

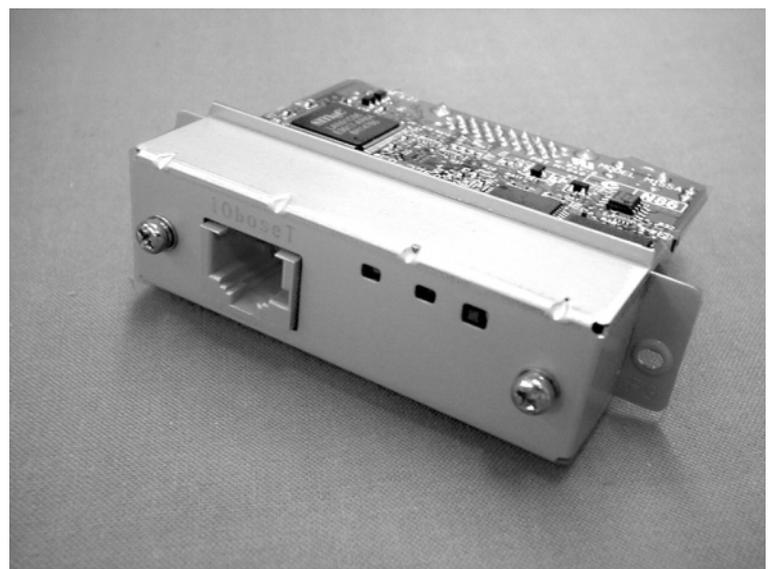
Confidential

developer's guide

10BASE-T ETHERNET

UB-E01

Copied Date	200 , ,
Copied by	



EPSON

English

401298701

Confidential

CONFIDENTIALITY AGREEMENT

BY USING THIS DOCUMENT, YOU AGREE TO ABIDE BY THE TERMS OF THIS AGREEMENT. **PLEASE RETURN THIS DOCUMENT IMMEDIATELY IF YOU DO NOT AGREE TO THESE TERMS.**

1. This document contains confidential, proprietary information of Seiko Epson Corporation or its affiliates. You must keep such information confidential. If the user is a business entity or organization, you must limit disclosure to those of your employees, agents and contractors who have a need to know and who are also bound by obligations of confidentiality.
2. On the earlier of (a) termination of your relationship with Seiko Epson, or (b) Seiko Epson's request, you must stop using the confidential information. You must then return or destroy the information, as directed by Seiko Epson.
3. If a court, arbitrator, government agency or the like orders you to disclose any confidential information, you must immediately notify Seiko Epson. You agree to give Seiko Epson reasonable cooperation and assistance in resisting disclosure.
4. You may use confidential information only for the purpose of facilitating authorized sales and service of, or developing software and similar products for authorized use with, EPSON products. Any other use requires the prior written consent of Seiko Epson.
5. THE INFORMATION IN THIS DOCUMENT IS PROVIDED "AS IS," WITHOUT WARRANTY OF ANY KIND, INCLUDING ANY WARRANTY OF TITLE OR NON-INFRINGEMENT. Seiko Epson has no liability for loss or damage arising from or relating to your use of or reliance on the information in the document.
6. You may not reproduce, store or transmit the confidential information in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise) without the prior written permission of Seiko Epson.
7. Your obligations under this Agreement are in addition to any other legal obligations. Seiko Epson does not waive any right under this Agreement by failing to exercise it. The laws of Japan apply to this Agreement.

CAUTIONS

- This document shall apply only to the product(s) identified herein.
- No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of Seiko Epson Corporation.
- The contents of this document are subject to change without notice. Please contact us for the latest information.
- While every precaution has been taken in the preparation of this document, Seiko Epson Corporation assumes no responsibility for errors or omissions.
- Neither is any liability assumed for damages resulting from the use of the information contained herein.
- Neither Seiko Epson Corporation nor its affiliates shall be liable to the purchaser of this product or third parties for damages, losses, costs, or expenses incurred by the purchaser or third parties as a result of: accident, misuse, or abuse of this product or unauthorized modifications, repairs, or alterations to this product, or (excluding the U.S.) failure to strictly comply with Seiko Epson Corporation's operating and maintenance instructions.
- Seiko Epson Corporation shall not be liable against any damages or problems arising from the use of any options or any consumable products other than those designated as Original EPSON Products or EPSON Approved Products by Seiko Epson Corporation.

TRADEMARKS

EPSON® and ESC/POS® are registered trademarks of Seiko Epson Corporation.

Microsoft and Windows are registered trademarks of Microsoft Corporation.

General Notice: Other product and company names used herein are for identification purposes only and may be trademarks of their respective companies.

Confidential

Revision Information

Revision	Page	Altered Items and Contents
Rev. A	All pages	Newly authorized
Rev. B	vii, 2-3, 2-4	Add supported TM printers Installing procedure of plate with U-shaped screw holes added

About This Guide

This guide is intended to provide all information necessary for system planning, design, installation and application of the UB-E01 for designers and developers of POS systems.

Contents of the Guide

The configuration of the guide is as follows:

Chapter 1, "System Preparation"	Supported operating system, network protocols, TM printers, and other limitations.
Chapter 2, "Installation"	Gives information on how to install and use the UB-E01.
Chapter 3, "Utilities"	Gives information on how to use the utilities.
Chapter 4, "Programming Samples"	Includes practical programming information.
Chapter 5, "Specification"	Gives specifications.
Appendix A, "Definitions"	Provides definitions of terms used in this guide.

Related Software and Documents

Software/document name	Description
UB-E01 Specification	Provides the specifications of the product
UB-E01 User's Manual	Provides instructions for operators of POS systems in which the UB-E01 is installed so that the operators can use the UB-E01 safely and correctly.

Confidential

EMC and Safety Standards Applied

Product Name: UB-E01
Model Name: M155A

The following standards are applied only to the interface boards that are so labeled. (EMC is tested using the EPSON PS-170 power supply and TM series printers.)

Europe:	CE marking
North America:	EMI: FCC/ICES-003 Class A
Japan:	EMC: VCCI Class A
Oceania:	EMC: AS/NZS 3548 Class B

WARNING

The connection of a non-shielded interface cable to this board will invalidate the EMC standards of this device.

You are cautioned that changes or modifications not expressly approved by Seiko Epson Corporation could void your authority to operate the equipment.

CE Marking

The printer conforms to the following Directives and Norms:

Directive 89/336/EEC	EN 55022 Class B
	EN 55024
	IEC 61000-4-2
	IEC 61000-4-3
	IEC 61000-4-4
	IEC 61000-4-5
	IEC 61000-4-6
	IEC 61000-4-11

The printer in which this board is installed does not conform to the following:

Directive 90/384/EEC	EN45501
----------------------	---------

FCC Compliance Statement For American Users

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

For Canadian Users

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

 **CAUTION:**

Connecting an outdoor overhead LAN cable directly to your product may lead to lightning damage. If you need to connect such a cable to your product, the cable must be protected against an electrical surge between the cable and your product. You should avoid connecting your product to a non-surge protected outdoor overhead LAN cable.

GERÄUSCHPEGEL

Gemäß der Dritten Verordnung zum Gerätesicherheitsgesetz (Maschinenlärminformations- Verordnung-3. GSGV) ist der arbeitsplatzbezogene Geräusch-Emissionswert kleiner als 70 dB(A) (basierend auf ISO 7779).

Key to Symbols

The following symbols are used in the documentation for this product. See the specific warnings and cautions at appropriate points throughout this guide.

 **WARNING:**

Warnings must be followed carefully to avoid serious bodily injury.

 **CAUTION:**

Cautions must be observed to avoid minor injury to yourself, damage to your equipment, or loss of data.

 **Note:**

Notes have important information and useful tips on the operation of the product.

Confidential

Safety Precautions

This section presents important information to ensure safe and effective use of this product. Please read this section carefully and store it in an accessible location.

CAUTION:

- ❑ *Be careful to avoid dropping conductive objects such as paper clips on the circuit board, as they could short circuit connections and cause damage from excessive current.*
- ❑ *This product should only be connected to the devices specified in this guide. Connecting other devices could cause damage, fire or explosion.*
- ❑ *Never disassemble or modify this product. Tampering with this product may result in injury, fire, or electric shock.*
- ❑ *Be sure to set the product on a firm, stable, horizontal surface. The product may break or cause injury if it falls.*
- ❑ *Never connect a public telephone line to the modular connector on this product.*
- ❑ *Do not use in locations subject to high temperature, humidity or dust levels. Excessive temperature, humidity or dust may cause equipment damage, fire, or shock.*
- ❑ *Parts on the circuit board may become hot during operation. Therefore, wait approximately 10 minutes after turning the power off before touching them.*
- ❑ *To prevent the possibility of electrical shock, do not perform installation or connect cables during a thunderstorm.*

Label

A caution label like the one is attached near the display module connector of the TM printers.



The label has the following meaning:

“The display module connector and the drawer kick-out connector use the same type of Ethernet connector; therefore, be sure not to connect the Ethernet connector cable or the telephone line to the display module connector or the drawer kick-out connector.”

Product Servicing

This product cannot be serviced at the component level. If damage occurs, the UB-E01 should be replaced as a unit.

Introduction

The UB-E01 is the 10BASE-T Ethernet interface board designed for the EPSON® TM printers. The board lets you connect your EPSON printer directly to your network and use it as a kitchen printer.

Operating Environments

Supported Operating Systems

- ❑ Microsoft® Windows® 95, Windows® 98, and Windows® 2000
- ❑ Windows NT® 4.0
- ❑ UNIX Sun OS 4.1.3 or later: SPARC

Supported Protocols

- ❑ TCP/IP

Environments for Setup Utility

- ❑ EPSON TMNet WinConfig applies to the following versions of Windows:
 - Windows 95
 - Windows 98
 - Windows NT 4.0
 - Windows 2000
- ❑ EPSON TMNet WebConfig applies to the following internet browsers:
 - Microsoft Internet Explorer version 4.0 or later
 - Netscape Navigator version 3.02 or later

Confidential

Supported TM Printers

The following printers can use the UB-E01.

TM-U675, TM-H6000, TM-J8000, TM-U325, TM-U590, TM-T88/T88II, TM-H5000/H5000II, TM-T285, TM-U210 Series, TM-U200 Series, TM-J2000/J2100, TM-T90, TM-L90, TM-U230
Please contact your EPSON representative or your place of purchase for new printers.

How to Use this Guide

Installation Overview

Be sure to read Chapter 1, "System Preparation," before using the product.

Perform the following steps to install and configure the UB-E01. See the indicated chapters for detailed information.

1. Install the UB-E01 in your printer. See Chapter 2.
2. Install the TCP/IP protocol in your operating system, if necessary. See Chapter 5.
3. Set the functions of the UB-E01. See Chapter 5.
4. If you set the functions of the UB-E01 using the EPSON TMNet WebConfig, you need to install Microsoft Internet Explorer or Netscape Navigator. If neither of them is installed, install it, referring to the individual browser's manual.

Programming

Chapter 6 provides you with a sample program of printing by network.

Appendix

The appendix provides you with the glossary.

Contents

Chapter 1 System Preparation

Supported Operating System	1-1
Supported Network Protocols	1-1
Supported TM Printers	1-1
Other Limitations	1-2

Chapter 2 Installation

Installation Precautions	2-1
Unpacking	2-2
Part Names	2-2
Functions	2-2
Switch	2-2
LEDs	2-3
UB-E01 Installation	2-3
Initializing UB-E01 and Status Sheet Printing	2-6

Chapter 3 Utilities

Setting the IP Address	3-1
Setting the IP Address using EPSON TMNet WinConfig	3-1
Installing EPSON TMNet WinConfig	3-6
Setting with the EPSON TMNet WinConfig	3-8
Setting the IP Address Using the arp/ping Command	3-10
EPSON TMNet WinConfig Functions	3-12
Menu Bar	3-12
Tool Menu	3-13
Search Options	3-13
Settings	3-14
EPSON TMNet WebConfig Functions	3-17
Opening Screen	3-18
Protocol Information and Settings	3-19
TCP/IP Information	3-20
SNMP Information	3-21
TCP/IP Setting	3-22
SNMP Communication Setting	3-23
SNMP IP Trap 1 Setting	3-24
SNMP IP Trap 2 Setting	3-25
Administrator Setting	3-26
Password Setting	3-27
Reset	3-28
Home Page Update	3-29
Telnet Functions	3-29
Connecting	3-30
Main Menu	3-30
TCP/IP Setting Menu	3-30
Hardware Menu	3-31

Confidential

Chapter 4 *Programming Samples*

Method of Printing to the UB-E01	4-1
Buffer of the UB-E01	4-2
Direct Printing by PORT9100	4-3
For Windows Console	4-3
For Linux	4-4
Commands Sent to a TM Printer When the Power is On	4-5
Monitoring of the ASB status	4-5
The Priorities of Printing	4-5
Time-out for Connection	4-5
Printer Operation by the UDP Commands	4-6
Commands Packets	4-6
03-0000 Retrieving Basic Information	4-7
03-0010 Retrieving Status	4-7
03-0011 Forced Transmission	4-8
03-0012 Reset	4-8
03-0013 Buffer Flash	4-9
Programming Sample	4-10

Chapter 5 *Specifications*

Structure	5-1
Printer Connection	5-1
Line Display Connection	5-1
Features	5-1
Overview	5-1
Printing Functions	5-2
Functions to Monitor Settings	5-2
Maintenance Functions	5-2
Hardware Specifications	5-3
Physical communications standard:	5-3
External size	5-3
Software Specifications	5-3
Basic Communications Protocols	5-3
Printing Communications Protocols	5-3
Status Inquiry and Setting Protocols	5-5
Automatic IP Address Assignment Protocols	5-7
Internal Settings	5-8
Initializing	5-9
Version Upgrading	5-9
Environmental Specifications	5-10
Storage Conditions	5-10
EMC and Safety Standards Applied	5-10

Appendix A *Definitions*

*Chapter 1***System Preparation**

Supported Operating System

- Microsoft Windows 95, Windows 98, and Windows 2000
- Windows NT 4.0
- UNIX Sun OS 4.1.3 or later: SPARC

Supported Network Protocols

- LPR
- FTP
- Socket printing (port 9100 for OPOS)

Supported TM Printers

The following printers can use the UB-E01.

- TM-U675
- TM-H6000
- TM-J8000
- TM-U325
- TM-U590
- TM-T88/T88II
- TM-H5000/H5000II
- TM-T285
- TM-U210 Series
- TM-U200 Series

Confidential

Other Limitations

Be sure to note the following:

- ❑ When the UB-E01 is installed, the display module connector (DM-D) of the TM printer cannot be used.
- ❑ Do not connect the Ethernet connector cable to the display module connector (DM-D) or the drawer kick-out connector.

Chapter 2

Installation

Installation Precautions

WARNING

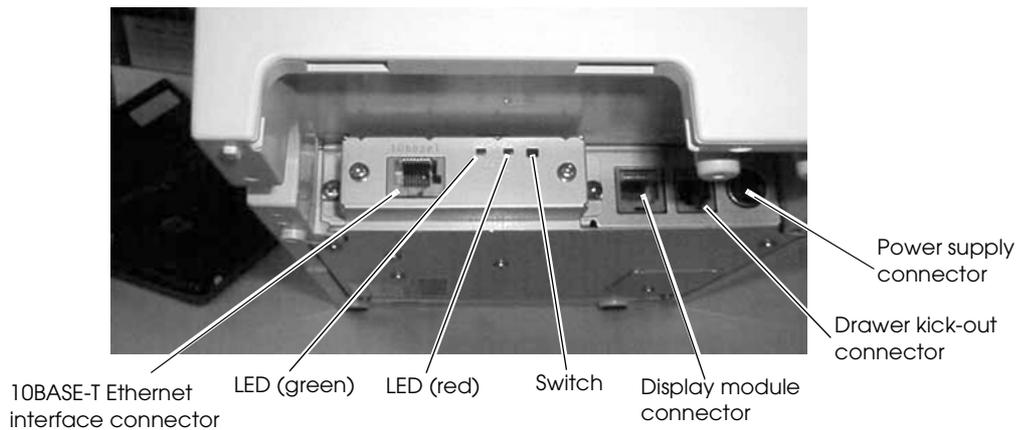
- ❑ *Before installing, disconnect the Power Unit from the TM Printer (as well as turning the power switch off).
Even when the power switch is off, voltage is still present at some points on the circuit board. Changing components while the Power Unit is connected can cause damage to the UB-E01 and the printer.*
- ❑ *A grounded wrist strap should be worn during installation, to avoid damage from static electricity.*
- ❑ *To avoid damage from static electricity when the unit is removed, place it on an static-safe surface such as conductive foam.*
- ❑ *Protect the unit from vibration and shock that could damage to the unit.*
- ❑ *Be careful to avoid dropping conductive objects such as paper clips on the circuit board, as they could short circuit connections and cause damage from excessive current.*
- ❑ *This product should only be connected to the devices specified in this guide. Connecting other devices could cause damage, fire or explosion.*
- ❑ *Do not attempt to wire this product other than as described in this document. Improper wiring could cause damage, fire or explosion.*
- ❑ *Never disassemble or modify this product. Tampering with this product may result in injury, fire, or electric shock.*
- ❑ *Do not use in locations subject to high temperature, humidity or dust levels. Excessive temperature, humidity or dust may cause equipment damage, fire, or shock.*
- ❑ *Never connect a public telephone line to the modular connector on this product.*
- ❑ *Parts on the circuit board may become hot during operation. Therefore, wait approximately 10 minutes after turning the power off before touching them.*
- ❑ *To prevent the possibility of electrical shock, do not perform installation or connect cables during a thunderstorm.*

Confidential

Unpacking

- ❑ UB-E01
- ❑ Screw × 2 [only for the plate with round holes (C8238310000A/C8238320000A)]
- ❑ UB-E01 User's Manual

Part Names



Note: This photograph shows the TM-H6000 printer with the UB-E01 installed.

Functions

The switch and LEDs of the UB-E01 provide you with important information on operation and status of the UB-E01.

Switch

Type: Non-locking push switch

You can do the following with the switch.

- ❑ Setting initialization
Turning on the power while pressing the switch and continuing to hold the switch for 5 seconds sets all the parameters of internal settings for the UB-E01 to the factory default values.
- ❑ Status sheet printing
When the printer is ready to print, holding the switch down for more than 3 seconds causes the printer to print the internal setting parameters of the UB-E01.

LEDs

The LEDs show the operating status of the UB-E01.

**Note:**

Be sure not to push the LEDs instead of the switch by accident. The LEDs might be damaged.

Status	LED (Green)	LED (Red)
Power Off	Off	Off
Hardware error	Off	On
CPU test error	Off	1 blink
Printer reset error	On	6 blinks
Waiting	On	Off
Data or status sheet printing	Slow blinking	Off
Download mode	Slow simultaneous blinking	
Downloading	Blinking alternately	
Initializing	Fast simultaneous blinking	
Packets transmission and reception	Fast blinking	Off

UB-E01 Installation

Install the UB-E01 following the steps below. There are two types of plate for the board. One has round screw holes and the other has U-shaped screw holes. The installing procedure is different between these types.

Plate with U-shaped screw holes: C8238310100B/C8238320100B

Plate with round screw holes: C8238310000A/C823832000A

**CAUTION:**

Before installing the UB-E01, be sure to make the reset signals of the parallel interface specification for your printer effective. Refer to the Specifications of the printer for the detailed DIP switch settings.

Before installing, disconnect the Power Unit from the TM Printer (as well as turning the power switch off). Even when the power switch is off, voltage is still present at some points on the circuit board. Changing components while the Power Unit is connected can cause damage to the UB-E01 and the printer.

1. Be sure that the power unit is disconnected from the printer and the power for the printer and host computer is turned off.

Confidential

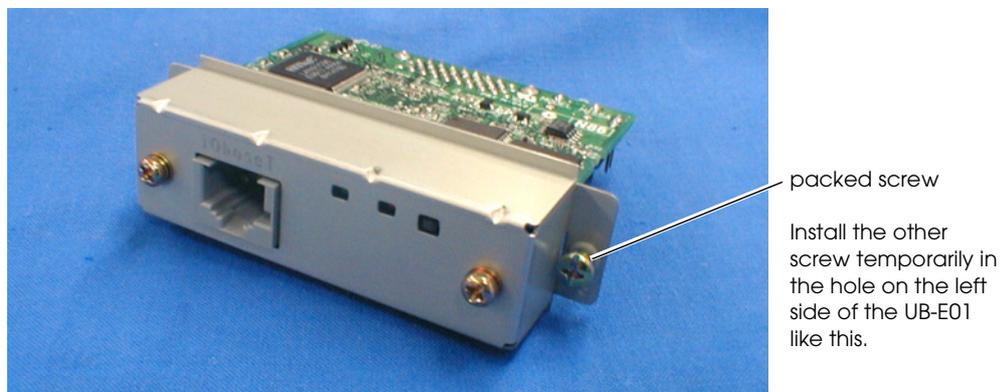
- For installing, if an interface circuit board is already installed in the TM printer, remove it.

For the plate with U-shaped screw holes, re-use the screws when mounting the UB-E01. For the plate with round screw holes, do not re-use the screws when mounting the UB-E01; use the screws packed in the box.



- Install the UB-E01 in the printer. For the plate with round screw holes, note the following.

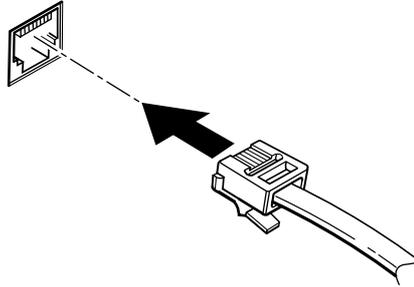
Install the two screws packed in the box temporarily in the screw holes of the UB-E01. Make sure that these screws are not crooked. The mounting holes on the UB-E01 are not threaded at the time of shipping. The threads are cut when installing the UB-E01 with the supplied (self-tapping) screws.



- Tighten the screws.



5. Plug the 10BASE-T cable into the 10BASE-T Ethernet connector of the UB-E01 until it clicks.



⚠ CAUTION:

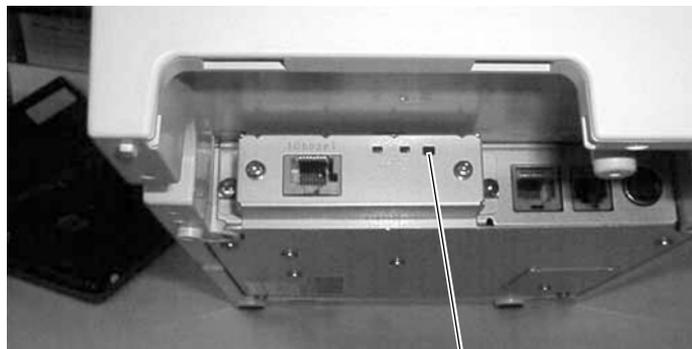
Be sure not to connect a telephone line, display module connector, or drawer kick-out connector to the 10BASE-T Ethernet connector of the UB-E01.

The display module connector on the TM printer cannot be used when the UB-E01 is installed.

6. Connect the power unit to the printer.

✎ Note:

When initializing the UB-E01 by turning off the power and then turning it back on or by resetting the printer, there is a waiting time until the network starts operating. During this time, all the communicating functions of the network do not work. The waiting time is approximately 20 seconds.



Switch

7. Print a status sheet to check whether the UB-E01 is installed correctly by holding the switch down for more than 3 seconds. The version of the UB-E01 and its settings are printed.

Confidential

Initializing UB-E01 and Status Sheet Printing

When initializing the UB-E01 after installing or replacing it, be sure to follow the steps below:

Initialize and print the status sheet, following the steps below:

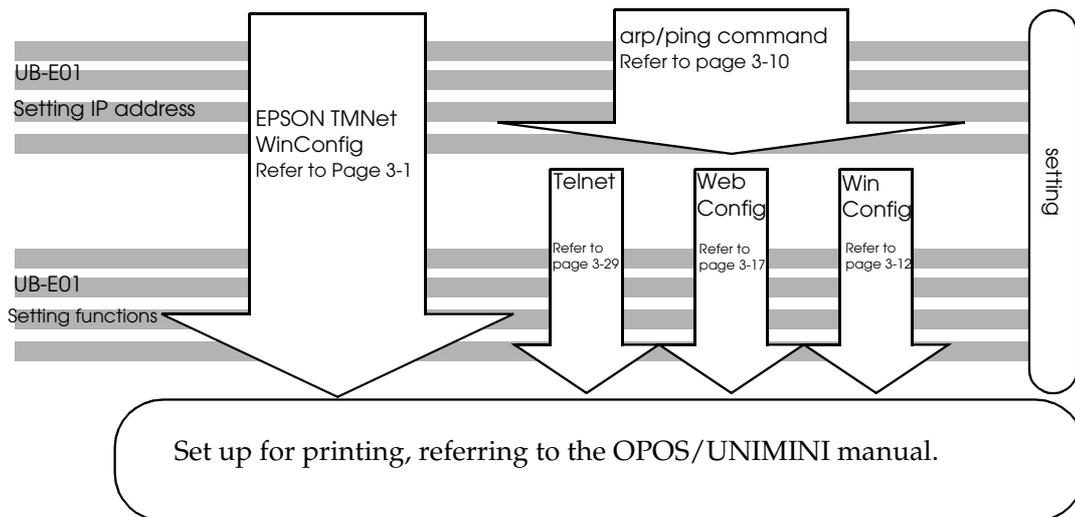
1. Turn off the printer power. Be sure to confirm that the LED lights are off.
2. Turn on the printer power while pressing the switch and hold the switch down for more than 5 seconds.
3. When both LEDs, green and red, start blinking simultaneously, release the switch. When the LEDs stop blinking, the initialization is finished.
4. After the initialization, please wait for 20 seconds; then print the status sheet by holding the switch for more than 3 seconds. During the initialization, the LED (green) blinks slowly. If the initialization is done correctly, the following is printed on the status sheet.
 - Version of UB-E01
 - IP address

Chapter 3

Utilities

Setting the IP Address

To use the UB-E01 with TCP/IP, you first need to set its IP address. You can set the IP address by using the EPSON TMNet WinConfig or arp/ping command.



Setting the IP Address using EPSON TMNet WinConfig

Follow the steps below.

1. Set the TCP/IP of your operating system.
2. Install the EPSON TMNet WinConfig.
3. Set the IP address using EPSON TMNet WinConfig.

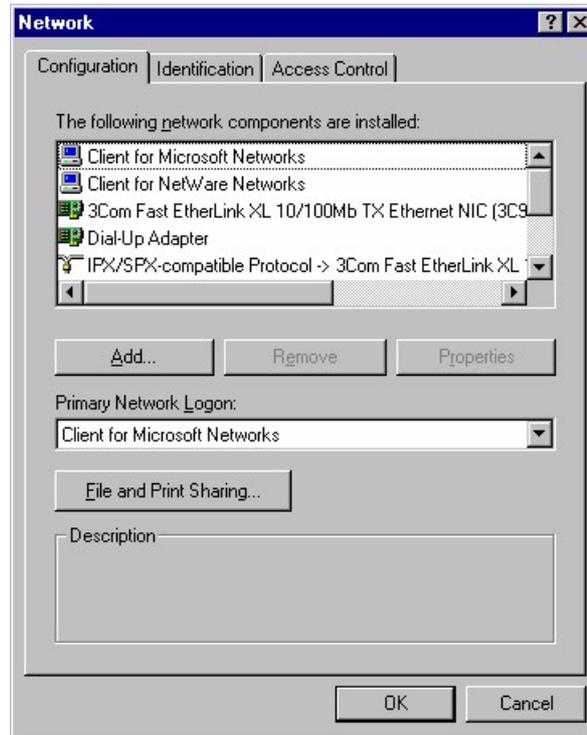
Setting the TCP/IP protocol in Your Operating System

To set the IP address, you need to install the TCP/IP protocol in your operating system. How to set the TCP/IP protocol is explained for Windows 95, Windows 2000, and Windows NT 4.0.

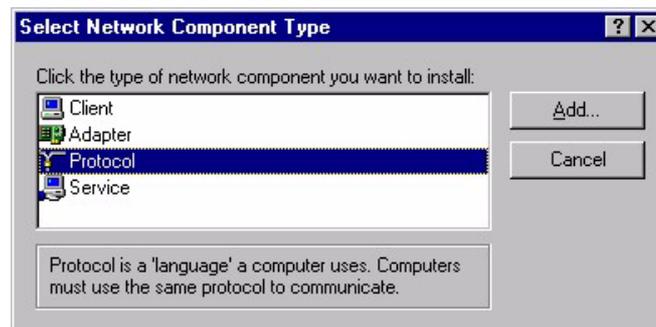
Confidential

Windows 95

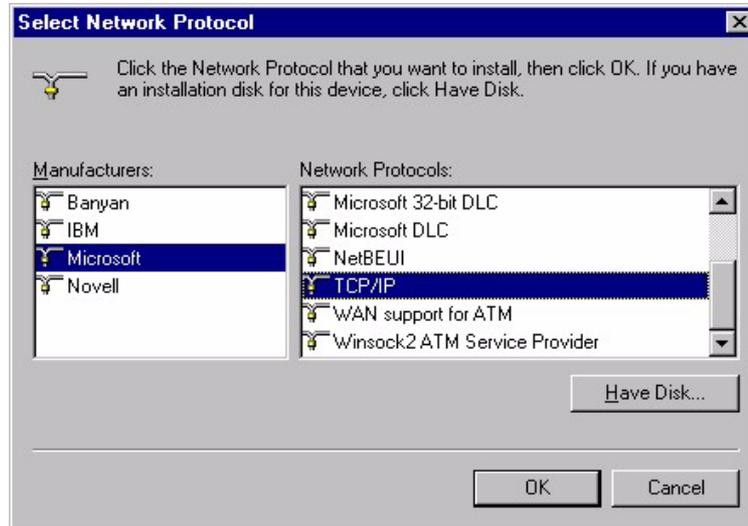
1. Double-click the Network icon in the Control Panel; then check whether TCP/IP is in the list of installed network components on the Configuration menu. If it is already installed, click Cancel and skip to the Installing TMNet WinConfig section. If TCP/IP is not in the list, click Add.



2. Select Protocol and click Add.



3. Select Microsoft from the list of manufacturers and TCP/IP from the Network protocols list. Then click OK.



4. Double-click TCP/IP on the Configuration menu to open the TCP/IP Properties dialog box. Make necessary settings, such as the IP address and subnet mask. Ask your network administrator for the settings such as the IP address.

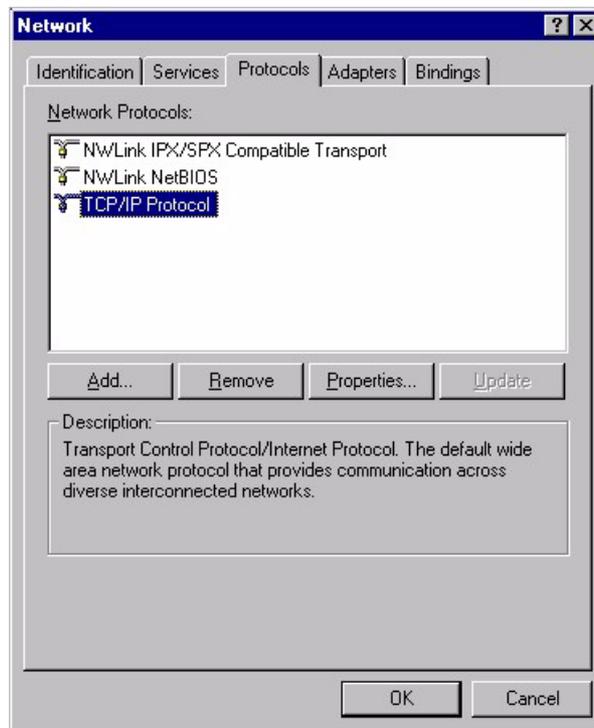
 **Note:**

After the TCP/IP is installed, restart your computer and move on to the Installing EPSON TMNet WinConfig section.

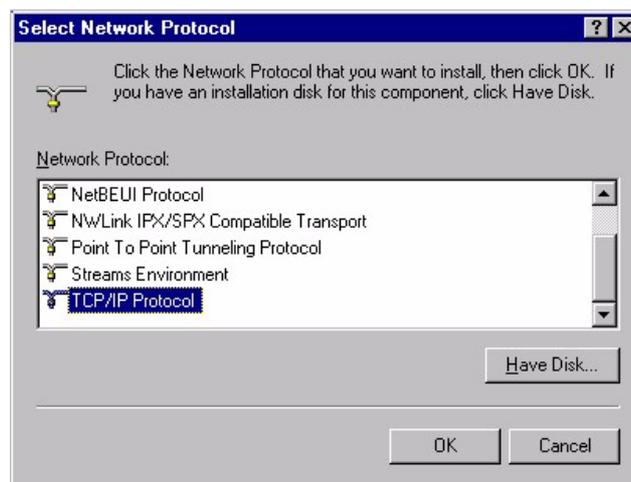
Confidential

Windows NT 4.0

1. Double-click the Network icon in the Control Panel to check whether the TCP/IP Protocol is installed. If it is already installed, click **Cancel** and skip to the Installing TMNet WinConfig section. If the component is not installed, click **Add**.



2. Select the TCP/IP protocol and click **OK**.



3. If you continue installing the TCP/IP protocol, the TCP/IP Configuration dialog box appears, and you can set the IP address. Ask your network administrator for your IP address.

**Note:**

To check the IP address which has already been assigned, click the Protocols tab in the Network dialog box, select TCP/IP Protocol, and then click the Properties button.

4. When the installation is complete, check items such as the IP address to make sure they have been entered correctly.

**Note:**

After the TCP/IP is installed, restart your computer and move on to the Installing EPSON TMNet WinConfig section.

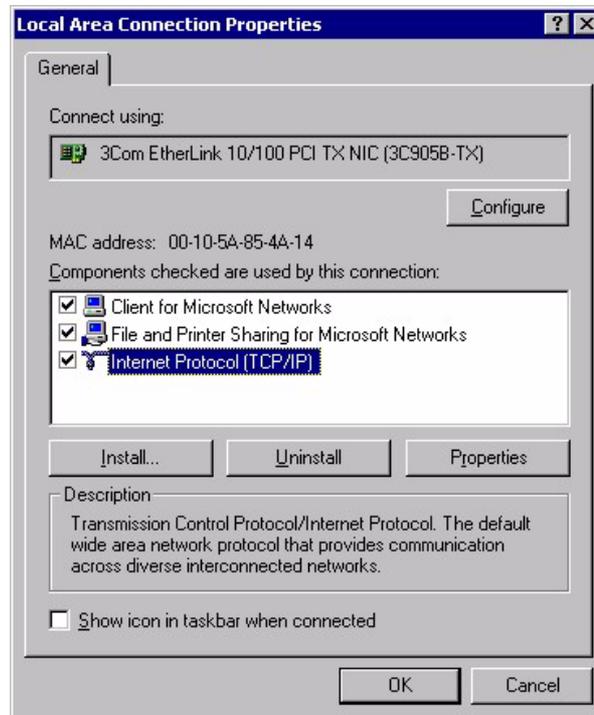
Windows 2000

1. Double-click the Network and Dial Set Up icon in the Control Panel; then click Local Area Connection Status.



Confidential

2. Click Properties and check whether the Internet Protocol (TCP/IP) check box is checked. If not, click the check box.



Note:

After the TCP/IP is installed, restart your computer and move on to the Installing EPSON TMNet WinConfig section.

Installing EPSON TMNet WinConfig



Note:

After the EPSON TMNet WinConfig is installed, if you add or remove protocols or services, the EPSON TMNet WinConfig might not work correctly. In this case, uninstall the EPSON TMNet WinConfig and reinstall it.

Please contact the dealer where you purchased the product to ask for the EPSON TMNet WinConfig utility.

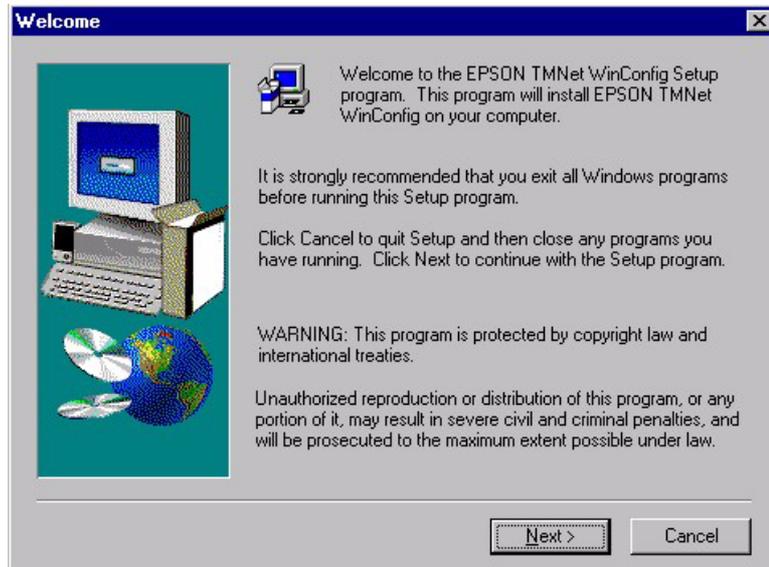
Installation Environments

Your computer should meet the following conditions:

- The hard disk must have unused memory of 3 MB or more.
- The operating system must be one of the following:
Windows 95, Windows 98, Windows 2000, Windows NT 4.0.
- IBM PC/AT compatible with the operating systems mentioned above.

Installation with Windows 95

1. Unzip the file and start Setup.exe.
2. Install the EPSON TMNet WinConfig, following the instructions shown on your display.



3. When the installation is finished, click a check box, if necessary and then click Finish.



Confidential

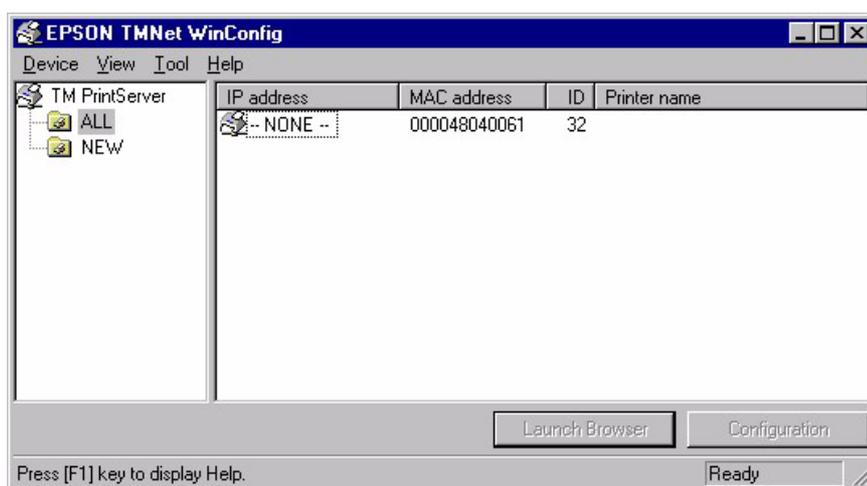
Setting with the EPSON TMNet WinConfig

CAUTION:

Be sure not to turn off the printer or send printing data to the printer while setting. Do not use the same IP address as that of other network devices or PCs.

Windows 95

1. Make sure Windows is running, the UB-E01 is connected to the network, and the printer is turned on.
2. Click Start, point to Programs, point to EPSON TMNet WinConfig; then click EPSON TMNet WinConfig.
3. Click the printer where you want to set the IP address, and then click the Configuration button. (You might wait for 10 seconds or more to view the UB-E01 over the network on your screen.)



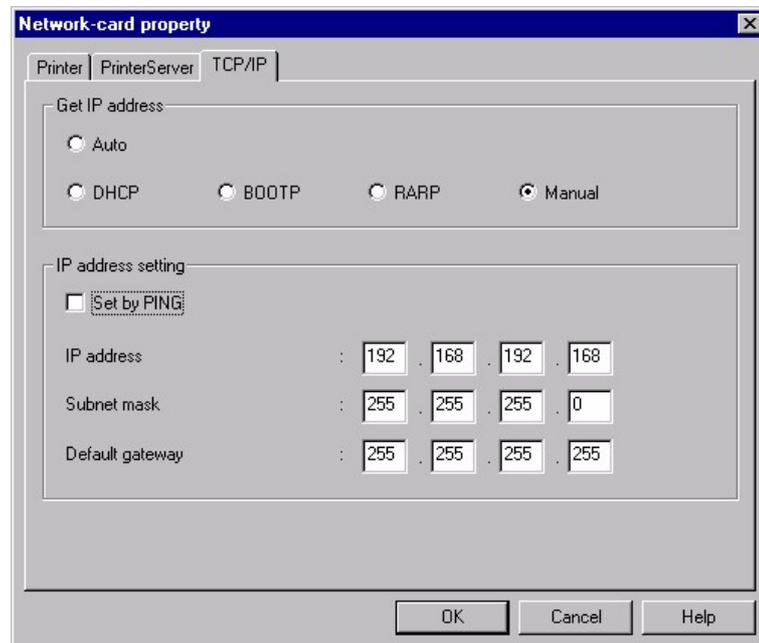
Note:

If you have connected more than one printer to the network and do not know for which printer you want to set the IP address, you can check the printer by finding out the MAC address of the UB-E01. The MAC address can be found on the status sheet or a label on the circuit board of the UB-E01. For printing the status sheet, refer to the *Initializing UB-E01 and Status Sheet Printing* section in Chapter 2.

CAUTION:

When you check the MAC address on the UB-E01 circuit board, be sure to finish the TM Net WinConfig by clicking **Close** from the **Device** tab, turn off the printer, and then remove the circuit board.

4. Double-click the TCP/IP tab.



Under Get IP address, select one of the following: Manual, RARP, BOOTP, or DHCP.

**Note:**

To use RARP, BOOTP, or DHCP, a server for each protocol is necessary. If there is no corresponding server, do not use any of these settings. See your network operating system documentation for the settings.

5. Assign the IP address, the Subnet mask, and the Default gateway. If you use DHCP to acquire an IP address, you cannot assign these items. Ask your administrator for the IP address and the Default gateway to be set.

**CAUTION:**

Be sure that the Set by PING box is turned on if a setting by ping or arp command is permitted.

**Note:**

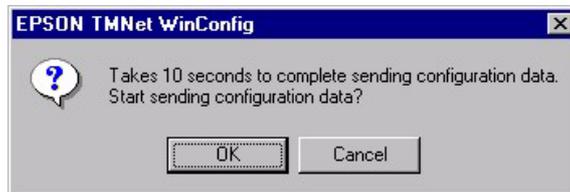
The default IP address is 192.168.192.168. and the default Subnet mask and the default gateway are 255.255.255.255.

If a server or router acts as a gateway, type the gateway address.

6. Click the OK button.

Confidential

- Click the OK button again to be sure.



- Enter the password set in the print server; then click OK. If the password is not set, just click OK without entering the password.



CAUTION:

After clicking OK, you must not turn off the printer while the new settings are being sent to the UB-E01.

- The update is complete when the message “Configuration is successfully done” appears.



Note:

To get the information for the UB-E01 for the other segments, refer to the EPSON TMNet WinConfig Functions section.

Setting the IP Address Using the arp/ping Command

You can set the IP Address using the arp/ping command. This way of setting is available with the host, which is in the same segment as that of the UB-E01.

CAUTION:

When setting the IP address of the UB-E01, do not use the same IP addresses as that of other network devices or PCs.

Here is an example of setting the IP address to 192.168.100.201.

- ❑ You will set the gateway address to the computer in which you will input the arp/ping command.
- ❑ If a server or router acts as a gateway, type the gateway address.
- ❑ If there is no gateway, type the IP address of your computer.
- ❑ If you do not know the gateway address, ask your network administrator for it.

**Note:**

The IP address cannot be set without setting the gateway address.

1. Connect the printer with the UB-E01 installed to the network and turn on the printer.
2. Execute the commands as described in the following steps.

**Note:**

Be sure to execute the commands within 2 minutes. After 2 minutes, you must restart the commands from the beginning.

3. Make the connection between the IP address which you want to set and the MAC address of the UB-E01 by executing an arp command.
 - From the command line, type: arp-s (IP address) (MAC address)
Example using DOS: arp-s 192.168.100.20100-00-48-83-00-00
Example using UNIX: arp-s 192.168.100.20100:00:48:83:00:00

**CAUTION:**

To check the MAC address on the label of the circuit board, turn off the printer and then remove the board.

**Note:**

The MAC address can be found on the status sheet or a label on the circuit board of the UB-E01. For printing the status sheet, refer to the Initializing UB-E01 and Status Sheet Printing section in Chapter 2.

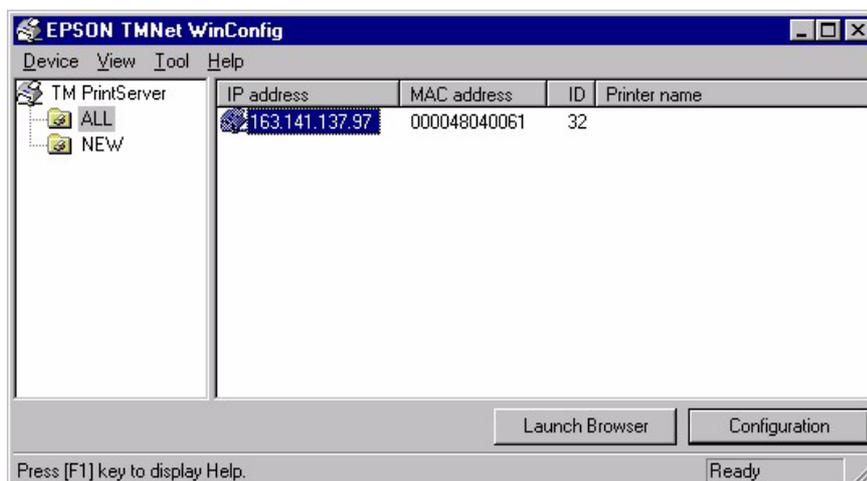
4. Set the IP address to the UB-E01 using the ping command.
 - Example: ping 192.168.100.201
5. If the ping command is successful, the message "Reply From 192.168.100.201: Bytes=32Time<10ms TTL=255" is shown. (The time indication will vary.)
6. Check if the IP address shown is 192.168.100.201.

Now, setting the IP address is complete. Next, set the default gateway and Subnet mask for the UB-E01, referring to the EPSON TMnet WebConfig Functions and Telnet Functions sections.

Confidential

EPSON TMNet WinConfig Functions

This section describes the functions, including options of the EPSON TMNet WinConfig. The main dialog box is shown below.



Item	Explanation
Tree view	The tree structure indicates the printer list. It consists of (All), which indicates everything and (NEW), which indicates the printers newly added.
Item	You can change the order by clicking on an item. You can also adjust the viewing size of the item by dragging a dividing line between the items.
List view	Indicates the information for the UB-E01.
Launch Browser	Select the IP address and then click this button. The EPSON WinConfig appears.
Configuration	Select the IP address and then click this button. The setting window of the EPSON WinConfig appears.

Menu Bar

The table shows each item and its function.

Menu	Sub Menus	Explanation
Device	Setting	Start the setting of the UB-E01 selected
	Launch Browser	Start up the TMNet WebConfig
	Close Applications	Close the TMNet WinConfig
Indication	Update	Find the printers and update the list to show the latest information.

Menu	Sub Menus	Explanation
Tool	Time-out setting	Set the time-out for data transmission and reception to 2 to 120 seconds.
	Find option	Set the IP find option.
Help	Find the topics	Indicate the T MNet WinConfig help.
	Version information	Indicate version information and copyright information.

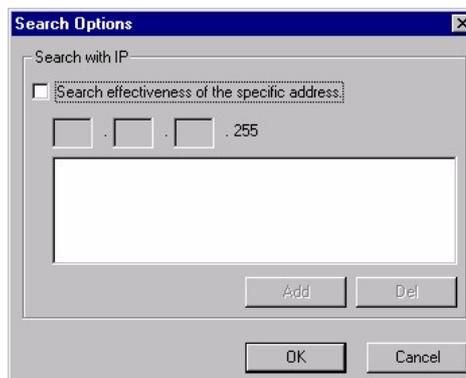
Tool Menu

Use Time-out setting to set the time-out for data transmission and reception. This can be set from 2 to 120 seconds. If the time-out exceeds the value set, a communication error occurs.



Search Options

If you want to show and set a UB-E01 that is controlled by TCP/IP and is outside the local network, input the specific address in the Search Options to find that UB-E01.



Confidential

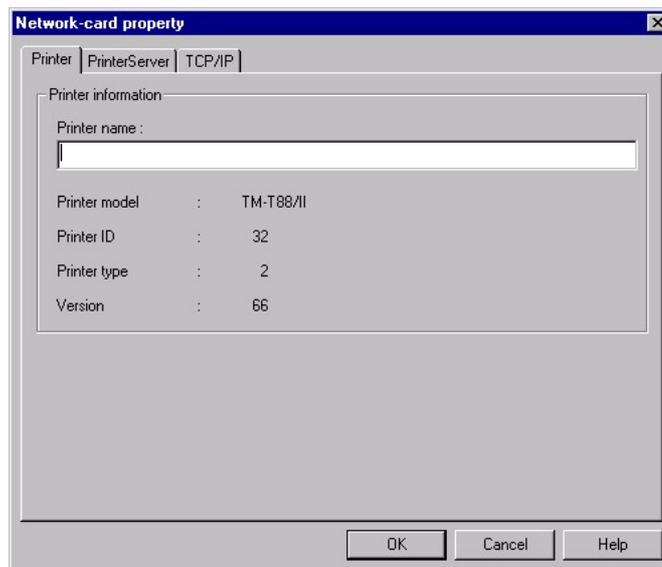
The settings and values stored are effective after executing Update in Indication menu or restarting the EPSON TMNet WinConfig.

Item	Explanation
Enabling a specific address search	Search for the UB-E01 which is outside the network.
IP address	Input an IP address to be searched (0 ~255). Input as follows based on the network classes: Class A: (Input), (255), (255), (255) Class B: (Input), (Input), (255), (255) Class C: (Input), (Input), (Input), (255)
IP address list	Show the IP addresses that have been registered.
Add	Add to the IP address list. Up to 20 addresses can be added. Do not add the local addresses.
Delete	Delete the IP addresses that will not be used.

Settings

Printer

You can set the printer name. This also shows printer information.

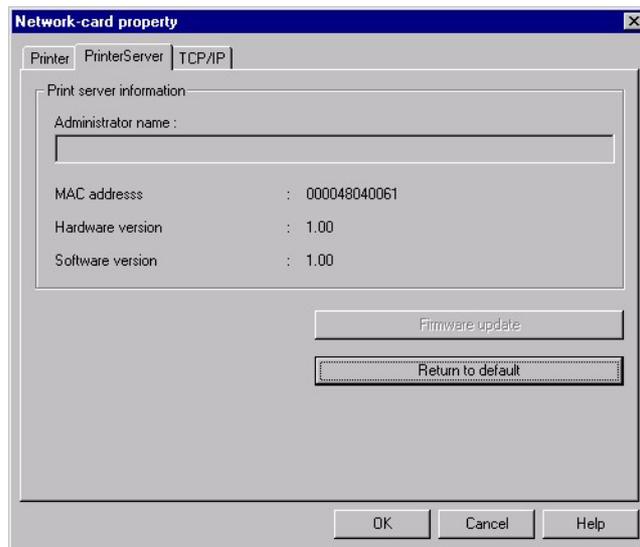


Item	Explanation
Printer name	Set the printer name.
Model name	Shows the printer model name.

Item	Explanation
Printer ID	Shows the printer ID.
Printer type	Shows the printer type.
Version	Shows the ROM version.

Print server

You can set administrator information. This also shows the printer server information

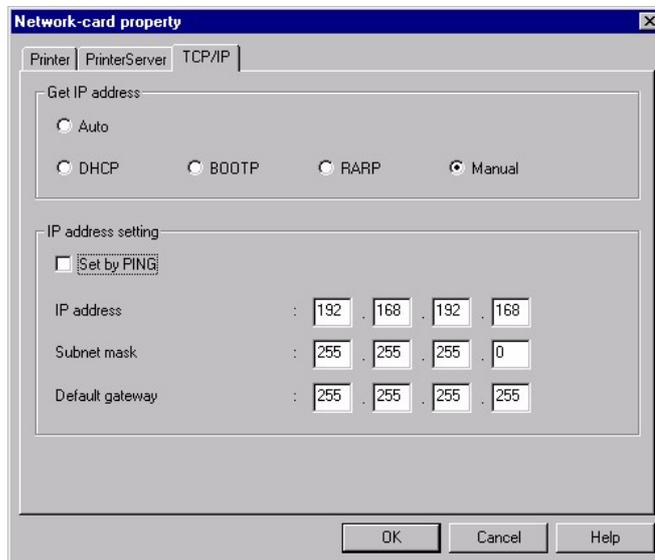


Item	Explanation
MAC address	Set the administrator name.
Hardware version	Shows the version of the UB-E01.
Software version	Shows the version of the UB-E01.

Confidential

TCP/IP

You can set the TCP/IP.



Item	Explanation
Get IP address	Select the way of acquiring an IP address.
Set by PING	Check the box if the setting of the UB-E01 by arg/ping is permitted.
Subnet mask	Set the subnet mask of the IP address.
Default gateway	Set the gateway.
IP address	Set the IP address for the UB-E01.

Password

The EPSON TMNet WinConfig can set a password to protect the UB-E01 settings. The screen shown below appears when you click OK or Return to Default.



- ❑ When you set the password the first time or you change the password, click the Change button. No password is registered until you set one.
- ❑ When you click the Change button, the screen shown below appears. Input the password (up to 20 single-byte alphanumeric characters) and then click OK. Capital and lower-case characters are distinguished.



The image shows a dialog box titled "Administrator password". It contains three text input fields labeled "Old password", "New password", and "Re-input password". Below the fields is a "Note" section with the text: "Note: New password will be effective after completion sending configuration data." At the bottom of the dialog are "OK" and "Cancel" buttons.

CAUTION:

The password is used for both the EPSON TMNet WinConfig and the EPSON TMNet Web Config. When you use either utility, be sure to control the password.

The new password is effective after clicking the OK button to send the configuration data. Right after the setting, using the Administrator password, input the current password.

If you forget your password, you need to return all settings to the default settings. Refer to the Initializing UB-E01 and Status Sheet Printing section in Chapter 2.

EPSON TMNet WebConfig Functions

This section explains each function of the EPSON TMNet WebConfig.

Note:

Launch a browser and input the IP address of the UB-E01. Be sure not to launch the EPSON TMNet WinConfig at the same time.

Address: [http://\(IP address of the UB-E01\)/](http://(IP address of the UB-E01)/)

Note:

Be sure to use Microsoft Internet Explorer 4.0 or later or Netscape Communicator 3.02 or later.

Confidential

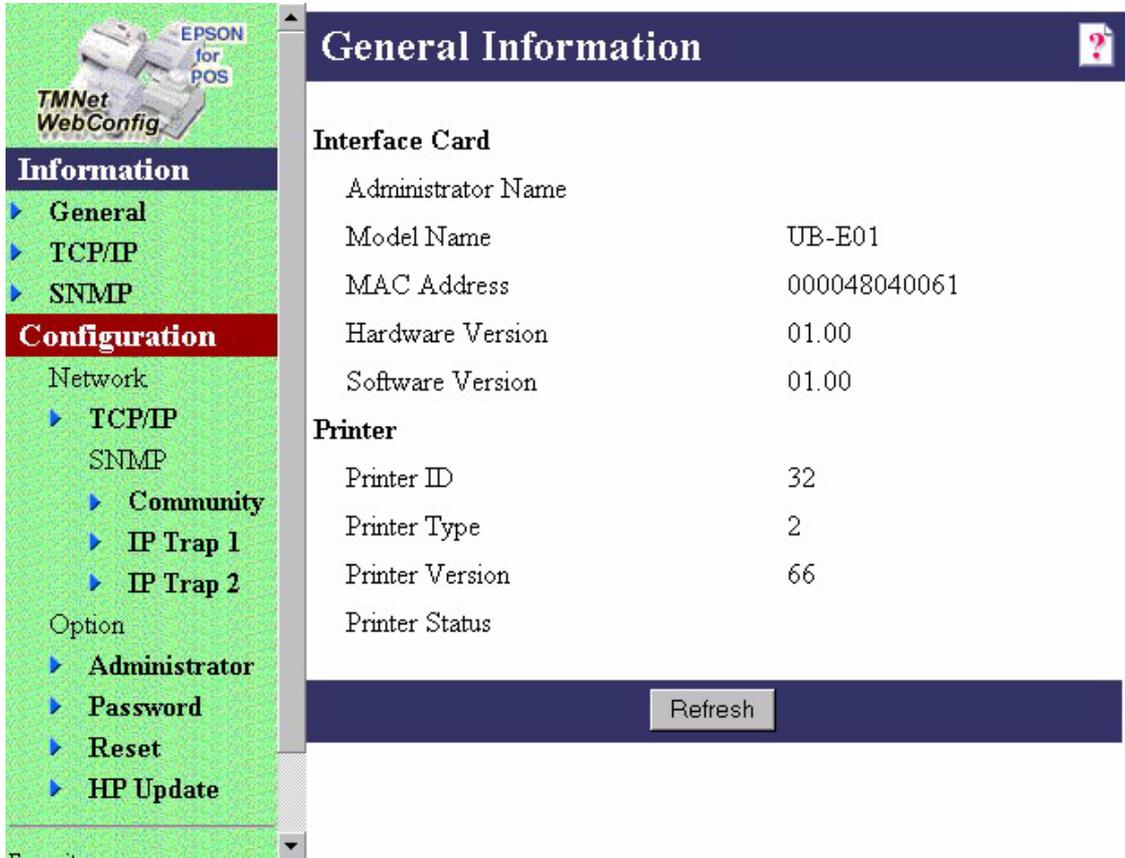
Opening Screen



Item		Explanation
Information	General	Show the UB-E01 information.
	TCP/IP	Show the TCP/IP information of the UB-E01.
	SNMP	Show the SNMP information of the UB-E01.
Configuration Network	TCP/IP	Set the TCP/IP of the UB-E01.
	Community	Set the community.
	IP Trap 1	Set the IP trap 1.
	IP Trap 2	Set the IP trap 2.
Configuration Option	Administrator	Set the banner on the opening screen.
	Password	Set the password to protect the network settings.
	Reset	Reset the UB-E01 or return to the factory default setting.
	Home Page Update	Update the EPSON TMNet WebConfig.

Protocol Information and Settings

General Information



Item	Explanation	
Interface card	Administrator name	Shows the administrator name.
	Model name	Shows the model name of the printer.
	MAC address	Shows the MAC address of the UB-E01.
	Hardware version	Shows the version of the UB-E01.
	Software version	Shows the version of the UB-E01.
Printer	Printer ID	Shows the printer ID.
	Printer type	Shows the type ID of the printer.
	Printer version	Shows the ROM version of the printer.
	Printer status	Shows the printer status.

Confidential

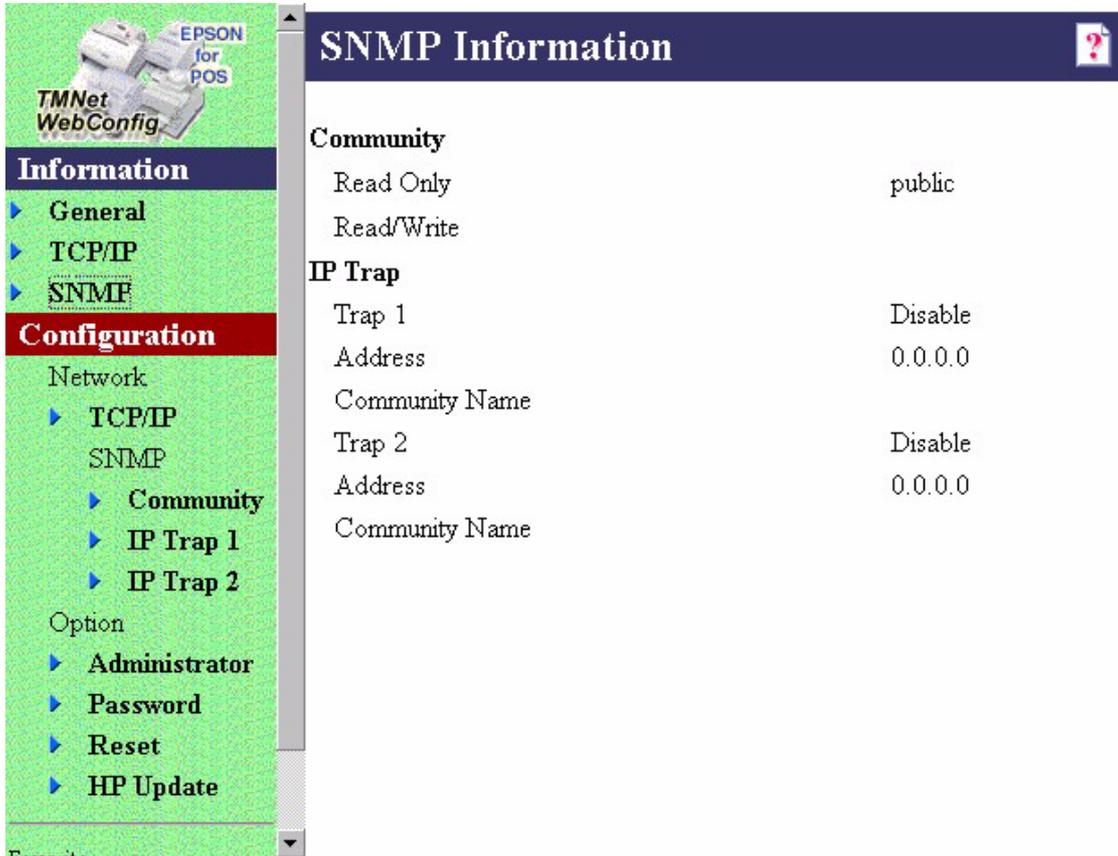
TCP/IP Information

The screenshot displays the 'TCP/IP Information' configuration page in the TMNet WebConfig utility. The left sidebar shows a navigation menu with 'Information' (General, TCP/IP, SNMP) and 'Configuration' (Network: TCP/IP, SNMP, Community, IP Trap 1, IP Trap 2; Option: Administrator, Password, Reset, HP Update). The main content area lists the following settings:

Item	Value
RARP	OFF
BOOTP	OFF
DHCP	OFF
Set by PING	OFF
IP Address	163.141.137.97
Subnet Mask	255.255.0.0
Default Gateway	163.141.137.1

Item	Explanation
RARP	Shows the RARP setting.
BOOTP	Shows the BOOTP setting.
DHCP	Shows the DHCP setting.
Set by PING	Shows the settings of prohibition and permission by the arp/ping command for the UB-E01.
IP Address	Shows the IP address.
Subnet Mask	Shows the subnet mask of the IP address.
Default Gateway	Shows the default gateway.

SNMP Information



Item		Explanation
Community	Read Only	Shows the Read Community information.
	Read/Write	Shows the Read/Write Community information.
IP Trap	Trap 1	Shows the Trap 1 information.
	Address	Shows the Trap 1 Address.
	Community Name	Shows the Trap 1 Community Name.
	Trap 2	Shows the Trap 2 information.
	Address	Shows the Trap 2 Address.
	Community Name	Shows the trap 2 Community Name.

Confidential

TCP/IP Setting

Information

- General
- TCP/IP
- SNMP

Configuration

Network

- TCP/IP**
- SNMP
 - Community
 - IP Trap 1
 - IP Trap 2

Option

- Administrator
- Password
- Reset
- HP Update

TCP/IP Setting

Get IP Address: Manual

Set by PING: OFF

IP Address: 163.141.137.97

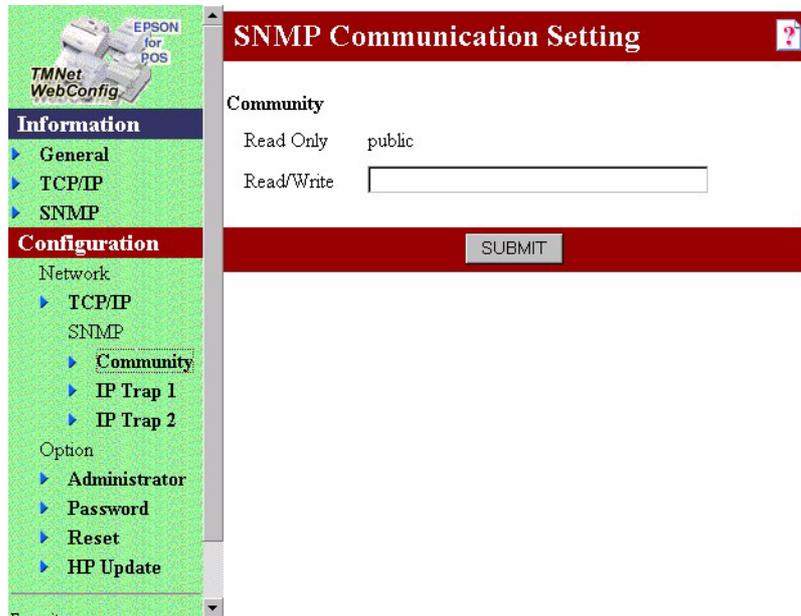
Subnet Mask: 255.255.0.0

Default Gateway: 163.141.137.1

SUBMIT

Item	Explanation
Get IP Address	Select the method of acquiring the IP address.
Set by PING	Select when the setting of the UB-E01 by arp/ping is permitted.
IP Address	Set the IP address of the UB-E01.
Subnet Mask	Set the subnet mask of the IP address.
Default Gateway	Set the default gateway.

SNMP Communication Setting



Item	Explanation	
Community	Read Only	The setting is fixed to "Public."
	Read/Write	Set the Read/Write Community Name (up to 32 characters).

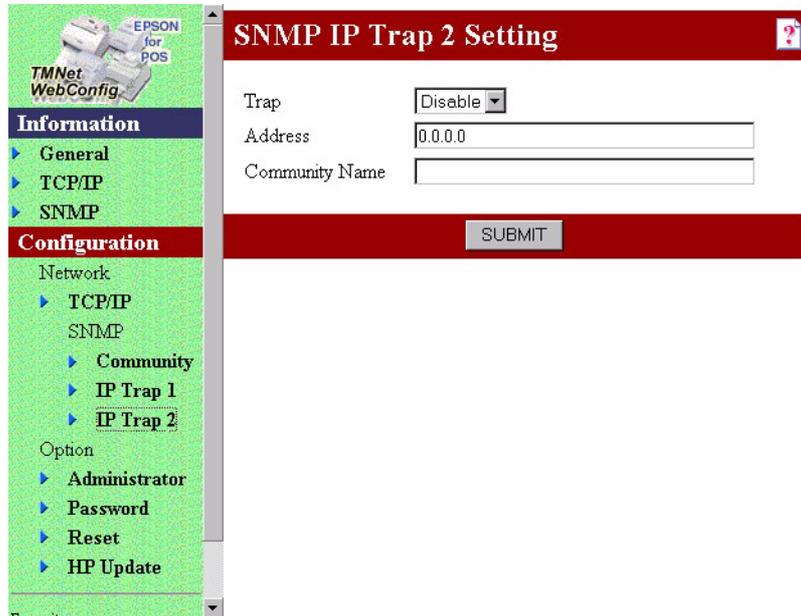
Confidential

SNMP IP Trap 1 Setting

The screenshot shows the 'SNMP IP Trap 1 Setting' page in the TMNet WebConfig utility. The left sidebar contains a navigation menu with 'Information' (General, TCP/IP, SNMP) and 'Configuration' (Network: TCP/IP, SNMP, Community, IP Trap 1, IP Trap 2; Option: Administrator, Password, Reset, HP Update). The main content area has a red header with a help icon. Below the header, there are three fields: 'Trap' (a dropdown menu set to 'Disable'), 'Address' (a text box containing '0.0.0.0'), and 'Community Name' (an empty text box). A red bar at the bottom contains a 'SUBMIT' button.

Item	Explanation
Trap	Set Trap 1.
Address	Set the Trap 1 Address.
Community Name	Set the Trap 1 Community Name.

SNMP IP Trap 2 Setting



Item	Explanation
Trap	Set Trap 2.
Address	Set the Trap 2 Address.
Community Name	Set the Trap 2 Community Name.

Confidential

Administrator Setting

The screenshot shows the 'Administrator Setting' page. The left sidebar is green and contains a tree view of settings. The 'Administrator' option under 'Option' is selected. The main content area is white with a red header. It contains four input fields: 'Administrator Name', 'Favorite Name' (containing 'Favorite'), 'Favorite URL' (containing 'http://'), and 'Description'. A red bar at the bottom contains a 'SUBMIT' button.

Item	Explanation	
Administrator Name	Set the administrator name.	
Favorite	Favorite Name	Set the name shown on a banner.
	Favorite URL	Set the address linked to a banner.
	Description	Set comments about the links.

Password Setting

The screenshot shows the 'Password Setting' page in the TMNet WebConfig interface. The left sidebar is divided into 'Information' and 'Configuration' sections. Under 'Information', there are links for 'General', 'TCP/IP', and 'SNMP'. Under 'Configuration', there are sub-sections for 'Network' (TCP/IP, SNMP, Community, IP Trap 1, IP Trap 2) and 'Option' (Administrator, Password, Reset, HP Update). The main content area features a red header with the title 'Password Setting' and a help icon. Below the header, there are three text input fields: 'Old Password', 'New Password', and 'Re-input Password'. A red bar at the bottom of the main content area contains a 'SUBMIT' button.

Item	Explanation
Old Password	Input the old password.
New Password	Input the new password.
Re-input Password	Re-input the new password.

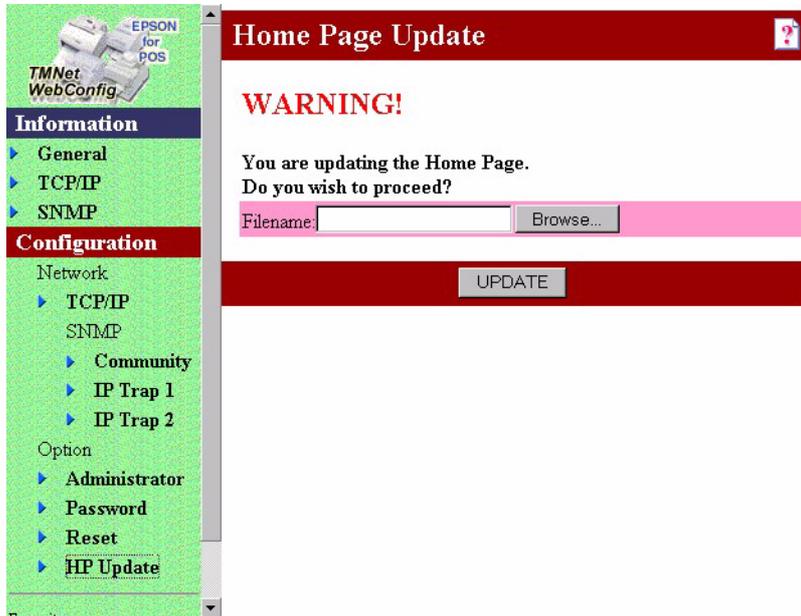
Confidential

Reset



Item	Explanation
Reset	Resets the UB-E01 to its status when the power was turned on.
Factory Default	Returns to the factory default settings.

Home Page Update



Item	Explanation
Filename	Shows the location of the updated file of the EPSON TMNet WebConfig .
Update	Starts to update using the file specified in "Filename."

Telnet Functions

After you have set the IP address of the UB-E01 using the EPSON WinConfig or the arp/ping command, you can make changes to the IP address or other settings using telnet.

CAUTION:

When you connect to the IP address using telnet, you need to set the IP address of the UB-E01. Once you make changes to the UB-E01, wait until the process is complete before turning off the printer or sending data to the printer.

Confidential

Connecting

When you connect to the IP address using telnet, the screen shown below appears. If you have set the password for the UB-E01 by using EPSON WinConfig, input the password. If the password has not set, press the Enter key.

```
Connected to Cheetah!  
  
Password:
```

Main Menu

```
MAIN  
1. TCP/IP  
2. HARDWARE  
3. PASSWORD  
Q. QUIT (DISCONNECT)
```

Item	Explanation
TCP/IP	Set the TCP/IP for the UB-E01.
HARDWARE	Shows the hardware information.
PASSWORD	Set the password.
QUIT (DISCONNECT)	Quit the telnet connection.

TCP/IP Setting Menu

```
1) TCP/IP  
  1. IP ADDRESS  
  2. SUBNET MASK  
  3. GATEWAY ADDRESS  
  4. ARP/PING  
  5. RARP  
  6. BOOTP  
  7. DHCP  
  
(ESC). PREVIOUS SCREEN
```

Item	Explanation
IP ADDRESS	Set the IP address of the UB-E01.
SUBNET MASK	Set the subnet mask of the UB-E01.
GATEWAY ADDRESS	Set the gateway address.
ARP/PING	Set the permission or prohibition of the IP address setting using the arg/ping command.
RARP	Set the RARP.
BOOTP	Set the BOOTP.
DHCP	Set the DHCP.
PREVIOUS SCREEN	Press the ESC key to return to the main menu.

Hardware Menu

2) HARDWARE 1. VERSION INFORMATION 2. ETHERNET ADDRESS (ESC). PREVIOUS SCREEN

Item	Explanation
VERSION INFORMATION	Show the hardware and software versions of the UB-E01.
ETHERNET ADDRESS	Show the MAC address of the UB-E01.
PREVIOUS SCREEN	Press the ESC key to return to the main menu.

Confidential

Chapter 4

Programming Samples

This chapter describes the following:

- ❑ Method of printing to the UB-E01
- ❑ Direct printing by PORT9100
- ❑ Commands sent to a TM printer when the power is on
- ❑ Monitoring of the ASB status
- ❑ The rights of printing
- ❑ Time-out for connection
- ❑ Printer operation by UDP commands
 - Command packets
 - 03-0000:retrieving the basic information
 - 03-0010:retrieving the status
 - 03-0011: forced transmission
 - 03-0012: reset
 - 03-0013: buffer flash
 - Programming sample

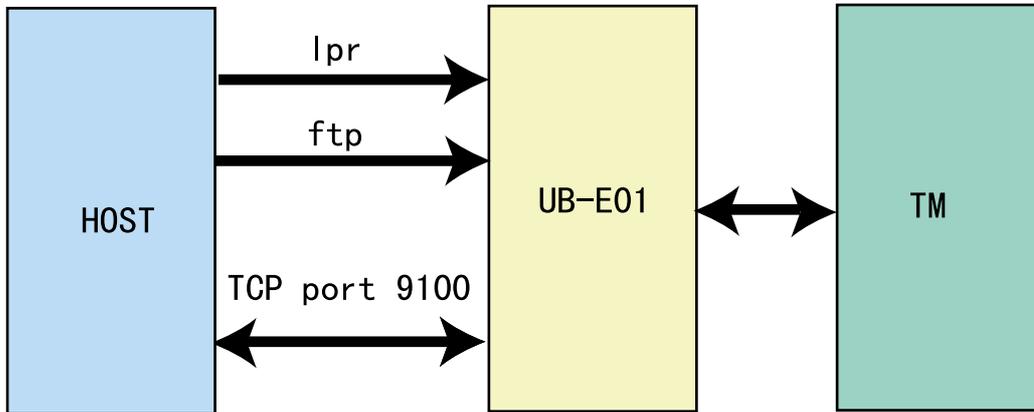
Method of Printing to the UB-E01

The UB-E01 is equipped with lpr and ftp protocols as general print protocols. It is easy to print by using lpr or ftp protocols because the printing is also supported by the operating system.

However, the command statuses sent by the printer are ignored because the printing by lpr or ftp applies only to output of the printer.

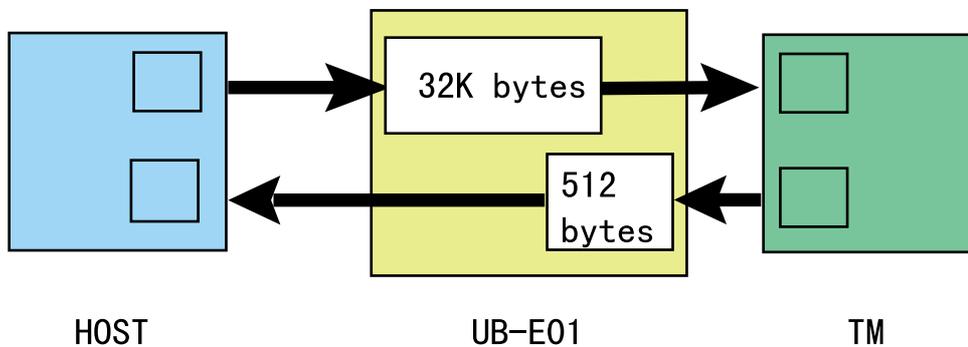
Confidential

The UB-E01 supports direct printing by TCP PORT9100. It is possible to control the printer directly by an application with the ESC/POS commands through writing and reading to the TCP PORT9100.



Buffer of the UB-E01

This is an image of the buffer. The buffer sent from the host computer to the TM printer is 32 KB. The buffer sent from the TM printer to the host computer is 512 bytes.



Direct Printing by PORT9100**For Windows Console**

The program is a sample of printing "EPSON UB-E01" to a TM printer with the UB-E01 from the Windows shell, through the ethernet connection.

```
/* TCP9100 programming sample for Win32
 * HOW TO BUILD
 * cl tcp9100.c wsock32.lib
 */
#include <stdio.h>
#include <winsock.h>

int main(int argc, char* argv[])
{
    WSADATA data;
    SOCKET sock;
    struct sockaddr_in addr;

    if (argc != 2) {
        printf("usage: tcp9100 IP_ADDRESS\n");
        exit(1);
    }

    /* Initialize windows sockets */
    WSAStartup(0x0101, &data);
    /* Create sockets */
    if ((sock = socket(AF_INET, SOCK_STREAM, 0)) == INVALID_SOCKET) {
        fprintf(stderr, "Error socket(): %d\n", WSAGetLastError());
        exit(1);
    }

    /* initialize the parameter */
    memset(&addr, 0, sizeof(addr));
    addr.sin_family = AF_INET;
    addr.sin_port = htons(9100);
    addr.sin_addr.s_addr = inet_addr(argv[1]);

    /* connect */
    if (connect(sock, (struct sockaddr*)&addr, sizeof(addr)) < 0) {
        fprintf(stderr, "Error connect(): %d\n", WSAGetLastError());
        exit(1);
    }
    printf("connected\n");

    /* send data */
    send(sock, "\x1b@EPSON\x0a", 8, 0);

    /* close socket */
    closesocket(sock);
    return 0;
}
```

Confidential

For Linux

The program is a sample of printing "EPSON UB-E01" to a TM printer with the UB-E01 from the Windows shell, through the ethernet connection.

```
/* TCP9100 programming sample for linux
 * HOW TO BUILD
 * cc tcp9100.c
 */
#include <stdio.h>
#include <string.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <netdb.h>

int main(int argc, char* argv[])
{
    int sockfd;
    struct sockaddr_in addr;
    if (argc != 2) {
        printf("usage: tcp9100 IP_ADDRESS\n");
        exit(1);
    }

    /* create socket */
    sockfd = socket(AF_INET, SOCK_STREAM, 0);
    if (sockfd < 0) {
        perror("socket()");
        exit(1);
    }

    /* initialize the parameter */
    memset(&addr, 0, sizeof(addr));
    addr.sin_family = AF_INET;
    addr.sin_port = htons(9100);
    addr.sin_addr.s_addr = inet_addr(argv[1]);

    /* connect */
    if (connect(sockfd, (struct sockaddr*)&addr, sizeof(addr)) < 0) {
        perror("connect()");
    }
    printf("connected\n");

    /* send data */
    send(sockfd, "EPSON UB-E01\x0a", 13, 0);
    /* close socket */
    close(sockfd);
    return 0;
}
```

Commands Sent to a TM Printer When the Power is On

When the power is turned on, the UB-E01 transmits the following commands to the TM printer and maintains the statuses. The UB-E01 acquires printer information by **GS I** and monitors the printer status through the TMNet WebConfig using the **GS a 255** command.

ESC/POC command descriptions:

- **GS I 1**: printer ID
- **GS I 2**: printer type ID
- **GS I 3**: printer ROM version ID
- **GS a FFh**: Enables ASB status

Note:

When the power is turned off or the printer is off-line, the commands above are not transmitted.

Monitoring of the ASB status

The UB-E01 monitors the ASB statuses transmitted from TM printers to control the printer statuses from host computers. The printer can know the statuses by remote using the TMNet WinConfig or the TMNet WebConfig.

If the printing data includes commands that disable the ASB such as **ESC @** and **GS a 00h**, the ASB status from the TM printer will not be transmitted afterward when the printer status is changed and the UB-E01 cannot monitor the status of the TM printer.

To monitor the printer status, when there is a command that disables the ASB in a data string sent by an application to the TM printer, transmit a command that enables the ASB.

The Priorities of Printing

The UB-E01 permits up to 3 requests of connecting regardless of the lpr/ftp/port9100 protocol. Printing by the TM printer is given the first priority. Data transmission is blocked for other requests until the first connection is closed (explicit close or close by time-out).

Time-out for Connection

If there is no data transmitted from the host for 5 minutes, regardless of the protocol, lpr/ftp/port9100, the UB-E01 closes the connection. To continue the connection, the host needs to send the UDP command explicitly.

Confidential

Printer Operation by the UDP Commands

By using the UDP commands, the following information can be received in order to recover from abnormal operations and errors.

Function Code	Packet	Function
03-0000	Q	Acquires basic information
03-0010	Q	Acquires status
03-0011	C	Off-line forced transmission
03-0012	C	Reset
03-0013	C	Buffer flash

Commands Packets

Off-set	Size	Packet Transmission	Packet Reply
0	5	Character string "EPSON"	Character string "EPSON"
5	1	Packet type: 'Q': Query 'C': Command	Packet type reply: 'q': Query reply 'c': Command reply
6	1	Device type (0 × 03 fixed)	Device type (0 × 03 fixed)
7	1	Device number (0 × 00 fixed)	Device number (0 × 00 fixed)
8	2	Function number	Function number
10	2	0 × 00, 0 × 00 fixed	Result code
12	2	Length (n)	Length (n)
14	n	Command parameter	Reply data

The following values are replied for the packet reply result codes. Check the results in an application.

- 0000h: Normal end
- FFFEh: No device requested
- FFFFh: Function requested are not supported

03-0000 Retrieving Basic Information**Reply data**

Off-set	Size	Description
14	1	Interface type
15	1	Communication method with TM printer
16	1	Printer ID acquired during a power-on
17	1	Printer type ID acquired during a power-on
18	1	Printer ROM version acquired during a power-on
19	n	Printer name character string (128 bytes)

03-0010 Retrieving Status**Reply data**

Off-set	Size	Description
14	1	Reserved
15	4	ASB
19	4	ASB for Ink
23	4	ASB for optional functions

Confidential

03-0011 Forced Transmission

Transmission is done, regardless of the flow control between the TM printer and the UB-E01.

Set-up data

Off-set	Size	Description
14	1	Flow control 0: With flow control 1: No flow control (forced transmission)
15	2	Data length (n: maximum: 255)
17	n	Data length (maximum: 255)

Reply data

Off-set	Size	Description
14	1	Result 0: Normal !0: Fail
15	2	Data length
17	n	Data string

03-0012 Reset

Set-up data

Off-set	Size	Description
14	1	Reserved (undefined)

Reply data

Off-set	Size	Description
14	1	Result 0: Normal !0: Fail

- To reset the printer, the reset function should be enabled by a DIP switch of the printer.
- The UB-E01 is also reset when the printer is reset.
- After resetting, wait for approximately 20 seconds before accessing to the UB-E01, which is the same as when turning on the power.

03-0013 Buffer Flash**Reply data**

Off-set	Size	Description
14	1	Result 0: Normal !0: Fail

- ❑ This clears only the buffer of the UB-E01 and cannot clear the receive buffer of the printer.

Confidential

Programming Sample

For Windows Console

```
/* UDP3289 programming sample for win32
 * HOW TO BUILD
 * cc udp3289.c
 */
#include <stdio.h>
#include <winsock.h>

#define MAXBUF 512
char buf[MAXBUF];

int main(int argc, char* argv[])
{
    WSADATA data;
    SOCKET sock;
    struct sockaddr_in addr;
    int i, len, fromlen;

    if (argc != 2) {
        printf("usage: udp3289 IP_ADDRESS\n");
        exit(1);
    }

    /* initialize windows sockets */
    WSASStartup(0x0101, &data);

    /* Create sockets */
    if ((sock = socket(AF_INET, SOCK_DGRAM, 0)) == INVALID_SOCKET) {
        fprintf(stderr, "Error socket(): %d\n", WSAGetLastError());
        exit(1);
    }

    /* initialize the parameter */
    memset(&addr, 0, sizeof(addr));
    addr.sin_family = AF_INET;
    addr.sin_port = htons(3289);
    addr.sin_addr.s_addr = inet_addr(argv[1]);

    /* GENERAL INFORMATION PACKET */
    buf[0] = 'E';
    buf[1] = 'P';
    buf[2] = 'S';
    buf[3] = 'O';
    buf[4] = 'N';
    buf[5] = 'Q';
    buf[6] = 0x03; // DeviceType(03h)
    buf[7] = 0x00; // DeviceNumber(00h)
    buf[8] = 0x00; // Function(0000h)
    buf[9] = 0x00;
    buf[10] = 0x00; // Result
    buf[11] = 0x00;
```

```
buf[12] = 0x00; // Parameter length
buf[13] = 0x00;

/* send packet */
i = sendto(sock, buf, 14, 0, (struct sockaddr*)&addr, sizeof(addr));
getchar();

/* receive packet */
fromlen = sizeof(addr);
len = recvfrom(sock, buf, MAXBUF, 0, (struct sockaddr*)&addr, &fromlen);

/* print receive packet */
if (len) {
    if ((buf[10] == 0x00) && (buf[11] == 0x00))
        for (i = 0; i < len; i++)
            printf("%3d:%02Xh\n", i, buf[i]&0xff);
}

/* close socket */
closesocket(sock);
return 0;
}
```

Confidential

For Linux

```
/* UDP3289 programming sample for linux
 * HOW TO BUILD
 * cc udp3289.c
 */
#include <stdio.h>
#include <string.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <netdb.h>

#define MAXBUF 512
char buf[MAXBUF];

int main(int argc, char* argv[])
{
    int sockfd;
    struct sockaddr_in addr;
    int i, len, fromlen;
    if (argc != 2) {
        printf("usage: udp3289 IP_ADDRESS\n");
        exit(1);
    }

    /* create sockets */
    sockfd = socket(AF_INET, SOCK_DGRAM, 0);
    if (sockfd < 0) {
        perror("socket()");
        exit(1);
    }

    /* initialize the parameter */
    memset(&addr, 0, sizeof(addr));
    addr.sin_family = AF_INET;
    addr.sin_port = htons(3289);
    addr.sin_addr.s_addr = inet_addr(argv[1]);

    /* GENERAL INFORMATION */
    buf[0] = 'E';
    buf[1] = 'P';
    buf[2] = 'S';
    buf[3] = 'O';
    buf[4] = 'N';
    buf[5] = 'Q';
    buf[6] = 0x03; // DeviceType(03h)
    buf[7] = 0x00; // DeviceNumber(00h)
    buf[8] = 0x00; // Function(0000h)
    buf[9] = 0x00;
    buf[10] = 0x00; // Result
    buf[11] = 0x00;
    buf[12] = 0x00; // parameter length Length
    buf[13] = 0x00;
```

```
/* send packet */
i = sendto(sockfd, buf, 14, 0, &addr, sizeof(addr));
getchar();

/* receive packet */
fromlen = sizeof(addr);
len = recvfrom(sockfd, buf, MAXBUF, 0, &addr, &fromlen);

/* print receive packet */
if (len) {
    if ((buf[10] == 0x00) && (buf[11] == 0x00))
        for (i = 0; i < len; i++)
            printf("%3d:%02Xh\n",i,buf[i]&0xff);
}

/* close socket */
close(sockfd);
return 0;
}
```

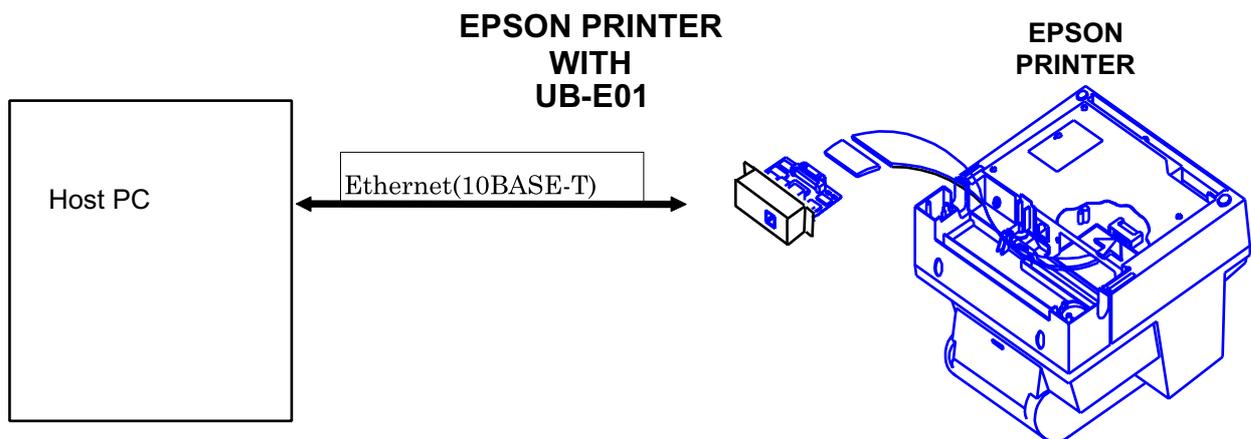
Confidential

Chapter 5

Specifications

Structure

The UB-E01 can be installed in the TM-series printers as an interface board to provide 10 Base-T communications.



Printer Connection

The interface board can be installed in TM-series printers that support the universal interface board system.

Line Display Connection

When the UB-E01 is connected, the DM connector on the TM unit cannot be used. Refer to the Supported TM Printers section in Chapter 1.

Features

Overview

- ❑ 10 BaseT Ethernet
- ❑ Complies with TCP/IP protocol (LP, LPR, FTP, and socket communications)
- ❑ The interface board system can be connected to a variety of TM printers with the universal interface
- ❑ Board size: 70 × 58 mm {2.76 × 2.28"}

Confidential

Printing Functions

- ❑ Printing by standard protocols (printing of network objects through a device driver)
- ❑ Socket printing by unique socket communications (port 9100 for OPOS)
- ❑ Supports OPOS/Unimini/JavaPOS

Functions to Monitor Settings

- ❑ Status displayed by LEDs
- ❑ Various settings and states displayed by telnet
- ❑ Various settings and states displayed by Web browser
- ❑ IP address setting by arp + ping
- ❑ Supports rarp
- ❑ Supports BOOTP
- ❑ Supports DHCP
- ❑ ping response
- ❑ Status printing function
- ❑ Module setting initialization using the Test switch
- ❑ Status monitoring by ENPC
- ❑ Status monitoring by SNMP

Maintenance Functions

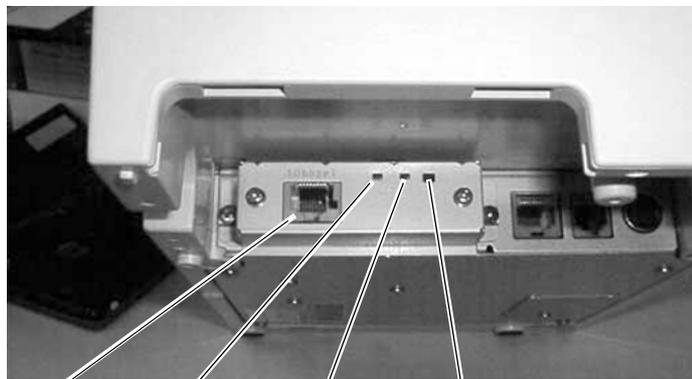
- ❑ Firmware writing through the network

Hardware Specifications**Physical communications standard:**

10 Base T (IEEE 802.3)

External size

- 1) Board size: 70 × 58 mm {2.76 × 2.28"}
- 2) External appearance drawing
- 3) Connector-side location drawing



10BASE-T Ethernet interface connector LED (green) LED (red) Switch

Software Specifications**Basic Communications Protocols**

Protocol	Application
IP, ARP, ICMP, UDP, TCP	Basic communications protocols for various functions (used by the following higher-level protocols)

Printing Communications Protocols

Protocol	Application
LP, LPR	Transfer printing data
FTP	Transfer printing data interactively
TCP Socket Port	Transfers printing data and printer status by direct socket communications (bidirectional)

Confidential

LP, LPR

- Remote printer name: aux
- Kanji filter: (EUC→JIS)
- Maximum simultaneous connections: 10
- Number of connections that can print: 1 (other users wait until done)
- Time out: about 5 minutes
- Job deletion: not supported
- Banner printing: not supported

FTP

- Port number: 21
- Password: none
- Max. simultaneous connections: 3
- Number of connections that can print: 1 (other users wait until done)
- Time out: none
- Job deletion: not supported
- Supported commands:
 - USER (specified user name)
 - BYE (log off)
 - PUT (specifies and sends file to print)
 - ASCII (specifies ASCII-format transfer)
 - BINARY (specifies binary-format transfer)
 - LS (displays status of UB-E01)

Socket Communications

- Port type: TCP comm. port for direct printing
- Port number: 9100
- Port communication direction: bidirectional
- Time out: about 5 minutes

Status Inquiry and Setting Protocols

Protocol	Application
telnet	Display module status and make settings by telnet commands
HTTP	Display module status and make settings by Web browser
SNMP	Acquire and set module settings or printer status by custom or general purpose MIB tool
ENPC	Acquire and set module settings or printer status by custom setup utility (WinConfig)

telnet

- Port number: 23
- User name: none
- Password: common with HTTP
- Maximum simultaneous connections: 1
- Time out: aborts if not accessed within about 2 minutes
- Display language: English

HTTP

- Port number: 80
- User name: optional
- Password: common with telnet
- Maximum simultaneous connections: 1
- HTTP version: HTTP/1.0
- Language support: An HTML file can be downloaded to the UB-E01 to support any language

Confidential

SNMP (MIB)

Terminology:

MIB: Management Information Base

PDU: Protocol Data Unit

- SNMP version: SNMP v1 (RFC1157) compliant
SNMP v2 not supported
- Transport protocol: UDP/IP
- Community: Each item may be up to 31 ASCII characters

Community	Object Attribute	Default
#1	Read-only	"Public"
#2	Read-write	None
Trap #1	Read-write	None
Trap #2	Read-write	None

- Trap destination: Up to two settable IP addresses
- MIB support: Part of MIB-II (RFC1213)
Part of Host Resource MIB
Part of Print Server MIB
- PDU support: Get Request
Get Next Request
Set Request
Get Response
Trap
- Server port number: 161
- Trap sending port number: 162

ENPC

- Protocol: UDP/IP
- UDP port number: 3289
- Compatible packet types: Probe
Initialize
Query
Setup
Notify
- Other: The UB-E01 does not send request packets, and Reply packets are ignored.

Automatic IP Address Assignment Protocols

The UB-E01 supports the following protocols for automatic IP address assignment. The automatic assignment is performed according to the following sequence, and if a protocol is disabled or fails, the next protocol is tried.

When an IP address is acquired, the next protocol is not tried. If the DHCP fails, the IP address assignment and the IP address cannot be assigned. If this occurs, the printer power must be turned on again or the printer must be reset with the utility.

Protocol	Sequence	Application
RARP	1	Acquire IP address
BOOTP	2	Acquire IP address
DHCP	3	Acquire IP address
manual setting	4	Uses the internal set parameters

RARP

- Item to acquire: IP address
- RARP requests: once

IP Address Acquisition by BOOTP

- Item to acquire: IP address
- BOOTP requests: once

IP Address Acquisition by DHCP

- Items to acquire: IP address, subnet mask, gateway address
- DHCP Discover retries: 10 times
- DHCP Discover retry interval: 30 seconds
- DHCP Request retries: 5 times
- DHCP Request retry interval: 5 seconds

Manual Setting

The UB-E01 operates in accordance with the internal parameter settings.

Confidential

Internal Settings

Item List

Item	Parameter	Initial value	telnet		HTTP		Status printout
			Ref	Setting	Ref	Setting	Ref
IP address	xxx.xxx.xxx.xxx	192.168.192.168	o	o	o	o	o
Subnet mask	xxx.xxx.xxx.x	255.255.255.0	o	o	o	o	o
Gateway address	xxx.xxx.xxx.xxx	255.255.255.255	o	o	o	o	o
RARP function	Enable/Disable	Disable	o	o	o	o	o
BOOTPfunction	Enable/Disable	Disable	o	o	o	o	o
DHCP function	Enable/Disable	Disable	o	o	o	o	o
AutoIP	Auto/Manual	Manual	o	o	o	o	o
arp/ping	Enable/Disable	Enable	o	o	o	x	x
Community name 1 (read-only)	Max. 16 chars.	"public"	o	x	o	x	o
Community name 2 (read-only)	Max. 16 chars.	None	o	o	o	o	o
Community name (IP Trap #1)	Character string	None	x	x	o	o	x
Community name 1 (IP Trap #2)	Character string	None	x	x	o	o	x
IP Trap #1 address	Character string	None	x	x	o	o	x
IP Trap #2 address	Character string	None	x	x	o	o	x
Password	Character string	None	x	o	x	o	x
Hardware version	-	-	o	x	o	x	o
Firmware version	-	-	o	x	o	x	o
MAC address	-	-	o	x	o	x	o

o = possible x = impossible

Internal Parameter Setting Methods

- Using an HTTP browser
- Using telnet
- Using ENPC protocol
- Using arp and ping commands (only to set IP address)

Setting with HTTP Browser

Setting can be made by an HTTP browser when connected to the module. The new IP address takes effect when the printer power is turned off and back on.

Setting with telnet

Settings can be made by telnet when a telnet client is in a normal communications state with the module. A new IP address takes effect when the printer power is turned off and back on.

Setting with ENPC

Settings cannot be made by the specified application software when the ENPC protocol is used. A dedicated utility which can set miscellaneous with the ENPC protocol is provided by EPSON.

Setting the IP Address with arp + ping

This function is available when it has been enabled.
The setting can be made from a host in the same segment as the module.
The host must support both arp and ping commands.
The new IP address takes effect when the module responds to the ping command.

Example-1: using SunOS

```
arp -s 123.456.789.123 00:00:85:06:00:01 temp  
ping 123.456.789.123
```

Example-2: using Windows

```
arp -s 123.456.789.123 00-00-85-06-00-01  
ping 123.456.789.123
```

How to check the Mac Address

The Mac address of the UB-E01 can be checked with any of the following methods:

- Printing the status sheet
- Checking the seal on the PCB
- Checking the printer self-test (however, the self-test function is limited for each model.)

Initializing

To initialize the UB-E01 when the power is turned on or reset, the standby period is required for 20 seconds. During this period. All network functions do not work.

Version Upgrading

The module can upgrade its own firmware over the network.

Supported protocol

- TCP/IP (HTTP)

Confidential

Upgrade Methods

- By Web browser
- By a special utility (TMNet WinConfig) (for Windows NT4.0/98/95/2000)

Environmental Specifications

Temperature: 0 to 50° C {32 to 122° F}

Humidity: 10 to 90% RH (non-condensing)

Storage Conditions

Temperature: -10 to 50° C {14 to 122° F}

- Humidity: 10 to 90% RH (non-condensing)

EMC and Safety Standards Applied

Europe: CE Marking
EN55022 Class B
EN50024
IEC61000-4-2
IEC61000-4-3
IEC61000-4-4
IEC61000-4-5
IEC61000-4-6
IEC61000-4-11

The printer in which the UB-E01 is installed does not conform to the following:
EN45501

North America: (EMI) FCC/ICES-003 Class A
Japan: (EMC) VCCI Class A
Oceania: (EMC) AS/NZS 3548 Class B

*Appendix A***Definitions**

A

ASB— Auto Status Back: The feature that allows the printer to send the status information back to the host computer automatically.

ARP —Address Resolution Protocol: Protocol which converts IP address to Ethernet address.

B

BOOTP—BOOTP (Bootstrap Protocol) is the protocol used for booting a diskless client, which operates on the UDP.

D

Domain—A group of computers administered together.

DHCP—Dynamic Host Configuration Protocol: Protocol which administers IP addresses, which operates on the UDP, in the whole network system together.

E

Ethernet—LAN, using CSMA/CD method.

F

FTP—File Transfer Protocol: FTP uses two connections on the TCP. One is the connection for controlling the FTP. The other is the connection for transferring data.

I

ICMP—Internet Control Message Protocol: a protocol which notifies an error status to a sender when an error occurs.

M

MIB—Management Information Base: a set of variables (database) that a gateway running SNMP maintains.

N

netmask—A binary value used for a sub-network and IP inter-networks.

P

ping—Command to test an IP connection.

Confidential

R

RARP—Reverse Address Resolution Protocol: a mechanism for a network device to discover its address dynamically when it boots. This has an opposite function of the ARP, converting the Ethernet address to the IP address.

rarp—Server that responds to requests for address discovery.

S

SNMP—Simple Network Management Protocol: a standard protocol used to monitor IP gateways, hosts, and the networks to which they are attached.

T

TCP—Transmission Control Protocol used for reliable end-to-end communication over an IP connection.

TCP/IP—Name given to the suite of protocols (including but not limited to TCP and IP) that govern the transmission and services of a network. The TCP indicates a transport layer and the IP indicates an internet layer.

TCP port—A logical connection point in the software on a TCP/IP host.

TELNET—Command and protocol to establish a terminal connection to a remote host over a TCP/IP network.

U

UDP—User Datagram Protocol: a connectionless type of a protocol which is suitable for transferring small packets.

Confidential

Confidential

EPSON

SEIKO EPSON CORPORATION

Printed in Japan