TEC

TEC Protable Printer

B-SP2D SERIES

Maintenance Manual

Document No. **EO18-33014**

Original **Mar., 2003**

(Revised)

TOSHIBA TEC CORPORATION

PRINTED IN JAPAN

WARNING!

Follow all manual instructions. Failure to do so could create safety hazards such as fire or electrocution.

CAUTION!

The country setting for the Wireless LAN Module may need to be changed according to each country's Radio Law. Before selling the printers, refer to Section 7 and change the setting if necessary.

NOTE: *Failure to follow manual instructions or any unauthorized modification, substitution or change to this product will void the limited product warranty.*

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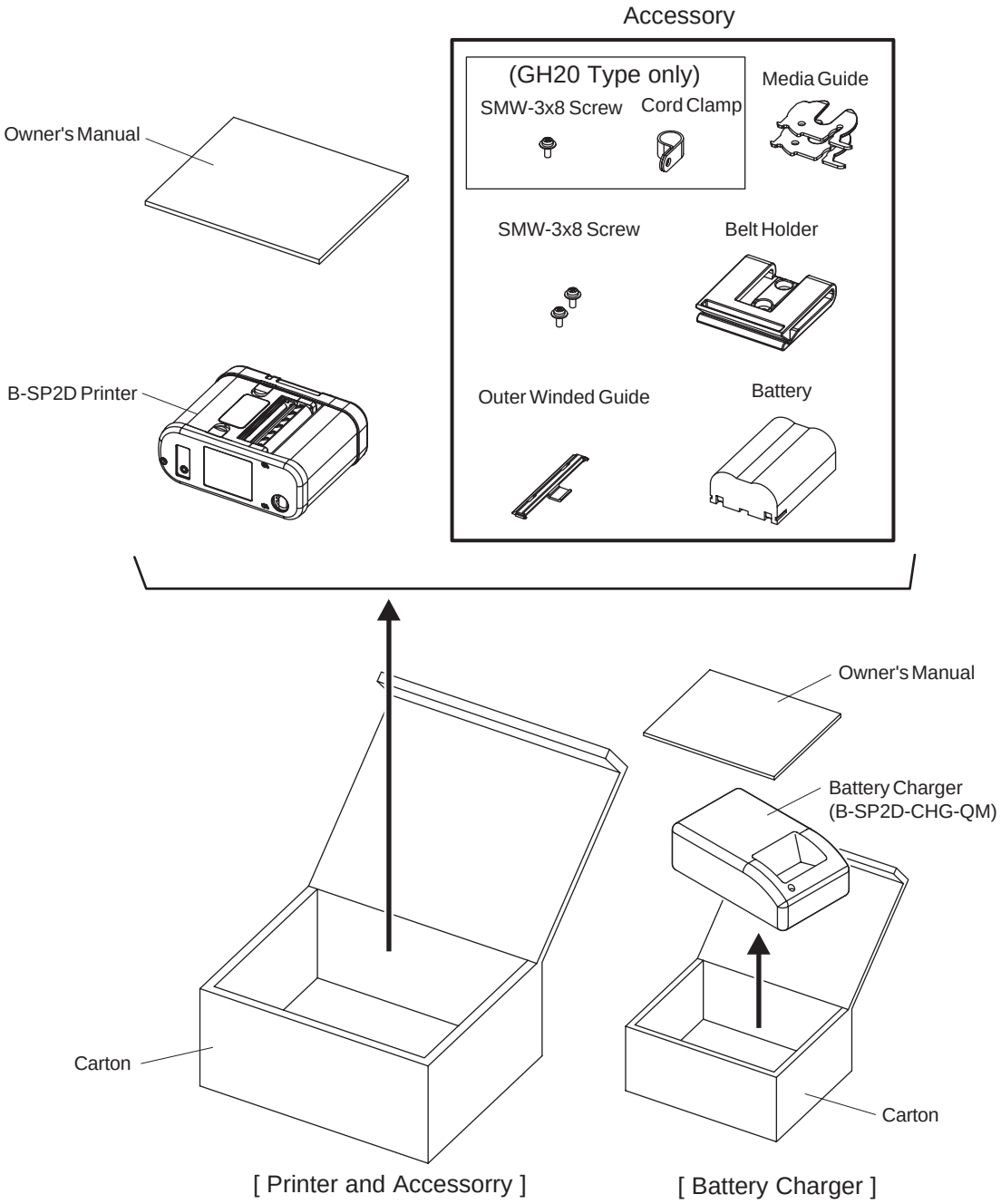
CAUTION!

1. *This manual may not be copied in whole or in part without prior written permission of TOSHIBA TEC.*
2. *The contents of this manual may be changed without notification.*
3. *Please refer to your local Authorized Service representative with regard to any queries you may have in this manual.*

1. UNPACKING

1.1 PROCEDURE

1) Open the carton.
2) Unpack the accessories from the carton.
3) Unpack the printer.



NOTES: *1. Keep the carton and pad for future transportation of the printer.*
2. Since the power cord set is not enclosed in this battery charger unit, please purchase an approved one which meets the standard for each country from your Authorized TOSHIBA TEC representative. For details, please refer to the B-SP2D-CHG Owner's Manual.

1.2 CHECKS

1) Check for damage or scratches on the machine.
2) Confirm that none of the accessories are missing.

2. MAIN UNIT REPLACEMENT

WARNING!
1. Unload the battery before replacing any parts. *2. Danger of explosion if battery is incorrectly replaced. Replace the battery only with 'TOSHIBA TEC Corporation, Battery Pack Type B-SP2D-BT, 7.4V 1400mAh Lithium-Ion. Discard used batteries according to the manufacture's instructions.*

CAUTION!
1. *Since a lot of small molded parts are used in this printer, care must be taken not to damage or lose them.*
2. *Be careful not to damage the print head while removing and reassembling.*
3. *In the United States, used lithium ion batteries should be returned to the store where you bought the machine. (USA only)*
4. *LITHIUM ION BATTERY*
   DISPOSE OF PROPERLY
   Caution: Do not handle damaged or leaking lithium ion battery.
5. *Before handling the main parts, be sure to discharge static electricity in human body through other metals. Failure to do this may damage the CPU PC board, print head, etc..*

■ **Lubrication**

CAUTION!
1. *Lubrication: During parts replacement*
2. *Kinds of oil: FLOIL G-488: 1Kg can. (Part No.19454906001)*
3. *Do not spray the inside of the printer with lubricants. Unsuitable oil can damage the mechanism.*

All machines are generally delivered in their best condition. Efforts should be made to keep them that way. Lack of oil, or the presence of debris or dust, may cause an unexpected failure. To maintain in optimal operating condition, periodically clean the machine and apply the proper kinds of oil to each part in which lubrication is needed.

Although the frequency of lubrication varies according to how often the machine is used, as a minimum it is necessary to lubricate before any part becomes dry. It is also necessary to wipe off excessive oil or it will collect dirt.

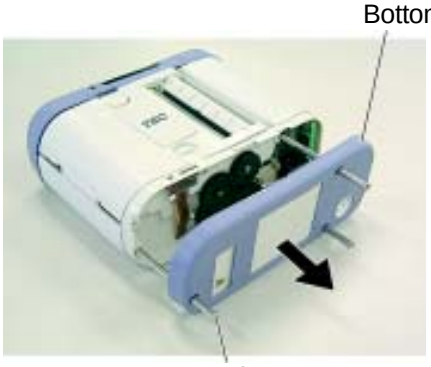
***NOTE**: Replacement procedures are partly different depending on the models.*

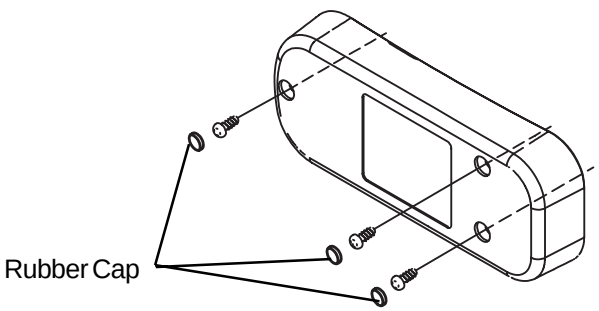
2.1 REPLACING THE CPU PC BOARD AND THE WIRELESS LAN MODULE

For GH20/GH30 models

1) Remove the three cover securing screws to remove the bottom cover. For the RoHS compliant printers, the cover securing screws are covered with rubber caps. First, remove the rubber caps using tweezers or something, and then, remove the cover securing screws. At this time, care must be taken not to damage the bottom cover.
   The removed rubber caps are non-reusable. Please use new rubber caps (Part No.: 7FM02372000) when reassembling the printer.

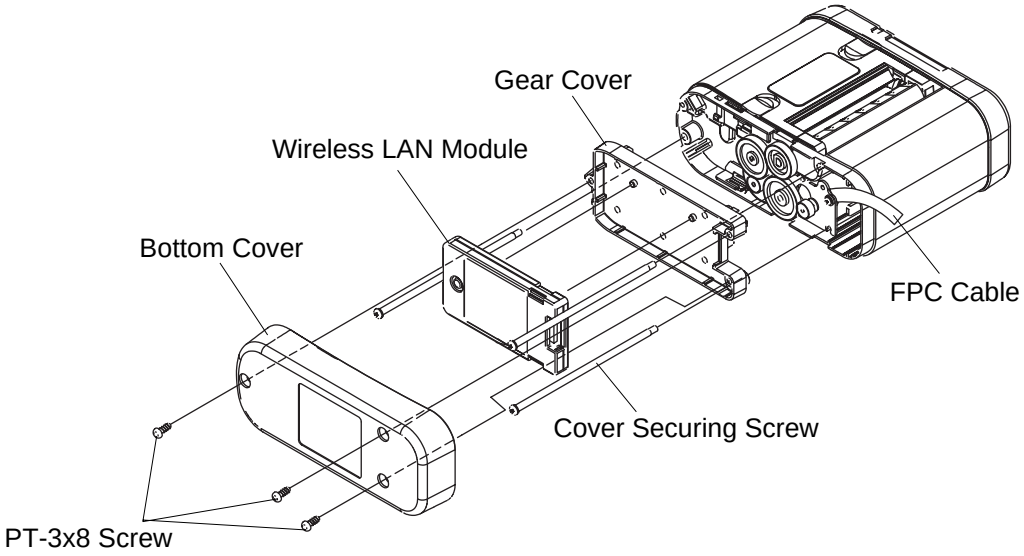
NOTES: *1. When removing the bottom cover, support the gears so that they don't come out.*
2. When reassembling, tighten the cover securing screws with 2.5 to 2.8kgf·cm (0.245 to 0.275N·m).
3. When reassembling, attach the bottom cover so as not to catch the FPC cable.



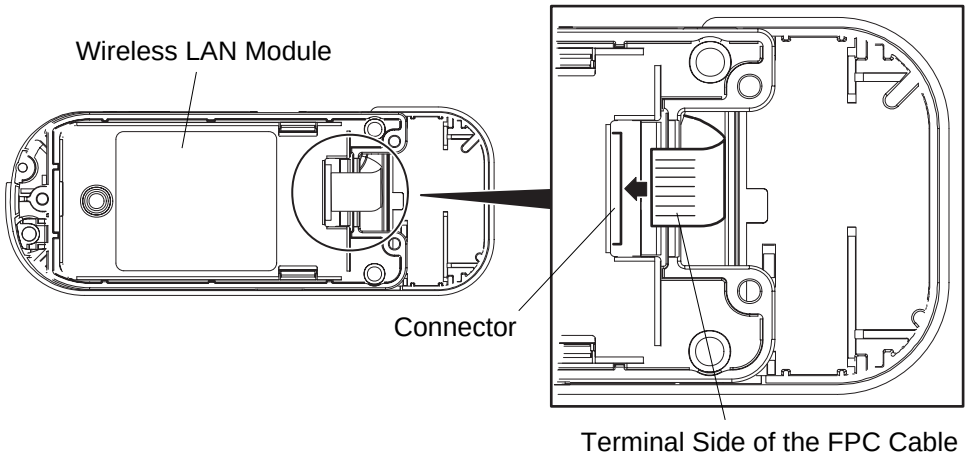


For GH40 model

1) Remove the three PT-3x8 screws to remove the bottom cover.
Remove the wireless LAN module from the gear cover, and then, disconnect the FPC cable from the wireless LAN module. Remove the three cover securing screws to remove the gear cover.



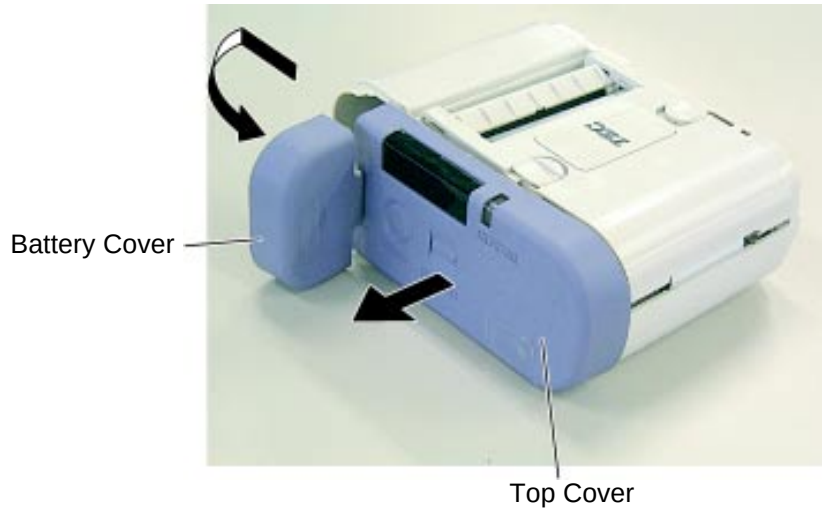
***NOTES**: 1. When removing the gear cover, support the gears so that they do not come off.*
2. When reassembling, tighten the PT-3x8 screws with 6kgf•cm (58.8N•cm).
3. When reassembling, be careful not to pinch the FPC cable by the bottom cover or gear cover. Also, connect the FPC cable to the wireless LAN module with the terminal side facing to the bottom cover. Then, lock the FPC cable with the connector lock.



4. When the wireless LAN module is replaced with a new one, it is necessary to set the country setting appropriately for the country where the printer is used. (Refer to Section 7.)

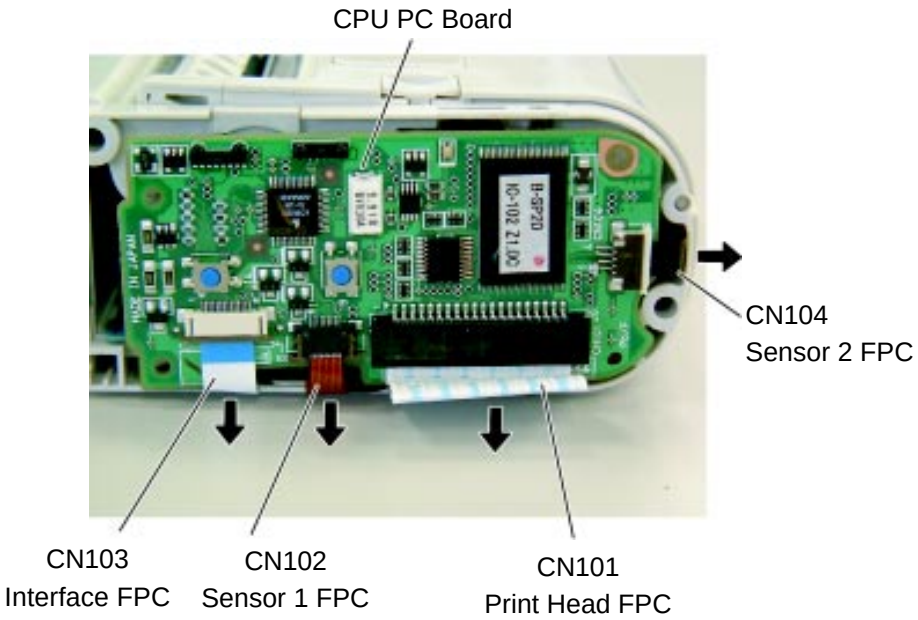
2) Open the battery cover, and then remove the top cover.

NOTE: *When reassembling, attach the top cover so as not to catch the FPC cable.*

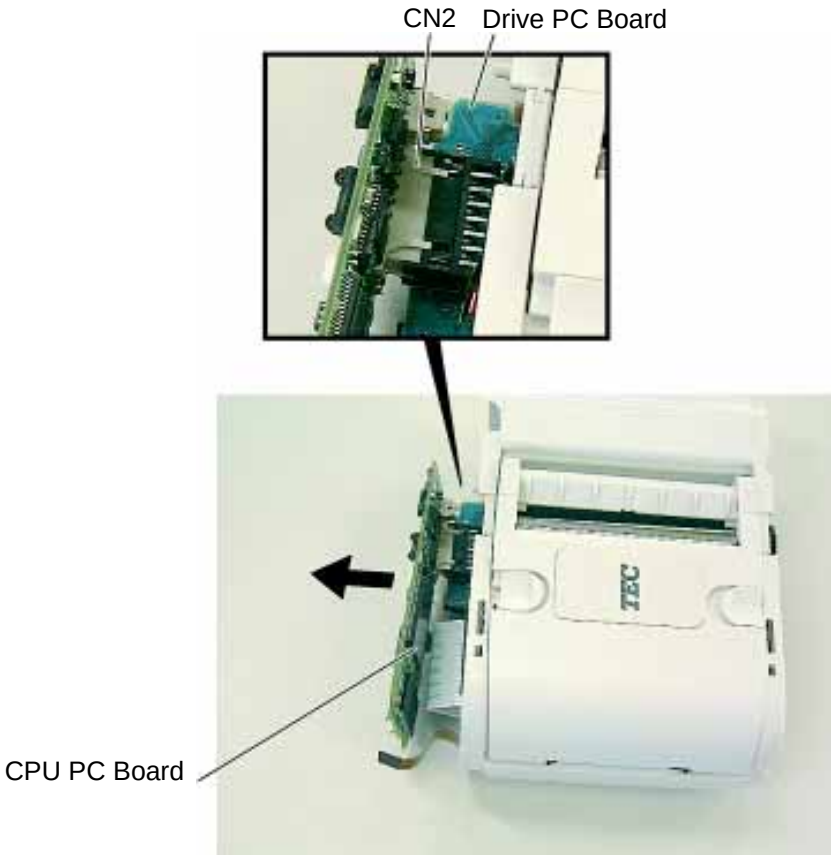


3) Disconnect all the connectors to remove the CPU PC board from the pritner.

NOTES: *1. When removing each FPC cable, unlock the connector with tweezers, etc. At this time, be careful not to scratch the FPC cable and the CPU PC board.*
2. Do not fold back the FPC cables. Doing so may damage the internal wires.



4) While raising the CPU PC board a little, remove the Drive PC board from CN2 on the CPU PC board.



5) After replacing the CPU PC board with the new one, reassemble in the reverse order of removal.

- **After the replacement, perform each check and setting below.**

(1) Status Indicator

Condition	Status Indicator
The printer is off.	The status indicator is off.
The printer is turned on.	The status indicator blinks in red for a few seconds, then lights in green. If the battery is nearly end, the status indicator lights in orange. If the battery voltage is low, the status indicator lights in red.
After the printer is turned on, the **[FEED]** button is pressed without media loaded.	The status indicator blinks in red.

When the status indicator doesn't perform as the table above shows, make sure that the cables are connected to the CPU PC board properly. If the status indicator still doesn't perform properly, replace the CPU PC board with the new one.

(2) Test Print

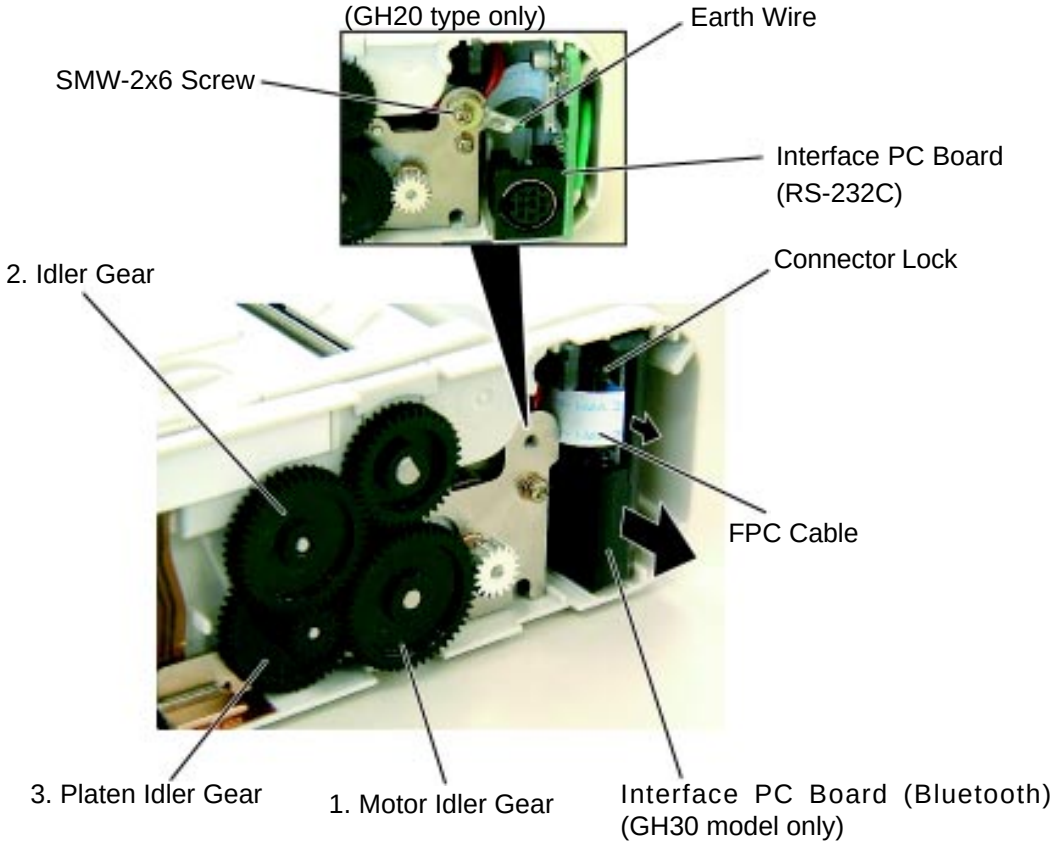
Perform a test print to check each item. (Refer to Section 2.6 TEST PRINT.)

(3) Initial Setting

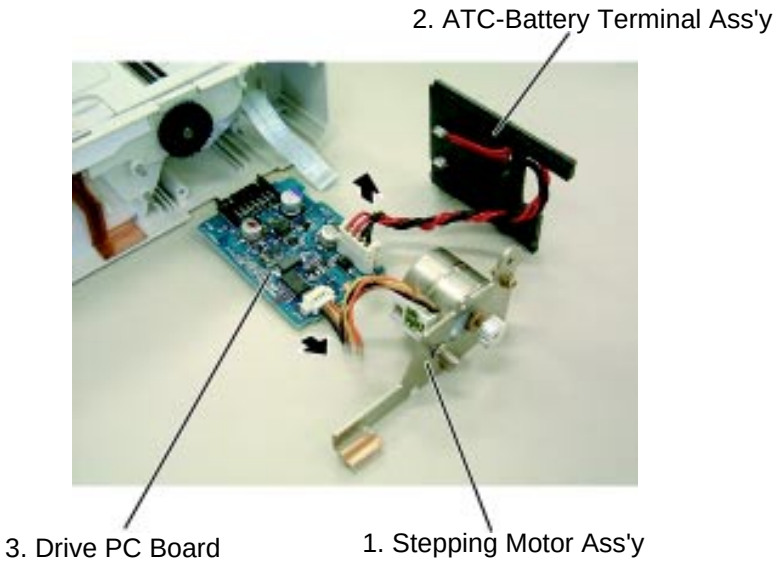
With Set Up Tool, be sure to perform each sensor adjustment, destination setting, printer ID setting, and online check printing. (Refer to Section 2.7 SETTING AND ADJUSTMENT.)

2.2 REPLACING THE DRIVE PC BOARD AND THE STEPPING MOTOR ASS'Y

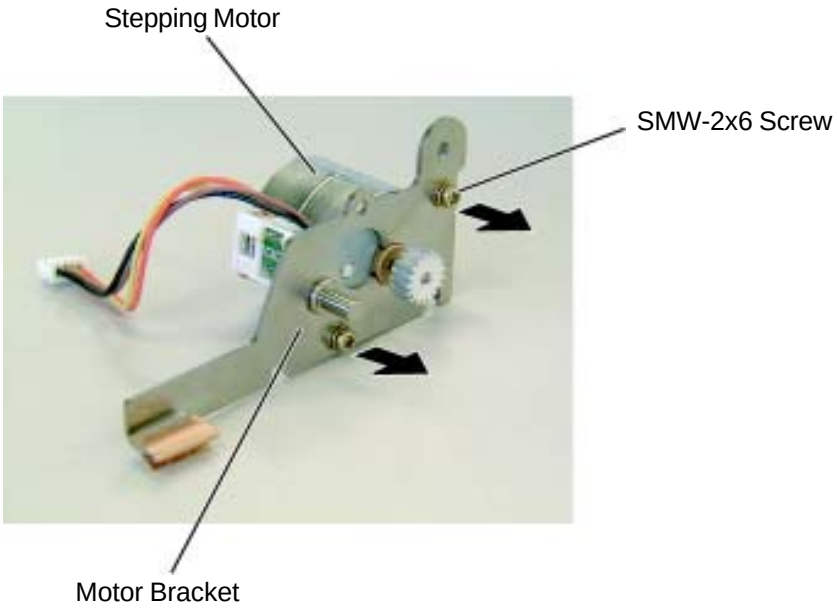
1) Remove the bottom cover, top cover, and CPU PC board from the printer. For the GH40 model, also remove the wireless LAN module and gear cover.
(Refer to Section 2.1 REPLACING THE CPU PC BOARD AND WIRELESS LAN MODULE.)
2) In case of the GH20 model, remove the SMW-2x6 screw to release the earth wire of the interface PC board (RS-232C).
3) Release the connector lock to disconnect the FPC cable, and then pull out the interface PC board (Bluetooth or RS-232C).
4) Remove the gears from the printer in the following order; 1. motor idler gear, 2. idler gear, 3. platen idler gear.



5) Remove the 1. stepping motor ass'y, 2. ATC-battery terminal ass'y, and 3. drive PC board from the printer as an assembly.
6) Remove the stepping motor ass'y and the ATC-battery terminal ass'y from the drive PC board.



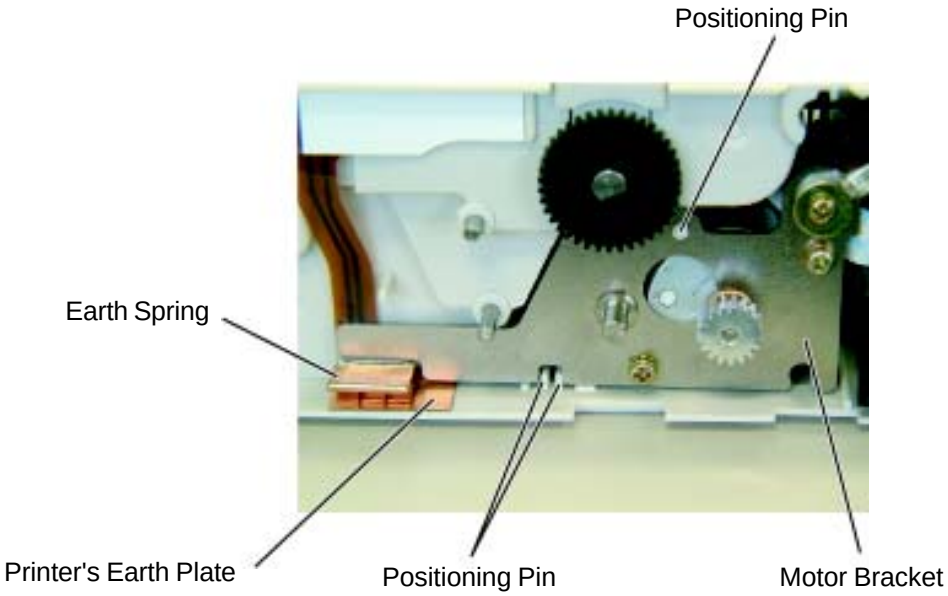
6) Remove the stepping motor ass'y and the ATC-battery terminal ass'y from the drive PC board.
7) Remove the two SMW-2x6 screws to remove the stepping motor from the motor bracket.



8) After replacing the drive PC board and the stepping motor ass'y with the new ones, reassemble in the reverse order of removal.

NOTES: *1. When reassembling the stepping motor ass'y, fit the positioning pins into the mounting hole of the motor bracket as the figure below shows.*

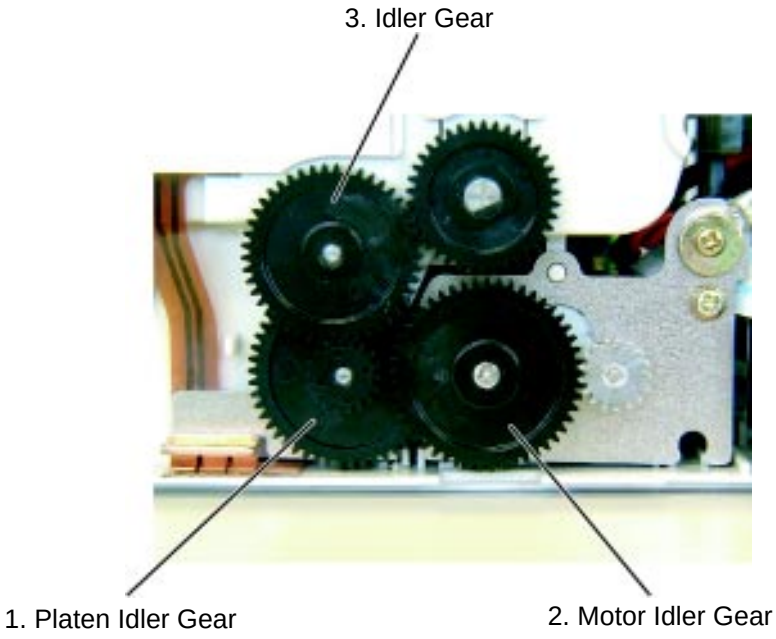
2. For the GH20 model, when attaching the motor braket to the printer, make sure that the earth spring on the motor braket comes in contact with the printer's earth plate.



3. Before reassembling the gears, wipe away dusts, stain or dirt on the gears with a clean cloth. Also apply FLOIL G-488 to each gear' shaft and the portion between the motor gear and the motor idler gear.

4. After reassembling the gears, manually rotate the gears to make sure that they works properly.

5. Make sure of the orientation of the gears, and then reassemble them in the following order; 1. platen idler gear, 2. motor idler gear, 3. idler gear.

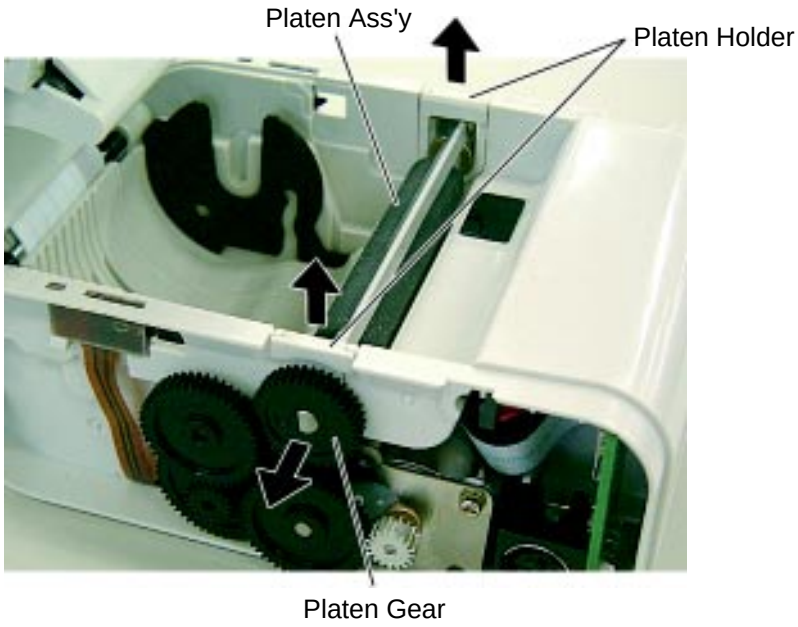


2.3 REPLACING THE PLATEN

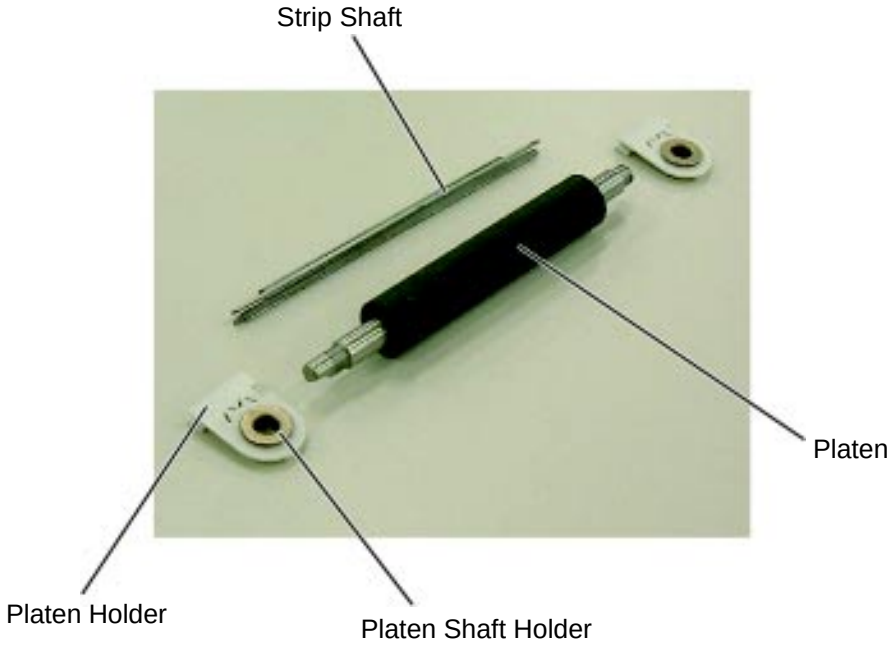
1) Remove the bottom cover and the top cover from the printer. For the GH40 model, also remove the wireless LAN module and gear cover.
(Refer to Section 2.1 REPLACING THE CPU PC BOARD AND WIRELESS LAN MODULE.)

2) Remove the platen gear from the platen.

3) Remove the platen holders in the direction indicated by the arrows to remove the platen ass'y.



4) Remove the platen shaft holders and the platen holders from the platen and the strip shaft.



5) After replacing the platen with the new one, reassemble in the reverse order of removal.

NOTES: *1. Before reassembling the platen gear, wipe away dusts, stain or dirt on the gear with a clean cloth.*

2. Make sure of the orientation of the platen gear, then reassemble is as the picture below shows.

Platen Gear

[Outer Side]

[Inner Side]

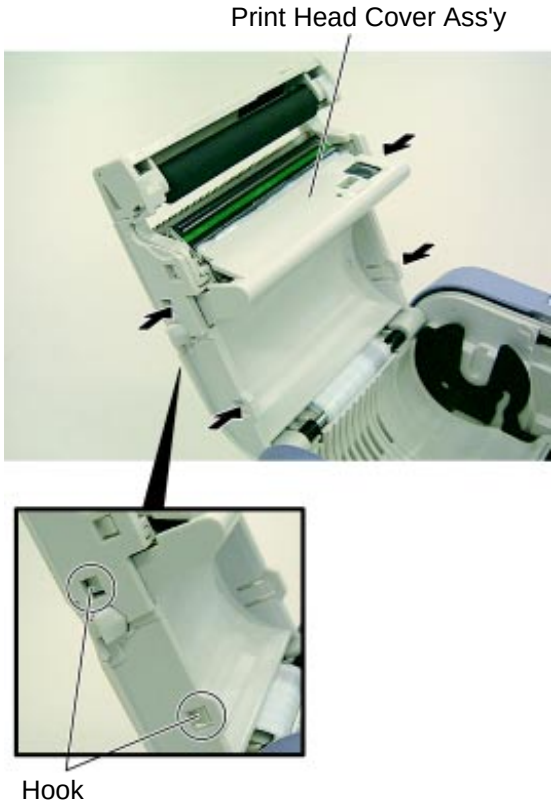
2.4 REPLACING THE PRINT HEAD, CUTTER, AND SENSORS

CAUTION!

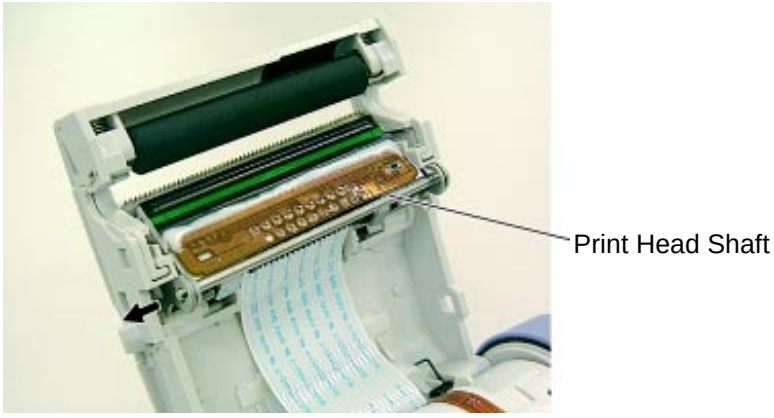
1. *Before handling the print head, be sure to discharge static electricity in human body through other metals. Failure to do this may damage the print head element.*
2. *Never touch the print head element directly by hands or hard objects. Doing so will damage the element, causing a dot missing and a print failure.*

1) Open the media cover.

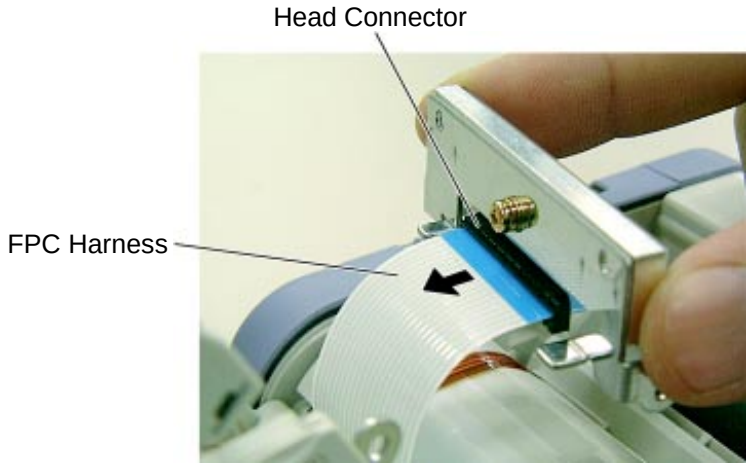
2) Release the four hooks to remove the print head cover ass'y.



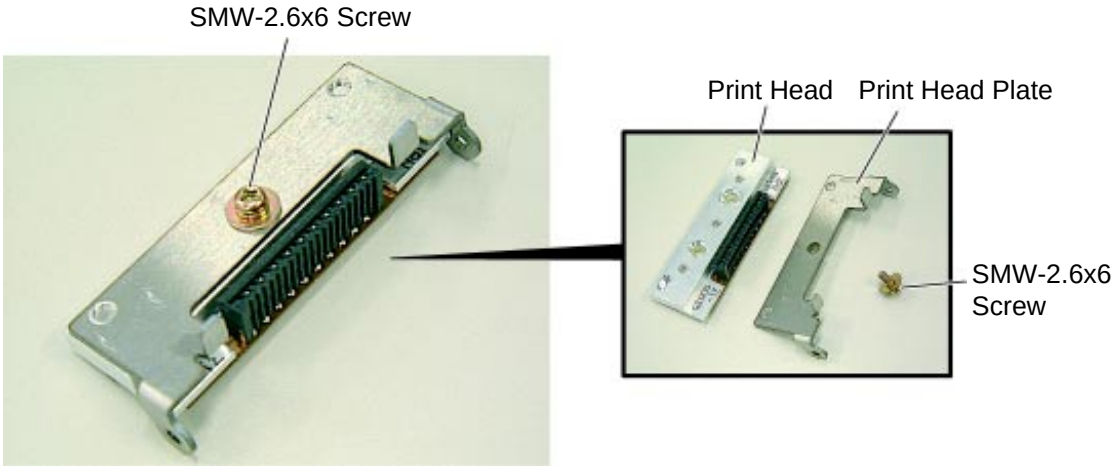
3) Pull out the print head shaft.



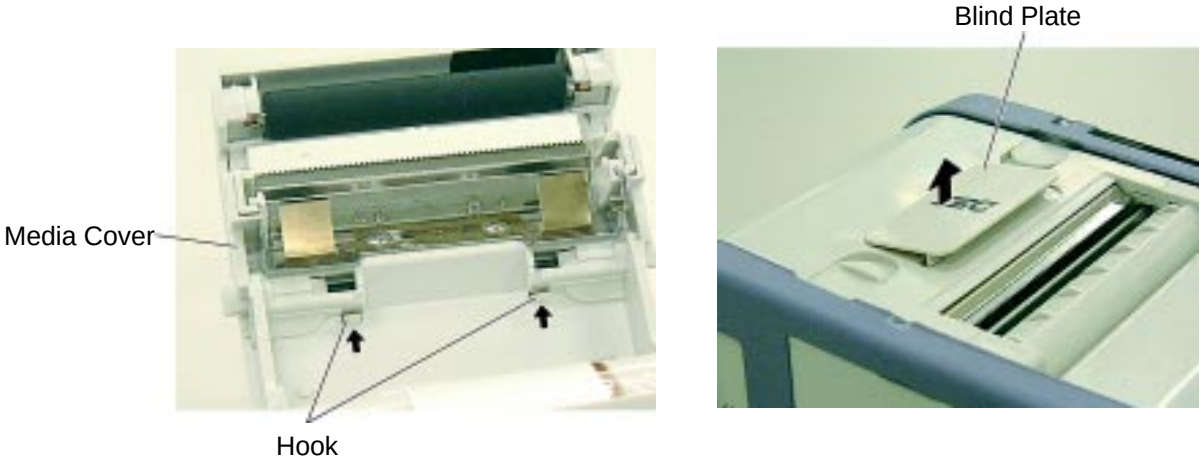
4) Remove the FPC harness from the head connector while being careful not to touch the print head element.



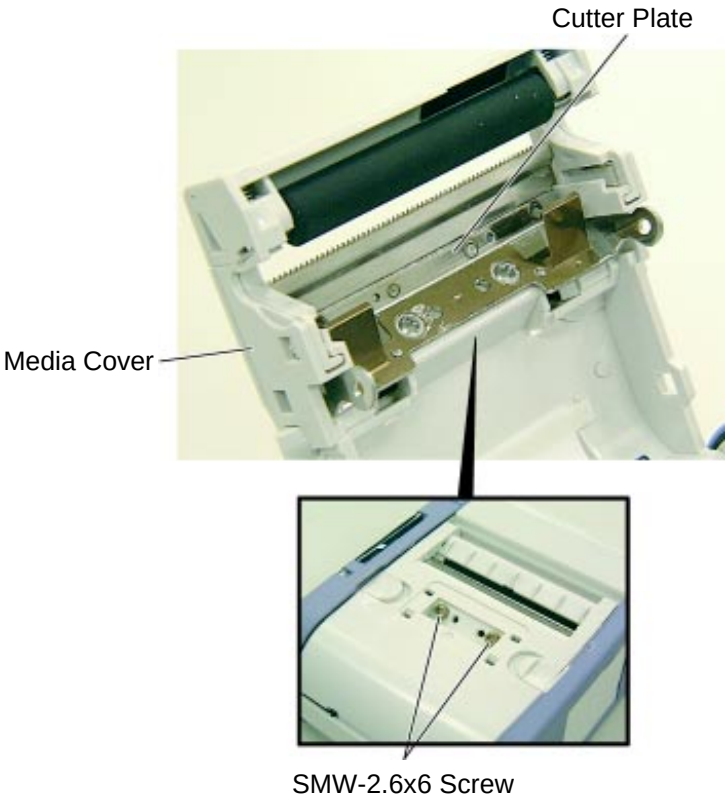
5) Remove the SMW-2.6x6 screw to remove the print haed from the print head plate.

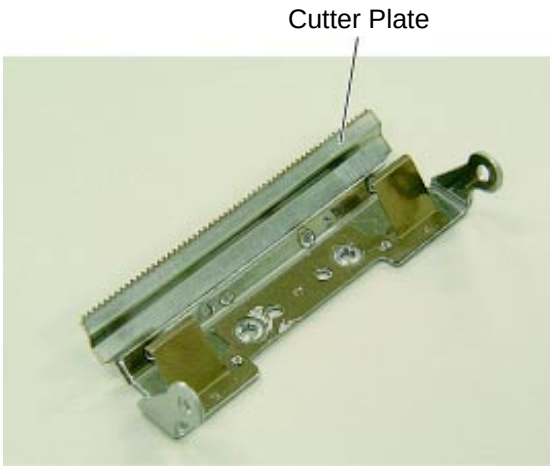


6) Release the two hooks which are provided at the inside of the media cover, and then remove the blind plate.



7) Remove the two SMW-2.6x6 screws to remove the cutter plate from the media cover.

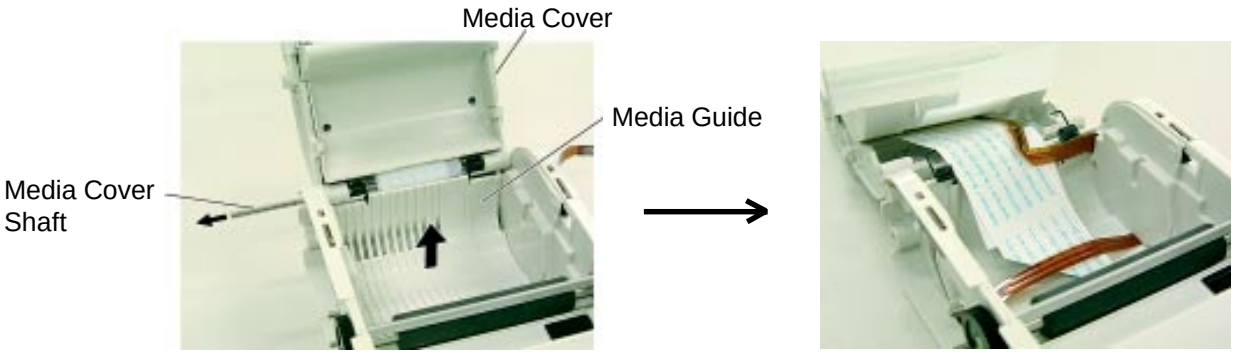




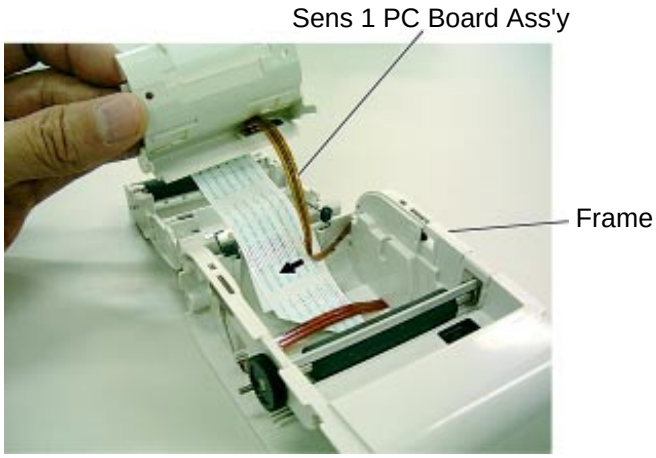
8) When replacing the print head FPC, sensor 1 FPC, or sensor 2 FPC, follow Step 9 and after.

9) Remove the bottom cover, top cover, CPU PC board, drive PC board, stepping motor ass'y, and gears. For the GH40 model, also remove the wireless LAN module and gear cover.
(Refer to Sections 2.1 REPLACING THE CPU PC BOARD AND WIRELESS LAN MODULE, 2.2 REPLACING THE DRIVE PC BOARD AND THE STEPPING MOTOR ASS'Y, and 2.3 REPLACING THE PLATEN.)

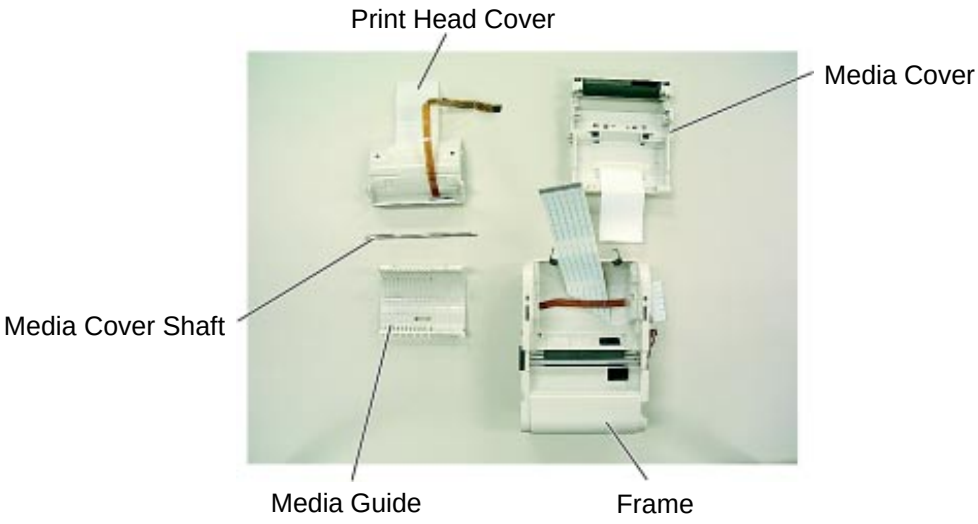
10) Pull out the media cover shaft, and then remove the media cover and the media guide.



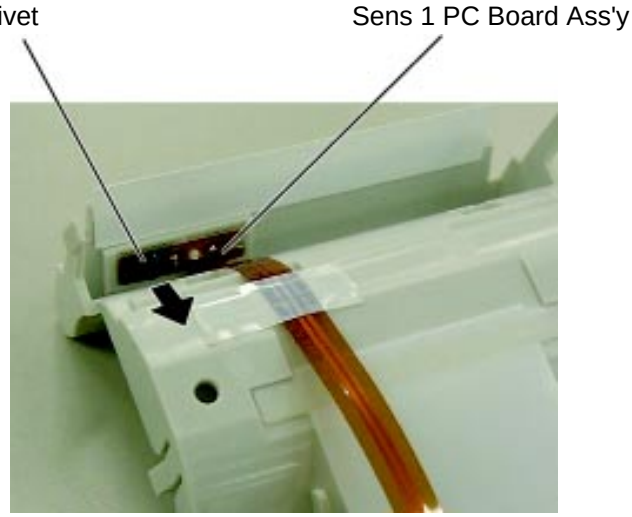
11) Remove the FPC of the sens 1 PC board ass'y from the frame.



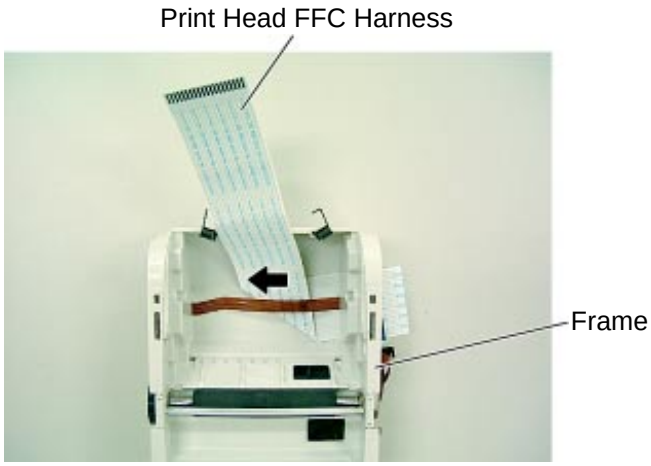
(After performing Step 10 and Step 11)



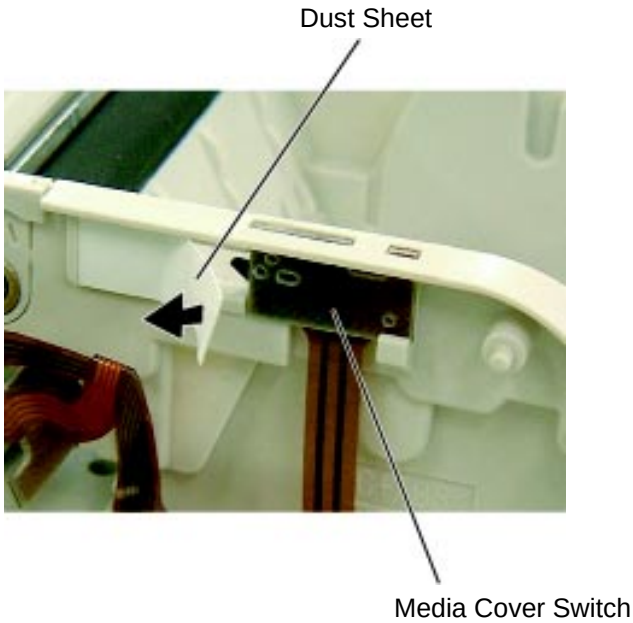
12) Remove the rivet, and then remove the sens 1 PC board ass'y from the print head cover.



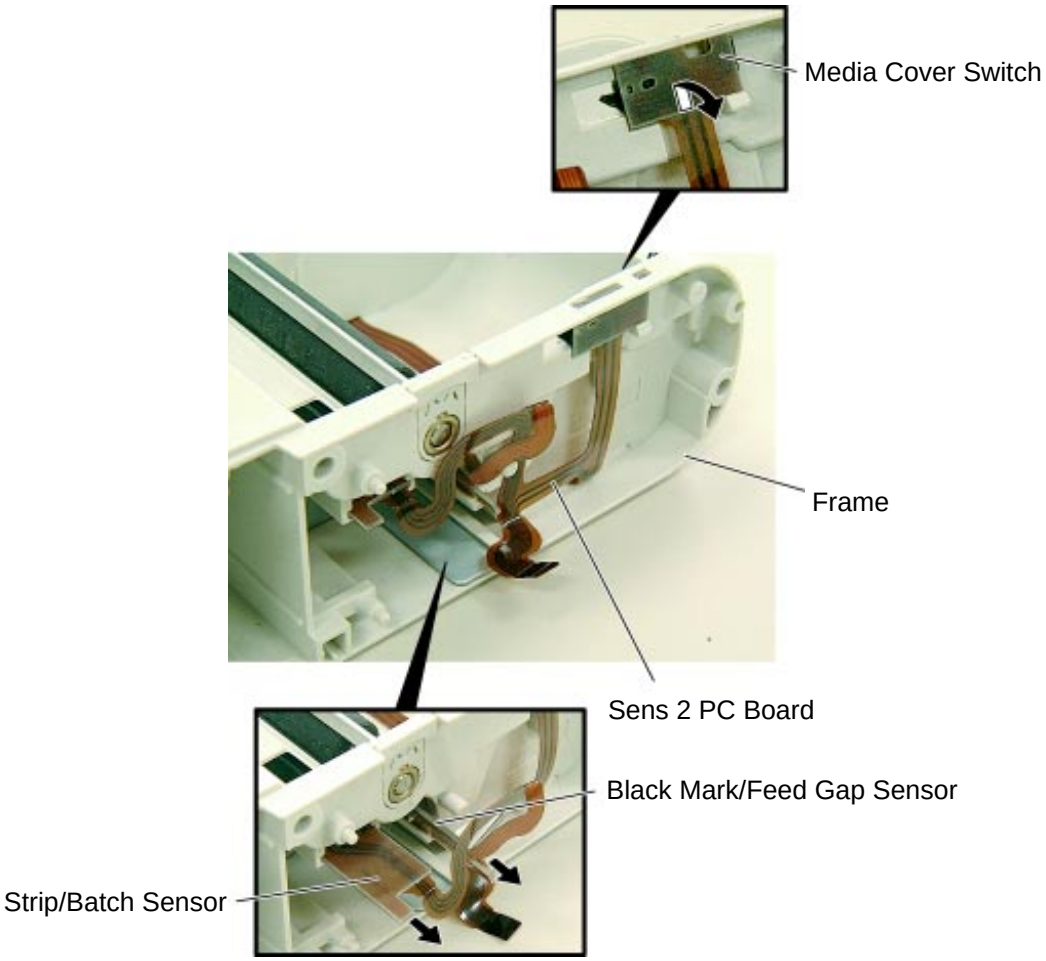
13) Remove the print head FFC harness from the frame.



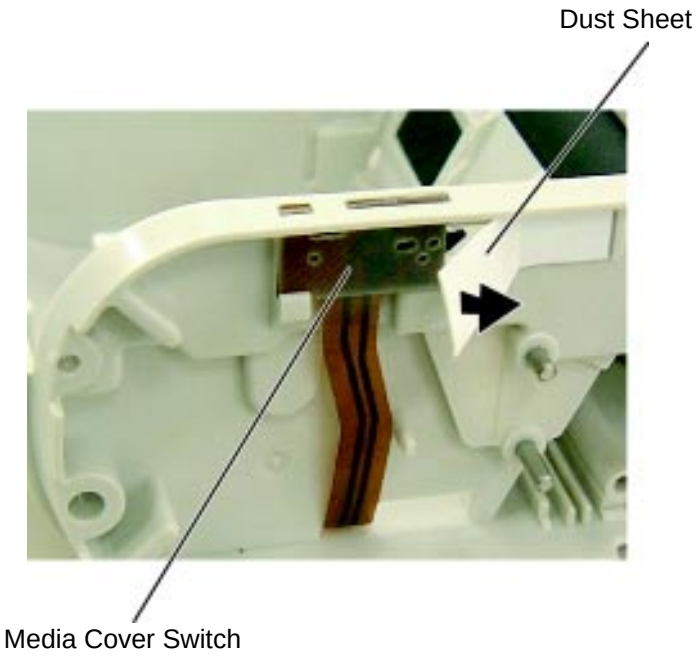
14) Remove the dust sheet from the upper media cover switch.



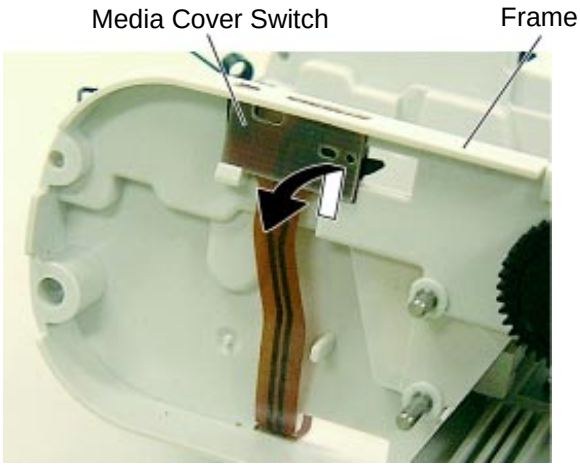
15) Remove the upper media cover switch, strip/batch sensor, and black mark/feed gap sensor , which are provided for the sens 2 PC board, from the frame.



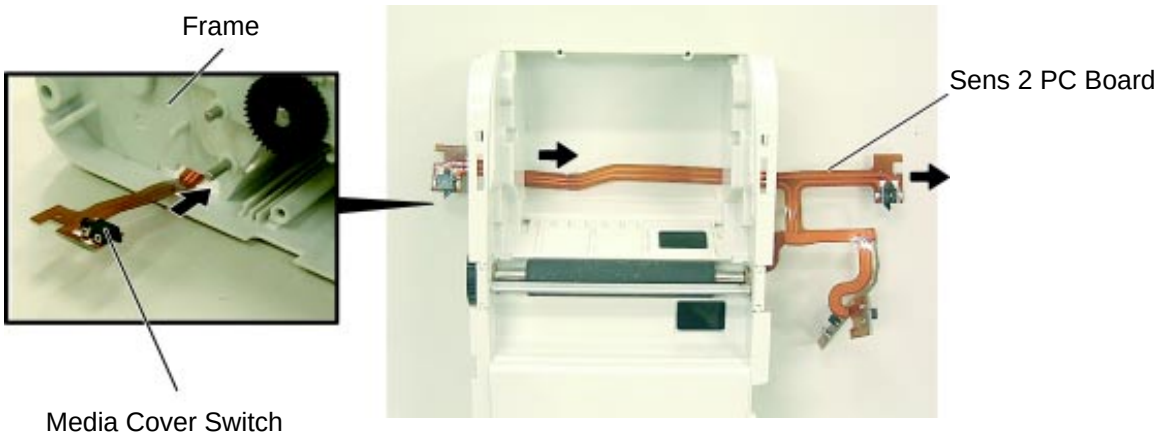
16) Remove the dust sheet from the lower media cover switch.



17) Unhook the lower media cover switch, which are provided for the sens 2 PC board, from the frame.

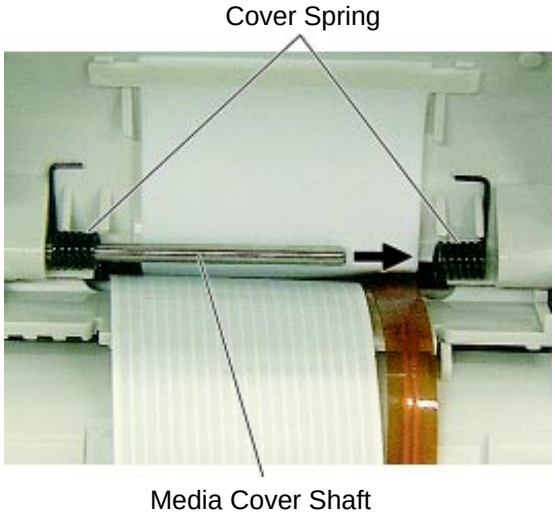


18) Remove the lower media cover switch with the sens 2 PC board from the frame.



19) After replacing the print head, cutter, and sensors with the new one, reassemble in the reverse order of removal.

NOTES: *1. Reassemble the cover springs properly when attaching the media cover shaft.*



2. After replacing the sensors, with the Set Up Tool, be sure to perform each sensor adjustment, destination setting, printer ID setting, and online check printing. (Refer to Section 2.7 SETTING AND ADJUSTMENT.)

3. After replacing the media cover switch, perform a check by following steps below.

1) Turn on the printer and load a media roll.

*2) Press the **[FEED]** button while sliding each of the media cover release catch.*

3) Make sure that the printer works properly as the table below shows.

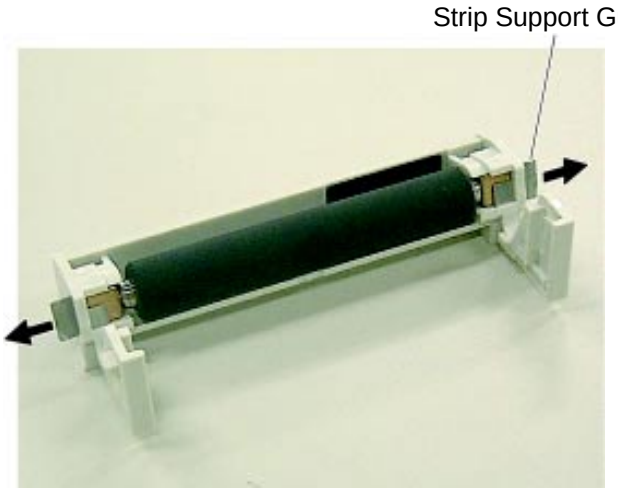
Condition	Performance
• Media cover release catches are fully released. • Either of the media cover release catch is released.	• The printer doesn't feed the paper. • The status indicator flashes in red.
• Media cover release catches are locked.	• The printer feeds the paper.

4) When the printer doesn't work properly, the media cover switch may not be attached properly or it may not be connected to the CPU PC board properly. Check these possible causes, then make sure of the printer's performance again. If the printer still doesn't work properly, replace the media cover switch with the new one.

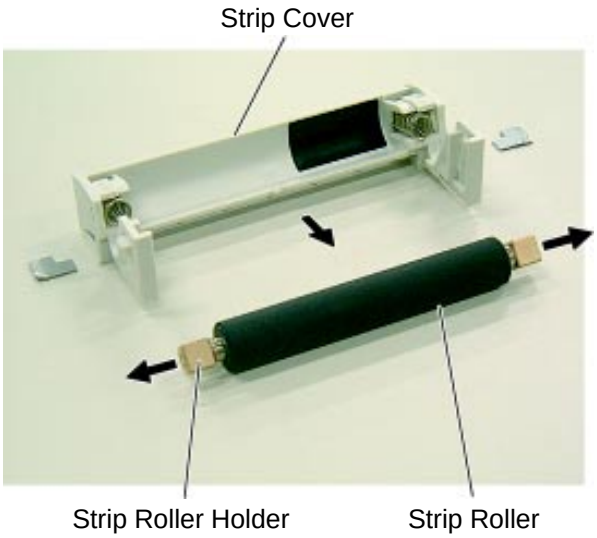
2.5 REPLACING THE STRIP ROLLER

1) Open the media cover.
2) Release the hooks to remove the strip cover to the direction indecated by the arrow.

3) Remove the two strip support guides in the direction indicated by the arrows.

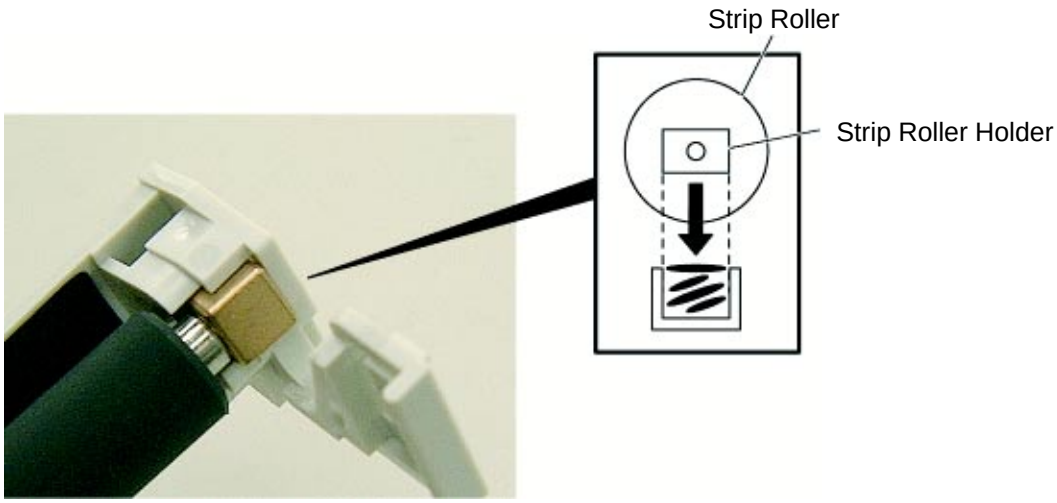


4) Remove the strip roller together with the strip roller holders from the strip cover.
5) Remove the strip roller holders from the strip roller.

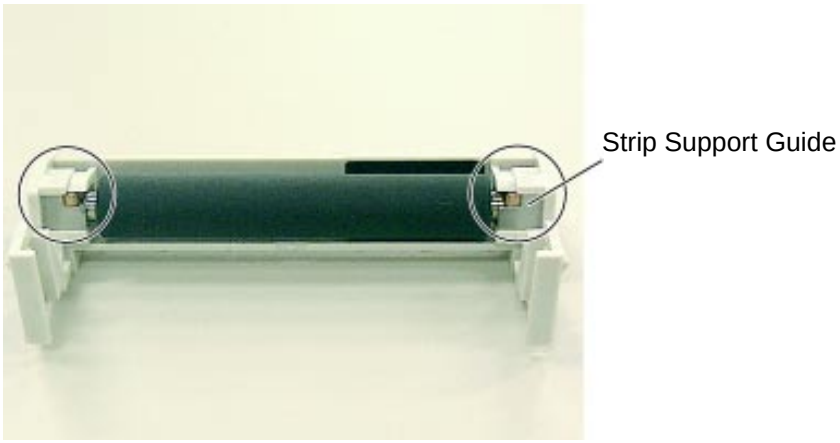


6) After replacing the strip roller with the new one, reassemble in the reverse order of removal.

NOTES: *1. When reassembling, fit the strip roller holders to the strip roller so that their wider sides contact the strip roller springs.*



2. When reassembling, attach the strip support guides correctly as the picture below shows.



2.6 TEST PRINT

After replacing the print head ass'y, sensor ass'y or CPU PC board ass'y, perform a test print to check the print condition.

- Procedure
  1) Load a receipt roll (Type: PD-190R or equivalent, Paper roll diameter: ∅36mm) and the battery into the printer.
  2) Turn on the printer while pressing and holding the **[FEED]** button.
  3) The printer will automatically print the self diagnosis result.
  4) Pressing the **[FEED]** button again causes the printer to print oblique patterns.

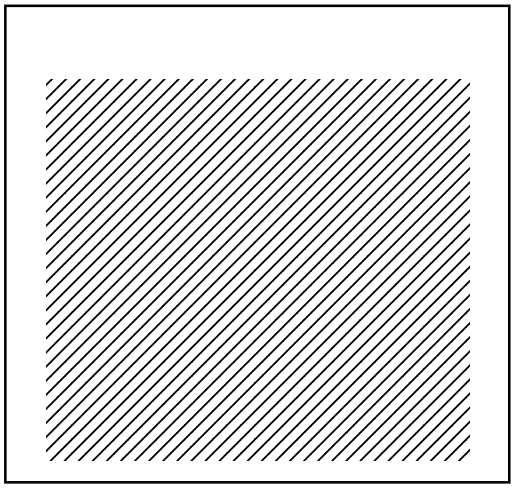
(Print sample)

1st label

2 Software version

①	**B-SP2D**	**ID**	**01234**	⑩
②	**7FM00434001**	**HEAD**	**OK (2)**	⑪
③	**MAIN V1.0 :xx00**	**BATT**	**8.2V (5)**	⑫
	10MAR2003	**ADJ.**	**+00 +0.0mm**	⑬
④	**BOOT V1.0 :xx00**	**P/W**	**120min**	⑭
	10MAR2003	**FORM**	**0000000000**	⑮
⑤	**FONT xx00**		**0000000000**	
⑥	**KANJI xx00**	**MODE**	**LABEL**	⑯
⑦	**SENS R:4.3V**	**PARA**	**[PC850][0]**	⑰
	T:1.2V	**LOOP**	**IR:OK BT:OK**	⑱
	P:1.0V	**IrDA**	**IrCOMM**	⑲
	H:+30°C		**FRONT**	
	A:+24°C	**OP.**	**Bluetooth**	⑳
⑧	**PEEL 3.2V**		**0001cc400020**	
⑨	**TYPE QM**			

2nd and subsequent labels



① Model name

B-SP2D
└── Model name

② Firmware Part Number

7FM00434001
└── Software Number

NOTE: *For the RoHS compliant printers (Firmware version V1.8 or greater), this part number is not printed.*

③ Checksum (MAIN)

MAIN V1.0 :xx00 10MAR2003
- 10MAR2003 — Date of issue
- :xx00 — Checksum
- V1.0 — Version

④ Checksum (BOOT)

BOOT V1.0 :xx00 10MAR2003
- 10MAR2003 — Date of issue
- :xx00 — Checksum
- V1.0 — Version

⑤ Checksum (FONT)

FONT xx00
└── Checksum for the C/G area

⑥ Checksum (Writable character)

KANJI xx00
└── Checksum for the writable character area

NOTE: *Chinese character will be printed when supported by the printer.*

⑦ Sensor status

SENS R:4.3V ——— Black mark sensor status
T:1.2V ——— Feed gap sensor status
P:1.0V ——— Strip/Batch
H:+30°C ——— Thermistor status
A:+24°C ——— Print head termistor status

NOTE: *Make sure that each sensor's voltage satifsies the standard below. If the voltage doesn't satisfy it, this sensor may be damaged. In this case, perform a sensor adjustment or replace it with the new one. (For the sensor adjustment, refer to Section 2.7 SETTING AND ADJUSTMENT.)*
R: 3.5V or more, T: 1.5V or more, P: 3.5V or more
H: (t-5) ~ (t+20)°C t = Environmental temperature
A: (t-5) ~ (t+5)°C

⑧ Threshold

PEEL 3.2V
└── Threshold voltage of strip sensor

⑨ Destination code

TYPE QM
└── Destination code

⑩ Printer ID No.

ID 01234
└── Printer ID No.

⑪ Print head element check

HEAD OK (2)
└── Print head output dividing method
(AUTO, 2, 3, AUTO 1)
└── Check result of the print head broken element
(OK: Normal, NG: Broken element)

NOTE: *When the check result is NG, the print head element may be broken. In this case, replace the print head with the new one.*

⑫ Battery status

BATT 8.2V (5)
└── 5 levels of the remaining battery voltage
└── Remaining battery voltage

NOTE: *Using a battery fully charged, make sure that the remaining voltage is 7.6V to 8.4V. If is is less than 7.6V, a battery failure may occur. In this case, replace the battery with the new one.*

⑬ Print tone & Print start position

ADJ. +00
- +00 — Print tone fine adjustment
- +0.0mm — Print position fine adjustment

***NOTE**: Setting value for the Print Position Fine Adjustment*
When the setting value is x.3 mm, the value will be automatically changed to x.2 mm. In the same way, x.8 mm will be changed to x.7 mm. This is because the print head's dot density is 8 dots/mm.

⑭ Auto power off

P/W 120min
- 120min — Auto power off (1min, 5min, 30min, 120min)

⑮ Versions of the forms No.1 to No.20

FORM 0000000000
0000000000
- 1st 0 — Versions of the form No.10 (top) and No.20 (bottom)
- 2nd 0 — Versions of the form No.9 (top) and No.19 (bottom)
- 3rd 0 — Versions of the form No.8 (top) and No.18 (bottom)
- 4th 0 — Versions of the form No.7 (top) and No.17 (bottom)
- 5th 0 — Versions of the form No.6 (top) and No.16 (bottom)
- 6th 0 — Versions of the form No.5 (top) and No.15 (bottom)
- 7th 0 — Versions of the form No.4 (top) and No.14 (bottom)
- 8th 0 — Versions of the form No.3 (top) and No.13 (bottom)
- 9th 0 — Versions of the form No.2 (top) and No.12 (bottom)
- 10th 0 — Versions of the form No.1 (top) and No.11 (bottom)

⑯ Print mode

MODE LABEL
- LABEL — Print mode (LABEL, RECEIPT, RECEIPT1, TPCL-LE)

⑰ Printer parameter

PARA [PC850] [0]
- [0] — Without zero slash
- [PC850] — Character code

⑱ Loopback test

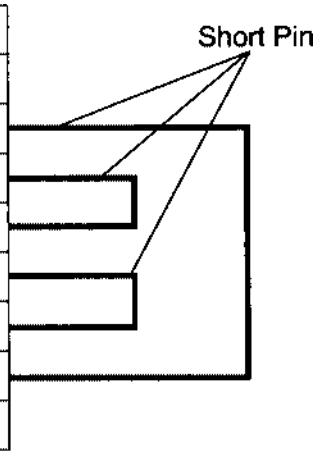
LOOP IR:OK BT:OK

- BT:OK — Check result of the option device interface (RS=RS-232C, BT=Bluetooth, LN=Wireless LAN) (OK, NG)
- IR:OK — Check result of IrDA (OK, NG)

NOTE: *The check result of RS-232C interface will be NG because a special jig is used.*

RS-232C Loopback Connector Wiring Pattern

Signal Name	Pin No.
SG	1
SG	2
RXD	3
TXD	4
CTS	5
RTS	6
TEST	7
NC	8



Connector Manufacturer: HIRAKAWA HEWTECH CORP.
Connector Type: VM2059 or equivalent

⑲ Baud rate & Protocol

IrDA IrCOMM 115,200 FRONT

- FRONT — Direction of IrDA (UPPER, FRONT)
- 115,200 — Baud rate (TEC only) (9,600, 19,200, 38,400, 115,200)
- IrCOMM — Protocol (TEC, IrCOMM)

⑳ Option interface

OP. Bluetooth

- Bluetooth — Interface to option devices (RS-232C, Bluetooth, Wireless LAN)

9,600 EVEN

- EVEN — Parity (RS-232C only) (EVEN, NON)
- 9,600 — Baud rate (RS-232C only) (9,600, 19,200, 38,400, 115,200)

0001cc400020

- 0001cc400020 — BD address (Bluetooth only) or MAC address (Wireless LAN only)

2.7 SETTING AND ADJUSTMENT

After replacing the CPU PC board or sensors, be sure to perform each setting and sensor adjustment with Set Up Tool. According to your condition, perform a proper setting and adjustment as shown below.

When the CPU PC board was replaced with the new one

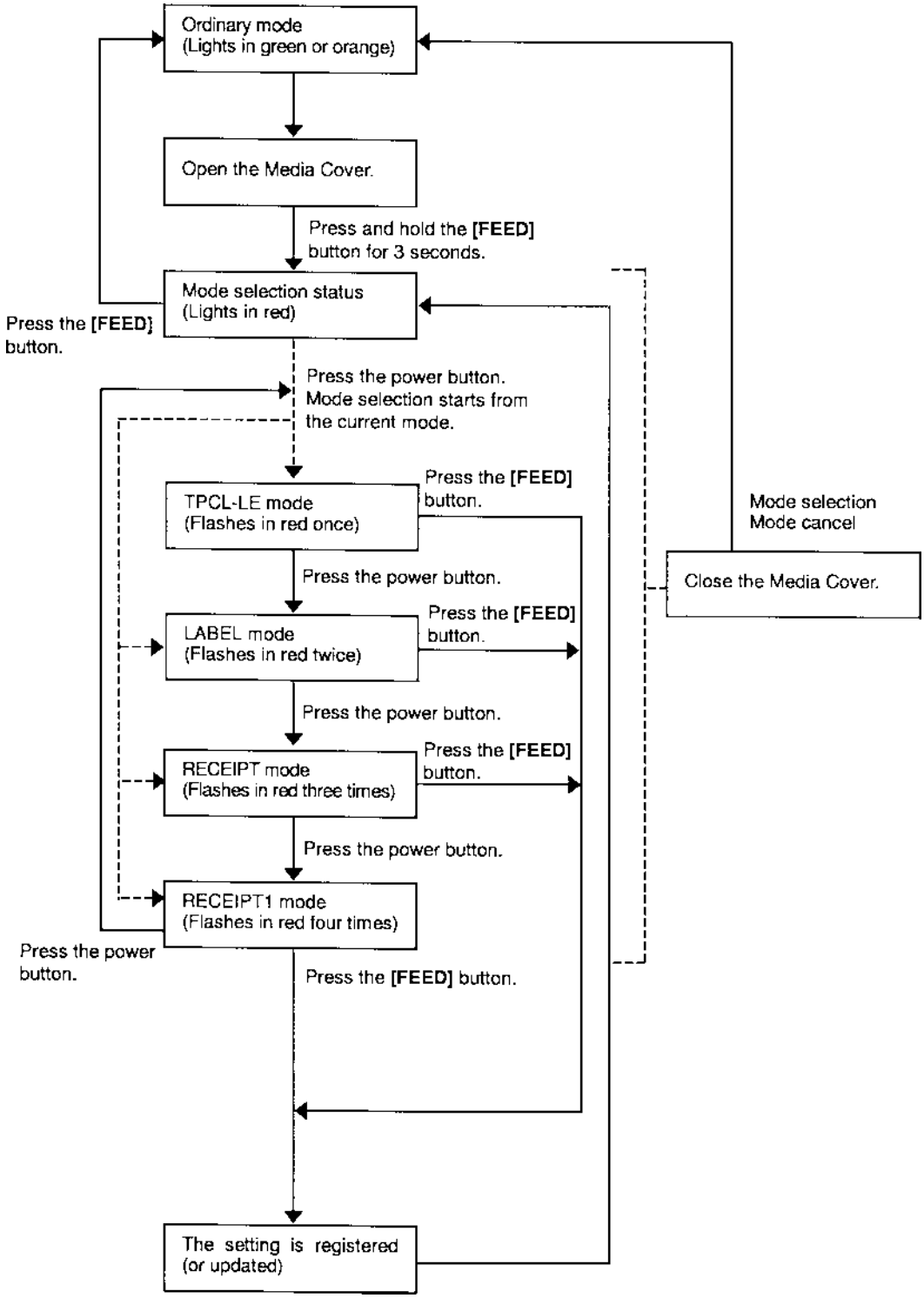
1) Install the Set Up Tool on a PC. (Refer to Section 2.7.2 Set Up Tool.)
2) Perform a sensor adjustment. (Refer to Section 2.7.3 Adjusting Sensors.)
3) Register a destination. (Refer to Section 2.7.4 Registering Destination.)
4) Register the printer ID. (Refer to Section 2.7.5 Registering Printer ID.)
5) Perform an online check printing. (Refer to Section 2.7.6 Performing Online Check Printing.)

When a sensor replacement or a sensor adjustment was performed
(in this case the CPU PC board is not replaced)

1) Perform a test print. (Refer to Section 2.6 TEST PRINT.)
   Make sure that the paper type is set to LABEL mode. (Refer to Section 2.7.1 Selecting Paper Type.)
2) Install the Set Up Tool on a PC. (Refer to Section 2.7.2 Set Up Tool.)
3) Register a destination. (Refer to Section 2.7.4 Registering Destination.)
   Select "IrDA:TEC Protocol" for F1:Transmission Cotrol, "Japan" for F2:Destination, respectively.
4) Perform a sensor adjustment. (Refer to Section 2.7.3 Adjusting Sensors.)
5) Register a destination. (Refer to Section 2.7.4 Registering Destination.)
   Restore F1:Transmission Control to "IrDA:IrCOMM", "RS-232C", or "Bluetooth" and F2:Destination to "Other countries" as printed on the test print performed in Step 1.
6) Perform an online check printing. (Refer to Section 2.7.6 Performing Online Check Printing.)

2.7.1 Selecting Paper Type

Type of paper to be issued can be selected on the printer. Select LABEL mode by following procedures below.



2.7.2 Set Up Tool

This software has the functions to adjust the sensors, set the destination, register the printer ID, and print the result of the online check. To perform any operations, face the B-SP2D's IrDA window to the IrDA jig (Actisys IR) connected to a PC through the serial interface.
The IrDA jig shown below is recommended. Please procure it locally.

Name: ACT-IR220L PLUS PC Serial IrDA Adaper
Manufacturer: ACTISYS

For details, please access to ACTISYS's homepage **http://www.actisys.com**

- Installing Software
  To perform the above functions, the software "B-SP2D Series Production Process for Windows" must be installed on a PC.
  When you need the above software, please contact TOSHIBA TEC Subsidiaries or our Sales Department.

[System Requirements]

System

IBM compatible PC running Windows 95®, Windows 98®, or Windows 2000®
(Performance of PC running other OS is not guaranteed.)

NOTE: *Windows 95, Windows 98, and Windows 2000 are registered trademarks of Microsoft Corporation.*

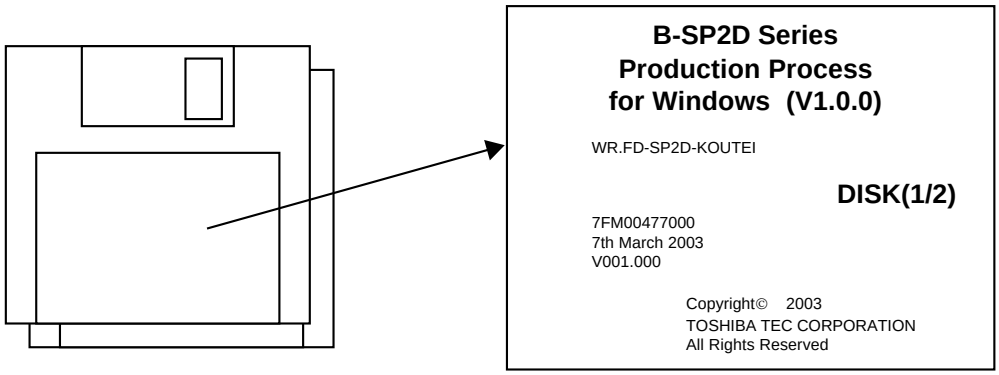
Installed memory of 16MB minimum (32MB or more is recommended.)
Available hard disk space of 10MB minimum (10MB or more is recommended.)

Interface

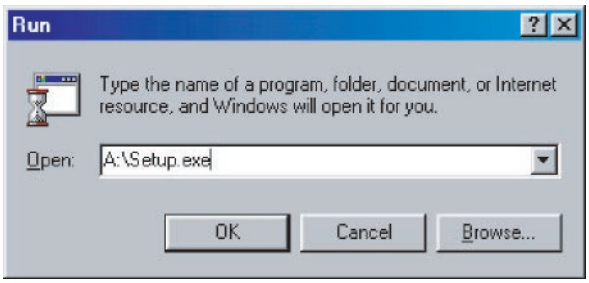
For IrDA communication, the IrDA interface should be provided for the PC (without drivers such as IrLAP) or an IrDA device which is connectable to a serial port should be provided for the PC.
For RS-232C communication, more than one serial port should be provided for the PC.

[Setup disk]

The SETUP DISK for installation consists of 2 floppy disks (3.5", 2HD, 1.44 MB).



1. While running Windows 98 (or Windows 95, Windows 2000), insert Setup Disk (1/3) into the PC floppydrive.
2. Click on the **[START]** button then highlight RUN and click on RUN.
3. When the RUN display appears, type in A:\SETUP.EXE and click on the **[OK]**.



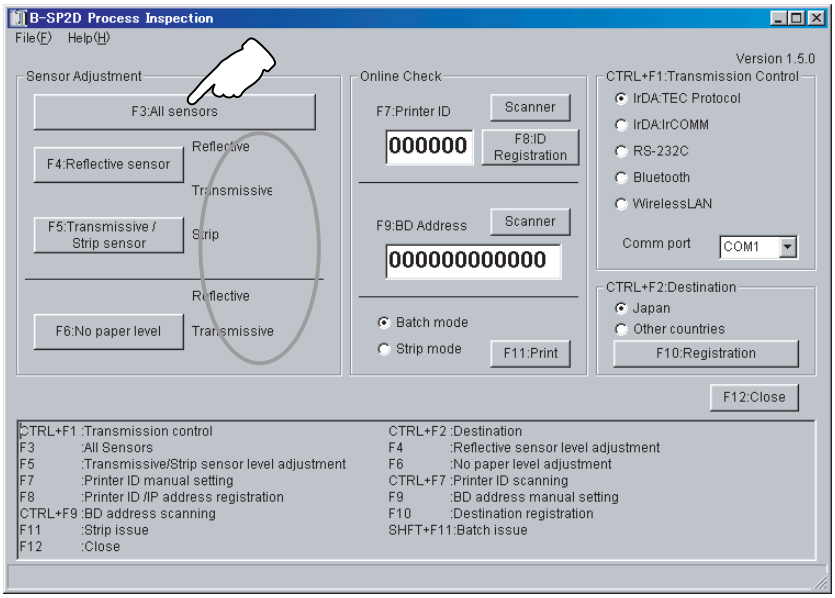
4. By following the messages on the screen, perform the installation.
5. When the installation was completed successfully, the end screen appears. Click on the **[Finish]** button to end the installation.

2.7.3 Adjusting Sensors

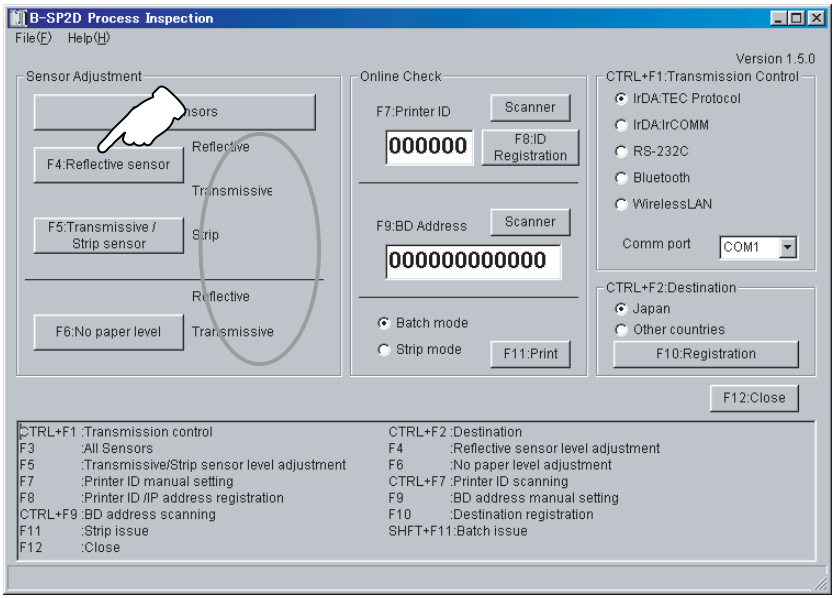
This function is provided for adjusting printer's sensors (Reflective, Transmissive, Strip, and No paper level). The sensors have been optimally adjusted before shipment from the factory. Therefore, the sensors should not be adjusted, except when there is a need to adjust them. If the sensors are adjusted, be sure to follow the procedure described below, or the printer will not operate properly. The interface to be used for adjusting sensors, should be "IrDA: TEC Protocol".

* "IrDA: IrCOMM" is not supported for the sensor adjustments. If the sensors have to be adjusted when the destination "Other countries" has already been registered, set "F1: Transmission Control" and "F2: Destination" to "IrDA: IrCOMM" and "Japan", respectively and register them. Then, adjust the sensors.
  When using the keyboard, press the **[F1]** or **[F2]** key together with the **[Ctrl]** key.
* To increase efficiency, until when the printer is turned OFF from when reading the sensor A/D values and each sensor adjustment are performed, a feed is not performed when the cover is closed.

1) Reading sensor A/D values
   Connect the IrDA jig (Actisys IR) to the serial port on a PC, then start up the software for production process.
   Turn the printer ON, then face the IrDA jig to the upper IrDA windows of the printer.
   Press the **[F3]** key of the keyboard or click on the **[F3: All sensors]** button on the screen.
   All of the current sensor A/D values will be read at once and displayed.

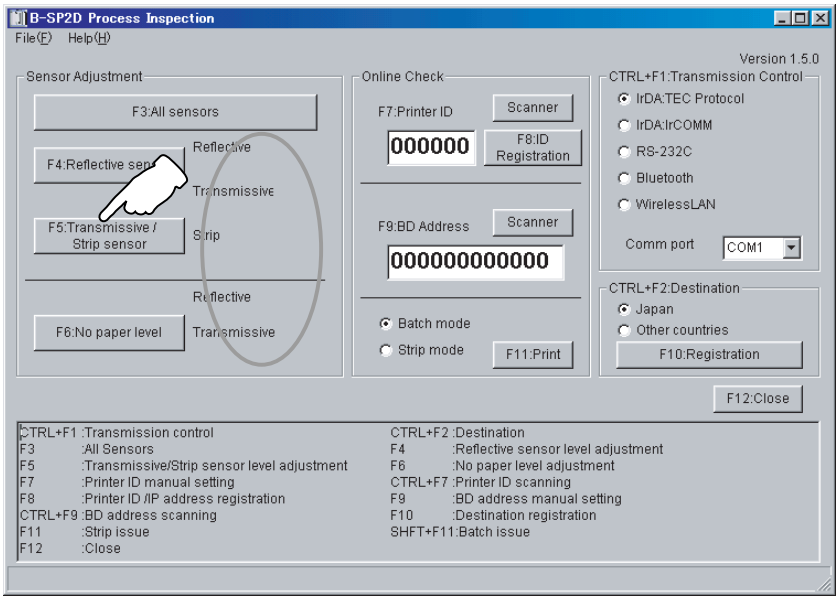


2) Adjusting reflective sensor
Place the label part of the specified paper on the reflective sensor, then press the **[F4]** key of the keyboard, or click on the **[F4: Reflective sensor]** button on the screen. The reflective sensor will be adjusted. When the adjustment is completed, all of the current sensor A/D values will be displayed.



***NOTE**: If the adjustment value of the reflective sensor is out of the judgement criterion, an error message will appear. When clicking on the OK button of the error message window, the A/D values will be displayed. In this case, however, an "Error" is shown in place of the A/D value for the reflective sensor. Readjust the reflective sensor.*

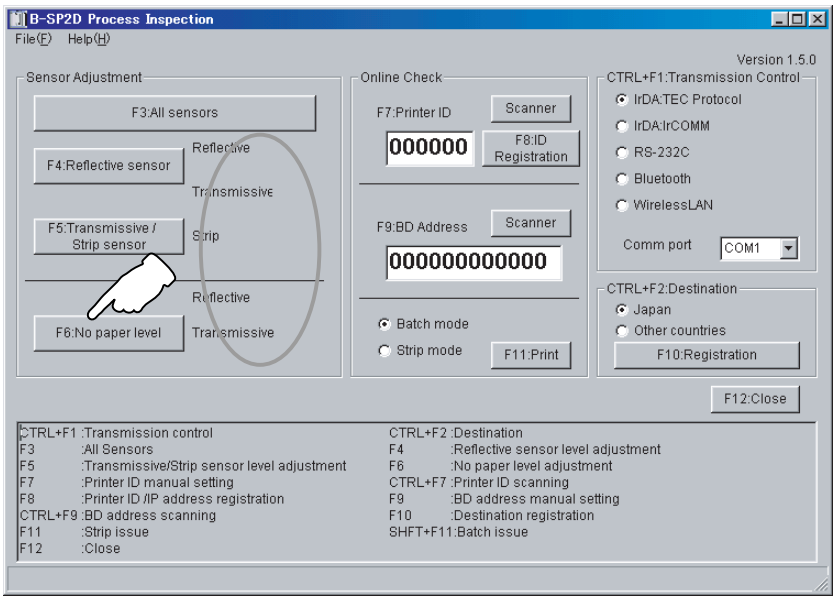
3) Adjusting transmissive/strip sensors
Remove labels from the backing paper of the specified paper, then place only the backing paper on the transmissive sensor. Pass the backing paper through the path for the strip issues.
Press the **[F5]** key of the keyboard, or click on the **[F5: Transmissive/Strip sensor]** button on the screen. The transmissive and strip sensors will be adjusted. When the adjustments are completed, all of the current sensor A/D values will be displayed.



***NOTE**: If the adjustment values of the transmissive/strip sensors are out of the judgement criterion, an error message will appear. When clicking on the OK button of the error message window, the A/D values will be displayed. In this case, however, an "Error" is shown in place of the A/D values for the transmissive and strip sensors. Readjust these sensors.*

4) Adjusting no paper level

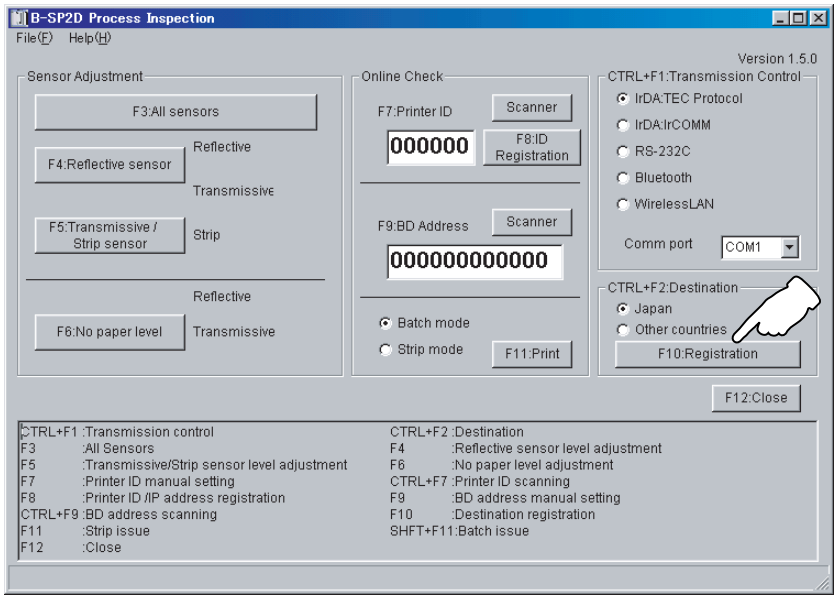
Without placing the paper in the printer, press the **[F6]** key of the keyboard, or click on the **[F6: No paper level]** button on the screen. The no paper levels for the reflective and the transmissive sensors will be adjusted. When the adjustments are completed, all of the current sensor A/D values will be displayed.



***NOTE**: If the adjustment values of the no paper level of the reflective and transmissive sensors are out of the judgement criterion, an error message will appear. When clicking on the OK button of the error message window, the A/D values will be displayed. In this case, however, an "Error" is shown in place of the A/D values for the reflective and transmissive sensor of no paper level. Readjust these sensors.*

2.7.4 Registering Destination

While holding down the **[FEED]** switch on the printer, turn the printer ON. After the printer is initialized (LED blinks in red), the LED will blink in green for several seconds, then printer prints the self-test result.
To register the destination, face the IrDA jig (Actisys IR) to the upper IrDA window of the printer in this state, then press the **[F10]** key of the keyboard, or click on the **[F10: Registration]** button on the screen.
The destination will be registered. When the destination registration is normally completed, the message “The destination has been registered.” will be displayed. The interface to be used for registering the destination, should be “IrDA: TEC Protocol”.

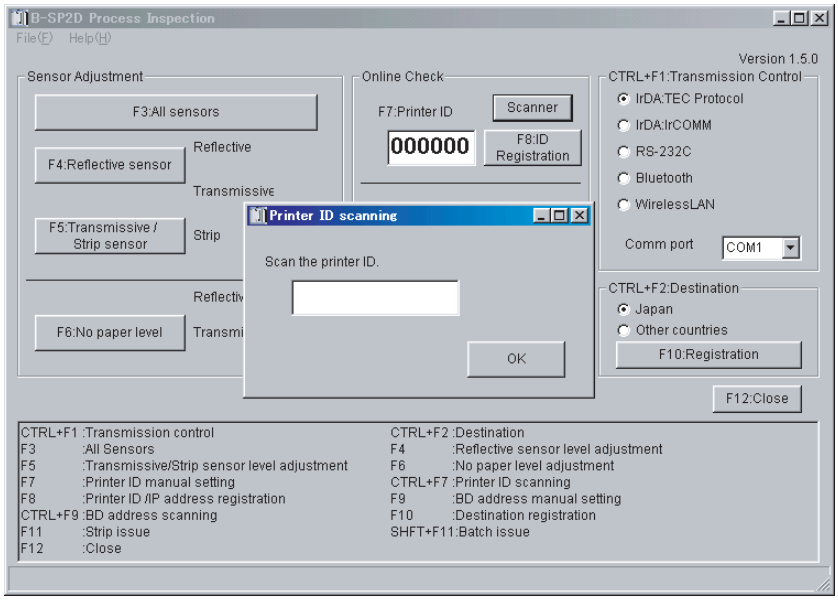


* When the destination is registered, the IrDA window of the printer will change from the upper window to the front window.
* The appropriate communications protocol for each destination is as follows:
  - Japan: IrDA: TEC Protocol
  - Other countries: IrDA: IrCOMM

NOTES: *1. When "Other countries" is mistakenly registered, change the **[F1: Transmission Control]** and **[F2: Destination]** to "IrDA: IrCOMM" and "Japan", respectively, then register them.*
2. "IrDA: IrCOMM" is not supported for the sensor adjustments. If the sensors have to be adjusted when the destination "Other countries" has already been registered, set "F1: Transmission Control" and "F2: Destination" to "IrDA: IrCOMM" and "Japan", respectively, and register them. Then, adjust the sensors. After all sensors are adjusted, change the destination to "Other countries" again.
*When using the keyboard, press the **[F1]** or **[F2]** key together with the **[Ctrl]** key.*

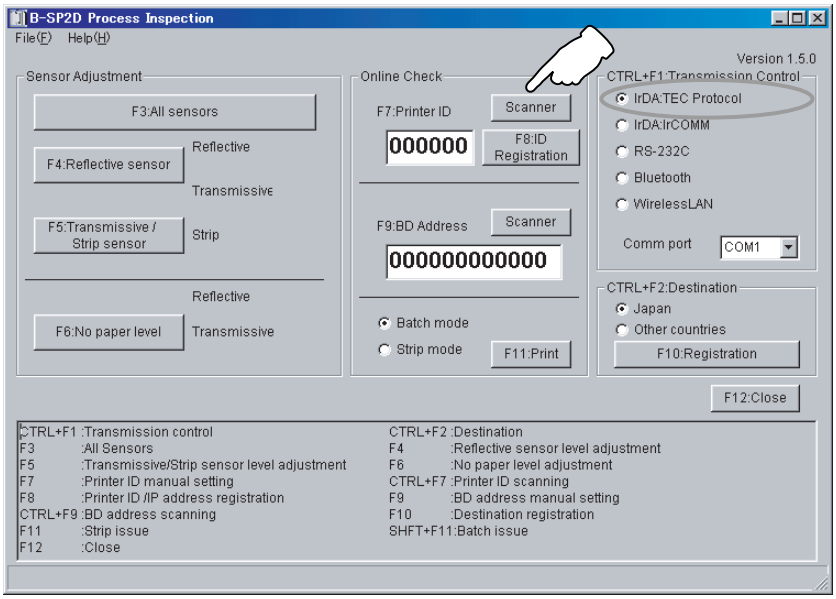
2.7.5 Registering Printer ID

Move the cursor to the printer ID entry box by pressing the **[F7]** key of the printer. Manually input the lower 6 digits of the printer's serial number in the **[F7: Printer ID]** entry box. Or, click on the **[Scanner]** button on the screen and scan the printer ID with a scanner.



Turn the printer ON, face the IrDA jig (Actisys IR) to the front IrDA window of the printer, then press the **[F8]** key of the keyboard, or click on the **[F8: ID Registration]** button on the screen. The printer ID will be registered. When the printer ID registration is normally completed, the message "The printer ID has been changed to xxxxx." will be displayed. The interface to be used for registering the printer ID, should be "IrDA: TEC Protocol" and "IrDA: IrCOMM" for Japan" and "Other countries" of the destination, respectively. Set the COM port number, also.

NOTES:
1. *The printer ID is from 0 to 65535. If any value over this range is input, an error message will be displayed.*
2. *COM Port number can be set in a range from COM1 to COM9.*

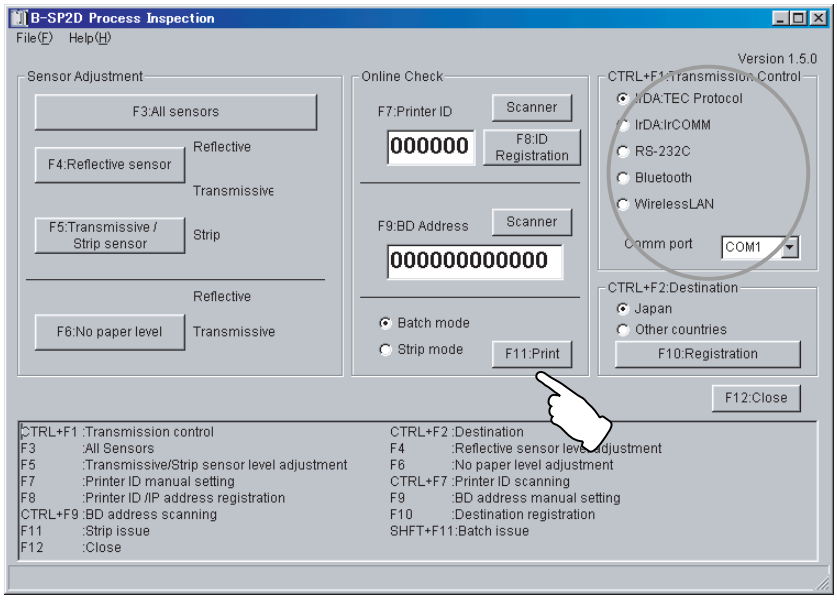


2.7.6 Performing Online Check Printing

To print the online check result, select either of the following interfaces, according to the destination.

- IrDA: TEC Protocol: When “Japan” has been registered as the destination.
- IrDA: IrCOMM: When “Other countries” has been registered as the destination.

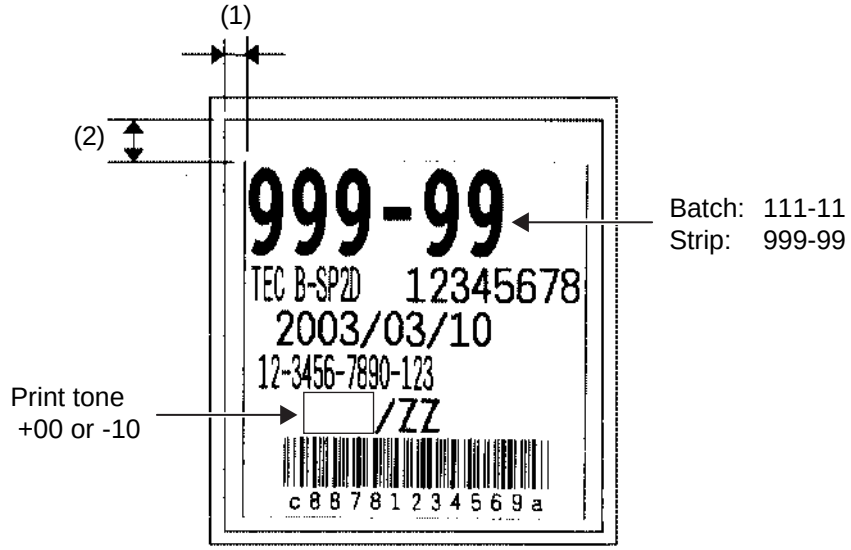
Select the appropriate option in **[F1: Transmission Control]**.



(1) Load the paper on the path for the batch issues, then press the **[Shift] + [F11]** keys of the keyboard. Or, check the "Batch mode" check box and click on the **[F11: Print]** button on the screen. This operation results that the three labels are issued in the order of slant line (print tone fine adjustment value -10), test print (print tone fine adjustment value -10), and test print (print tone fine adjustment value +00).

(2) Load the paper on the path for the strip issues, then press the **[F11]** key of the keyboard. Or,check the "Strip mode" check box and click on the **[F11: Print]** button on the screen. One label will be printed.

(3) Make sure of printing on the labels and print positions.



Judgment criteria of (1): (Horizontal scanning direction)
Distance from the left edge of the label to the left edge of the printed rectangle: [4.5 ± 1 mm]
Judgment criteria of (2): (Vertical scanning direction)
Distance from the top edge of the label to the top edge of the printed rectangle: [8.0 ± 1 mm]

4) Self-Test Result Printing

B-SP2D-GH20-QM

```
B-SP2D            ID   01234
7FM00434001       HEAD OK (2)
MAIN V1.0 :xx00   BATT 8.2V (5)
     10MAR2003    ADJ. +00 +0.0mm
BOOT V1.0 :xx00   P/W  120min
     10MAR2003    FORM 0000000000
FONT xx00              0000000000
漢字 xx00          MODE LABEL
SENS R:4.3V       PARA [PC850][0]
     T:1.2V       LOOP IR:OK RS:OK
     P:1.0V       IrDA IrCOMM
     H:+30°C           FRONT
     A:+24°C   OP.   RS-232C
PEEL 3.2V              9600   EVEN
TYPE QM
```

B-SP2D-GH30-QM

```
B-SP2D            ID   01234
7FM00434001       HEAD OK (2)
MAIN V1.0 :xx00   BATT 8.2V (5)
     10MAR2003    ADJ. +00 +0.0mm
BOOT V1.0 :xx00   P/W  120min
     10MAR2003    FORM 0000000000
FONT xx00              0000000000
漢字 xx00          MODE LABEL
SENS R:4.3V       PARA [PC850][0]
     T:1.2V       LOOP IR:OK BT:OK
     P:1.0V       IrDA IrCOMM
     H:+30°C           FRONT
     A:+24°C   OP.   Bluetooth
PEEL 3.2V              0001cc400020
TYPE QM
```

B-SP2D-GH40-QM

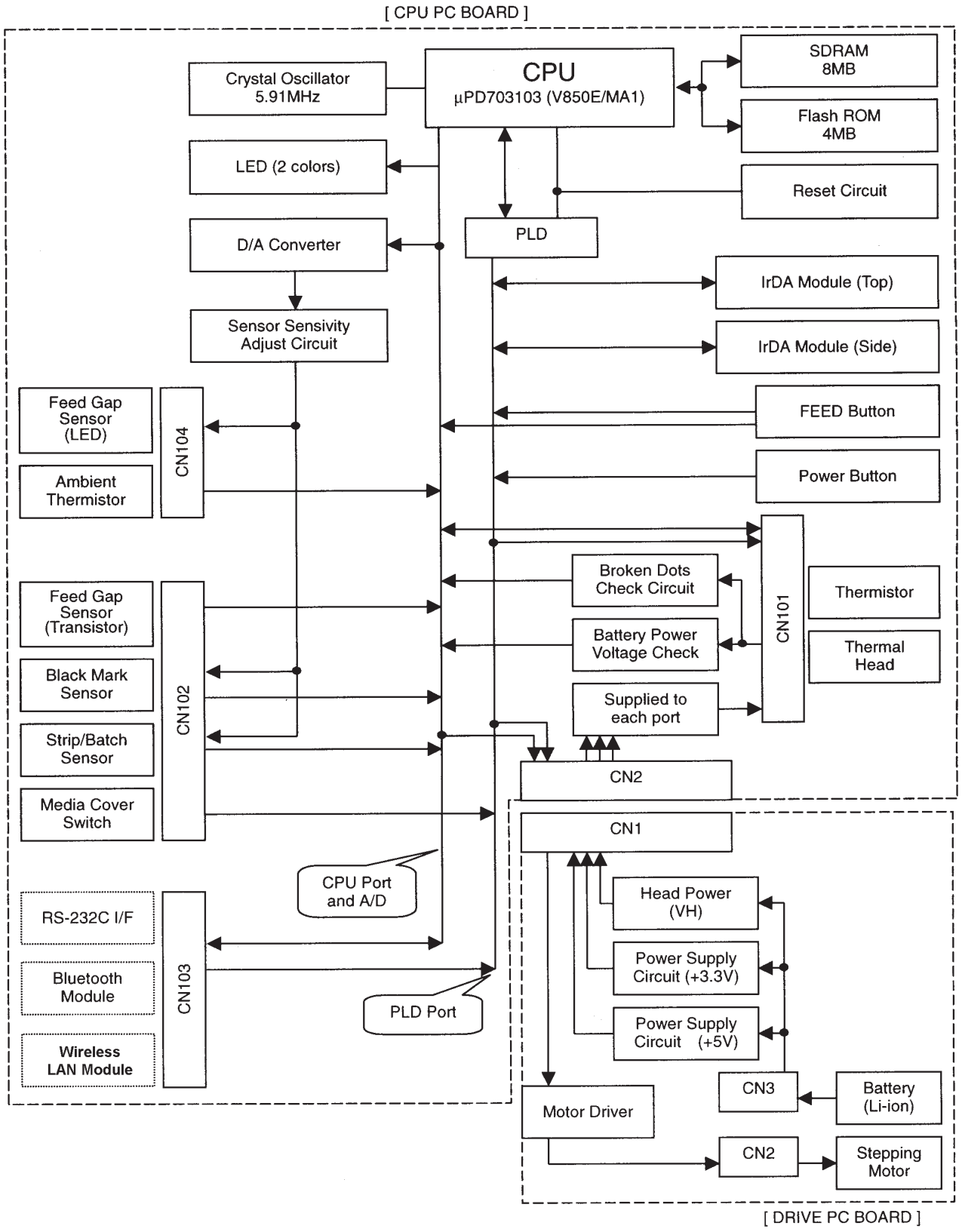
```
B-SP2D            ID   01234
7FM00434001       HEAD OK (2)
MAIN V1.0 :xx00   BATT 8.2V (5)
     10MAR2003    ADJ. +00 +0.0mm
BOOT V1.0 :xx00   P/W  120min
     10MAR2003    FORM 0000000000
FONT xx00              0000000000
漢字 xx00          MODE LABEL
SENS R:4.3V       PARA [PC850][0]
     T:1.2V       LOOP IR:OK LN:OK
     P:1.0V       IrDA IrCOMM
     H:+30°C           FRONT
     A:+24°C   OP.   WirelessLAN
PEEL 3.2V              0010c61ccda9
TYPE QM
```

* Details of checked contents are as described in Section 2.6 TEST PRINT. Especially, the destination ("TYPE" on the printouts) must be correctly set. Loop back check ("LOOP" on the printouts) for each interface must be OK. The optional device ("OP." on the printouts) must match the model.

NOTE: *The special jig is required for the loop back check for B-SP2D-GH20 (RS). If it is not used, the check will result in NG.*
For B-SP2D-GH30, the Bluetooth device address must be printed for the optional device ("OP." on the printouts).

3. ELECTRONICS

3.1 BLOCK DIAGRAM



3.2 CPU PC BOARD

This PC board is the central part of the printer, consisting of the following components and circuits:

- CPU
- Flash ROM (4MB)
- SDRAM (8MB)
- D/A Converter and Sensor Sensitivity Adjust Circuit
- Reset Circuit
- PLD (Programmable Logic Device)
- IrDA Interface Driver/Receiver
- Print Head Circuit

(1) CPU

A 32-bit CPU operates by the 30MHz internal clock. (External clock is 5.91MHz.)
This CPU includes 4-KB RAM, 16-bit timer (8 channels), 10-bit A/D converter (8 channels), DMA (4 channels), serial interface (3 channels), memory interface, etc., and processes the following:

- Controlling the read/write of the SDRAM and flash ROM
- Detecting and controlling the status of the various sensors and switches (Feed gap sensor, black mark sensor, strip/batch sensor, ambient thermistor, meida cove swtich, and FEED button)
- Communicating with the RS-232C interface or Bluetooth module.
- Controlling the print head circuit
- Detecting the control signal of the stepping motor
- Controlling the status LED

(2) Flash ROM (4MB)

This printer uses a 4MB flash ROM, on which the boot program and application program are written. This is also used to store the printer settings.

(3) SDRAM (8MB)

This printer uses a 8MB SDRAM, which is used to draw print data.

(4) D/A Converter and Sensor Sensitivity Adjust Circuit

The status signals from the feed gap/black mark sensor, strip/batch sensor, ambiment thermistor, print head voltage, print head broken element voltage, and print head temperature are sent to the A/D converter of the CPU. The CPU acknowledges the printer status from these signals and processes the following:

- Controlling the print start position
- Controlling the printer ON/OFF
- Controlling the print pulse
- Detecting the issue mode

Also, the status signals are sent back to each sensor so that the sensor sensitivity can be optimized.
The D/A converter converts these feed back signals from digital to analog, and then outputs them to each sensors (feed gap/black mark sensor, strip/batch sensor).

(5) Reset Circuit

The reset circuit controls resetting the CPU, PLD, and flash ROM by monitoring the +3.3V.
After the power is turned on and the voltage becomes stable, the reset status of the CPU, PLD and flash ROM is released. When the power is turned off and the battery voltage drop is detected, the CPU and the flash ROM are reset to protect the data and the circuit.

(6) PLD (Programmable Logic Device)

This component supports the CPU by processing the following:

- Outputting data to the IrDA interface
- Controlling the Bluetooth module
- Controlling the print head circuit buffer

(7) Print Head Circuit

This circuit sends print data to the print head and outputs the strobe signals, enable signals, etc.
The termistor signal output from the print head is transferred to the A/D converter of the CPU. The CPU uses this signal to control the print tone by detecting the print head temperature. This circuit also checks the voltage supplied to the print head and the print head broken element.

(8) Interface Circuit

To CN103 on the CPU PC board, various interface devices used to interface with the host or handy terminal are connected. The interface types are different depending on the models.
- RS-232C interface: GH20 model
- Bluetooth interface: GH30 model
- Wireless LAN: GH40 model

The IrDA driver/receiver is installed on the CPU PC board of the all models as standard,

3.3 DRIVER PC BOARD

This PC board, including the stepping motor driver, generator IC, etc, controls the stepping motor and generates the voltages from the battery supply voltage.

(1) Stepping Motor Driver

This circuit controls the stepping motor connected to Connector 2. Using the PM1 and PM2 signals output from the CPU PC board, it generates the PMA1, PMA2, PMB1, and PMB2 stepping motor drive signals.
Also, the PMEN signal output from the PLD on the CPU PC board is used as the driver's enable signal.

(2) Power Supply Circuit

This circuit generates the operating voltage for the logic ICs, print head, stepping motor, etc. from the voltage VM (DC 7.4V) that is supplied from the Li-ion battery connected to Connector 3.
The 3.3V is used to operate the CPU, PLD, Flash ROM, SDRAM, etc. 5VB (5V) is used to operate the peripherals and control circuits, such as, the stepping motor driver, feed gap/black mark sensor, strip/batch sensor, print head (signal), etc.
The VH voltage is used as the operating voltage for the print head and stepping motor.
Also, this circuit protects itself when an overcurrent of the battery or an overvoltage is detected by cutting off the circuit.

4. PROGRAM DOWNLOAD

This section provides step by step instructions on how to setup and download the firmware to the B-SP2D portable printer. The software for performing the program download will allow the download of the firmware (application program and character generator) from the provided floppy disk. The application program and the character generator are installed into the B-SP2D printer's flash memory prior to being shipped to the customer. However, if specifications should change at a later date, this software will allow downloading firmware updates to the B-SP2D printer. The firmware download will be made from a personal computer via the IrDA interface (or RS-232C interface). Without this software, the firmware can be copied from the B-SP2D printer to another B-SP2D printer via IrDA communication.

4.1 PROGRAM DOWNLOADING TO A WINDOWS MACHINE

4.1.1 System Requirements

System

IBM compatible PC running Windows 95®, Windows 98®, Windows 2000®, or Windoes XP®
(Performance of PC running other OS is not guaranteed.)

NOTE: *Windows 95, Windows 98, Windows 2000, and Windows XP are registered trademarks of Microsoft Corporation.*

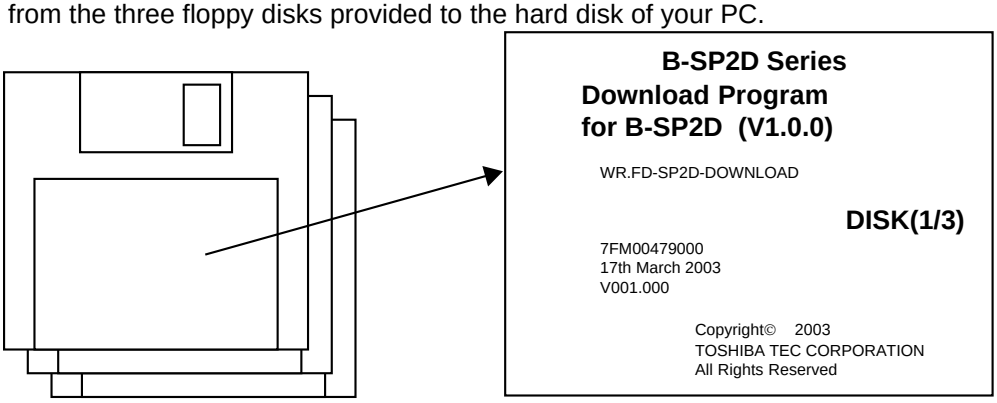
Installed memory of 16MB minimum (32MB or more is recommended.)
Available hard disk space of 10MB minimum (10MB or more is recommended.)

Interface

For IrDA communication, the IrDA interface should be provided for the PC (without drivers such as IrLAP) or an IrDA device which is connectable to a serial port should be provided for the PC.
For RS-232C communication, more than one serial port should be provided for the PC.

4.1.2 Setup

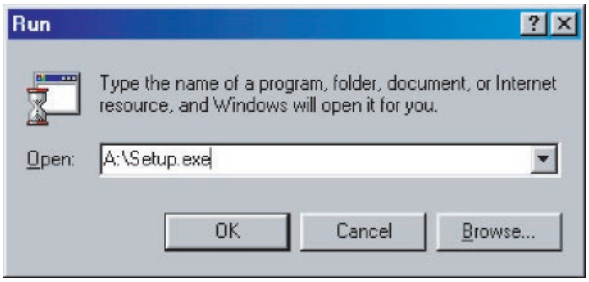
Before you can communicate from your PC to the B-SP2D printer, you must first copy the "Download Program for B-SP2D" from the three floppy disks provided to the hard disk of your PC.



Setup Disk

Make sure that you have all three diskettes available of the "Download Program for B-SP2D".

1. While running Windows 98 (or Windows 95, Windows 2000, Windows XP), insert Setup Disk (1/3) into the PC floppydrive.
2. Click on the **[START]** button then highlight RUN and click on RUN.
3. When the RUN display appears, type in A:\SETUP.EXE and click on the **[OK]**.

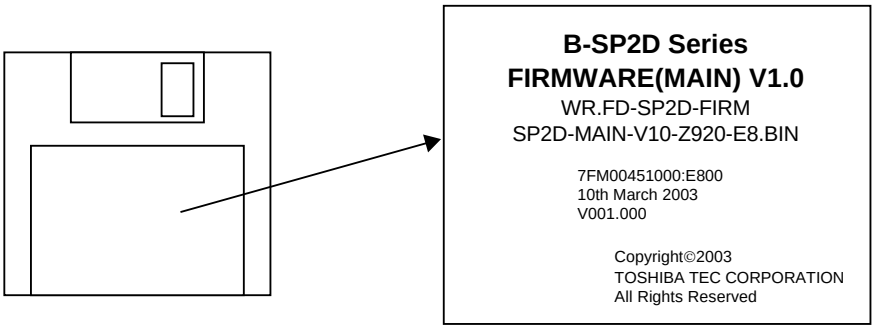


4. By following the messages on the screen, perform the installation.
5. When the installation was completed successfully, the end screen appears. Click on the **[Finish]** button to end the installation.

4.1.3 Firmware Files Copy

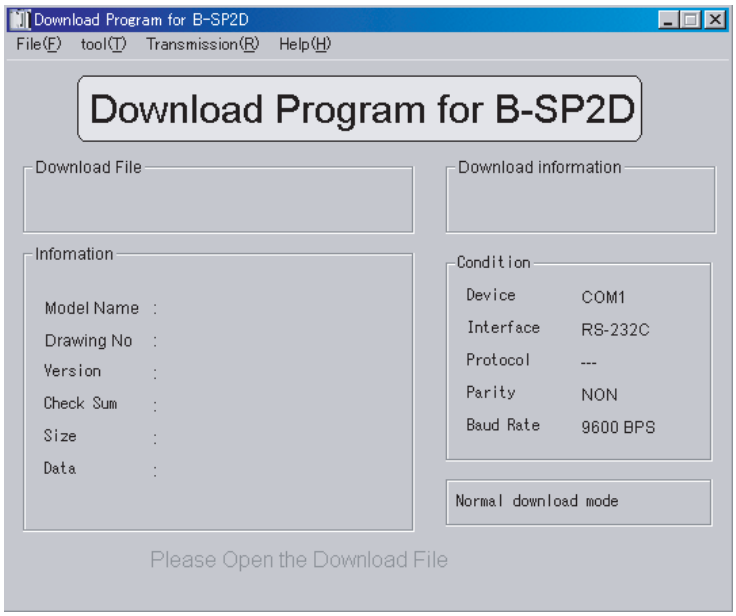
If it ever becomes necessary to upgrade the firmware in the B-SP2D printer you will be supplied with a floppy disk containing the latest firmware revision similar to that shown below.
The files contained on the Install Kit can be copied to PC hard disk and then downloaded to the printer.

(Example)

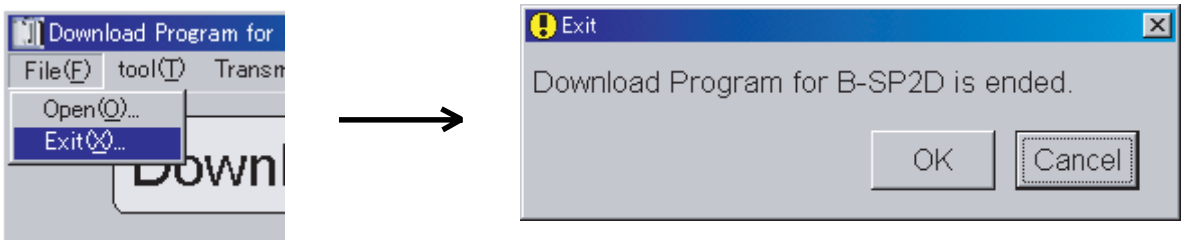


4.1.4 Running the Download Program for B-SP2D

1. Click on the **[START]** button to access the program menu.
2. Highlight Programs then highlight TOSHIBA TEC, B-SP2D, Download. And then click on Download Program for B-SP2D in the screen display below.
3. The screen will change to display the initial screen of the Download Program as shown below.



4. After the download was completed successfully, from the **[File(F)]** drop down menu select **[Exit(X)]**, and then click on the **[OK]** to terminate the download.

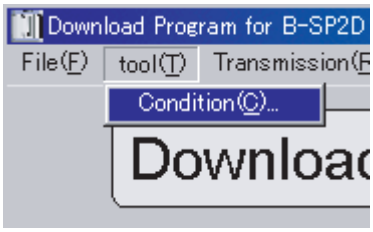


4.2 COMMUNICATION PARAMETERS SETTING

This section provides communication parameters setting for the PC to perform the firmware download to the B-SP2D printer. As the communication parameters, device, parity, interface, baud rate, and forced download mode can be set.

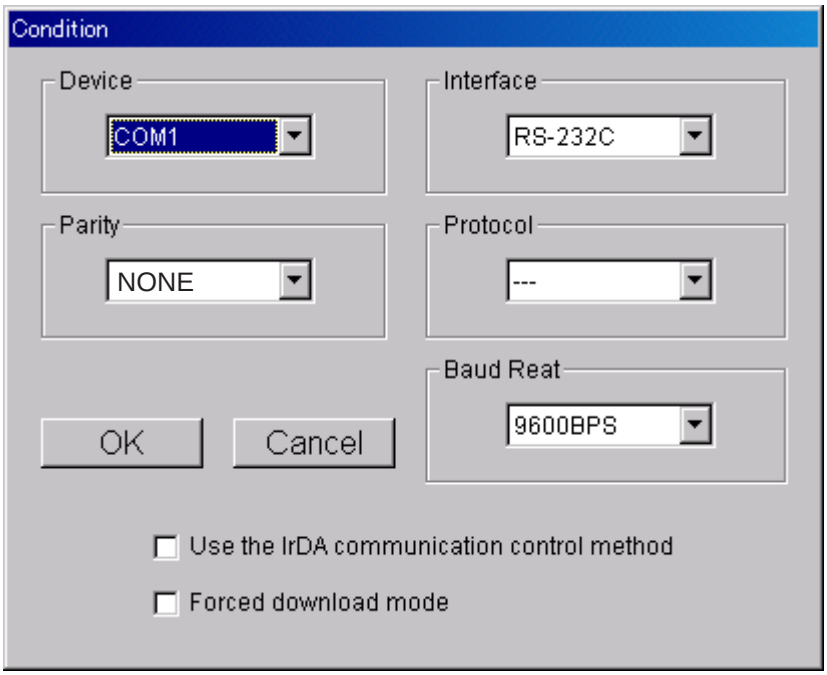
4.2.1 Communication Conditions

1. From the **[tool(T)]** drop down menu select **[Condition(C)]**.



2. Select desired settings for device, parity, interface, and baud rate. Then click on the **[OK]**.

NOTES: *1. After the PC starts up, COM1, None, RS-232C, and 9600bps are programmed as default setting.*
2. To perform Forced Download, make a check in the check box "Forced download mode".
3. From the firmware version V1.1, IrCOMM protocol has been supported. When downloading the firmware by using the IrCOMM protocol, be sure to turn the printer to the system mode, as this is the only mode that enables downloading with the IrCOMM protocol. In case of Windows 95 and Windows 98, the data will be output to a virtual COM port. Set the virtual COM port for the Device. In case of the forced download, be sure to use the TEC protocol regardless of the protocol set for the printer.



4.3 DOWNLOAD TO THE PRINTER

4.3.1 Conditions for Downloading

(1) IrDA (TEC Protocol) Interface

Item	Specification	
	Forced Download	Normal Mode (Label mode, Receipt mode, TPCL-LE mode, System mode)
Baud Rate	115200 bps	Depending on the communication protocol setting. (9600/19200/38400/115200 bps)
Stop Bit	1 bit	
Data Length	8 bit	
Parity	None	

(2) IrDA (IrCOMM) Interface

Protocol	IrCOMM (9-wire)
Device Name	B-SP2D
Service Name (Class name)	IrDA: IrCOMM
Minimum Turn Around Time	1 msec.
Link Release Threshold Time	12 sec.

(3) RS-232C Interface

Item	Specification	
	Forced Download	Normal Mode (Label mode, Receipt mode, TPCL-LE mode, System mode)
Baud Rate	115200 bps	Depending on the communicatio nprotocol setting. (9600/19200/38400/115200 bps)
Stop Bit	1 bit	
Data Length	8 bit	
Parity	None	Depending on the communication protocol setting. (None/Even)

(4) Printer to Printer

Baud Rate	115200 bps
Stop Bit	1 bit
Date Length	8 bit
Parity	None

4.3.2 Status Indicator during Download

The following table shows the state of the status indicator and the printer during download.

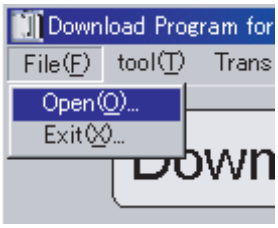
Printer State			Status Indicator
Receives an ACK (06H) twice when entering the Download Mode.			Blinks in red twice.
When executing a loading preparation command, the printer detects a low battery or near low battery.			Blinks in red.
Communicating	IrDA (TEC Protocol) interfae IrDA (IrCOMM) interface RS-232C interface		Blinks in green.
	Printer to printer	Source printer	Blinks in green and orange alternately.
		Destination printer	Blinks in green.
Writing/deleting data to/from the Flash memory.			Lights in green.
An error occurs during download.			Blinks in red.

***NOTES**:*

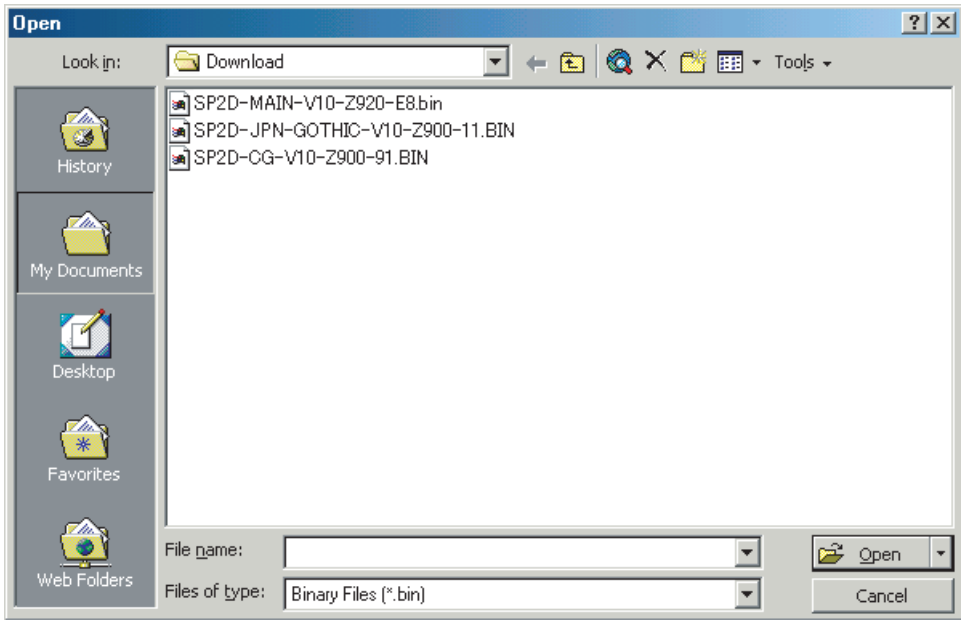
1. *When downloading is completed properly, the printer will be automatically reset and started.*
2. *If an error occurs during a download, the printer will stop. To recover from the error state, it is necessary to turn off and then on the printer.*
3. *If an error occurs while the main program is downloaded, turn off and then on the printer. The printer will enter the download mode. Retry downloading.*

4.3.3 Selecting a Firmware File

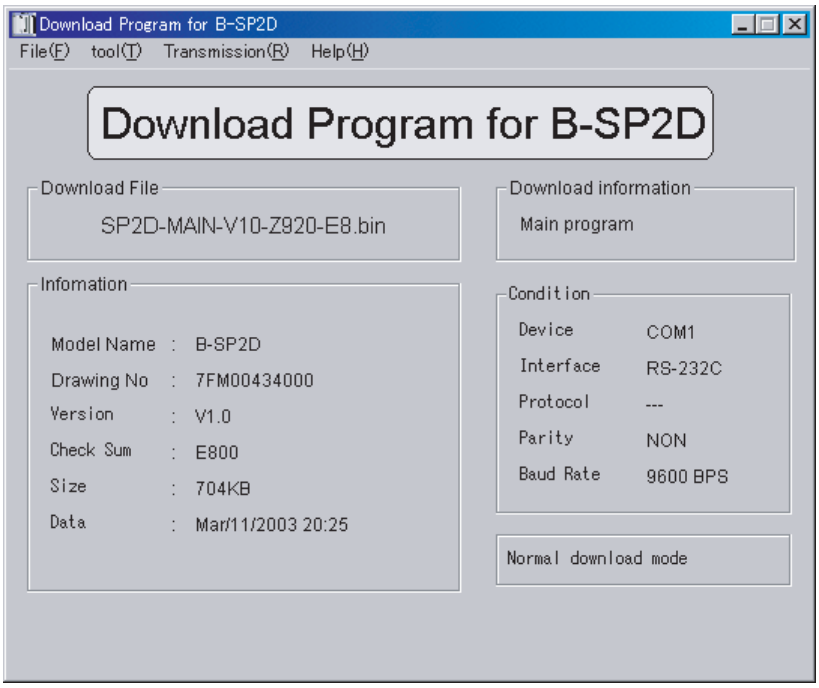
1. From the **[File(F)]** drop down menu select **[Open(O)]**.



2. Select a binary file (*.BIN) to be downloaded.



3. The screen returns to the main menu screen, and the download file information will be shown as follows. Make sure all items in the information box.



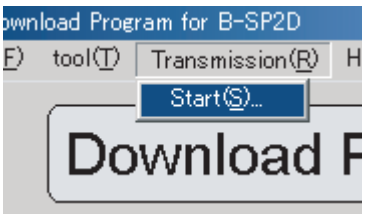
4.3.4 Forced Download to Printer

1. For IrDA communication, face the IrDA interface windows of both PC (or a device) and the printer, and then turn on the printer while pressing and holding the **[FEED]** button.
   For RS-232C communication, connect the printer to the PC with the RS-232C cable, and then turn on the printer while pressing and holding the **[FEED]** button.
   When the the status indicator blinks slowly in red twice, the printer enters the forced download mode.

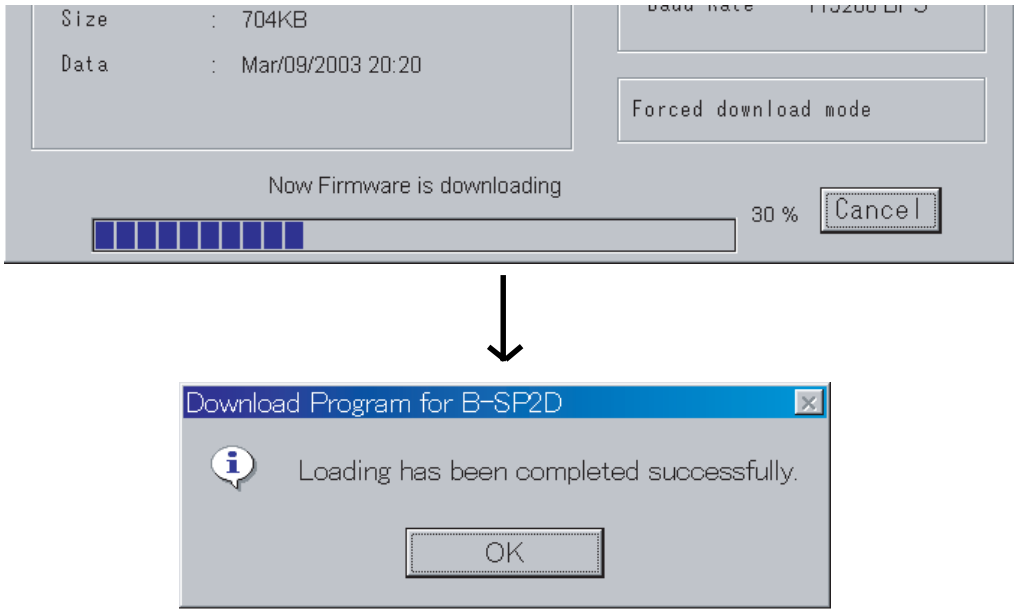
> ***CAUTION!***
> *For RS-232C communication, use a battery-driven PC. If an AC-power-driven PC is used, a noise may occur on the signal line, causing the printer's CPU PC board to be damaged.*

NOTE: *If the status indicator doesn't blink slowly in red twice, the printer doesn't enter the forced download mode. Retry to turn on the printer while pressing and holding the **[FEED]** button.*

2. When the printer is in the forced download mode, open a file for downloading. And then, from the **[Transmission(R)]** drop down menu select **[Start(S)]** to start the download.
   NOTE: *Be sure to open a file for downloading first.*



3. During data transmission, the screen below appears with a progress indicator at the bottom. When the file has been successfully transferred, the message below appears.
   NOTES: *1. For IrDA communication, do not interrupt the IrDA interface windows of both PC and the printer nor move the PC and the printer during data transmission.*
   2. Never turn off the printer nor remove the battery from the printer during data transmission. Doing so may cause an error.
   3. If an error occurs during data transmision, retry from Step 1.



4.3.5 Execution of Download to Printer

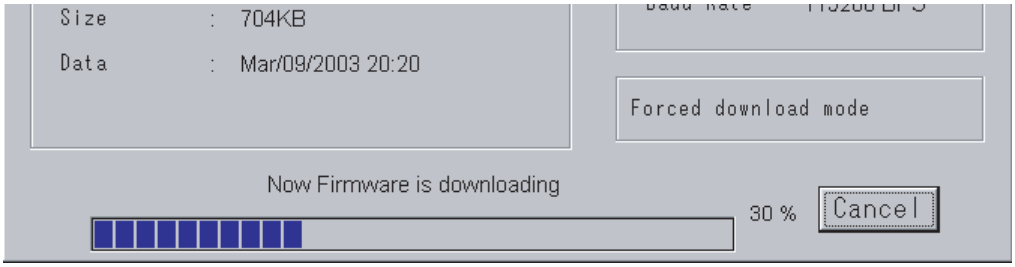
1. Match the printer communication conditions for the PC and the printer. For IrDA communication, turn on the printer and face the IrDA interface windows of both PC (or a device) and the printer. (Direction of the printer's IrDA depends on the setting.)
   For RS-232C communication, connect the printer to the PC with the RS-232C cable, and then turn on the printer.
   When the the status indicator blinks slowly in red twice, the printer enters the download mode.
   NOTE: *If the status indicator doesn't blink slowly in red twice, the printer doesn't enter the download mode. Turn off then on the printer, make sure the communication conditions, and then retry Step 1.*

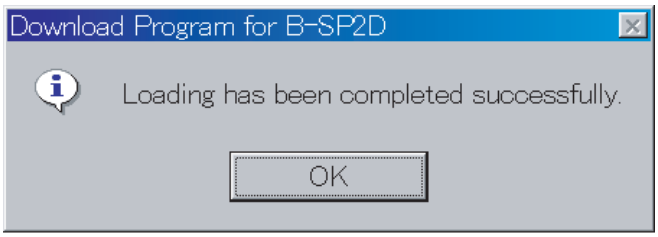
   > ***CAUTION!***
   > *For RS-232C communication, use a battery-driven PC. If an AC-power-driven PC is used, a noise may occur on the signal line, causing the printer's CPU PC board to be damaged.*

2. When the printer is in the download mode, open a file for downloading. From the **[Transmission(R)]** drop down menu select **[Start(S)]** to start the download.
   NOTE: *Be sure to open a file for downloading first.*

3. During transmission, the screen below appears with a progress indicator at the bottom. When the file has been successfully transferred, the message below will appear.

NOTES: *1. For IrDA communication, do not interrupt the IrDA interface windows of both PC and the printer nor move the PC and the printer during data transmission.*
2. Never turn off the printer nor remove the battery from the printer during data transmission. Doing so may cause an error.
3. If an error occurs during data transmision, retry from Step 1.

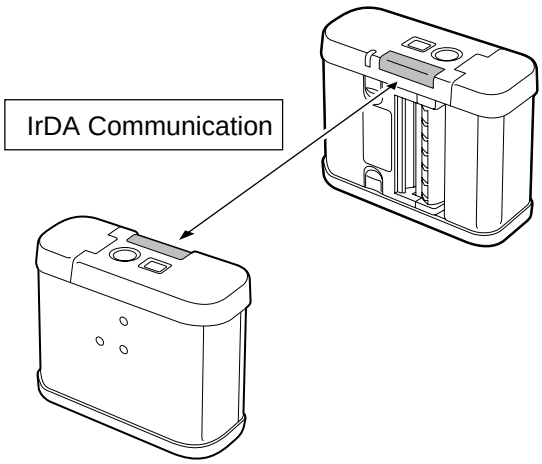




4.3.6 Copying the Firmware from the Printer to Another Printer

Without using the PC, you can copy the firmware from the printer to another printer. By following procedures below, the firmware can be copied via IrDA communication at a high speed of 115.2K bps.

1. Make sure that the two printers are off, and then place them within 10 cm facing the IrDA interface windows.



2. Open the source printer cover, then turn on the power by pressing and holding the power button, resulting that the status indicator lights in red and then blinks in orange.
Keep pressing and holding the power button while the status indicator blinks in orange.

NOTE: *While the status indicator blinks in orange, the printer is waiting a response from the other printer which was inquired.*

3. During Step 2 (i.e. when the status indicator blinks in orange with the depression of the power button), turn on the destination printer by pressing and holding the **[FEED]** button. After the destination status indicator blinks in red twice, release the two buttons which are being held.
   NOTE: *In case the destination status indicator doesn't blink in red twice, the printer doesn't enter the download mode. Retry to turn on the destination printer by pressing and holding the **[FEED]** button.*
4. When ensuring the destination printer was on, the source one starts transferring the firmware data via IrDA communication.
5. During data transmission, the source status indicator blinks in green and in orange alternately. The destination one blinks in green.
   NOTE: *After having received the data, the destination status indicator lights in green, indicating that the Flash ROM erase and write is performed. Never turn off the printer nor remove the battery while the printer is working.*
6. Data transmission is completed in approximately 3 minutes.
7. After the data transmission is completed successfully, the source status indicator keeps blinking in green. After the Flash ROM erase and write was completed successfully, the destination printer restarts automatically while the status indicator blinks in red, blinks in green, then lights in green.
8. If an error occurs during data transmission, either of the status indicator blinks in red. Retry from Step 1.

NOTE: *Do not move the printers nor interrupt their IrDA interface windows during data transmission. Doing so may fail in IrDA communication.*

4.3.7 Execution of Download by using the IrCOMM Protocol

1. Match the printer communication conditions for the PC and the printer. Turn on the printer while holding down the **[FEED]** key to turn the printer to the system mode. Face the IrDA interface windows of both PC (or a device) and the printer. (Direction of the printer's IrDA depends on the setting.)
2. Click on the **[Start(S)]** of the **[Transmission(R)]** on the screen to start downloading.
   When the printer enters the download mode, the status indicator slowly blinks in red twice.
   When the printer is in the download mode, open a file for downloading.
   NOTES: *1. Be sure to open a file for downloading first.*
   2. If the status indicator doesn't blink in red twice, the printer doesn't enter the download mode. Turn off then on the printer, make sure the communication conditions, and then retry from Step 1.

3. During transmission, the progress indicator is not displayed at the bottom of the screen.
   NOTES: *1. For IrDA communication, do not interrupt the IrDA interface windows of both PC and the printer nor move the PC and the printer during data transmission.*
   2. Never turn off the printer nor remove the battery from the printer during data transmission. Doing so may cause an error.
   3. If an error occurs during data transmision, retry from Step 1.
   4. Whether the downloading is completed properly or not is indicated by the status indicator as follows:
   When succeeded: Blinks in green (downloading) → Lights in green (Writing data) → Blinks in green and red alternately. (Normal completion)
   When error occurs: Blinks in red
4. After completing the download, be sure to turn off the printer by pressing the power button.

4.4 DOWNLOAD TO THE WIRELESS LAN MODULE

Firmware download to the wireless LAN module can be performed by using the B-SP2D RFLAN F/W Download Tool.
In this section, the procedures for the firmware download to the wireless LAN module are provided.

4.4.1 System Requirements

System

IBM compatible PC running Windows® 95, Windows® 98, Windows® 2000, or Windoes® XP
(Performance of PC running other OS is not guaranteed.)

NOTE: *Windows 95, Windows 98, Windows 2000, and Windows XP are registered trademarks of Microsoft Corporation.*

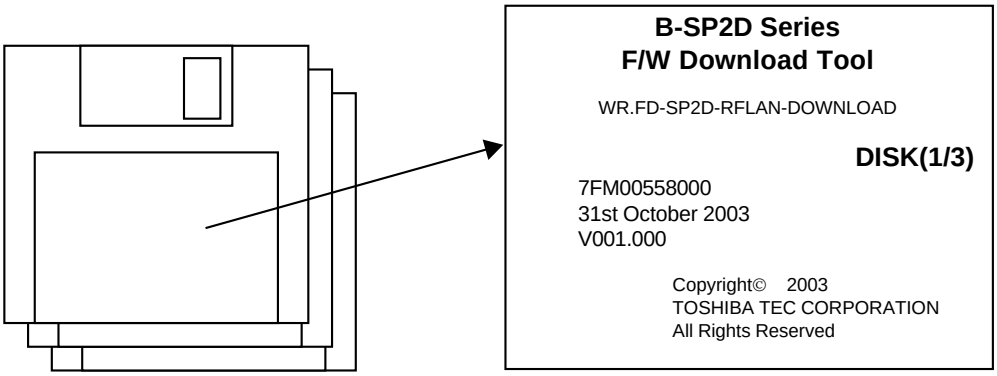
Installed memory of 16MB minimum (32MB or more is recommended.)
Available hard disk space of 10MB minimum

Interface

IrDA interface is used for the communication between the PC and the printer.
When using the TEC Protocol, ACTiSYS ACT-IR220L+ (IrDA Com-Port Serial Adapter) is required.
When using the IrCOMM Protocol, use a communicable IrDA interface.

4.4.2 Setup

Before you can communicate from your PC to the B-SP2D printer, you must first copy the “FW Download Tool" from the provided three floppy disks to the hard disk of your PC.



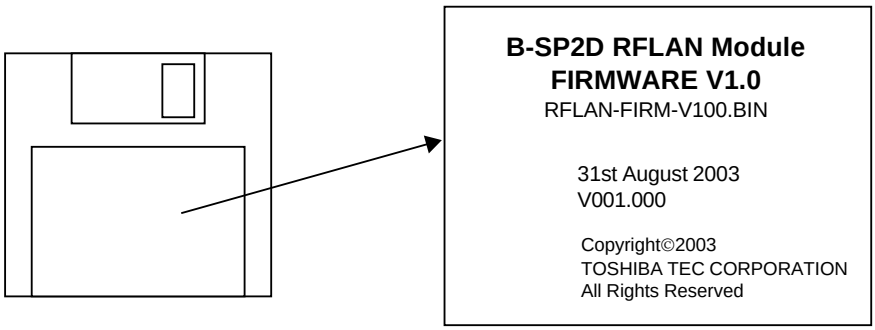
Setup Disk

Make sure that you have all three diskettes available of the “FW Download Tool”.

1. While running Windows 98 (or Windows 95, Windows 2000, Windows XP), insert Setup Disk (1/3) into the PC floppydrive.
2. Click on the **[START]** button then highlight RUN and click on RUN.
3. When the RUN display appears, type in A:\SETUP.EXE and click on the **[OK]**.
4. By following the messages on the screen, perform the installation.
5. When the installation was completed successfully, the end screen appears. Click on the **[Finish]** button to end the installation.

4.4.3 Firmware Files Copy

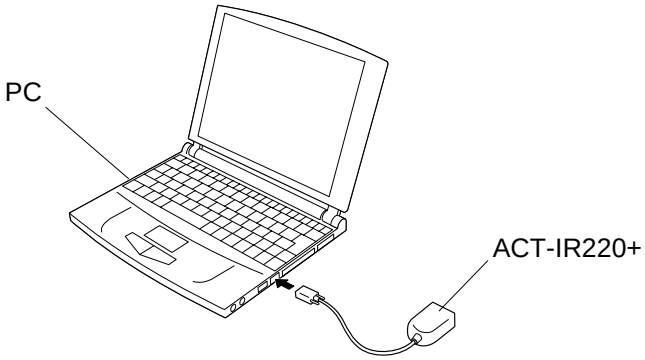
If it ever becomes necessary to upgrade the firmware in the wireless LAN module you will be supplied with a floppy disk containing the latest firmware revision similar to that shown below.
The files contained on the Install Kit can be copied to PC hard disk and then downloaded to the printer.



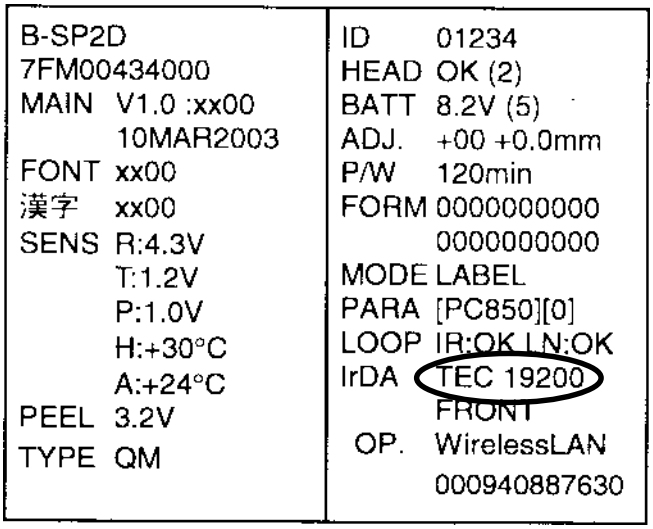
4.4.4 Installation Procedure (When using the TEC Protocol)

1 Connect the ACT-IR220+ to the serial port of the PC.

Example

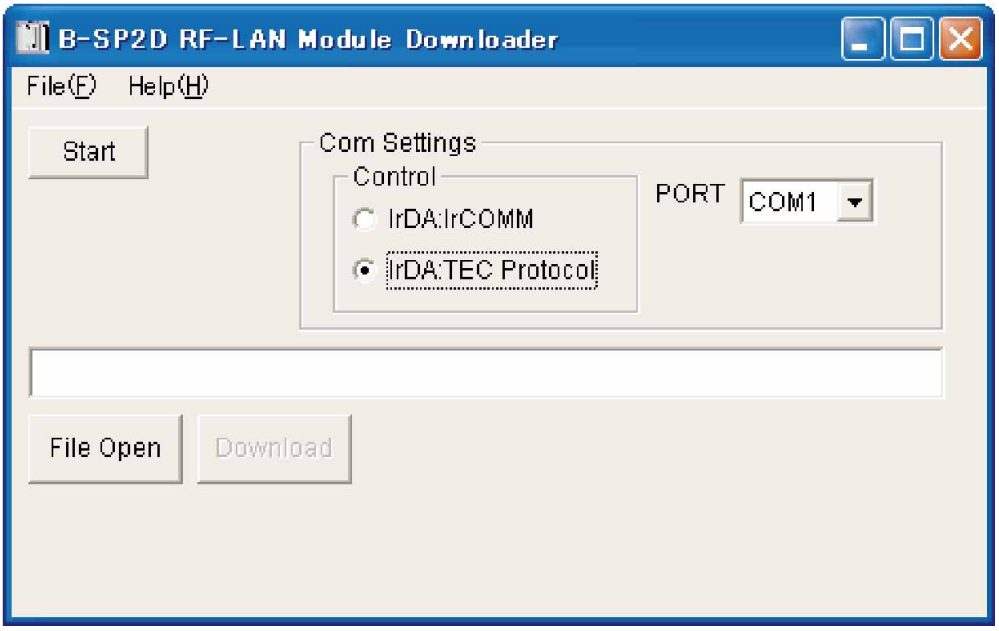


2 Confirm the IrDA settings of the PC in the following way.
Turn on the printer while pressing and holding the **[FEED]** key on the printer to start the printer in the system mode. Hold the **[FEED]** key until the indicator LED starts to blink in green. Since a diagnostic test result is automatically printed, confirm that the settings of the IrDA interface are "TEC 19200".



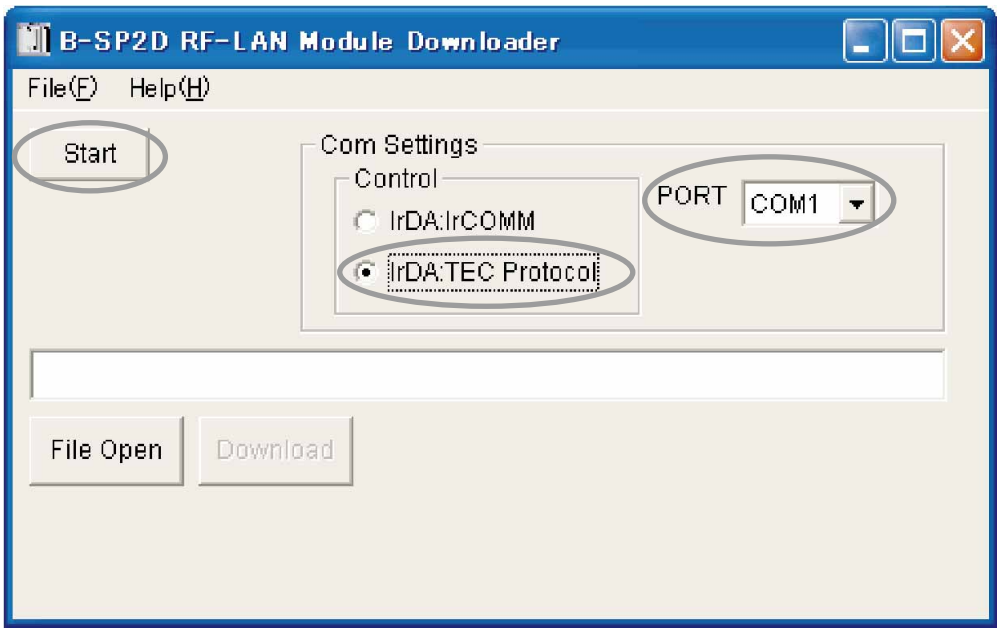
***NOTE**: Do not press the **[FEED]** key after the diagnostic test printing. Doing so causes the printer to enter another mode where printer parameters cannot be set.*

3 Run the firmware downloader, "B-SP2D RFLAN F/W Download Tool", on the PC.



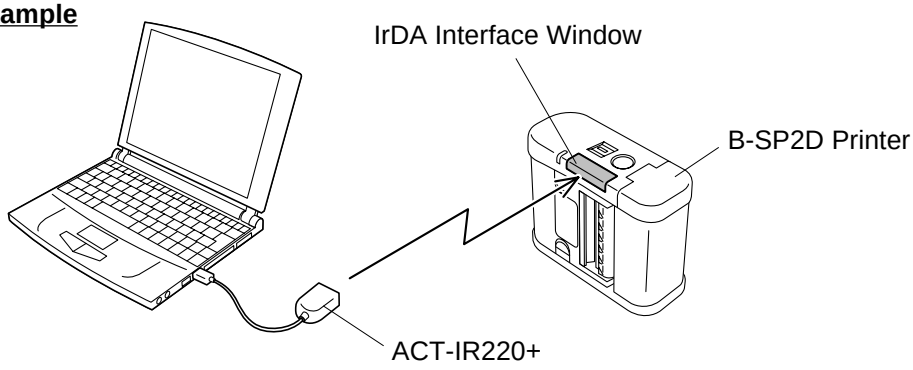
4 Confirm that the settings of the downloader are as follows:
Control port of the Com Settings is IrDA: TEC Protocol.
The port number to which the ACT-IR220+ is connected is selected for the Com Settings Port.

***NOTE**: While the downloader is communicating with the wireless LAN module, do not switch the active window to another application.*

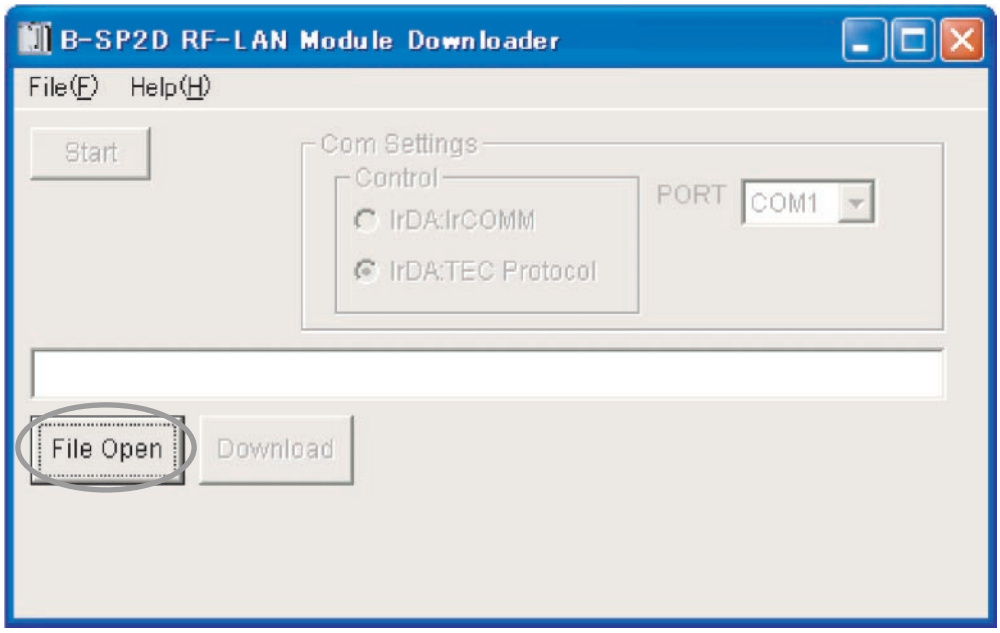


5 Place the ACT-IR220+ so that it faces to the IrDA interface window. Then, click on the **[Start]** button on the screen to be ready for downloading. (When the **[Start]** button is clicked, the printer's LED will blink in green.)

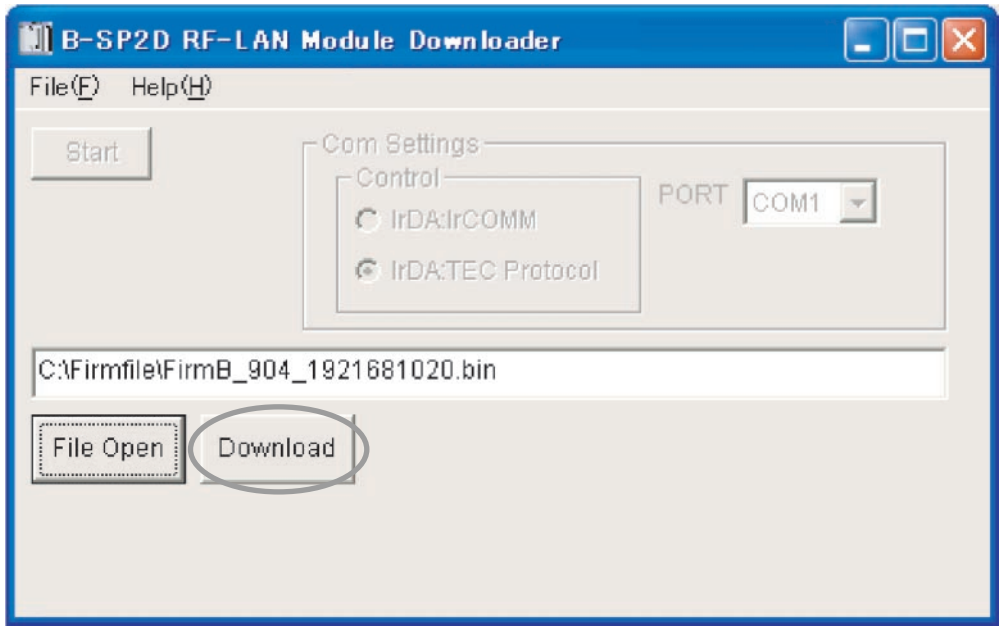
Example



6 Click on the **[File Open]** button and select the firmware file to be downloaded.

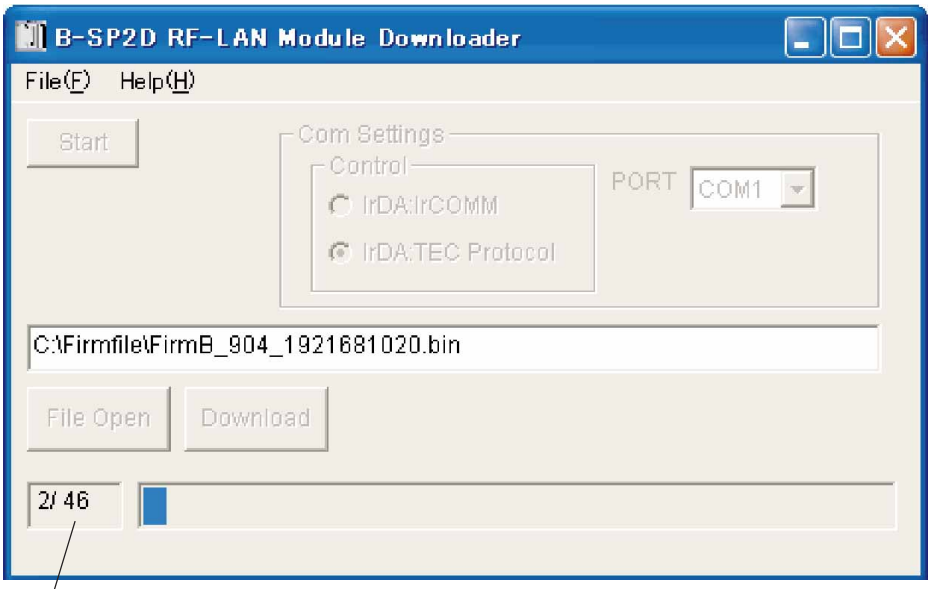


7 Then, click on the **[Download]** button to start downloading.



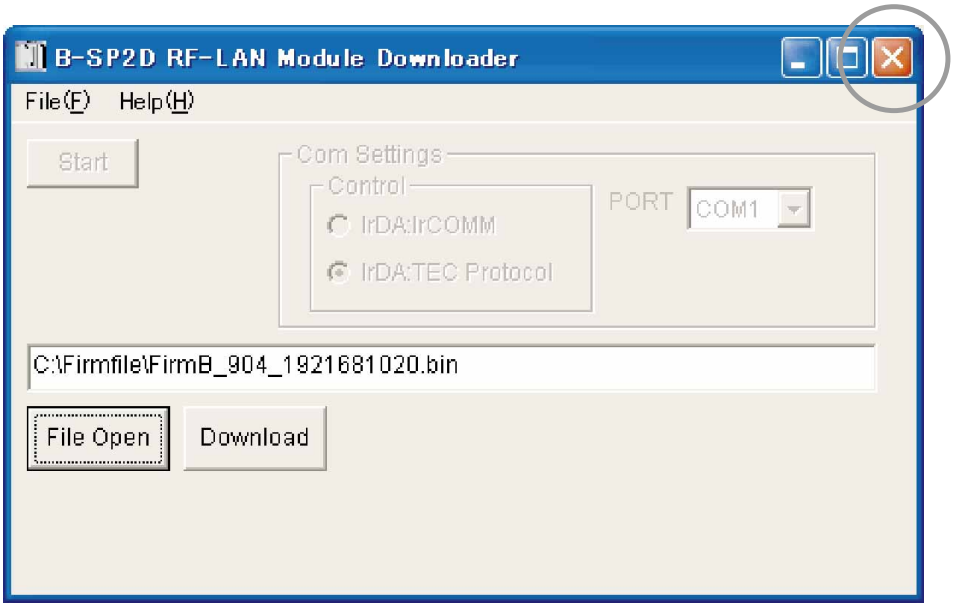
8 During data transmission, the screen below appears with a progress indicator at the bottom. When the file has been successfully transferred, the message will appear in about 30 to 90 seconds. Click on the **[OK]** button.

> ***CAUTION!***
> *Never turn off the printer before the download completion message appears.*



Total number of the download file blocks and the number of the transferred blocks

9 Click on the Close button to exit the downloader.



10 Press and hold the Power button on the printer to turn it off.

4.4.5 Installation Procedure (When using the IrCOMM supporting IrDA)

When using the IrDA interface supporting the IrCOMM, such as, IrDA interface built in a laptop PC, the IrCOMM Protocol should be used.

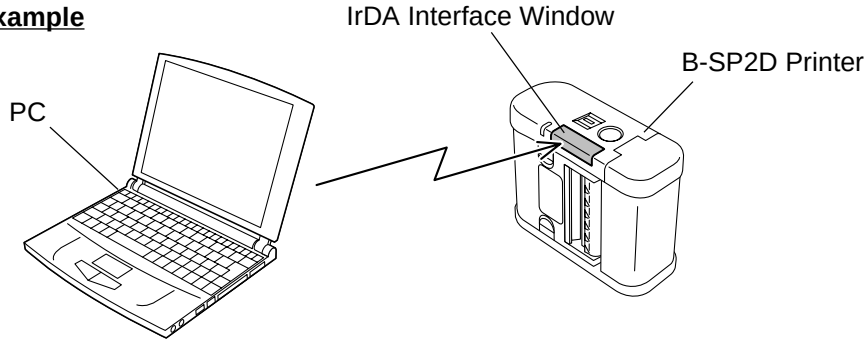
1 Confirm the IrDA settings of the PC in the following way.
Turn on the printer while pressing and holding the **[FEED]** key on the printer to start the printer in the system mode. Hold the **[FEED]** key until the indicator LED starts to blink in green. Since a diagnostic test result is automatically printed, confirm that the settings fo the IrDA interface are "IrCOMM".

B-SP2D		ID	01234
7FM00434000		HEAD	OK (2)
MAIN	V1.0 :xx00	BATT	8.2V (5)
	10MAR2003	ADJ.	+00 +0.0mm
FONT	xx00	P/W	120min
漢字	xx00	FORM	0000000000
SENS	R:4.3V		0000000000
	T:1.2V	MODE	LABEL
	P:1.0V	PARA	[PC850][0]
	H:+30°C	LOOP	IR:OK LN:OK
	A:+24°C	IrDA	IrCOMM
PEEL	3.2V		FRONT
TYPE	QM	OP.	WirelessLAN
			0009408876

NOTE: *Do not press the **[FEED]** key after the diagnostic test printing. Doing so causes the printer to enter another mode where printer parameters cannot be set.*

2 Run the firmware downloader, "B-SP2D RFLAN F/W Download Tool", on the PC.
3 Confirm that the settings of the downloader are as follows:
Control port of the Com Settings is IrDA: IrCOMM.
Vertual port for the IrDA is selected for the Com Settings Port.
NOTE: *When the OS is Windows 2000 or Windows XP, COM port setting will be ineffective.*
4 Place the PC and the printer so that their IrDA interface windows face each other. Then, click on the **[Start]** button on the screen to be ready for downloading. (When the **[Start]** button is clicked, the printer's LED will blink in green.)

Example



5 Download the firmware to the wireless LAN module in the printer. After downloading is completed, turn off the printer. (Refer to Step 6 to Step 10 of Section 4.4.4.)

5. TROUBLESHOOTING

Problem	Cause	Corrective action
The printer is not turned on.	1. The battery is not loaded correctly. 2. The battery terminal is disconnected from the soldering part. 3. CPU PC board ass'y failure or Drive PC board ass'y failure	• Re-load the battery correctly. • Replace the battery terminal. • Replace the CPU PC board ass'y or the Drive PC board ass'y.
The printer does not print media. (The status indicator blinks in red.)	1. The media roll is not loaded correctly. 2. The media cover is not closed completely. 3. The media is jammed in the printer. 4. The print head FFC harness or the print head element is broken. 5. The print head temperature reached the upper limit of the operating temperature. 6. A communication error occurred. 7. Flash ROM write error or erase error occurred. 8. There is insufficient area in the flash ROM. 9. The print mode is not selected correctly.	• Re-load the media roll correctly. • Close the media cover completely. • Remove the jammed media and re-load the media roll correctly. • Replace the print head FFC harness or the print head ass'y. • Open the media cover and allow the print head to cool. • Check that the interface cable is connected firmly. Check the communication parameters. • Open the media cover and close it again. Replace the CPU PC board ass'y. • Open the media cover and close it again. Erase the data. • Open the media cover and close it again. Send the correct print mode from the PC or handy terminal.
The printer does not print media. (The status indicator lights in red.)	1. The battery voltage is low.	• Turn off the printer and replace the battery with a fully charged one.
The printer does not print media. (The status indicator lights in orange.)	1. The battery is nearly end.	• Replace the battery with a fully charged one as soon as possible.
The **[FEED]** button does not function.	1. The **[FEED]** button is depressed incompletely.	• Press the **[FEED]** button more strongly. Replace the CPU PC board ass'y.

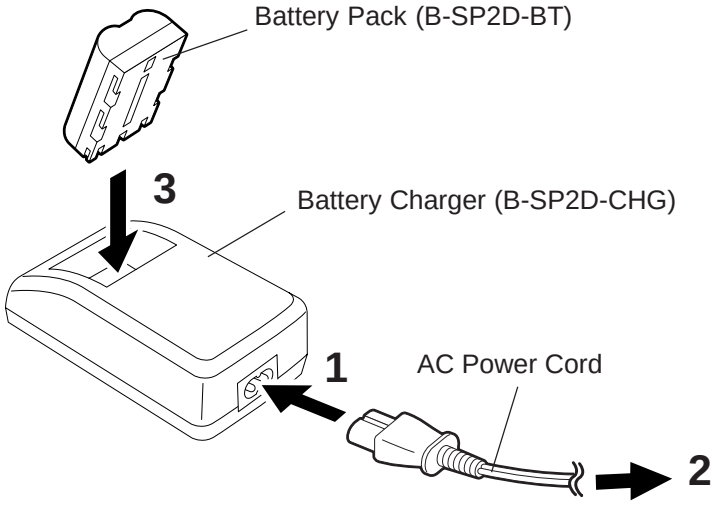
Problem	Cause	Corrective action
The printer does not print labels one by one in the strip mode or specified number of labels in the batch mode.	1. The sensors are not adjusted properly. 2. The sensors are not installed properly. 3. The sensors are dirty. 4. The sensors are disconnected from the CPU PC board ass'y.	• Re-adjust the sensors. • Re-install the sensors. • Clean the sensors. • Connect the sensors to the CPU PC board ass'y.
A cover open error occurs after closing the media cover.	1. Either side of the media cover is unlocked. 2. The media cover switch failure	• Close the media cover until both sides of the cover click in position. • Replace the media cover switch.
The printer does not print by radio communication.	1. Interface PC board ass'y failure 2. CPU PC board ass'y failure 3. Interface PC board ass'y is disconnected from the CPU PC board ass'y. 4. The FPC cable for the interface PC board is broken.	• Replace the interface PC board ass'y. • Replace the CPU PC board ass'y. • Connect the interface PC board ass'y with the CPU PC board ass'y completely. • Replace the FPC cable for the interface PC board.
Poor print quality	1. The print head is dirty. 2. Unspecified media is used.	• Clean the print head. • Change the media to the specified one.
The print start position is not detected.	1. The sensor is not adjusted properly. 2. The sensor is not installed properly. 3. The sensor or the sensor filter is dirty. 4. The sensor is disconnected from the CPU PC board ass'y.	• Re-adjust the sensor. • Re-install the sensor. • Clean the sensor and sensor filter. • Connect the sensor to the CPU PC board ass'y completely.
The power switch does not perform.	1. Power switch failure or CPU PC board ass'y failure	• Replace the power switch or the CPU PC board ass'y.
The battery cover is not closed completely.	1. The battery cover failure 2. The top cover failure	• Replace the battery cover. • Replace the top cover.
Print tone is uneven.	1. The print head is dirty. 2. The print head ass'y is not installed in position. 3. The print head failure 4. The platen failure	• Clean the print head. • Re-install the print head ass'y correctly. • Replace the print head ass'y. • Replace the platen.
A print error occurs in the feed direction.	1. Failure in the motor idler gear, platen idler gear, idler gear, or platen gear 2. Print head failure 3. Platen failure	• Replace the motor idler gear, platen idler gear, idler gear, or platen gear. • Replace the print head ass'y. • Replace the platen.

6. OPTIONAL EQUIPMENT

6.1 HOW TO USE THE BATTERY CHARGER (B-SP2D-CHG-QM)

WARNING!
1. The B-SP2D-CHG battery charger is exclusively used for the B-SP2D-BT lithium-ion battery pack. DO NOT charge any other battery packs, or explosion, combustion, heat may result.
2. If the battery charger gives out smoke, bad smell, or extraordinary heat, unplug the power cord from the outlet immediately. Failure to do this may cause fire or electric shock.

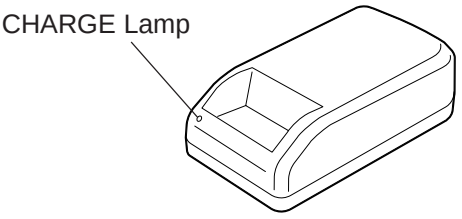
NOTE: *Since the power cord set is not enclosed in this battery charger unit, please purchase an approved one which meets the standard for each country from your Authorized TOSHIBA TEC representative. For details, please refer to the B-SP2D-CHG Owner's Manual.*



1) Connect the AC power cord to the charger.
2) Connect the AC plug to a wall outlet.
3) Install the battery pack.

   The CHARGE lamp will light and charging will begin. The CHARGE lamp indicates how much the battery pack is charged.

CHARGE lamp	State
OFF	Unconnected.
Red	Charged.
Green	Completed.
Blinking red	Abnormal state



4) After charging is completed, remove the battery pack from the battery charger.
5) Disconnect the power cord from the AC outlet.

Charging time

To charge an empty battery pack:

Battery pack	Charging time
B-SP2D-BT	about 3 hours

- The charging time may differ depending on the condition of the battery pack or the temperature of the environment.

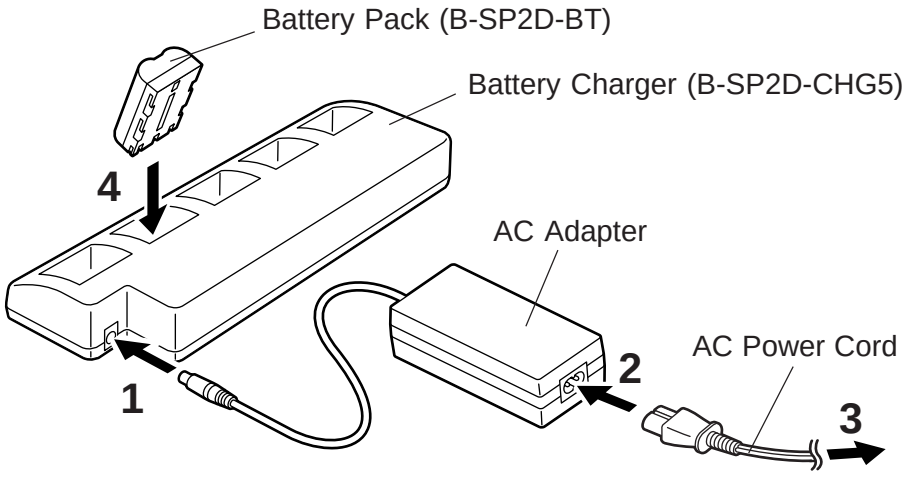
NOTES:

1. *Battery packs should be charged on condition that both ambient temperature and battery temperature fall within a range of 0 °C to 40°C.*
2. *The battery charger will get warmer during charging (room temperature + about 30°C). This is not abnormal state.*
3. *When a completely discharged battery is charged, the CHARGE lamp may not light for a while. Leave the battery charger and the battery pack alone for a few minutes.*
   Stop using that battery pack if the CHARGE lamp does not light yet. The battery pack is faulty.
4. *Periodically clean the charger terminals with a dry cloth.*

6.2 HOW TO USE THE BATTERY CHARGER (B-SP2D-CHG5-QM)

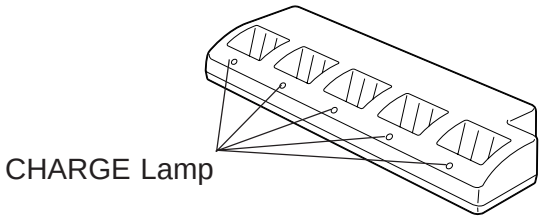
WARNING!
1. *The B-SP2D-CHG5 battery charger is exclusively used for the B-SP2D-BT lithium-ion battery pack. DO NOT charge any other battery packs, or explosion, combustion, heat may result.*
2. *If the battery charger gives out smoke, bad smell, or extraordinary heat, unplug the power cord from the outlet immediately. Failure to do this may cause fire or electric shock.*

NOTE: *Since the power cord set is not enclosed in this battery charger unit, please purchase an approved one which meets the standard for each country from your Authorized TOSHIBA TEC representative. For details, please refer to the B-SP2D-CHG5 Owner's Manual.*



1) Connect the enclosed AC adapter to the battery charger.
2) Connect the AC power cord to the AC adapter.
3) Connect the AC plug to an AC outlet.
4) Install the battery pack.
   The CHARGE lamp will light and charging will begin. The CHARGE lamp indicates how much the battery pack is charged. Maximum of 5 battery packs can be charged at the same time.

CHARGE lamp	State
OFF	Unconnected.
Red	Charged.
Green	Completed.
Blinking red	Abnormal state



5) After charging is completed, remove the battery pack from the battery charger. The CHARGE lamp will not go off immediately after the battery pack is removed, but this is not abnormal.
6) Disconnect the AC plug from the AC outlet.

Charging time

To charge an empty battery pack:

Battery pack	Charging time
B-SP2D-BT	about 3 hours

- The charging time may differ depending on the condition of the battery pack or the temperature of the environment.

NOTES:

1. *Battery packs should be charged on condition that both ambient temperature and battery temperature fall within a range of 0 °C to 40°C.*
2. *The battery charger will get warmer during charging (room temperature + about 30°C). This is not abnormal state.*
3. *When the CHARGE lamp blinks in red, it means a battery pack error. As the life of the battery pack may be expired, replace it with a new one.*
4. *If the CHARGE lamp does not light in red even if a battery pack is installed, check the following:*
   - *The AC power cord or AC adapter's plug may not be connected properly. Connect it properly.*
   - *The charging terminal of the battery charger or the battery pack is stained. Wipe it clean with a dry soft cloth.*
   - *When the battery's over discharge protector has been operated, leave the battery charger and the battery pack alone for a few minutes. Stop using the battery pack if the CHARGE lamp does not light at all.*
5. *Periodically clean the charger terminals with a dry cloth.*

7. WIRELESS LAN PARAMETER SETTING

This section provides the parameter setting procedure for the wireless LAN module. There are two parameter setting methods: One uses the B-SP2D RFLAN Configuration Tool and the parameters are set via IrDA. The other uses the Web browser and the parameters are set via wireless LAN.

***NOTES**:*

1. *Since the available frequency of the wireless LAN is different from country to country, it is required to select the country from JA, EU, US, France, and Spain. (When the printer is delivered, EU is selected.) When the printer is used in the U.S.A., France, or Spain, select the appropriate country.*
2. *The set parameters are stored in the wireless LAN module.*
3. *RFLAN Configuration Tool V1.0 covers wireless LAN module V7xx only. RFLAN Configuration Tool V1.1 covers both of wireless LAN module V1xx and V7xx.*

7.1 WHEN USING THE RFLAN CONFIGURATION TOOL

7.1.1 System Requirements

System

IBM compatible PC running Windows® 95, Windows® 98, Windows® 2000, or Windoes® XP
(Performance of PC running other OS is not guaranteed.)

***NOTE:** Windows 95, Windows 98, Windows 2000, and Windows XP are registered trademarks of Microsoft Corporation.*

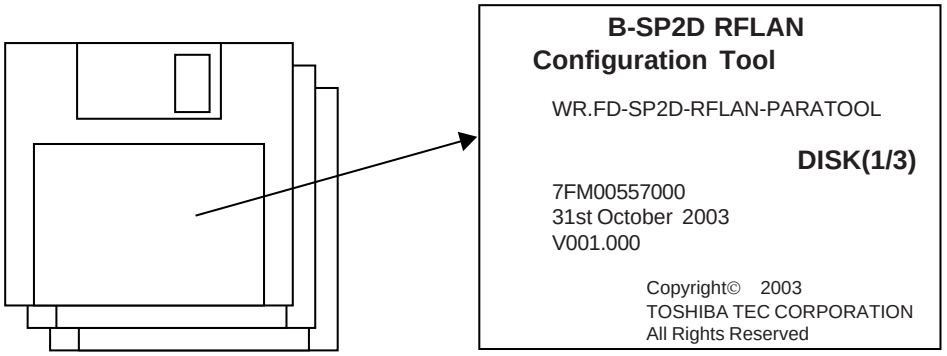
Installed memory of 16MB minimum (32MB or more is recommended.)
Available hard disk space of 10MB minimum

Interface

Communicatin between the PC and the printer should be via IrDA interface.
When using the TEC Protocol, ACTiSYS ACT-IR220L+ (IrDA Com-Port Serial Adapter) is required.
When using the IrCOMM Protocol, use the communicable IrDA interface.

7.1.2 Setup

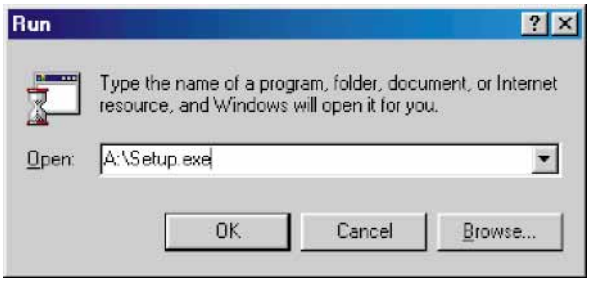
Before you can communicate from your PC to the B-SP2D printer, you must first copy the “RFLAN Configuration Tool" from the provided three floppy disks to the hard disk of your PC.



Setup Disk

Make sure that you have all three diskettes available of the “RFLAN Configuration Tool”.

1. While running Windows 98 (or Windows 95, Windows 2000, Windows XP), insert Setup Disk (1/3) into the PC floppydrive.
2. Click on the **[START]** button then highlight RUN and click on RUN.
3. When the RUN display appears, type in A:\SETUP.EXE and click on the **[OK]**.



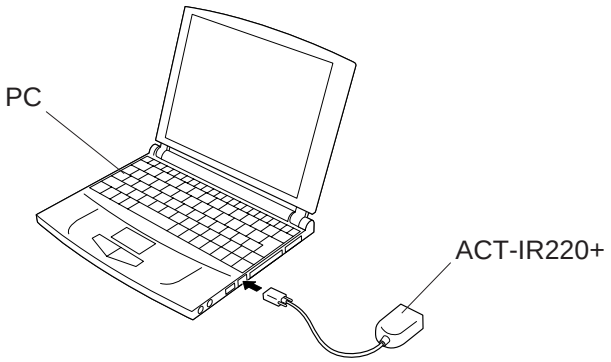
4. By following the messages on the screen, perform the installation.
5. When the installation was completed successfully, the end screen appears. Click on the **[Finish]** button to end the installation.

7.1.3 Parameter Setting Procedure (when using TEC Protocol)

When using the TEC Protocol, ACTiSYS ACT-IR220L+ (IrDA Com-Port Serial Adapter) is required.

1.Connect the ACT-IR220L+ to the serial port of the PC.

Example

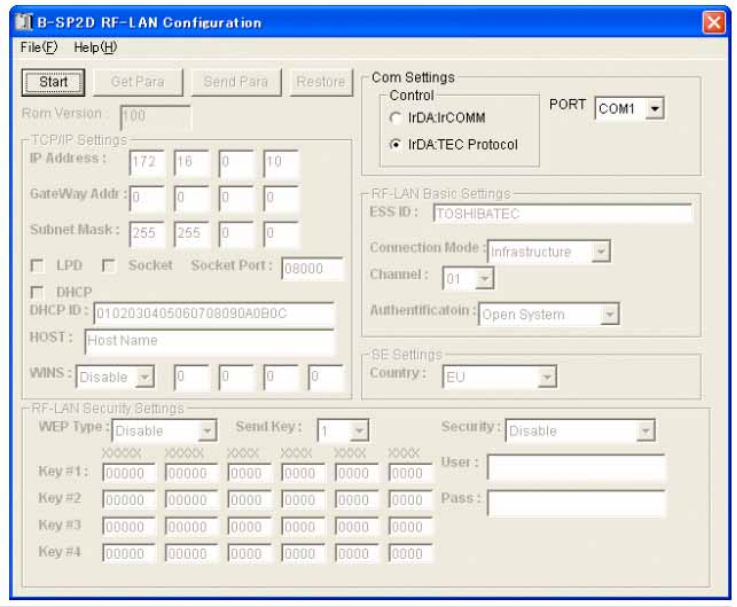


2. Confirm the IrDA settings of the printer in the following way.
   Turn on the printer while pressing and holding the **[FEED]** key on the printer to start the printer in the system mode. Hold the **[FEED]** key until the indicator LED starts to blink in green. Since a diagnostic test result is automatically printed, confirm that the settings fo the IrDA interface are "TEC 19200".

B-SP2D	ID 01234
7FM00434000	HEAD OK (2)
MAIN V1.0 :xx00	BATT 8.2V (5)
10MAR2003	ADJ. +00 +0.0mm
FONT xx00	P/W 120min
漢字 xx00	FORM 0000000000
SENS R:4.3V	0000000000
T:1.2V	MODE LABEL
P:1.0V	PARA [PC850][0]
H:+30°C	LOOP IR:OK LN:OK
A:+24°C	IrDA TEC 19200
PEEL 3.2V	FRONT
TYPE QM	OP. WirelessLAN
	000940887630

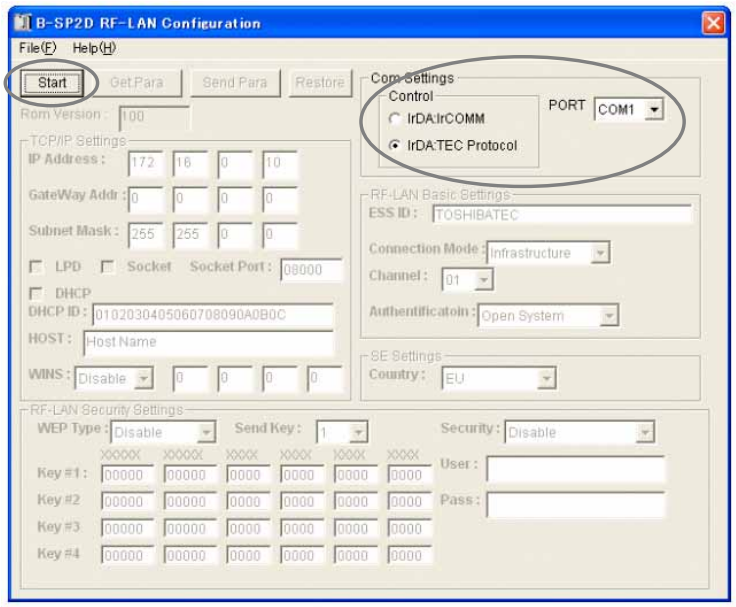
***NOTE**: Do not press the **[FEED]** key after the diagnostic test printing. Doing so causes the printer to enter another mode where printer parameters cannot be set.*

3 Run the parameter setting application, RFLAN Configuration Tool, on the PC.

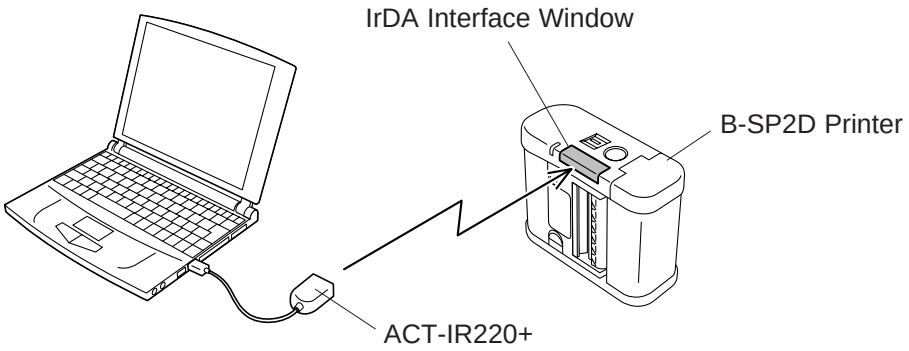


***NOTE**: While the RFLAN Configuration Tool is communicating with the wireless LAN module, do not switch the active window to another application.*

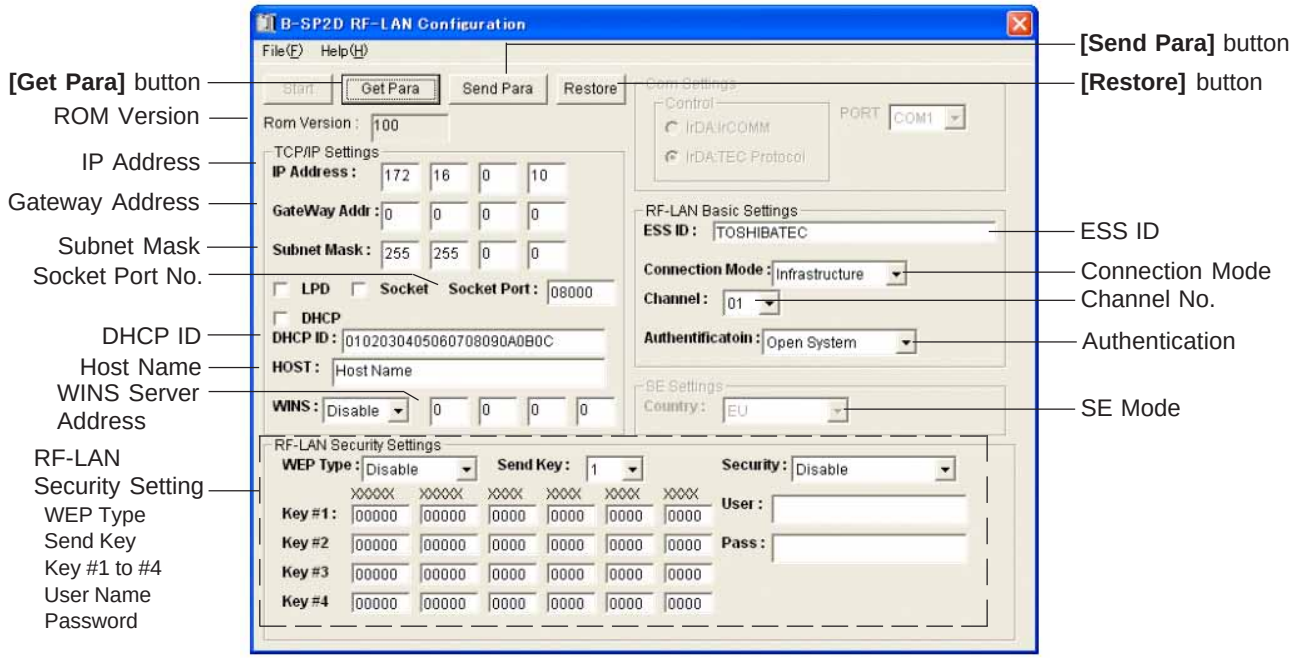
4 Confirm that the settings of the application are as follows:
Control port of the Com Settings is IrDA: TEC Protocol.
The port number to which the ACT-IR220+ is connected is selected for the Com Settings Port.



5 Place the ACT-IR220+ so that it faces to the IrDA interface window. Then, click on the **[Start]** button on the screen to be ready for downloading. (When the **[Start]** button is clicked, the printer's LED will blink in green.)



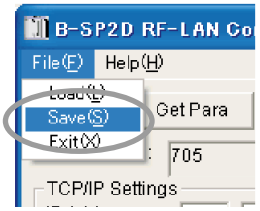
6 After setting each parameter, click on the **[Send Para]** button. The setting data will be donwloaded to the wireless LAN module. During transmission, the parameters being downloaded are shown below the **[Send Para]** button.



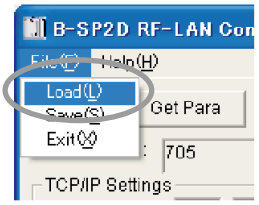
NOTES:

1. *How to call the factory set initial settings*
   *Clicking on the **[Restore]** button resets the parameter settings to the initial values that were set at the shipment from the factory. Regarding the IP address, the upper 2 bytes are fixed to "172.16", and the lower 2-byte number is set to the printer ID. However, the IP address called by the **[Restore]** button will be always "172.16.0.10".*
   *Also, clicking on the **[Restore]** button disables the **[Get Para]**, **[Send Para]**, and **[Restore]** buttons until the factory set initial values have been displayed.*
2. *How to call the currernt settings*
   *Clicking on the **[Get Para]** button displays the current settings.*
   If an unavailable channel has been set for the selected country, it will be automatically changed to a proper channel on this tool. (Applicable from the RFLAN Configuration Tool V1.1.)
3. *How to save and load the settings*
   It is possible to save the parameter settings shown on the screen and to load the saved parameter settings.

Save
*Click on the **File** menu and select the Save(S) to show the File save screen. Name the file and save.*



Load
Click on the File menu and select the Load(L) to show the File load screen. Specify the file name and load it.



***NOTE**: On the RFLAN Configuration Tool screen, parameters to be set are shown in boldface and those to be omitted (skipped) are shown in normal style. These are also saved or loaded. (Applicable from the RFLAN Configuration Tool V1.1.)*

4. *Description of each parameter*

Firmware version of the wireless LAN module

ROM Version:	*ROM version No. of the printer*

TCP/IP setting

IP Address:	*IP Address (Default: 172.16.xxx.xxx)* (xxx.xxx: Printer ID) *Setting value: xxx.xxx.xxx.xxx*
Gateway Address:	*Gateway IP Address (Default: 0.0.0.0)* *Setting value: xxx.xxx.xxx.xxx*
Subnet Mask:	*Subnet Mask (default: 255.255.0.0)* *Setting value: xxx.xxx.xxx.xxx*
LPD:	*Whether LPD protocol is enabled or disabled. (Default: Enabled)* ☐ *: Disabled* ☑ *: Enabled*
Socket:	*Whether Socket communication is enabled or disabled. (Default: Enabled)* ☐ *: Disabled* ☑ *: Enabled*
Socket Port:	*Port No. to be use for socket communication (Default: 8000)* *Setting value: 0 - 65535*
DHCP:	*Whether DHCP Client Protocol is enabled or disabled. (Default: Disabled)* ☐ *: Disabled* ☑ *: Enabled*
DHCP ID:	*Client ID to be notified to the DHCP server when using DHCP (Default: MAC Address)*
HOST:	*Host name to be notified to the host when using DHCP, WINS Protocol* *Max. 32 bytes (Default: MAC Address)*
WINS:	*Whether WINS Protocol is enabled or disabled, and WINS Server address (Default: OFF)* *Disable: OFF* *ON (STATIC): WINS Server assigned is used.* *ON (DHCP): WINS Server notified by the DHCP Server is used.*
WINS Server Address:	*WINS server address (Default: 0.0.0.0)* *Setting value: xxx.xxx.xxx.xxx*

RF-LAN Basic Settings

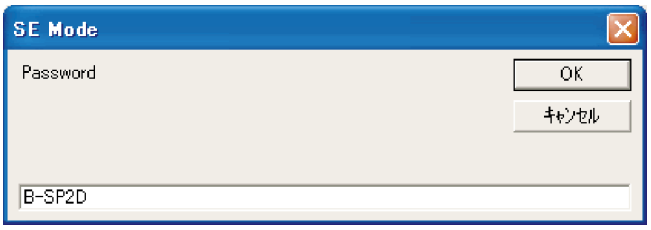
ESS ID:	*ESS ID (Network Name) (Default: TOSHIBA TEC)* *Max. 32 bytes*
Connection Mode:	*Connection mode (Default: Infrastructure)* *Infrastructure mode* *Adhoc mode*
Channel:	*Channel to be used for Adhoc communication (Default: 1)* *Channel No. using only Adhoc mode*
Authentication:	*Authentication method (Default: Open system)* *Open system* *Shared key*

5. *Parameters to be set are shown in boldface on the screen of the RFLAN Configuration Tool. Those to be omitted are shown in normal style and skipped when the parameter settings are downloaded. This makes the download time shorter.*
   Whether to set the parameter or not can be switched alternately by double-clicking. (Applicable from the RFLAN Configuration Tool V1.1.)
6. *Clicking on the **[Send Para]** button disables the **[Get Para]**, **[Send Para]**, and **[Restore]** buttons until the parameter settings have been downloaded to the wireless LAN module.*

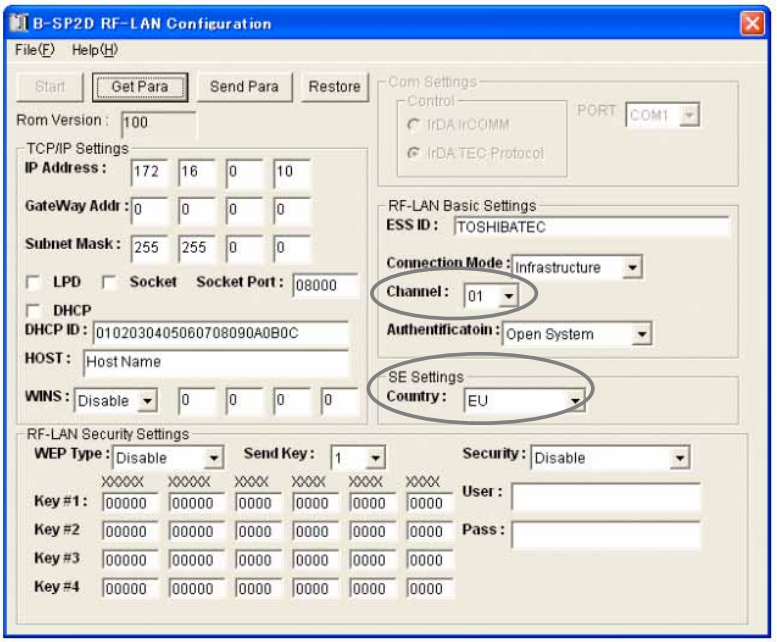
SE Settings

Country: *Country where the printer is used. (Default: EU)*
- *EU: Europe*
- *US: America*
- *FRA: France*
- *ESP: Spain*
- *JA: Japan*

***NOTE**: Since the frequency band of the wireless LAN is different from country to country, it is necessary to set the country. To set the country, a password entry is required. Click on the Help(H) menu and then SE Mode, the password entry screen will appear. Type in "B-SP2D" and click on the **[OK]** button.*



Select the country on the screen.



***NOTE**: When the country is changed, selectable channels are also changed. After changing the country, be sure to set the available channel. (Applicable from the RFLAN Configuration Tool V1.1.)*

Country	Available channel
EU	1 to 13
US	1 to 11
FRA	10 to 13
ESP	10 to 11
JA	1 to 14

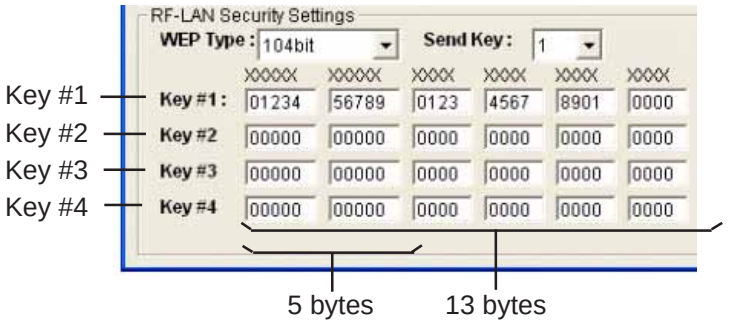
RF-LAN Security Settings

WEP Type: *Whether WEP key is enabled or disabled. (Default: OFF)*
Disable: OFF
ON (40 bits): Enabled (The length of the WEP Key is 40 bits)
ON (140 bits): Enabled (The length of the WEP Key is 104 bits)

Send Key: *WEP key number to be used for transmission*
1: Key #1
2: Key #2
3: Key #3
4: Key #4

Security: *Security mode (Default: OFF)*
OFF: Disabled
MD5: MD5
LEAP: LEAP (Applicable from the RFLAN Configuration Tool is V1.1.)

Key #1 to #4: *Setting for WEP Keys #1 to #4 (Default: 0000 [NUL 13 bytes])*
When the WEP Type is set to 104 bits, the all bits are effective. When set to 40 bits, the top 40 bits (5 bytes) only are effective.

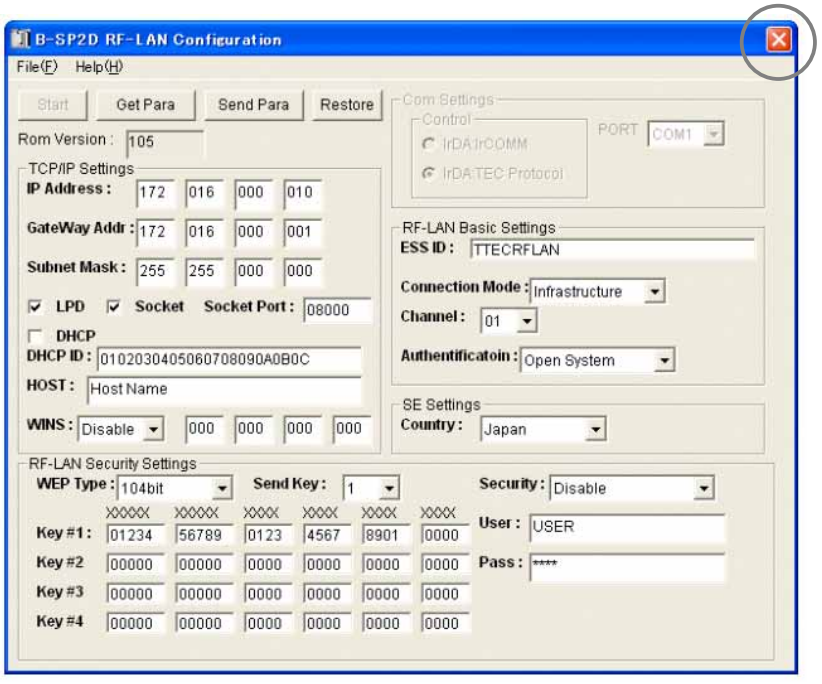


User: *User name to be used for authentication (Default: 0000 [NUL 32 bytes])*
Max. 32 bytes

Pass: *Password to be used for authentication (Default: 0000 [NUL 32 bytes])*
Max. 32 bytes
NOTE**: The entered password is displayed as "**" on the screen.*

For details of each parameter, refer to Section 7.2.9.

7. After setting the parameters, click on the Close button to exit the appliation.

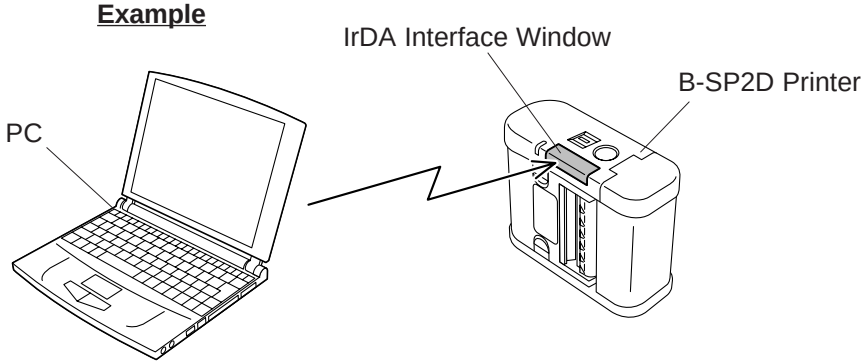


8. Press and hold the Power button on the pritner to turn it off.

7.1.4 Parameter Setting Procedure (when using IrCOMM Protocol)

When using the IrDA interface supporting the IrCOMM, such as, IrDA interface built in a notebook PC, the IrCOMM Protocol should be used.

Example



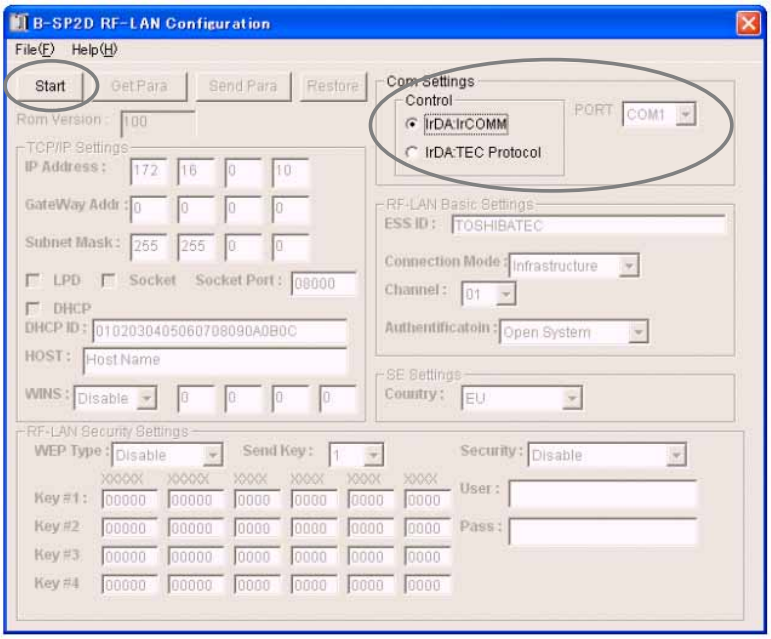
1. Confirm the IrDA settings of the PC in the following way.
   Turn on the printer while pressing and holding the **[FEED]** key on the printer to start the printer in the system mode. Hold the **[FEED]** key until the indicator LED starts to blink in green. Since a diagnostic test result is automatically printed, confirm that the settings fo the IrDA interface are "IrCOMM".

B-SP2D		ID	01234
7FM00434000		HEAD	OK (2)
MAIN	V1.0 :xx00	BATT	8.2V (5)
	10MAR2003	ADJ.	+00 +0.0mm
FONT	xx00	P/W	120min
漢字	xx00	FORM	0000000000
SENS	R:4.3V		0000000000
	T:1.2V	MODE	LABEL
	P:1.0V	PARA	[PC850][0]
	H:+30°C	LOOP	IR:OK LN:OK
	A:+24°C	IrDA	IrCOMM
PEEL	3.2V		FRONT
TYPE	QM	OP.	WirelessLAN
			0009408876

NOTE: *Do not press the **[FEED]** key after the diagnostic test printing. Doing so causes the printer to enter another mode where printer parameters cannot be set.*

2 Run the parameter setting application, "RFLAN Configuration Tool", on the PC.

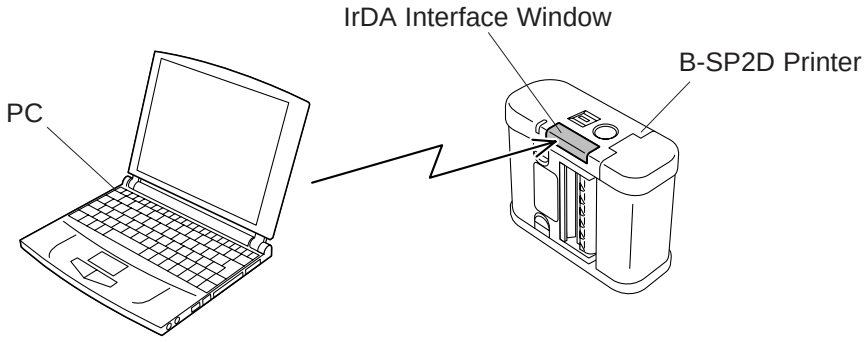
3. Confirm that the settings of the downloader are as follows:
   Control port of the Com Settings is IrDA: IrCOMM.
   Vertual port for the IrDA is selected for the Com Settings Port.



***NOTES**:*

1. *When the OS is Windows 2000 or Windows XP, COM port setting will be ineffective.*
2. *While the RFLAN Configuration Tool is communicating with the wireless LAN module, do not switch the active window to another application.*

4. Place the PC and the printer so that their IrDA interface windows face each other. Then, click on the **[Start]** button on the screen to be ready for downloading. (When the **[Start]** button is clicked, the printer's LED will blink in green.)



5. Refer to Section 7.1.3 and set the parameters, then download the settings to the printer.

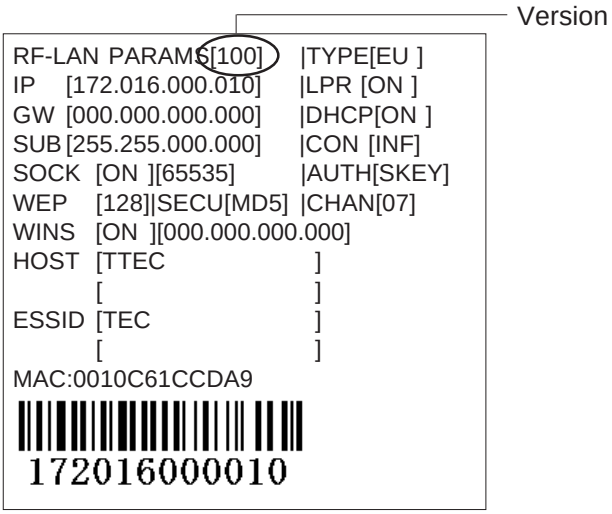
7.2 WHEN USING THE WEB BROWSER

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.
The URL, http://[printer's IP address]/maintenance.html, allows an access to the printer maintenance web page. On this page, the country where the printer is used and UART baud rate can be set.
For details, refre to the following sections.

7.2.1 Wireless Parameter Print

First, print the wireless LAN module's parameter setting before setting the parameters.
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, it is required to 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.

Sample

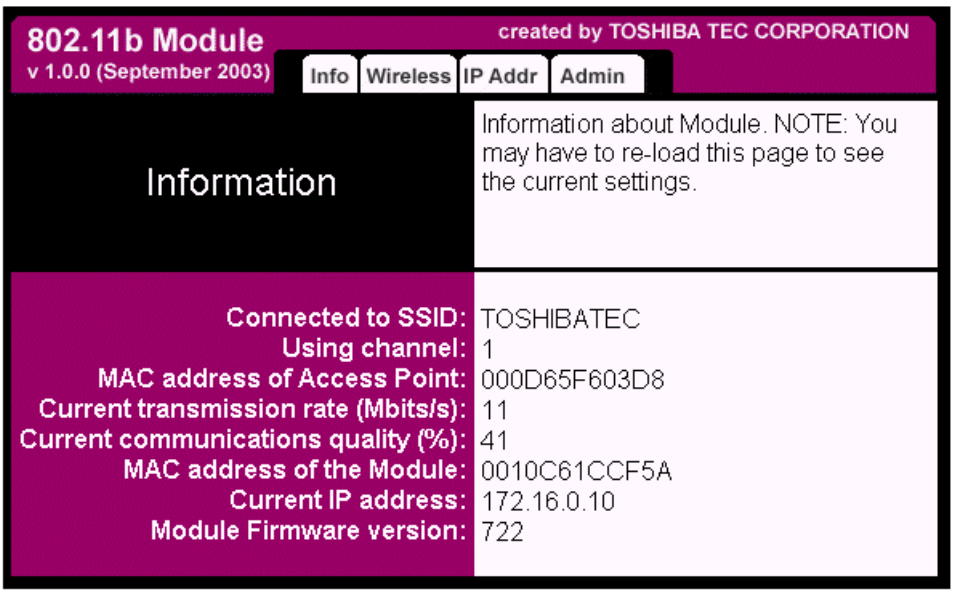


Item	Parameter	Setting	Print
	Module Version	xxx	[xxx]
IP	IP Address	xxx.xxx.xxx.xxx	[xxx.xxx.xxx.xxx]
GW	Gateway IP Address	xxx.xxx.xxx.xxx	[xxx.xxx.xxx.xxx]
SUB	Subnet Mask	xxx.xxx.xxx.xxx	[xxx.xxx.xxx.xxx]
SOCK	Socket communication	ON/OFF	[ON] [OFF]
	Socket port	0 to 65535	[00000] to [65535]
TYPE	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 /LEAP	[OFF] [MD5] [LEAP]
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.

***NOTE**: LEAP is selectable for the security mode only when the wireless LAN module version is V1xx.*

7.2.2 Info Page

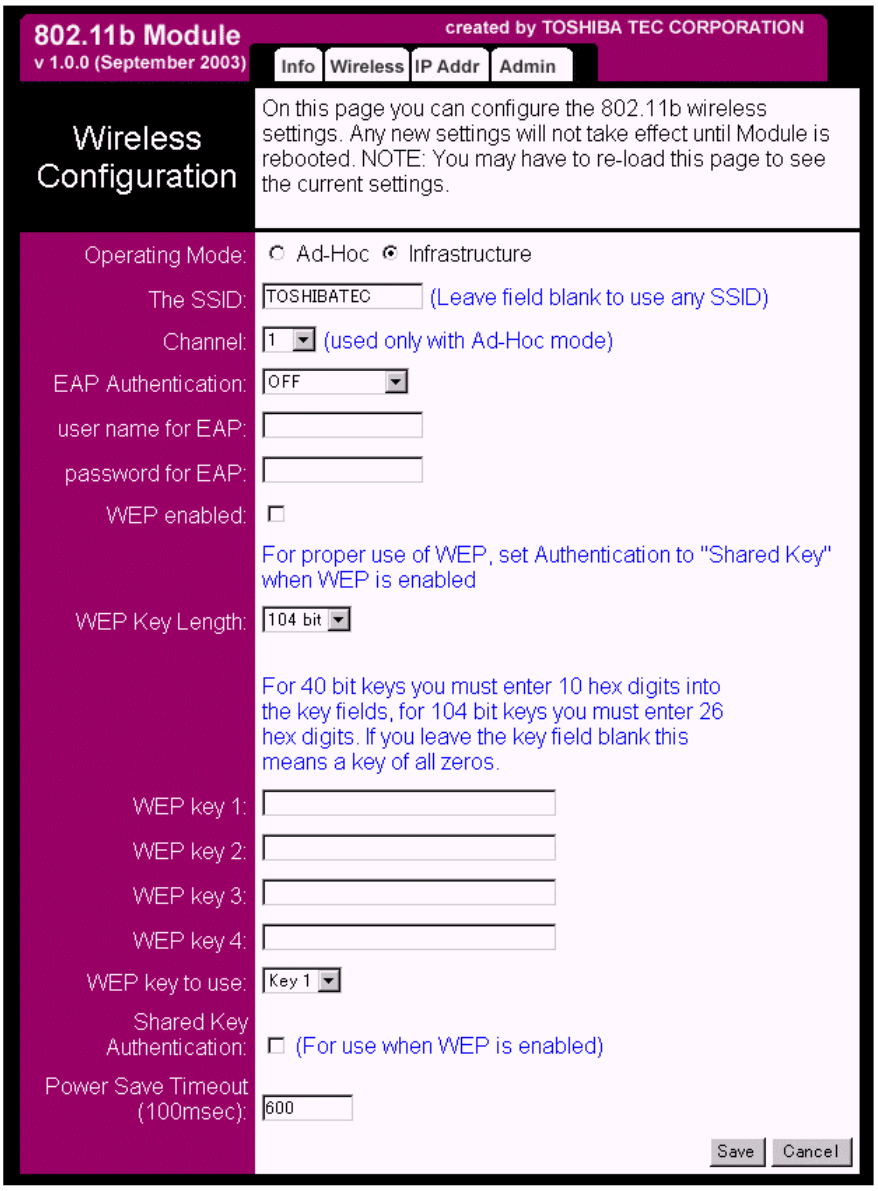
The current printer state is displayed.



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

7.2.3 Wireless Page

The parameter settings associated to the wireless LAN module can be browsed or changed.



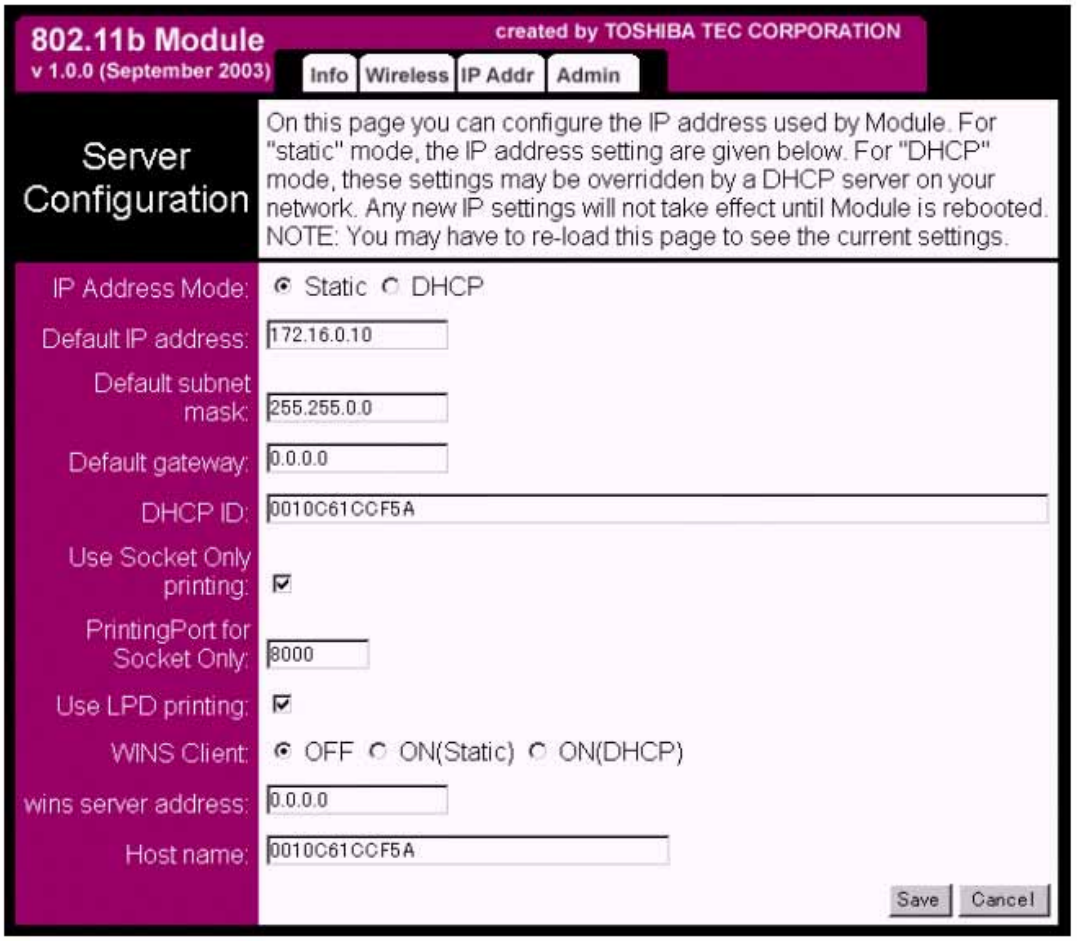
Operating Mode:	Connection mode
The SSID:	SSID to be used.
Channel:	Channel to be used in Adhoc mode
EAP Authentication:	Security protocol to be used.
User name for EAP:	User name to be used for the security protocol (See NOTE.)
Password for EAP:	Password to be used for the security protocol (See NOTE.)
WEP Enabled:	Whether WEP is enabled or disabled.
WEP Key length:	WEP key length
WEP Key 1 – 4:	WEP keys #1 to #4 (See NOTE.)
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.

For details, refer to Section 7.2.9.

***NOTE**: The entered data are displayed as "• • • •" on the browser for security. (Wireless LAN module version V1xx.)*

7.2.4 IP Addr Page

The parameter settings associated to the IP address can be browsed or changed.

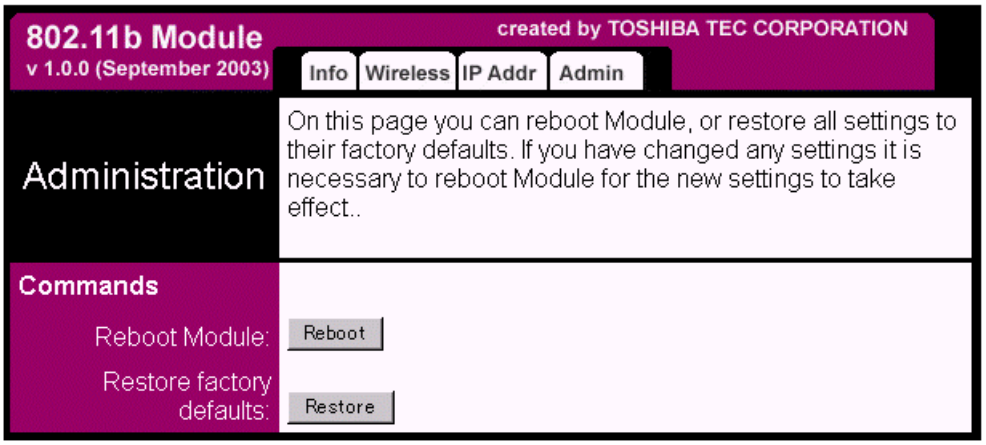


IP Address mode:	IP Address setting mode
Default IP Address:	IP Address setting
Default Subnet Mask:	Subnet mask setting
Default gateway:	Gateway setting
DHCP ID:	DHCP ID used for the DHCP client protocol
Use Socket Only printing:	Whether printing by socket communication is enabled or disabled.
Printing 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

For details, refer to Section 7.2.9.

7.2.5 Admin Page

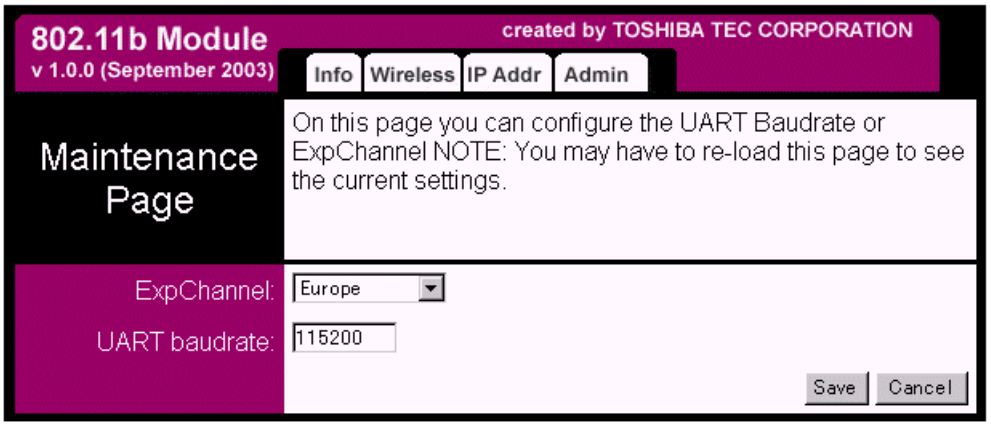
The parameter settings can be initialized or the wireless LAN module can be rebooted.



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

7.2.6 Maintenance Page

The country where the printer is used and the transmission rate between the wireless LAN module and the printer can be set. Note that this page is exclusively for service personnel.
The URL, http://[printer's IP address]/maintenance.html, allows an access to this page.



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

For details, refer to Section 7.2.9.

7.2.7 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.

7.2.8 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.
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.

7.2.9 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	Description	Setting Value	Module's Initial value
TCP/IP	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.	xxx.xxx.xxx.xxx	172.16.0.10
	Gateway IP Address	Set the IP address of the default gateway.	xxx.xxx.xxx.xxx	0.0.0.0
	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".	xxx.xxx.xxx.xxx	255.255.0.0
LPR	LPR communication	Select whether the LPR communication is enabled or disabled.	ON/OFF	ON
Socket communication	Socket communication	Select whether the socket communication is enabled or disabled.	ON/OFF	ON
	Socket communication port	Set the port number for the socket communication.	0~65535	8000
DHCP	DHCP	Select whether the DHCP is enabled or disabled.	ON/OFF	OFF
	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.	xxxxxxxx... (Max. 32bytes HEX)	MAC Address
	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.	xxxxxxxx... (Max. 32bytes)	MAC Address
WINS	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.	OFF/ON (STATIC)/ON(DHCP)	OFF
	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.	xxx.xxx.xxx.xxx	0.0.0.0
Wireless LAN	ESS ID	Set the ESS ID.	xxxxxxx... (Max. 32bytes)	TOSHIBATEC
	Connection mode	Select the connection mode between Adhoc and Infrastructure.	Adhoc/Infrastructure	Infrastructure
	Used channel	Select the channel to be used for Adhoc communication.	1~14	1
	Authentication method	Select the authentication method.	Open/Shared	Open
	WEP	Select whether WEP is used or not.	Disabled Enabled 40bits Enabled 104 bits OFF	OFF
	WEP Key #1	Set WEPKEY #1.	xxxxxxxx... (5or13bytes)	0000[NUL 13bytes]
	WEP Key #2	Set WEPKEY #2.	xxxxxxxx... (5or13bytes)	0000[NUL 13bytes]
	WEP Key #3	Set WEPKEY #3.	xxxxxxxx... (5or13bytes)	0000[NUL 13bytes]
	WEP Key #4	Set WEPKEY #4.	xxxxxxxx... (5or13bytes)	0000[NUL 13bytes]
EAP/MD5/LEAP	Security mode	Set the security mode.	OFF/MD5/LEAP	OFF
	User Name	Set the user name used for the security mode.	xxxxxxx (Max. 32bytes)	0000[NUL 32bytes]
	Password	Set the password used for the security mode.	xxxxxxx (Max. 32bytes)	0000[NUL 32bytes]
Others	Country	Select the country where the printer (wireless LAN module) is used. This item should not be set by a user.	JP,EU,US,FRA,ESP	EU
	UART communication parameter	Set the wireless LAN module's transmission rate. This item should not be set by a user.	115200	115200

***NOTE**: LEAP is selectable for the security mode only when the wireless LAN module version is V1xx.*

(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.

NOTE: *Country Setting*
When the printer is turned on, the country settings for the printer and the wireless LAN module are compared and the final country setting is determined.
When the country setting for the printer is "JP", it takes precedence over that for the wireless LAN module. For example, whenever the printer's country setting is "JP", the setting for the wireless LAN will be automatically changed to "JP" at the power on time, regardless of the wireless LAN module's setting.
In order to set to a desired country other than "JP", it is necessary to set "QM" for the printer before setting for the wireless LAN module.
The following table shows the combination of the country settings and the final result of the wireless LAN module.

		Country Setting for the Wireless LAN Module					
		JP	EU	US	France	Spain	Other
Countery Setting for the Printer	JP	JP	JP	JP	JP	JP	JP
	QM	EU	EU	US	FRA	ESP	Other

The country setting may need to be changed according to each country's Radio Law. Refer to the following table, and, if necessary, change the country setting for the wireless LAN module before selling the printers or after replacing the wireless LAN module.
As the all printers have been shipped from the factory with the country setting of "EU", there is no need to change the country setting when the setting corresponds to "EU".

Country	Setting	Country	Setting	Country	Setting
U.S.A.	US	Canada	US	Austria	EU
Belgium	EU	Denmark	EU	Finland	EU
France	FRA	Germany	EU	Greece	EU
Italy	EU	Ireland	EU	Luxembourg	EU
Portugal	EU	Spain	EU or ESP	Sweden	EU
The Netherlands	EU	United Kingdom	EU	Australia	EU
New Zealand	EU	Switzerland	EU	Norway	EU
Iceland	EU	Hungary	EU	Liechtenstein	EU