



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



Serial Device Servers

USER MANUAL



B+B SMARTWORX

Powered by

ADVANTECH

Advantech B+B SmartWorx - Americas

707 Dayton Road
Ottawa, IL 61350 USA
Phone (815) 433-5100
Fax (815) 433-5105

Advantech B+B SmartWorx - European Headquarters

Westlink Commercial Park
Oranmore, Co. Galway, Ireland
Phone +353 91-792444
Fax +353 91-792445

www.advantech-bb.com
support@advantech-bb.com

Table of Contents

Introduction	4
Understanding How Virtual Communication Ports Work	5
Understanding MAC and IP Addresses and Port Numbers	5
Identifying Operating Modes	6
Identifying B+B SmartWorx's Serial Device Servers	7
System Requirements	7
Features	7
Protocol Support	8
TCP Socket Services – IntelliSock™	8
Getting Started.....	9
Unpacking Your Serial Device Server	9
Identifying Parts	10
Understanding LED Codes	11
Locating Serial and Network Ports	12
Making Connections	15
Installing the Device Drivers	16
Win NT Device Manager	28
Win NT – Changing Port Numbers	28
Uninstalling Your Serial Device Server	29
Uninstalling from Windows XP/2000	29
Uninstalling from Windows NT4	29
Alternative Installation Steps	30
Configuring the Serial Device Server Using the Web Interface	44
Setting TCP/IP (LAN) Parameters.....	46
Setting SNMP parameters.....	50
Viewing the serial port parameters.....	53
Setting serial port parameters.....	53
Setting Normal operating mode parameters	53
Setting Tunneling operating mode parameters.....	56
Setting Raw TCP Operating Mode Parameters	59
Setting Auto TCP Operating Mode Parameters	62
Setting Raw UDP Operating Mode Parameters.....	66
Running Diagnostic Tests.....	70
Using the Port Status screen.....	70
Running the Ping test	70
Checking wireless status.....	71
Performing Administrative Functions	72
Managing Users.....	72
Giving the Serial Device Server a Descriptive Name	74
Upgrading Firmware	74
Troubleshooting and Maintaining a Serial Device Server	76
Troubleshooting a Serial Device Server.....	76
Maintaining a Serial Device Server	79
Operating Conditions	79
Handling the Serial Device Server.....	79
Moving the Serial Device Server.....	79
Cleaning the Serial Device Server.....	79

Servicing the Serial Device Server	79
Appendix A	80
Specifications	80
Appendix B	84
Declaration of Conformity	84
Appendix C	86
Warranty information	86

Figures

Figure 1 – Connectors and Indicators.....	10
Figure 2 - DB9 pinouts	12
Figure 3 - RJ45 Pinouts (DB9 to RJ45 adapter)	13
Figure 4 - RJ45 Ethernet Port Pinout.....	14
Figure 5 - Connecting a serial device server to a serial device	15
Figure 6 - Main Menu screen	16
Figure 7 - Welcome screen	17
Figure 8 - Prepare to Install screen.....	17
Figure 9 - Search network for Serial device server(s) screen.....	18
Figure 10 - Where is the Serial Device Server Attached screen	19
Figure 11 - Network Connectivity Test screen	20
Figure 12 - Retrieving Unit Configuration pop-up box	20
Figure 13 - TCP/IP Network Configuration Parameters screen.....	21
Figure 14 - Internet Protocol (TCP/IP) Properties dialog box	22
Figure 15 - Restart confirmation pop-up box	23
Figure 16 - Information pop-up box.....	23
Figure 17 - TCP/IP Network Configuration Parameters screen.....	24
Figure 18 - Rerun network connectivity test pop-up box	24
Figure 19 - Network Connectivity Test screen	25
Figure 20 - Retrieving Unit Configuration pop-up box	25
Figure 21 - TCP/IP Network Configuration Parameters screen.....	26
Figure 22 - Install the Device Drivers screen	26
Figure 23 - Installation Complete screen	27
Figure 24 - Reconfigure the Serial Device Server screen	30
Figure 25 - Serial Device Server is Configured for a Remote Subnet.....	31
Figure 26 - Internet Protocol (TCP/IP) Properties dialog box	32
Figure 27 - Restart confirmation pop-up box	33
Figure 29 - TCP/IP Network Configuration Parameters screen.....	34
Figure 31 - Rerun network connectivity test pop-up box	34
Figure 40 - Specify IP Address screen	42
Figure 43 - Network Setup screen	46
Figure 44 - IP Address Successful screen.....	49
Figure 45 - Remote Reset screen.....	50
Figure 46 - serial device server is now resetting screen.....	50
Figure 47 - SNMP Setup screen	51
Figure 48 - SNMP Address Update Successful screen	52
Figure 49 - Remote Reset screen.....	52
Figure 50 - serial device server is now resetting screen.....	52
Figure 51 - Serial Port Status screen.....	53
Figure 52 - Serial Port Setup screen for Normal mode.....	54
Figure 53 - Serial Port Setup screen for Tunneling mode	57
Figure 54 - Serial Port Setup screen for Raw TCP mode.....	60

Figure 55 - Serial Port Setup Screen for Auto TCP Mode	63
Figure 56 - Serial Port Setup screen for Raw UDP mode	67
Figure 57 - Port Status screen	70
Figure 58 - Ping Test screen.....	70
Figure 59 - Ping results screen	71
Figure 60 - Wireless Status screen	71
Figure 61 - Show Users screen	72
Figure 62 - Add/Del Users screen.....	72
Figure 63 - Network confirmation prompt.....	73
Figure 64 - Add/Del Users screen.....	73
Figure 65 - Show Users screen	74
Figure 66 - Set Descriptive Name screen	74
Figure 67 - Firmware Upgrade screen	75
Figure 68 - Remote Reset.....	75

Tables

Table 1 - Serial Device Server Models	7
Table 2 - Serial Device Server LED Codes.....	11
Table 3 - RS-232 Signals on DB9 connector	12
Table 4 - RS-422/485 Signals on DB9 Connector	12
Table 5 - RS-232 Signals on RJ45 Connector (DB9 to RJ45 adapter)	13
Table 6 - RS-422/485 Signals on RJ45 Connector (DB9 to RJ45 adapter)	13
Table 7 - RJ45 Ethernet Port Signals	14
Table 8 - Class A, B, and C address masks	47
Table 9 - Complete list of address masks.....	47

Introduction

B+B SmartWorx's line of Serial device servers is designed to network-enable any device currently using RS-232 or RS-422/485 serial communications protocols. These Device Servers provide industry-leading hardware and user-friendly software to make connecting your serial devices to an Ethernet network a surprisingly simple process.

There are many reasons to network your serial devices using a B+B SmartWorx Device Server, such as:

Note: For online technical support, see B+B SmartWorx's Website.

Typical Scenario:

You have a serial device that is operated by a PC. The application software on the PC "talks" to the serial device using COM port 3. Unfortunately, anyone who wants to communicate with that device must come to the local PC. This can be very time consuming if the serial device is located in a remote area, and expensive if you need a PC for every serial device.

A Device Server eliminates the need for a local PC and allows anyone with the proper application software, the B+B SmartWorx Device Server drivers, and authorized access to the network, to communicate with the serial device.

- Remote support – support personnel can diagnose and repair many problems by communicating with your serial devices via the Internet or Intranet.
- Remote management – install new firmware or software upgrades on your serial devices without physically removing them from service.
- Efficient communications – instead of having one device communicating with one computer, your device can communicate with any computer on the network.
- Lower cost of ownership – no need to upgrade serial devices to newer, costlier versions containing built-in Ethernet interfaces – if such an upgrade is even available.
- Extended service life of software – your existing software can be used to communicate with the serial device as if connected to a local COM port; the network connection is "invisible" to the application.

After following the simple steps to attach your network and serial devices to the appropriate connectors on the Serial device server, you'll need just a few more minutes to install the driver. You'll then be able to communicate with the serial device via its own application software and with the serial device server using a Web browser.

To network-enable a serial device, plug it into the serial port located on the Device Server. Plug in the network Ethernet cable and power source, and load the B+B SmartWorx device drivers onto a host PC anywhere on the network using the instructions provided. The B+B SmartWorx device drivers will install the serial device server's serial ports as if they were additional local COM ports in Windows. Simply change the settings in the serial device's application software to look for the serial device on the new COM port. It's that easy!

Understanding How Virtual Communication Ports Work

Note: B+B SmartWorx Device Server technology now allows access to individual serial devices by anyone with access to the network on which they are installed.

Note: Anyone with a PC can connect to the serial device over the network just as though the two devices were directly connected.

Note: A protocol is a set of rules that notifies a transmitting device and a receiving device that the other is present and ready to exchange information, when the exchange is complete, and whether it was successful.

Single-port Device Servers allow you to network individual serial devices such as printers, simple terminals, or medical monitoring equipment that were previously accessible only via a direct link.

According to Dataquest, a Device Server is a “specialized network-based hardware device designed to perform a single or specialized set of functions with client access independent of any operating system or proprietary protocol.” In terms of your new serial device server, this means that you can connect any serial device to your network by connecting the serial device to a serial port on your serial device server and connecting the Ethernet port on your serial device server to your network.

The serial device server, once it has been correctly configured, makes accessing a single serial device such as a time clock from your network a transparent operation. This means that a PC can perform all the operations in the same way it would if the serial device were plugged directly into its serial port.

A network connection allows operation of serial devices at much greater distances than can be accomplished with a direct serial connection. Your serial device server uses the TCP/IP protocol suite for network communications. This means that communication through a serial device server can actually be more reliable than communication over long serial lines, which lacks the advanced error checking built into TCP/IP.

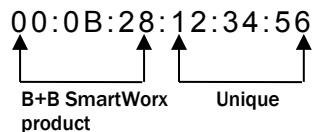
Another benefit of accessing a serial device through a serial device server is that you can monitor and manage the device remotely, even from across the world, if you have authorization and the network connection is to the Internet.

Understanding MAC and IP Addresses and Port Numbers

Identifying the Ethernet (MAC) Address

Note: You can find the unit's Ethernet (MAC) address on the product information label located on the bottom of the unit.

Ethernet address, hardware address, and MAC address are all equivalent names for a device's unique network address. In the case of a serial device server, the first three bytes identify the unit as a B+B SmartWorx product. The last three bytes are unique to each unit and are assigned when the unit is released from production. Colons separate the bytes. The following is an example of a serial device server Ethernet (MAC) address:



Assigning an IP Address

Every device that communicates over the Internet must have a unique IP address. You can assign an IP address to your serial device server by either of two methods:

- Through the installation Wizard for initial configuration.
- Through the web interface for reconfiguration and maintenance.

Using Port Numbers

Note: You can think of the IP address as a telephone number and the port number as a telephone extension.

Note: This information is useful for firewall configuration.

In order for devices to communicate via a TCP connection or a UDP datagram, they must know each other's IP address and port number. The serial device server driver automatically sets the unit's port number for you.

A specific port number identifies each serial device server serial port. An serial device server assigns a port number of 5000 to the first port and then increments the port number sequentially for each subsequent serial port. Serial device server drivers must see the first port as IP address: 5000.

Identifying Operating Modes

Normal, Tunneling, Raw TCP, Auto TCP, and Raw UDP are all different schemes to make a serial connection across a network using one or more Serial device servers.

Normal Mode

Note: Normal is the standard connection mode for a serial device server.

If you use B+B SmartWorx's virtual COM port drivers or the IntelliSock™ SDK (see TCP socket services – IntelliSock™), you should use the Normal mode to make your network connections. Normal mode is used in the vast majority of applications. Unless you are certain that you need to use a different mode, go ahead and configure your serial device server in Normal mode. This mode allows for complete software control of the serial port by an application program.

Tunneling Mode

Note: In Tunneling, a master sends out the configuration information to a slave so that the slave can communicate with it.

Serial Tunneling allows two Device Servers and their Ethernet TCP/IP connection to act like a direct cable connection between two serial devices. No host computer is required.

Tunneling is very simple to use. Use the serial device server's web interface to designate one serial device server serial port as the tunneling master and the other serial device server port as the tunneling slave. Configure the master with the serial port settings desired for the connection as well as the IP address of the tunneling slave. The master makes the connection and automatically configures the slave with the corresponding settings.

Raw TCP Mode

Note: You could use Raw TCP if you were running a simple, custom TCP application.

In Raw TCP mode, serial port data travels over the TCP/IP connection without any protocol wrapper. You must configure the serial port settings using the serial device server's web interface. Raw TCP mode works with most third party universal serial device server drivers.

Auto TCP Mode

Note: Auto TCP is the only communication mode that lets a serial device server initiate the connection.

Auto TCP mode is a special case of Raw TCP mode that allows the serial device server to act as a network client and to initiate a TCP connection to a network host. You can configure the serial device server so that it makes the connection in one of two possible instances:

- It receives serial data (Data mode).
- It sees that the DSR input is active (DSR mode).

As with Raw TCP mode, you must configure the serial port settings using the serial device server's web interface. You must configure the serial

device server with the IP address and TCP port number of the network host to which it should connect. If the serial device server is idle, it will listen for normal Raw TCP mode connections from the network host.

Raw UDP Mode

Note: Raw UDP can provide one-to-many communications.

Raw UDP is used primarily for broadcasting messages over a network. It is lightweight and efficient; however, your application program must handle all error processing and retransmission. B+B SmartWorx supports the following modes of UDP communication:

- Multicast (transmits to specified group of recipients)
- Broadcast (transmits to unspecified recipients)
- Point-to-Point (transmits to one recipient)

Identifying B+B SmartWorx’s Serial Device Servers

B+B SmartWorx offers two families of serial device server products. DSE-100 and ESE-100 provide two and eight RS-232 ports for your serial devices, respectively, and allow you to software-select between RS-232 and RS-422/485 communications. B+B SmartWorx’s serial device server products all perform the same function, differing mainly in the number of serial ports available or in the serial protocol supported. For convenience, this manual refers to these products as “SDS” or “serial device server” unless otherwise noted.

Table 1 - Serial Device Server Models

Model	Ports (DB9)	Protocol
DSE-100D	2	RS-232 Device
ESE-100D	8	RS-232 Device
ESE-400D	8	RS-232/422/485 Device

System Requirements

B+B SmartWorx’s serial device servers ship with device drivers for Windows 2000, NT4, XP, and Linux. Other operating systems can access the serial device server using Raw TCP mode or the IntelliSock™ TCP socket services. B+B SmartWorx will provide reference materials and utilities to assist those who wish to do so.

Contact our sales department for details on current software offerings. Most device drivers are available for download from the B+B SmartWorx website at www.advantech-bb.com

Features

Note: B+B SmartWorx Device Servers capture data from legacy serial devices without having to go through a PC.

B+B SmartWorx Device Servers can connect virtually any serial device to any standard Ethernet network (Intranet or Internet) using TCP/IP protocols. The following list details some of the serial devices a serial device server can bring to your fingertips:

- Security system alarm/access control devices
- Industrial computers and sensors

- Point-of-Sale (POS) peripherals
- Time clocks
- Banking peripherals and ATM machines
- Medical equipment

Protocol Support

The serial device server communicates over an Ethernet network using the standard IP and TCP protocols to ensure data integrity and accurate targeting. A serial device server supports the following protocols:

- Network addressing, routing, and data block handling: IP
- Network communications: TCP, UDP, DHCP, HTTP, and ARP
- Network management: SNMP

SNMP Network Management Support

Note: Only serial device server devices with a firmware revision level of 5.0 and above can support SNMP. To determine the revision level of a serial device server, check the bottom of the home page in the Web-based interface.

The Simple Network Management Protocol (SNMP) agent running on your serial device server collects network statistics such as the amount of data transmitted and received, the number of frames that contain errors, and the speed of the interface.

A network management system consists of these four parts:

- Network manager – One or more workstations used to monitor and manage the elements comprising a network
- Managed system – Composed of managed devices on the network running the agent process, such as a serial device server
- Management Information Base (MIB) – Standard organization scheme for storing data records; a serial device server device with a firmware revision of 5.0 and above supports MIB-II
- Network management protocol – SNMP is a set of rules governing the exchange of management information between a network manager and the elements of a managed system

Note: SNMP is used to communicate status updates and parameter values between a remote device such as a serial device server and a network manager.

The serial device server supports MIB II, which is a standard set of statistics. It includes information on system interfaces, address translation, IP, ICMP, TCP, UDP, transmission, and SNMP group information.

Note: The serial device server is a read-only device. You cannot set any parameters via SNMP.

For example, the agent running on the serial device server collects network statistics including the amount of data transmitted and received, the number of frames that contain errors, the percentage of utilization of the network, maximum packet size, speed, MAC address, and whether the device is up and working. The agent provides a whole tree of information that a management network host can retrieve using the Get command.

Note: Traps are messages or alarms generated by an SNMP agent to indicate to the SNMP manager that a significant event has occurred.

In addition to providing information upon request, the serial device server supports a cold start Trap, which is a spontaneous message the serial device server initiates whenever it boots up.

TCP Socket Services – IntelliSock™

Note: B+B SmartWorx's IntelliSock™ provides the most flexible and powerful TCP socket services available for custom applications.

The serial device server implements B+B SmartWorx's IntelliSock™ TCP socket services. B+B SmartWorx supplies device drivers for Windows 2000, NT4, XP, and Linux to make the serial device server look like it is a built-in COM port.

Note: If you do not need the power of the IntelliSock interface, the Raw TCP mode provides a simple way of using a direct TCP connection with the serial device server.

IntelliSock offers you the option of interfacing directly to the serial device server through a TCP socket programming interface rather than using the virtual COM port device drivers. IntelliSock can be used with any operating system that supports TCP/IP communication.

Refer to the IntelliSock Software Developer's Kit (SDK) folder on the installation CD-ROM for documentation and sample code.

Getting Started

Unpacking Your Serial Device Server

Follow these steps to unpack your serial device server.

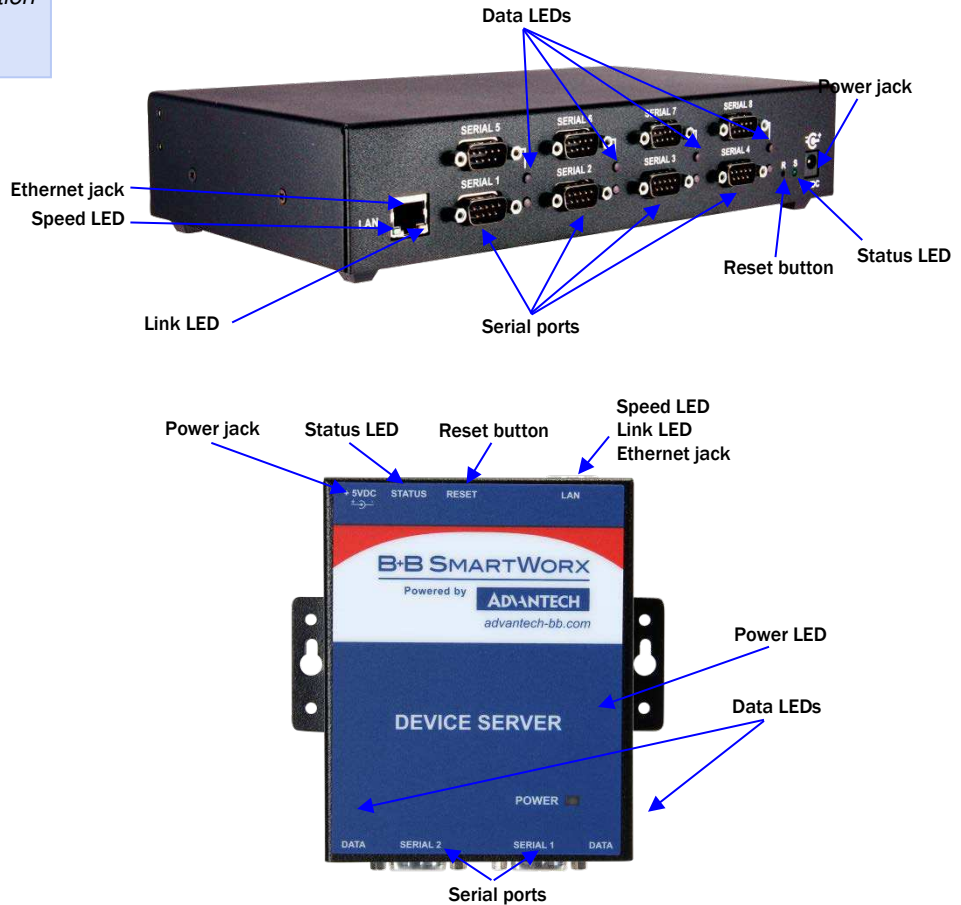
Step	Procedure	Description
❑ Step 1	Remove the serial device server from the box.	
❑ Step 2	Remove all packing material from the serial device server.	<i>Save the packaging in case you ever need to store the unit or return it to B+B SmartWorx for service.</i>
❑ Step 3	<p>Check the contents of the package to make sure you have received everything listed below:</p> <ul style="list-style-type: none"> ➤ <i>serial device server</i> ➤ <i>Power cable</i> ➤ <i>Power source</i> ➤ <i>Loopback connector(s)</i> ➤ <i>CD-ROM containing the serial device server device drivers and configuration software</i> ➤ <i>Quick Start Guide</i> 	<i>The complete serial device server package ships in a single box.</i>
❑ Step 4	Check the serial device server and accessories for shipping damage.	<i>Pay particular attention to the serial device server's case and port connectors. If anything is missing or damaged, contact your B+B SmartWorx sales representative.</i>

Identifying Parts

Figure 1 shows the connectors and indicator lights (LEDs) of the serial device server. See below for a description of each item shown.

Figure 1 – Connectors and Indicators

The actual number and location of serial ports will vary according to the model.



The serial device server has several indicator LEDs:

- Power (blue) – indicates when the serial device server has line power
- Data (red/green) – indicates serial port data activity by blinking red for RS-232 or green for RS-422/485
- Status (green) – indicates when the embedded processor is up and running
- Link (green) – indicates when a network link has been established; located in the Ethernet connector
- Speed (amber) – differentiates between 100Base-T (glowing) and 10Base-T (off) Ethernet connection speeds; located in the Ethernet connector

The DB9 serial port(s) connect to your serial device(s) and can support RS-232, RS-422, or RS-485 connections. They are located either to the left, to either side of the Ethernet port, or on the front panel, depending on the model.

The RJ45 Ethernet jack connects the serial device server to the Internet or to your Intranet. It has two small status LEDs: Link (green) and Speed (amber).

The power jack should be connected to a +5V power source, as provided with the serial device server.

The Reset button puts the serial device server through a reset cycle and can also restore the serial device server to the factory default settings.

The information label (not shown) is on the bottom of the serial device server. It includes the following:

- MAC address
- Serial number
- Certifications
- Pinout diagram

Understanding LED Codes

The serial device server LEDs inform you of the communications status and activity of the serial device server. The following table lists the possible states of the LEDs and their meaning.

Table 2 - Serial Device Server LED Codes

LEDs	Meaning
Link (green)	On steady = connected to network On steady for WiFi serial device server units: <ul style="list-style-type: none"> ➤ Infrastructure = serial device server is associated with Access Point ➤ Ad hoc = serial device server has found device to communicate with
Speed (amber)	Off = 10 Mbps network connection established if Link LED is on On steady = 100 Mbps network connection established
Data (red/green)	Red = RS-232 connection Green = RS-422/485 connection Blinking = data activity
Status (green)	On = serial device server is up and running
The Status LED also works in conjunction with the Reset button as follows:	
1. To restore the serial device server to the <i>factory default configuration</i> , push in and hold the Reset button. When the Status LED starts flashing slowly, and before it starts flashing rapidly, release the button. The serial device server then restarts automatically.	<i>If the Reset button is held during the first 10 seconds of bootup, the Status LED flashes at a rate of 1 flash every 2 seconds for 10 seconds. If the button is released during this time period, the configuration is reset to factory defaults.</i>
2. To restore the serial device server to the <i>factory default firmware revision</i> , push in and hold the Reset button. When the Status LED changes from a slow flash to a rapid flash, release the button. The serial device server then restarts automatically.	<i>If the Reset button is held past the first 10 seconds of bootup, the LED flashes faster at a rate of 1 flash every second for 10 seconds. If the button is released during this time period, the serial device server is reset back to the factory default firmware revision.</i>

Note: If you press and immediately release the Reset button, the serial device server restarts automatically with no changes. Also, if you continue holding the Reset button longer than 20 seconds, the Status LED stops flashing and no changes are made.

Locating Serial and Network Ports

Serial Port(s)

Note: The location of the serial port(s) varies, depending on the model.

Serial device server serial ports connect via cables to your serial device(s). The number of these ports will vary depending on the model. All serial device server models come with DB9 serial port connectors. See “Making Connections” on page 15 for directions on connecting a serial device server serial port to a serial device.

The following figures and tables show the serial port pinouts for RS-232 and RS-232/422/485 applications.

Figure 2 - DB9 pinouts

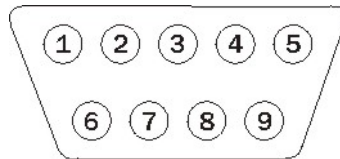


Figure 3 and Tables 3 and 4 show the RS-232/422/485 DB9 pinouts and signal descriptions.

Table 3 - RS-232 Signals on DB9 connector

RS-232 Signal Description	DB9
Data Carrier Detect (DCD)	1
Receive Data (RxD)	2
Transmit Data (TxD)	3
Data Terminal Ready (DTR)	4
Signal Ground (GND)	5
Data Set Ready (DSR)	6
Request To Send (RTS)	7
Clear To Send (CTS)	8
Ring Indicator (RI)	9

Table 4 - RS-422/485 Signals on DB9 Connector

RS-422/485 Signal Description - Four-wire Mode	DB9	RS-422/485 Signal Description - Two-wire Mode
Auxiliary Input (AuxIn-)	1	NC
Receive Data (RxD+)	2	NC
Transmit Data (TxD+)	3	Transmit/Receive Data (Data+)
Auxiliary Output (AuxOut-)	4	NC
Signal Ground (GND)	5	Signal Ground (GND)
Receive Data (RxD-)	6	NC
Auxiliary Output (AuxOut+)	7	NC
Auxiliary Input (AuxIn+)	8	NC
Transmit Data (TxD-)	9	Transmit/Receive Data (Data-)

Note: Pins labeled NC are indeterminate in two-wire mode and should be left unconnected.

Figure 4 and Tables 5 and 6 show the RS-232/422/485 -RJ45 pinouts and signal descriptions.

Figure 3 - RJ45 Pinouts (DB9 to RJ45 adapter)

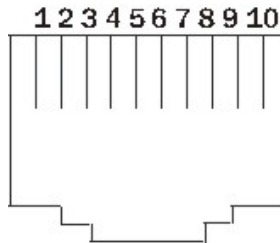


Table 5 - RS-232 Signals on RJ45 Connector (DB9 to RJ45 adapter)

Note: If your serial port cable uses an 8-pin RJ45 plug, you can use the center eight pins of the serial device server's RJ45 connector for RS-232 communications. You will lose access to the Ring Indicator signal.

RS-232 Signal Description	RJ45
Ring Indicator (RI)	1
Request To Send (RTS)	2
Data Terminal Ready (DTR)	3
Signal Ground (GND)	4
Transmit Data (TxD)	5
Receive Data (RxD)	6
Data Carrier Detect (DCD)	7
Data Set Ready (DSR)	8
Clear To Send (CTS)	9
No Connection	10

Table 6 - RS-422/485 Signals on RJ45 Connector (DB9 to RJ45 adapter)

Note: Pins labeled NC are indeterminate in two-wire mode and should be left unconnected.

RS-422/485 Signal Description - Four-wire Mode	T	RS-422/485 Signal Description - Two-wire Mode
Transmit Data (TxD-)	1	Transmit/Receive Data (Data-)
Auxiliary Output (AuxOut+)	2	NC
Auxiliary Output (AuxOut-)	3	NC
Signal Ground (GND)	4	Signal Ground (GND)
Transmit Data (TxD+)	5	Transmit/Receive Data (Data+)
Receive Data (RxD+)	6	NC
Auxiliary Input (AuxIn-)	7	NC
Receive Data (RxD-)	8	NC
Auxiliary Input (AuxIn+)	9	NC
No Connection	10	No Connection

Network Port

All serial device server devices have one eight-pin RJ45 Ethernet port on the back panel.

Figure 4 - RJ45 Ethernet Port Pinout

Figure 5 and Table 7 show the Ethernet RJ45 pinouts and signal descriptions.

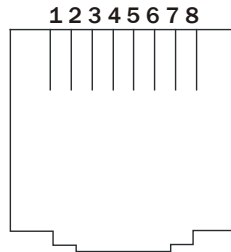


Table 7 - RJ45 Ethernet Port Signals

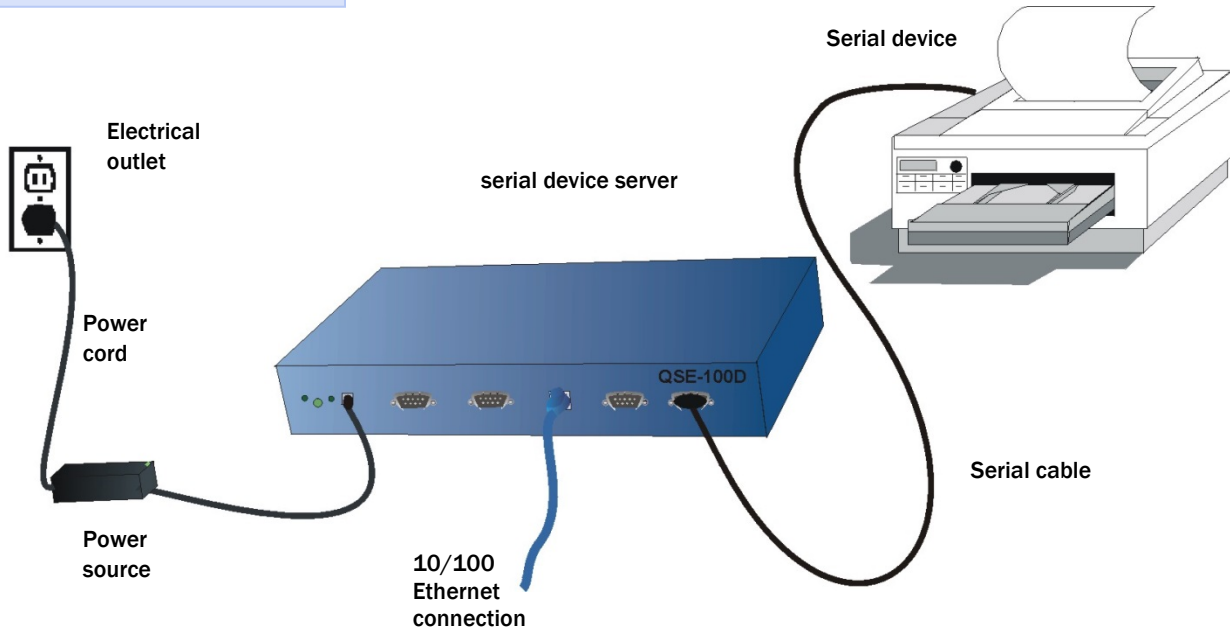
Ethernet Signal Description	RJ45
Transmit Data (TxD+)	1
Transmit Data (TxD-)	2
Receive Data (RxD+)	3
No Connection	4, 5
Receive Data (RxD-)	6
No connection	7, 8

Making Connections

Figure 6 shows a four-port serial device server connected to a printer.

You can easily connect each serial port on your serial device server to any serial device that you want to make accessible to an Ethernet network.

Figure 5 - Connecting a serial device server to a serial device



Follow these steps to connect your serial device server to one or more serial devices.

Step	Procedure	Description
❑ Step 1	Make sure the serial device you are connecting to the serial device server is turned off.	<i>The serial device server should be unplugged.</i>
❑ Step 2	Connect a serial cable between the serial device server and your serial device.	<i>See "Serial Port(s)" on page 12 for pinout and connector information.</i>
❑ Step 3	Connect an Ethernet cable between your Ethernet outlet and the serial device server' 10/100 port.	<i>The Ethernet port is located on the back panel.</i>
❑ Step 4	Insert the power source jack into the power plug on the back of the serial device server.	<i>A serial device server requires a 5-VDC, 2-A (10-W max) power source. The power source ships with the serial device server.</i> <i>Note: Power cables available. Contact B+B SmartWorx.</i>
❑ Step 5	Plug the power source into a wall socket.	<i>The serial device server powers up automatically.</i>
❑ Step 6	Power up the serial device.	<i>Now you are ready to install the device drivers!</i>

Installing the Device Drivers

Note: You must install the drivers on the installation CD-ROM on every computer that accesses the device(s) attached to the serial device server.

Hint: Click on **Go to Step** in the rightmost column to jump to your next step.

This section explains how to install the serial device server software under the Windows 2000, NT4, and XP operating systems.

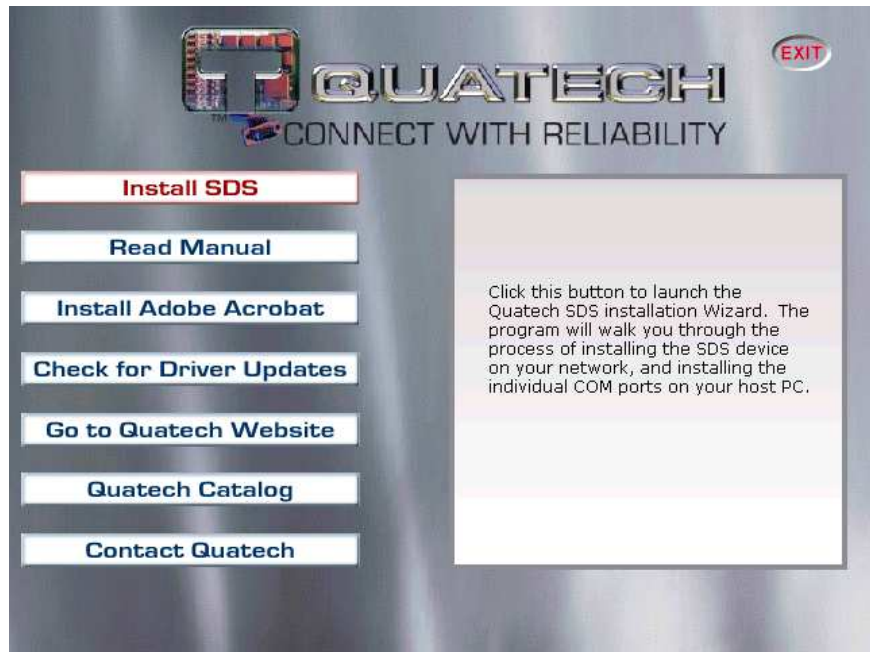
The B+B SmartWorx Device Server Install Wizard helps you add new serial device server hardware. It takes into account a variety of circumstances and directs you to jump to different Steps as needed. Click on the blue **“Go to Step”** text in the *Description* column to automatically jump to that step. Continue from that point until you are directed to a different location.

Step	Procedure	Description
<input type="checkbox"/> Step 1	Turn on the power to your computer system.	<i>This is the client PC in which the serial device server drivers are to be installed.</i>
<input type="checkbox"/> Step 2	Insert the B+B SmartWorx serial device server installation CD-ROM into your CD-ROM drive.	<i>This is the CD that shipped with the serial device server.</i>
<input type="checkbox"/> Step 3	The CD-ROM should launch automatically. If the CD-ROM does not launch automatically, select Start – Run from the Task bar, browse to the CD-ROM drive, and select the ThinQ.exe file. Click “OK” in the Run window to launch the installation.	<i>The B+B SmartWorx Serial Device screen displays, followed by the Main Menu screen. Continue with Step 4.</i> <i>The B+B SmartWorx Serial Device screen displays, followed by the Main Menu screen. Continue with Step 4.</i>

Figure 6 - Main Menu screen

Figure 7 illustrates the B+B SmartWorx Install Wizard’s Main Menu screen. The Wizard helps you to install the drivers and configure the serial device server. This installation adds the serial device server to the devices in the Windows Device Manager under Multi-port serial adapters and installs the serial port(s) as it would a standard COM port(s) under Ports (COM & LPT).

Note: Press the Help key for additional information as you go through the installation procedure.



Step	Procedure	Description
<input type="checkbox"/> Step 4	From the Main Menu, select Install serial device server.	<i>The Install Wizard launches and displays the Welcome screen. Continue with Step 5.</i>

Figure 7 - Welcome screen

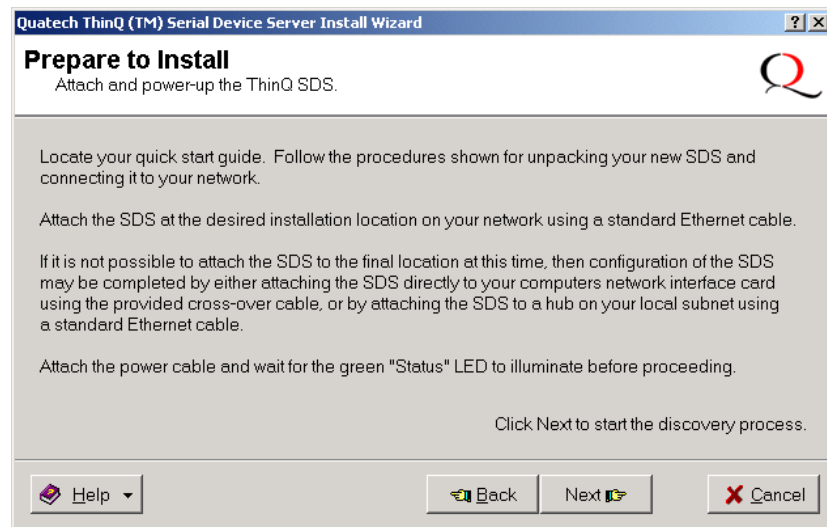
Figure 8 illustrates the B+B SmartWorx Install Wizard's Welcome screen.



Step	Procedure	Description
<input type="checkbox"/> Step 5	Click the Next button to continue.	<i>The Prepare to Install screen displays. Continue with Step 6.</i>

Figure 8 - Prepare to Install screen

Figure 9 illustrates the Prepare to Install prompt. Be sure to read this screen carefully before proceeding.



Note: Press the Help key for additional information as you go through the installation procedure.

Step	Procedure	Description
<input type="checkbox"/> Step 6	Connect the Ethernet port on your serial device server to one of the following: <ul style="list-style-type: none"> ➤ Desired installation location, ➤ Hub on your local subnet, or ➤ Network Interface Connection (NIC) on your computer using an Ethernet crossover patch cable. 	<p><i>If you cannot immediately attach the serial device server to the target installation site, temporarily attach it to the local hub or your computer's NIC for configuration purposes.</i></p> <p><i>Notes: Use a CAT5 or better Ethernet cable to attach the serial device server to your network.</i></p> <p><i>If your serial device server is pre-configured for your network, attach it now to the appropriate subnet location.</i></p> <p>Continue with Step 7.</p>

Step	Procedure	Description
<input type="checkbox"/> Step 7	Connect power to the serial device server.	Connect the cable attached to the power source to the serial device server. Plug the connector of the unattached power cable into the power source's socket. Plug the other end of the cable into a power outlet. The serial device server powers up and the blue Power LED lights.
<input type="checkbox"/> Step 8	Confirm that the serial device server is ready to proceed.	The Status LED to the left of the power jack should glow green. The Power LED should glow blue and the Link LED should glow green.
<input type="checkbox"/> Step 9	Click the Next button to search for device servers.	The Search Network for Serial Device Servers screen displays and the Wizard searches the local subnet for active serial device servers. Continue with Step 10.

Figure 9 - Search network for Serial device server(s) screen

Figure 10 shows the search results for all active device servers on the local subnet.



Step	Procedure	Description
<input type="checkbox"/> Step 10	When the search is completed, look in the list of detected devices.	
	<ul style="list-style-type: none"> ➤ If you find your serial device server, highlight it and click on <i>I have selected the device I wish to install.</i> Press Next. ➤ If you do not see your serial device server, click on the Retry Search button. If it still is not found, click on <i>"My device was not found."</i> Press Next. 	<p>Continue with <input type="checkbox"/> Step 11.</p> <p><i>The Locate the Serial device server screen displays. Go to <input type="checkbox"/> Step 42.</i></p>

Step	Procedure	Description
------	-----------	-------------

- Step 11 One of two possible screens displays:
 - Where is the Serial device server attached?
 - Reconfigure the Serial device server

If your serial device server is directly connected to your computer or to the local subnet, the Where is the Serial device server attached screen displays.

Continue with Step 12.

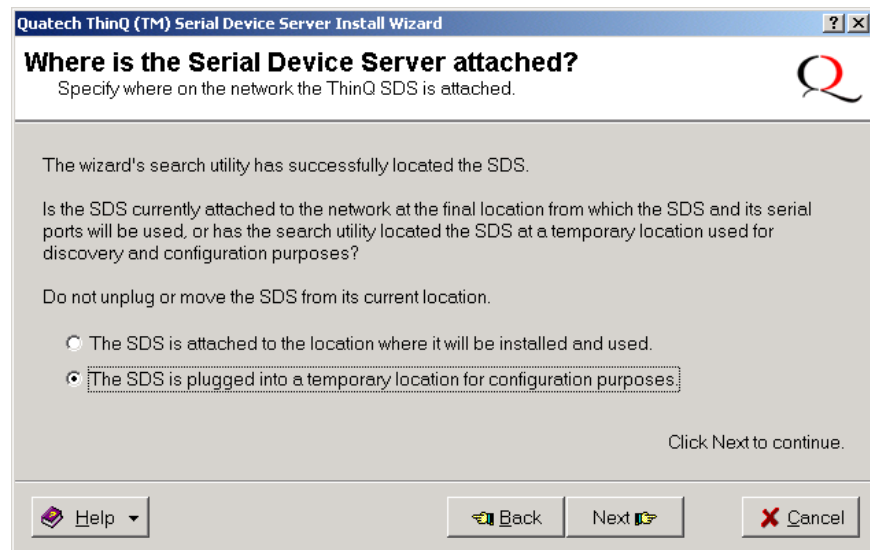
If your serial device server is remotely connected, the Wizard offers you the option to change the configuration and move the serial device server to the subnet where it will be permanently installed. The Reconfigure the Serial device server screen displays.

Go to Step 30.

Figure 10 - Where is the Serial Device Server Attached screen

Figure 10 asks you to specify whether the serial device server is in its final installation location or if it is temporarily installed while you configure it.

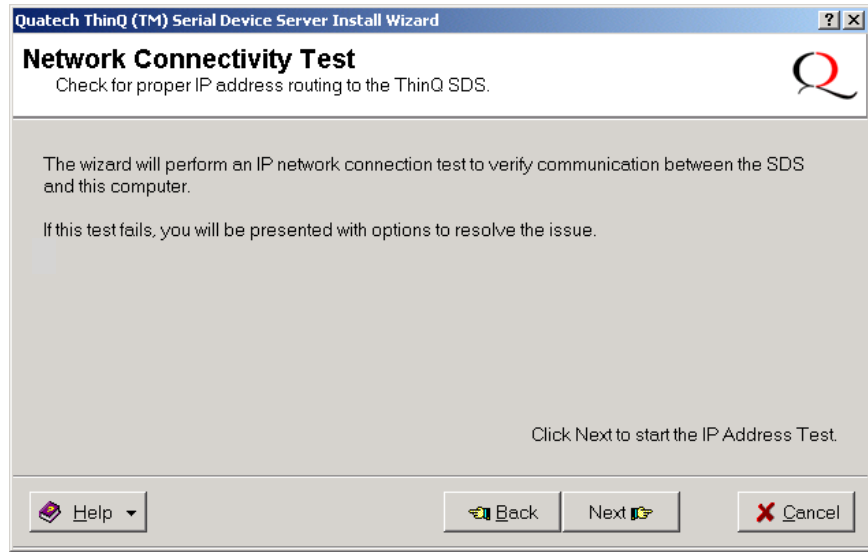
Caution! Do not unplug or move the serial device server at this time.



Step	Procedure	Description
□ Step 12	Select one of two options: <ul style="list-style-type: none"> ➤ The serial device server is attached to the location where it will be installed and used. ➤ The serial device server is plugged into a temporary location for configuration purposes. 	<p>Choose this option if the serial device server is installed where you intend to use it. Continue with Step 13.</p> <p>Choose this option if you need to move the serial device server to another location before using it. Continue with Step 13.</p>
□ Step 13	Press Next to continue. One of two possible screens displays: <ul style="list-style-type: none"> ➤ Network Connectivity Test ➤ Reconfigure the Serial device server 	<p>If your serial device server is installed in its final location, the Network Connectivity Test screen displays. Continue with Step 14.</p> <p>The Wizard helps you to configure and move the serial device server to its permanent spot. Go to Step 30.</p>

Figure 11 - Network Connectivity Test screen

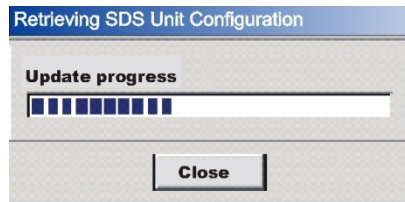
Figure 11 shows the Network Connectivity Test prompt. This prompt informs you that the Wizard is ready to check the IP connectivity of the serial device server.



Step	Procedure	Description
□ Step 14	Press the Next button to run the IP connectivity test.	The Retrieving Unit Configuration pop-up box displays briefly. Continue with Step 15.

Figure 12 - Retrieving Unit Configuration pop-up box

Figure 12 shows the Retrieving Unit Configuration pop-up box. This box shows the configuration retrieval progress and closes when it is complete.



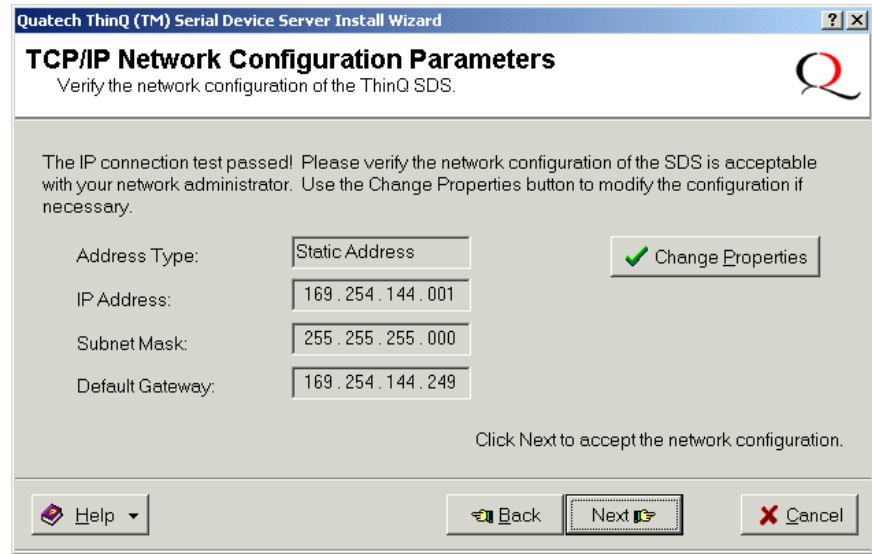
Step	Procedure	Description
□ Step 15	Depending on whether the test passes or fails, one of two screens displays: <ul style="list-style-type: none"> ➤ TCP/IP Network Configuration Parameters ➤ Network Connectivity Test Failed 	<p>If the test passes, the TCP/IP Network Configuration Parameters screen displays. Continue with Step 16.</p> <p>If the test fails, the Network Connectivity Test Failed screen displays. Go to Step 55.</p>

Figure 13 - TCP/IP Network Configuration Parameters screen

Figure 13 shows the following TCP/IP network configuration parameters:

- Address type
- IP Address
- Subnet mask
- Default gateway

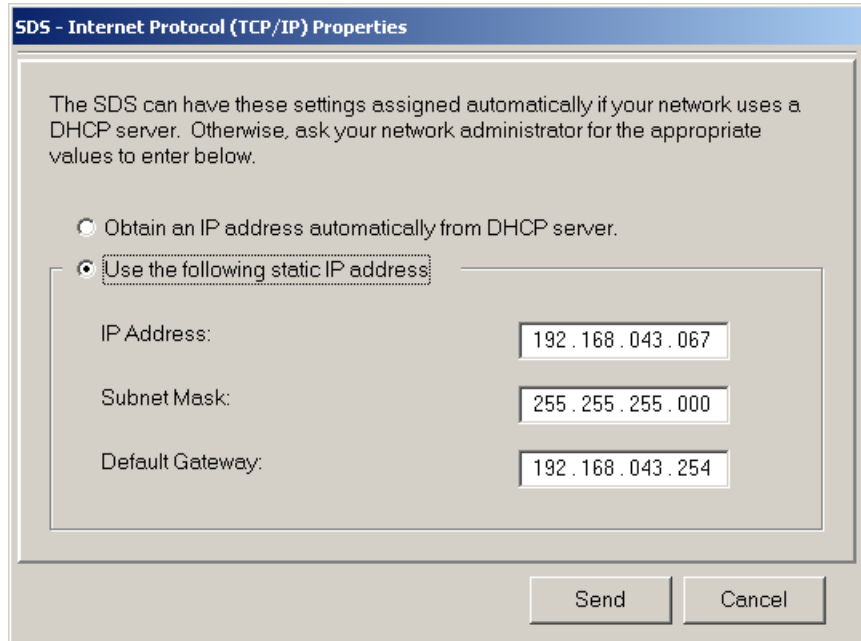
Caution! If your address type is Dynamic, the Wizard asks you to confirm that you want the DHCP server to assign the IP address for your serial device server. Be aware that if your DHCP server is not configured to assign the same address to the serial device server every time, communication with the serial device server may fail should the serial device server ever be reset.



Step	Procedure	Description
□ Step 16	Note the TCP/IP configuration parameters.	<i>The serial device server initially ships with a DHCP address type.</i> <i>Note: If the serial device server is attached to a network utilizing a DHCP server, it will ask for and obtain a valid IP address from that server. If not, the serial device server will default to the IP address 192.168.192.168.</i>
	<ul style="list-style-type: none"> ➤ If you need to change the parameters, press the Change Properties button. ➤ If you are satisfied with the parameters, press the Next button. <p>One of two possible screens displays, depending on whether your address type is:</p> <p>Static Address</p> <p>or</p> <p>Assigned by DHCP.</p>	<p><i>The Internet Protocol (TCP/IP) Properties dialog box displays.</i> Continue with Step 17.</p> <p><i>If your address type is Static Address, the Install the Device Drivers screen displays. Go to Step 27.</i></p> <p><i>If your address type is Assigned by DHCP, the DHCP server will assign an IP address for your serial device server. The DHCP confirmation pop-up box displays. Go to Step 40.</i></p>

Figure 14 - Internet Protocol (TCP/IP) Properties dialog box

Figure 14 shows the current configuration parameters for the serial device server. You can change these parameters by keying in the desired values.



Step	Procedure	Description
<input type="checkbox"/> Step 17	<p>The Internet Protocol Properties (TCP/IP) dialog box lets you change the serial device server configuration so that it can operate in its permanent location.</p> <p>Select one of the following options:</p> <ul style="list-style-type: none"> ➤ Use the following static IP address. ➤ Obtain an IP address automatically from the DHCP server. 	<p><i>If you are not sure of the configuration parameters, consult your system administrator.</i></p> <hr/> <p><i>Note: For reliable operation, we recommend a static IP address.</i></p> <hr/> <p>Continue with Step 18.</p> <p>Go to Step 19.</p>
<input type="checkbox"/> Step 18	<p>Key in any necessary changes to the:</p> <ul style="list-style-type: none"> ➤ IP address, ➤ Subnet mask, and ➤ Default gateway. 	<p><i>If you are not sure of the configuration parameters, consult your system administrator for the specific parameters.</i></p>
<input type="checkbox"/> Step 19	<p>Press Send to send your changes to the serial device server.</p>	<p><i>The Restart confirmation pop-up box displays.</i></p> <p>Continue with Step 20.</p>

Figure 15 - Restart confirmation pop-up box

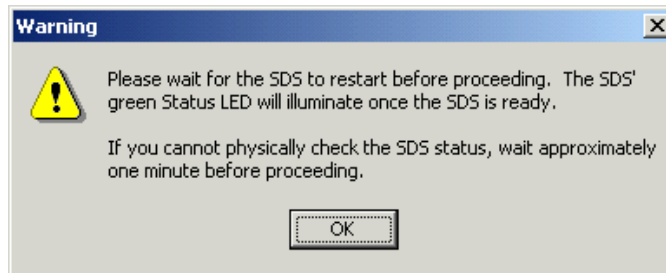
Figure 15 shows the Restart confirmation pop-up box.



Step	Procedure	Description
<input type="checkbox"/> Step 20	Press OK to restart the serial device server and make your changes active.	<i>The serial device server reboots and takes on the new configuration. The Information pop-up box displays. Continue with Step 21.</i>

Figure 16 - Information pop-up box

Figure 16 warns you that the serial device server needs time to reset. Wait until the Status LED glows green, and then press OK.



Step	Procedure	Description
<input type="checkbox"/> Step 21	When the Status light glows green, press OK.	<i>The glowing Status light indicates that the serial device server is ready. The TCP/IP Network Configuration Parameters screen displays. Continue with Step 22.</i>