Serial Device Server Quick Installation Guide

Introducing the *Serial Device Server*

The *Serial Device Server* will link any serial device to your computer network using the Ethernet for access control or remote control and monitoring purposes.

Features and Benefits

- Data conversion between RS-232/422/485
- Dynamic IP configuration
- Dual LAN speed
- Server/Client dual modes
- Web-based setup
- Built-in security control

System Requirements

- Pentium® or equivalent computer with an available serial port and ethernet port
- Windows® 7 (32-/64-bit) / Vista (32-/64-bit) / XP (32-/64-bit) / Server 2003 & 2008 (32/-64-bit) / 2000

Serial Number Sticker

For future product return or exchange, this serial number is required. Please keep it for your reference.

Package Contents

- *Serial Device Server*
- Power adapter
- Driver CD
- Quick installation guide

Layout

Figure 1: Serial Device Server

LED Indicators

- Sys (Red): Power indicator (when power is on the LED flashes every second)
- LAN: Network status (when converter links to LAN the LED stays on) Green: 100 Mbps, Red: 10Mbps
- Data (Red): Network activity indicator (when sending and receiving data the LED will blink)
- PWR (Red): Power indicator (when the power is on the LED will flash continuously)

Introduction

The *Serial Device Server* is designed to operate serial ports over 10/100 Mbps Ethernet networks, transmitting via TCP/IP protocol. Control is available via Ethernet, Intranet, and Internet. The device server is packaged in a plastic case well suited for industrial environments. All serial ports operate in standard RS-232 mode and industrial RS-422 and RS-485 modes.

Overview

The *Serial Device Server* is designed to make your serial devices network ready. This device server is the ideal choice for connecting your RS-232 or RS-422/485 serial devices, such as PLCs, meters, and sensors to an IP-based Ethernet LAN, making it possible for your software to access serial devices anywhere and anytime over a local LAN or the Internet.

The *Serial Device Server* is compatible with most network software that used standard network API (Winsock or BSD sockets) by providing TCP server mode, TCP client mode, and UDP mode. The VirtualCOM driver software, that works with the COM port, can be set up to work over a TCP/IP network. This excellent feature preserves your software investment and lets you enjoy the benefits of networking your serial devices.

The *Serial Device Server* supports manual configuration via the handy web browser console and many protocols including TCP, IP, UDP, HTTP, DHCP, ICMP, and ARP.

Figure 2: Layout

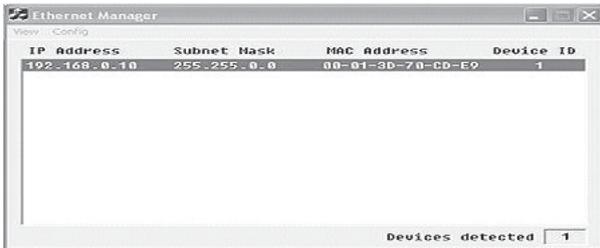# Device Server Configuration

Initial IP Configuration

When setting up the *Serial Device Server* for the first time, the first thing you should do is configure the IP address. This chapter introduces the method to configure the device server's IP address. For more details about the network settings, see **Web Console Configuration**, in the next sub section.

Device Management Utility (ETM)

Device Management Utility, named ETM.exe, is an executable prograom in Windows 32-bit environments. ETM Setup Toll is used to detect and setup the *Serial Device Server*. It uses UDP broadcast packets to query and configure the device server on the network.

When you activate the toll, it will detect the existence of the installed device server and the device server's display status, such as IP address,. subnet mask, MAC address, and device II, see **Figure 2** below.

Temporarily disable Windows firewall when using ETM. You can restart it after completing the parameter settings.

Figure 2

Menu View

Refresh the status. ETM will sne another query to get updated information, see Figure 3. **Important**: Always run **View > Refresh** after any data change.
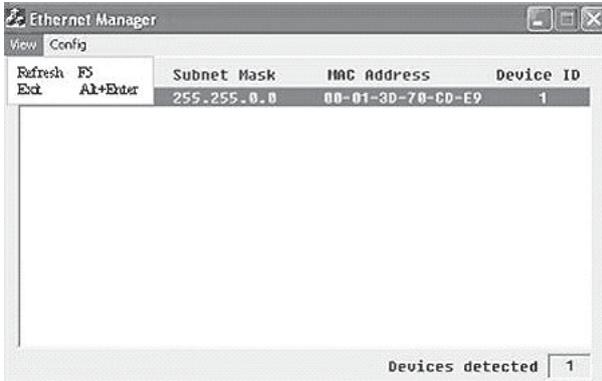

Figure 3

Press Enter or select [IP Address] in the [Config] menu, a dialog box will be shown, see **Figure 4** below. Assign an IP address with the same subnet mask as your computer, avoiding any IP conflict with other network devices.
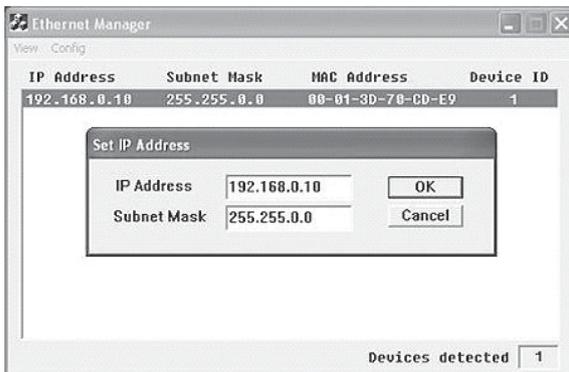

Figure 4

Press Ok, and the IP address will be refreshed in 2-3 seconds, see **Figure 5**.

Figure 5

Web Console Configuration

In addition to basic IP address and subnet mask, specific device settings can be set through HTTP protocol with popular browsers, e.g. Internet Explorer, Firefox, etc. Setup is as easy as surfing the web, no special software is required. Pressing **[Alt] + [Enter]** or select **[Device Settings]** in the [Config] menu will ipen a new window in the browser to log into the device. Alternatively, if the IP address of the *Serial Device Server* is already known, you can connect to it directly by typing in its IP address in the URL field of the browser.

Controller Status

To enter the Controller Status page, follow the steps below.

1. Start your browser. This chapter will use IE as the default internet browser.

2. In the browser URL field, type the IP address of the *Serial Device Server* directly and press Enter (the IP address is what you set using the Device Management Utility). The Controller Status page will be shown, see Figure 6 below.

Figure 6

Field Description

*   **System time elapsed**: the time elaped since start of this device in [Day:Hour:Minute:Sec] format. This information can be useful in identifying the reliability of the system.
*   **Firmware version**: The device server firmware is identified by date code. This information will be required in looking for techinical support.
*   **Serial number**: The first 5 digits is the serial number. The next 8 digits is the unique MAC (Media Access Control) address used for identification by Ethernet network.

- **Password (Setup Login)**: This field is the administration password for authentication. The factory default setting is blank. However, it is recommended to set a password under normal operation. If you forget the password, the device server can be returned to factory default setting (blank password) by pressing in the reset button while powering on the *Serial Device Server*.

  The *Serial Device Server* uses the same password protection mechanism commonly used in Windows NT or UNIX. If there are more than **3 consecutive failures** during login, the login function will be disabled for **15 minutes**. During this 15 minute period, you will not be able to login if you supply the correct password. This prevents intruders from finding the password by computer generated programs.

Controller Setup

Type in the password and click Login button, the Controller Setup page will appear similar to **Figure 7** on the next page.

> **Note**: If you forget the password or can't login successfully, return the *Serial Device Server* to the factory default setting of blank password. See **Password (Setup Login)** above for more information.

Figure 7

Field Description

- **IP address**: Must not conflict with other devices on your network. If DHCP client mode is enabled and there's a DHCP server on the network, the IP address will be assigned by the DHCP server.

- **Destination IP address**: The device server IP address and socket port would be connected in TCP client and UDP mode for a certain server IP address

- **Destination socket port**: The device server socket port would be connected in TCP Client and UDP mode or a certain socket port.

- **TCP socket inactive timeout (minutes)**: Sets inactive timeout period from 1-99 minutes

- **Connection**: The connection can be selected in 2 modes. Auto - automatic program control of the converter; Manual - manual program control of the converter

- **Serial I/O setting (baud rate, parity, data bits, stop bits)**: Baud rate: 300-115200 bps; Parity: None; Even; Odd; Data bits: 7 or 8; Stop bits: 1 or 2

- **Interface of serial I/O**: RS 232: TxD, RxD for data stream, no flow control

- **Packet mode of serial input**: Can be set to enabled or disabled mode. If packet mode is enabled, the data input from the UART will be deferred until the input buffer is full, or the device server detects a 10-character packet gap and no more characters arrive. The block waiting time is extended to avoid the splitting of the complete packet

- **Device ID**: User assigned ID number for the device server. AvailableIDs: 0-65535

- **Report device ID when connected**: In TCP mode, if this parameter is enabled, every time the socket is connected, the *Serial Device Server* will report it's device ID. The total length is 8 bytes, where "nnnnn" is a 5-digit device ID assigned by the user; [LF] is decimal 10; [CR] is decimal 13

Serial #1	nnnnnA[LF][CR]
Serial #2	nnnnnB[LF][CR]
Digital I/O	nnnnnC[LF][CR]

- **Setup password**: Administration password used to login to the Controller Setup page. It may be empty or up to 15 characters long.

Device Server Updated

Press Update button after you finish the detailed parameter settings. The *Serial Device Server* will save all parameters into internal non-volatile memory and then reboot. It taked about 5 seconds to complete the whole process, and a new login page will be displayed.

> **Note**: If **Controller Updated/Now restarting** doesn't shoe up after clicking the update button, this means the configuration page was left idling too long and it timed out. No update was performed. The user will be sent back to the login page. You can re-login and checkif all the parameters have been saved. If everything is ok, you can close the browser. **Important**: If the domain of the *Serial Device Server* is different from that of the computer running the browser, the loging page won't appear unless the *Serial Device Server's* gateway address has been correctly set.

- **Subnet mask**: Subnet mask of 255.255.255.0 is usually used for small networks, 255.255.0.0 for larger networks. If your IP address is provided by an ISP or networ administrator, please obtain that information and enter it correctly. If DHCP client mode is enabled and there's a DHCP server on the network, this field will be assigned by the DHCP sever automatically.

- **Gateway address**: Gateway or Router IP address. A gateway is a device which connects a local network to an external network. Type in this information carefully. If there is no gateway on the network, leave it as 0.0.0.0. If DHCP client mode is enabled and there is a DHCP server on the network, this field will be assigned by the DHCP server automatically.

- **Network link speed**: Ethernet physical link speed can be set to **Auto** or you can specify 10Mbps or 100Mbps to match the speed of the network.

- **DHCP client**: DHCP client mode can be enabled/disabled. If DHCP is enabled, there should be a DHCP server on the network.

- **Socket port of HTTP setup**: The socket port used to conduct the browser setup. Normally, HTTP protocol uses port **80** for communication. If the field is changed to **81**, port **80** will be reserved for user's own Web.

  To enter the browser setup page, **http://x.x.x.x:81** should be typed for socket port **81** and **http://x.x.x.x** for socket port **80**, where **x.x.x.x** is the converter's IP address.

- **Socket port of serial I/O**: <u>Port number</u>: A 16-bit number, ranging from 1 to 65535. Because the numbers below 1000 are used for specific purposes **e.g. 80 is for HTTP protocol**, we suggest you use numbers larger than 1000. Generally port number 4660 is used for the serial communication. However you should specify a different port number for each serial port. <u>Socket types</u>: TCP Server - TCP protocol, passive open, to be connected from the TCP clients. TCP Client - TCP protocol, active open, connect to the TCP server.

  UDP Client: UDP protocol, connectionless

- **Socket port of digital I/O**: Same as **Socket port of serial I/O**.

Factory Default Setting

If by chance, you forget the setup password, or have incorrect settings making the *Serial Device Server* inoperable, there are two ways to reset the server to factory default settings.

A)

1.   Turn off the *Serial Device Server*.
2.   Press and hold down the reset button as you power on the *Serial Device Server*.
3.   Wait for 3 seconds, then release the reset button.
4.   The password will reset to the factory default (blank - no password).

B)

1.   Log into the web page.
2.   Press and hold down the reset button of the *Serial Device Server*.
3.   Select the update button.
4.   After Tx & Rx lights start flashing, release the reset button.
5.   The password will reset to the factory default (blank - no password).

Self-Testing

After completing the wiring and parameter setting, use this chapter to test the *Serial Device Server*.

Hyper Terminal utility should be installed on your PC see **Figure 8** on the next page. It can be found in your Windows installation CD. The wiring architecture is similar to **RS-232 Wiring** on **page 19**, and the serial device is replaced by the PC's COM 1. The same PC also plays the roll of the Remote Host.

Hyper Terminal for TCP/IP WinSock

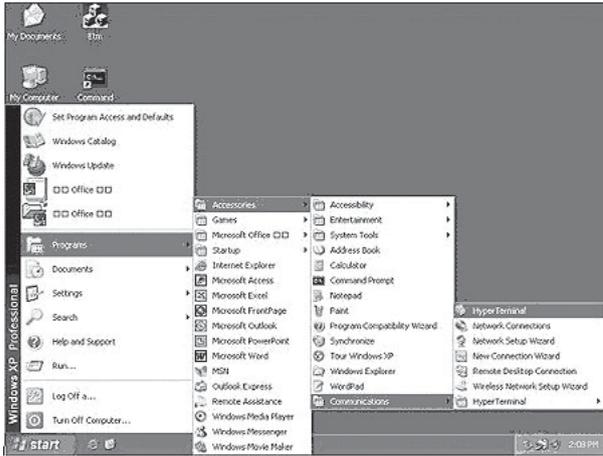Initiate Hyper Terminal from the Start Menu in Windows, see **Figure 8**.

Figure 8

Give a terminal name, choose an icon, and press **OK** button, see **Figure 9**.

Figure 9

Select **TCP/IP(Winsock)** option at the **Connect** using: field, see **Figure 10**.
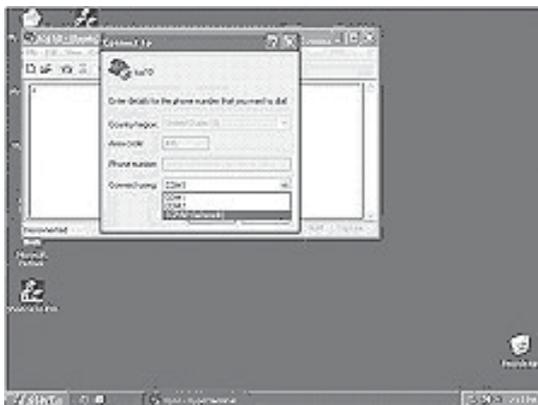

Figure 10

After **OK** button is pressed, see **Figure 11** appears. Enter the converter's IP address (e.g. 192.168.0.10) at the **Host address** field, and the Socket port number set for Serial Port 1 at the **Port number**: field (e.g 4660). (The Socket type of the Serial Port 1 should be **TCP Server**)
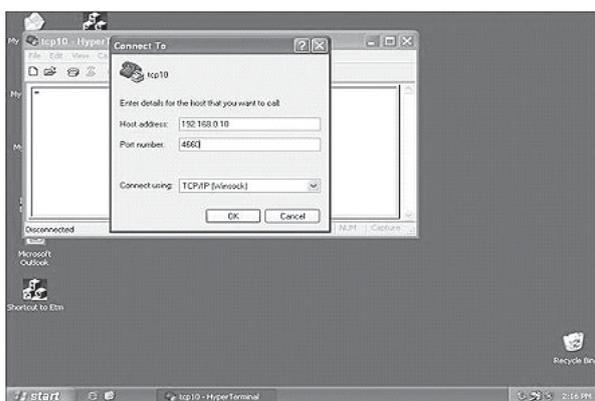

Figure 11

If Hyper Terminal connects with the *Serial Device Server* successfully, the time clock at the lower left corner, **Connected hh:mm:ss**, will start counting, see **Figure 12**.
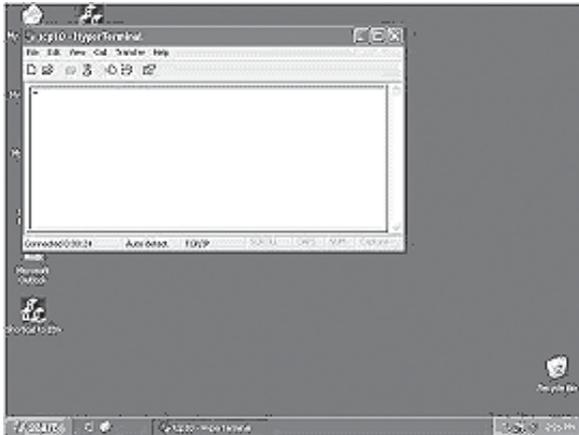

Figure 12

Hyper Terminal for COM Port

Initiate another Hyper Terminal as a COM Port Terminal, (see **Figure 10**, select COM 1 or other COM port. Set the COM port Properties to the same as those set for the serial port of *Serial Device Server*.

Data Transmission

When all steps described above are finished, type any characters on the COM Port Terminal and check if the typed characters are also displayed on the TCP/IP Winsock Terminal. Alternatively, check if the characters typed on the TCP/IP Winsock Terminal are also displayed on the COM Port Terminal. If yes, then all settings are correct and the converter is operating properly.

Pin out and Cable Wiring

RJ-45 Pin Assignment

RJ45 Port

Pin	Signal
1	Tx+
2	Tx-
3	Rx+
6	Rx-
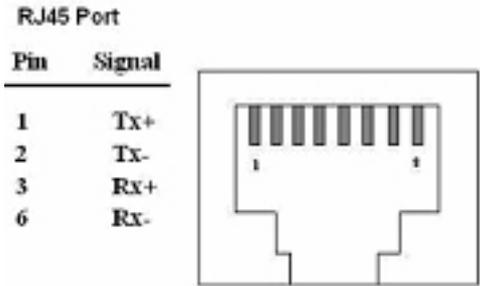
RS-232 Pin Assignment

The pin assignment scheme for a 9-pin male connector on a DTE is given below.
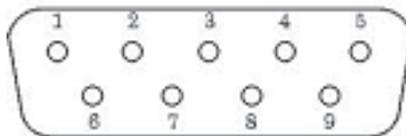
Pin 1: DCD   Pin 6: DSR
Pin 2: RXD   Pin 7: RTS
Pin 3: TXD   Pin 8: CTS
Pin 4: DTR   Pin 9: X
Pin 5: GND

RS-422 Pin Assignment

The pin assignment scheme for a 4-pin RS-422 is given below.

```
┌─────────────────────┐
│   1    2    3    4   │
│                     │
│  ▯    ▯    ▯    ▯   │
│                     │
└─────────────────────┘
```
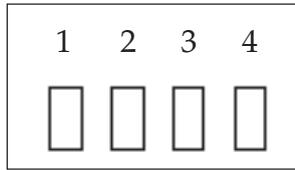
Pin 1: T+   Pin 2: T-   Pin 3: R+   Pin 4: R-

RS-485 Pin Assignment

The pin assignment scheme for a 4-pin RS-485 is given below.

```
┌─────────────────────┐
│   1    2    3    4   │
│                     │
│  ▯    ▯    ▯    ▯   │
│                     │
└─────────────────────┘
```
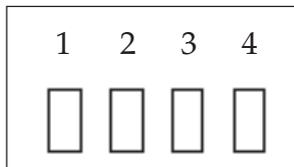
Pin 1: X   Pin 2: X   Pin 3: D+   Pin 4: D-

Wiring Architecture

RS-232 Wiring


```
Serial Device    Converter
    TX              RX
    RX              TX
    GND             GND
```

RS-232 (RTS / CTS) Wiring


```
Serail Device    Converter
    RX              TX
    TX              RX
    GND ———————     GND
    RTS             CTS
    CTS             RTS
```

RS-232 (RTS / CTS, DSR / DTR) Wiring


```
Serail Device    Converter
    RX              TX
    TX              RX
    GND             GND
    RTS ———————     CTS
    CTS             RTS
    DTR             DSR
    DSR             DTR
```

RS-422 Wiring

Serial Device	Converter
T +	R +
T -	R -
R +	T +
R-	T-

HUB

RS-485 Wiring

Serial Device	Converter
D+	D+
D -	D -

HUB

FAQ

Q1. Why can't ETM.exe detect the *Serial Device Server* on the network?

A1. Please check the following:

*   Make sure the power adapter is properly plugged into the *Serial Device Server*.

*   Make sure the network cable is properly connected between the *Serial Device Server* and the computer.

*   Close the anti-virus program and Firewall utility.

*   Make sure the subnet mask of the computer is the same as the *Serial Device Server* (default 255.255.0.0).

Q2.   Why can't I use my browser to setup the *Serial Device Server*?

A2. Check if the network domain of the PC is the same as the *Serial Device Server*.

Blank Page

Technical Support and Warranty

QUESTIONS? SIIG's **Online Support** has answers! Simply visit our web site at *www.siig.com* and click **Support**. Our online support database is updated daily with new drivers and solutions. Answers to your questions could be just a few clicks away. You can also submit questions online and a technical support analysts will promptly respond.

SIIG offers a 2-year manufacturer warranty with this product. This warranty covers the original purchaser and guarantees the product to be free of any defects in materials or workmanship for two (2) years from the date of purchase of the product.

SIIG will, at our discretion, repair or replace (with an identical product or product having similar features and functionality) the product if defective in materials or workmanship. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Please see our web site for more warranty details.

If you encounter any problems with this product, please follow the procedures below.

A) If it is within the store's return policy period, please return the product to the store where you purchased it.

B) If your purchase has passed the store's return policy period, please follow these steps to have the product repaired or replaced.

Step 1: Submit your RMA request. Go to **www.siig.com**, click **Support**, then **RMA** to submit a request to SIIG RMA or fax a request to 510-657-5962. Your RMA request will be processed, if the product is determined to be defective, an RMA number will be issued.

Step 2: After obtaining an RMA number, ship the product.
- Properly pack the product for shipping. All software, cable(s) and any other accessories that came with the original package must be included.
- Clearly write your RMA number on the top of the returned package. SIIG will refuse to accept any shipping package, and will not be responsible for a product returned without an RMA number posted on the outside of the shipping carton.
- You are responsible for the cost of shipping to SIIG. Ship the product to the following address:

  SIIG, Inc.
  6078 Stewart Avenue
  Fremont, CA 94538-3152, USA
  RMA #: _____
- SIIG will ship the repaired or replaced product via Ground in the U.S. and International Economy outside of the U.S. at no cost to the customer.

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SIIG is the premier one-stop source of upgrades and is committed to providing high quality products while keeping economical and competitive prices. High-quality control standards are evident by one of the lowest defective return rates in the industry. Our products offer comprehensive user manuals, user-friendly features, and most products are backed by a lifetime warranty.

SIIG products can be found in many computer retail stores, mail order catalogs, and e-commerce sites in the Americas, as well as through major distributors, system integrators, and VARs.

PRODUCT NAME
Serial Device Server

FCC RULES: TESTED TO COMPLY WITH FCC PART 15, CLASS B OPERATING ENVIRONMENT: FOR HOME OR OFFICE USE

FCC COMPLIANCE STATEMENT:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

THE PARTY RESPONSIBLE FOR PRODUCT COMPLIANCE

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Fremont, CA 94538-3152, USA
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