CipherLab
Reference Manual

Ethernet Cradle

For 8200 Series Mobile Computers

Version 3.00

CIPHER LAB

CIPHERLAB CO., LTD.
Website: http://www.cipherlab.com

IMPORTANT NOTICES

FOR USA

This equipment has been tested and found to comply with the limits for a **Class B** digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

▶ Reorient or relocate the receiving antenna.
▶ Increase the separation between the equipment and receiver.
▶ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
▶ Consult the dealer or an experienced radio/TV technician for help.

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

FOR CANADA

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of Industry Canada.

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

Cet appareil numerique respecte les limites de bruits radioelectriques applicables aux appareils numeriques de Classe B prescrites dans la norme sur le material brouilleur: "Appareils Numeriques," NMB-003 edictee par l'Industrie.

SAFETY PRECAUTIONS

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

▶ The use of any batteries or charging devices, which are not originally sold or manufactured by CipherLab, will void your warranty and may cause damage to human body or the product itself.

▶ DO NOT disassemble, incinerate or short circuit the battery.

▶ DO NOT expose the scanner or the battery to any flammable sources.

▶ For green-environment issue, it's important that batteries should be recycled in a proper way.

▶ Under no circumstances, internal components are self-serviceable.

▶ The charging and communication cradle uses an AC power adaptor. A socket outlet shall be installed near the equipment and shall be easily accessible. Make sure there is stable power supply for the mobile computer or its peripherals to operate properly.

CARE & MAINTENANCE

▶ This cradle is intended for indoor use only. It may do damage to the cradle when being exposed to extreme temperatures or soaked wet.

▶ When the body of the cradle gets dirty, use a clean and wet cloth to wipe off the dust. DO NOT use/mix any bleach or cleaner. Always keep the cradle dry.

▶ If you shall find the cradle malfunctioning, write down the specific scenario and consult your local sales representative.

RELEASE NOTES

Version	Date	Notes	
3.00	Aug. 17, 2011	▶ Separation:	8200 Ethernet Cradle Reference Manual is separated from 8200/8400 Ethernet Cradle Reference Manual v2.0.
		▶ Modification:	Ethernet Cradle default IP address is modified to 192.168.1.250 in sections 2.0, 2.1.1, 3.1, and Specifications Sheet.
		▶ New Addition:	Command "AT+WMODE=" is added to section 1.1.3, to the AT Commands list.
2.00	Mar. 09, 2011	The first release of 8200 Ethernet Cradle information was included in version 2.00 of 8200/8400 Ethernet Cradle Reference Manual.	

CONTENTS

INTRODUCTION

Seeing your need to connect CipherLab Mobile Computers to your existing Ethernet networks, CipherLab now makes the easy solution available to you by presenting the Ethernet Cradle for 8200 Mobile Computers.

This manual serves to guide you through the installation, configuration, and operation of the 8200 Ethernet Cradle. We recommend that you keep one copy of this manual at hand for quick reference or necessary maintenance in the future. To avoid any improper use or operation, please read the manual thoroughly before use.

Thank you for choosing CipherLab products!

OVERVIEW

No.	Description	No.	Description
1	LED Indicators (POWER, DATA, READY)	2	Ethernet Port (RJ-45)
3	Cable Connector (USB or RS-232)	4	Power Jack
5	IP Reset Switch		

Note: It is recommended that the Ethernet Cradle be operated in room temperature (18°C to 25°C) for optimal performance. The Ethernet Cradle will not charge the battery when the temperature drops below 0°C or exceeds 40°C.

THE FRONT AND REAR VIEWS

Take a look around the 8200 Ethernet Cradle:
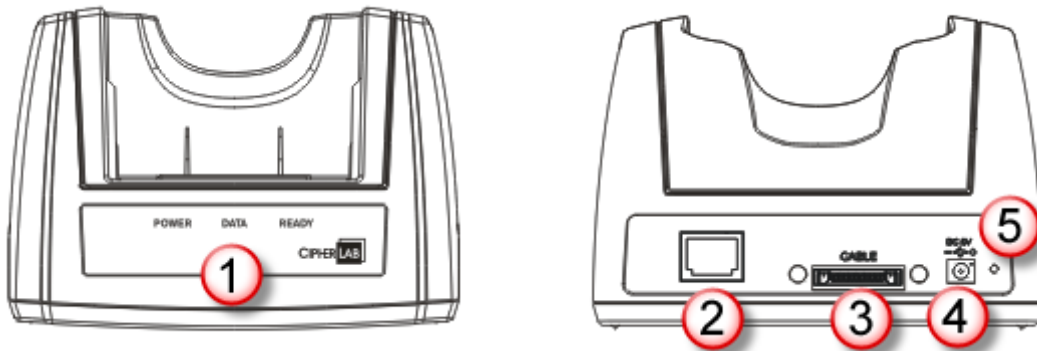
HOW IT WORKS

The following diagram shows how an 8200 Ethernet Cradle communicates and exchanges data with a server.
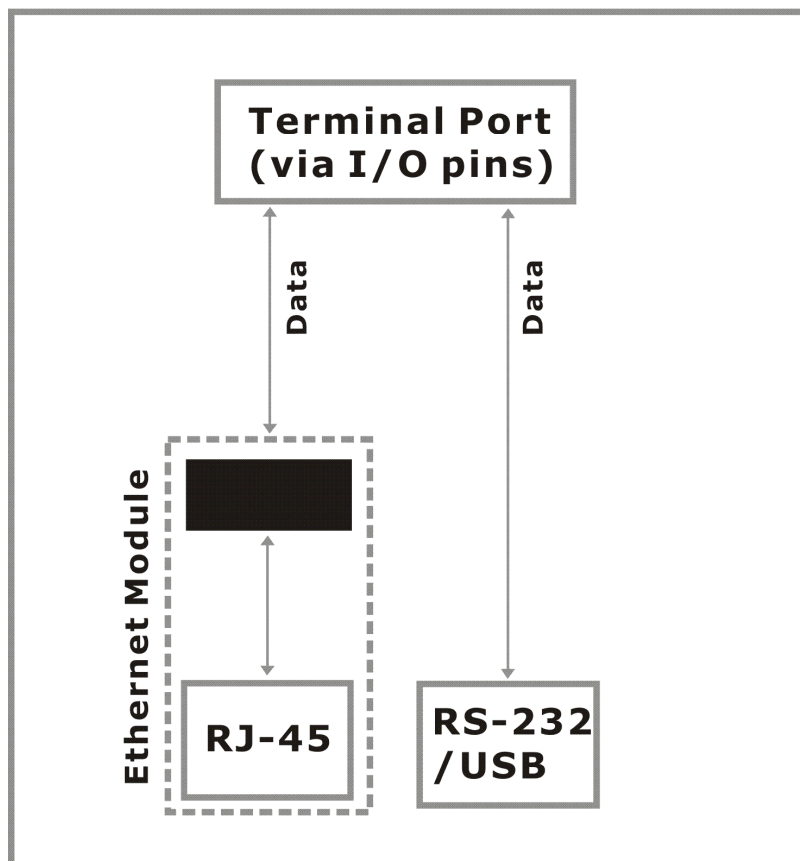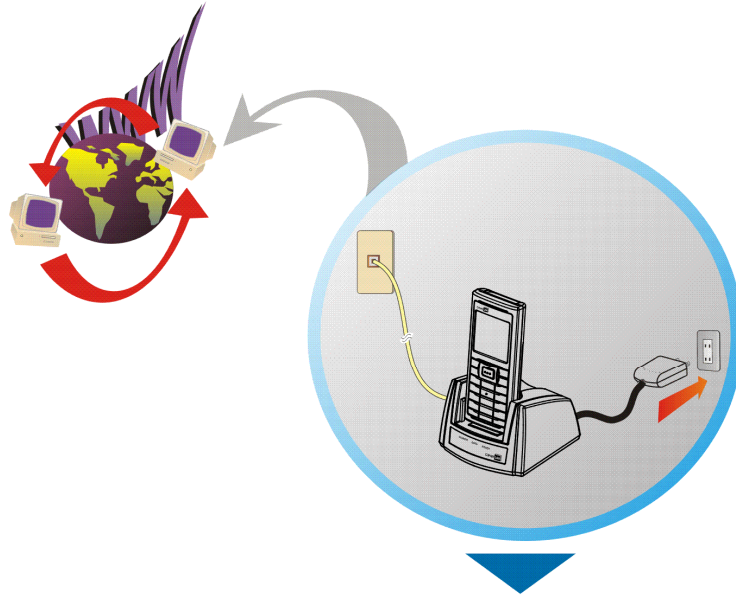
FEATURES

▸ 16-bit CMOS CPU, low power consumption

▸ Firmware upgradeable

▸ 10/100 Mbps auto-switching mechanism

▸ Front panel LED indicators for monitoring operation status

▸ Supports 3 operation modes: Data Mode, Modem Mode, and Transparent Mode

▸ Supports DHCP IP Allocation

▸ Supports TCP/UDP, Server/Client

▸ Supports Name Resolution via DNS (Modem mode only)

INSIDE THE PACKAGE

The following items are included in the package. Save the box and packaging material for future use in case you need to store or ship the cradle.

▸ Ethernet Cradle. The complete set includes power adaptor and supply cord.

▸ Cat. 5 cable, 1 meter long

▸ Quick Installation Guide

Note: This manual is included on the Product CD shipped with CipherLab 8200 Series Mobile Computers.

USING THE ETHERNET CRADLE

The Ethernet Cradle is a charging & communication cradle specifically designed for CipherLab Mobile Computers to network via Ethernet. This chapter will show you how the 8200 Ethernet Cradle can function for you.

1.1 WORKING MODES

The Ethernet Cradle supports three working modes for networking: Modem Mode, Data Mode, and Transparent Mode.

▶ Baud Rate

The Ethernet Cradle works at the baud rate of 115,200 bps by default.

Note: In order to communicate with the Ethernet Cradle, the 8200 mobile computer must be programmed to "COMM_DOCKING, 115,200 bps" via C functions SetCommType() and open_com() separately.

▶ The working modes supported by the Ethernet Cradle would need the settings as tabulated below. These settings are to be made through a configuration menu provided by the Ethernet Cradle accessible through telnet.

(See also Configuring Ethernet Cradles for the configuration menu.)

Modem Mode (Default)	Description
1. Set Local IP, Subnet Mask, Default Router IP & Local Name	View IP settings
2. Set LED Indicator Setting	Select status for Network or Terminal (via I/O pins)
3. Set Connection Settings | 2. Timer & Line Terminator	Configure Timer setting only!
4. Set Working Mode	Select working mode
7. Set Modem Configuration	Configure dialing/idle time-out
Data Mode	**Description**
1. Set Local IP, Subnet Mask, Default Router IP & Local Name	View IP settings
2. Set LED Indicator Setting	Select status for Network or Terminal (via I/O pins)
3. Set Connection Settings	Configure connection settings
4. Set Working Mode	Select working mode
5. Set Working Type	Select Work Online/Offline
Transparent Mode	**Description**
1. Set Local IP, Subnet Mask, Default Router IP & Local Name	View IP settings
4. Set Working Mode	Select working mode

1.1.1 DATA MODE

A diagram that depicts how an 8200 mobile computer communicates with the Ethernet Cradle through "Data Mode":
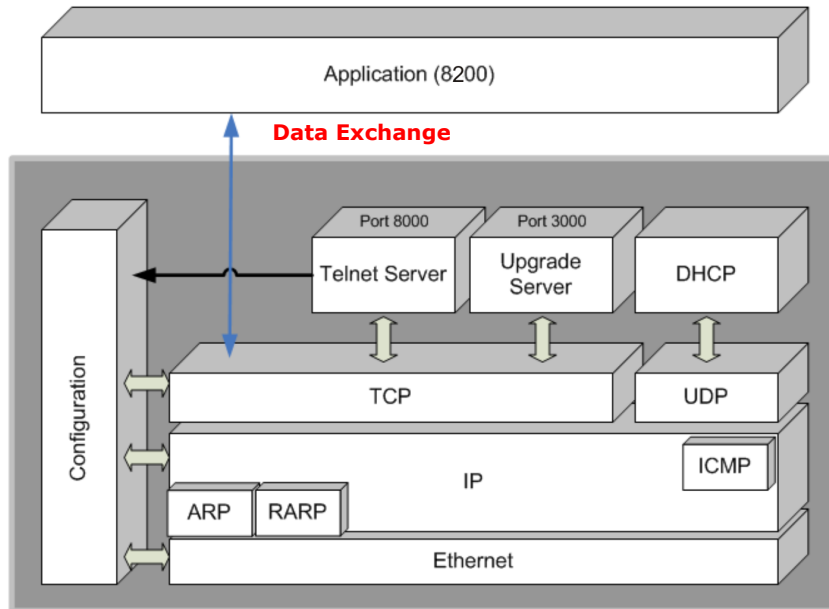
The pros and cons of Data Mode can be summarized as follows:

Pros

▶ This working mode is exactly the same as supported on CipherLab 350 Ethernet Box.

▶ It automatically connects to any specific IP via assigned port number.

▶ It automatically reconnects to the target device after disconnection occurs.

▶ It supports TCP/UDP, server/client mode.

Cons

▶ The mobile computer cannot detect the connection status.

▶ Noise is also packed into a complete data packet.

▶ No configuration is allowed because everything is treated as a data packet.

1.1.2 TRANSPARENT MODE

A diagram that depicts how an 8200 mobile computer communicates with the Ethernet Cradle through "Transparent Mode":
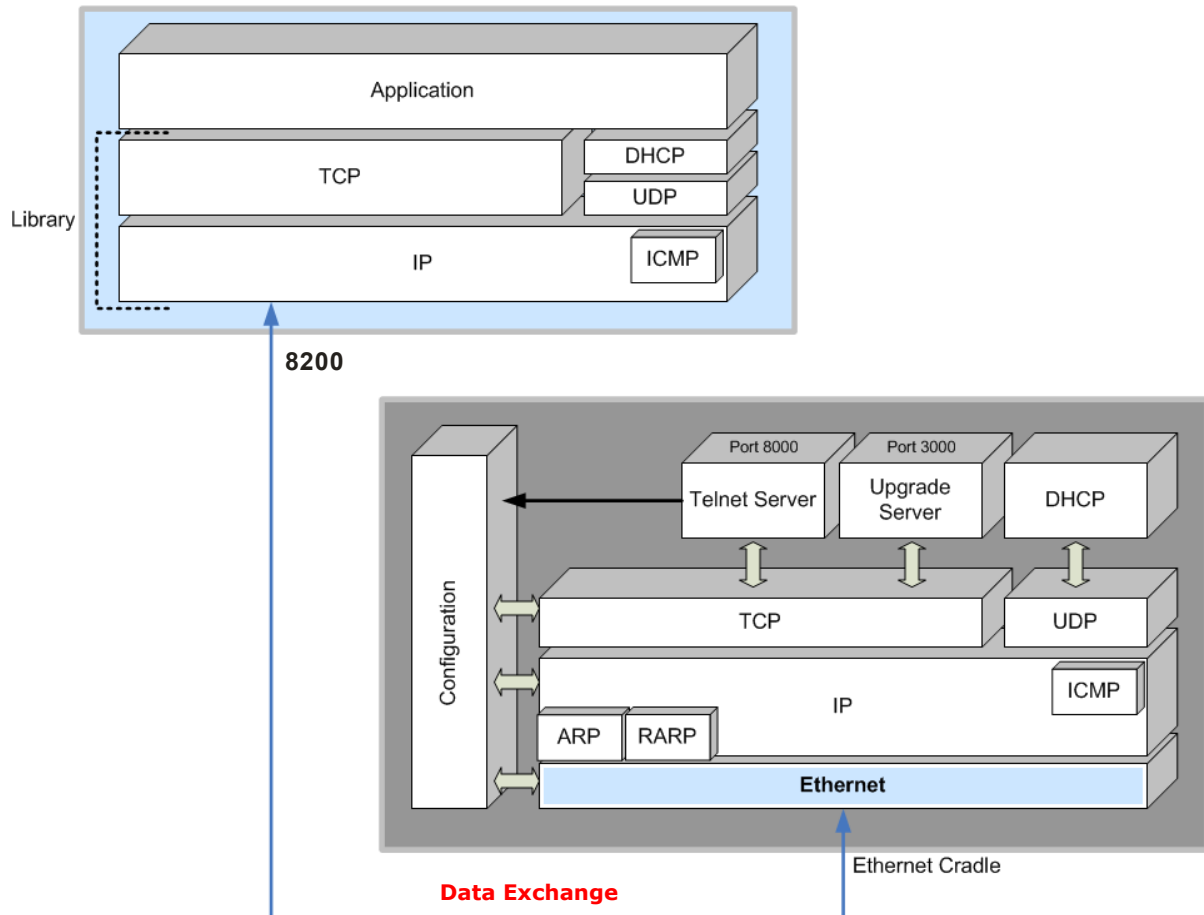
Features

▶ Ethernet Cradle functions as a physical layer bridge.

▶ Everything is controlled by the mobile computer or the remote computer.

▶ It is possible for the mobile computer to work as a FTP client.

Virtual MAC ID & software MAC ID filter

By Transparent Mode, the mobile computer uses a virtual MAC ID to transmit/receive data. The mobile computer's virtual MAC ID is a number based on the Ethernet Cradle's MAC ID plus one though. For example, when the MAC ID of the Ethernet Cradle is 0x00d017c00100, the mobile computer's virtual MAC ID will be 0x00d017c00101.

In order to reduce the communication traffic on the terminal port (via I/O pins), a software filter is implemented so that packets destined to any MAC ID other than that of the mobile computer will be discarded. Only DHCP broadcasting packets or packets for the specified MAC ID (the virtual one) will be forwarded to the mobile computer. Ethernet Cradle will automatically detect the transaction from the mobile computer.

1.1.3 MODEM MODE

A diagram that depicts how an 8200 mobile computer communicates with the Ethernet Cradle through "Modem Mode":
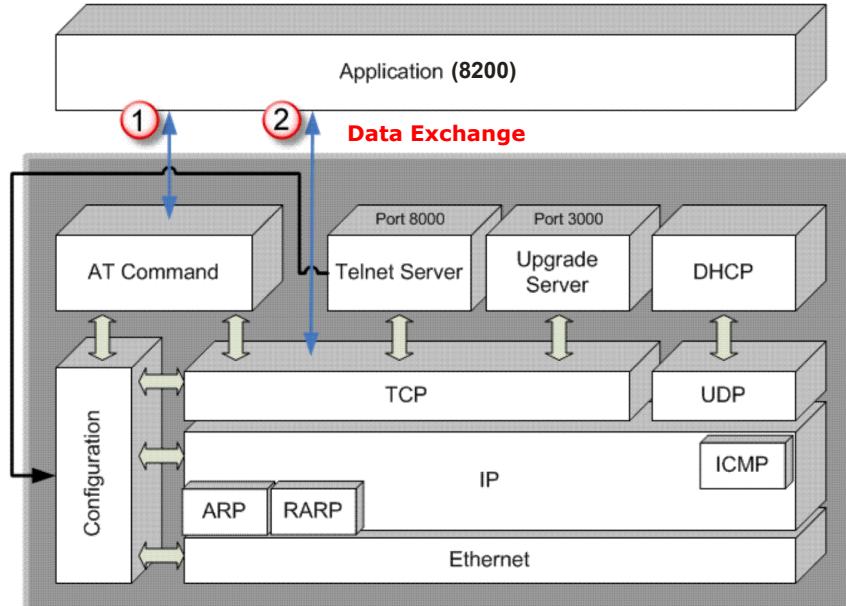
Features

▸ It works almost the same as a modem device.

▸ It connects to any specific IP via an assigned port number, using syntax as in the following examples —

"ATDT162.168.1.1:5000"   (IP address: port number)

"ATDTwww.cipherlab.com:1024" (Host name: port number)

▸ It supports TCP server/client mode.

▸ It supports AT commands to configure the Ethernet Cradle.

▸ It supports "+++" to escape to command mode.

AT Commands

The Ethernet Cradle can be controlled by the use of a DTE (Data Terminal Equipment) platform. Issue AT commands via Terminal (via I/O pins) interface in Modem Mode.

▸ The attention: "AT" prefix is required prior to entering any command.

▸ All commands require a carriage return or <CR> following the entry of the desired command, and are not case-sensitive.

▸ All command responses are encapsulated by a carriage return and line feed or <CR><LF>. The ASCII display of these characters is suppressed with only the modem response being presented.

▸ The Ethernet Cradle does not support multiple commands such as "ATE0=1&W".

Normally, the Ethernet Cradle is in TCP server mode and waits for the connection request call from a remote device. When "\r\nRING\r\n" is received, the mobile computer has to accept it by issuing "ATA". However, when the mobile computer issues "ATDTxxx.xxx.xxx.xxx:kkkk" to create a

connection with a remote device, the Ethernet Cradle will be in TCP client mode.

Note: The "RING" message will be sent to the mobile computer up to ten times at an interval of 7.5 seconds. The mobile computer has to respond before the counter times out.

▶ Escape Sequence <+++>

The escape sequence consists of three plus signs (+++). Once a connection is established, type the escape sequence to return to the command state. When entering the next command after an escape sequence, always wait to receive "\r\nOK\r\n". The escape sequence only works after dialing out and the connection is established.

Note: The escape sequence will break the connection.

There are equal guard time periods before (leading) and after (trailing), as illustrated below.

◀┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄▶│ **+++** │◀┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄▶
　　　Leading Guard Time (50 ms)　　　　　　　　Trailing Guard Time (50 ms)
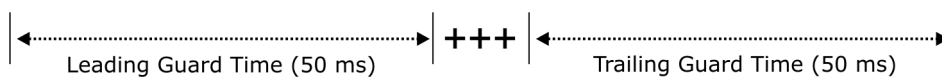
If the escape sequence is not followed by another command within 50 milliseconds (trailing guard time), the Ethernet Cradle will hang up after another 10 seconds. Normally, the mobile computer receives "\r\nOK\r\n" during the 10-second interval unless the line is abnormally busy.

Note: The Guard Time is 50 milliseconds and cannot be changed.

When working by Modem Mode, the Ethernet Cradle recognizes the following AT commands and carries out the instructed actions:

AT Commands	Task

ATDT	The Ethernet Cradle will create a connection with a remote PC:
	 ▶ By IP address, for example, 192.168.6.123, via port 5000 —
	 `ATDT192.168.6.123:5000`
	 ▶ By host name, for example, www.cipherlab.com.tw, via port 1024. The IP address associated with the host name will be obtained from the DNS server —
	 `ATDTwww.cipherlab.com.tw:1024`

AT+MACID?	The Ethernet Cradle will respond with its MAC ID to the mobile computer.
AT+GCI?	The Ethernet Cradle will respond with its country code, which is fixed to FE (=Taiwan), to the mobile computer.
ATXX…	The Ethernet Cradle will simply respond with "\r\nOK\r\n" to the mobile computer.
AT+DHCP?	The Ethernet Cradle will respond with "\r\nENABLE\r\n" to the mobile computer when DHCP is enabled; otherwise, it will respond with "\r\nDISABLE\r\n".
ATA	The mobile computer accepts the connection request when it receives "\r\nRING\r\n".
AT+IP?	The Ethernet Cradle will respond with its IP address to the mobile

	computer.
AT+DNS=	The Ethernet Cradle will be assigned with the IP address of DNS server.
AT+DNS?	The Ethernet Cradle will respond with the IP address of DNS server.
AT+GWY=	The Ethernet Cradle will be assigned with the IP address of Gateway.
AT+GWY?	The Ethernet Cradle will respond with the IP address of Gateway.
ATS7=	The Ethernet Cradle will wait for the specified period of time (5~50 sec.) for receiving a carrier from the remote modem before hanging up. By default, it is set to 10 seconds. ▸ S7 – wait for carrier after dialing (ATDT…)
ATS7?	The Ethernet Cradle will respond with the current setting of waiting time for receiving a carrier from the remote modem before hanging up.
AT+IDLETIMEOUT=	The Ethernet Cradle will wait for the specified period of time (10~180 sec.) for sending/receiving data before hanging up. By default, it is set to 30 seconds. ▸ For the Ethernet Cradle to wait permanently, set 0.
AT+IDLETIMEOUT?	The Ethernet Cradle will respond with the current setting of waiting time for sending/receiving data before hanging up.
AT+LOCALNAME=	The Ethernet Cradle will be identified by the new name. ▸ This human readable name will be converted to an IP address by DNS server. Refer to 2.1.6 Set Local Name.
AT+LOCALNAME?	The Ethernet Cradle will respond with its human readable name to the mobile computer.
AT+WMODE=	Sets new working mode for the Ethernet Cradle. When the command succeeds, the Ethernet Cradle will reboot and start working by the newly set mode. AT+WMODE=0 sets the Ethernet Cradle to Data Mode. AT+WMODE=1 sets the Ethernet Cradle to Transparent Mode.

Note: Any setting made by AT commands is only valid for the current use. The previous settings always restore whenever the Ethernet Cradle reconnects to the power supply. To change settings permanently, access the configuration menu.

1.2 UNDERSTANDING STATUS INDICATORS

The Ethernet Cradle provides three red LED indicators on the front panel to indicate connection status. Normally, when the power cord is good and properly connected, the POWER indicator shall start to flash shortly and become solid finally.

▶ If the Ethernet Cradle is connected to power for a while and the POWER indicator does not start to flash, hardware error may have occurred.

▶ If the POWER indicator keeps constant flashing, you may need to check if the network cable is properly connected.

The LED lamps' various actions represent the statues of the Ethernet Cradle as tabulated below:

Front Panel LED	Tasks	Indication	
POWER	Local status	Solid	IP ready for the Ethernet Cradle
		Flashing	Attempting to get IP
		Off	Hardware initializing or no power
DATA	Transmission status	Flashing	Data transmission *Configurable when working mode is set to Data or Modem mode
		Off	No activity
READY	Remote status	**Data Mode**	
		Solid	Connection established
		Flashing	Connecting in client mode, or waiting connection request in server mode
		Off	Disconnected
		Transparent Mode	
		Solid	IP Ready for the mobile computer
		Off	IP released
		Modem Mode	
		Solid	Connection established
		Flashing	Dialing out or receiving "RING" message
		Off	Disconnected

Note: In Transparent Mode, the READY indicator lights on when transmitting/receiving data. Upon receipt of the last packet, it will stay on for 1 minute and then goes off.

CONFIGURING THE ETHERNET CRADLE

The Ethernet Cradle is configured through a Main Menu provided over Ethernet connection. By such menu, you can configure related networking parameters, as well as working mode or working type over the networks.

1) Connect the Ethernet Cradle and your PC with a networking cable.

2) Connect the Ethernet Cradle to power source.

3) Run a telnet client program on your PC. Connect the Ethernet Cradle to your PC via port 8000.

   If you forget the current IP of the Ethernet Cradle, you need to reset it. Find the "IP Reset Switch" in the rear of the Ethernet Cradle that is right next to the power jack. Have an object with a pointed end to press and hold the "IP Reset Switch" while in the same time supplying power to the Ethernet Cradle by plugging the power connector. This would bring the IP address of the Ethernet Cradle back to the default state temporarily for configuration.

   During configuration, the POWER and DATA indicators will flash in an alternate manner.

Note: The default IP address for the 8200 Ethernet Cradle is 192.168.1.250. Such IP address serves for users to access the Main Menu of the Ethernet Cradle. It doesn't override the current IP in use.

Ethernet Cradle as a telnet server

▶ Current IP or default IP 192.168.1.250

▶ Port: 8000

Default Settings of Ethernet Cradle

▶ Working mode set to Modem Mode

▶ DHCP enabled

4) The Main Menu displays. Proceed to configure related settings for the Ethernet Cradle to run by a specific working mode.

```
<<<<<       CipherLab Ethernet Cradle      >>>>>
<<<<<------------------------------------->>>>>
          [Press 'Enter' to continue.]
Kernel Version: Kernel-1.01
Lib Version: Ethernet Cradle-1.07
MACID: 00:D0:17:C0:01:D6
IP: 192.168.6.97
Local Name: ENetCradle-C001D6




<<<<<            Main Menu                >>>>>
<<<<<------------------------------------->>>>>
1. Set Local IP, Subnet Mask, Default
   Router IP & Local Name
2. Set LED Indicator Setting
3. Set Connection Settings
4. Set Working Mode
5. Set Working Type
6. Reset Configuration to Default
7. Set Modem Configuration
8. Set Password Configuration
9. Save and Exit
0. Exit without Saving

Choose a Number => _
```

5) To complete and apply the new settings, type [9] and press [Enter]. The Ethernet Cradle will reboot and re-initialize by the new settings.

The Main Menu features the configurations as tabulated below:

Main Menu Options	Working Mode Applicability	Default Settings
1. Set Local IP, Subnet Mask, Default Router IP & Local Name	Any	Check local IP if you don't remember
2. Set LED Indicator Setting	Data mode or Modem mode	Default to Network Rx/Tx Status
3. Set Connection Settings	Data mode Modem mode: Timer only	Default to TCP Server…
4. Set Working Mode	Select working mode	Default to Modem mode
5. Set Working Type	Data mode	Default to Work Online
6. Reset Configuration to Default	Any	
7. Set Modem Configuration	Modem mode	Default to 10 seconds for dialing time-out and 30 seconds for idle time-out
8. Set Password Configuration	Any	
9. Save and Exit	Any	
0. Exit without Saving	Any	

2.1 IP CONFIGURATION

From the Main Menu, type [1] and press [Enter].

The following submenu will display for the configuration of Ethernet networking.

```
Local IP Address: 192.168.6.97
subnet Mask: 255.255.255.0
Default Router IP Address: 192.168.6.253
DNS Server IP Address: 192.168.7.1
DHCP: Enable
Local Name: ENetCradle-C001D6

COMMANDS:
1 -- Local_IP_Address
2 -- Subnet_Mask
3 -- Default_Router_IP
4 -- DHCP (0=Disable, 1=Enable)
5 -- DNS_Server
6 -- Set Local Name (1 - 32 characters)
0 -- Return to Main Menu
EXAMPLES:
 to set the local IP address to 192.168.1.1
 => 1 192.168.1.1
 to set the subnet mask to 255.255.255.0
 => 2 255.255.255.0
 to set Local Name to ENetCradle01
 => 6 ENetCradle01

Enter Command => _
```

2.1.1 LOCAL IP ADDRESS

This is the IP address of the Ethernet Cradle in your local area network (LAN).

▶ To assign a new IP address, e.g. "168.95.192.1":

Type "**1** 168.95.192.1" and press [Enter].

Note: The IP address is set to "192.168.1.250" by default.

2.1.2 SUBNET MASK

A subnet mask functions to determine which bits of the IP address are considered part of the Network Number, and which bits part of the Host ID. Normally, it is set to "255.255.255.0"; namely the "Natural Mask" of a Class C network.

Note: By default, the subnet mask IP is obtained from the DHCP server.

15

2.1.3 DEFAULT ROUTER IP

If the remote IP is not on the same segment of the network, data needs to be transmitted through a router. When DHCP is disabled, you need to specify the IP address for the router (Gateway).

▶ For example, type "**3** 192.168.1.254" and press [Enter].

Note: By default, the router IP is obtained from the DHCP server.

2.1.4 DHCP

If static IP addresses are desired, disable the DHCP server.

▶ Type "**4** 0" and press [Enter].

Note: By default, DHCP is enabled and all of the settings can be obtained from the DHCP server.

2.1.5 DNS SERVER

When DHCP is disabled, you need to specify the IP address for the DNS server.

▶ For example, type "**5** 192.168.70.1" and press [Enter].

Note: By default, the DNS server IP is obtained from the DHCP server.

2.1.6 SET LOCAL NAME

The local name is displayed on the Main Menu. It is also the host name of the Ethernet Cradle. You can specify a new string for the identification, and this human readable name will be converted to an IP address by DNS server. The local name allows 32 alphanumeric characters at the most and case-sensitive. The hyphen character is acceptable while the "dot" and "space" characters are not. If you give a string longer than 32 characters, not including the terminating null character, it will be rejected.

For networking with Microsoft operating systems, you should be aware that a NetBIOS name is often the same as the host name, although it may be truncated to 15 characters. (The NetBIOS name allows for 16 characters, however, Microsoft limits the host name to 15 characters and reserves the 16th character as a NetBIOS Suffix.)

▶ For example, type "**6** ENetCradle_User1" and press [Enter].

Note: By default, the local name is set to "ENetCradle-XXXXXX" where XXXXXX represents the last six digits MAC ID. Since the host name is not case-sensitive, it makes no difference between "ENetCradle_usa" and "enetcradle_usa", unless you keep a unique part such as the digits for MAC ID.

2.2 LED SETTING (DATA/MODEM MODE)

From the Main Menu, type [2] and press [Enter].

The following submenu will display for the configuration of LED indicators.

```
LED Setting: Network Rx/Tx Status

COMMANDS:
 1 -- Set LED to Network Rx/Tx Status
 2 -- Set LED to Terminal Rx/Tx Status
 0 -- Return to Main Menu

Enter Command => _
```

This submenu configures whether the DATA indicator notices the data transmission status over the Ethernet or the Terminal port (via I/O pins) when the Ethernet Cradle is working by Data Mode and Modem Mode.

The DATA indicator flashes whenever data transmission occurs whatever the selected working mode is.

2.2.1 NETWORK RX/TX STATUS (DEFAULT)

By default, the DATA indicator flashes when data transmission occurs over Ethernet port.

2.2.2 TERMINAL RX/TX STATUS

Select this item to have the DATA indicator flash when data transmission occurs over Terminal port (via I/O pins).

▸ Type "**2**" and press [Enter].

2.3 CONNECTION SETTINGS (DATA MODE)

From the Main Menu, type [3] and press [Enter].

The following submenu will display for connection settings.

```
<<<<<          Setup Connection          >>>>>
<<<<<--------------------------------->>>>>
1. Connection Type, Remote IP Address,
   Local Port & Remote Port
2. Timer & Line Terminator
3. Echo Settings
0. Return to Main Menu

Choose a Number => _
```

Note: The Timer setting is applicable to Modem Mode as well.

2.3.1 CONNECTION TYPE, REMOTE IP ADDRESS, LOCAL PORT & REMOTE PORT

From the Setup Connection menu, type [1] and press [Enter].

The following submenu will display.

```
Connection Type: TCP SERVER
Local Port: 4000
Remote IP Address: 0.0.0.0
Remote Port: 4000

COMMANDS:
1 -- Connection Type (0=TCP SERVER, 1=TCP CLIENT,
                      2=UDP SERVER, 3=UDP CLIENT)
2 -- Local Port
3 -- Remote IP Address
4 -- Remote Port
0 -- Return to Previous Menu

Enter Command => _
```

The featured configurations are tabulated as follows:

Connection Type

The Ethernet Cradle can be configured as a server or client, and you can choose to use TCP or UDP as the transport layer protocol of data communications.

▸ By default, the connection type of the cradle is TCP Server.

▸ To change the connection type, e.g. to UDP SERVER, type "**1** 2" and press [Enter].

Connection Type:	Local Port	Remote IP Address	Remote Port
0= TCP Server	Available	N/A	N/A
1= TCP Client	N/A	Available	Available
2= UDP Server	Available	N/A	N/A
3= UDP Client	N/A	Available	Available

Local Port

When the Ethernet Cradle is configured as a TCP server or UDP server, you have to define a port number for the clients to connect.

Note: Port 8000 is reserved for the use of configuring the cradle over Ethernet connection. Port 3000 is reserved for downloading, such as a firmware download.

Remote IP Address & Port Number

When the Ethernet Cradle is configured as a TCP client or UDP client, you have to define the remote IP and port number for setting up a connection. For example, type "**3** 192.168.6.36" and press [Enter].

2.3.2 TIMER & LINE TERMINATOR

From the Setup Connection menu, type [2] and press [Enter].

The following submenu will display.

```
Timer: 10 ms
Transmit on Line Terminator: Enable
Transmit Line Terminator: Enable
Line Terminator: 0Dh

COMMANDS:
1 -- Timer (1 - 10000 ms)
2 -- Transmit on Line Terminator (0=Disable, 1=Enable)
3 -- Transmit Line Terminator (0=Disable, 1=Enable)
4 -- Line Terminator (00h - FFh)
0 -- Return to Previous Menu
EXAMPLE:
 to set timer to 20 ms
 => 1 20
 to set '$' as the LT_Character
 => 4 24

Enter Command => _
```

Data sent to the Ethernet Cradle over Terminal port (via I/O pins) is first buffered in the memory. When any of the following conditions is met, the Ethernet Cradle proceeds to transmit the buffered data to a remote host:

▶ The amount of data reaches the maximum data byte count that is retainable in an IP packet.

▶ The Ethernet Cradle doesn't receive any data for a period of time longer than the value of the Timer setting.

▶ The Line Terminator configured is received.

The featured configurations are tabulated as follows:

Timer

Specify a timer setting from 1 to 10,000, in units of millisecond.

▶ By default, the timer is set to 10 milliseconds.

▶ To change the timer setting, e.g. to 20 milliseconds, type "**1** 20" and press [Enter].

Transmit on Line Terminator

▶ By default, this setting is enabled so that data received over IR will not be sent out as a TCP/IP packet until the Line Terminator character is received.

▶ To disable it, type "**2** 0" and press [Enter].

Transmit Line Terminator

▶ By default, this setting is enabled so that the Line Terminator character will be included in the TCP/IP packet and sent out.

▶ To disable it, type "**3** 0" and press [Enter]. The Line Terminator character will be discarded from the received buffer before transmission.

Line Terminator

Specify a Line Terminator character from 00h to FFh.

▶ By default, the Line Terminator is "0Dh" (Carriage Return).

▶ Below are examples for setting a new Line Terminator character.

To set "$" as the Line Terminator, type "**4** 24" and press [Enter].

To set "A" (41h) as the Line Terminator, type "**4** 41" and press [Enter].

2.3.3 ECHO SETTINGS

From the Setup Connection menu, type [3] and press [Enter].

The following submenu will display.

```
Client Echo: Disable
Echo String: Connection OK!

COMMANDS:
1 -- Client Echo (0=Disable, 1=Enable)
2 -- Echo String (0 - 31 characters)
0 -- Return to Previous Menu

Enter Command => _
```

Note: The Ethernet Cradle must be configured as a TCP server or UDP server.

The featured configurations are tabulated as follows:

Client Echo

▶ By default, this setting is disabled.
▶ To enable Echo, type "**1** 1" and press [Enter].

Echo String

When Echo is enabled, the Ethernet Cradle will send a predefined string to a remote device (client) as soon as the connection is established. The client will then start to communicate with the Ethernet Cradle after it receives the Echo String.

▶ By default, the Echo String is "Connection OK!"
▶ You can specify a new string, which allows 31 characters at the most. Type "**2** NewString" and press [Enter].

2.4 WORKING MODE

From the Main Menu, type [4] and press [Enter].

The following submenu will display for your configuration of working modes. The Ethernet Cradle supports three working modes, which are detailed as follows:

```
Communication Mode Setting: Modem Mode

COMMANDS:
 1 -- Data Mode
 2 -- Transparent Mode
 3 -- Modem Mode
 0 -- Return to Main Menu

Enter Command => _
```

Note: The Ethernet Cradle is set to Modem Mode by default.

2.4.1 DATA MODE

If you select Data Mode, proceed to configure the following items in the Main Menu:

‣ LED Indicator Setting
‣ Connection Settings
‣ Working Type

2.4.2 TRANSPARENT MODE

If you select Transparent Mode, all you need to configure are the general settings in the Main Menu such as Local IP, Subnet Mask, Router IP, etc. Either the mobile computer or the remote computer will control and handle the data.

2.4.3 MODEM MODE (DEFAULT)

This is the default mode. Proceed to configure the following items in the Main Menu:

‣ LED Indicator Setting
‣ Working Type

2.5 WORKING TYPE (DATA MODE)

From the Main Menu, type [5] and press [Enter].

The following submenu will display for the configuration of working type.

```
Working Type Setting: Work Online

COMMANDS:
1 -- Set Work Online
2 -- Set Work Offline
0 -- Return to Main Menu

Enter Command => _
```

2.5.1 SET WORK ONLINE (DEFAULT)

This refers to the real-time transmission. However, data loss may occur in the following cases due to buffer being cleared:

▶ Timer times out.
▶ The Ethernet Cradle unexpectedly disconnects from a remote host.

2.5.2 SET WORK OFFLINE

This means data won't be sent out immediately. When the Ethernet Cradle unexpectedly disconnects from a remote host, the data received over Terminal port (via I/O pins) will be temporarily saved in the buffer, and then sent out when the connection is re-established.

Note: The Ethernet Cradle can buffer up to 128 Kbytes of data.

2.6 RESET TO DEFAULT

From the Main Menu, type [6] and press [Enter]. This will restore the settings to default state.

2.7 MODEM CONFIGURATION

From the Main Menu, type [7] and press [Enter].

The following submenu will display for changing the elapsed time before hanging up.

▶ Dialing time-out: 10 seconds by default.
▶ Idle time-out: 30 seconds by default.

```
Dialing Wait Time: 10
Idle Time Out: 30

COMMANDS:
1 -- Set Default Dialing Wait Time (5 - 50 sec)
2 -- Set Default Idle Time Out (10 - 180 sec) (0=Turn Off)
0 -- Return to Main Menu

Enter Command => _
```

2.7.1 DIALING WAIT TIME

By default, the dialing time-out is set to 10 seconds.

Note: This setting is applicable to Modem Mode only.

2.7.2 IDLE TIME OUT

By default, the idle time-out is set to 30 seconds.

Note: This setting is applicable to Modem Mode only.

2.8 PASSWORD CONFIGURATION

From the Main Menu, type [8] and press [Enter].

The following submenu will display for the configuration of password.

```
Password Setting: Disable
Passwork: 0000

COMMANDS:
 1 -- Password Setting (0=Disable, 1=Enable)
 2 -- New Password String (1 - 16 characters)
 0 -- Return to Main Menu
EXAMPLES:
 to set Password Setting to Enable
 => 1 1
 to set Password String to Pass123
 => 2 Pass123

Enter Command => _
```

2.8.1 PASSWORD SETTING

For security concerns, the Ethernet Cradle supports password security to prevent unauthorized user intervention.

▶ Type "**1** 1" and press [Enter].

When password protection is enabled, users will be asked for the password to enter the Main Menu.

```
<<<<<------------------------------->>>>>
<<<<<     CipherLab Ethernet Cradle     >>>>>
<<<<<------------------------------->>>>>

Password: _
```

Note: By default, password protection is disabled.

2.8.2 NEW PASSWORD

Select this item to specify a new string for the password. 16 ASCII characters are allowed at the most and case-sensitive; the hyphen character "-" is also acceptable.

▶ Type "**2** NewString" and press [Enter].

Note: By default, the password is "0000".

2.9 SAVE AND EXIT

From the Main Menu, type [9] and press [Enter]. This will save the current settings and exit the configuration mode.

If you want to abort the current settings and exit the configuration mode, type [0] and press [Enter].

UPGRADING FIRMWARE

The Ethernet Cradle supports firmware upgrade either through Ethernet or the mobile computer. We suggest that you first download the kernel program (Kernel.SHX), and then the user program (User.SHX).

Warning: DO NOT update the firmware unless it concerns an "upgrade". The information about the current firmware version is displayed right after the [Enter] key is hit to CipherLab welcome screen on telnet screen.
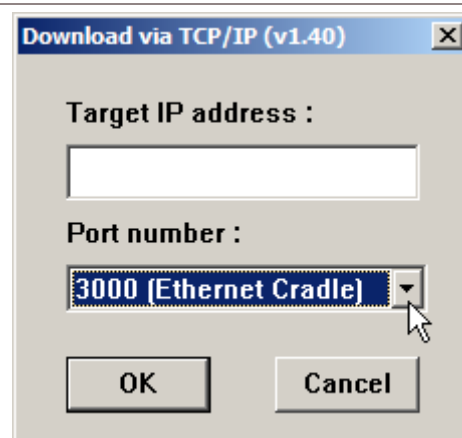

3.1 DOWNLOAD VIA ETHERNET

Follow through the steps below to upgrade the Ethernet Cradle's firmware via Ethernet.

1) Connect the Ethernet Cradle to a computer with a networking cable.

2) Connect the Ethernet Cradle to an external power source.

3) Run CipherLab utility UDP_load.exe on your PC and connect to the Ethernet Cradle via port 3000 for updating firmware.

UDP_Load.exe

▶ Ethernet Cradle as a UDP server
▶ Current IP or default IP 192.168.1.250
▶ Port: 3000

If you forget the current IP of the Ethernet Cradle, you need to reset it. Find the "IP Reset Switch" in the rear of the Ethernet Cradle that is right next to the power jack. Have an object with a pointed end to press and hold the "IP Reset Switch" while in the same time supplying power to the Ethernet Cradle by plugging the power connector. This would bring the IP address of the Ethernet Cradle back to the default state temporarily for configuration.

During configuration, the POWER and DATA indicators will flash in an alternate manner.

Note: The default IP address for the 8200 Ethernet Cradle is 192.168.1.250. Such IP address serves for users to access the Main Menu of the Ethernet Cradle and doesn't override the current IP in use.

4) While upgrading firmware, the POWER and DATA indicators on the Ethernet Cradle will flash in an alternate manner.

5) The downloading process won't complete until both POWER and DATA indicators becomes solid and then go off together.

Note: After the "Download Successfully" message appears on your PC, wait for approximately 5 seconds.

6) The Ethernet Cradle will reboot itself.

Warning: DO NOT disconnect the power to the Ethernet Cradle before the downloading completes.

3.2 DOWNLOAD VIA MOBILE COMPUTER

Follow the steps below to upgrade the Ethernet Cradle's firmware through the mobile computer:

1) Download the latest firmware version from CipherLab website to the mobile computer. Activate the firmware program. The mobile computer will shut down and restart showing the Ethernet Cradle's firmware upgrade menu on the screen.

2) Place the mobile computer into the Ethernet Cradle.

3) Power off the Ethernet Cradle by disconnecting the power supply.

4) Press and hold the "IP Reset Switch" while re-connecting power to the Ethernet Cradle.

5) From the firmware upgrade menu on the mobile computer, select "Kernel (version x.xx)" to send the new kernel or select "User (version x.xx)" to send the new user program to the Ethernet Cradle.

Chapter 4

PROGRAMMING YOUR MOBILE COMPUTER

It is C-programmable for the mobile computer to communicate with the Ethernet Cradle. You may write your own code to achieve your desired interaction between the mobile computer and the Ethernet Cradle.

4.1 PROGRAMMING IN C LANGUAGE

A number of functions are made available for the mobile computer to communicate with the Ethernet Cradle. Refer to CipherLab C Programming Guide for more details.

Working Mode	Available Functions
Data Mode	open_com(), read_com(), nwrite_com(), write_com(), close_com(), clear_com(), com_eot(), com_overrun(), com_cts(), com_rts()
Transparent Mode	NetInit(6L) Socket programming NetClose()
Modem Mode	open_com(), read_com(), nwrite_com(), write_com(), close_com(), clear_com(), com_eot(), com_overrun(), com_cts(), com_rts(), AT Commands

SPECIFICATIONS

Processor & Memory	
CPU	16-bit CMOS, low power consumption
Memory	Firmware upgradeable ▸ Up to 128K bytes of buffer provided in Data mode when only one connection is established and set to work offline

Power Adapter	
Input	100~240 V, 50/60 Hz
Output	5V DC, 3 A

Power Consumption* (5V DC)		
Standby	400 mW	: 80 mA for cradle only
	750 mW	: 150 mA when battery is charged to full
	1075 mW	: 215 mA while charging
	4505 mW	: 901 mA while charging with backlight on
	4800 mW	: 960 mA when battery is charged to full
Operating (dial-out & transmission)	1325 mW	: 265 mA while charging
	4825 mW	: 965 mA while charging with backlight on
	5075 mW	: 1015 mA for cradle only

Enclosures	
Materials	PC + ABS plastic
Dimensions	100 mm (L) × 104 mm (W) × 80 mm (H)
Weight	Approx. 365 g

Notifications	
Status Indicators	3 LEDs for connection status

Communication Ports	
Ethernet	TCP/UDP, Server/Client ▸ IP address set to 192.168.1.250 by default
RS-232	Peer-to-peer ▸ Transmission rate set to 115,200 bps by default
USB	HID, Virtual COM or Mass Storage

Temperature	
Operating	-10 °C to 60 °C
Storage	-20 °C to 70 °C
Humidity	
Operating	10% to 90%, non-condensing
Storage	5% to 95%, non-condensing

Note: Power consumption data is obtained based on connecting the cradle to a 100BASE-TX network.