communications and power wiring through the same conduit may cause signal interference. To avoid interference and signal degradation, route power and communications wires through separate conduits.*

2.2.8 Grounding the Device

Caution! *Do not disconnect modules or cabling unless the power is first switched off.*

The device only supports the voltage outlined in the type plate. Do not use any other power components except those specifically designated for the switch device.

Caution! *Before connecting the device properly ground the device. Lack of a proper grounding setup may result in a safety risk and could be hazardous.*

Caution! *Do not service equipment or cables during periods of lightning activity.*

Caution! *Do not service any components unless qualified and authorized to do so.*

Caution! *Do not block air ventilation holes.*

Electromagnetic Interference (EMI) affects the transmission performance of a device. By properly grounding the device to earth ground through a drain wire, you can setup the best possible noise immunity and emissions.
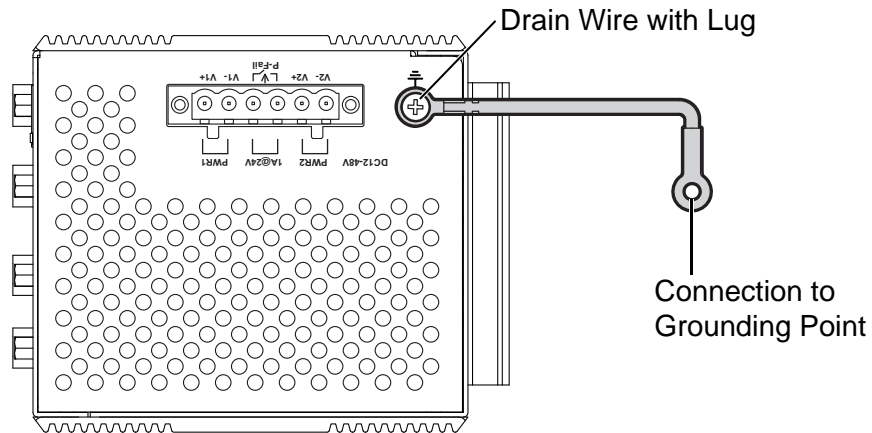

Figure 2.14 Grounding Connection

By connecting the ground terminal by drain wire to earth ground the switch and chassis can be ground.

Note! *Before applying power to the grounded switch, it is advisable to use a volt meter to ensure there is no voltage difference between the power supply's negative output terminal and the grounding point on the switch.*

2.2.9 Wiring a Relay Contact

The following section details the wiring of the relay output. The terminal block on the EKI-1228-DR Series is wired and then installed onto the terminal receptor located on the EKI-1228-DR Series.
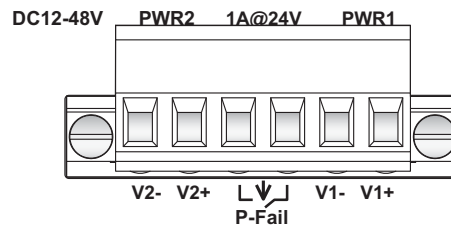

Figure 2.15 Terminal Receptor: Relay Contact

The terminal receptor includes a total of six pins: two for PWR1, two for PWR2 and two for a fault circuit.

2.2.10 Wiring the Power Inputs

Caution! Do not disconnect modules or cabling unless the power is first switched off.

The device only supports the voltage outlined in the type plate. Do not use any other power components except those specifically designated for the switch device.

Warning! Power down and disconnect the power cord before servicing or wiring the switch.

There are two power inputs for normal and redundant power configurations. The power input 2 is used for wiring a redundant power configuration. See the following for terminal block connector views.
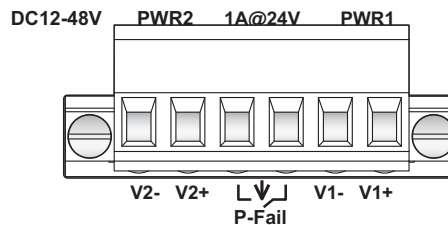
Figure 2.16 Terminal Receptor: Power Input Contacts

To wire the power inputs:

Make sure the power is not connected to the switch or the power converter before proceeding.

1. Loosen the screws securing terminal block to the terminal block receptor.
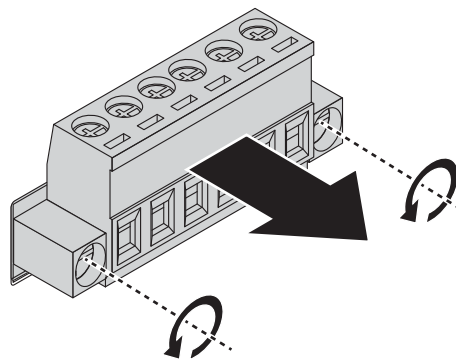2. Remove the terminal block from the switch.

Figure 2.17 Removing a Terminal Block

3. Insert a small flat-bladed screwdriver in the V1+/V1- wire-clamp screws, and loosen the screws.
4. Insert the negative/positive DC wires into the V+/V- terminals of PW1. If setting up power redundancy, connect PW2 in the same manner.

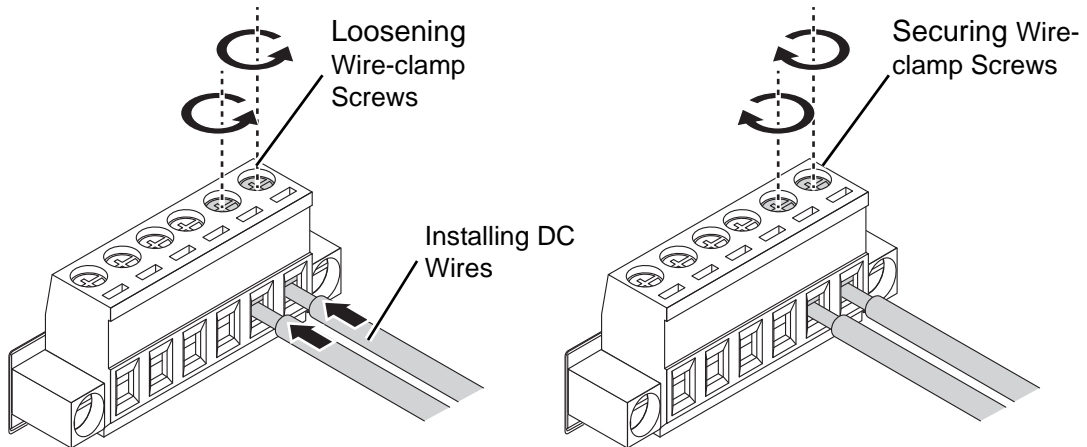5. Tighten the wire-clamp screws to secure the DC wires in place.

Loosening Wire-clamp Screws

Securing Wire-clamp Screws

Installing DC Wires

Figure 2.18 Installing DC Wires in a Terminal Block

6. Align the terminal block over the terminal block receptor on the switch.
7. Insert the terminal block and press it in until it is flush with the terminal block receptor.
8. Tighten the screws on the terminal block to secure it to the terminal block receptor.

   If there is no gap between the terminal block and the terminal receptor, the terminal block is seated correctly.
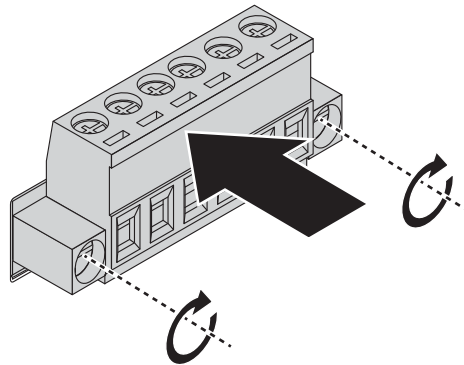

Figure 2.19 Securing a Terminal Block to a Receptor

2.3 Reset Button

Reset configuration to factory default:

Press and hold Reset button for 10 seconds.

System reboot:

Press and hold Reset button for 2 seconds.

Note! *Do NOT power off the Ethernet switch when loading default settings.*

Chapter 3

Utility Configuration

3.1 Installing the Configuration Utility

> **Note!** *Microsoft.NET Framework version 2.0 or greater is required for this application.*

1. Insert the Advantech EKI Device Configuration Utility CD-ROM into the CD-ROM drive (whereas E:\ is the drive name of your CD-ROM) on the host PC.
2. Use Windows explorer or the Windows Run command to execute the setup program, the path for the setup program on the CD-ROM is as follows:
   E:\EKI_Device_Configuration_Utility_v2.01.exe
3. If there is an existing COM port mapping utility on the host PC, remove it at this time. A system reboot may be necessary before continuing the installation.
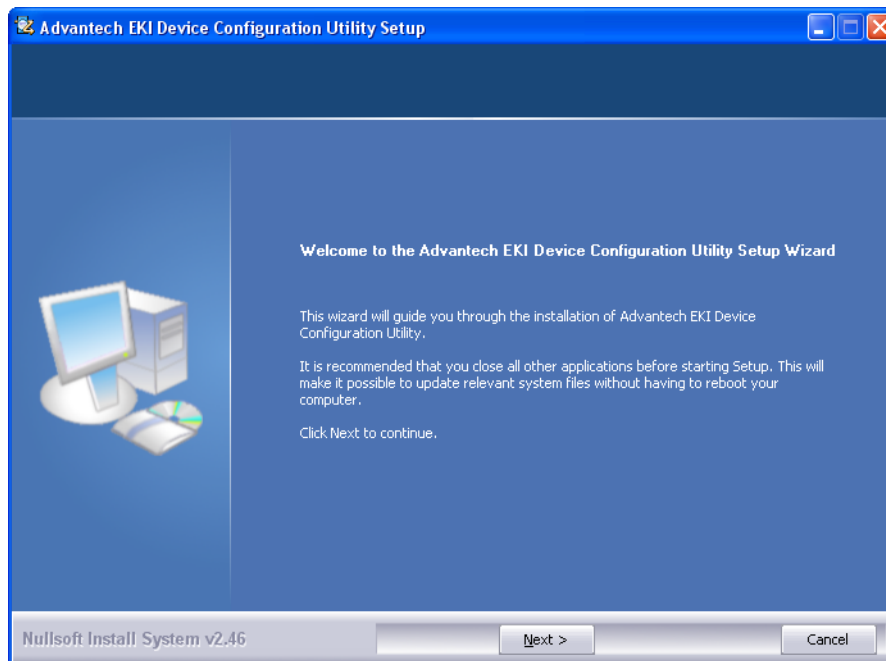4. Once the InstallShield Wizard screen displays, click **Next** to proceed with the installation.

Figure 3.1 InstallShield Wizard 1 of 4

5. The Software License Agreement displays, press **I Agree** to continue or **Cancel** to stop the installation.
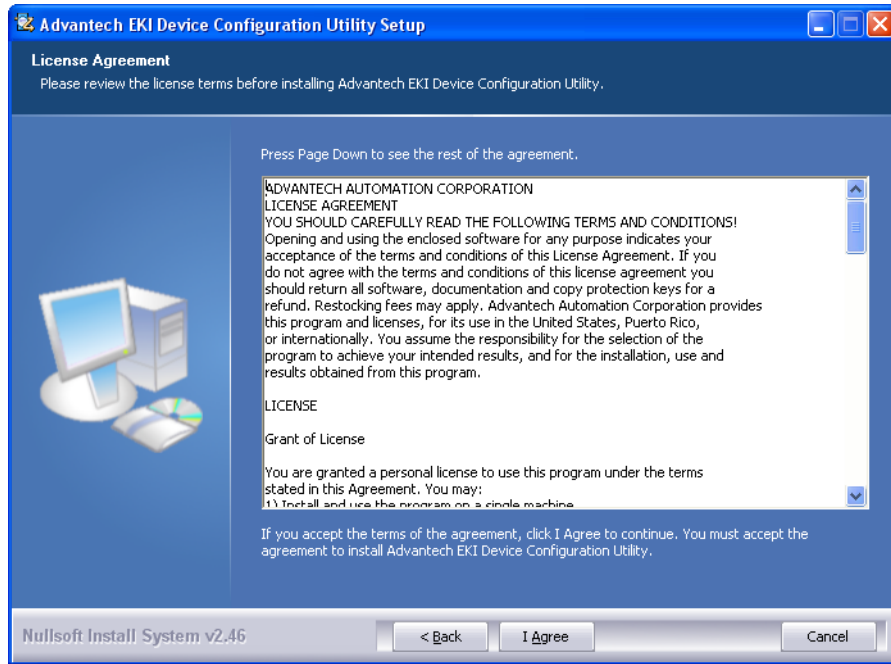
Figure 3.2 InstallShield Wizard 2 of 4

The InstallShield continues and a status screen displays. The default installation path is C:\Program Files\EKI Device Configuration Utility.
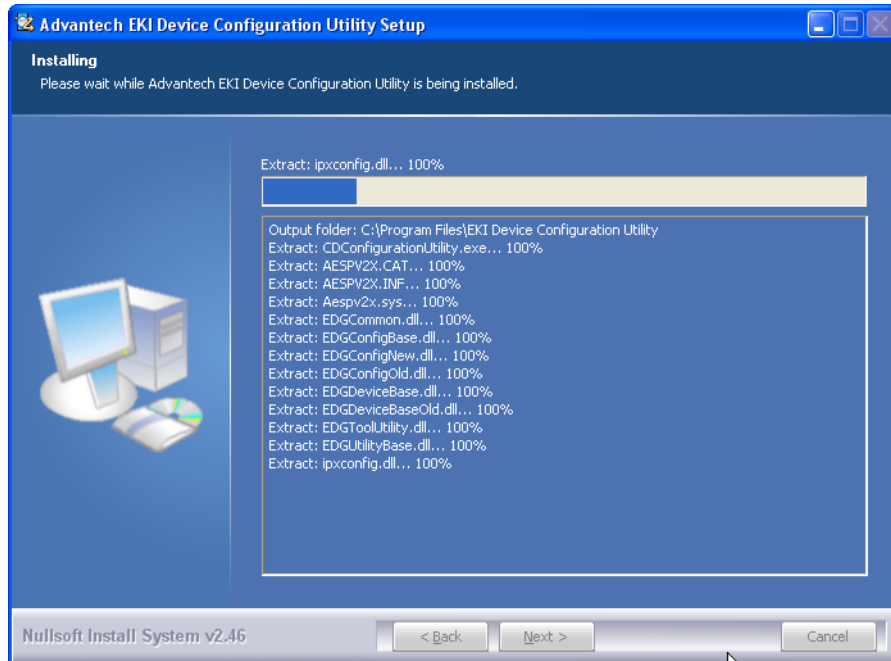

Figure 3.3 InstallShield Wizard 3 of 4

6. Once the installation of the package is finished a Configuration Utility Setup screen displays. Click **Finish** to conclude the process and exit the InstallShield Wizard.
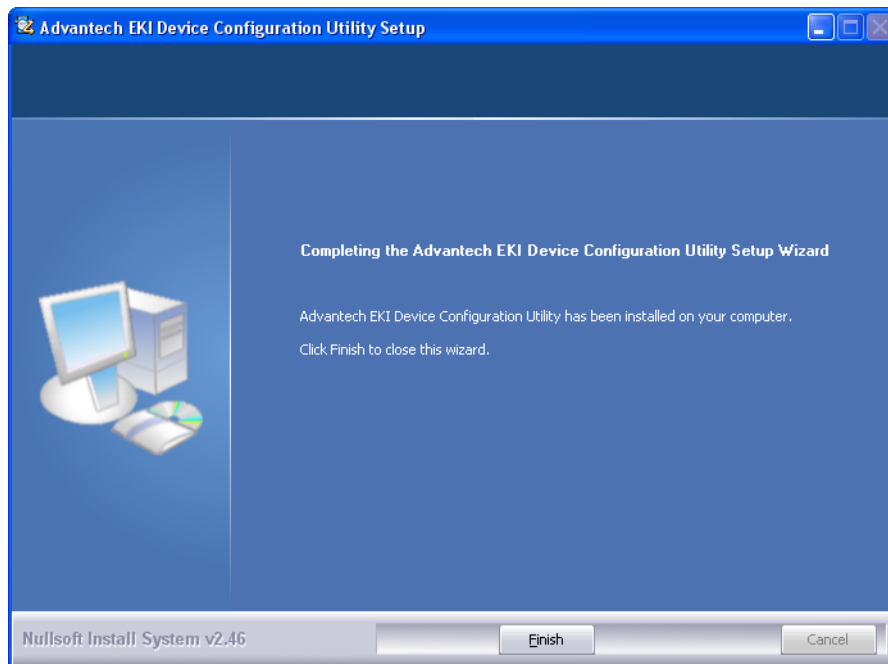

Figure 3.4 InstallShield Wizard 4 of 4

3.2 Starting the Configuration Utility

Advantech EKI-1228-DR Series device servers provide an easy-to-use utility to configure your serial device server through an Ethernet connection. For secure administration, it can also restrict the access rights for configuration to only one host PC. With this secure function enabled, other PCs will not have permission for configuration. After the installation program on the Advantech IEDG Series Driver Utility CD-ROM is finished, the serial device servers are ready for use and configuration.

Advantech Serial Device Server Configuration Utility is an excellent device server management tool. You can connect and configure the local and remote Advantech serial device servers easily. The utility provides access to the following functions:

■ Configure the network settings (you can set the IP address, Gateway address, and Subnet mask)

■ View and set the serial port parameters (configure operating mode, baud rate, serial port settings and operating mode settings)

■ Perform diagnostic tests (virtual COM port testing, port status list)

■ Perform administrative functions (export and import the serial device server setting, manage access IP, a descriptive name, upgrade firmware)

You can open the Configuration Utility from the Windows Start Menu by clicking **Start** > **All Programs** > **EKI Device Configuration Utility** > **EKI Device Configuration Utility**. The Configuration Utility displays as shown in the following figure.
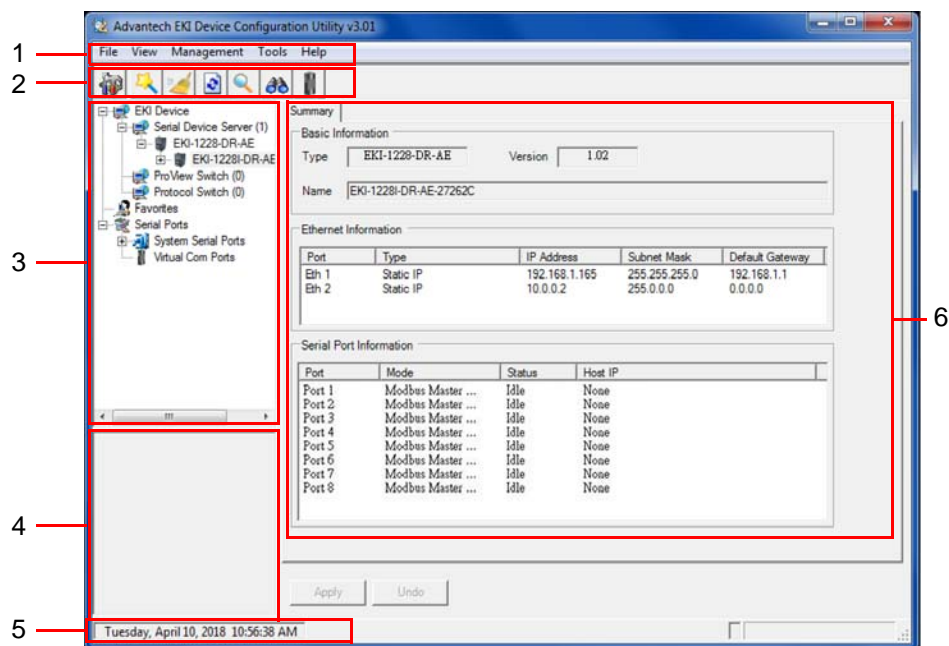

Figure 3.5 Configuration Utility Overview

No	Item	Description
1	Menu Bar	Displays File, View, Management, Tools and Help.
2	Quick Tool Bar	Useful management functions shortcuts.
3	Serial Device Server List Area	Available devices are listed in this area. Devices and COM ports can be organized or grouped in this area.
4	Information Panel	Click on the devices or move cursor to the devices, the related information is shown in this area.
5	Status Bar	Displays the current time.
6	Configuration Area	Click on the item on the Device Server List Area, the configuration page displays.

3.3 Discovering Your Device Server

3.3.1 Auto Searching

Advantech Serial Device Server Configuration Utility will automatically search all the EKI-1228-DR Series device servers on the network and show them on the Serial Device Server List Area of the utility. The utility provides an auto-search function to show your device (s) by simply executing the configuration utility program from the Start Menu.

From here all device on the same network domain will be searched and displayed on Device Server List Area. You can click on the device name to show the features of the specific device.

Click on the "+" before the model name, and the utility will expand the tree structure to show the individual device name. Click on the "-" before the model name, and the utility will collapse the tree structure.
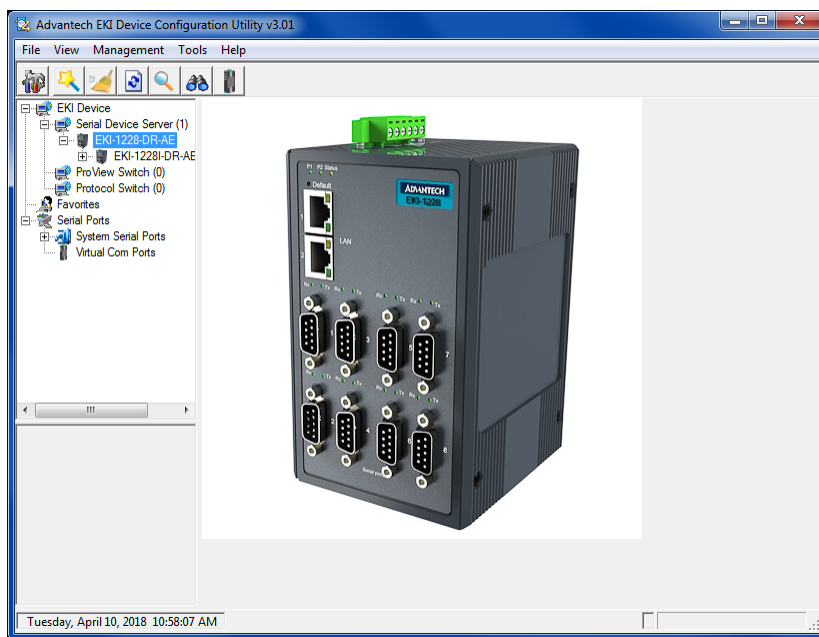

Figure 3.6 Open View of Serial Device Configuration Utility

Note!

When you run the configuration utility for the first time, the default device name is obtained from the serial device's MAC identification number. The name can be altered through the configuration utility.

Select the device in this sub-tree. The first tab on the Configuration Area shows the summary of "Basic Information" included device type, version, and name, "Ethernet

Information", and "Serial Port Information". The serial port information frame displays the operation mode, status and connected host IP.
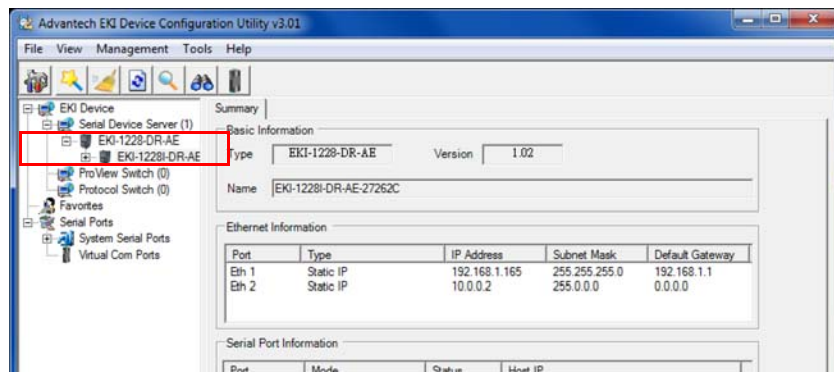

Figure 3.7 Selecting a Group

Click on the "+" before the device name, and the utility will expand the interfaces on this device server.
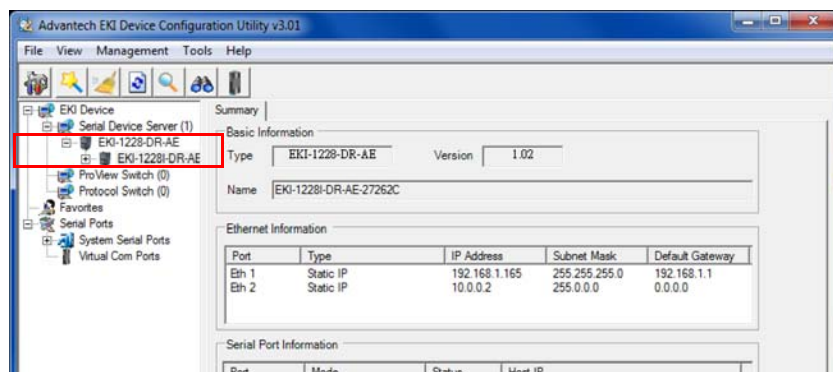

Figure 3.8 Selecting a Device

Click on each item to enter the configuration page to change the setting. The configuration will be introduced on following sections.
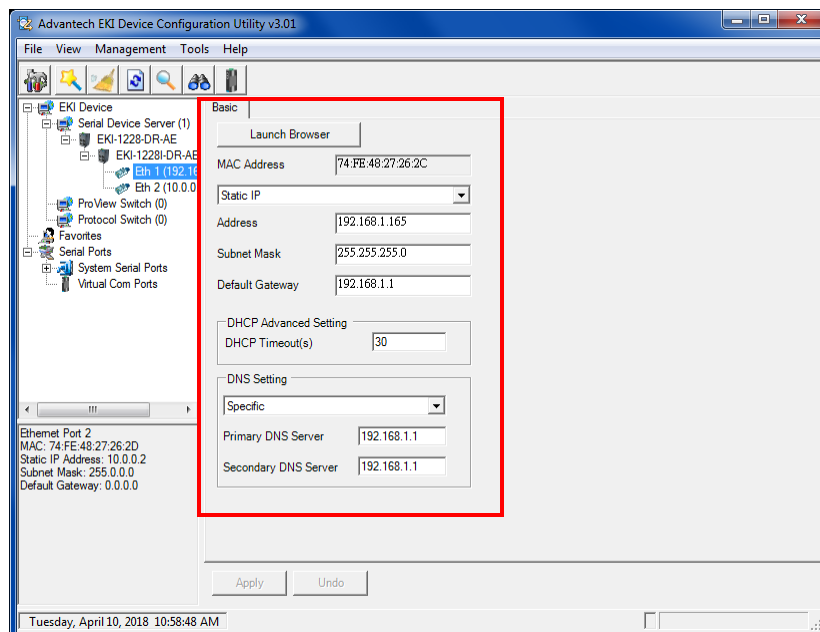

Figure 3.9 Viewing Basic Settings

3.3.2 Network Settings

Prior to setting up the server's IP address determine the IP address mode.

There are four mode types available:

■ Static IP: mode to assign a specific assigned address
■ DHCP / AutoIP: mode to automatically assign IP addresses through a DHCP server
■ BOOTP / AutoIP: mode to automatically assign an IP address through the configuration server
■ DHCP/BOOTP/AutoIP: mode to automatically assign an IP address using a Bootstrap Protocol or DHCP server.

The server is set with the following default IP configuration:

■ 10.0.0.1 (Eth1)
■ 10.0.0.2 (Eth2)

The EKI-1228-DR Series includes a software utility option, which you can install on your system, for configuration through computer-based software. The EKI-1228-DR Series also includes a web interface option for configuration through a standard web browser.
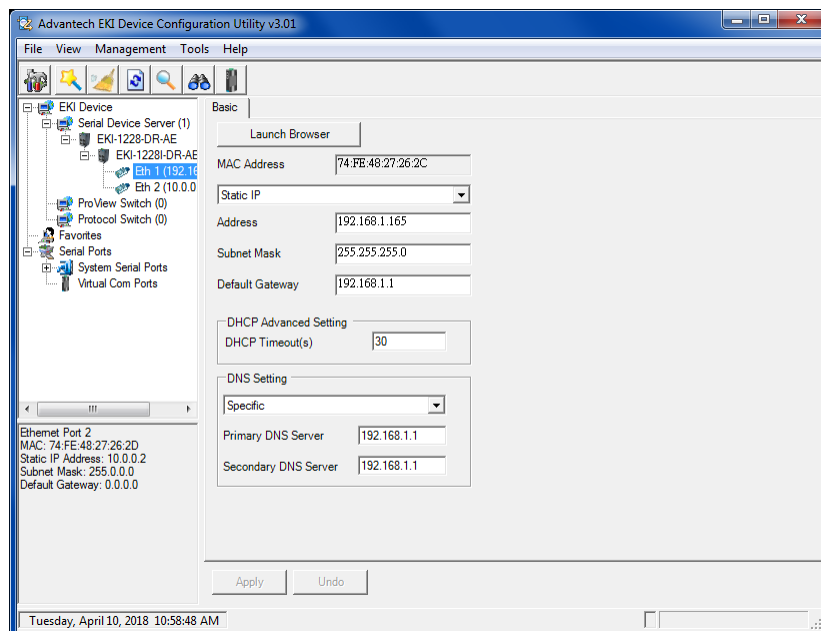

Figure 3.10 Utility Overview

You can choose from four possible IP Configuration modes --- Static, DHCP, BOOTP, and DHCP/BOOTP.

Figure 3.11 Network Settings Overview

Item	Description
Static IP	Static IPUser defined IP address, Subnet Mask, and Default Gateway.
DHCP + Auto-IP	DHCP Server assigned IP address, Subnet Mask, Default Gateway, and DNS.
BOOTP + Auto-IP	BOOTP Server assigned IP address.
DHCP + BOOTP + Auto-IP	DHCP Server assigned IP address, Subnet Mask, Default Gateway, and DNS, or BOOTP Server assigned IP address. (If the DHCP Server does not respond)
DHCP Advanced Setting	When the DHCP setting is enabled, the device waits for the IP address the designated period of time before timing out. The default value is 180 seconds.
DNS Setting	In order to use DNS feature, you need to set the IP address of the DNS server to be able to access the host with the domain name. The EKI-1228-DR Series device server provides Primary DNS Server and Secondary DNS Server configuration items to set the IP address of the DNS server. Secondary DNS Server is included for use when Primary DNS server is unavailable.

Note! *When you have finished the configuration of these settings for each category, please press the "Apply" button in order to make these settings effective on the Serial Device Server.*

3.4 Administrator Settings

3.4.1 Locate the Serial Device Server

When several serial device servers are connected to the network, identification of a specific serial device is possible through the Locate function.

To locate the serial device server:

1. From the device list frame, locate the desired device and right-click on it to display the settings menu.
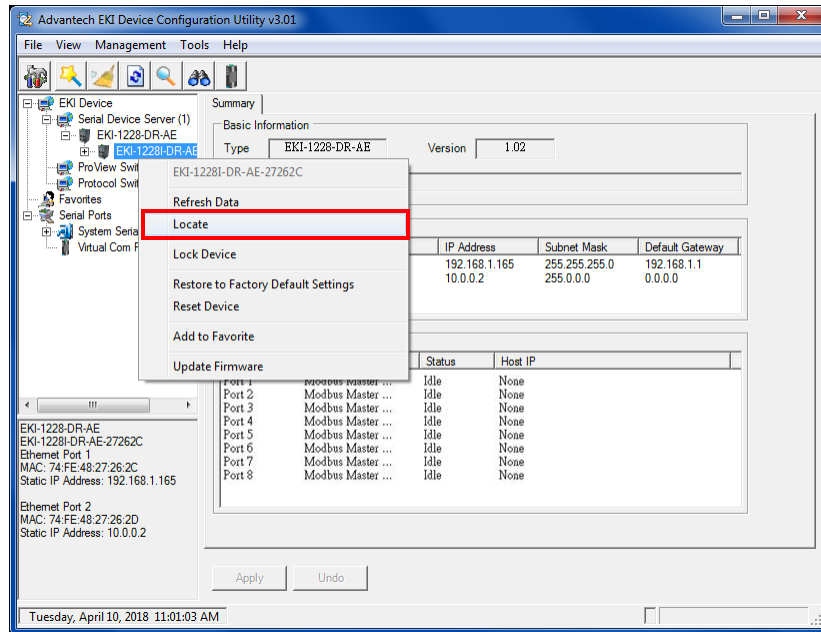2. Select **Locate** from the menu.

Figure 3.12 Locate the Serial Device Server

The unit's Status LED will turn solid amber and the buzzer will sound until you click **Stop Locate**.

3.4.2 Securing the Serial Device Server

3.4.2.1 Lock the Serial Device Server

The configuration utility provides the "Lock Device" function to make it more secure.

To lock the serial device server:

1. Right-click a desired device to display the settings menu.
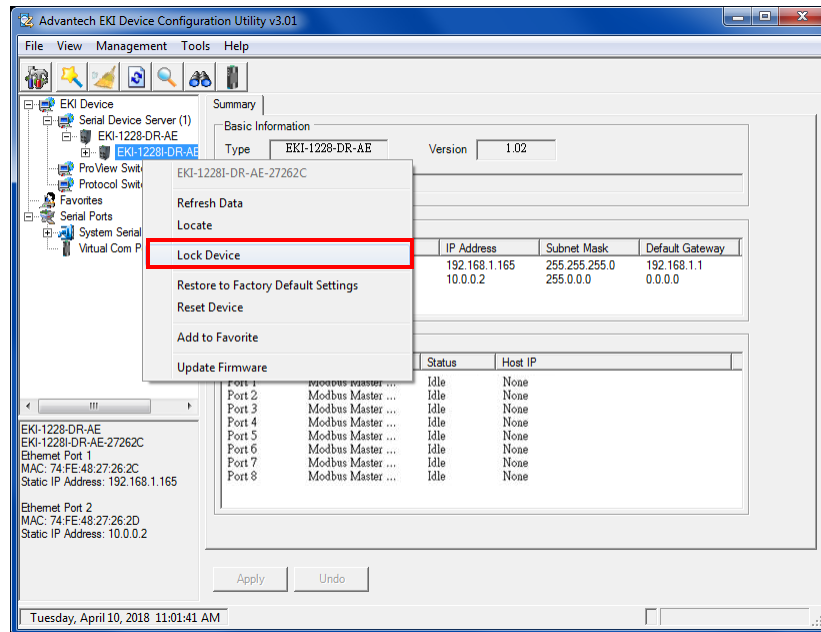2. Select **Lock Device**.

Figure 3.13 Lock the Serial Device Server

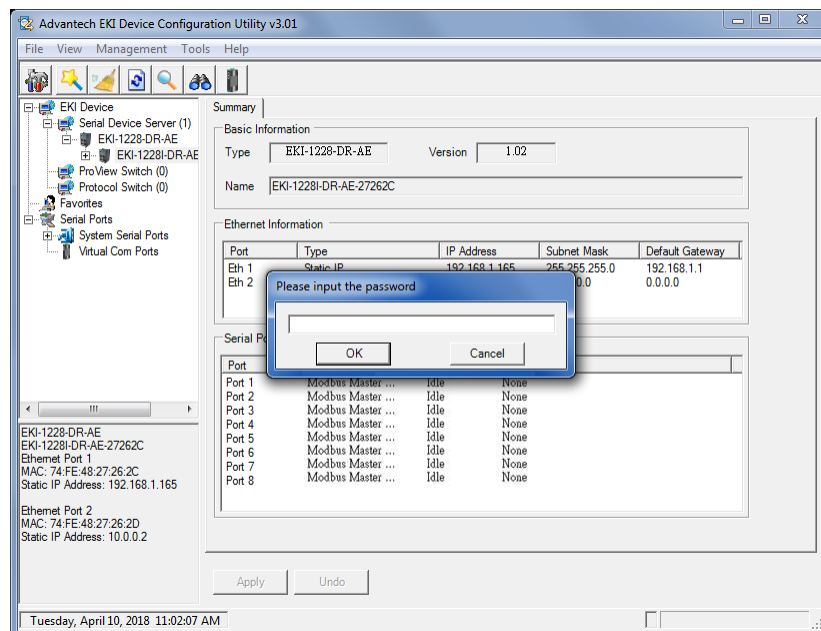3. Enter a password. Retype the password entry to confirm the profile password.

Figure 3.14 Enter a Password

4. Right-click a desired device to display the settings menu. Select **Reset Device** to restart the serial device server and store your setting password into the memory.
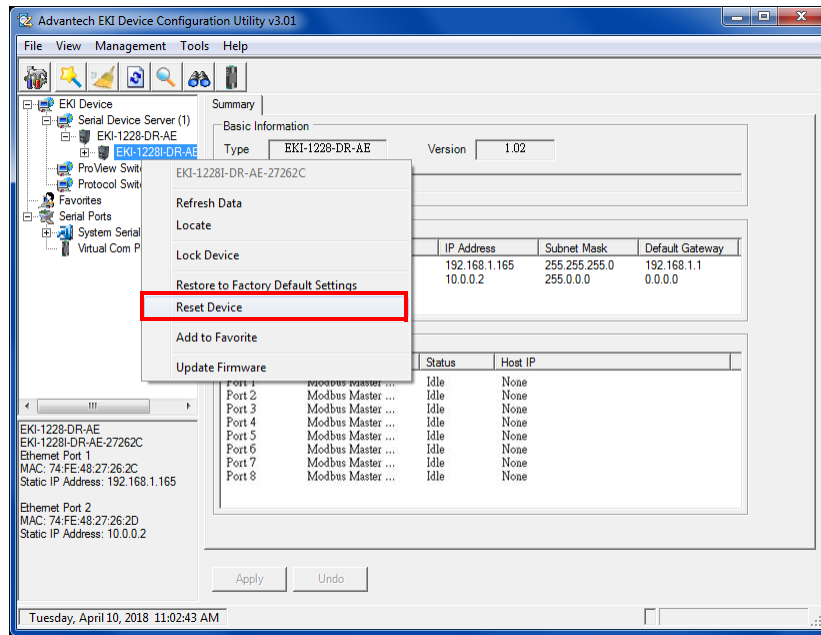

Figure 3.15 Reset Device

3.4.2.2 Unlock the Serial Device Server

To unlock the serial device server:

1. Right-click a desired device to display the settings menu.
2. Select **Unlock Device**.
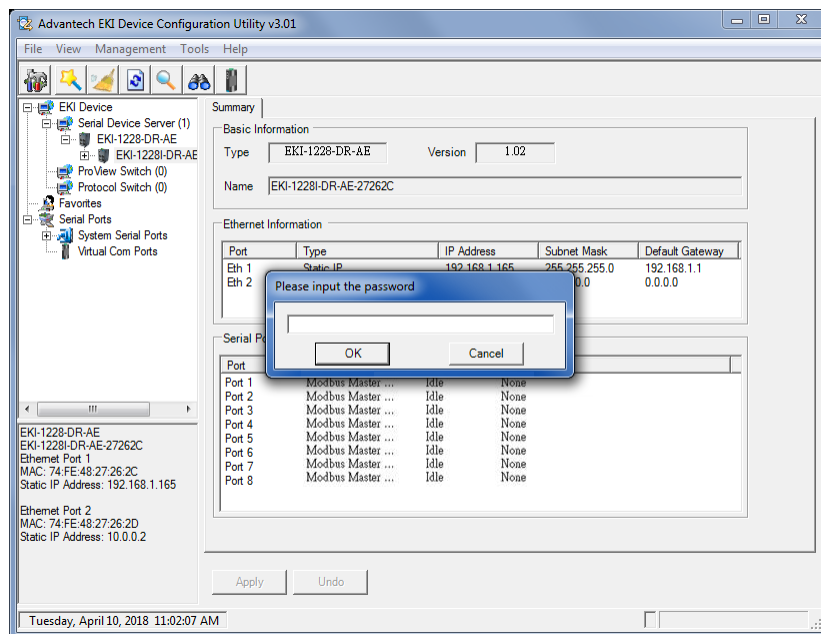3. Enter the password as entered in the Lock Device procedure.

Figure 3.16 Unlock the Serial Device Server

If you forgot the password, you must restore the setting of the serial device server to the factory defaults, which will be introduced in the next section.

3.4.3 Restore to Factory Default Settings

The configuration utility provides the function to restore the serial device server to factory default settings.
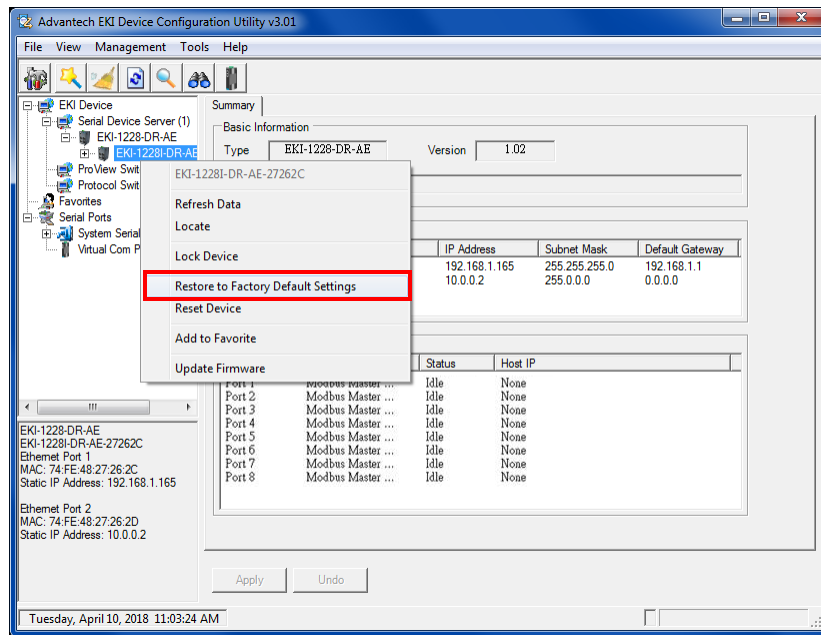
Figure 3.17 Restore to Factory Default Settings

The confirm message will display after clicking **Restore to Factory Default Settings**. If you really want to restore the serial device server to factory default settings, please click the **Yes** button to continue.

Power off the serial device server within ten seconds. After reconnecting the power, all settings will be reset to the factory default. If the power supply remains connected for more than ten seconds, the serial device server will not be changed.

3.4.4 Resetting the Device

The **Reset Device** is available to allow you to reset the serial device server. The function disconnects both the ethernet and serial connections.

The function also allows the serial device server to save new configuration settings to flash memory. Once a new setting is changed, you can use the Save function to accept the changes. You will need to reset the device to save the settings to flash memory.

To reset the device:

1. Right-click a desired device to display the settings menu.
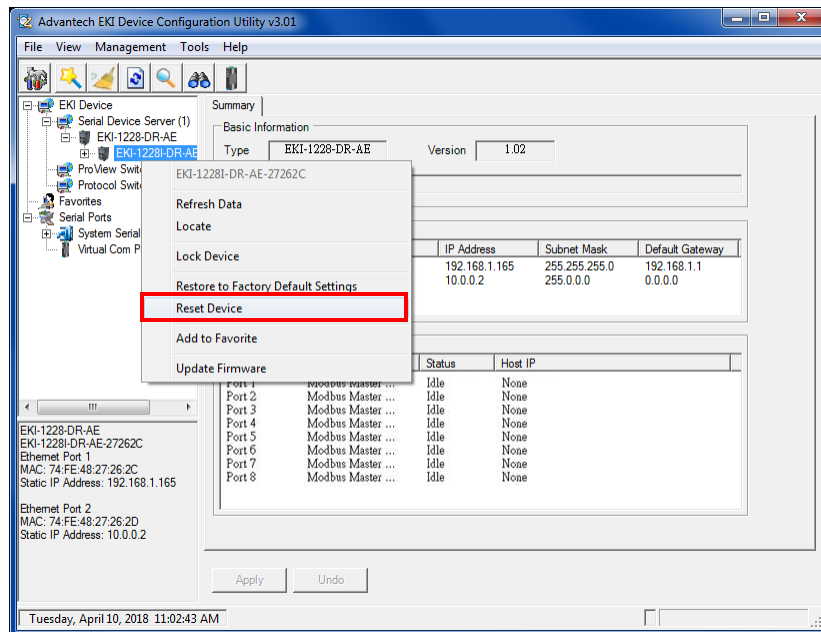2. Select **Reset Device**.

Figure 3.18 Reset Device

The device resets. Once the process is complete, the serial device server displays under the Serial Device Server listing once again.

3.4.5 Add to Favorite

The Add to Favorite function allows to easily map available devices to Favorite's. By bookmarking specific devices, you can create quickly accessible shortcuts for existing critical devices from the vast pool of locally or remotely networked EKI-1228-DR Series devices.
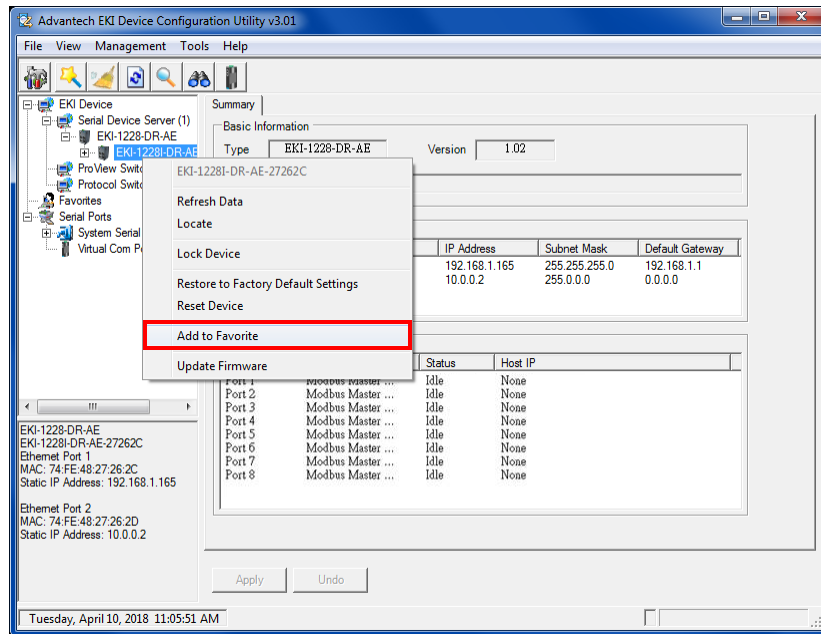

Figure 3.19 Add to Favorite

3.4.6 Update Firmware

Advantech continually upgrades its firmware to keep up with the ever-expanding world of computing. You can use the update firmware function in the utility to carry out the upgrade procedure. Please access Advantech's website: http://www.advantech.com to download the latest version of the firmware. Before updating the firmware, make sure that your host's Network domain is as same as the serial device server or the host can establish the TCP connection to the serial device server.

To update firmware:
1. Right-click a desired device to display the settings menu.
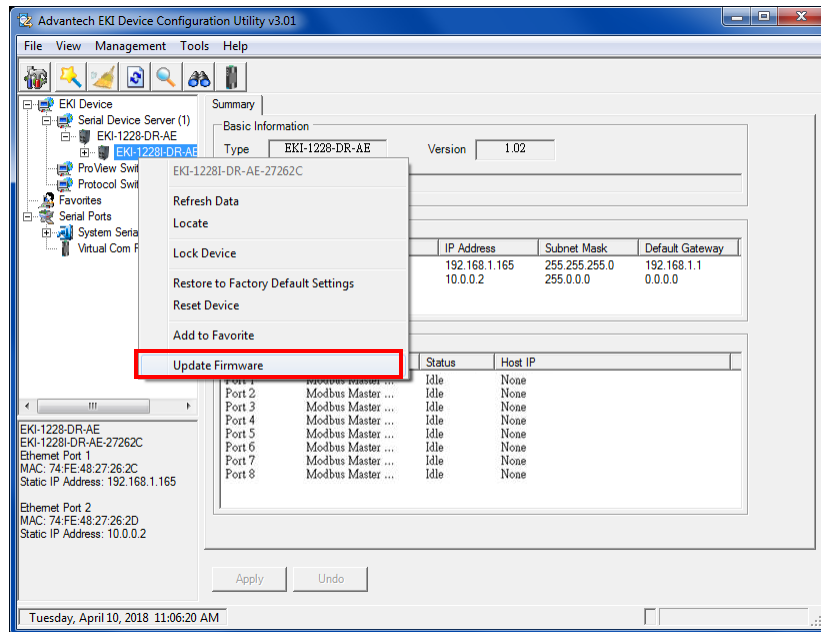2. Select **Update Firmware**.

Figure 3.20 Update Firmware

3. Select the firmware file you want to update.

Wait for a few seconds for the firmware to finish updating. After the update has completed, click on the **OK** button. The serial device server will restart automatically.

> **Note!** *Be sure that the host PC Ethernet network domain is as same as the EKI-1228-DR Series serial device server or the host PC can establish the TCP connection with the serial device server while doing the updating firmware process.*

Chapter 4

Web Interface

4.1 Overview

EKI-1228-DR Series serial device server 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 EKI-1228-DR Series serial device server. 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.

> **Note!** Before using the web-based configuration, make sure your host PC Ethernet network IP domain is as same as the serial device server, or it can establish the TCP connection with the serial device server.

> **Note!** It is recommended that you use Microsoft Internet Explorer 7.0 or higher.

4.2 Accessing the Web Page

4.2.1 Accessing the Web Page via Configuration Utility

To access the web page via configuration utility:
1. Select Ethernet under the desired device.
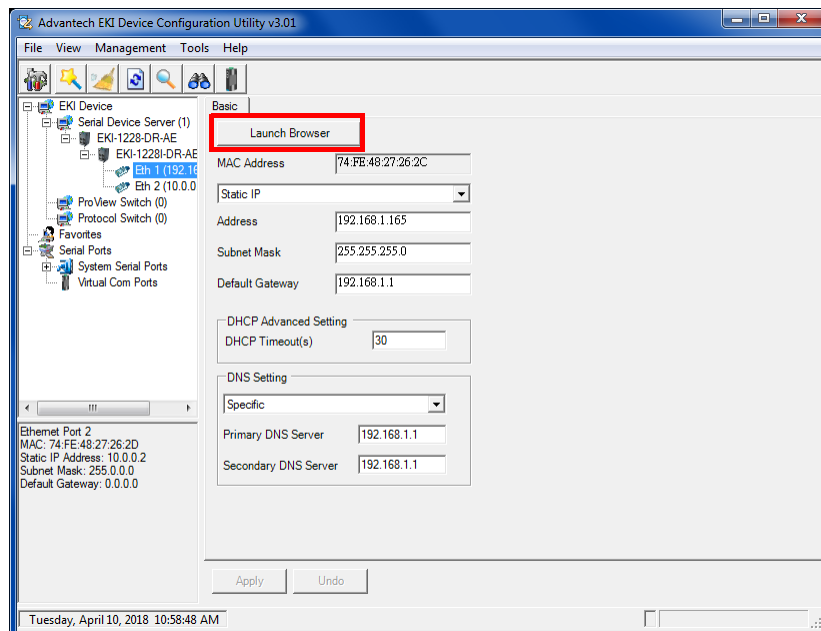2. Click **Launch Browser**.

Figure 4.1 Accessing the Web Page via Configuration Utility

4.2.2 Accessing the Web Page via Web Browser

Once the device is installed and connected, power on the device. The following information guides you through the logging in process.

1. Launch your web browser on the PC.
2. In the browser's address bar, type the device's default IP address (Eth1: 10.0.0.1, Eth2: 10.0.0.2).
   The main menu is shown.

4.3 System

You can change the Device Name and Device Description on this page. Moreover, you can set the Time zone related settings.

To access this page, click **System**.

Figure 4.2 System

The following table describes the items in the previous figure.

Item	Description
Firmware version	Displays the current firmware version of the device.
Revision number	Displays the revision number of the device.
Device Name	Enter the device name: up to 31 alphanumeric characters.
Device Description	Enter the device description.
Local Time	Click **Modify** to set local date and time of the system.

Item	Description
Time Server	Enter the address of the SNTP server. This is a text string of up to 64 characters containing the encoded unicast IP address or hostname of an SNTP server. Unicast SNTP requests will be sent to this address. If this address is a DNS hostname, then that hostname should be resolved into an IP address each time an SNTP request is sent to it.
Modbus Settings	
Listen Port for Slave Mode	Enter a value to identify the channel for remote initiating connections. The default value is 502.
Redundant	
Redundant ID for Slave Mode	Click the drop-down menu to select the redundant ID for Modbus Slave mode.
Virtual Gateway Settings	
Virtual Gateway	Click the radio button to enable the virtual gateway function.
Save	Click **Save** to save the values and update the screen.

4.4 Ethernet Configuration

Choose either **Eth 1** or **Eth 2** in the Ethernet Configuration page.Enter the corresponding values for your network environment. Once the settings are modified, press **Save** to keep the configurations.

To access this page, click **Ethernet Configuration**.

Figure 4.3 Ethernet Configuration

The following table describes the items in the previous figure.

Item	Description
IPv4 Configuration	
Mode	Click the drop-down menu to select the IP Address Setting mode: Static or DHCP.
MAC Address	Enter the MAC address to which packets are statically forwarded.
IP Address	Enter a value to specify the IP address of the interface. The default is 192.168.1.1.
Subnet Mask	Enter a value to specify the IP subnet mask for the interface. The default is 255.255.255.0.
Default Gateway	Enter a value to specify the default gateway for the interface. The default is 192.168.1.254.
DNS Configuration	
DNS	Click the radio button to select the DNS mode: Automatic or Specific.
Current Status	
IP 1	Displays the current IP address 1 of the device.
IP 2	Displays the current IP address 2 of the device.
Save	Click **Save** to save the values and update the screen.

Note! *All new configurations will take effect after rebooting. To reboot the device, click **Tools** > **Reboot**.*

4.5 Port Configuration

The serial port configuration menu has Basic and Operation Mode.

4.5.1 Basic

The Basic menu allows for the configuration of the serial interface type, baud rate, parity, data / stop bits, and flow control for port configuration.

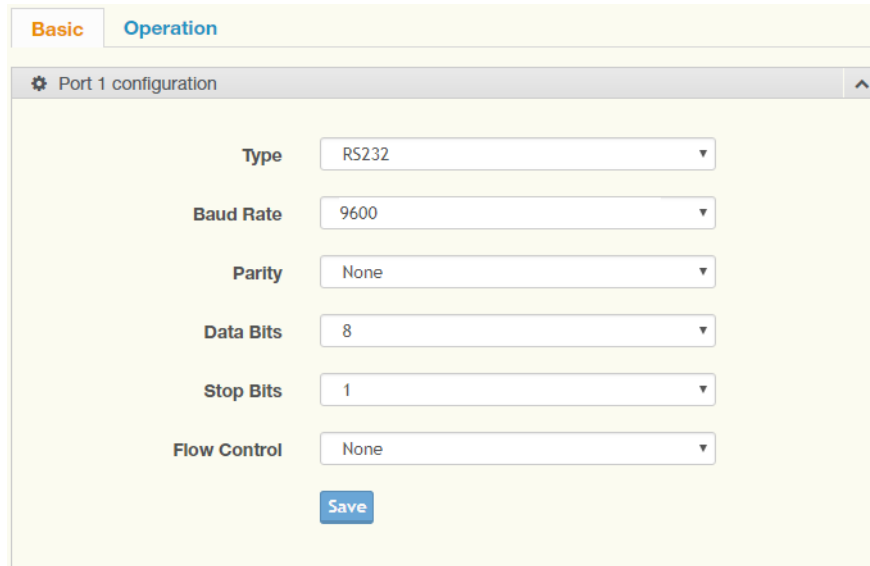To access this page, click **Port Configuration** > **Basic**.

Figure 4.4 Port Configuration > Basic

The following table describes the items in the previous figure.

Item	Description
Type	Click the drop-down menu to select a serial interface: RS232, RS422 or RS485.
Baud Rate	Enter a value to specify the baud rate. The value should conform to the current transmission speeds of connected devices when setting the baud rate.
Parity	Click the drop-down menu to select the parity: None, Odd, Even, Mark or Space.
Data Bits	Click the drop-down menu to select the data bits: 5, 6, 7, or 8.
Stop Bits	Click the drop-down menu to select the stop bits: 1, 1.5 or 2.
Flow Control	Click the drop-down menu to select the flow control mode: None, XOn/XOff, RTS/CTS or DTR/DSR
Save	Click **Save** to save the values and update the screen.

4.5.2 Operation

The Operation menu allows for the configuration of the mode type and related attributes for port configuration.

To access this page, click **Port Configuration** > **Operation**. Use this menu to select the port configuration mode: Modbus Master Mode or Modbus Slave Mode.
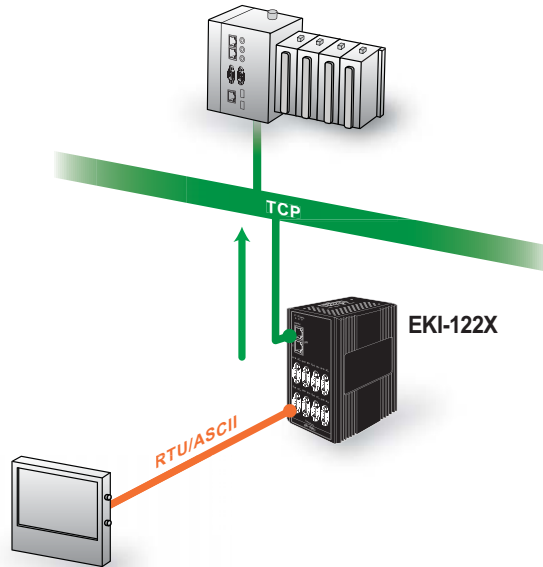
To translate RTU/ASCII to TCP, use Master Mode.

Figure 4.5 Master Mode

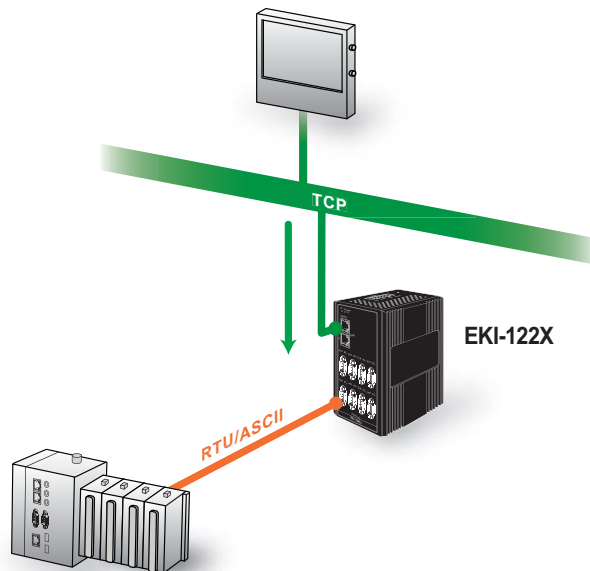To translate TCP to RTU/ASCII, use Slave Mode.

Figure 4.6 Slave Mode

These are the options for Modbus Master Mode.

Figure 4.7 Port Configuration > Operation > Modbus Master Mode

The following table describes the items in the previous figure.

Item	Description
Mode	Click the drop-down menu to select the port configuration mode: Modbus Slave Mode or Modbus Master Mode.
Protocol	Select the protocol of the Slave Mode or Master Mode (RTU or ASCII).
Master Timeout (ms)	Specify the time duration in milliseconds for the EKI-1228-DR Series to wait for a response after it has issued a command while using Modbus/RTU or Modbus ASCII. After the timeout is expired and no response is received, the EKI-1228-DR Series will regard the command as failed. Note that the timeout for the host PC must be greater than the timeout setting here specified, otherwise an error will occur.
Frame Break (ms)	Enter a value to specify the frame break time.
Peer for Receiving Data	
Peer Number	Click the drop-down menu to select the number of network devices to connect.
IP	Enter the IP address of the peer Modbus TCP device.
Port	Enter the TCP port number of the Modbus TCP device.
From, To	Enter the From and To values defining the Modbus Unit ID range of the Modbus TCP device network.
Offset	Enter the offset value of the Unit ID of the Modbus TCP frame before sending it to the Modbus TCP device. This offset value is subtracted from the Modbus TCP response before converting and passing it to the serial interface.
Save	Click **Save** to save the values and update the screen.

These are the options for Modbus Slave Mode.

Figure 4.8 Port Configuration > Operation > Modbus Slave Mode

The following table describes the items in the previous figure.

Item	Description
Mode	Click the drop-down menu to select the port configuration mode: Modbus Slave Mode or Modbus Master Mode.
Protocol	Select the protocol of the Slave Mode or Master Mode (RTU or ASCII).
Slave Timeout (ms)	Specify the time duration in milliseconds for the EKI-1228-DR Series to wait for a response after it has issued a command while using Modbus/RTU or Modbus ASCII. After the timeout is expired and no response is received, the EKI-1228-DR Series will regard the command as failed. Note that the timeout for the host PC must be greater than the timeout setting here specified, otherwise an error will occur.
Delay Timeout (ms)	Enter a value to specify the delay timeout.
ASCII Timeout (ms)	Enter a value to specify the ASCII timeout.
RTS Control	Click the radio button to enable RTS control function.
Peer for Receiving Data	
Peer Number	Click the drop-down menu to select the number of network device which you want to connect.
Slave ID	Enter the Modbus Unit ID for the serial interface of the connected device.
Description	Enter the description of the Modbus mapping.

Item	Description
Mapping ID AS	Enter the Modbus Unit ID presented to the Modbus TCP interface. The related device can be accessed by the Mapping ID from the Modbus TCP master; the Modbus command is converted to the corresponding Modbus Unit ID before it is sent to the Modbus Serial Device. The behavior is particularly helpful when different serial ports have devices with the same Unit IDs.
Save	Click **Save** to save the values and update the screen.

4.6 Monitor

The EKI-1228-DR Series device server allows monitoring of the serial ports' status. The serial port's operation mode and status is available for display. The IP address of the host PC which is communicating with serial port is also displayed.

The Monitor function provides a method to monitor the serial device server's status (operation mode, baud rate, data bits, stop bits, parity and RTS/XON/DTR).

Monitoring information is divided into three main message types: Setting/Statistic/Connected IP.

4.6.1 Setting

The Monitor Setting page allows for easy viewing of the port's statistics.

To access this page, click **Monitor** > **Setting**.

Setting	Statistic	Connected IP

⊞ Port 1 Status	
Operation Mode	Virtual COM Mode
Baud Rate	9600
Data Bits	8
Stop Bits	1
Parity	None
RTS/CTS	OFF
XON/XOFF	OFF
DTR/DSR	OFF
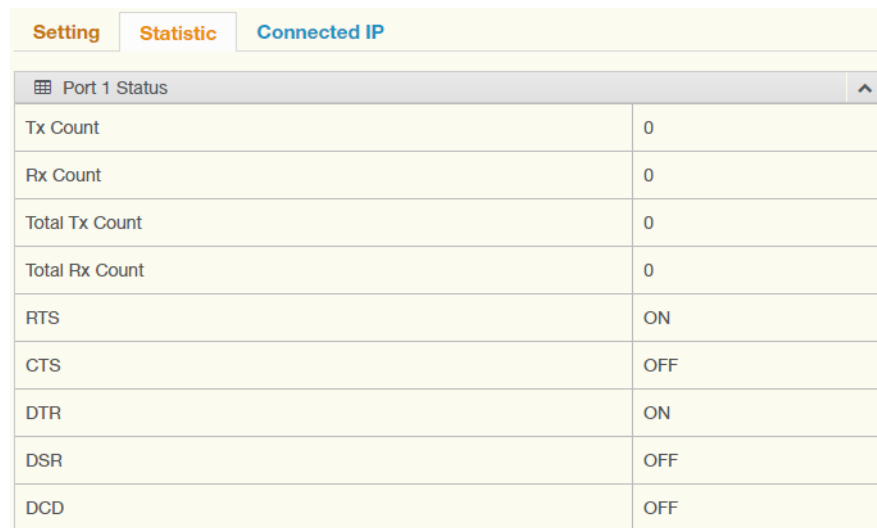
Figure 4.9 Monitor > Setting

The following table describes the items in the previous figure.

Item	Description
Operation Mode	Display the current operation mode of the selected port.
Baud Rate	Display the current baud rate of the selected port.
Data Bits	Display the current data bits of the selected port.
Stop Bits	Display the current stop bits of the selected port.
Parity	Display the current parity of the selected port.
RTS/CTS	Display the current RTS/CTS status of the selected port.
XON/XOFF	Display the current XON/OFF status of the selected port.
DTR/DSR	Display the current DTR/DSR status of the selected port.

4.6.2 Statistic

The Monitor Statistic page allows for easy viewing of the port's TX/RX data count.

To access this page, click **Monitor** > **Statistic**.

Setting	Statistic	Connected IP	
⊞ Port 1 Status			∧
Tx Count			0
Rx Count			0
Total Tx Count			0
Total Rx Count			0
RTS			ON
CTS			OFF
DTR			ON
DSR			OFF
DCD			OFF

Figure 4.10 Monitor > Statistic
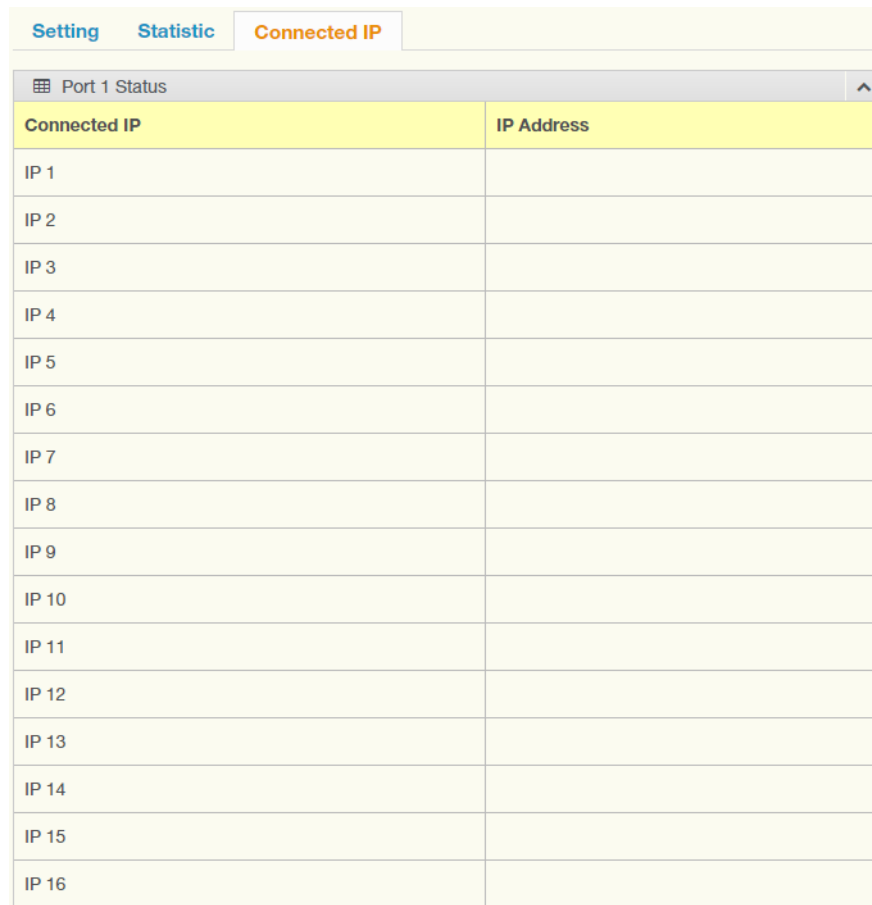
The following table describes the items in the previous figure.

Item	Description
Tx Count	Display the current Tx count of the selected port.
Rx Count	Display the current Rx count of the selected port.
Total Tx Count	Display the current total Tx count of the selected port.
Total Rx Count	Display the current total Rx count of the selected port.
RTS	Display the current RTS status of the selected port.
CTS	Display the current CTS status of the selected port.
DTR	Display the current DTR status of the selected port.
DSR	Display the current DSR status of the selected port.
DCD	Display the current DCD status of the selected port.

4.6.3 Connected IP

The Monitor Connected IP page allows for easy viewing of all connected device's IP address.

To access this page, click **Monitor** > **Connected IP**.

Figure 4.11 Monitor > Connected IP

The following table describes the items in the previous figure.

Item	Description
Connected IP	Displays the IP designation for the device.
IP Address	Displays the current connected IP address of the selected port.

4.7   Syslogd

The EKI-1228-DR Series device server provides the functionality to allow network devices to send event messages to a logging server, also known as a Syslog server, by way of the Syslogd function. The Syslog protocol is supported by a wide range of devices and can be used to log different types of events.

4.7.1   Syslogd Setting

Users can enable the syslogd function to record historical events or messages locally or on a remote syslog server.

To access this page, click **Syslogd** > **Syslogd Setting**.
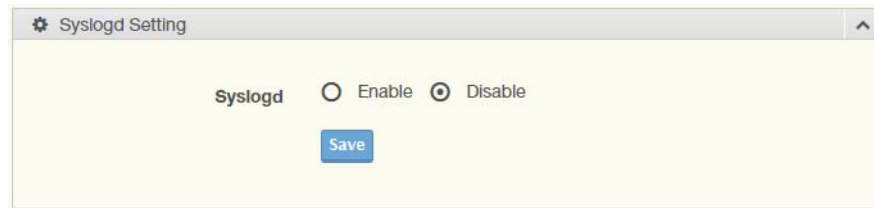
Figure 4.12 Syslogd > Syslogd Setting

The following table describes the items in the previous figure.

Item	Description
Syslogd	Click **Enabled** or **Disabled** to set the logging service status.
Save	Click **Save** to save the values and update the screen.

4.7.2   Syslogd Message

After enabling the syslogd function, users can check the history in the syslogd message page.

To access this page, click **Syslogd** > **Syslogd Message**.

Figure 4.13 Syslogd > Syslogd Message

4.7.3 Modbus IP Mapping

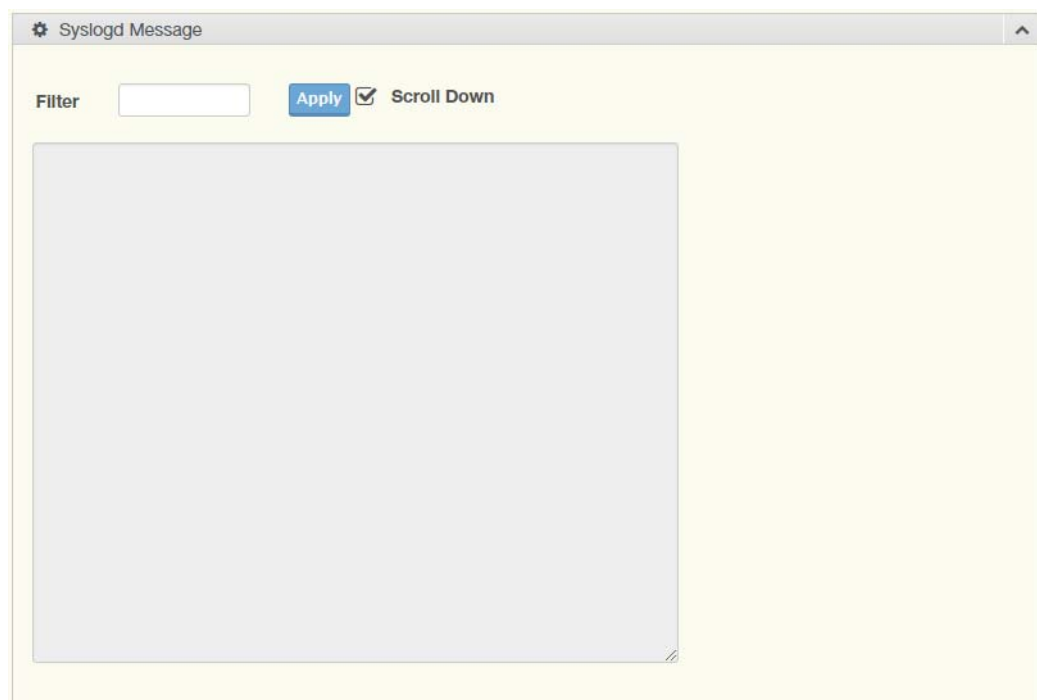While the gateway is operating under "Modbus Slave Mode", users can check the status of all the Modbus TCP master devices, which are currently accessing the gateway.

To access this page, click **Syslogd** > **Modbus IP Mapping**.

Figure 4.14 Syslogd > Modbus IP Mapping

4.7.4 Modbus Port Mapping

Users can check the overview of the "Unit ID"/"serial port" mapping table of the Modbus Slave Mode. It also records the error status of each individual Unit ID, which is very helpful while analyzing a Modbus communication.

To access this page, click **Syslogd** > **Modbus Port Mapping**.

Figure 4.15 Syslogd > Modbus Port Mapping

4.7.5 Modbus Slave Response Time

This page shows the longest response time of each individual unit ID. This should be helpful for optimizing the performance.

To access this page, click **Syslogd** > **Modbus Slave Response Time**.

Click **Clear All** to clear all response information.

Figure 4.16 Syslogd > Modbus Slave Response Time

4.8 Tools

The EKI-1228-DR Series device server provides tools for access to ping and reset functions.

4.8.1 Ping

The Ping page can help users diagnose ethernet problems. Users can use the ping page to ask the device to ping a specific target to check the Ethernet network status.

The Ping page allows you to configure the test log page.
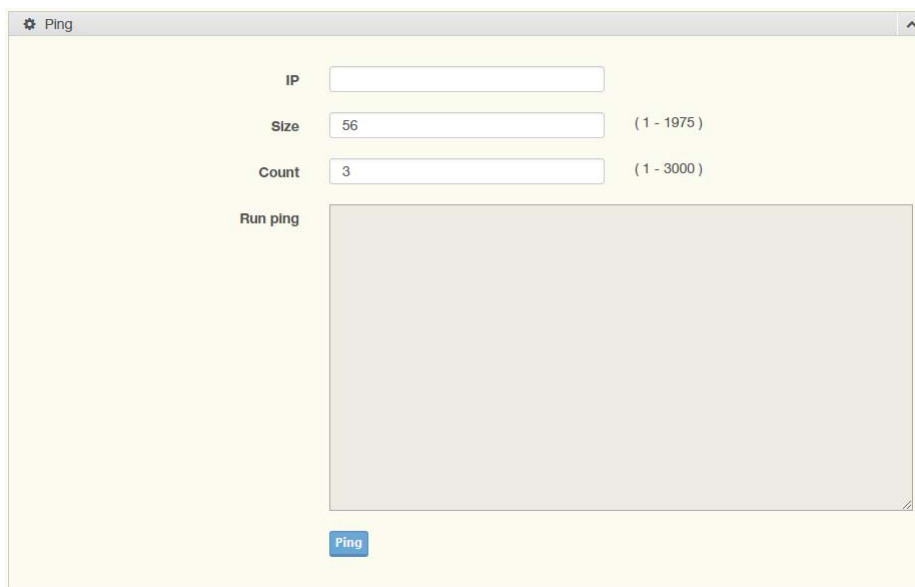
To access this page, click **Tools** > **Ping**.

Figure 4.17 Tools > Ping

The following table describes the items in the previous figure.

Item	Description
IP	Enter the IP address or host name of the station to ping. The initial value is blank. The IP Address or host name you enter is not retained across a power cycle. Host names are composed of series of labels concatenated with periods. Each label must be between 1 and 63 characters long, maximum of 64 characters.
Size	Enter the size of the ping packet. The default value is 56. The value ranges from 8 to 5120. The size entered is not retained across a power cycle.
Count	Enter the number of echo requests to send. The default value is 4. The value ranges from 1 to 5. The count entered is not retained across a power cycle.
Run ping	Display the ping reply format.
Ping	Click **Ping** to check the Ethernet network status.

4.8.2 Reboot

The configuration will take effect after clicking Save button. All configurations are saved to flash memory after a system reboot. Press the Reboot button and the system will give a reset response. It will take a few seconds to reconnect with the new values.

To access this page, click **Tools** > **Reboot**.

Warning!! Reboot will disconnect both ethernet and serial connection.
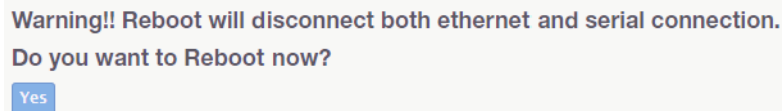**Do you want to Reboot now?**

Yes

Figure 4.18 Tools > Reboot

Click **Yes** to reboot the serial device server. Any configuration changes you have made since the last time you saved will be lost.

4.9 Management

The EKI-1228-DR Series device server allows for easy installation and maintenance and reliable maintenance access from anywhere. With the reliable management tools available, you can streamline staffing and troubleshooting requirements to a centralized system.

4.9.1 Change Password

The Change Password function allows you to easily update your current password from a single menu.

To access this page, click **Management** > **Change Password**.

⚙ Change Password

New password   [   ]

New password again   [   ]

                      Save

Figure 4.19 Management > Change Password

The following table describes the items in the previous figure.

Item	Description
New password	Enter the character set for the define password type.
New password again	Retype the password entry to confirm the profile password.
Save	Click **Save** to save the values and update the screen.

If you have set a password through the configuration utility or serial console, when you access the web configuration, you need to key in the password. It is not necessary to enter the user name in the dialog.

If you want to disable the password protection, change the password to default option **None** (leave the new password column blank). Be sure to press the **Save** button and reboot the serial device server to make the change effective.

4.9.2 Export Device Settings

Export the server configuration settings to a .conf file.

To access this page, click **Management** > **Export**.

Click **Export** to export the serial device server settings.

4.9.3 Import Device Settings

Import the server configuration settings to a .conf file.

To access this page, click **Management** > **Import**.

Figure 4.20 Management > **Import**

The following table describes the items in the previous figure.

Item	Description
Choose File	Click **Choose File** to select the configuration file.
Submit	Click **Submit** to backup the settings.

Chapter 5

TCP and UDP Port Numbers

5.1 List of Known TCP and UDP Port Numbers

Port	Protocol	Service
5048	(TCP/UDP)	Configuration Utility
5058	(TCP/UDP)	Configuration Utility
5202	(TDP)	VCOM/RVCOM
9999	(TDP)	Firmware Download
22	(TDP)	SSH
23	(TDP)	Telnet
25	(TDP)	SMTP (Mail Client)
53	(TCP/UDP)	DNS
67	(UDP)	BOOTP Server/DHCP
68	(UDP)	BOOTP Client/DHCP
80	(TDP)	Web Interface/HTTP
123	(TDP)	NTP
161	(TDP)	SNMP
162	(TCP/UDP)	SNMP Trap
443	(TDP)	HTTPS
502	(TDP)	Modbus/TCP (Default)
514	(TDP)	Syslog
546	(TCP/UDP)	DHCPv6 Client
547	(TCP/UDP)	DHCPv6 Server

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