



# **Ethernet Adaptor**

## **User Manual** (Version 1.77)

**SPARR  
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## **1. Introduction.**

### **1.1 About Ethernet Adaptor (EAD)**

The EAD connects any Serial device to Ethernet LAN network using the IP protocol. The EAD connects serial devices through a TCP data channel or through a Telnet connection to computers or another device servers.

### **1.2. Network Protocol**

The EAD uses IP protocol for network communications. For network connections to the serial port and TCP, Telnet protocol is used.

#### **1.2.1. Ethernet Address or MAC Address**

The Ethernet adaptors have what is known as Hardware address or MAC address. It has its own addressing scheme based on a unique six-byte address. This is generally called Media Access and Control (MAC) address.

One example of Ethernet Address is given below:

00-50-C2-18-E0-00 *or* 00:50:C2:18:E0:00

#### **1.2.2. Internet Protocol (IP) Address**

To identify an individual computer/device on the IP network, the device must have an unique IP address in a Network. The current version of Internet Protocol uses a four-byte number, expressed in dotted decimal notation.

Sample IP Address

192.168.0.250

#### **1.2.3. Port Number**

Every TCP connection is established using a destination IP address and a Port number. For example Telnet application commonly uses port number 23 of contacted IP number.

The EAD's Serial channel (port) can be associated with a specific TCP Port number. Port number 7727 (as a source port no.) is reserved for *Internet Fax Dialer* configuration. (To know more about this product, contact Sparr Electronics Ltd.)

## **2. EAD Kit Contains**

1. Ethernet Adaptor
2. User Guide and EAD Configuration Program in CD ROM

## **3. Product Description**

This section describes various components of EAD and explains how to install it on a basic network

### **3.1. Serial Interface**

The EAD has a 9- pin RS 232 Male Serial connector or RJ45 male (depending on the model), which can be connected to any Serial device.

### **3.2. Network Interface**

EAD has one RJ45 Female 10 Base T Ethernet port that supports up to 10Mbps speed.

### **3.3. LEDs**

Two LEDs are located on the top of the unit. One Marked as ON which has RED LED and the second one marked as LINK which has GREEN LED. The following table explains their functions.

<b>LED state</b>	<b>Function</b>
Red LED glowing	Power On
Red LED blinking	EAD is in Default configuration Mode.
Green LED glowing	EAD is connected to Ethernet
Both Red and Green LEDs are glowing	EAD is ready to use.

### **3.4. Power Input**

There is an Input power socket in the EAD 01 MBX model, which can take in 9V AC 300 mA Power where you can plug in the Power adaptor supplied along with the unit.

4. Connection and Pinout diagrams

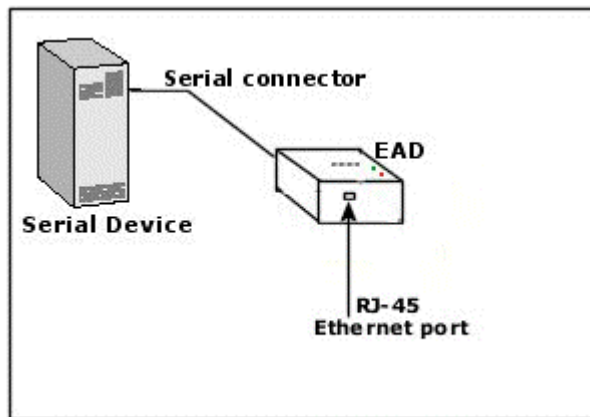


Fig.1. Connection diagram

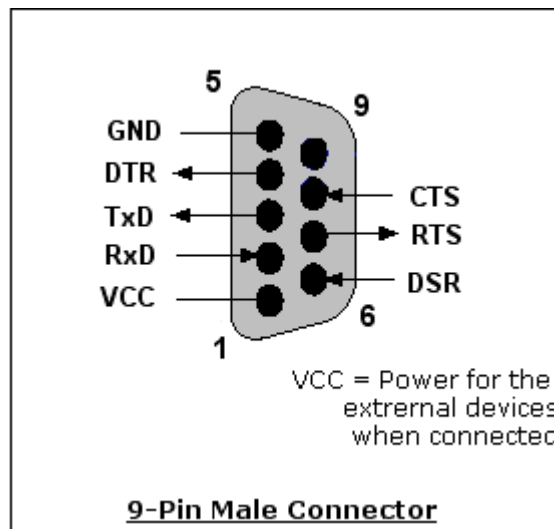


Figure. 3. 9-pin Male Pin out Diagram  
EAD 01 MBX M

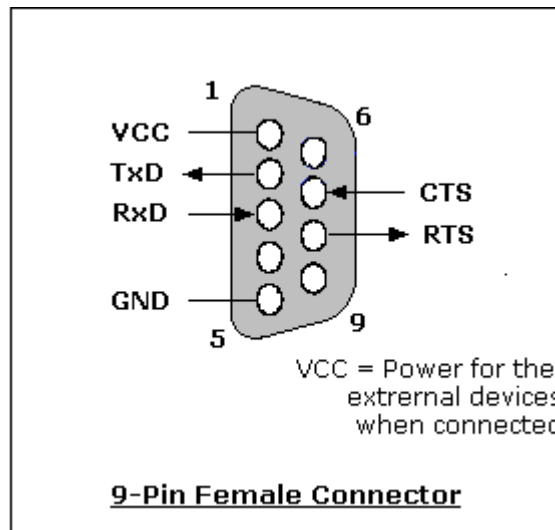


Figure. 4. 9-pin Female pin out Diagram.  
(Optional) EAD 01 MBX F

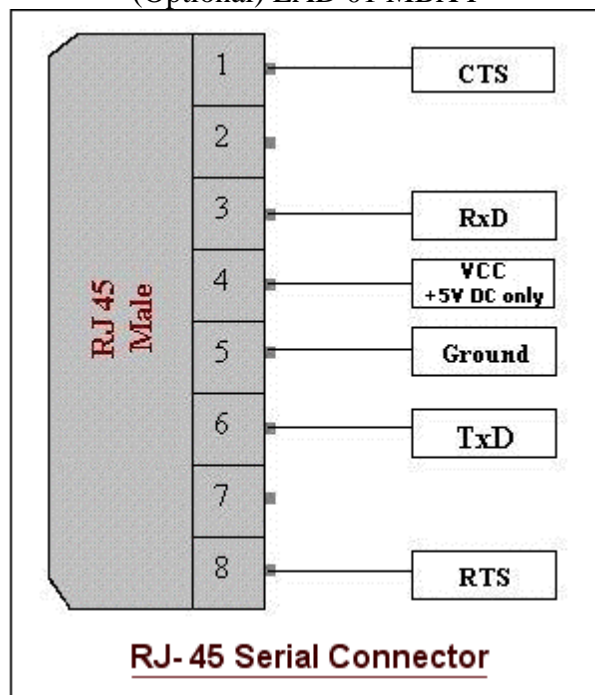


Figure. 5. RJ-45 Male pin out Diagram  
(Optional) Model EAD 01 PB

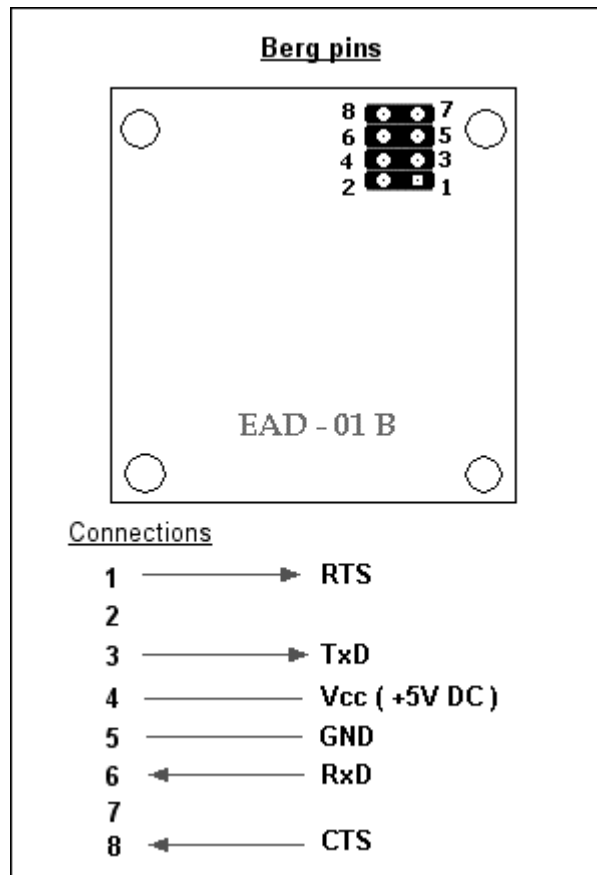
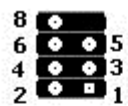


Figure. 6. EAD-01B Berg Pin out Diagram.

**Berg pin Female with wire**



Pin No.	Colour of wire	Signal name
1	ORANGE	RTS
2	GREEN	GND
3	YELLOW	TxD
4	RED	VCC
5	BLACK	GND
6	BLUE	RxD
7	—	—
8	WHITE	CTS

EAD Module Pinout Diagram

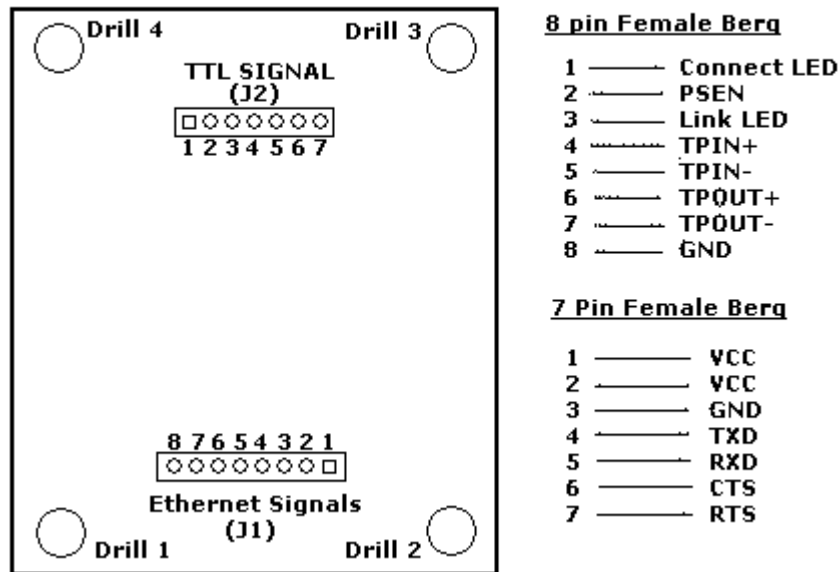


Figure. 7. EAD Module pinout diagram.

**5. Installing EAD Programmer Software**

The shipped unit contains a CD which has all the relevant files in “d:\8BIT TCPIP Low Cost Ethernet to Serial Server\EAD Programmer V1.4” where D: is your CD ROM Drive.

(Warning: - All files are important for the Installation of EAD Programmer, any changes made in any file may affect the process of installation)

1. Click the *Setup.exe* for the installation of EAD Programmer from the above directory.
2. Wait for the Installer program to extract files
3. Select the Directory to install the program
4. After installation is completed, EAD Programmer is available in the Start Button -> Programs -> Ethernet Adaptor->EAD Programmer Vx.x

In order to Remove the EAD Programmer go to Start Button ->Settings -> Control Panel. Select Add/Remove Program and click EAD Programmer to remove it.

## 6. Programming through Hyper Terminal, Telnet and GUI

You can configure the EAD in three possible ways. They are described in detail as below.

### 6.1. Programming through Hyper Terminal

#### 6.1.1. Serial Port Login & Programming of EAD Parameters.

- 1 Use any Communication Program like Hyper Terminal, XTalk, Mirror etc to configure EAD through RS 232 Serial Interface. The Serial port settings should be 9600 bps, 8 data bits, No Parity, 1 Stop bit with Flow control option selected as None. Select appropriate Communication (COM) port to which the EAD is connected in the software.
- 2 To enter the *Configuration Mode*, hold down the ‘**Space bar key**’ on your keyboard and power ON the EAD.
- 3 Once the EAD senses the Space bar key EAD will first send the following string which will appear on screen:

**Enter configuration password:**

Enter the default password , which is 77277.

(If the password entered is wrong then the EAD will prompt you to re-enter Correct Password for three times. If all the three attempts fail then you will have to follow step 2 in getting the option to enter a password again. If you are still not successful, please do call us for resetting of Password with Master Password from Factory).

- 4 Figure below shows how the display looks in Hyper Terminal.

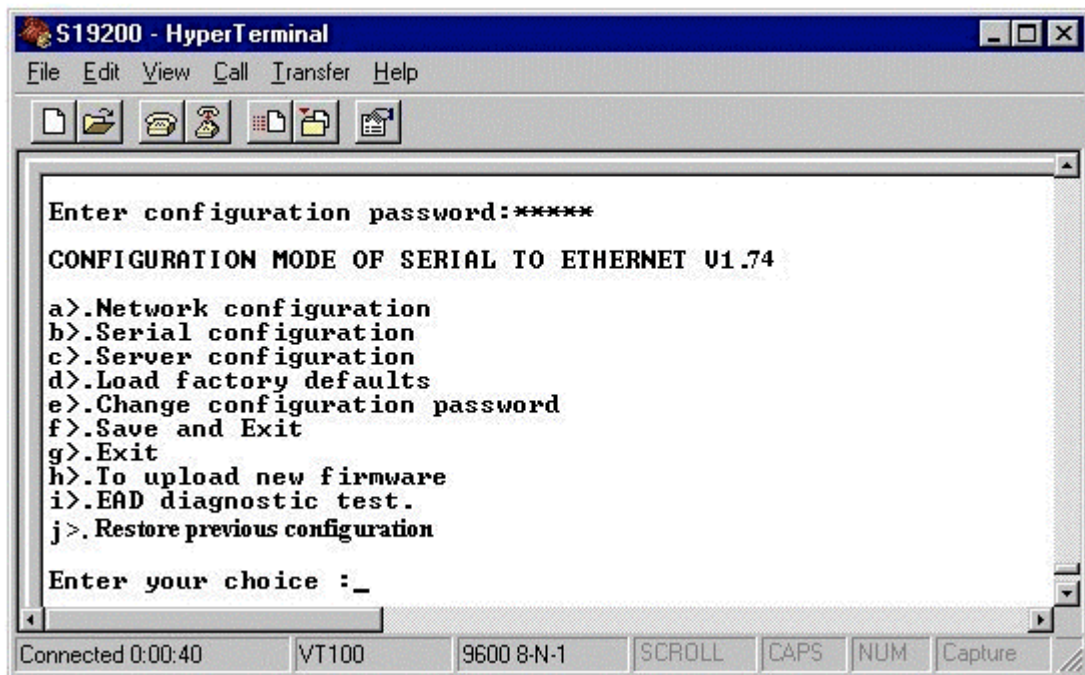


Fig 8. Programming through Hyper Terminal

- 5 Enter the choice, for example 'a' for entering the *Network configuration* mode, and configure the EAD. Refer the later chapters for various options and the functionality.

## 6.2. Programming through Telnet

EAD can also be programmed through Telnet program available in Windows. Open the Telnet programme and select 'Connect as remote system' from the Connect menu. Please see the screen shot below: -

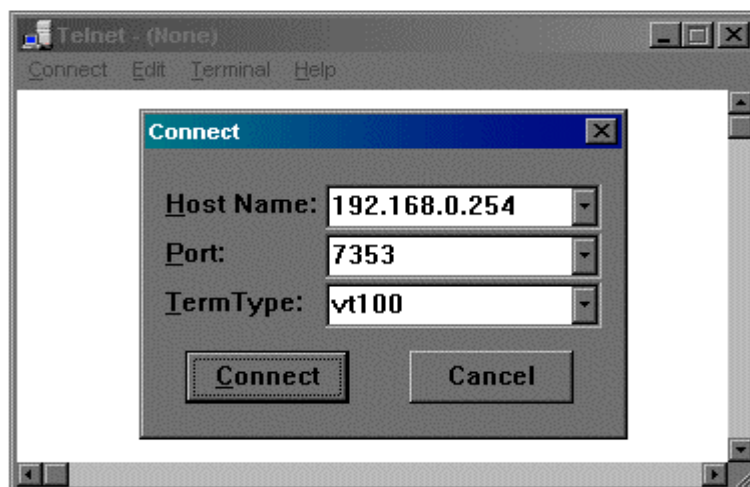


Fig. 9. Connect through Telnet

Enter the correct Host Name (IP Address) and the Port number. Host Name is the IP address you programmed and assigned in your EAD, for example 192.168.0.254. The reserved Port number in EAD for configuration through Telnet is **7353**. Click on 'Connect' and enter the Password when prompted. Default password is 77277. Change the parameters as per your choice. For detailed description on parameters of EAD, see later section .

**Note:** - If you want to program through the Telnet then the Port number should always be **7353**.

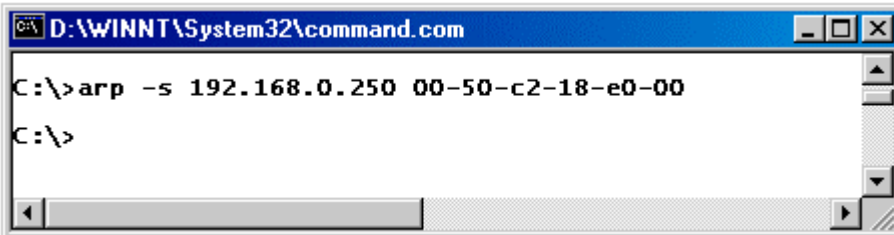
### 6.3. Auto IP Programming

If user knows only the MAC address of the EAD and he doesn't know the IP address then he can program it by adding "arp" (Address resolution Protocol) entry in his Computer and then connect through telnet using that IP and port number 7353.

For adding the "arp" entry, go to the DOS or Command prompt in your PC and enter the IP and MAC address as below.

```
C:\> arp -s [IP address] [MAC Address]
```

For example: -

A screenshot of a Windows Command Prompt window. The title bar reads "D:\WINNT\System32\command.com". The command prompt shows the command "C:\> arp -s 192.168.0.250 00-50-c2-18-e0-00" being entered and executed. The prompt then returns to "C:\>".

```
D:\WINNT\System32\command.com
C:\> arp -s 192.168.0.250 00-50-c2-18-e0-00
C:\>
```

After that "arp" command is executed in the Command Line, you can program the EAD through Telnet programme. Enter the Host Name and the IP that you set in your system arp table, and the Port should be **7353**. Follow the steps mentioned above for the programming through Telnet and setup the EAD as you require.

### 6.4. Programming through GUI

#### 6.4.1. Starting up.

In order to program EAD from EAD Programmer click Ethernet Adaptor present in Start Menu -> Programs -> Ethernet Adaptor

There are two modes of configuring EAD.

- 1) Through PC's Serial COM Port
- 2) Through TCP/IP LAN port from any computer in the Network which is loaded with the EAD programmer software.

### 6.4.2. Configuring EAD through COM Port

If the EAD is connected to the PC where the software is installed, Select the appropriate Serial Communication Port (COM1 or COM2 or COM3 or COM4) which is connected to the EAD.

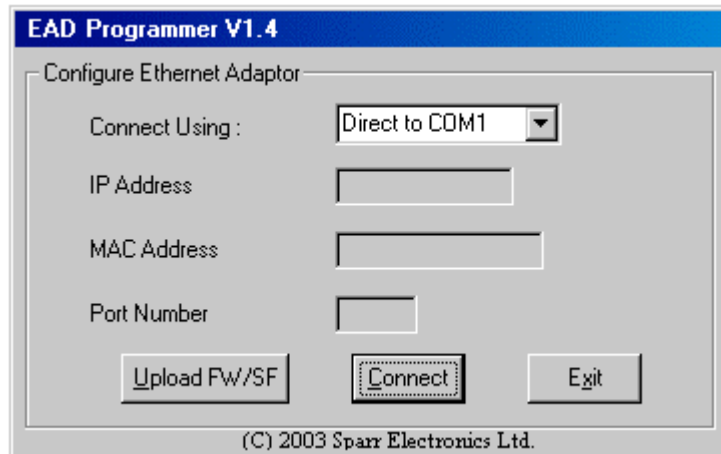


Fig 10. Connect through COM1

(Note: If some other Program is using the same Serial Port, an Error Message will be shown. Release the Serial Port by exiting the program before selecting the Serial Port in EAD Programmer Software).

### 6.4.3. Configuring EAD through TCP/IP Port:

If the EAD is connected to any one of the available LAN ports from Hub or Switch in your Network, you can program the EAD by choosing this method of configuration through TCP/IP port from any PC in the LAN which has this Software installed.

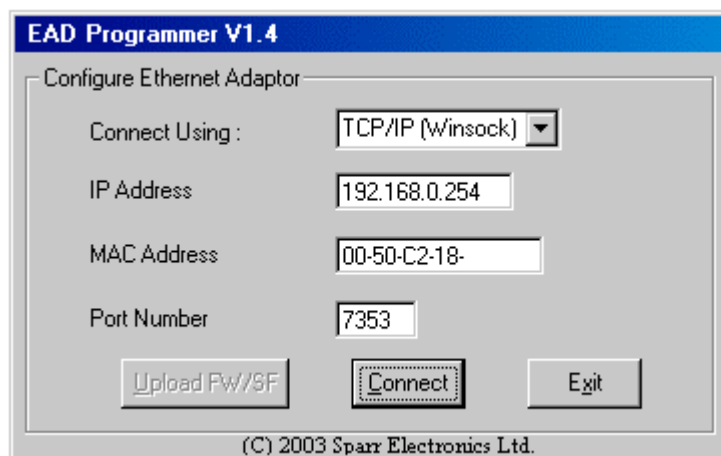


Fig 11. Connect through TCP/IP(Winsock)

**Note:** To program new EAD, for the first time using TCP/IP, enter an IP address (an unused IP) and also the MAC Address in the specified field ( You can get the MAC Address of our EAD by looking at the details in our EAD unit). And then go for *Connect* it will display the *Configuration* window as shown in the figure 11.

Our unit is set with a default IP number of 192.168.0.254, which you can also identify by the blinking RED LED or by Pinging the EAD unit for response. For this, your computer should be in the same IP group as: 192.168.0.XXX.

#### **6.4.4. Configuration Window**

Enter the correct password to get to the main window as shown in the figure 11. The Default password assigned to EAD is “77277”.



Fig. 12. Main Window for configuring the parameters.

The parameters are categorized into two different windows. *Network* and *Serial/Server* configuration as show in the figure below. And all the Windows can be selected from the Main Menu also.

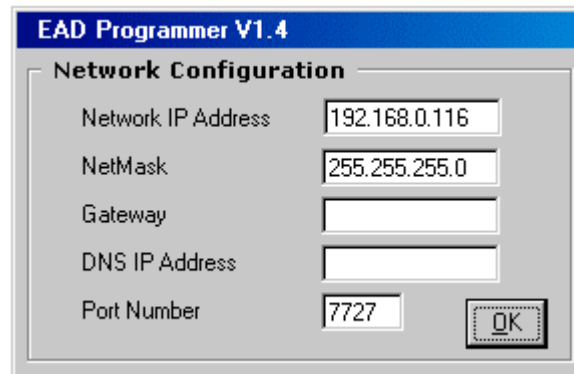


Fig. 13. Network configuration.

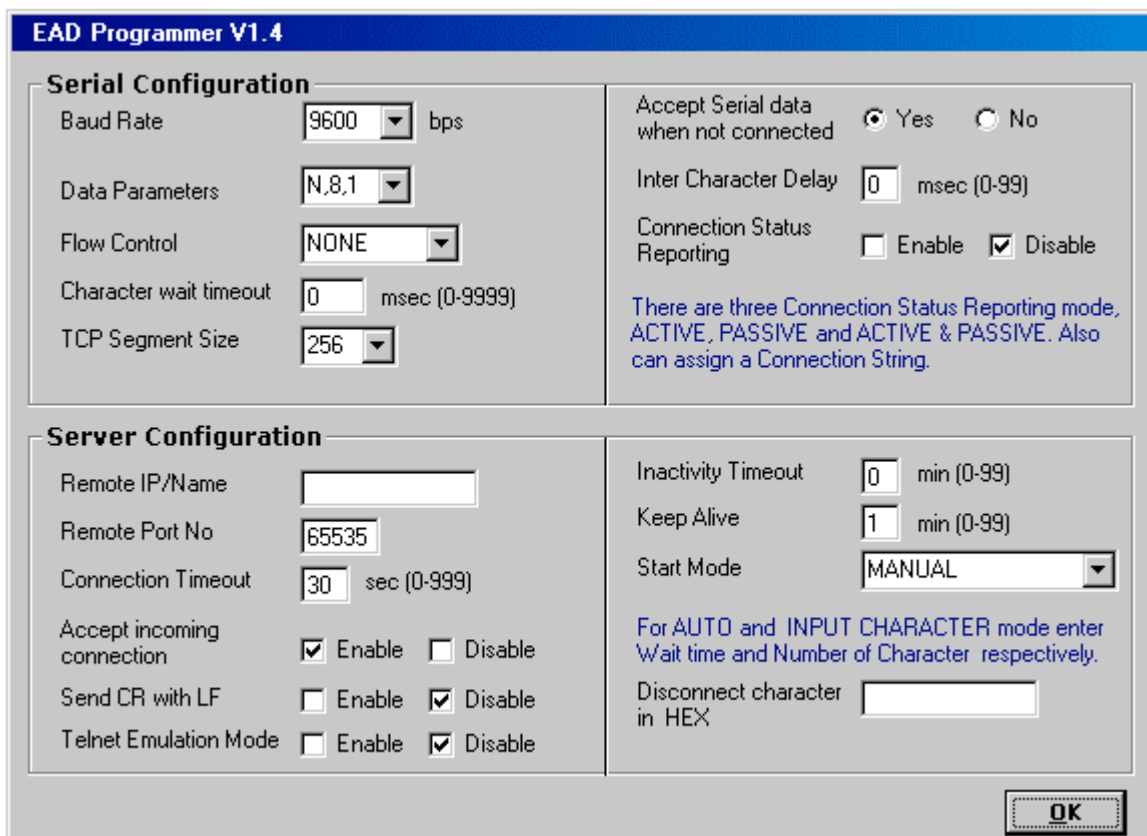


Fig 14. Serial and Server configuration

For changing the *password* of EAD there is a window provided in the GUI as shown below.



Fig 15. Change your password.

#### **6.4.5. Upload and Default loading Operations**

Upload FW/SW Button is used for uploading a firmware, (Supplied by Sparr Electronics) in to the EAD

For loading the factory default value click on the button *Load Default* from the main window, see figure 12.

### **7. Load Factory default**

Select this option from the main menu to load factory default values.

The factory default values are shown in the table provided later in the Manual.

### **8. EAD Setup Parameters**

The Main Configuration Menu items are listed and explained below.

1. Network configuration
2. Serial configuration
3. Server configuration
4. Load factory defaults
5. Change configuration password
6. Save and Exit
7. To upload new firmware
8. EAD diagnostic test
9. Restore previous configuration
10. Exit.

*In the **Network configuration** section there are five parameters as mentioned below.*

- a) IP Address
- b) Netmask
- c) Gateway
- d) DNS IP address
- e) Port number
- f) Exit

*Under the **Serial configuration** menu, there are eight parameters:*

- a) Baud rate
- b) Data Parameter.
- c) Flow control
- d) Character wait timeout
- e) Inter Character delay
- f) Connection status reporting
- g) Exit

*Under the **Server configuration** menu, there are ten parameters:*

- a) Connection time out [in sec]
- b) Start mode
- c) Accept incoming connection
- d) Remote IP address
- e) Remote Port number
- f) Send CR with LF
- g) Accept serial data when not connected. y/n.
- h) TCP Segment Size
- i) Connection Inactivity Timeout [ 00 - 9999 Sec ]
- j) Keep Alive Time [ 00 - 99 Min ]
- k) Disconnect active connection
- l) Telnet Emulation mode
- m) Exit

## 9. Parameter description

### 9.1. Network configuration.

Under the Network configuration there are five parameters which are programmable. The parameters are explained below.

#### 9.1.1. IP Address.

The IP address must be set to a unique value in your network. (See section 1.2.2). The EAD cannot connect to the network if the assigned IP address is already in use by any another device.  
**Ex. 192.168.0.250**

#### 9.1.2. Netmask.

A netmask defines the number of bits taken from the IP address that are assigned for the host section. **Ex 255.255.255.0**

#### 9.1.3. Gateway.

The Gateway or Router, allows communication to other LAN segments. The gateway address should be the IP address of the router connected to the same LAN segment. The gateway address must be within the local network address range. **Ex 192.168.0.XXX** . There is no default value.

#### 9.1.4 DNS IP Address.

Enter the Domain Name Server IP address in this option, if you have in your network, which is used to resolve the Name of the remote connecting server.

#### 9.1.5 Port Number.

This setting represents the port number for TCP connections to the serial device. Once the IP number is selected and the port number is opened then the serial device becomes transparent for data Transfer. (**Default is 7727**). You can select values from 0 to 65335 based on your application TCP socket program. The suggested value for this is from 3000 upwards.

#### 9.1.6 EXIT

Use this option to exit and come back to the previous selection menu.

### 9.2. Serial Configuration

This section helps in configuring the Serial port parameters of the EAD. The parameters are described below.

### **9.2.1. Baud rate.**

The EAD is normally attached to a Serial device, which needs to be controlled from LAN. The speed or baud rate selected should match between Device and the setting in the EAD for proper Serial data transfer. Set the correct baud rate with option 0,1,2,3, or 4 for valid baud rates of 1200, 2400, 4800, **9600 (Default)** and 19200 bps

### **9.2.2. Data Parameter.**

There are **Six** options available for Data parameters settings with choice from 0 to 5 for various Data bits, Parity and Stop bit selections.

**N (No Parity), 8( Data bit), 1(Stop bit) (default)**

**E (Even Parity), 8(Data bit), 1(Stop bit)**

**O (Odd Parity), 8(Data bit), 1(Stop bit)**

**E (Even Parity), 7(Data bit), 2(Stop bits)**

**0 (Odd Parity), 7 (Data Bits), 1(Stop Bit) and**

**N (No parity), 8 (Data Bits), 2 (Stop Bit)**

### **9.2.3. Flow control.**

Flow control is required for handshake with the Serial device for stopping serial data input/output to avoid character loss. Supported options are NONE for No Flow control, XON/XOFF for Software Flow control and RTS/CTS for Hardware Flow control. **Default None**

### **9.2.4. Character wait timeout.**

Character wait time out defines how long the EAD should wait before sending accumulated serial characters to network. Serial data arrives at EAD, which is packetized and sent through the LAN after this period. Set this to smaller value for immediate transfer. **Default is 0 Milliseconds. You can set this up to 9999 milliseconds**

### **9.2.5. Inter Character delay.**

Inter Character delay is the delay between two characters from the EAD to the serial port / device. The range is from 00 to maximum of 99msec.**Default 0 milliseconds.** Higher Inter Character delay is selected if the device can receive the serial character only with delay between characters.

### **9.2.6. Connection Status Reporting.**

Once EAD establishes connection with the Remote Server Machine, the user can be intimated with some connect Message. This reporting of connection status can be Enabled or Disabled. **(Default disabled)**. When Enabled with Option 1, you will have to choose the option for Active or Passive or Active and Passive mode. Once this option is selected you will be prompted to enter the message string (up to 10 Character)

Example:

Enter your choice: f

Current value: Disable

Enter 0:Disable 1:Enable: 1

Current value :0

Enter 0:Active 1:Passive 2:Active & Passive: 2

Existing string:

Enter connect string: CONNECT

### **9.3. Server Configuration**

Under *Server Configuration* various parameters required for EAD to connect to Server are provided and the available options are described below.

#### **9.3.1. Connection time out.**

The time to wait till a successful connection is established (**Default 30 Seconds**). The permitted value is between 00 to 999 Seconds

#### **9.3.2. Start mode.**

There are three types of start modes available. 0 for *auto start*, 1 for *manual mode* and 2 for *input character mode*.

**Auto Start:** - This mode is selected when you want EAD to Automatically connect on Power Up to a Server in Network running any application listening for incoming connections. The connection parameters like the Remote IP address and the TCP port number parameters are configured and saved for this. If Automatic connection method is selected (here you can program the time to get connected after switching on the unit also), all parameters must be provided. (i.e. Remote IP, Remote port number, Start mode = 0). It will connect to the programmed IP address and the port number according to the time programmed.

**Manual mode:** - In the manual mode, TCP connection can be made by entering command from Terminal or Serial port as:

**C IP address/Port number** (No space between C and IP address).

Example: - **C192.168.0.250/25**.

Note: - You can use Manual Mode only if the *Accept serial data when not connected* (see Section 7.3.7) option is disabled.

**Input Character Mode:** - This Mode is selected when you require EAD to connect automatically to Server when there is character from the Serial Port. For the input character mode automatic connection, Remote IP address and the TCP port number parameters are required and should be programmed. If the Input character mode is selected (here you can program the number of characters given as input), all parameters must be provided. (i.e. Remote IP, Remote port number, Start mode = 2). It will connect to the programmed IP address and the port number when unit receives the number of characters equal to the one you programmed.

**Default setting is Manual**

### 9.3.3. Accept incoming connection.

Set the incoming connection as enable or disable. This should be enabled for a Computer in the Network to initiate connection to the EAD. This can be disabled if EAD makes the connection to the Server and does not require connection from Server. **Default setting is Enable**

### 9.3.4. Remote IP Address.

When the start mode is Auto start (automatic connection) or based on Input Character Mode, EAD makes a connection to this IP address on the network. This IP address should be within your Network IP Range. **Default Setting is NIL**

### 9.3.5. Remote Port number.

The remote TCP port number must be set for use automatic connections and for connection based on Input Character Mode. This parameter defines the port number on the target host to which a TCP connection is attempted. This works in conjunction with Remote IP Address. **Default Setting is NIL**

### 9.3.6. Send CR with LF.

EAD in addition will send a line feed character (LF) with every Carriage return (CR) received from the Serial Port to the Host PC, if this option is enabled. The available option is Disable or Enable. **Default Setting is Disable**

### 9.3.7. Accept serial data when not connected.

This signifies the TCP segment data size on the LAN side. The received serial data is sent on LAN side. The received serial data is sent on LAN in this packet format. Select the higher value for large data transfer. The available options are 0:256 bytes, 1:512 bytes, 2:768 bytes, and 3:1024 bytes. **Default Setting is 0 for 256 Bytes.**

### 9.3.8. TCP Segment size.

EAD can be set to buffer the data from Serial Port based on this selection set the buffer length by selecting this option. The available options are 0:256 bytes, 1:512 bytes, 2:768 bytes, and 3:1024 bytes. **Default Setting is 0 for 256 Bytes**

### **9.3.9. Connection Inactivity timeout.**

Use this parameter to set inactivity time out. The connection is dropped if there is no activity on the serial line after the set time expires. If the Value is 0, inactivity timeout is disabled. The range of selection is from 00 to 9999 Seconds. **Default 0 (Zero).**

### **9.3.10. Keep Alive Time.**

This will make the EAD to check the remote TCP connection whether it is active or not, if there is no Data Transfer activity is observed in the Serial side or Network side for the duration of time set .If the remote TCP connection is not there, EAD will disconnect the current connection. Otherwise it will maintain the connection. If there is no activity on both sides, it rechecks the connection after *Keep Alive Time out* occurs once again,

Note: - This setting is effective only when the Connection inactivity Timeout option is set to 0.

### **9.3.11. Disconnect character.**

When EAD is connected to the remote server, then user can disconnect the EAD TCP connection by sending the Disconnect character programmed from the Serial Port. Disconnect character should be in HEX, from **00 – FE**.

**FF** is not allowed. Maximum 5 hex character is allowed.

Example: - **A1EFAD0023**

## **9.4. Change configuration password.**

Select this option to change the password required for entering in to Configuration Mode for making any changes to the Settings. **Default password is 77277.**

## **9.5. Save and Exit.**

To Save the programmed parameters, select this option from the main menu. EAD will take some time to save the data you have selected and programmed. Once the new values are stored, EAD automatically will exit from the programming (configuration) mode and will go to Data Connection mode ready for communication.

**Please do look for the following message and wait till the Data Saved message appears on the screen.**

Saving the data please wait....  
DO NOT POWER OFF

Data saved

## **9.6. Exit**

Select this option to exit from the configuration mode without saving the data.

## **9.7. Upload new firmware**

This option is available only through Terminal Mode and not from Telnet mode. To upload new upgraded versions of firmware to the built-in Flash RAM, select this choice from the main menu and then follow the instructions. Files are to be uploaded as text files only. You can also be able to upload new firmware through EAD Programmer (see section 6.3.5) software provided.

## **9.8. EAD Diagnostic test**

This option is used to for test the H/W of the EAD. There are three type of tests are included.

- a. RAM test.**  
Performs the RAM check of the EAD and reports the result.
- b. Network controller test.**  
Performs LAN Controller check in the EAD and reports the Result.
- c. Ping test.**  
Performs Ping operation of the IP Address programmed in the EAD and reports the Result.

## **9.9 Restore previous configuration**

Select this option to restore the configuration values that were previously saved.

## **9.10 Telnet Emulation Mode**

The Telnet Emulation mode needs to be enabled if you are planning to connect to Telnet Server running either in Window Server or Linux or Unix. **Default is Disable**

<b>10. Control-Monitor RTS/CTS through Port no.(s) 7354 &amp; 7355</b>
--

**Controlling RTS (Request T Send) signal**

Open the Telnet Connection from any PC in the Network and select 'Connect as remote system' from the Connect menu. (Refer the Figure. 9). Enter the correct Host Name (IP Address) and the Port Number (**7354**). Host Name is the IP address you programmed in your EAD, for example 192.168.0.254. The port number should be **7354**. Then go for *Connect*.

Enter '**1**' from you keyboard to switch ON the RTS Signal and '**2**' for switching OFF the RTS Signal.

**Monitoring RTS/CTS**

Open the Telnet connection and select 'Connect as remote system' from the Connect menu. (Refer the Figure. 8). Enter the correct Host Name (IP Address) and the Port number (**7355**). Host Name is the IP address you programmed in your EAD, for example 192.168.0.254. The port number should be **7355**. Then go for *Connect*.

Once got connected it sends data **0/1/2/3** depending on the status (showed in table below) of RTS/CTS, and disconnects immediately.

DATA	STATUS	
	RTS	CTS
<b>0</b>	ON	ON
<b>1</b>	OFF	ON
<b>2</b>	ON	OFF
<b>3</b>	OFF	OFF

<b>11. Factory default values</b>
-----------------------------------

<b>Parameter</b>	<b>Default value</b>
Password	77277
IP Address	192.168.0.254
Netmask	255.255.255.0
Gateway	Nil
DNS IP Address	Nil
Port number	7727
Baud rate	9600
Flow control	None
Character wait timeout	0
Connection time out	30 sec
Start mode	Manual mode
Accept incoming connection	Enable
Remote IP Address	Nil
Remote port number	65535
Send CR with LF	Disable
Accept serial data when not connected	Enable
TCP Segment size	256 bytes
Connection Inactivity timeout	0
Keep Alive Time	1 min.
Data Parameter	N, 8,1
Inter Character delay	0
Use with IFD	Disable.
Connection Status Reporting	Disable
Disconnect character	Nil

## 12. Viewing the parameter through Web browser

One of the add-on feature of the EAD is you can view the Configured parameters through the web browser by giving the IP Address of the unit as http request.

Eg. <http://192.168.0.100>

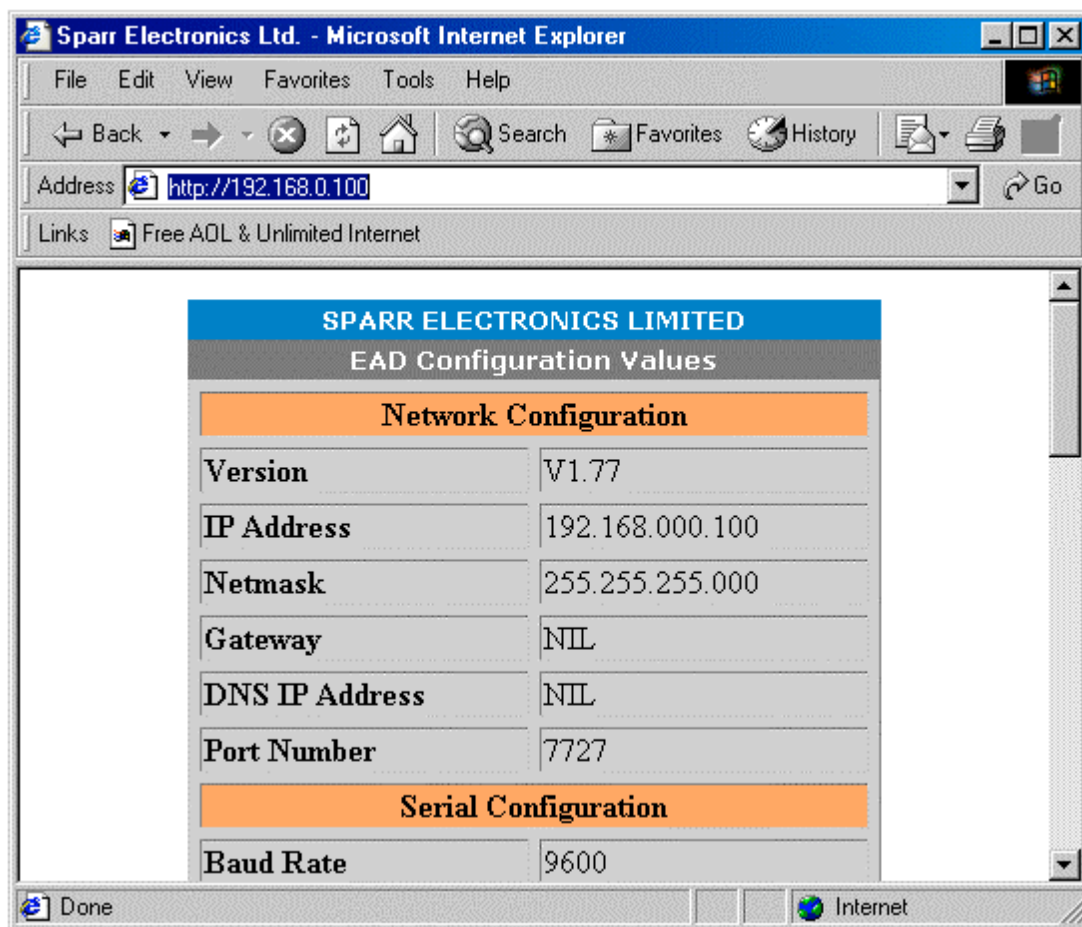


Fig.16. Browser view of EAD Configuration Values

**13. Board level and outside views**

**EAD-01MB (Metal box)**



<b>Physical Dimensions</b>	
Length	134mm
Breadth	90mm
Height	38mm
Weight	700gm
Power	230V AC for MB 9V AC or DC for MBX model
<b>LED Indicator</b>	
Red	For power
Green	For link

**EAD-01 PB (Plastic box)**

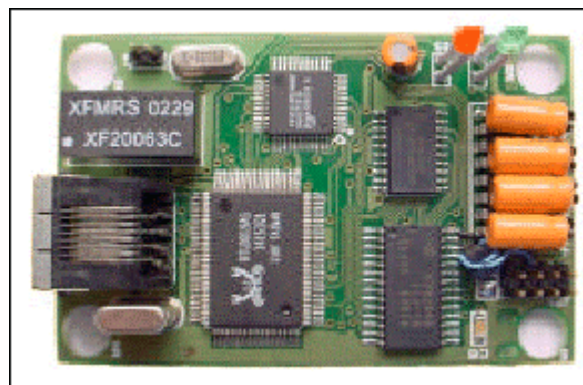


<b>Physical Dimensions</b>	
Length	80mm
Breadth	50mm
Height	30mm
Weight	80gram
Power	+5V DC @ 100ma.
<b>LED Indicator</b>	
Red	For power

## Ethernet Adaptor

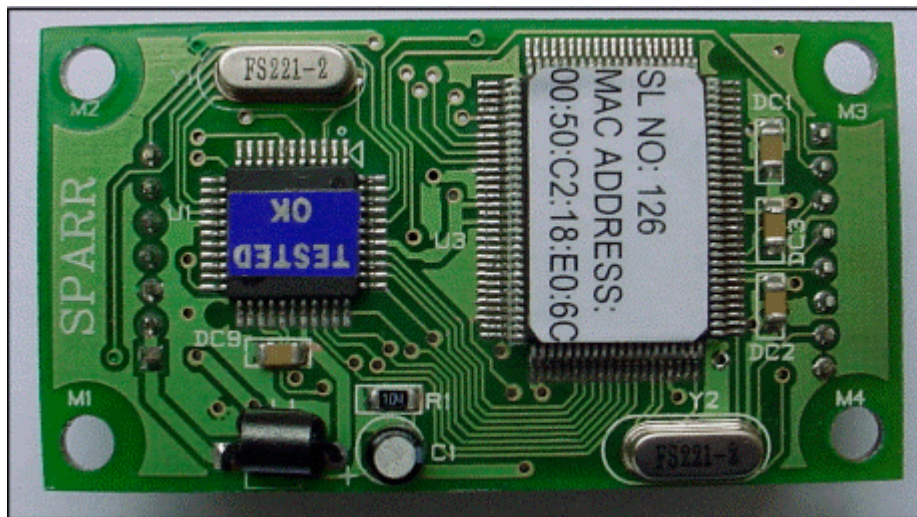
Green	For Link
-------	----------

### EAD-01 B (Board level view)



Physical Dimensions	
Length	79mm
Breadth	50mm
Height	15mm

**EAD-01 MD (Module)**



<b>Physical Dimensions</b>	
Length	66mm
Breadth	35mm
Height	10mm





## 14. Troubleshooting

This section describes commonly encountered problems, associated symptoms, and suggested troubleshooting actions. A general piece of advice: if you are unable to proceed any further, despite the guidelines given through the manual, contact your supplier or the company. It would be extremely useful if you could capture the problem environment to the extend possible (in terms of detailed description of the problem). This will assist in a quick response to your problem. However, there is a rare chance that you might encounter a problem that you cannot solve yourself.

PROBLEM	CHECK
1. Reset Problem	Check when you power ON the EAD, Red and Green LED is glowing and the Green goes OFF and Red blinks three times and remains ON.
2. Link is not detecting	Check the LAN cable
3. Not able to connect to LAN	Check the LAN cable, when you connect the LAN cable to EAD Green LED should glow. Check the IP Address and Port Number programmed.
4. Getting junk character in serial side	Check the serial settings 1) Baud rate 2) Flow control and 3) Data parameter Check the Serial connection from devise to EAD
5. Not able to send data from serial device to EAD	Check the Serial connection Check the Tx/Rx are connected to corresponding pins. For serial pinout details refer the <i>Connection and pinout diagrams</i> section in the manual

## 15. Glossary of Terms

In the section, we give brief definitions of several important networking terms and acronyms.

---

A

### *ARP (Address resolution Protocol)*

Address Resolution Protocol (ARP) is a protocol for mapping an Internet Protocol address (IP address) to a physical machine address that is recognized in the local network. .) A table, usually called the ARP cache, is used to maintain a correlation between each MAC address and its corresponding IP address. ARP provides the protocol rules for making this correlation and providing address conversion in both directions.

---

B

### *Baud rate*

Baud was the prevalent measure for data transmission speed until replaced by a more accurate term, bps (bits per second). One baud is one electronic state change per second. Since a single state change can involve more than a single bit of data, the bps unit of measurement has replaced it as a better expression of data transmission speed.

The measure was named after a French engineer, Jean-Maurice-Emile Baudot. It was first used to measure the speed of telegraph transmissions.

---

C

### *Client program*

A client program is a type of computer program that actively requests service from a server program, which often resides on another computer.

### *COM port*

A COM port is serial communications port (RS 232 interfaced) on a Windows-based PC. Most PCs come with two built-in COM ports, although the number of ports can be extended into the hundreds by installing either multiport serial boards, or network-based serial device servers.

---

D

### *Data-stream transmission*

Data-stream transmission refers to a series of data transmitted continuously without interruption.

---

**E**

*Ethernet*

Ethernet is a local-area network architecture developed by Xerox, DEC, and Intel in 1976. It operates using a shared bus or star topology, and supports data transfer rates of 10 Mbps, 100Mbps, and even 1000 Mbps formats

*Ethernet frame*

An Ethernet frame is a packet of data bits sent from one device to another over an Ethernet network.

---

**F**

*Firmware*

Firmware is programming that is inserted into programmable read-only memory (programmable ROM), thus becoming a permanent part of a computing device. Firmware is created and tested like software (using microcode simulation). When ready, it can be distributed like other software and, using a special user interface, installed in the programmable read-only memory by the user. Firmware is sometimes distributed for printers, modems, and other computer devices.

---

**H**

*host*

A host is a computer, such as a PC or Linux server that is connected to a network. Each host is assigned its own unique IP address.

*HTML*

HTML (Hyper Text Markup Language) is the computer language used to produce text files that contain typesetting commands which allow the document to be viewed with a web browser (such as Internet Explorer® or Netscape®). HTML defines the structure of tags and attributes used to create Web text documents.

*HTTP*

HTTP (Hyper Text Transfer Protocol) defines how messages are formatted and transmitted, and what actions the Web server should take.

---

**I**

*IP address*

An IP address is 32-bit identification number assigned to networking devices connected to a TCP/IP network such as the Internet. IP address are written, for example, in the form 192.168.206.10.

---

**L**

*LAN*

A LAN(Local Area Network) is a computer network characterized by the fact that a message sent from one LAN computer to another does not pass through a router. Note that most LANs are located within a relatively small geographical area, such as the a building or campus.

---

**M**

*MAC address*

On a local area network (LAN) or other network, the MAC (Media Access Control) address is your computer's unique hardware number. (On an Ethernet LAN, it's the same as your Ethernet address.) When you're connected to the Internet from your computer (or host as the Internet protocol thinks of it), a correspondence table relates your IP address to your computer's physical (MAC) address on the LAN.

---

**N**

*netmask*

A netmask is a 32-bit number that is used to determine the network scope of a computers's IP address. The most commonly used netmasks are 255.0.0.0 for Class A networks, 255.255.0.0 for Class B networks, and 255.255.255.0 belongs to a class C network, in which all computers on the network have IP address of the form 192.168.254.xxx.

---

**R**

*RS-232*

RS-232 is a standard interface for connecting serial devices. Many modems, display screens, and printers are designed to operate via an RS-232 port.

---

**S**

*serial communications*

Serial communications refers to the transmission of data bit-by-bit.

*serial device server*

A serial device server is a standalone device that has at least one Ethernet port and one or more serial ports. Serial device servers are equipped with an embedded network operating system and allow computers to access serial devices over a network.

### *socket programming*

Socket programming refers to scripts that execute functions which read data to and from socket.

---

T

### *TCP/IP*

The TCP/IP protocol suite refers to the family of network protocols used by most Ethernet networks, and by the Internet, to connect hosts. TCP/IP, in which TCP stands for Transmission Control Protocol and IP stands for Internet Protocol, is a standard for transmitting data over networks.

### *TCP port*

A TCP port is similar to a native COM port, which extends from the Ethernet.

### *TCP socket*

A TCP socket is a program that can send and receive TCP/IP messages by opening a socket, and then reading and writing data to and from the socket.

### *Telnet*

Telnet is a widely used protocol that establishes a network connection with a networked device. Many standard software utilities are based on the Telnet protocol, such as Telnet (system utility name) under Windows and Linux. Many network devices, such as serial device servers and routers have a built-in Telnet console that allows users to configure the device by the Telnet utility.

---

W

### *WinSock*

WinSock is the standard Windows API utility that uses TCP/IP protocol to connect other network devices.

Contact

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