

LIF-200

RS232/RS485 to TCP/IP Converter Module

USER MANUAL

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1 . G e t t i n g t o K n o w y o u r L I F - 2 0 0

1.1. Introduction

The LIF-200 is an RS232/RS485 to TCP/IP converter integrated with a robust system and network management features designed for industrial equipment to be accessed and controlled via Intranet or Internet.

By integrating RTOS (Real Time Operating System) and complete TCP/IP protocol stack capability, RBH's LIF-200 provides not only a robust and high performance system for connecting your device to a Network, but also ease installation and Internet access.

The LIF-200 Web Configurator is a breeze to operate and totally independent of the operating system platform you use.

1.2. Main features

The following are the main features of LIF-200.

► TCP/UDP server/client support

The LIF-200 supports four types of connection: TCP server, UDP server, TCP client and UDP client, users can select one of these types depending on your application requirements.

► DHCP Client

The DHCP (Dynamic Host Configuration Protocol) client obtains the TCP/IP configuration at start-up from a centralized DHCP server.

► PPPoE Over Ethernet

PPPoE is a protocol for connecting remote hosts to the Internet over a DSL connection by simulating a dial-up connection.

► Dynamic DNS

With dynamic DNS support, you can have a static hostname alias for a dynamic IP address, allowing the host to be more easily accessible from various locations on the Internet.

► Auto-negotiating 10/100Mbps Ethernet

The Ethernet interface automatically detects if it is on a 10 or a 100 Mbps Ethernet.

► Full Network Management via Web

This feature allows you to access or manage the device through Internet Explorer or Netscape on any platform. The firmware also can be upgraded via the Web browser.

► Backup and Restore configuration

This feature allows you to backup your system configuration to a file and restore from it. For the security reasons the file that is backed-up is in an encrypted format.

1.3. Applications for LIF-200

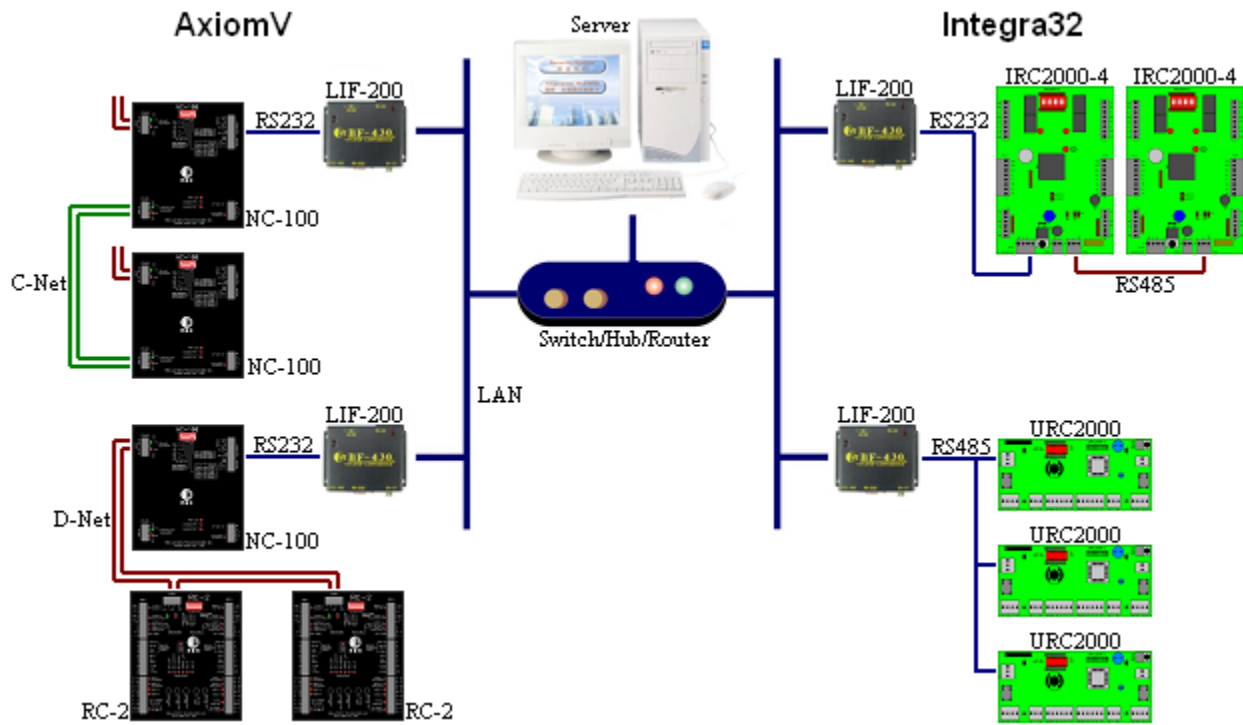


Figure 1 LIF-200 applications

2. Hardware Installation & Initial Setup

2.1. Hardware Installation



2.1.1. Power

Power is connected through either the power input terminals beside the RS485 port or through the center positive modular plug on the same side as the RJ45 jack.

2.1.2. Communications

The LAN communication is connected to the RJ45 jack, and the serial communication can be connected through either the RS232 port (DB9M) or the RS485 port (terminal block). Ensure that both the programming and the slide switch are set the same (RS232 or RS485).

2.2. LED status

LED	Color(s)	Activity	Description
POWER	Red	Off	Power OFF
		On	Device Ready
LINK	Red	Off	No Ethernet Link
		On	Ethernet Link established
100M	Red	Off	10 Mbps
		On	100 Mbps
TRANS	Green	Off	No TCP/IP session link
		On	TCP/IP session link established
		Blinking	Booting/System Self-Test Data Sending/Receiving between Serial and Ethernet

2.3. Initial Setup



Set up your computer by assigning it a static IP address in the 192.168.168.1 to 192.168.168.254 range with a subnet mask of 255.255.255.0. This is necessary to ensure that your computer can communicate with your LIF-200.



Your computer must have an Ethernet card and TCP/IP installed. TCP/IP should already be installed on computer using Windows 98/2000/XP and later operating systems.

Note: To connect a computer directly to the LIF-200 Ethernet port use a crossover Ethernet cable, if both the computer and the LIF-200 are connected to a hub/switch use a straight-through Ethernet cable.

2.3.1. Fixed IP Addresses Configuration

For details please refer to Section 3 Basic Configuration Setup.

2.3.2. Configure your LIF-200

For details please refer to Section 4 Advanced Configuration Setup.

3. LIF-200 Basic Configuration Setup

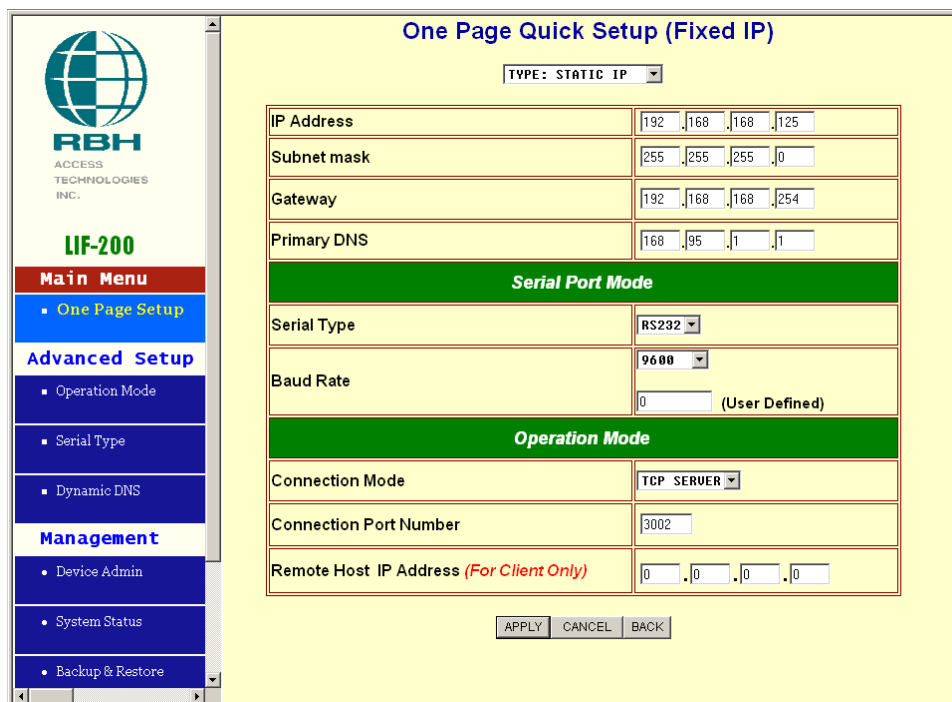
This section will show the basic configuration of the LIF-200. Use the 'One Page Quick Setup' to connect your device through Intranet or Internet.

The LIF-200 supports three IP connection types: Static IP, DHCP and PPPoE. These types are listed in the drop-down menu for the IP Configuration setting. Each setup screen and available features will differ depending on what kind of IP connection type you select. The default setting is 'Static IP'.

Check the software version of your IPLocator under Help: About. The default user is 'RBH' and the default password is 'password'.



3.1. One Page Quick Setup with Fixed IP Static (or Fixed) IP



One Page Quick Setup (Fixed IP)	
TYPE: STATIC IP	
IP Address	192 . 168 . 1 . 125
Subnet mask	255 . 255 . 255 . 0
Gateway	192 . 168 . 1 . 254
Primary DNS	168 . 95 . 1 . 1
Serial Port Mode	
Serial Type	RS232
Baud Rate	9600 (User Defined)
Operation Mode	
Connection Mode	TCP SERVER
Connection Port Number	3002
Remote Host IP Address (For Client Only)	0 . 0 . 0 . 0
APPLY CANCEL BACK	

IP Mode

IP Address: default 192.168.168.125

Subnet mask: default 255.255.255.0

Gateway: default 192.168.168.254

Primary DNS: default 168.95.1.1

Serial Port Mode

Serial Type: RS232

Baud Rate: 9600

If no suitable Baud Rate appears in the drop-down menu chose “Others” and enter your own value.

Operation Mode

Connection Mode: TCP Server

Connection Port Number: 3002

Remote Host IP Address: Only used with TCP Client

If you are connecting through a static or fixed IP address from your network, perform these steps :

Step 1: Enter IP address.

Step 2: Enter Subnet mask.

Step 3: Enter Gateway IP address.

Step 4: Enter Primary DNS IP address.

Step 5: Select correct setting of Serial Port Mode and Operation Mode.

Step 6: Click Apply button.

3.2. One Page Quick Setup with DHCP Client

DHCP

One Page Quick Setup (DHCP Client)

TYPE: DHCP CLIENT

Host Name (optional) LIF-200

Serial Port Mode

Serial Type RS232

Baud Rate 9600 (User Defined)

Operation Mode

Connection Mode TCP SERVER

Connection Port Number 3002

Remote Host IP Address (For Client Only) 0.0.0.0

APPLY CANCEL BACK

IP Mode

Host Name (Optional): default LIF-200, maximum length 15 characters.

Serial Port Mode

Serial Type: RS232

Baud Rate: 9600

If no suitable Baud Rate appears in the drop-down menu chose “Others” and enter your own value.

Operation Mode

Connection Mode: TCP Server

Connection Port Number: 3002

Remote Host IP Address: Only used with TCP Client

If there is a DHCP Server existing in your network environment or you subscribe a CABLE service from your ISP, you can set your IP configuration to DHCP to get a dynamic IP address. The Host Name is an *optional* item, depending on your DHCP Server setting.

Note 1: To use a CABLE service, you also need to change the MAC address of the LIF-200 to the MAC address of register at the ISP. Please refer to Chapter 4 Device Admin/Mac Address Change.

3.3. One Page Quick Setup with PPPoE

PPPoE

One Page Quick Setup (PPPoE)

TYPE: PPPoE

User Name (1 - 47)

Password (1 - 35)

Service Name (optional) (1 - 47)

Close Connection when Idle Time Over 0 (seconds)

PPPoE with Fixed IP Address DISABLE

Serial Port Mode

Serial Type RS232

Baud Rate 9600 (User Defined)

Operation Mode

Connection Mode TCP SERVER

Connection Port Number 3002

Remote Host IP Address (For Client Only) 0.0.0.0

APPLY CANCEL BACK

IP Mode

User Name: no default, maximum length 47 characters.

Password: no default, maximum length 35 characters.

Service Name (optional): no default, maximum length 47 characters.

Close Connection when Idle Time Over (second): default 0, range 0 to 4294967295.

PPPoE with Fixed IP Address: default DISABLE.

Serial Port Mode

Serial Type: RS232

Baud Rate: 9600

If no suitable Baud Rate appears in the drop-down menu chose “Others” and enter your own value.

Operation Mode

Connection Mode: TCP Server

Connection Port Number: 3002

Remote Host IP Address: Only used with TCP Client

If you subscribe to a DSL service with PPPoE connection from your ISP, you can set the IP configuration to PPPoE to get a dynamic IP address. Your ISP will provide you the ‘User Name’ and ‘Password’; some ISP will also need the ‘Service Name’ for authentication, but this is optional and depends on your ISP.

If you want to keep the connection always on between LIF-200 and your ISP, then set the value of item 'Close Connection When Idle Time Over' to 0, otherwise, when the on line idle time exceeds the setting value, the LIF-200 will terminate this PPPoE connection.

If your ISP can provide you with a fixed IP address when the PPPoE connection established each time, you can select 'PPPoE with Fixed IP Address' as ENABLE and enter the IP address given to you from your ISP.

3.4. Change Password

Device Administration Setting

Block Standard Http Port(80) Management ☒ UNBLOCK ☐ BLOCK

Device Management IP Address 192 . 168 . 200 . 200

Device Hostname LIF-200

Device Location

Administrator Password

User Name

Password Change

Password Confirm

Block Ping Request ☒ UNBLOCK ☐ BLOCK

MAC Address Change 00 : 00 : 00 : 00 : 00 : 00

Reset System to Factory Default

Reboot System

3.4.1. Changing User Name and Password

- 1) On the left side of the screen under Management select Device Admin and open the Device Administration Setting screen.
- 2) Beside Administrator Password type in a new user name and password (verify the password by entering it in both boxes).
- 3) Click apply and accept the change by re-logging in with the new user name and password.

4 . L I F - 2 0 0 A d v a n c e d C o n f i g u r a t i o n S e t u p

This chapter will show you how to configure the LIF-200 to function in your network and gain access to your device through Intranet or Internet.

4.1. Operation mode

The LIF-200 supports four operational modes: TCP Server, TCP Client, UDP Server and UDP Client. These modes are listed in the drop-down menu for the 'Operation Mode' setting. Each setup screen and available features will differ depending on what kind of operation mode you select. The default setting is TCP Server.

TCP Server

The screenshot shows the 'Operation Mode Setup (TCP Server)' web interface. On the left is a sidebar with the RBH logo and a menu. The main area contains configuration fields for the TCP Server mode.

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Main Menu

- One Page Setup
- Advanced Setup**
 - Operation Mode
 - Serial Type
 - Dynamic DNS
- Management**
 - Device Admin
 - System Status
 - Backup & Restore

Operation Mode Setup (TCP Server)

MODE: TCP SERVER

Local Listen Port Number	3002
Close Connection When Remote Idle	100 (seconds)
Access Password	(maxlen 31)
Keep Alive Check	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Max TCP Connection	2

APPLY CANCEL BACK

Listen Port Number: default 3002, range 0 to 65535.

If your device is configured as passive (to accept commands from a remote, and data reception by the peer needs to be guaranteed) then you can set the LIF-200 as TCP Server. Be sure that the value 'Listen Port Number' is set to the same value that your remote control application is using.

Close Connection When Remote Idle (second): default 100, range 0 to 32768.

If you want to keep the connection between LIF-200 and your remote control application always on, then set the value of 'Close Connection When Remote Idle' to 0, otherwise, when the on line idle time exceeds the setting value, the LIF-200 will terminate this connection.

For security purposes you can input an **Access Password** to protect your device. The LIF-200 will authenticate the TCP connection with that password.

Keep Alive Check: default Disable.

Disable: Disable the check of the TCP connection to verify if it is still alive or not.

Enable: LIF-200 will automatically send a Ping request to the peer every 30 seconds. The TCP connection will be terminated if there is no response to the Ping from the peer.

Max TCP Connection: default 2, range from 1 to 4.

Max TCP Connection allows multiple TCP connections to be accepted by the LIF-200 simultaneously. It is usually used when users need to receive data from different hosts simultaneously. When multiple hosts establish TCP connections to the LIF-200 at the same time, it will duplicate serial data and transmit it to all hosts. When data comes in from the Ethernet port, it is sent out on a first-in-first-out basis to the serial port.

TCP Client

The screenshot shows the LIF-200 web interface. On the left is a sidebar with the RBH logo and a menu with sections: Main Menu (One Page Setup), Advanced Setup (Operation Mode, Serial Type, Dynamic DNS), and Management (Device Admin, System Status, Backup & Restore). The main content area is titled 'Operation Mode Setup (TCP Client)'. It features a dropdown menu set to 'MODE: TCP CLIENT'. Below this are three input fields: 'Remote Connection Port Number' (value 3002, range 0 - 65535), 'Remote Host IP Address' (value 0.0.0.0), and 'TCP Connection' (radio buttons for 'Start Up' and 'Any Character', with 'Any Character' selected). At the bottom of the form are 'APPLY', 'CANCEL', and 'BACK' buttons.

Remote Connection Port Number: default 3002, range 0 to 65535.

Remote Host IP Address: default 0.0.0.0.

If your device is configured as active (to report real-time status to a remote, and data reception by the peer needs to be guaranteed) then you can set the LIF-200 as TCP Client. Be sure the value 'Remote Connection Port Number' is set to the same value that your remote control application is using, and set the correct value of 'Remote Host IP Address'.

TCP Connection: default Any Character.

Start Up means that the LIF-200 will attempt to establish a TCP connection as soon as it is powered up.

Any Character means that the LIF-200 will attempt to establish a TCP connection as soon as it starts receiving data from serial port.

UDP Server

The screenshot shows the 'Operation Mode Setup (UDP Server)' web interface. On the left is a sidebar with the RBH logo and a menu. The menu includes 'Main Menu' (with 'One Page Setup' highlighted), 'Advanced Setup' (with 'Operation Mode' highlighted), and 'Management' (with 'Device Admin', 'System Status', and 'Backup & Restore' listed). The main content area is titled 'Operation Mode Setup (UDP Server)' and features a dropdown menu set to 'MODE: UDP SERVER'. Below this is a text input field for 'Local Listen Port Number' with the value '3002' and a range '(0 - 65535)'. At the bottom of the main area are three buttons: 'APPLY', 'CANCEL', and 'BACK'.

Local Listen Port Number: default 3002, range 0 to 65535.

If your device is configured as passive (to accept commands from a remote and data reception by the peer needn't be guaranteed) then you can set the LIF-200 as UDP Server. Be sure the value 'Listen Port Number' is set to the same value that your remote control application is using.

UDP Client

The screenshot shows the 'Operation Mode Setup (UDP Client)' web interface. The sidebar is identical to the previous screenshot. The main content area is titled 'Operation Mode Setup (UDP Client)' and features a dropdown menu set to 'MODE: UDP CLIENT'. Below this are two text input fields: 'Remote Connection Port Number' with the value '3002' and range '(0 - 65535)', and 'Remote Host IP Address' with the value '0.0.0.0'. At the bottom of the main area are three buttons: 'APPLY', 'CANCEL', and 'BACK'.

Remote Connection Port Number: default 3002, range 0 to 65535.

Remote Host IP Address: default 0.0.0.0.

If your device is configured as active (to report real-time status to a remote and data reception by the peer needn't be guaranteed) then you can set LIF-200 as UDP Client. Be sure the value 'Remote Connection Port Number' is set to the same value that your remote control application is using and set the correct value of 'Remote Host IP Address'.

4.2. Serial Type

The LIF-200 supports two serial types: RS232, and RS485, these types are listed in the drop-down menu for the 'Serial Type' setting. Each setup screen and available features will differ depending on what 'Serial Type' you selected. The default setting is RS232.

RS232/RS485

Serial Port Setup	
Serial Type	RS232
Baud Rate	9600 (User Defined)
Data Bits	8
Parity Check	None
Stop Bits	1
Flow Control	None
Force Packet Transmit Time	0 (0 - 65535)ms
Force Packet Transmit Length	0 (0 - 65535)bytes
Delimiter 1	0x00 (HEX) <input type="radio"/> Enable <input checked="" type="radio"/> Disable
Delimiter 2	0x00 (HEX) <input type="radio"/> Enable <input checked="" type="radio"/> Disable
RS485 Transmission Delay Time	0 (0 - 65535)us <i>Note: for RS485 only</i>

APPLY CANCEL BACK

Baud Rate: default 9600, range 1200bps to 230.4Kbps, 'Others'.

If no suitable Baud Rate appears in the drop-down menu chose "Others" and enter your own value.

Data Bits: 5, 6, 7, 8 (default).

Parity Check: None (default), even, odd, mark, space.

Stop Bits: 1 (default), 2.

Flow Control: None (default), CTS/RTS (or Hardware), XON/XOFF (or Software).

Force Packet Transmit Time (ms): default 0, range 0 to 65535.

You can adjust the timing for transmitting an Ethernet packet. In order to get all of your data in one packet you can tune this setting value to fit the data length of your device.

Delimiter 1 (00 to FF): default 0x00.

Delimiter 2 (00 to FF): default 0x00.

The LIF-200 immediately packs all data currently in buffer and sends it to the Ethernet port, once it receives delimiter 1 or both delimiters through its serial port.

Force Packet Transmit Length (bytes): default 0, range 0 to 65535.

You can fix the length of a transmitted Ethernet packet. Tune this setting value to fit the data length of the packet to match your device.

RS485 Only

RS485 Transmission Delay Time (ms): default 0, range 0 to 65535.

Different devices have different capabilities for handling data received from a serial port. For this reason you can tune this setting to slow down the speed of LIF-200 to fit the speed of your device.

5. LIF-200 Management Setup

This chapter will show you how to manage LIF-200's access setting as well as configure the E-mail alert and the firmware upgrade.

5.1. Device Admin

The screenshot shows the 'Device Administration Setting' web interface. On the left is a sidebar with the RBH logo and a menu. The main content area is titled 'Device Administration Setting' and contains several configuration sections. The 'Block Standard Http Port (80) Management' section has radio buttons for 'UNBLOCK' (selected) and 'BLOCK', and an 'APPLY' button. The 'Device Management IP Address' section shows the IP '192.168.200.200' and a 'LIF-200' hostname, with an 'APPLY' button. The 'Device Location' section has an empty text field. The 'Administrator Password' section has fields for 'User Name', 'Password Change', and 'Password Confirm', with an 'APPLY' button. The 'Block Ping Request' section has radio buttons for 'UNBLOCK' (selected) and 'BLOCK', and an 'APPLY' button. The 'MAC Address Change' section has a MAC address field and an 'APPLY' button. At the bottom, there are buttons for 'Reset System to Factory Default' (labeled 'FACTORY DEFAULT'), 'Reboot System' (labeled 'REBOOT'), and a 'BACK' button.

Block Standard Http Port (80) Management: default UNBLOCK

If for some reason, the HTTP (80) service is blocked in your network environment and the result is failure to configure or manage the LIF-200, then you can select BLOCK in this function and use port 8080, instead of standard port 80. So you should then enter: <http://192.168.168.125:8080> in your browser.

Device Management IP Address: default 192.168.200.200.

In case the LIF-200's IP address is forgotten, you can use this management IP to connect to LIF-200 in order to figure out what the current IP address is.

If you set the LIF-200's IP Configuration as DHCP or PPPoE, which will assign dynamic IP address to LIF-200, you also can use this management IP address to find out what the current working IP address in Intranet is.

Block Standard HTTP Port (80) Management: default UNBLOCK

If for some reason, the HTTP (80) service is blocked in your network environment and the result is failure to configure or manage the LIF-200, then you can select BLOCK in this function and use port 8080, instead of standard port 80. So you should then enter: <http://192.168.168.125:8080> in your browser.

Device Management IP Address: default 192.168.200.200.

In case the LIF-200's IP address is forgotten, you can use this management IP to connect to LIF-200 in order to figure out what the current IP address is.

If you set the LIF-200's IP Configuration as DHCP or PPPoE, which will assign dynamic IP address to LIF-200, you also can use this management IP address to find out what the current working IP address in Intranet is.

Note: If you forgot the IP address setting even management IP address, please use the broadcast utility we offer IPLocator to search it.

Device Hostname: default LIF-200, maximum length 15 characters.

Device Hostname is used to describe the name of LIF-200 for management purpose.

Device Location: no default, maximum length 15 characters.

Device Location is used to describe the location of LIF-200 for management purpose.

Administrator Password:

User Name: default RBH

Password: default password

To ensure the LIF-200's security, you will be asked for your password when you access the LIF-200's Web-based Utility.

User Name: Enter the user name to one of your choice.

Password: It is recommended that you change the default password to one of your choice.

Password Confirm: Re-enter the LIF-200's new Password to confirm it.

Block Ping Request: default UNBLOCK

To prevent hacker intruding your network, check the BLOCK option to enable this function to reject the PING requests from Internet.

MAC Address Change:

The LIF-200's MAC address can be changed from the original values if necessary. Some ISPs require users to change the MAC address to a registered one when users change their access equipment. (Detail sees Appendix D)

Reset System to Factory Default:

Click "Apply", if you want to return all the LIF-200's current settings to its factory default. *Note: do not restore the factory defaults unless it is absolutely necessary.*

Reboot System:

Click "Apply", if you want to clear a connection, reboot, and re-initialize the unit without affecting any of your configuration setting.

5.2. Device Status

This screen shows the LIF-200's current status. All of the information provided is read-only.

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LIF-200

Main Menu

- One Page Setup

Advanced Setup

- Operation Mode
- Serial Type
- Dynamic DNS

Management

- Device Admin
- System Status
- Backup & Restore
- Upgrade Firmware
- Ping

LIF-200 Status Monitor

System Status	
Product Name:	RBH LIF-200 Serial Server
Firmware Version:	1.06.02, Apr 19 2006
System Up Time:	1H:35M:46S

Ethernet Status	
IP Configuration Mode:	STATIC IP
Operation Mode:	TCP SERVER
Connection Port:	3002
MAC Address:	00:0e:e3:00:20:18
IP Address:	125.100.75.114
Subnet mask:	255.255.255.0
Default Gateway:	0.0.0.0
Primary DNS:	168.95.1.1
STATUS:	Up

Serial Status	
Serial Type:	RS232
Baud Rate:	9600
Data Bits:	8
Parity Check:	none
Stop Bits:	1
Flow Control:	None

Statistic		
Ethernet :	TX Bytes:	35528 bytes
	TX Packets:	60 packets
	RX Bytes:	444048 bytes
	RX Packets:	3167 packets
Serial:	TX Bytes:	0 bytes
	RX Bytes:	0 bytes

Product Name: the product model name of this LIF-200.

Firmware Version: the installed version of the firmware.

System up Time: the time of system from start up to current.

Management IP Address: the current setting of management IP.

Ethernet Status: the LIF-200's IP Configuration, MAC address, IP address, subnet mask, default gateway IP address, primary DNS IP address and current connection status.

Serial Status: the LIF-200's setting in serial type.

Statistic: the transmission and receive bytes and packets count in Ethernet and Serial port separately.

5.3. Backup and Restore

This function allows you to save LIF-200's configuration as a backup, or retrieve a configuration file you previously saved to turn the settings back.

The screenshot shows a web browser window displaying the 'Backup & Restore Configuration' page. On the left is a vertical navigation menu with the RBH Access Technologies Inc. logo at the top, followed by 'LIF-200'. The menu is divided into three sections: 'Main Menu' (containing 'One Page Setup'), 'Advanced Setup' (containing 'Operation Mode', 'Serial Type', and 'Dynamic DNS'), and 'Management' (containing 'Device Admin', 'System Status', and 'Backup & Restore'). The 'Backup & Restore' option is currently selected. The main content area has a yellow background and is titled 'Backup & Restore Configuration'. It contains two sections: 'Backup' with a 'Backup' button, and 'Restore' with a text input field, a 'Browse...' button, a 'Restore' button, and a 'BACK' button at the bottom.

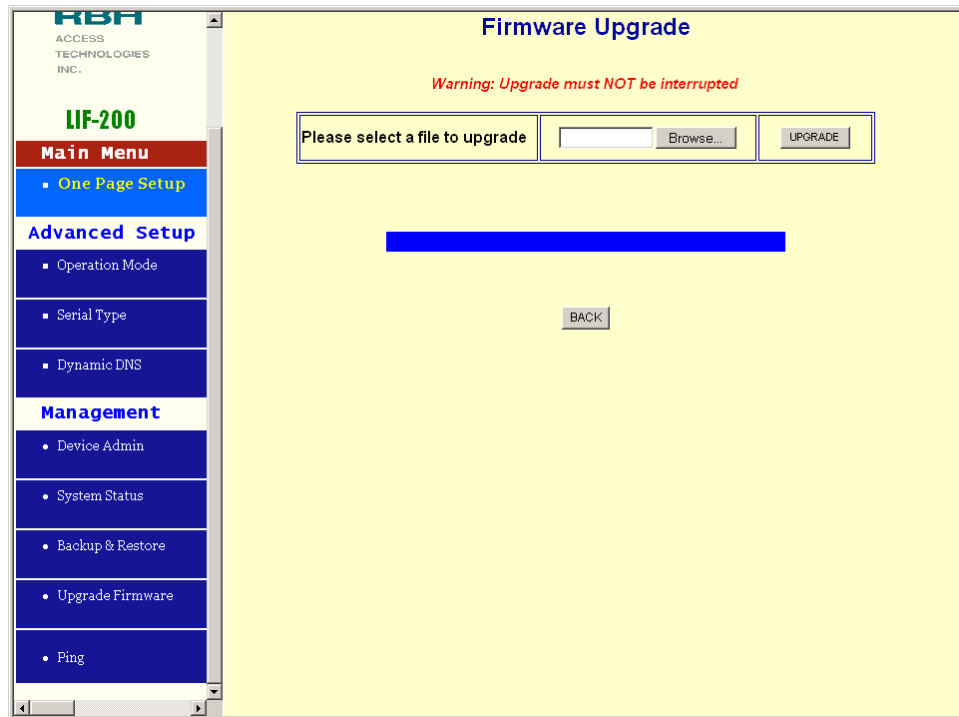
Backup: Click “Backup” button save the current configuration as a backup file in your hard disk.

Restore: Enter path of the configuration file you saved on the PC. You can click “Browse” to view the folders and select the file. Click “Restore” to retrieve it.

Note: the sub-name of file you retrieve must be “.cfg”.

5.4. Upgrade Firmware

This function allows you to upgrade the latest version firmware to keep your LIF-200 up-to-date. Before you upgrade the firmware, you have to get the latest firmware and save it on the PC you use to configure the LIF-200.



Browse: To select a file to upgrade, you have to enter path of the latest firmware you saved on the PC. You can choose “Browse” to view the folders and select the firmware.

Upgrade: After you have entered or selected the path, click “Upgrade” to start the firmware upgrade process.

Note: don't power off the router during the firmware upgrading, otherwise the incompleteness of firmware upgrading will cause serious damage to the integrity of the LIF-200's firmware that will lead to the LIF-200 failing to boot again.

5.5. Ping

This function allows you to test the connection between the LIF-200 and the LAN or between the LIF-200 and the Internet.

The screenshot shows the LIF-200 web interface. On the left is a sidebar menu with the following items: 'Main Menu' (highlighted in red), 'One Page Setup' (blue), 'Advanced Setup' (blue), 'Operation Mode' (blue), 'Serial Type' (blue), 'Dynamic DNS' (blue), 'Management' (blue), 'Device Admin' (blue), 'System Status' (blue), 'Backup & Restore' (blue), 'Upgrade Firmware' (blue), and 'Ping' (blue). The main content area is titled 'Networking Diagnostic (PING)' and contains a form with the following fields: 'Source IP Address' (192.168.168.125), 'Destination IP Address' (four input boxes for IP octets), 'Packet Number' (4, with a range of 0-4), 'Packet Size' (60, with a note '(Maximum 1460 Bytes)'), and 'Ping Result' (containing 'Sent Request' and 'Receive Reply', both with values of 0). At the bottom of the form are three buttons: 'PING', 'CANCEL', and 'BACK'.

Source IP Address: the current LIF-200's IP address (Read Only).

Destination IP Address: the IP Address of destination device you want to ping.

Packet Number: the packet numbers you wish to use to ping the destination device. The maximum numbers are 4.

Packet Size: the numbers of packet size you wish to use to ping the destination device. The maximum packet sizes are 60.

Ping Result: The result will show the numbers of sending packet, numbers of packet receiving (Read Only).

6. Troubleshooting

PROBLEM	CORRECTIVE ACTION
None of the LEDs turn on when you turn on the LIF-200.	<p>Make sure that you have correct power connected to LIF-200 and plugged in to an appropriate power source. Check all cables connections.</p> <p>If the LEDs still do not turn on, you may have a hardware problem. In this case, you should contact your local vendor.</p>
Can not access LIF-200 from Ethernet.	<p>Check cable connection between LIF-200 and computer or hub. Ping LIF-200 from computer. Make sure your computer Ethernet card is installed and functioning properly.</p>
Can not ping any computer on the LAN.	<p>If the 10/100M LED is off, check the cable connection between LIF-200 and your computer.</p> <p>Verify that the IP address and subnet mask of the LIF-200 and computer are in the same IP address range.</p>
Can not access LIF-200 from Serial.	<p>Check the Serial cable connection between LIF-200 and your device.</p> <p>Verify that the LIF-200's setting for Serial type is same as your device and make sure the hardware jumper is in the correction position.</p>

Appendix A: Product Specifications

Hardware	
Processor	80186
Memory	512 KB
Interface	
LAN	Auto-detection 100 Base-T (10/100 Mbps)
Serial	RS-232 - RS-485
No. of serial interface	1
Signals	RS-232: TxD, Rxd, RTS, CTS, DTR, DSR, DCD, GND RS-485: data+, data-
Performance	
Speed	50 bps ~ 230 Kbps
Configuration	
Parity	None, even, odd, Mark, Space
Data bits	5, 6, 7, 8
Stop bits	1, 2 (with parity setting of None)
OS Support	Windows 98/2000/XP
Protocol	TCP, IP, UDP, Telnet, RTelnet, DHCP, ICMP
Management	Serial console, Telnet console
Windows Utility	IP-Search program, Firmware Upgrade by web
Power and Environment	
Power requirements	DC 9V, 300 mA max DC 12V, 230 mA max DC 24V, 160 mA max
Operating temp.	0 ~ 55°
Dimensions	LIF-200 - 67X93X22 mm
Regulatory approval	FCC, CE

Appendix B: Glossary

10BaseT - An Ethernet standard that uses twisted wire pairs.

100BaseTX - IEEE physical layer specification for 100 Mbps over two pairs of Category 5 UTP or STP wire.

Adapter - Printed circuit board that plugs into a PC to add to capabilities or connectivity to a PC. In a networked environment, a network interface card (NIC) is the typical adapter that allows the PC or server to connect to the intranet and/or Internet.

Auto-MDI/MDIX - On a network hub or switch, an auto-MDI/MDIX port automatically senses if it needs to act as a MDI or MDIX port. The auto-MDI/MDIX capability eliminates the need for crossover cables.

Auto-negotiate - To automatically determine the correct settings. The term is often used with communications and networking. For example, Ethernet 10/100 cards, hubs, and switches can determine the highest speed of the node they are connected to and adjust their transmission rate accordingly.

Browser - A browser is an application program that provides a way to look at and interact with all the information on the World Wide Web or PC. The word “browser” seems to have originated prior to the Web as a generic term for user interfaces that let you browse text files online.

Cable Modem - A device that connects a computer to the cable television network, which in turn connects to the Internet. Once connected, cable modem users have a continuous connection to the Internet. Cable modems feature asymmetric transfer rates: around 36 Mbps downstream (from the Internet to the computer), and from 200 Kbps to 2 Mbps upstream (from the computer to the Internet).

CAT 5 - ANSI/EIA (American National Standards Institute/Electronic Industries Association) Standard 568 is one of several standards that specify “categories” (the singular is commonly referred to as “CAT”) of twisted pair cabling systems (wires, junctions, and connectors) in terms of the data rates that they can sustain. CAT 5 cable has a maximum throughput of 100 Mbps and is usually utilized for 100BaseTX networks.

CTS (Clear To Send) - An RS-232 signal sent from the receiving station to the transmitting station that indicates it is ready to accept data.

Data Packet - One frame in a packet-switched message. Most data communications is based on dividing the transmitted message into packets. For example, an Ethernet packet can be from 64 to 1518 bytes in length.

Default Gateway - The routing device used to forward all traffic that is not addressed to a station within the local subnet.

Download - To receive a file transmitted over a network. In a communications session, download means receive, and upload means transmit.

Dynamic IP Address - An IP address that is automatically assigned to a client station in a TCP/IP network, typically by a DHCP server. Network devices that serve multiple users, such as servers and printers, are usually assigned static IP addresses.

Ethernet - IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium. Has a transfer rate of 10 Mbps. Forms the underlying transport vehicle used by several upper-level protocols, including TCP/IP and XNS.

DDNS (Dynamic Domain Name System) - Allows a network device with a dynamic Internet IP address to have a fixed host and domain name, such as *myhostname.mydomainname.com*. It is useful when you are hosting your own website, FTP server, or other server behind a router, so people can find your site no matter how often the Internet IP address changes. Using DDNS requires registering with a DDNS service provider on the Internet.

DHCP (Dynamic Host Configuration Protocol) - A protocol that lets network administrators centrally manage and automate the assignment of Internet Protocol (IP) addresses in an organization's network. Using the Internet's set of protocols (TCP/IP), each machine that can be connected to the Internet needs a unique IP address. When an organization sets up its computer users with a connection to the Internet, an IP address must be assigned to each machine. Without DHCP, the IP address must be entered manually at each computer and, if computers move to another location in another part of the network, a new IP address must be entered. DHCP lets a network administrator supervise and distribute IP addresses from a central point and automatically sends a new IP address when a computer is plugged into a different place in the network. DHCP uses the concept of a "lease" or amount of time that a given IP address will be valid for a computer. The lease time can vary depending on how long a user is likely to require the Internet connection at a particular location. It's especially useful in education and other environments where users change frequently. Using very short leases, DHCP can dynamically reconfigure networks in which there are more computers than there are available IP addresses. DHCP supports static addresses for computers containing Web servers that need a permanent IP address.

DNS - The Domain Name System (DNS) is the way that Internet domain names are located and translated into Internet Protocol (IP) addresses. A domain name is a meaningful and easy-to-remember "handle" for an Internet address.

Domain - A sub network comprised of a group of clients and servers under the control of one security database. Dividing LANs into domains improves performance and security.

Firmware - Code that is written onto read-only memory (ROM) or programmable read-only memory (PROM). Once firmware has been written onto the ROM or PROM, it is retained even when the device is turned off.

Full Duplex - The ability of a device or line to transmit data simultaneously in both directions.

Gateway - A device that interconnects networks with different, incompatible communications protocols.

Half Duplex - Data transmission that can occur in two directions over a single line, but only one direction at a time.

Hardware - Hardware is the physical aspect of computers, telecommunications, and other information technology devices. The term arose as a way to distinguish the “box” and the electronic circuitry and components of a computer from the program you put in it to make it do things. The program came to be known as the software.

Hub - The device that serves as the central location for attaching wires from workstations. Can be passive, where there is no amplification of the signals; or active, where the hubs are used like repeaters to provide an extension of the cable that connects to a workstation.

HTTP (Hyper-Text Transport Protocol) - The communications protocol used to connect to servers on the World Wide Web. Its primary function is to establish a connection with a Web server and transmit HTML pages to the client browser.

MAC Address - The MAC (Media Access Control) address is a unique number assigned by the manufacturer to any Ethernet networking device, such as a network adapter, that allows the network to identify it at the hardware level.

Mbps (Mega-Bits Per Second) - One million bits per second; unit of measurement for data transmission.

IP Address - In the most widely installed level of the Internet Protocol (IP) today, an IP address is a 32-bit binary digital number that identifies each sender or receiver of information that is sent in packets across the Internet. When you request an HTML page or send e-mail, the Internet Protocol part of TCP/IP includes your IP address in the message (actually, in each of the packets if more than one is required) and sends it to the IP address that is obtained by looking up the domain name in the Uniform Resource Locator you requested or in the e-mail address you're sending a note to. At the other end, the recipient can see the IP address of the Web page requestor or the e-mail sender and can respond by sending another message using the IP address it received.

IPCONFIG - A utility that provides for querying, defining and managing IP addresses within a network. A commonly used utility, under Windows NT and 2000, for configuring networks with static IP addresses.

ISP - An ISP (Internet service provider) is a company that provides individuals and companies access to the Internet and other related services such as website building and virtual hosting.

Packet - A unit of data routed between an origin and a destination in a network.

Network Mask - Also known as the “Subnet Mask.”

NIC (Network Interface Card) - A board installed in a computer system, usually a PC, to provide network communication capabilities to and from that computer system. Also called an adapter.

RJ-45 - A connector similar to a telephone connector that holds up to eight wires, used for connecting Ethernet devices.

Server - Any computer whose function in a network is to provide user access to files, printing, communications, and other services.

SMTP (Simple Mail Transfer Protocol) - The standard e-mail protocol on the Internet. It is a TCP/IP protocol that defines the message format and the message transfer agent (MTA), which stores and forwards the mail.

Ping (Packet Internet Groper) - An Internet utility used to determine whether a particular IP address is online. It is used to test and debug a network by sending out a packet and waiting for a response.

Port - A pathway into and out of the computer or a network device such as a switch or router. For example, the serial and parallel ports on a personal computer are external sockets for plugging in communications lines, modems, and printers.

PPPoE (Point to Point Protocol over Ethernet) - PPPoE is a method for the encapsulation of PPP packets over Ethernet frames from the user to the ISP over the Internet. One reason PPPoE is preferred by ISPs is because it provides authentication (username and password) in addition to data transport. A PPPoE session can be initiated by either a client application residing on a PC, or by client firmware residing on a modem or router.

Subnet Mask - The method used for splitting IP networks into a series of subgroups, or subnets. The mask is a binary pattern that is matched up with the IP address to turn part of the host ID address field into a field for subnets.

TCP (Transmission Control Protocol) - A method (protocol) used along with the IP (Internet Protocol) to send data in the form of message units (datagram) between network devices over a LAN or WAN. While IP takes care of handling the actual delivery of the data (routing), TCP takes care of keeping track of the individual units of data (called packets) that a message is divided into for efficient delivery over the network. TCP is known as a “connection oriented” protocol due to requiring the receiver of a packet to return an acknowledgment of receipt to the sender of the packet resulting in transmission control.

TCP/IP (Transmission Control Protocol/Internet Protocol) - The basic communication language or set of protocols for communications over a network (developed specifically for the Internet). TCP/IP defines a suite or group of protocols and not only TCP and IP.

Telnet - A terminal emulation protocol commonly used on the Internet and TCP/IP-based networks. It allows a user at a terminal or computer to log onto a remote device and run a program.

TFTP (Trivial File Transfer Protocol) - A version of the TCP/IP FTP protocol that has no directory or password capability.

Static IP Address - A permanent IP address that is assigned to a node in a TCP/IP network.

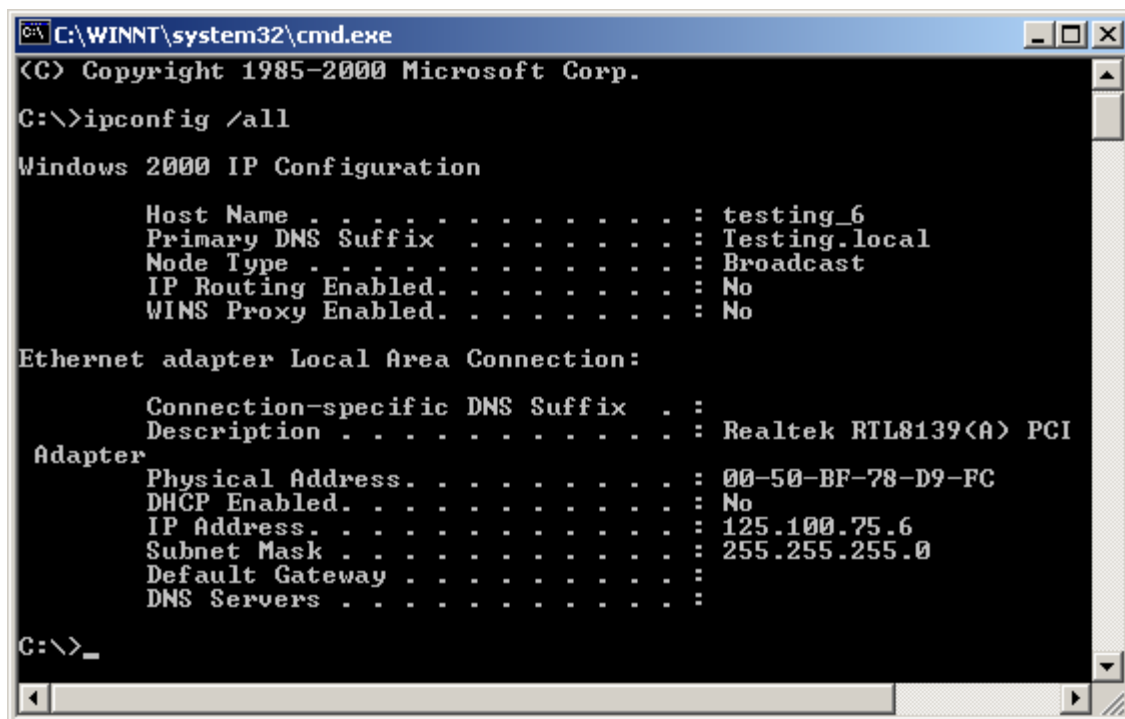
Appendix C: Finding the MAC Address and IP Address for Your Ethernet Adapter

This section describes how to find the MAC address for your computer's Ethernet adapter so you can use the MAC address change feature of the LIF-200. You can also find the IP address of your computer's Ethernet adapter. This IP address is used for the LIF-200's configuration. Follow the steps in this appendix to find the adapter's MAC or IP address in Windows 98, Me, 2000, or XP.

1. Click Start and Run. In the *Open* field, enter cmd. Press the Enter key or click the OK button.
2. At the command prompt, enter ipconfig /all. Then press the Enter key.
3. Write down the Physical Address as shown on your computer screen (Figure D-1); it is the MAC address for your Ethernet adapter. This appears as a series of numbers and letters.

The MAC address/Physical Address is what you will use for MAC address changing.

The example in Figure D-1 shows the Ethernet adapter's IP address as 192.168.168.100. Your computer may show something different.



```
C:\WINNT\system32\cmd.exe
(C) Copyright 1985-2000 Microsoft Corp.
C:\>ipconfig /all

Windows 2000 IP Configuration

        Host Name . . . . . : testing_6
        Primary DNS Suffix . . . . . : Testing.local
        Node Type . . . . . : Broadcast
        IP Routing Enabled. . . . . : No
        WINS Proxy Enabled. . . . . : No

Ethernet adapter Local Area Connection:

        Connection-specific DNS Suffix . : 
        Description . . . . . : Realtek RTL8139(A) PCI
        Adapter
        Physical Address. . . . . : 00-50-BF-78-D9-FC
        DHCP Enabled. . . . . : No
        IP Address. . . . . : 125.100.75.6
        Subnet Mask . . . . . : 255.255.255.0
        Default Gateway . . . . . : 
        DNS Servers . . . . . :
```

Figure D-1 MAC Address/Physical Address

Appendix D: Set LIF-200 to factory default

Set LIF-200 to factory default with push button



1. Power off LIF-200.
2. Click & hold the Reset Button.
3. Power on LIF-200.
4. Release the Reset Button after about 3 seconds.
5. The LIF-200 is now reset to the factory default settings.

Set LIF-200 to factory default using RS232 communications

- 1) Connect LIF-200 to computer via RS-232 cable and set RS232/485 switch to the RS232 position.

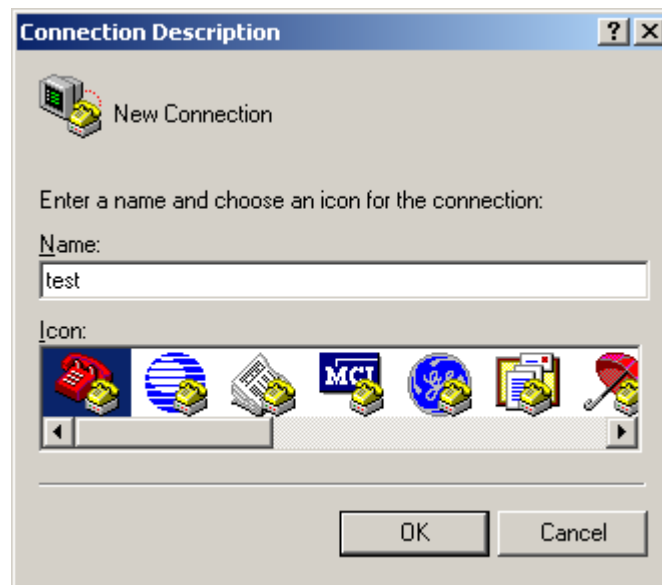


You must use a crossover cable. *The second pin of the LIF-200 connects to the third pin of the computer and the third pin of the LIF-200 connects to the second pin of the computer.*

- 2) Run HyperTerminal™



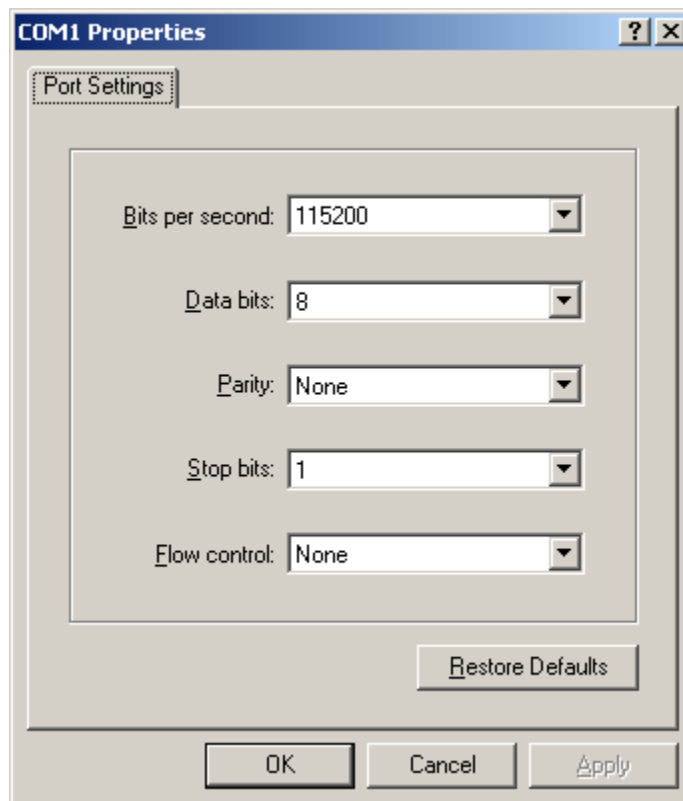
- a) Enter a name and select an icon for this communication, then click 'OK' to continue.



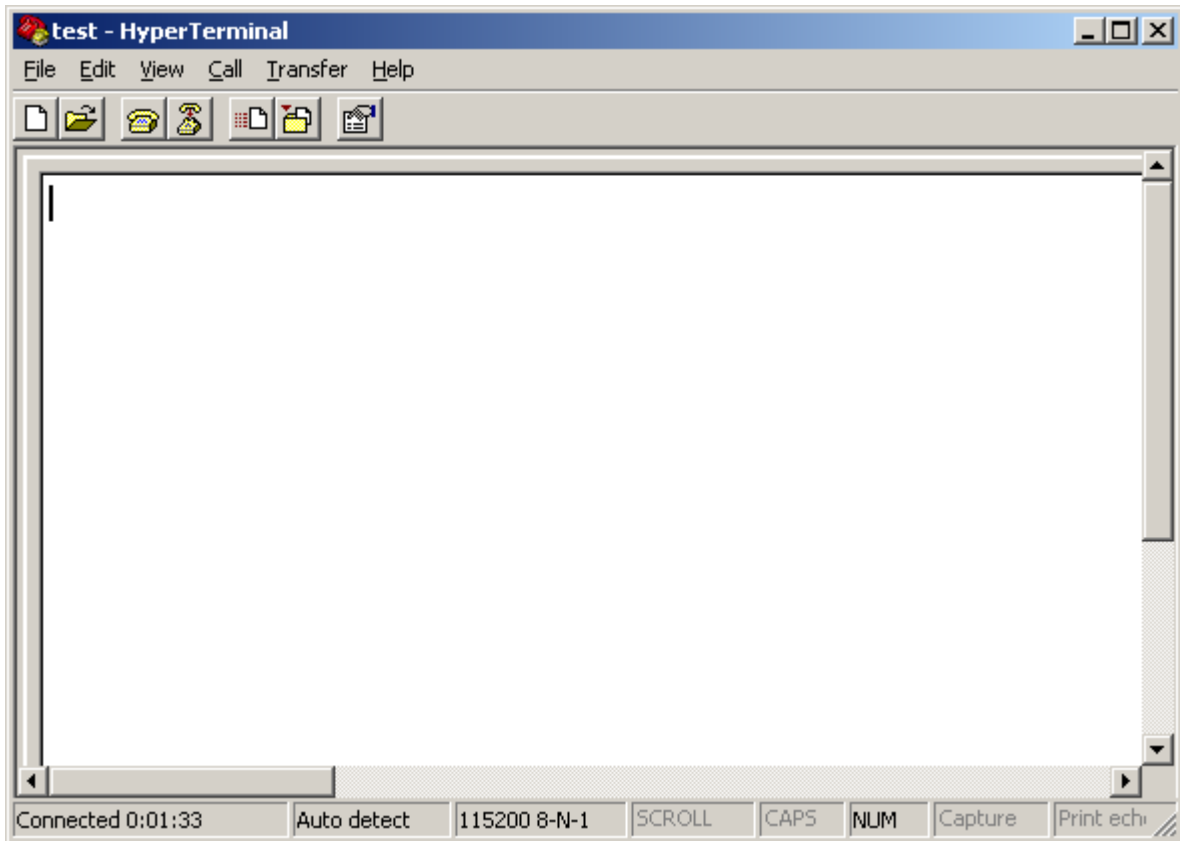
- b) Select the appropriate COM port for the LIF-200 connection to the computer then click 'OK' to continue.



- c) Configure your port settings as follows:
- i) Set: Bits per second = 115200
 - ii) Set: Data bits = 8
 - iii) Set: Parity = None
 - iv) Set: Stop bits = 1
 - v) Set: Flow control = None



- vi) Click 'OK' to confirm port settings.
- 3) With HyperTerminal™ set as the working window repower the LIF-200 and click “**Ctrl+R**” within three seconds of the LIF-200 being powered on.



- 4) Use IP Locator to confirm that the factory default settings have been reset.

