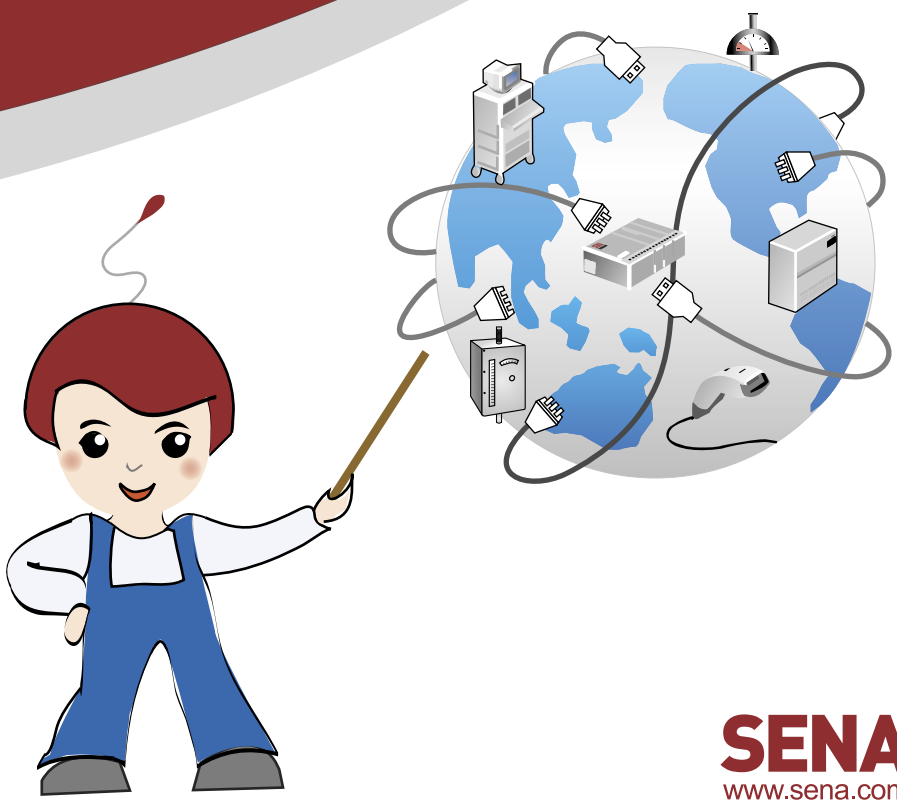
A Leader in Device Networking

Device Server Handbook for Beginners



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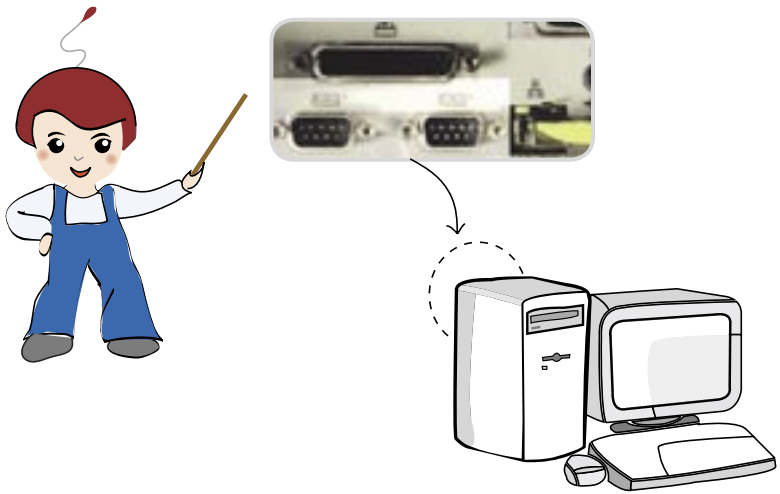
Introduction to Serial Devices

What is a Serial Device?

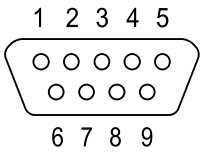
Considered to be one of the most basic external connections to a computer, the serial device has been an important part of most computers for more than 20 years. Although many of the newer systems have done away with the serial port completely in favor of USB connections, most modems still use the serial port, as do some printers, PDA's and digital cameras. Figure 1 shows a typical DB9 Serial port that is usually located in the back of a standard PC.

Essentially, the serial port includes a standard connector (DB9 connector) and runs on the serial protocol to allow you attach devices, such as modems, to your computer.



Fgure 1.

The Serial Connection

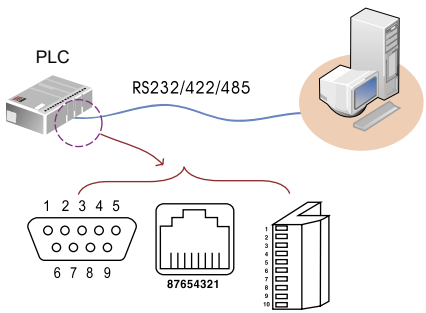


Fgure 2

A typical Serial port looks very similar to the following:.

As depicted in Figure 2. A typical serial port consists on 9 pin signals. Each pin signals serves a specific function to aid in the communication of two Serial Devices. The name "Serial" comes from the fact that a serial port "serializes" data. That is, it takes a byte of data and transmits the 8 bits of data in the byte one at a time. A serial port will use one signal to transmit data (pin #6) and one signal to receive data (pin #3), the other pin signals used in a serial port are important but to simplify things the two most important signals needed to communicate between serial devices are the Transmit and Receive signals.

There are three common types of Serial devices on the market, RS232, RS422, and RS485. In Figure 2, the Serial device depicted is a standard RS232 device with a DB9 connector. Each serial device is usually connected by a Serial Data Cable. Figure 3 depicts a typical connection to a serial device from a PC.



Fgure 3.

As you can see in Figure 3, a PLC (Programmable Logic Device) is attached to the back of a PC using a Serial Data Cable. At this point the PC is able to send data and receive “serially” to and from the PLC. If you are not familiar with a PLC and its functionality your can use any kind of serial device, such as, Temperature sensor, serial modem, etc..., to send and receive data to the PC.

What is TCP/IP

TCP/IP is a set of protocols developed to allow cooperating computers share resources across a network. It was developed by a community of researchers centered on the ARPAnet (Wide Area Network developed by the United States Defense department). TCP/IP consists of two parts TCP and IP.

TCP stands for Transmission Connection Protocol. Using this method, the computer sending data connects directly to the computer it is sending the data to, and will stay connected for the duration of the data transfer. With this method, the two computers can guarantee that the data has arrived safely and correctly, and then disconnect the connection when finished. A real life comparison TCP method of communication would be to pick up the phone and call a friend. You have a conversation and when it is over, you both hang up, releasing the connection.

The second part is IP, which stands for Internet Protocol. The Internet protocol portion of the TCP/IP requires that all devices on a network have a unique number assigned to it. This is commonly known as an IP address. The IP address is used to recognize your particular computer out of the millions of other computers connected to the network or even the internet. A real life comparison of an IP address would be similar to that of a phone number.
In summary, both TCP and IP counterparts work together to allow computers to communicate with each other over various networks, as is depicted in Figure 4

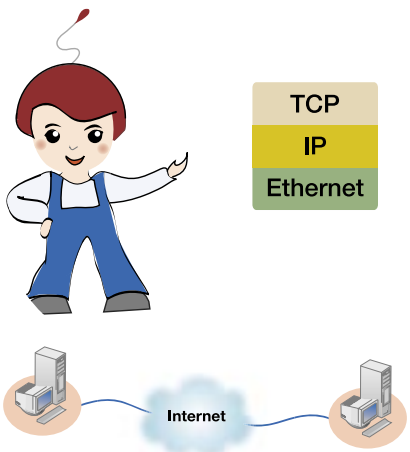


Figure 4.

Why Network?

A network is nothing more than two or more computers connected by a cable (or in some cases, by a wireless connection) so that they can exchange information.
You can create a computer network by attaching all the computers in your office together with cables and installing a special network interface card (or better known as an Ethernet Card) in each computer so you have a place to plug in the cable. Then you set up your computer's operating-system software to make the network work, and like "magic" you have a working network. That's all there is to it.

If you don't want to mess with cables, you can create a wireless network instead. In a wireless network, each computer is equipped with a special wireless network adapter that has an antenna. Thus, the computers can communicate with each other without the need for cables.
Figure 5 shows a typical network with three computers. You can see that all two computers are connected with a network cable to a central network device called a hub (a common connection point for devices in a network), and two computers are running wireless connections to a Wireless Access Point (Wireless version of a hub).

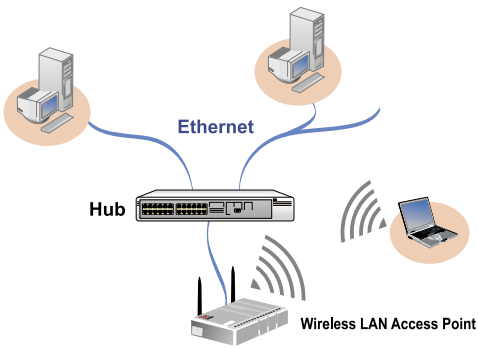


Figure 5.

Frankly, some computer networks are a bit of a pain to set up. So why bother? Because the benefits of having a network make the pain of setting one up bearable. You don't have to be a PhD to understand the benefits of networks. Networks are all about sharing. Specifically, networks are about sharing two things: files, resources.

- **Sharing files:** Networks enable you to share information with other computers on the network. Depending on how you set up your network, you can share files with your network friends in several different ways.
- **Sharing resources:** You can set up certain computer resources - such as a hard drive or a printer - so all the computers on the network can access them. For example, the laser printer attached to the network is a shared resource, which means that anyone on the network can use it.

Another benefit of networking is that networks enable computer users to communicate with one another over the network. The most obvious way networks allow computer users to communicate is by passing messages back and forth, using e-mail or instant-messaging programs.

LAN vs. WAN

LAN stands for Local Area Network ; a LAN network is the type of network that all small businesses with just one office would use. It covers a small region of space, typically a single building, and they are usually run and maintained by the business. Figure 5 is a typical example of a LAN network.

WAN stands for Wide Area Network ; a WAN network is the type of network that spans a relatively large geographical area. Typically, a WAN consists of two or more local-area networks (LANs). The largest WAN in existence is the Internet. Figure 6 is a scaled down example of how a typical WAN operates.

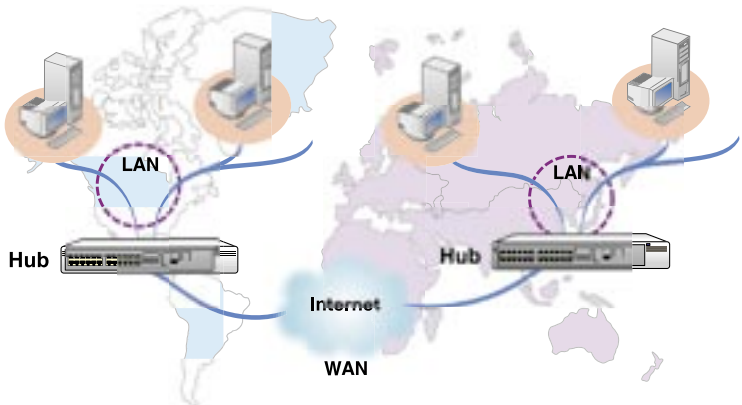


Figure 6.

As you can clearly see in Figure 6 we have two LAN's one in the United States and one in South Korea. Both LAN's can be connected by the internet making the "internet" a WAN.
As stated before a WAN can connect two or more networks over a semi-large to large geographical area.

What is WiFi?

WiFi commonly referred to as Wireless technology or 802.11 networking share the same purpose and functionality of your standard network. Except instead of using wires connecting you to a network you use a wireless protocol called 802.11. 802.11 come in three forms: 802.11a, 802.11b, and 802.11g.

802.11a supports data transfer speeds of up to 54 Megabits per second. 802.11a uses the 5 GHz frequency range which basically means that it emits a radio frequency of 5 GHz, similar to a FM radio station emitting 106.1 MHz. 802.11a, for its time, had good data transfer performance, but due to the high cost to manufacture 802.11a devices and its short signal range (up to 60feet), which was easily obstructed. 802.11a devices pretty much have disappeared off of the market.

802.11b supports data transfer speeds of up to 11 Megabits per second. 802.11b uses the 2.4 GHz frequency range. Compared to 802.11a, 802.11b transmits data at a slower rate, but 802.11b can transmit data up to 300 feet and is less likely to be obstructed by minor obstacles (walls, floors, etc...). In the market 802.11b devices also tend to be cheaper to manufacture.

Because of the way 802.11a and 802.11b transmit radio signals 802.11a devices are not compatible with 802.11b devices, and visa versa. Thus, 802.11b is one of the most widely adopted wireless standards on the market. 802.11g supports data transfer speeds of up to 54 Megabits per second. 802.11g also uses the 2.4 GHz frequency range. Since 802.11b and 802.11g use similar radio transmission techniques, 802.11g can also transmit data up to 300feet and also is compatible with 802.11b networks and devices.

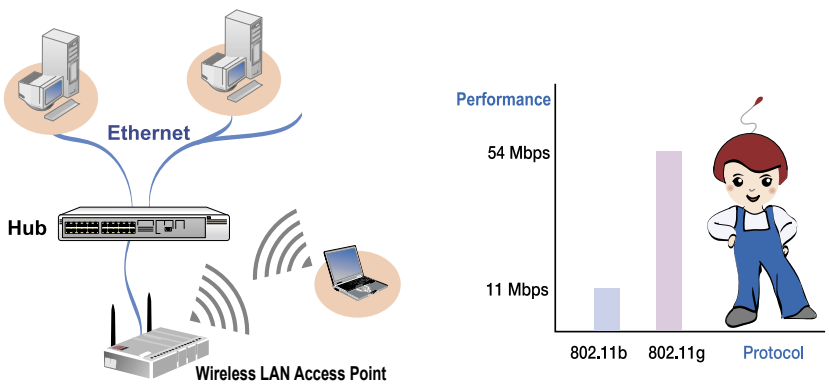


Figure 7.

What is Bluetooth? Bluetooth®

The Bluetooth SIG (Special Interest Group) was formed in early 1998 as a result of the global commitment of the five founding companies (Ericsson, Nokia, IBM, Toshiba and Intel). Its purpose was to enable seamless voice and data transmission via wireless, short-range radio, this new technology would allow users to connect a wide range of devices easily and quickly, without the need for cables. It currently competes with the 802.11 specification for wireless networking.
As stated before, Bluetooth was originally intended as a point to point connection between computers and cell phones to keyboards and headphones -- to make its own connections, without wires, cables or any direct action from a user.

Like Wifi, Bluetooth operates on the 2.4 GHz frequency range. Unlike Wifi, Bluetooth is less prone to interference by other 2.4 GHz devices (baby monitors, garage door openers, florescent lights, etc,,,). To accomplish such a feat, Bluetooth implements two techniques to avoid interference.

One of the ways Bluetooth devices avoid interfering with other systems is by sending out very weak signals of 1 milliwatt. By comparison, the most powerful cell phones can transmit a signal of 3 watts. The low power limits the range of a Bluetooth device to about 10 meters (32.8 feet), cutting the chances of interference between your computer system and your portable telephone or television. Even with the low power, the walls in your house won't stop a Bluetooth signal, making the standard useful for controlling several devices in different rooms.

The second technique used to avoid interference is called “Frequency Hopping”. The theory is that, it is unlikely that several devices will be on the same frequency at the same time, because Bluetooth uses a technique called spread-spectrum frequency hopping. In this technique, a device will use 79 individual, randomly chosen frequencies within a designated range, changing from one to another on a regular basis.

In the case of Bluetooth, the transmitters change frequencies 1,600 times every second, meaning that more devices can make full use of a limited slice of the radio spectrum. Since every Bluetooth transmitter uses spread-spectrum transmitting automatically, it’s unlikely that two transmitters will be on the same frequency at the same time. This same technique minimizes the risk that portable phones or baby monitors will disrupt Bluetooth devices, since any interference on a particular frequency will last only a tiny fraction of a second.

When Bluetooth-capable devices comes within range of one another, an electronic conversation takes place to determine whether they have data to share or whether one needs to control the other. The user doesn't have to press a button or give a command -- the electronic conversation happens automatically. Once the conversation has occurred, the devices form a point-to-point network. Bluetooth systems create a personal-area network (PAN) that may fill a room or may encompass no more distance than that between the cell phone on a belt-clip and the headset on your head. Once a connection is established, the members randomly hop frequencies in unison so they stay in touch with one another and avoid other connections that may be operating in the same room.

WiFi® vs. Bluetooth®

At this point you are probably asking your self, “What is the difference between Wifi and Bluetooth? Which one is better?” Well the answer is “Neither!” Neither Bluetooth nor Wifi is better than the other. It all depends on the application they will be used in. Both Wifi and Bluetooth have their pros and cons. The following is a small list of Wifi’s and Bluetooth’s pros and cons:

- **Speed :** Bluetooth has a maximum data transfer rate of 720 Kilobits per second, while Wifi has a maximum data transfer rate of up to 54 Megabits per second for 802.11g, and 11 Megabits per second for 802.11b.
- **Frequency :** Both Bluetooth and Wifi operate in the 2.4 GHz frequency range, but Bluetooth using its Digital Spread Spectrum technique is less prone to interference from other devices than Wifi.
- **Security :** Both Bluetooth and Wifi have encryption. In most cases Bluetooth is more secure and less prone to hacking than Wifi (WEP 128-bit). Bluetooth also usually is very easy to setup security between devices (in some cases is automatically done for you without your knowledge), while Wifi requires you know more a little about Wifi security protocols.
- **Applications :** Bluetooth is considered more of a direct cable replacement, and is designed for point-to-point connections. For example, Bluetooth can replace Serial, USB, or Fire Wire cables to devices. Wifi was originally designed to replace existing Ethernet cabling.
- **Ease of Use :** In most cases pairing Bluetooth items is a relatively simple process, considering most Bluetooth products some with easy to use setup software. Unlike Wifi which may need previous knowledge of networking protocols or may need help from a network administrator to get things up and running.
- **Power :** Bluetooth radios use as little as 1milliwatt of power, where Wifi can use in an excess of 3 Watts.
- **Distance :** In most cases 802.11b or g can transmit up to 1200 feet in an unobstructed space, while Bluetooth is limited to distances of up to 30 feet (Some new Bluetooth devices are known to transmit data in distances exceeding 30 feet).

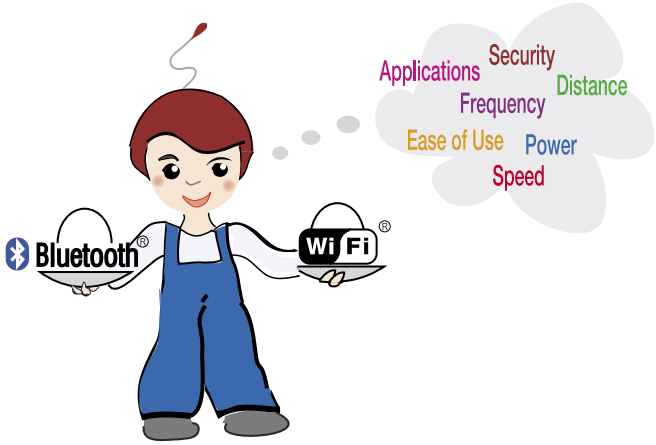


Figure 8.

Why do we need Serial Device Servers?

The Serial Device Dilemma

As displayed in Figure 9, this is a Serial device connection using a Serial Cable.

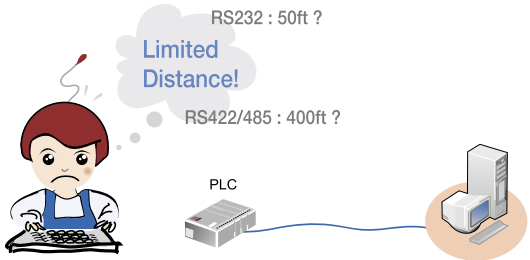


Figure 9.

Depending on the Serial Device one of the biggest limiting factors will be the distance to which the serial cable is run. In many cases you may be limited to the number of serial ports available on the PC.

Sena Technologies answer to the Dilemma

As technology evolves, more and more devices are turning into Ethernet based devices, which will allow users to access their devices over a network or even the internet. One example of this is the invention of a network printer. In Figure 10 a standard printer uses a parallel or USB cable to allow a computer to print to it.

Figure 10.

As you can see, the dilemma with Figure 10 is that one PC is only allowed to print to the printer and you may be restricted to how far the printer can be from the PC since the printer is attached by a cable. Now most mid-grade and high-end printers come with an Ethernet port which allows the printer to become a network device and allow every user on the network to access it, as shown in Figure 11.

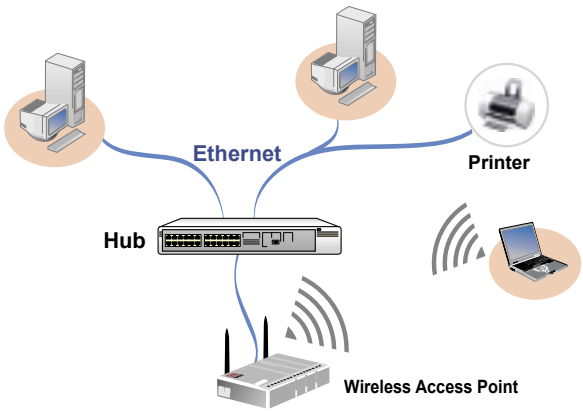


Figure 11.

Similarly, Sena Technologies provides users the ability to turn a user's serial device into an Ethernet enabled device as shown in Figure 12.

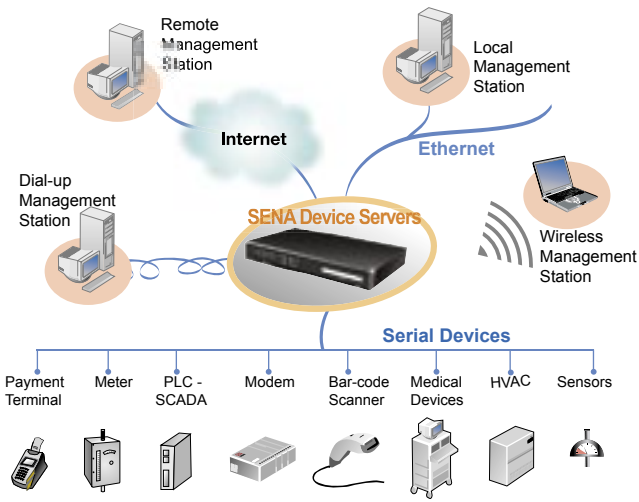


Figure 12.

What this means is that Sena Serial Devices Servers convert Serial data to Ethernet (TCP) friendly data, hence the name “Serial to Ethernet converter.”
The following are three typical scenarios to which Sena Technologies’ devices are able to take Serial devices and make them Ethernet friendly:

Scenario # 1

Figure 13.

- In Scenario #1 is the most basic scenario out on the market, where a Serial device uses a Sena Serial Device Server to convert Serial Data to Ethernet friendly data. This allows any PC on the Ethernet network to access that data of the serial device.

Scenario # 2

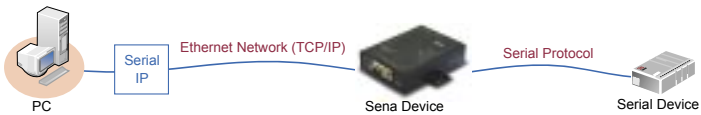


Figure 14.

- In Scenario #2 is very similar to Scenario #1 except now we introduce Serial IP. Many serial applications for some serial devices usually look for physical serial ports for data communication. By using a Sena device the old application will not be able to find the serial device since it s on a network. In this case they will need to install Serial IP, which creates a Virtual COM port, and tricks the old application into thinking that the Serial device is actually on a Serial port, and Serial IP then forwards the data from the application to the network, then onto the serial device which is attached to a Sena Serial Device Server.

Scenario # 3

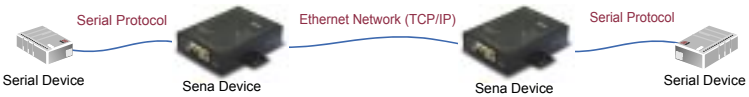


Figure 15.

- In Scenario #3 displays, what is called in the industry as tunneling. In some cases one of the Serial connections will not be attached to a PC, but it maybe attached to another Serial device of some kind. By using a pair of Sena Serial Device Servers this allows both Serial devices to talk to each other over the Ethernet.

In all the Scenarios mentions the serial device can be any kind of device, whether it may be a PLC, temperature sensor, etc... Now that you probably have a good idea about how Sena Technologies network enables serial devices, the following is a list of advantages to why network enabling your serial device is so important:

- Network enabling your serial devices allows users to share the serial device s functionality with all computers on the network
- Allows serial devices to be monitored and serviced from anywhere a network is available.
- Allows serial devices to be compatible with updated applications.

Which Device Server do I Choose?

Choosing the proper device out of our line-up can be a very hard task. The best thing to do is to look at your design requirements. Based on the design requirements you should be able to answer one or more of the following basic questions:

- What kind of Serial Device? (RS232/422/485?)
- How many ports do you need?
- What basic protocols are needed? (Digital I/O, TCP, 802.11b, Bluetooth, MODBUS, SNMP, etc)
- Do you security? (3DES, SSL, TLS, RC4, etc)
- Do you require Linux?
- Do you need a built-in web server?
- Do you require lots of storage space?
- Embedded or External device?

Of course there will be many other factors that will determine what kind of Sena Device you will need to use, but if you have one or more of the basic questions, you should be able to look at the products specifications and find a device to suit your requirements.

Sena Technologies Product Line-up

Lite Series

The Lite Series, LS100 is a cost-effect 1-port serial device server whose main purpose is to Ethernet enable RS232 serial devices. It supports only RS232 based serial devices through a DB9 style serial port, and 10 Base T Ethernet networks. Configuration of the unit can be accomplished by any standard terminal application (Telnet, HyperTerminal, etc...) or by the Hello Device Manager Windows Utility.

Pro Series

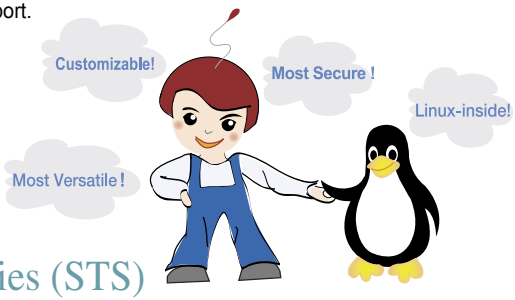
The Pro Series, which can be split up into two categories, the old PS and new PS. The old PS, which consists of the PS100/200/400, support 1, 2, 4 port designs. The Pro Series is a step up from the Lite Series. The PS100/200/400 support RS232, RS422, RS485 serial devices, and 10 Base-T Ethernet networks. The PS also adds 3DES encryption functionality for those who want to have a more secure data connection. Configuration of the unit can be accomplished by any standard terminal application (Telnet, HyperTerminal, etc...) or by the Hello Device Manager Windows Utility.

The new PS, which consists of the PS110/410/810, support 1, 4, 8 port designs. The PS110/410/810 also supports RS232, RS422, RS485 serial devices and support 10 and 100 Base-T Ethernet networks. The new PS also uses Linux as its operating system. The new PS has SSL and TLS encryption functionality for secure data connections. The new PS also supports telnet COM port control or RFC2217, which allows user serial devices to deliver pin status information to their serial application. For added functionality the new PS also includes SNMP support as well as Port Event Handling capabilities (SNMP traps, email notifications, etc...). Lastly, an added new feature of the new PS also adds a web based configuration utility for easy setup over your favorite Internet Browser application in addition to conventional configuration methods of the old PS.

Super Series

The Super Series is our top of the line Serial Device Server, which consists of the SS100/110/400/800, come in 1, 4, 8 port designs. The Super Series devices support RS232, RS422, RS485 serial devices and 10 and 100 Base-T Ethernet Networks. The following is a list of features available on the Super Series:

- Supports RS232, RS422, RS422 Serial Devices.
- Uses Linux as an operating system.
- PCMCIA slot for added functionality with PCMCIA cards (except SS100).
- Telnet COM port control, RFC2217 support.
- SSL, TLS, RC4, 3DES data encryption methods.
- Built-in Firewall, IP address filtering.
- Web based configuration utility.
- Built-in Web Server, which allows you to store web pages.
- User developed customized applications that can run stand alone on the Super Series.
- Dynamic DNS Support
- SNMP v1 and v2 Support
- Port Event Handling (SNMP trap, email notification, etc)
- Configuration via Web, telnet, or local console port.



Secure Terminal Server Series (STS)

The STS series is our Terminal Server Line of products, which consists of 8 and 16 port designs. The STS series supports RS232, and 10 and 100 Base-T Ethernet networks. The following is a list of features supported by the STS:

- Supports RS232 Serial Devices.
- Uses Linux as an operating system.
- PCMCIA slot for added functionality with PCMCIA cards.
- Telnet COM port control, RFC2217 support.
- SSL, TLS, RC4, 3DES data encryption methods.
- Built-in Firewall, IP address filtering.
- Web based configuration utility.
- Dynamic DNS support
- SNMP v1 and v2 Support
- Port Event Handling (SNMP trap, email notification, etc)
- Configuration via Web, telnet, or local console port.

Console Servers Series (VTS)

The VTS Series is our Console Management Series of devices that provide remote access to major network and telecom equipment. The VTS comes in 4, 8, 16, 32, and 48 port designs. The following is a list of features supported by the VTS:

- Remote Management of Servers switches, etc.
- 10 and 100 Base-T Ethernet Network support.
- PCMCIA card support for added functionality
- SNMP v1 and v2 support
- Port Event handling (SNMP traps, email notifications, etc)
- Dynamic DNS support
- Configuration via web, telnet, SNMP, or system console.
- SSH, RADIUS, LDAP, TACACS+ and Kerberos security support.

Embedded Products

Nemo10 Module

Nemo10 is a low-cost embedded serial device server module, which shares all of the same functionality of the LS100. The Nemo10 is a module only, allowing system integrators and manufactures design a custom board that contain all the physical Ethernet and Serial connections as they please.

LS 100M Module

LS100M is a Module type embedded device server which shares all the same functionality of the LS100. The LS100M is a module only, allowing system integrators and manufactures design a custom board that contain all the physical Ethernet and Serial connections as they please.

HD1100 module is a Digital I/O to Ethernet module device. The HD1100 allows you to control and monitor 16 Digital I/O devices from your Local Ethernet network. The HD1100 also has a built-in Web Server functionality to allow you to store web pages on the module.

HD1100 Module

The LS100B, PS100B, and SS100B are board level products which come without any external casing. The LS100B, PS100B, and SS100B share all the same functionality of the LS100, PS100, and SS100 counterparts.

LS100B,PS100B,SS100B Module

Application Specific Device Servers

The IALink100 Series shares all the same functionality of the PS100. The IALink100 was designed to meet Industrial Automation environment standards (Din Rail Support, Surge Protection, etc...). The IALink100 Modbus functionality is slightly different from that of the regular IALink100. IALink100 Modbus allows users to convert Modbus/RTU or ASCII to Modbus/TCP.

IALink100/IALink100 Modbus

The RHIO10 is a Digital I/0 to Ethernet device. The RHIO 232 is a Digital I/O to RS232 device. The RHIO10 provides 12 digital inputs, 4 analog inputs and 10 digital outputs and allows you to control or monitor the inputs and outputs via Ethernet (RHIO10) or RS232 (RHIO232).
Also, included are basic logic output functionality such as, AND, OR, NOT, and Delay.

RHIO10 and RHIO232

Wireless Device Servers

The LS100W is a Wireless version of the LS100. It shares the same features as the LS100 with the addition of 802.11b wireless support. The LS100W is wireless only and does not have an Ethernet connection.

Parani10

The Parani10 is a RS232 Serial to Bluetooth adapter. The Parani10 allows for point-to-point wireless connection with the use of Bluetooth technology. A pair of Parani10's can be used as a RS232 cable replacement between serial devices (See Figure 16.). Unlike standard Bluetooth products which are restricted to 10m (32.8ft), the Parani10, using a standard antenna (pictured) can transmit data up to 200m (656ft), and with the use of an option patch antenna, the Parani10 can reach distances of 1200m (3937ft.).

Figure 16.

Parani100

The Parani100 is our Ethernet to Bluetooth gateway device. This allows you to connect up 7 Bluetooth devices and communicate with the network simultaneously (See Figure 17.). The following are a list of key features of the Parani100:

- 10/100 Base-T Ethernet network support
- Supports up to 7 simultaneous Bluetooth connections.
- Supports a maximum data transfer rate of 723Kbps.
- Supports LAN, and PAN access allowing you to share an internet connection with Bluetooth enabled devices (Laptop, PDA, etc...)
- Support for the Serial Port profile (Parani10 support) allowing you to connect to a Serial device using the Parani10.

Other than the previously stated devices, the Super Series, STS Series, and VTS Series all support Wireless connection via PCMCIA compatible wireless card.

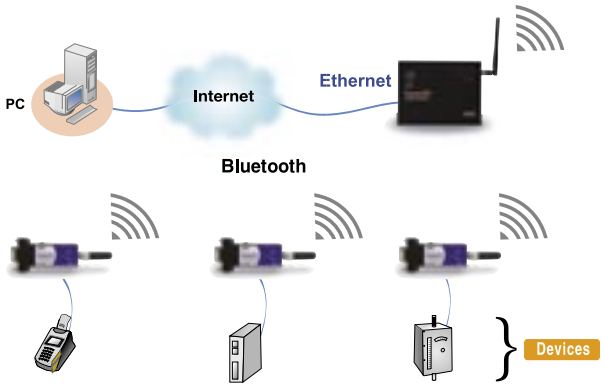


Figure 17.

Software

Hello Device Manager

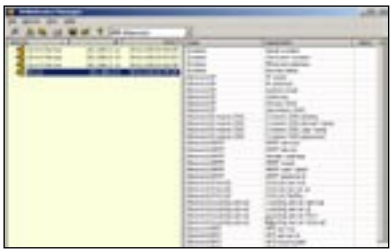


Figure 18.

Figure18 shows our Hello Device Manager. Hello Device Manager is a Windows application that scans your local area network and locates, then helps the user to configure their Serial Device Server. The following is a list of products that the Hello Device Manager supports:

- Lite Series
- Pro Series
- Super Series
- STS Series
- VTS Series

Serial/IP

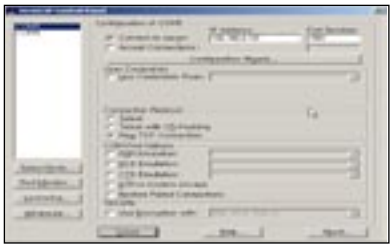


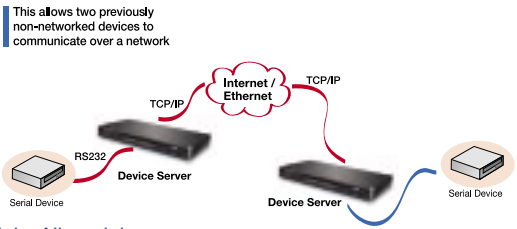
Figure 19.

Figure 19 shows you a screenshot of Tactical Software's Serial/IP software. Serial/IP is a Windows based application. Serial/IP is a COM port redirection software. The purpose is to allow older application or application that look for traditional COM ports to be compatible with Ethernet based solutions. Please refer to Scenario #2 (page 17) for more details.

Typical Application Scenarios using Sena Device Servers

Tunneling Mode

Serial tunneling occurs when two device servers are configured to work together to share or communicate their respective serial device's data. The serial tunnel is established by connecting one device server configured for Server mode to a device collecting data and the other device server configured for Client mode to the field device sending data. This allows two previously non-networked and isolated devices to communicate information and operate with existing installed software applications of devices on a network, instead of a long serial cable.

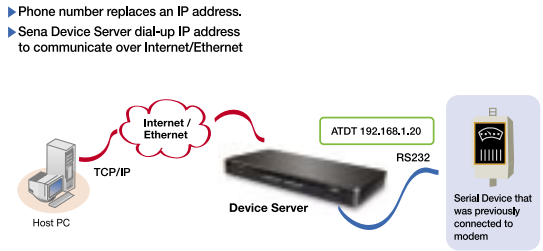


※ Applicable Models: All models

Figure 20.

Modem Emulation

Modem emulation feature enables a networked Sena product to act as a modem to send and receive data over an IP network instead of a PSTN. Furthermore, Sena's high-end product lines, Super and STS Series supports Modem Emulation mode over SSL encryption. This unique feature provides secure serial modem emulation, accepting AT commands in an encrypted format to connect and communicate with Serial devices.

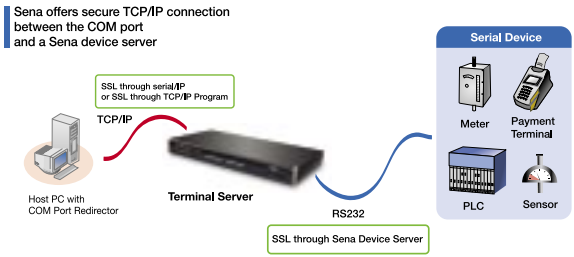


※ Applicable Models: All models except LS100/100W

Figure 21.

Secure Communication

Sena products support Security features such as static key based 3DES data encryption, and SSL for secure connection between a client and a server, over which any amount of data can be sent securely. In addition, HTTPS for secure data transfer over the web, SCP for secure file transfer, and IP filtering controls the access to serial devices.



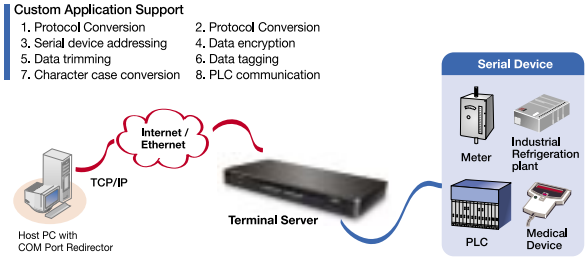
※ Applicable Models: PS110/410/810, SS100/110/400/800, STS800/1600

Figure 22.

Custom Application Support Deploy your own embedded Linux applications

One of the strengths of Sena's products is their flexibility. Since no two solutions are the same, Super Series product line has been designed to correctly facilitate the connection in any situation. The Super Series Device Server is intended for the deployment of your own embedded Linux applications.

Users can customize the web management interface, and integrate the programmed dynamic web pages to web menu. In addition, Users can manipulate the raw data stream between remote hosts and serial device by adding a filtering program. The user-defined filter program communicates with other programs that are reading/writing to the serial port and socket by using FIFO, and so users can easily manipulate the serial data. Sena is committed to open-source development and fully supporting its customers.

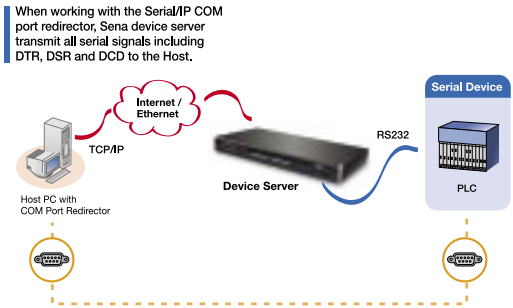


※ Applicable Models: SS100/110/400/800

Figure 23.

Virtual COM Mode

Virtual COM Mode of Sena device and terminal servers uses a driver to create a "Virtual COM Port" so that the software thinks it's talking to a serial port, but it's really talking to a LAN. The serial port may be anywhere on the LAN. After connection, the LAN is transparent to the program and serial device. Applications work just as if the serial device is connected directly to a physical COM port on the PC. In addition, when working with Serial/IP COM port redirector, Sena device servers transmit all serial signals including DTR, DSR and DCD.

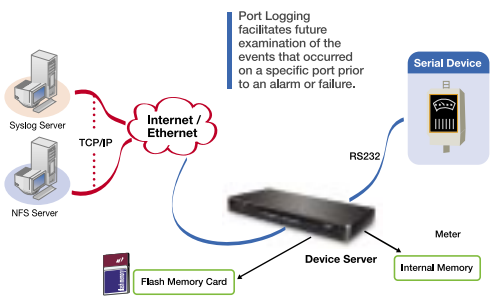


※ Applicable Models: PS110/410/810, SS100/110/400/800, STS800/1600

Figure 24.

Port Logging

Port Logging feature allows user to keep Serial and TCP data safely in data storage locations such as NFS Server, Syslog server, Internal memory and PCMCIA Flash Memory card. This facilitates future examination of the events that occurred on a specific port prior to an alarm or failure.

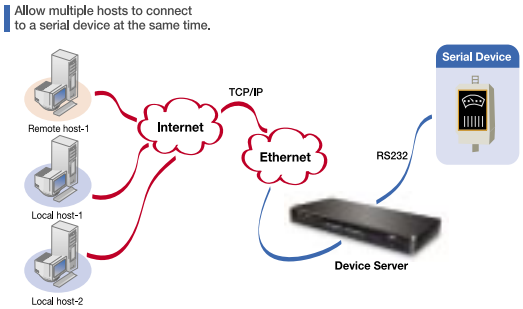


※ Applicable Models: PS110/410/810, SS100/110/400/800, STS800/1600

Figure 25.

Multiple Access for Port

Sena products support multiple sessions for a port which provides the ability for device servers or terminal servers to allow multiple hosts to connect to a serial device simultaneously.
This feature is particularly useful in applications that require failover alternative connections and applications that need multiple accesses to share communications with a particular device.

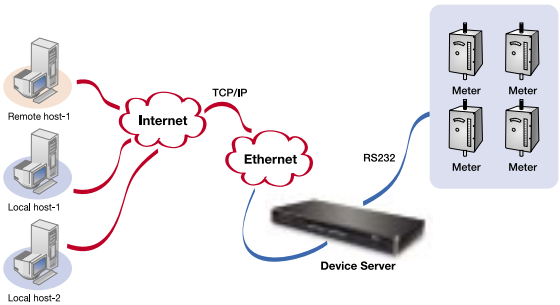


※ Applicable Models: PS110/410/810, SS100/110/400/800, STS800/1600

Figure 26.

Multicasting

Sena products support an enhancement transmission method "TCP/UDP multicasting", which automatically broadcasts the same serial data to upto 32 remote destinations simultaneously by TCP packet or by UDP datagram. The device server transmits the data to the multiple host computers at the same time in the network data collection system. This feature is very useful in the applications where multiple management stations want to collect data from the same data acquisition system as if they may share it.



※ Applicable Models: PS110/410/810, SS100/110/400/800, STS800/1600

Figure 27.

Wireless Device Networking

Sena offers wireless networking options either 1:1 communication solution for simple cable replacement or for 1:N communication solution for more advanced aplications. Users may choose from Wireless LAN or Bluetooth based solutions according to their needs. Sena Device Server and Terminal Server's family supports 802.11b network interface either by PC Card interface or by built-in WiFi modules. The Parani family is a standalone Bluetooth-compatible solution for wireless RS-232 serial cable replacement.
Sena's wireless device networking solution brings wireless networking capabilities to various equipments such as printers, scales, medical equipment, manufacturing machinery, barcode readers, card readers, RFID reader and other data collection devices.

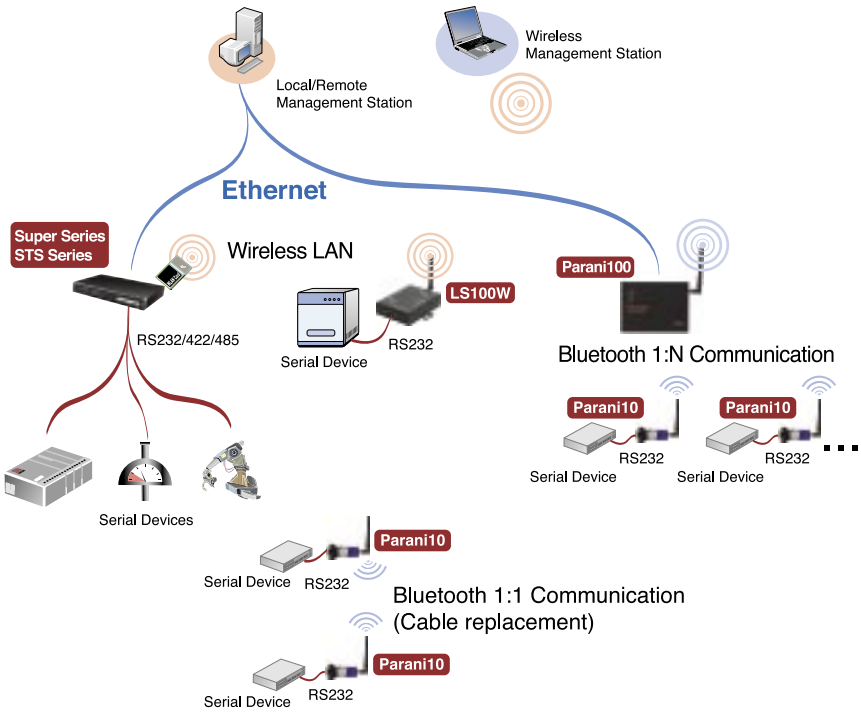


Figure 28.

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