TEC

TOSHIBA TEC Portable Printer

B-SP2D Series

Wireless LAN Network Specification

For customers

First Edition: February 12, 2004

TOSHIBA TEC CORPORATION

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1. SCOPE

This specification applies to the wireless LAN network specification of the B-SP2D series portable printer.

2. GENERAL DESCRIPTION

The B-SP2D-GH40 is equipped with a wireless LAN module, which enables a connection to the host by TCP/IP.

3. SUPPORTING PROTOCOL

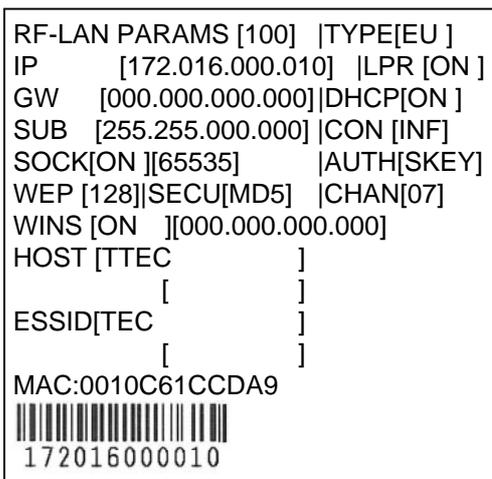TCP/IP

4. NETWORK SPECIFICATION

The network specification of this printer includes the LPR server function, socket communication server function, DHCP client function, WINS client function, HTTP server function, and security function (MD5/EAP).

5. WIRELESS LAN PARAMETERS

5.1 CONFIRMING THE WIRELESS LAN PARAMETER SETTINGS

Pressing and holding the Power button while the printer power is off causes the printer to turn on and print a wireless LAN parameter settings label regardless of the issue mode.   If the label is not printed successfully due to an error like no paper, it is required to load the media correctly, turn off the power, and then retry from the beginning.   This is because the printer will not print the label even if the error is cleared.

Although the wireless LAN parameter settings label is also printed by sending a reset command while holding down the Power button of the printer in operation, these printed parameter settings are not effective.   Therefore, the parameter settings label must be printed when the printer power is off.

```
RF-LAN PARAMS [100]  |TYPE[EU ]
IP       [172.016.000.010]  |LPR [ON ]
GW    [000.000.000.000]|DHCP[ON ]
SUB   [255.255.000.000] |CON [INF]
SOCK[ON ][65535]        |AUTH[SKEY]
WEP [128]|SECU[MD5]   |CHAN[07]
WINS [ON   ][000.000.000.000]
HOST [TTEC            ]
             [            ]
ESSID[TEC            ]
             [            ]
MAC:0010C61CCDA9
```

```
172016000010
```

For details of each parameter, refer to Section 5.6 WIRELESS LAN PARAMETER LIST AND INITIAL VALUES.

5.2 PARAMETER SETTING VIA IrDA INTERFACE

When the B-SP2D RFLAN Configuration Tool is used, the wireless LAN parameters can be set via IrDA interface of the printer.

For details, refer to the Wireless LAN Setting Tool Operating Specification.

5.3 PARAMETER SETTING BY HTTP FUNCTION

It is possible to access the printer's website at "http://[printer's IP address]/" by using the web browser. From this website, the wireless LAN parameters can be set.

There are the Info, Wireless, IP Addr, and Admin tabs on the web page.   On each page, it is possible to browse and set the parameters.

(1)   Info Page

The current printer state is displayed.

Connected to SSID:	Currently used SSID
Using channel:	Currently used channel
MAC address of Access Point:	IP address of the currently connected access point
Current transmission rate (Mbits/s):	Current transmission rate
Current communication quality (%):	Ratio of successfully sent packets to the all packets
MAC address of the Module:	MAC address of the wireless LAN module
Current IP address:	Currently used IP address (When DHCP is enabled, the leased IP address is displayed.)
Module Firmware version:	Firmware version of the wireless LAN module

(2) Wireless Page

Operating Mode:	Connection mode
The SSID:	SSID to be used.
Channel:	Channel to be used in AdHoc mode
EAP Authentication:	Security protocol to be used.
User name for EAP:	User name to be used for the security protocol
Password for EAP:	Password to be used for the security protocol
WEP Enabled:	Whether WEP is enabled or disabled.
WEP Key length:	WEP key length
WEP Key 1 – 4:	WEP keys #1 to #4
WEP key to use:	WEP key to be used for transmission
Shared key Authentication:	Whether the shared key authentication mode is enabled or disabled. When it is disabled, the authentication will be open system.
Power save timeouts:	Time that the wireless LAN module takes to enter the power save mode.

802.11b Module
v 1.0.0 (September 2003)

created by TOSHIBA TEC CORPORATION

Info | Wireless | IP Addr | Admin

Wireless Configuration

On this page you can configure the 802.11b wireless settings. Any new settings will not take effect until Module is rebooted. NOTE: You may have to re-load this page to see the current settings.

Operating Mode: ○ Ad-Hoc ● Infrastructure

The SSID: `TOSHIBATEC` (Leave field blank to use any SSID)

Channel: `1 ▼` (used only with Ad-Hoc mode)

EAP Authentication: `OFF ▼`

user name for EAP: [ ]

password for EAP: [ ]

WEP enabled: ☐

For proper use of WEP, set Authentication to "Shared Key" when WEP is enabled

WEP Key Length: `104 bit ▼`

For 40 bit keys you must enter 10 hex digits into the key fields, for 104 bit keys you must enter 26 hex digits. If you leave the key field blank this means a key of all zeros.

WEP key 1: [ ]

WEP key 2: [ ]

WEP key 3: [ ]

WEP key 4: [ ]

WEP key to use: `Key 1 ▼`

Shared Key Authentication: ☐ (For use when WEP is enabled)

Power Save Timeout (100msec): `600`

Save | Cancel

(3) IP Addr Page

IP Address mode:	IP Address setting mode
Default IP Address:	IP Address setting
Default Subnet Mask:	Subnet mask setting
Default gateway:	Gateway setting
DHCP ID:	DHCP ID used for the DHCP client protocol
Use Socket Only printing:	Whether printing by socket communication is enabled or disabled.
Printing Port for Socket Only:	Port number used for printing by socket communication
Use LPD printing:	Whether printing by using LPR protocol is enabled or disabled.
WINS Client:	Whether WINS protocol is enabled or disabled, and WINS server address acquisition method
Wins server address:	WINS server address
	Only when the WINS client parameter is set to ON (Static), this setting is effective.
Host name:	Host name

802.11b Module
v 1.0.0 (September 2003)   created by TOSHIBA TEC CORPORATION

Info | Wireless | IP Addr | Admin

Server Configuration

On this page you can configure the IP address used by Module. For "static" mode, the IP address setting are given below. For "DHCP" mode, these settings may be overridden by a DHCP server on your network. Any new IP settings will not take effect until Module is rebooted. NOTE: You may have to re-load this page to see the current settings.

IP Address Mode: ⊙ Static ○ DHCP

Default IP address: 172.16.0.10

Default subnet mask: 255.255.0.0

Default gateway: 0.0.0.0

DHCP ID: 0010C61CCF5A

Use Socket Only printing: ☑

PrintingPort for Socket Only: 8000

Use LPD printing: ☑

WINS Client: ⊙ OFF ○ ON(Static) ○ ON(DHCP)

wins server address: 0.0.0.0

Host name: 0010C61CCF5A

Save | Cancel

(4) Admin Page

Reboot Module: Used to restart the wireless LAN module.
Restore factory defaults: Used to restore the parameter settings to the initial values.

(5) Maintenance Page

ExpChannel: Country where the wireless LAN module is used.
UART baudrate: Transmission rate between the wireless LAN module and the printer

5.4 PARAMETER SETTINGS AT POWER ON TIME

When the printer is started in the usual way, the wireless LAN module is started according to the parameter settings stored in the wireless LAN module.   However, when the printer is started while holding the Feed button, the wireless LAN module is not started at the time of diagnostic test label printing.   Accordingly, communication via wireless LAN module cannot be performed.

Exceptionally, if the printer is restarted by the reset command while the Feed button is held in online mode, a communication via wireless LAN is possible even after the diagnostic test label printing. However, this does not meet the specification and the parameters should not be set in this state. When the slant line pattern has been printed by pressing the Feed button after the diagnostic test label printing, the wireless LAN module will restart according to the following specific parameter settings, regardless of the stored settings.

IP Address:	172.16.0.10
Subnet Mask:	255.255.0.0
DHCP:	Disabled
WINS:	Disabled
ESSID:	TTEC
Connection mode:	Adhoc
Channel:	10
Authentication:	Open
WEP:	Disabled
Security:	Disabled

For the parameter settings other than above, the stored settings are effective.   The above parameter settings allows always connecting to the printer on the same settings, regardless of the stored settings.

5.5 IP ADDRESS SETTING BY USING THE ID SETTING COMMAND

After the printer is started while holding down the Feed button and the diagnostic test label is printed, the printer ID and the printer IP address can be set at the same time, by using the ID command.   (For details, refer to External Equipment Interface Specification, Section 10.5.1 ID Command.)
The printer IP address consists of the upper 2 bytes of "172.16" and the lower 2-byte number which is equal to the printer ID.   At this time, the subnet mask is set to 255.255.0.0.

NOTES:

1. When both of the following conditions are satisfied, only the printer ID is set.

   - When the ID command is sent in online mode after the printer prints the diagnostic test label and the slant line pattern.

   - When the wireless LAN IP address disabling parameter of the ID command is set with ", 0".

2. IP address setting is possible only right after the diagnostic test label is printed, therefore, the command cannot be sent via wireless LAN interface.

5.6 WIRELESS LAN PARAMETER LIST AND INITIAL VALUES

(1) Wireless LAN Parameter List and Wireless LAN Module's Initial Value

The following table shows the wireless LAN parameters and the wireless LAN module's initial values. The wireless LAN module's initial values can be obtained by clicking on the Restore button on the parameter setting screen via both IrDA and HTTP.

Category	Parameter	Setting Value	Module's Initial value
TCP/IP	IP Address	xxx.xxx.xxx.xxx	172.16.0.10
	Gateway IP Address	xxx.xxx.xxx.xxx	0.0.0.0
	Subnet Mask	xxx.xxx.xxx.xxx	255.255.0.0
LPR	LPR communication	ON OFF	ON
Socket communication	Socket communication	ON OFF	ON
	Socket communication port	0 to 65535	8000
DHCP	DHCP	ON OFF	OFF
	DHCP ID	xxxxxxxx…(Max. 32 bytes HEX)	MAC Address
	Host name	xxxxxxxx… (Max. 32 bytes)	MAC Address
WINS	WINS	OFF ON (STATIC) ON (DHCP)	OFF
	WINS Server	xxx.xxx.xxx.xxx	0.0.0.0
Wireless LAN	ESS ID	xxxxxx… (Max. 32 bytes)	TOSHIBA TEC
	Connection mode	Adhoc Infrastructure	Infrastructure
	Used channel	1 to 14	1
	Authentication method	Open Shared	Open
	WEP	Disabled Enabled 40bits Enabled 104 bits	OFF
	WEP Key #1	xxxxxxxx… (5 or 13 bytes)	0000 [NUL 13 bytes]
	WEP Key #2	xxxxxxxx… (5 or 13 bytes)	0000 [NUL 13 bytes]
	WEP Key #3	xxxxxxxx… (5 or 13 bytes)	0000 [NUL 13 bytes]
	WEP Key #4	xxxxxxxx… (5 or 13 bytes)	0000 [NUL 13 bytes]
EAP/MD5	Security mode	OFF MD5	OFF
	User name	xxxxxxxx (Max. 32 bytes)	0000 [NUL 32bytes]
	Password	Xxxxxxxx (Max. 32 bytes)	0000 [NUL 32 bytes]
Others	Country	JP, EU, US, FRA, ESP	EU
	UART communication parameter	xxxxxx	115200

(2) Factory Set Initial Values

All wireless LAN parameter settings of the factory set initial values, except IP address, are same as those of wireless LAN module's initial values. Regarding the IP address of the factory set initial value, the upper 2 bytes of the IP address are fixed to 172.16, and the lower 2-byte number equals to each printer ID.

(3) Explanation of Wireless LAN Parameter

The following table explains each parameter.

Parameter	Explanation
IP Address	Set the IP address of the wireless LAN module. To restore the setting to the initial values, use the [Restore] button on the Admin page of the printer's web site or B-SP2D RFLAN Configuration Tool. Though the IP address is restored to the default, the actual IP address contains each printer's ID. (For details, refer to Section 5.5 IP ADDRESS SETTING BY USING THE ID SETTING COMMAND.)
Gateway IP Address	Set the IP address of the default gateway.
Subnet Mask	Set the subnet mask. To restore the setting to the initial value, use the [Restore] button on the Admin page of the printer's web site or B-SP2D RFLAN Configuration Tool. Though the IP address is restored to the default, "255.255.255.0", the actual address is "255.255.0.0". (For details, refer to Section 5.5 IP ADDRESS SETTING BY USING THE ID SETTING COMMAND.)
LPR Communication	Select whether the LPR communication is enabled or disabled.
Socket communication	Select whether the socket communication is enabled or disabled.
Socket communication port	Set the port number for the socket communication.
DHCP	Select whether the DHCP is enabled or disabled.
DHCP ID	Set the client ID number to be notified to the DHCP server by using the DHCP. When zeros (0) are set, the MAC address will be assigned as the ID.
Host name	Set the character string of the host name to be notified to the host by using the DHCP or WINS protocol. When zeros (0) are set, the MAC address will be assigned as the host name.
WINS	Select whether the WINS protocol is enabled or disabled. In case of "ON (STATIC)", the WINS server is designated by the WINS Server parameter. In case of "ON (DHCP)", the WINS server is notified by the DHCP server.
WINS Server	Designate the WINS server address when the WINS parameter is set to "ON (STATIC)". When the WINS parameter is set to ON (DHCP), this parameter setting is ignored.
ESS ID	Set the ESS ID.
Connection mode	Select the connection mode between Adhoc and Infrastructure.
Used channel	Select the channel to be used for Adhoc communication.
Authentication	Select the authentication method.
WEP	Select whether WEP is used or not.
SEND KEY	Set the key number to be used for transmission.
WEP Key #1	Set WEPKEY #1.
WEP Key #2	Set WEPKEY #2.
WEP Key #3	Set WEPKEY #3.
WEP Key #4	Set WEPKEY #4.
Security mode	Set the security mode.
User name	Set the user name used for the security mode.
Password	Set the password used for the security mode.

(4) Explanation of Parameter Settings Label

The following table explains each item printed on the wireless LAN parameter settings label.

Item	Parameter	Setting	Print
	Module Version	xxx	[xxx]
IP	IP Address	xxx.xxx.xxx.xxx	[xxx.xxx.xxx.xxx]
GW	Gateway IP Address	xxx.xxx.xxx.xxx	[xxx.xxx.xxx.xxx]
SUB	Subnet Mask	xxx.xxx.xxx.xxx	[xxx.xxx.xxx.xxx]
SOCK	Socket communication	ON/OFF	[ON] [OFF]
	Socket port	0 to 65535	[00000] to [65535]
TYPE	Country where the printer is used.	EU/US/JP/FRA/ESP	[EU] [US] [JP] [FRA] [ESP]
LPR	LPR communication	ON/OFF	[ON] [OFF]
DHCP	DHCP	ON/OFF	[ON] [OFF]
CON	Connection mode	Infrastructure/Adhoc	[INF][ADH]
AUTH	Authentication method	Open system/Shared key	[OPEN] [SKEY]
WEP	WEP	OFF/ON (40 bits)/ON (128 bits)	[OFF][40] [128]
SECU	Security mode	OFF/MD5	[OFF] [MD5]
CHAN	Used channel	0 to 14	[00] to [14]
WINS	WINS	OFF/ON (STATIC)/ON(DHCP)	[OFF] [ON] [DHCP]
		xxx.xxx.xxx.xxx	[xxx.xxx.xxx.xxx]
HOST	Host name	xxxxxxxx… (Max. 32 bytes)	[xxxxxxxx…]
ESSID	ESS ID	xxxxxxxx… (Max. 32 bytes)	[xxxxxxxx…]
Barcode	IP Address	xxx.xxx.xxx.xxx	A bar code is printed.

6. SUPPORTED PROTOCOL

6.1 SOCKET COMMUNICATION

It is possible to send print data to the printer by using the socket communication protocol.

At this time the socket communication becomes bi-directional communication, therefore, the status from the printer can be received.

Parameters to be set:
Socket communication: Enabled
Socket communication port: Port number to be used for the socket communication

6.2 LPR COMMUNICATION

It is possible to send print data to the printer by using the LPR communication protocol.

Parameter to be set:
LPR communication: Enable

6.3 DHCP

It is possible to acquire the IP address from the DHCP server by using the DHCP.   At this time, the DHCP ID notified to the DHCP server will be set as the DHCP ID.

Parameters to be set:
DHCP: Enabled
DHCP ID: ID notified to the DHCP server

6.4 WINS PROTOCOL

It is possible to register the printer IP address and the host name table in the WINS server by using the WINS protocol.   By inquiring of the WINS server, the host can obtain the printer IP address according to the printer's host name.

Parameters to be set:
WINS: Enabled or DHCP
When "Enabled" is selected, IP address and the host name table are registered in the WINS server that has been specified by the WINS IP parameter.
When "DHCP" is selected, IP address and the host name table are registered in the WINS server notified by the DHCP server.
WINS IP: IP address of the WINS server

6.5 SECURITY PROTOCOL

Use of the security protocol enables more secure encryption communication than WEP.   The security protocol is MD5/EAP.

Parameters to be set:
SECURITY: MD5/EAP
User: User name to be used for authentication
Pass: Password to be sued for authentication

6.6 ENCRYPTION BY WEP

It is possible to make encryption communications by using WEP.   This encryption communication is effective even in the LPR communication and socket communication.   The length of the WEP key is 40 bits or 104 bits.

Parameters to be set:
WEP: 40 bits or 104 bits
SEND KEY: The number of the key to be used for transmission.
KEY #1 to #4: Encryption keys   A 104-bit (13-byte) encryption key is set to each key.   When the WEP parameter is set to 104 bits, the all bits are effective.   When set to 40 bits, the top 40 bits (5 bytes) only are effective.