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EPSON

WIRELESS ETHERNET INTERFACE BOARD FOR TM PRINTERS

UB-R03

Specification

STANDARD	
Rev. No.	A
Notes	

Copied Date	, ,
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REVISION SHEET

Sheet 1 of 2

The table below indicates which pages in this specification have been revised.
Before reading this specification, be sure you have the correct version of each page.

Revisions		Design Section			Sheet Rev. No.					
Rev.	Document	WRT	CHK	APL	Sheet	Rev.	Sheet	Rev.	Sheet	Rev.
A	Enactment	Kimura	Aruga	Yamaji	I	A				
					II	A				
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REVISION SHEET

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A	All	Newly enacted.
TITLE		
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Points That Must Be Observed To Assure Product Safety

To assure the safe operation of this product, carefully observe the specifications as well as the notes provided below.

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- 1) Do not drop conductive material such as a paper clip onto the circuit board. Short circuiting pins on the board may cause heat damage due to excess current or may melt the bonding wire.
- 2) Do not use cables other than the specified in these specifications. Also, do not connect wires other than the way specified in these specifications.
- 3) Never disassemble or modify this product. Tampering with this product may result in injury, fire, or electric shock.
- 4) Be sure to set this equipment on a firm, stable, location. Or product may break or cause injury if it falls.
- 5) Do not use in locations subject to high humidity or dust levels. Excessive humidity and dust may cause equipment damage, fire, or shock.
- 6) Do not place heavy objects on top of this product. Never stand or lean on this product. Equipment may fall or collapse, causing breakage and possible injury.
- 7) To ensure safety, unplug this product prior to leaving it unused for an extended period.

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GENERAL FEATURES

1. Application

This specification applies to the UB-R03 Wireless Ethernet interface board for TM printers.

See the UB-R03 Technical Reference Guide, separately issued, for detailed information.

2. Features


The UB-R03 has the following features:

- 1) Equipped with a Wireless LAN module
- 2) IEEE802.11b compatible
- 3) Equipped with 64/128 bit WEP(RC4) / TKIP(RC4) / CCMP(AES) encryption feature
- 4) External dimensions: 86 mm × 80 mm × 27 mm {3.39 × 3.15 × 1.06"} (W × L × H)
- 5) UIB (Universal Interface Board) standard compatible
- 6) Supports TCP/IP protocol
- 7) Compatible with OPOS, JavaPOS, and APD

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1. STRUCTURE

The UB-R03 is installed in the TM-series printers as an interface board to provide Wireless Ethernet communications.

1.1 Printers that can use the UB-R03

The UB-R03 can be used for the TM series printers from which an interface board can be removed. Since some TM printers cannot use the UB-R03, see the TM-UIB Combination Specification for the latest restrictions on TM printers - UB-R03 combination.

NOTE: Printing may slow down when printing large sized graphic data.

1.2 Line Display Connection

When UB-R03 is connected, the DM-D connector on the TM unit cannot be used.

1.3 Connection of AC Adapter

The PA and PB series AC adapters that come with the TM-U200 or TM-U210 cannot be used.

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2. FEATURES

2.1 Overview

- Wireless Ethernet (Compatible with 802.11b standards)
- Complies with TCP/IP protocol (LPR and socket communications)

2.2 Printing Functions

- Printing by standard protocols (printing of network objects through a device driver)

OS	Printing Protocol
Microsoft Windows 2000/XP	LPR
Printing from Unix	LP, LPR

- Socket printing with the unique socket communications (port 9100 for OPOS)

2.3 Monitoring and Settings Functions

- A variety of settings and status display with the Web browser
- A variety of settings and status display with the dedicated utility
- IP address setting by arp + ping
- Supports DHCP
- Supports APIPA
- Ping response
- Status printing function
- Initialization with the push button
- Status monitoring by ENPC
- Status monitoring by SNMP

2.4 Maintenance Functions

- Firmware rewriting with wireless communication or wired communication (USB)

2.5 Countries where the UB-R03 can be used


The UB-R03 can be used only in the countries listed below:

[Europe]

Austria, Belgium, Germany, Luxembourg, Netherlands, Switzerland, France, Italy, Greece, Spain, Portugal, Denmark, Finland, Ireland, Sweden, UK, Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Slovenia, Slovak Republic, and Norway

[North America]

U.S.A., and Canada

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3. HARDWARE SPECIFICATIONS

3.1 Physical communications standard:

Wireless Ethernet IEEE 802.11b

3.2 External size

- 1) Dimensions: 86 mm × 80 mm × 27 mm {3.39 × 3.15 × 1.06"} (W × L × H)
- 2) External appearance



3.3 Wireless LAN Module

The UB-R03 has the following wireless LAN modules:

Product Name	: WIFI BOARD
Type	: M238A
Manufacturer	: Seiko Epson Corporation

3.4 Environmental Specifications

- 1) Operating Conditions

Temperature:	0 to 50°C {32 to 122°F}
Humidity:	10 to 90 %RH (non-condensation)
- 2) Storage Conditions

Temperature:	-10 to 50°C {14 to 122°F}
Humidity:	10 to 90 %RH (non-condensation)

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3.5 Safety Standards Applied

North America: EMI: FCC/ICES-003 Class A

Wireless LAN Module

FCC Part15 Sub Part C /RSS-210

FCC ID: BKMFBM238A

IC ID: 1052C-M238A

Europe: CE marking

R&TTE:

DIRECTIVE 1999/5/EC

EN300 328

EN60950-1

EN301 489-1

EN301 489-17

EMC:

DIRECTIVE 2004/108/EC

EN301 489- 1

EN301 489-17

The printers in which this board is installed do not conform to the following:

Directive 90/384/EEC EN45501

Japan: ARIB STD-T66

License number: 007WWCUL0263 (Cannot be sold in Japan.)

3.6 Push Button

A push button is provided to perform the following functions:

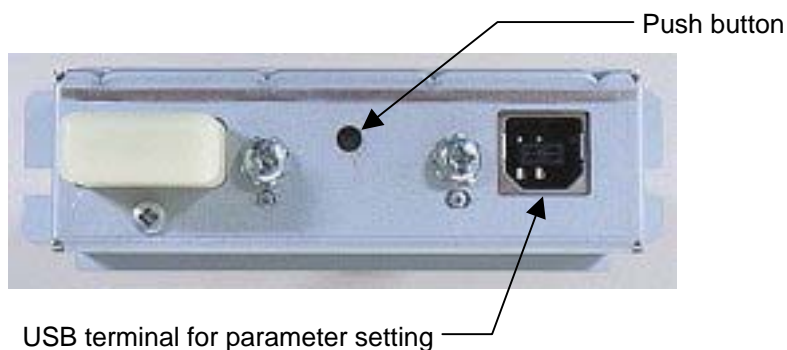
1. Status sheet printing

Holding the push button for three seconds or longer while the printer is ready to print can print the information of the internal setting parameters of these modules.

2. Setting initialization

The following method restores all the internal setting parameters of these modules to the factory settings:

- Hold down the push button, turn the printer power on, and then keep pressing the push button for another 5 seconds or longer.
- Hold down the push button for more than 3 seconds to start printing of the status sheet, and keep pressing it for another 7 seconds or longer after the printing has started.



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3.7 USB Terminal for Parameter Setting

The UB-R03 has a USB terminal to set the internal parameters. This USB terminal can be used for the following use only:

- 1) To be connected with a USB cable to the PC on which the dedicated utility (TMNetWinConfig v3) is installed to set the internal parameters
- 2) To update the UB-R03 firmware with the dedicated firmware update utility

NOTE: The USB terminal is intended to be used only for the above purpose. Use the USB cable only when using the USB terminal for the above purpose; otherwise, disconnect the USB cable from the UB-R03.

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4. SOFTWARE SPECIFICATIONS

4.1 Supported Protocols

Protocol	Application
IP,ARP,ICMP,UDP,TCP	Basic communications protocols for various functions (used by the higher-level protocols below)
LPR,TCP Socket Port	Protocol for printing
DHCP,APIPA	Protocol for automatic settings of IP address, etc.
SNMP,ENPC	Protocol to obtain the product status
HTTP	Protocol used in the Web application for the product settings (WebConfig)
TFTP	Protocol to update the firmware

4.2 Printing Communications Protocols


Protocol	Application
LPR	Transfers printing data.
TCP Socket Port	Transfers printing data and printer status by direct socket communications (bi-directional).

4.2.1 LPR

- Port number: 515
- Maximum Simultaneous Connections: 6
- Number of connections that can print: 1 (Other users must wait until the printing has completed.)
- Time Out: 5 minutes
- Job cancellation: Not supported
- Banner printing: Not supported
- Printing Job Queue: Not supported

4.2.2 TCP Socket Port

- Port type: TCP communication port for direct printing
- Port number: 9100
- Port communication direction: Bi-directional
- Maximum Simultaneous Connections: 6
- Number of connections that can print: 1 (Other users must wait until the printing has completed.)
- Time Out: 5 minutes
- Job cancellation: Not supported

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4.3 Automatic IP Address Assignment Protocols

The UB-R03 supports DHCP and APIPA, the protocols that assign an IP address automatically. Automatic IP address assignment is performed with the protocols in the order of descending priorities shown in the table below. If automatic assignment with one protocol results in “disabled” or “failure,” the subsequent protocol is used.

Protocol	Priority	Application
DHCP	1	Used to obtain the IP address from the DHCP server.
APIPA	2	Used to assign the internal IP address automatically.
(Manual assignment)	(3)	Uses the internal setting parameters.

4.3.1 IP address obtainment with DHCP

When a DHCP client boots up, it looks for a DHCP server to obtain an IP address, subnet mask, and other possible DHCP options configured on the server.

- Items to acquire: IP address, subnet mask, gateway address
- Times of DHCP Discover retries: Maximum 4 (The first retry excluded)
- DHCP Discover retries: 4, 8, 16, 32 seconds (+/- 1 second)
- Times of DHCP Request retries: Maximum 4 (The first retry excluded)
- Interval of DHCP Request retries: 4, 8, 16, 32 seconds (+/- 1 second)
- Timeout for obtaining IP address with DHCP: 65 seconds

NOTE: To prevent DHCP Discover packet transmission from concentrating at the moment of power-on, a random delay time of 5 seconds or shorter is inserted before transmitting the first DHCP Discover packet. If the timing of the forth retry is after the timeout for obtaining the IP address with DHCP (65 seconds later), the delay time prohibits the retry packet from being transmitted.


4.3.2 IP Address assignment by APIPA

- Items to obtain: IP address
- IP address range: 169.254.1.0 to 169.254.254.255

If the DHCP client is unable to find the information, it uses APIPA to automatically configure itself with an IP address in the above range. If an IP address is assigned by APIPA, it is not possible to communicate through a router.

4.3.3 Manual assignment

When all the automatic IP address assignment protocols are disabled, the IP address recorded in the internal setting parameter is assigned.

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4.4 Status Inquiry and Setting Protocols

Protocol	Application
ENPC	<ul style="list-style-type: none">• Gets and/or sets module settings or printer status with the custom setup utility (WinConfig).• Gets and/or sets module settings or printer status with the custom driver software OPOS/APD.
SNMP	<ul style="list-style-type: none">• Gets and/or sets module settings or printer status with the universal MIB administration tool.• Gets and/or sets module settings or printer status with the custom driver software (OPOS/APD, etc.).

4.4.1 ENPC


- Protocol: UDP/IP
- UDP port number: 3289
- Supported packet types: Probe
Initialize
Query
Setup
Notify

4.4.2 SNMP

- SNMP Version: SNMP v1 (RFC1157) compliant
(SNMP v2/SNMP v3 not supported)
- Transport Protocol: UDP/IP
- Server Port Number: 161
- Trap Sending Port Number: 162
- Trap Destination: Up to two settable IP Addresses (Default: Undefined)
- Supported PDU type: Get Request
Get Next Request
Get Response
Set Request
Trap
- Community: Each community name can be set with 16 ASCII characters or less.

Community	Object Attribute	Default Community Name
#1	Read Only	"public" *Do not change
#2	Read/Write	None (Undefined)
Trap #1	Read/Write	None (Undefined)
Trap #2	Read/Write	None (Undefined)

- Supported MIB: Part of MIB-II
Part of Host Resource MIB
Part of Printer MIB
Part of SNMPv2 MIB
Part of EPSON Private MIB

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4.5 HTTP

The UB-R03 has an internal Web page dedicated to obtaining and changing the internal setting values by using the Web browser (WebConfig function). With the UB-R03, a password to protect the set information can also be set.

- HTTP Version: HTTP/1.1
- Server Port number: 80
- Supported Language: English
- Maximum Simultaneous Connections: 1

4.5.1 Protection with a password

A password can be set to protect the values set in the UB-R03.

- User Name: "epson" (*User name cannot be changed.)
- Password: (Default) Undefined
(Type of characters settable) ASCII characters
(Number of characters settable) Maximum 20


NOTE: The password set with this function can also be used as a password to make settings with ENPC.

4.6 TFTP

TFTP is used to update the UB-R03 firmware.

4.6.1 How to update the UB-R03 firmware

- With the TFTP command (Windows2000/Windows XP)
- With the dedicated update utility


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4.7 Internal Settings

4.7.1 Item list

Articles	Parameters	Initial Value	WebConfig		Dynamic Status Sheet
			Refer	Setting	
IP address	-	192.168.192.168	Yes	Yes	Yes
Subnet mask	-	255.255.255.0	Yes	Yes	Yes
Gateway	-	0.0.0.0	Yes	Yes	Yes
DHCP	Enable/Disable	Disable	Yes	Yes	Yes
APIPA	Enable/Disable	Disable	Yes	Yes	Yes
ARP+Ping	Enable/Disable	Enable	Yes	Yes	Yes
Network Mode	Ad-Hoc/Infrastructure	Ad-Hoc	Yes	Yes	Yes
SSID	0-31 characters	EpsonNetIBSS	Yes	Yes	Yes
Channel	1-11	11	Yes	Yes	Yes
MAC address	-	(unique value)	Yes	Yes	Yes
Encryption Type	None/WEP/WPA2-PSK	None	Yes	Yes	Yes
Authentication Algorithm	Open System/Shared Key	Open System	Yes	Yes	Yes
Default WEP Key	Key1-4	Key 1	Yes	Yes	Yes
WEP Key Size	64bits/128bits	64bit	Yes	Yes	Yes
WEP Key 1-4	-	(no value)	Yes	Yes	No
Transmission Rate	Auto/1Mbps/2Mbps/5.5Mbps/11Mbps	Auto	Yes	Yes	Yes
RTS Threshold	0 – 2347	2347	Yes	Yes	Yes
Fragmentation Threshold	256 – 2346	2346	Yes	Yes	Yes
Wireless LAN Frequency Region	-	Americas	Yes	Fixed	No
WPA/WPA2 Pre-Shared Key	0-63 ASCII characters, or 64 Hexadecimal characters	(no value)	Yes	Yes	No
Wireless Disconnection Timeout Value	0-300	5	Yes	Yes	Yes
Administrator Name	0-255 ASCII characters	(no value)	Yes	Yes	No
Location/Person	0-255 ASCII characters	(no value)	Yes	Yes	No
Password	0-32 ASCII characters	(no value)	Yes	No	No
Model Name	-	UB-R03	Yes	Fixed	No
Community name 1	-	public	Yes	Fixed	Yes
Community name 2	0-16 ASCII characters	(no value)	Yes	Yes	Yes
IP Trap 1 Enable	Enable/Disable	Disable	Yes	Yes	No
IP Trap 2 Enable	Enable/Disable	Disable	Yes	Yes	No
Community name (IP Trap #1)	0-16 characters	None	Yes	Yes	No
Community name (IP Trap #2)	0-16 characters	None	Yes	Yes	No
IP trap #1 address	-	0.0.0.0	Yes	Yes	No
IP trap #2 address	-	0.0.0.0	Yes	Yes	No
SNMP General Current Operator	0-127 characters	(no value)	No	No	No
SNMP General Service Person	0-127 characters	(no value)	No	No	No
SNMP Input Media Name	0-63 characters	(no value)	No	No	No

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4.7.2 Changing internal setting

The internal settings can be changed by the following methods:

- With the dedicated setting utility
- Setting with the Web browser through the WebConfig function
- Using the arp and ping commands (Only IP address is settable.)

4.7.3 Making internal settings with the dedicated utility

Epson provides a dedicated utility that makes a variety of settings with the ENPC protocol.

4.7.4 Setting the IP address with arp + ping

This function is available when it has been enabled.

The setting can be made from the host computer in the same segment as the module.

The host computer must support both arp and ping commands.

When an IP address is obtained with the Ping (ICMP Echo Request) command, the setting changes below follow:

- Changes the IP address to the obtained value.
- Changes the value of the subnet mask according to the obtained IP address class.
- Disables this function.
- Changes the mode to obtain an IP address to "Manual assignment."

After the above changes are made, the printer is reset.

*When the IP address obtained with the ICMP Echo Request command is the same as the IP address presently assigned, the above changes are not made.

Example: using Windows

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

4.7.5 How to check the Mac Address


The Mac address of the UB-R03 can be checked with the following method:

- Printing the status sheet
- Label attached on the product
- Obtaining the information with the WebConfig function
- A printer self-test (May not be supported by some TM printers.)
- Obtaining the information with the dedicated utility

4.8 System Bootup

The UB-R03 requires some bootup time for initializing the system or network functions after power-on or system reset. The required bootup time is as follows. The network communication functions are unavailable during system bootup.

- When setting the IP address in the Manual mode: approximately 6 to 10 seconds
 - When setting the IP address automatically: approximately 13 to 17 seconds
- (*Above values may vary, depending on the response time of the DHCP server.)

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4.9 Setting the TM Printer

- When using this interface board, the interface of the TM printer must be selected as “parallel” with the appropriate settings. With a TM printer that can set the reset signal to pin 31, set the pin reset signal to “enable.” For more details, see the specifications for each TM printer for these settings.
- As running a self-test on printer power-on requires the standby time described in “4.8 System Bootup,” the FEED button must be held down during the standby time.

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5. RESTRICTIONS

5.1 Restrictions on Using the USB Terminal for Parameter Settings

When the product power is turned on when all the following conditions are satisfied, the network functions of the UB-R03 do not function:

- The host PC is connected with a USB cable to the USB terminal for parameter settings.
- The TM printer has a factor that causes offline, such as no paper is installed or a cover is open.

To operate the network functions, disconnect the USB cable or remove the offline factor that is occurring in the TM printer.

5.2 Restrictions on Using the CISCO Access Point

When using the UB-R03 with the Cisco access point AP1231G, if the threshold value on the access point side is smaller than 140, normal communication is not provided.

5.3 Restrictions on Using the Ad-Hoc Mode


5.3.1 Setting the Encryption Type

With the UB-R03, WPA/WPA2-PSK is not available in the Ad-Hoc mode. Although using the WebConfig function allows the Encryption Type "WPA/WPA2-PSK" to be selected in the Ad-Hoc mode, this setting actually is ignored. (In fact, the setting is the same as "no encryption.")

5.3.2 Dynamic Status Sheet

When using the UB-R03 in the Ad-Hoc mode, printing a dynamic status sheet is subject to the following restrictions:

- Even if there is no host computer to connect to, "Connect" appears as the Link Status.
- Between power-on and the time when the printer to connect is found, "0dBm" appears as the Signal Level. If the host computer connected to the TM printer discontinues communication, the value that had been obtained immediately before discontinuation of communication is held/appears.

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