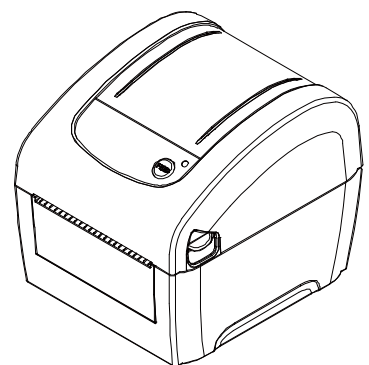


**DA210/ DA310 Series**  
**DA220/ DA320 Series**

**Direct Thermal Bar Code Printer**

**USER'S  
MANUAL**



## **Copyright Information**

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## Agency Compliance and Approvals



EN 55032, Class A  
EN 55024  
EN 60950-1; EN 61000-3-2; EN 61000-3-3  
This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.



FCC part 15B, Class A  
ICES-003, Class A  
  
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause harmful interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

This Class A digital apparatus complies with Canadian ICES-003.  
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



AS/NZS CISPR 32, Class A



KN 32  
KN 35  
이 기기는 업무용(A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.



GB 4943.1  
GB 9254, Class A  
GB 17625.1  
此为 A 级产品，在生活环境中，该产品可能会造成无线电干扰，在这种情况下，可能需要用户对干扰采取切实可行的措施。



IS 13252(Part 1)/  
IEC 60950-1



UL 60950-1(2nd Edition)  
CSA C22.2 No. 60950-1-07(2nd Edition)



Energy Star for Imaging Equipment Version 2.0



TP TC 004/2011  
TP TC 020/2011

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LP0002

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Note: There may have certification differences in the series models, please refer to product label for accuracy.

**Important safety instructions:**

1. Read all of these instructions and keep them for later use.
2. Follow all warnings and instructions on the product.
3. Disconnect the power plug from the AC outlet before cleaning or if fault happened.  
Do not use liquid or aerosol cleaners. Using a damp cloth is suitable for cleaning.
4. The mains socket shall be installed near the equipment and easily accessible.
5. The unit must be protected against moisture.
6. Ensure the stability when installing the device, Tipping or dropping could cause damage.
7. Make sure to follow the correct power rating and power type indicated on marking label provided by manufacture.
8. Please refer to user manual for maximum operation ambient temperature.

**WARNING:**

Hazardous moving parts, keep fingers and other body parts away.

**CAUTION:**

(For equipment with RTC (CR2032) battery or rechargeable battery pack)

Risk of explosion if battery is replaced by an incorrect type.

Dispose of used batteries according to the Instructions as below.

1. DO NOT throw the battery in fire.
2. DO NOT short circuit the contacts.
3. DO NOT disassemble the battery.
4. DO NOT throw the battery in municipal waste.
5. The symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.



**Caution:** The printhead may be hot and could cause severe burns. Allow the printhead to cool.

**CAUTION:**

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

**Below statement are for product with optional RF function.**

**CE Statement:**

This equipment complies with EU radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

All operational modes:

2.4GHz: 802.11b, 802.11g, 802.11n (HT20), 802.11n (HT40)

5GHz: 802.11a,

The frequency, mode and the maximum transmitted power in EU are listed below:

2400 MHz – 2483.5 MHz: 19.88 dBm (EIRP)(Wi-Fi)

5150 MHz – 5250 MHz: 17.51 dBm (EIRP)(Wi-Fi)

2402 MHz – 2480 MHz: 6.02 dBm (EIRP)(Bluetooth)

Requirements in

AT/BE/BG/CZ/DK/EE/FR/DE/IS/IE/IT/EL/ES/CY/LV/LI/LT/LU/HU/MT/NL/NO/PL/PT/RO/SI/SK/TR/FI/S  
E/CH/UK/HR. 5150MHz~5350MHz is for indoor use only.

5150-5350MHz for Only indoor use

5470-5725MHz for indoor/outdoor use



### Restrictions In AZE

National restrictions information is provided below

Frequency Band	Country	Remark
5150-5350MHz	Azerbaijan	No license needed if used indoor and power not exceeding 30mW
5470-5725MHz		

Hereby, TSC Auto ID Technology Co., Ltd. declares that the radio equipment type [Wi-Fi] IEEE 802.11 a/b/g/n is in compliance with Directive 2014/53/EU

The full text of the EU declaration of conformity is available at the following internet address:

<http://www.tscprinters.com/cms/theme/index-39.html>

### FCC Statement:

#### RF exposure warning (For Wi-Fi)

This equipment must be installed and operated in accordance with provided instructions and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be providing with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

#### RF exposure warning (For Bluetooth)

The equipment complies with FCC RF exposure limits set forth for an uncontrolled environment.

The equipment must not be co-located or operating in conjunction with any other antenna or transmitter.

### **Canada, Industry Canada (IC) Notices**

This Class B digital apparatus complies with Canadian ICES-003 and RSS-210.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

### **Radio Frequency (RF) Exposure Information**

The radiated output power of the Wireless Device is below the Industry Canada (IC) radio frequency exposure limits. The Wireless Device should be used in such a manner such that the potential for human contact during normal operation is minimized.

This device has also been evaluated and shown compliant with the IC RF Exposure limits under portable exposure conditions. (Antennas are less than 20 cm of a person's body). **(For Bluetooth)**

### **Canada, avis de l'Industry Canada (IC)**

Cet appareil numérique de classe B est conforme aux normes canadiennes ICES-003 et RSS-210. Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

### **Informations concernant l'exposition aux fréquences radio (RF)**

La puissance de sortie émise par l'appareil sans fil est inférieure à la limite d'exposition aux fréquences radio de l'Industry Canada (IC). Utilisez l'appareil sans fil de façon à minimiser les contacts humains lors du fonctionnement normal.

Ce périphérique a également été évalué et démontré conforme aux limites d'exposition radio-fréquence par l'IC pour des utilisations par des opérateurs mobiles (les antennes sont à moins de 20 cm du corps d'une personne). **(Pour le Bluetooth)**

### **NCC 警語:**

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。(即低功率電波輻射性電機管理辦法第十二條)

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。(即低功率電波輻射性電機管理辦法第十四條)

### **BSMI Class A 警語:**

這是甲類的資訊產品，在居住的環境使用中時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

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# 1. Introduction

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## 1.1 Product Introduction

Thank you very much for purchasing TSC bar code printer.

The DA210 series of direct thermal desktop printers are ideal for a wide variety of applications including product marking, point of sale, retail, small office, shipping labels, and other labeling and tag applications at the best price anywhere.

The DA210 series is a perfect combination of affordability with a durable and reliable design. With a cost that can't be beat, the DA210 series offers both 203 and 300 dots per inch print resolution with printing speeds up to a fast 6 inches per second. The large 60 watt power supply produces high quality printed labels, even at its fastest print speeds.

For easy loading, the DA210 employs a user-friendly double-wall clamshell design with a large five-inch (outside diameter) center-biased media bay. The spring-loaded label roll holder makes loading simple. Top-of-form sensing – by gap, black mark, or notch – is standard. The printer also comes with a head-open sensor.

To print label formats, please refer to the instructions provided with your labeling software; if you need to write the custom programs, please refer to the TSPL/TSPL2 programming manual that can be found on the accessories CD-ROM or on TSC website at <http://www.tscprinters.com>.

- Applications
  - Small Parcel Shipping
  - Mail Room Address and Routing Labels
  - Shipping & Receiving
  - Entertainment and Transportation Ticketing
  - Retail Point-of-Sale
  - File-Folder Labeling

## 1.2 Product Features

### 1.2.1 Printer Standard Features

The printer offers the following standard features.

Product standard feature		
Direct thermal printing		
Gap transmissive sensor (Fixed, center of offset to right 4 mm from center)		
Black mark reflective sensor (Fixed, center of offset to right 4 mm from center)		
Head open sensor		
1 operation button		
1 LED with 3 colors		
USB 2.0 (High speed mode) port for DA210/310 series USB 2.0+USB host+RS-232+Ethernet ports for DA220/320 series		
32-bit RISC high performance processor		
16 MB DRAM memory for DA210/310 series 64 MB DRAM memory for DA220/320 series		
8 MB Flash memory for DA210/310 series 128 MB Flash memory for DA220/320 series		
Eltron <sup>®</sup> EPL, Zebra <sup>®</sup> ZPL and Datamax <sup>®</sup> DPL emulation languages support		
Internal 8 alpha-numeric bitmap fonts		
One Monotype Imaging <sup>®</sup> CG Triumvirate Bold Condensed scalable font		
Built-in Monotype True Type Font engine		
Fonts and bar codes can be printed in any one of the four directions (0, 90,180, 270 degree)		
Downloadable fonts from PC to printer memory		
Downloadable firmware upgrades		
Bar code, graphics/image printing		
<b>Supported bar code</b>		<b>Supported image</b>
1D bar code Code128 subsets A.B.C, Code128UCC, EAN128, Interleave 2 of 5, Code 39, Code 93, EAN-13, EAN-8, Codabar, POSTNET, UPC-A, UPC-E, EAN and UPC 2(5) digits, MSI, PLESSEY, China Post, ITF14, EAN14, Code 11, TELPEN, PLANET, Code 49, Deutsche Post Identcode, Deutsche Post Leitcode, LOGMARS	2D bar code CODABLOCK F mode, DataMatrix, Maxicode, PDF-417, Aztec, MicroPDF417, QR code, RSS Barcode (GS1 Databar)	BITMAP, BMP, PCX (Max. 256 colors graphics)

## Code page

- Codepage 437 (English - US)
- Codepage 737 (Greek)
- Codepage 850 (Latin-1)
- Codepage 852 (Latin-2)
- Codepage 855 (Cyrillic)
- Codepage 857 (Turkish)
- Codepage 860 (Portuguese)
- Codepage 861 (Icelandic)
- Codepage 862 (Hebrew)
- Codepage 863 (French Canadian)
- Codepage 864 (Arabic)
- Codepage 865 (Nordic)
- Codepage 866 (Russian)
- Codepage 869 (Greek 2)
- Codepage 950 (Traditional Chinese)
- Codepage 936 (Simplified Chinese)
- Codepage 932 (Japanese)
- Codepage 949 (Korean)
- Codepage 1250 (Latin-2)
- Codepage 1251 (Cyrillic)
- Codepage 1252 (Latin-1)
- Codepage 1253 (Greek)
- Codepage 1254 (Turkish)
- Codepage 1255 (Hebrew)
- Codepage 1256 (Arabic)
- Codepage 1257 (Baltic)
- Codepage 1258 (Vietnam)
- ISO-8859-1: Latin-1 (Western European)
- ISO-8859-2: Latin-2 (Central European)
- ISO-8859-3: Latin-3 (South European)
- ISO-8859-4: Latin-4 (North European)
- ISO-8859-5: Cyrillic
- ISO-8859-6: Arabic
- ISO-8859-7: Greek
- ISO-8859-8: Hebrew
- ISO-8859-9: Turkish
- ISO-8859-10: Nordic
- ISO-8859-15: Latin-9
- UTF-8

## 1.2.2 Printer Optional Features

The printer offers the following optional features.

### DA210/310 Series

Product option feature for <u>DA210/310 series</u>	User option	Dealer option	Factory option
1.5" adapter	<input type="radio"/>		
External roll mount, media OD. 214 mm (8.4") with 76.2 mm (3") core	<input type="radio"/>		
Internal Bluetooth 4.0 module			<input type="radio"/>

Product option feature for <u>DA220/320 series</u>	User option	Dealer option	Factory option
Peel-off module		<input type="radio"/>	
Guillotine cutter (full cut or partial cut)		<input type="radio"/>	
Main board for USB & IE ports only			<input type="radio"/>
Real time clock			<input type="radio"/>
Internal 802.11 a/b/g/n wireless module			<input type="radio"/>
Internal Bluetooth 4.0 module			<input type="radio"/>
1.5" adapter for i.5" paper core	<input type="radio"/>		
KP-200 Plus keyboard display unit (option with RS-232)	<input type="radio"/>		
KU-007 Plus programmable smart keyboard (option with RS-232)	<input type="radio"/>		
External Bluetooth connectivity (option with RS-232)	<input type="radio"/>		
External roll mount, media OD. 214 mm (8.4") with 76.2 mm (3") core	<input type="radio"/>		

### 1.3 General Specifications

General Specifications	
Physical dimensions	172 mm (W) x 165 mm (H) x 195 mm (D)
Mechanism	Plastic with double-walled clamshell design
Weight	1.5 kg
Power	External universal switching power supply Input: AC 100-240V, 50-60Hz Output: DC 24V, 2.5A, 60W
Environmental condition	Operation: 5 ~ 40°C, 25~85% non-condensing <b>Note : Peeler mode : 40°C/ 45%</b> Storage: -40 ~ 60 °C, 10~90% non-condensing
Environmental concern	Comply with RoHS, WEEE

### 1.4 Print Specifications

Print Specifications	203 dpi models	300 dpi models
Print head resolution (dots per inch/mm)	203 dots/inch (8 dots/mm)	300 dots/inch (12 dots/mm)
Printing method	Direct thermal	
Dot size (width x length)	0.125 x 0.125 mm (1 mm = 8 dots)	0.084 x 0.084 mm (1 mm = 11.8 dots)
Max. print speed (inches per second)	152.4 mm (6")	102 mm (4")
	2,3 ips for peeler mode	
Max. print width	108 mm (4.25")	105.7 mm (4.16")

Max. print length	2,794 mm (110") for DA210 1,016 mm (40") for DA310 25,400 mm (1000") for DA220 11,430 mm (450") for DA320
Printout bias	Vertical: max. 1 mm Horizontal: max. 1 mm

## 1.5 Media Specifications

Media Specifications	
Media roll capacity	127 mm (5") OD
Media core diameter	1" (1.5") ID core <b>Note : 1.5" adapter (option)</b>
Media type	Continuous, die-cut, black mark, External fan-fold, receipt
Media wound type	Outside wound
Media width	19 mm ~ 114 mm (0.7" ~ 4.5")
Media thickness	0.055 mm ~ 0.19 mm (2.16 ~ 7.48 mil)
Label length	10 ~ 2,794 mm (0.39" ~ 110") for DA210 10 ~ 1,016 mm (0.39" ~ 40") for DA310 10 ~ 25,400 mm (0.39" ~ 1000") for DA220 10 ~ 11,430 mm (0.39" ~ 450") for DA320 1" ~ 6" for peeler mode 1" ~ max. for cutter mode
Gap height	Min. 2 mm
Black mark height	Min. 2 mm
Black mark width	Min. 16 mm

## 2. Operations Overview

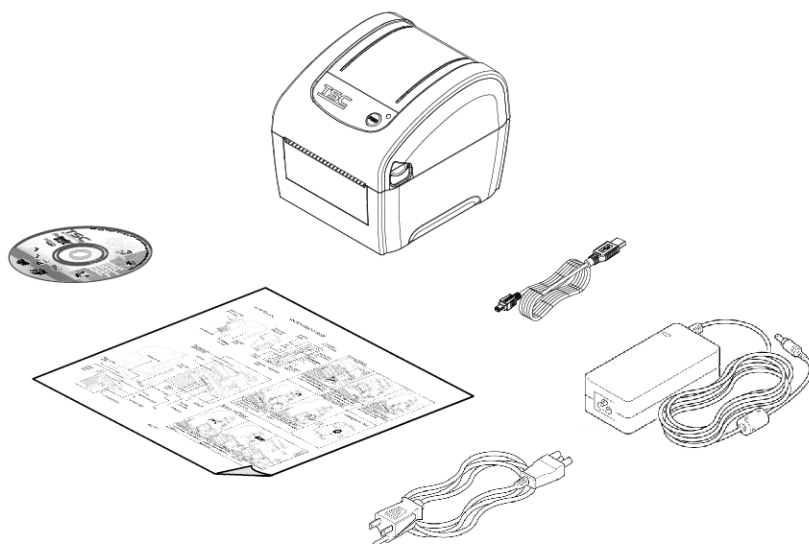
---

### 2.1 Unpacking and Inspection

This printer has been specially packaged to withstand damage during shipping. Please carefully inspect the packaging and printer upon receiving the bar code printer. Please retain the packaging materials in case you need to reship the printer.

Unpacking the printer, the following items are included in the carton. If any parts are missing, please contact the Customer Service Department of your purchased reseller or distributor.

- One printer unit
- One Windows labeling software/ Windows driver CD disk
- One quick installation guide
- One USB port cable
- One power cord
- One power supply



## 2.2 Printer Overview

### 2.2.1 Front & rear





## 2.2.2 Interior View



- 1.** Print head
- 2.** Gap sensor (transmitter)
- 3.** Media viewer
- 4.** Media holder
- 5.** Platen roller
- 6.** Media holder lock switch
- 7.** Black mark sensor/ Gap sensor (receiver)

## 2.3 LED and Button Function

This printer has one button and one three-color LED indicator. By indicating the LED with different color and pressing the button, printer can feed labels, pause the printing job, select and calibrate the media sensor, print printer self-test report, reset printer to defaults (initialization). Please refer to the button operation below and “Power-on Utilities” section for different functions.

### 2.3.1 LED Indication

LED Color	Description
Green/ Solid	This illuminates that the power is on and the device is ready to use.
Green/ Flash	This illuminates that the system is downloading data from PC to memory or the printer is paused.
Amber	This illuminates that the system is clearing data from printer.
Red / Solid	This illuminates printer head open, cutter error.
Red / Flash	This illuminates a printing error, such as head open, paper empty, paper jam, or memory error etc.

### 2.3.2 Regular Button Function

#### 1. Feed labels

When the printer is at ready states (Green/ Solid), press the button to feed one label to the beginning of next.

#### 2. Pause the printing job

When the printer is at printing states, press the button to pause a print job. When the printer is paused the LED will be green blinking. Press the button again to continue the printing job.

## 3. Setup

### 3.1 Setting up the Printer




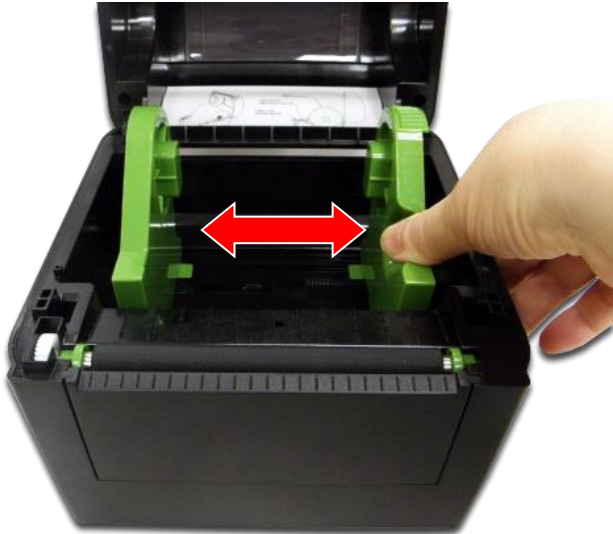

1. Place the printer on a flat, secure surface.
2. Make sure the power switch is off.
3. Connect the printer to the computer with the provided USB cable.
4. Plug the power cord into the AC power cord socket at the rear of the printer, and then plug the power cord into a properly grounded power outlet.

**Note:**

- \* Please switch OFF (O) printer power switch prior to plug in the power cord to printer power jack.
- \* The interface picture here is for reference only. Please refer to the product specification for the interfaces availability.

## 3.2 Loading the Media

### 3.2.1 Loading the Roll Labels

 A black TSC printer is shown from a three-quarter perspective. The top cover is slightly raised. Two red arrows point upwards to the top cover open tabs on the left and right sides of the printer.	<ol style="list-style-type: none"><li>1. Open the printer top cover by pressing up the top cover open tabs located on each side of the printer.</li></ol>
 The printer's top cover is fully open. A hand is shown on the right side, pulling one of the green media holders outwards. A red double-headed arrow indicates the horizontal movement of the holder.	<ol style="list-style-type: none"><li>2. Separate the media holders to the label roll width.</li></ol>
 The printer's top cover is open. A roll of white labels is now positioned between the two green media holders. The holders are closed, securing the roll in place.	<ol style="list-style-type: none"><li>3. Place the roll between the holders and close them onto the core.</li></ol>



4. Place the label leading edge onto the platen roller. (printing side face up)


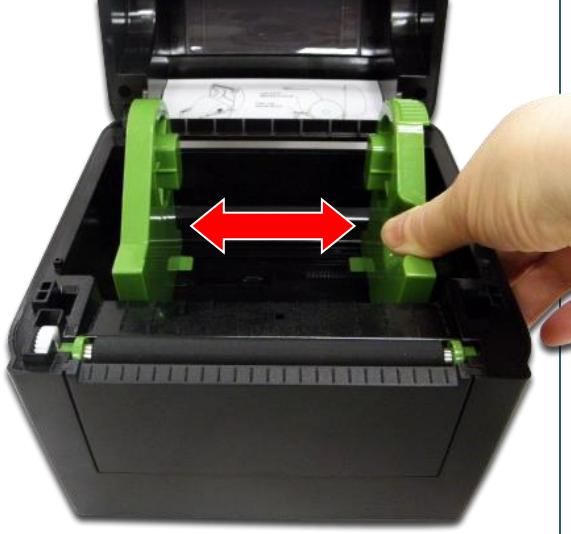
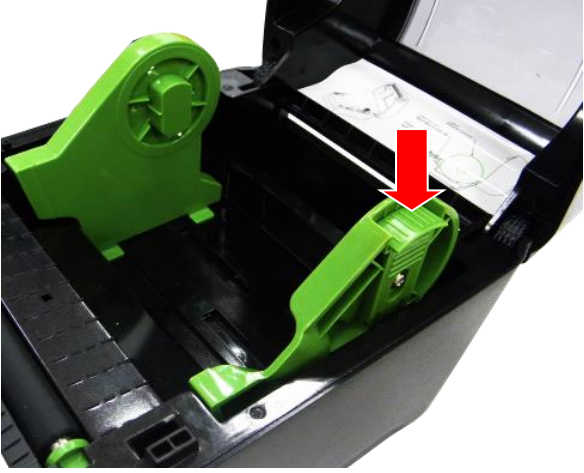


5. Close the top cover gently and make sure the cover latches securely.
6. Use "Diagnostic Tool" to set the media sensor type and calibrate the selected sensor. (Start the "Diagnostic tool" → Select the "Printer Configuration" tab → Click the "Calibrate Sensor" button)

**Note:**

- \* Please calibrate the gap/black mark sensor when changing media.
- \* Please refer to video on [TSC YouTube](#) or driver CD.

### 3.2.2 Loading External Media

 A black TSC printer with its top cover open. Two red arrows point upwards to the top cover open tabs on the left and right sides of the printer.	<ol style="list-style-type: none"><li>1. Open the printer top cover by pressing up the top cover open tabs located on each side of the printer.</li></ol>
 A close-up view of the printer's interior. A hand is shown pulling the green media holders apart. A red double-headed arrow indicates the direction of movement.	<ol style="list-style-type: none"><li>2. Separate the media holders to the label width.</li></ol>
 A close-up view of the media holder lock switch. A red arrow points downwards to the switch, indicating it should be pressed down.	<ol style="list-style-type: none"><li>3. Press down the media holder lock switch to fix the media holder.</li></ol>



4. Feed the media through the rear external label entrance chute. (printing side face up) Place the label leading edge onto the platen roller.
5. Close the top cover gently and make sure the cover latches securely.
6. Use "Diagnostic Tool" to set the media sensor type and calibrate the selected sensor. (Start the "Diagnostic tool" → Select the "Printer Configuration" tab → Click the "Calibrate Sensor" button)

**Note:**

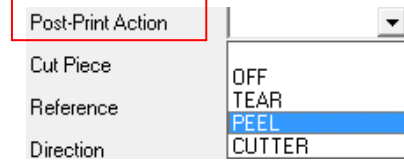
- \* Please calibrate the gap/black mark sensor when changing media.
- \* Please refer to video on [TSC YouTube](#) or driver CD.



### 3.2.3 Loading Media in Peel-off Mode (Option for DA220 series)

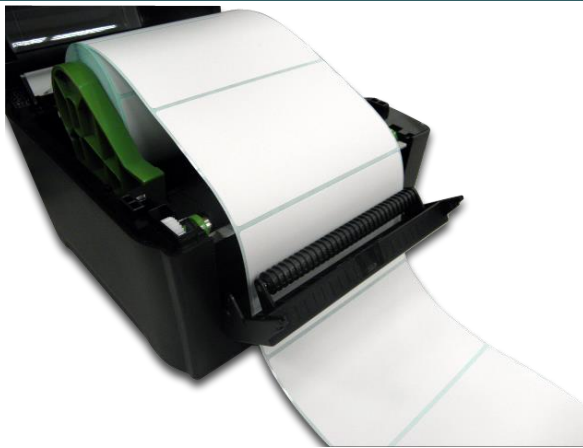


1. Please refer to section 3.2.1 to load the media. Place the label leading edge onto the platen roller.
2. Close the top cover gently. Use “Diagnostic Tool” to set the media sensor type, calibrate the selected sensor and set the post-print action to “PEEL”.



**Note:**

Please calibrate the sensor before loading media into the peel-off module for avoiding paper jam.

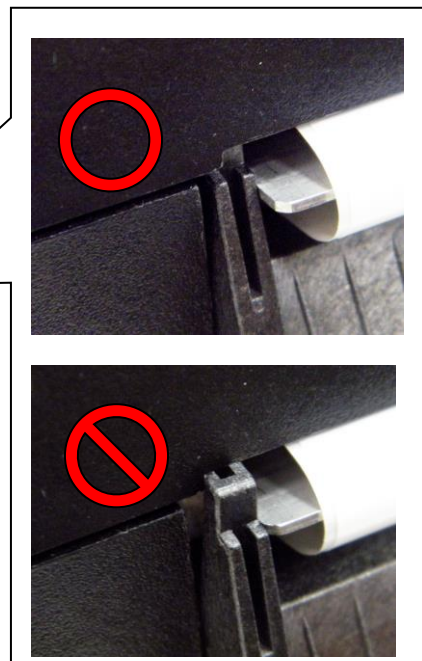


3. Open the top cover and peel-off cover. Feed the media into peel-off cover slot.

4. Close the peel-off cover and printer cover.

**Note:**

Make sure the latches of peel-off cover are engaged securely by printer cover.





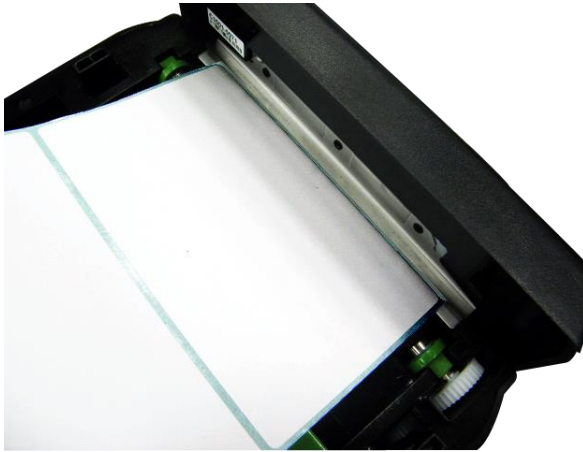


5. Printer is ready for peel-off mode. Print a label for test.

**Note:**

- \* Please calibrate the gap/black mark sensor when changing media.
- \* Please refer to video on [TSC YouTube](#) or driver CD.

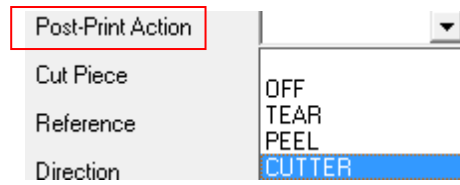
### 3.2.4 Loading Media in Cutter Mode (Option for DA220 series)



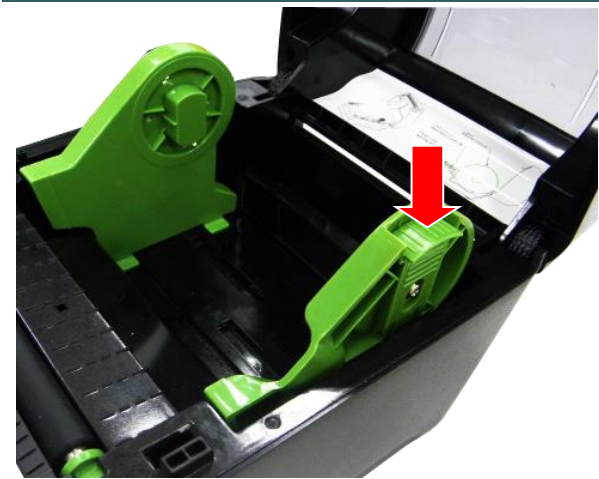
1. Please refer to section 3.2.1 to load the media. Lead the paper through the cutter paper opening.



2. Close the top cover gently.
3. Use "Diagnostic Tool" to set the media sensor type, calibrate the selected sensor and set the post-print action to "CUTTER".



### 3.3 Install the Adapter for 1.5” Paper Core (Option)



1. Please refer to section 3.2.2 to fix the media holders for installing the 1.5” adapters.



2. Press 1.5” adapters into both media holders for using 1.5: core media roll.



## 4. Power-on Utilities

There are six power-on utilities to set up and test printer hardware. These utilities are activated by pressing FEED button then turning on the printer power simultaneously and release the button at different color of LED.

Please follow the steps below for different power-on utilities.

1. Turn off the power switch.
2. Hold on the button then turn on the power switch.
3. Release the button when LED indicates with different color for different functions.

<i>Power on utilities</i>	<i>The LED color will be changed as following pattern:</i>						
<i>LED color</i>	Amber	Red	Amber	Green	Green/Amber	Red/Amber	Solid green
<i>Functions</i>		(5 blinks)	(5 blinks)	(5 blinks)	(5 blinks)	(5 blinks)	
<b>1. Gap / black mark sensor calibration</b>		<i>Release</i>					
<b>2. Gap / black mark sensor calibration, Self-test and enter dump mode</b>			<i>Release</i>				
<b>3. Printer initialization</b>				<i>Release</i>			
<b>4. Set black mark sensor as media sensor and calibrate the black mark sensor</b>					<i>Release</i>		
<b>5. Set gap sensor as media sensor and calibrate the gap sensor</b>						<i>Release</i>	
<b>6. Skip AUTO.BAS</b>							<i>Release</i>

## 4.1 Gap/Black Mark Sensor Calibration

Gap/black mark sensor sensitivity should be calibrated at the following conditions:

1. A brand new printer
2. Change label stock.
3. Printer initialization.

Please follow the steps below to calibrate the gap/black mark sensor.

1. Turn off the power switch.
2. Hold on the button then turn on the power switch.
- 3 Release the button when LED becomes **red** and blinking. (Any red will do during the 5 blinks).

- It will calibrate the gap/black mark sensor sensitivity.
- The LED color will be changed as following order :  
Amber → **red (5 blinks)** → amber (5 blinks) → green (5 blinks) → green/amber (5 blinks) → red/amber (5 blinks) → solid green

**Note:**

1. Sensor calibration can be done by Diagnostic Tool or by power on utility. Please refer to “Diagnostic Tool” section for more information.
2. Please select gap or black mark sensor type prior to calibrate the sensor.

## 4.2 Gap/Black Mark Calibration, Self-test and Dump Mode

While calibrate the gap/black mark sensor, printer will measure the label length, print the internal configuration (self-test) on label and then enter the dump mode. To calibrate gap or black mark sensor, depends on the sensor setting in the last print job.

Please follow the steps below to calibrate the sensor.

1. Turn off the power switch.
2. Hold on the button then turn on the power switch.
3. Release the button when LED becomes **amber** and blinking. (Any amber will do during the 5 blinks)

- The LED color will be changed as following order.

Amber → red (5 blinks) → **amber (5 blinks)** → green (5 blinks) → green/amber (5 blinks) → red/amber (5 blinks) → solid green

4. It calibrates the sensor and measures the label length and prints internal settings then enter the dump mode.

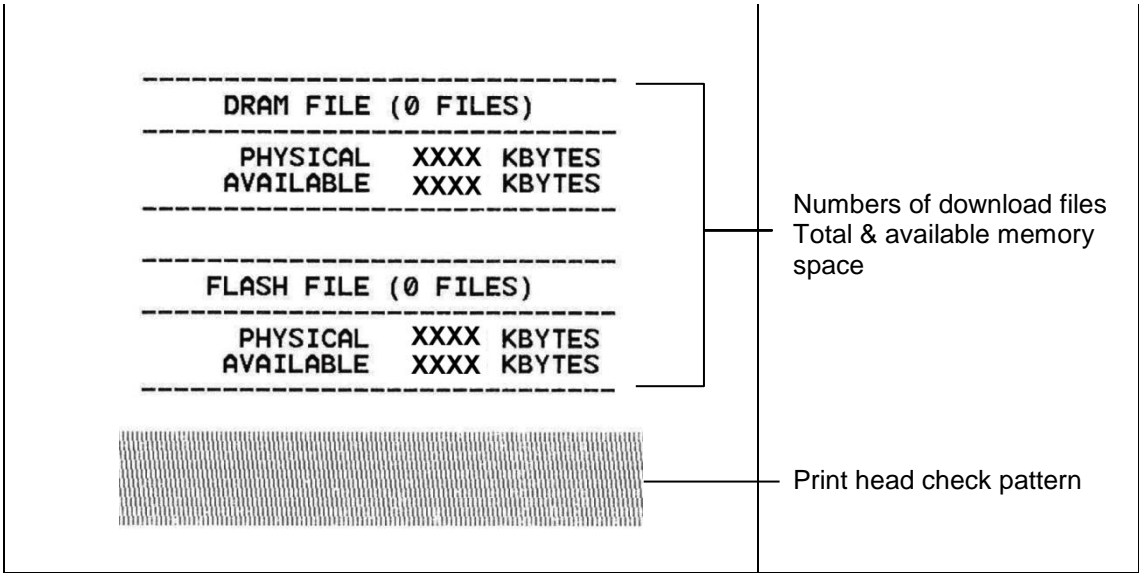
### Note:

1. Sensor calibration can be done by Diagnostic Tool or by power on utility. Please refer to “Diagnostic Tool” section for more information.
2. Please select gap or black mark sensor type prior to calibrate the sensor.

## 4.2.1 Self-test

Printer will print the printer configuration after media sensor calibration. Self-test printout can be used to check if there is any dot damage on the heater element, printer configurations and available memory space.

Self-test printout	
-----	
<b>SYSTEM INFORMATION</b>	
-----	
MODEL: XXXXXX	Model name
FIRMWARE: X.XX	F/W version
CHECKSUM: XXXXXXXX	Firmware checksum
S/N: XXXXXXXXXXXX	Printer S/N
TCF: NO	TSC configuration file
DATE: 1970/01/01	System date
TIME: 00:04:18	System time
NON-RESET: 110 m (TPH)	Printed mileage (meter)
RESET: 110 m (TPH)	
NON-RESET: 0 (CUT)	
RESET: 0 (CUT)	
-----	
<b>PRINTING SETTING</b>	
-----	
SPEED: 5 IPS	Print speed (inch/sec)
DENSITY: 8.0	Print darkness
WIDTH: 4.00 INCH	Label size (inch)
HEIGHT: 4.00 INCH	Gap distance (inch)
GAP: 0.00 INCH	Gap/black mark sensor
INTENSION: 5	intension
CODEPAGE: 850	Code page
COUNTRY: 001	Country code
-----	
<b>Z SETTING</b>	
-----	
DARKNESS: 16.0	ZPL setting information
SPEED: 4 IPS	Print darkness
WIDTH: 4.00 INCH	Print speed (inch/sec)
TILDE: 7EH (~)	Label size
CARET: 5EH (^)	Control prefix
DELIMITER: 2CH (,)	Format prefix
POWER UP: NO MOTION	Delimiter prefix
HEAD CLOSE: NO MOTION	Printer power up motion
-----	
<b>RS232 SETTING</b>	
-----	
BAUD: 9600	RS232 serial port configuration
PARITY: NONE	
DATA BIT: 8	
STOP BIT: 1	
-----	
<p><b>Note:</b> ZPL is emulating for Zebra® language.</p>	





## 4.2.2 Dump mode

Printer will enter dump mode after printing printer configuration. In the dump mode, all characters will be printed in 2 columns as following. The left side characters are received from your system and right side data are the corresponding hexadecimal value of the characters. It allows users or engineers to verify and debug the program.

ASCII Data	→	<pre> SPEED 2,0 53 50 45 45 44 20 32 2E 30 0D DENSITY 8 0A 44 45 4E 53 49 54 59 20 38 SET PEEL 0D 0A 53 45 54 20 50 45 45 4C OFF DIRE 20 4F 46 46 0D 0A 44 49 52 45 CTION 0 0 43 54 49 4F 4E 20 30 0D 0A 47 AP 3,00 mm 41 50 20 33 2E 30 30 20 6D 6D ,0,00 mm 2C 30 2E 30 30 20 6D 0D 0A REFERENCE 52 45 46 45 52 45 4E 43 45 20 0,0 SET C 30 2C 30 0D 0A 53 45 54 20 43 UTTER OFF 55 54 54 45 52 20 4F 46 46 0D SIZE 100, 0A 53 49 5A 45 20 31 30 30 2E 02 mm,65,0 30 32 20 6D 6D 2C 36 35 2E 30 4 mm CLS 34 20 6D 6D 0D 0A 43 4C 53 0D BARCODE 1 0A 42 41 52 43 4F 44 45 20 31 44,149,"39 34 34 2C 31 34 39 2C 22 33 39 ",120,1,0, 22 2C 31 32 30 2C 31 2C 30 2C 2,6,"57114 32 2C 36 2C 22 35 37 31 31 34 3BT* PRIN 33 38 54 22 0D 0A 50 52 49 4E T 1,1 SPE 54 20 31 2C 31 0D 0A 53 50 45 ED 2,0 DE 45 44 20 32 2E 30 0D 0A 44 45 NSITY 8 S 4E 53 49 54 59 20 38 0D 0A 53  ET PEEL OF 45 54 20 50 45 45 4C 20 4F 46 F DIRECTI 46 0D 0A 44 49 52 45 43 54 49 ON 0 GAP 4F 4E 20 30 0D 0A 47 41 50 20 3,00 mm,0, 33 2E 30 30 20 6D 6D 2C 30 2E 00 mm REF 30 30 20 6D 6D 0D 0A 52 45 46 ERENCE 0,0 45 52 45 4E 43 45 20 30 2C 30 SET CUTT 0D 0A 53 45 54 20 43 55 54 54 ER OFF SI 45 52 20 4F 46 46 0D 0A 53 49 ZE 100,02 5A 45 20 31 30 30 2E 30 32 20 mm,65,04 m 6D 6D 2C 36 35 2E 30 34 20 6D m CLS BA 6D 0D 0A 43 4C 53 0D 0A 42 41 RCODE 144, 52 43 4F 44 45 20 31 34 34 2C 149,"39",1 31 34 39 2C 22 33 39 22 2C 31 20,1,0,2,6 32 30 2C 31 2C 30 2C 32 2C 36 ,"571143BT 2C 22 35 37 31 31 34 33 38 54 * PRINT 1 22 0D 0A 50 52 49 4E 54 20 31 ,1 2C 31 0D 0A </pre>	←	Hex decimal data related to left column of ASCII data
------------	---	---	---	---

**Note:**

1. Dump mode requires 4" wide paper width.
2. Turn off / on the power or press FEED button to resume printer for normal printing. (Ready mode)

## 4.3 Printer Initialization

Printer initialization is used to clear DRAM and restore printer settings to defaults.

Printer initialization is activated by the following procedures.

1. Turn off the power switch.
2. Hold on the button then turn on the power switch.
3. Release the button when LED turns **green** after 5 amber blinks. (Any green will do during the 5 blinks).

- The LED color will be changed as following:

Amber → red (5 blinks) → amber (5 blinks) → **green (5 blinks)** → green/amber (5 blinks) → red/amber (5 blinks) → solid green

Printer configuration will be restored to defaults as below after initialization.

Parameter	Default setting
Speed	127 mm/sec (5 ips) (203DPI) 76.2 mm/sec (3 ips) (300 DPI)
Density	8
Media Width	4" (101.5 mm)
Media Height	4" (101.5 mm)
Sensor Type	Gap sensor
Print Direction	0
Reference Point	0,0 (upper left corner)
Gap Offset	0
Post-Print Action	Tear mode
Serial Port Settings	9600 bps, none parity, 8 data bits, 1 stop bit
Code Page	850
Country Code	001
Clear Flash Memory	No

**Note:**

**When printer initialization has done, please calibrate the gap or black mark sensor before printing.**

## 4.4 Set Black Mark Sensor as Media Sensor and Calibrate the Black Mark Sensor

Please follow the steps as below.

1. Turn off the power switch.
2. Hold on the button then turn on the power switch.
3. Release the button when LED turns **green/amber** after 5 green blinks. (Any green/amber will do during the 5 blinks).

- The LED color will be changed as following:  
Amber → red (5 blinks) → amber (5 blinks) → green (5 blinks) → **green/amber (5 blinks)** → red/amber (5 blinks) → solid green

## 4.5 Set Gap Sensor as Media Sensor and Calibrate the Gap Sensor

Please follow the steps as below.

1. Turn off the power switch.
2. Hold on the button then turn on the power switch.
3. Release the button when LED turns **red/amber** after 5 green/amber blinks. (Any red/amber will do during the 5 blinks).

- The LED color will be changed as following:  
Amber → red (5 blinks) → amber (5 blinks) → green (5 blinks) → green/amber (5 blinks) → **red/amber (5 blinks)** → solid green

## 4.6 Skip AUTO.BAS

TSPL2 programming language allows user to download an auto execution file to flash memory. Printer will run the AUTO.BAS program immediately when turning on printer power. The AUTO.BAS program can be interrupted without running the program by the power-on utility.

Please follow the procedures below to skip an AUTO.BAS program.

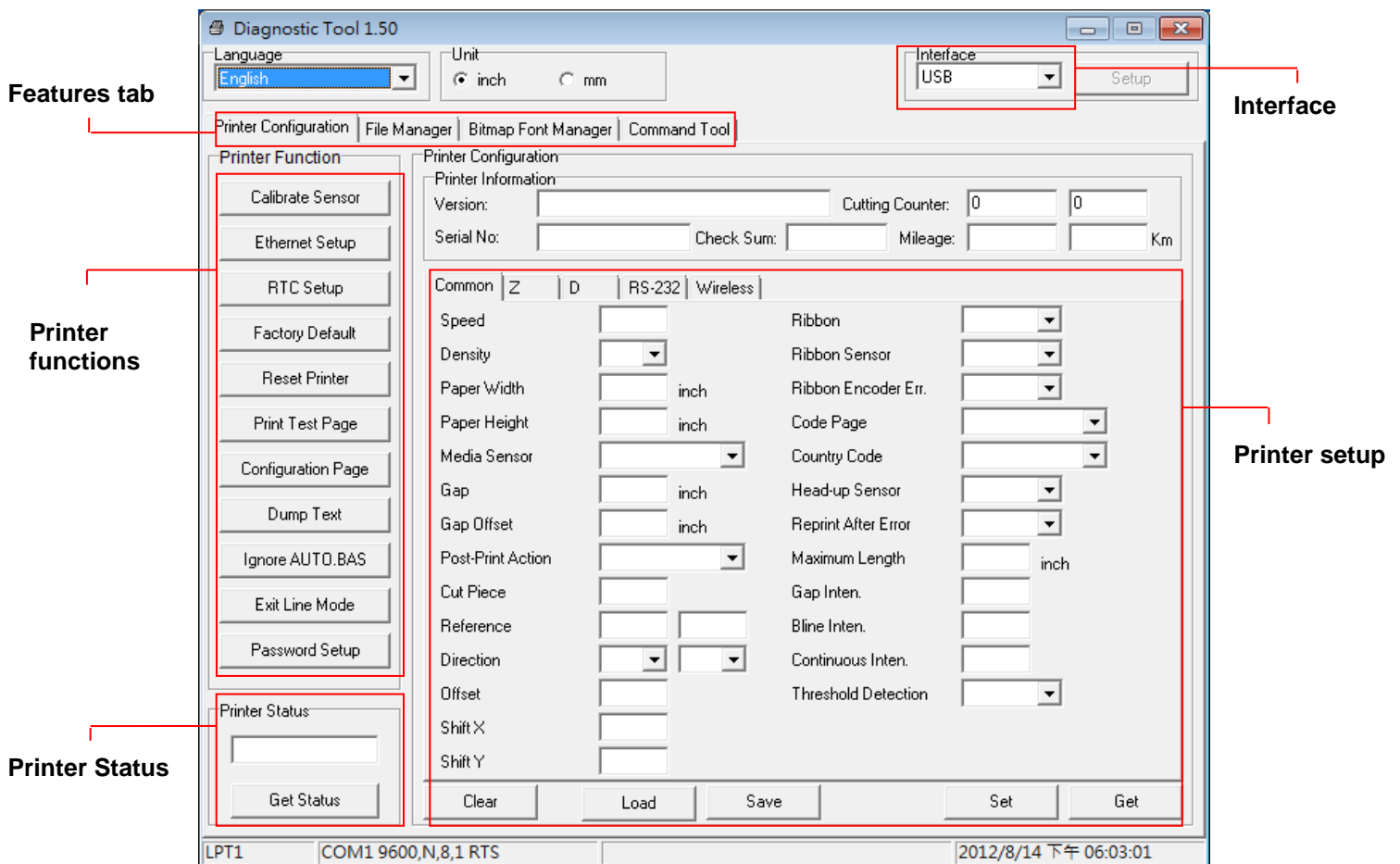
1. Turn off printer power.
2. Press the FEED button and then turn on power.
3. Release the FEED button when LED becomes **solid green**.
  - The LED color will be changed as following:  
Amber → red (5 blinks) → amber (5 blinks) → green (5 blinks) → green/amber (5 blinks) → red/amber (5 blinks) → **solid green**
4. Printer will be interrupted to run the AUTO.BAS program.

## 5. Diagnostic Tool

TSC's Diagnostic Utility is an integrated tool incorporating features that enable you to explore a printer's settings/status; change a printer's settings; download graphics, fonts and firmware; create a printer bitmap font; and send additional commands to a printer. With the aid of this powerful tool, you can review printer status and setting in an instant, which makes it much easier to troubleshoot problems and other issues.

### 5.1 Start the Diagnostic Tool

1. Double click on the Diagnostic tool icon   to start the software.
2. There are four features (Printer Configuration, File Manager, Bitmap Font Manager, Command Tool) included in the Diagnostic utility.



## 5.2 Printer Function

1. Connect the printer and computer with a cable.
2. Select the PC interface connected with bar code printer.

USB interface	Others interface
Interface USB <input type="button" value="Setup"/>	Interface COM <input type="button" value="Setup"/> <b>2</b> USB COM <b>1</b> LPT ETHERNET
The default interface setting is USB interface. If USB interface is connected with printer, no other settings need to be changed in the interface field.	

3. Click the “Printer Function” button to setup.
4. The detail functions in the Printer Function Group are listed as below.


Printer Function	Function	Description
<input type="button" value="Calibrate Sensor"/>	Calibrate Sensor	Calibrate the sensor specified in the Printer Setup group media sensor field
<input type="button" value="Ethernet Setup"/>	Ethernet Setup	Setup the IP address, subnet mask, gateway for the on board Ethernet
<input type="button" value="RTC Setup"/>	RTC Setup	Synchronize printer Real Time Clock with PC
<input type="button" value="Factory Default"/>	Factory Default	Initialize the printer and restore the settings to factory default.
<input type="button" value="Reset Printer"/>	Reset Printer	Reboot printer
<input type="button" value="Print Test Page"/>	Print Test Page	Print a test page
<input type="button" value="Configuration Page"/>	Configuration Page	Print printer configuration
<input type="button" value="Dump Text"/>	Dump Text	To activate the printer dump mode.
<input type="button" value="Ignore AUTO.BAS"/>	Ignore AUTO.BAS	Ignore the downloaded AUTO.BAS program
<input type="button" value="Exit Line Mode"/>	Exit Line Mode	Exit line mode.
<input type="button" value="Password Setup"/>	Password Setup	Set the password to protect the settings

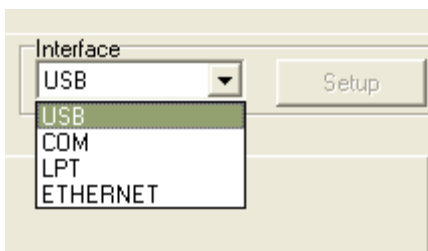
**For more information about Diagnostic Tool, please refer to the diagnostic utility quick start guide in the CD disk \ Utilities directory.**

## 5.3 Setting Ethernet by Diagnostic Tool (For DA220 series)

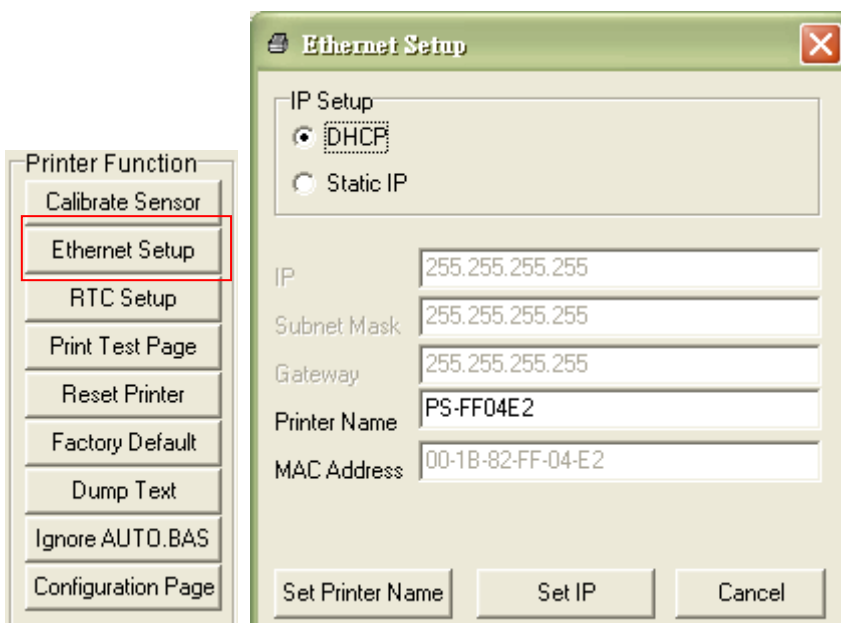
The Diagnostic Utility is enclosed in the CD disk \Utilities directory or can be downloaded from [www.tscprinters.com](http://www.tscprinters.com) website. Users can use Diagnostic Tool to setup the Ethernet by USB and Ethernet interfaces. The following contents will instruct users how to configure the Ethernet by these interfaces.

### 5.3.1 Using USB interface to setup Ethernet interface

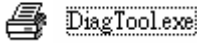
1. Connect the USB cable between the computer and the printer.
2. Turn on the printer power.
3. Start the Diagnostic Utility by double clicking on the  icon.
4. The Diagnostic Utility default interface setting is USB interface. If USB interface is connected with printer, no other settings need to be changed in the interface field.

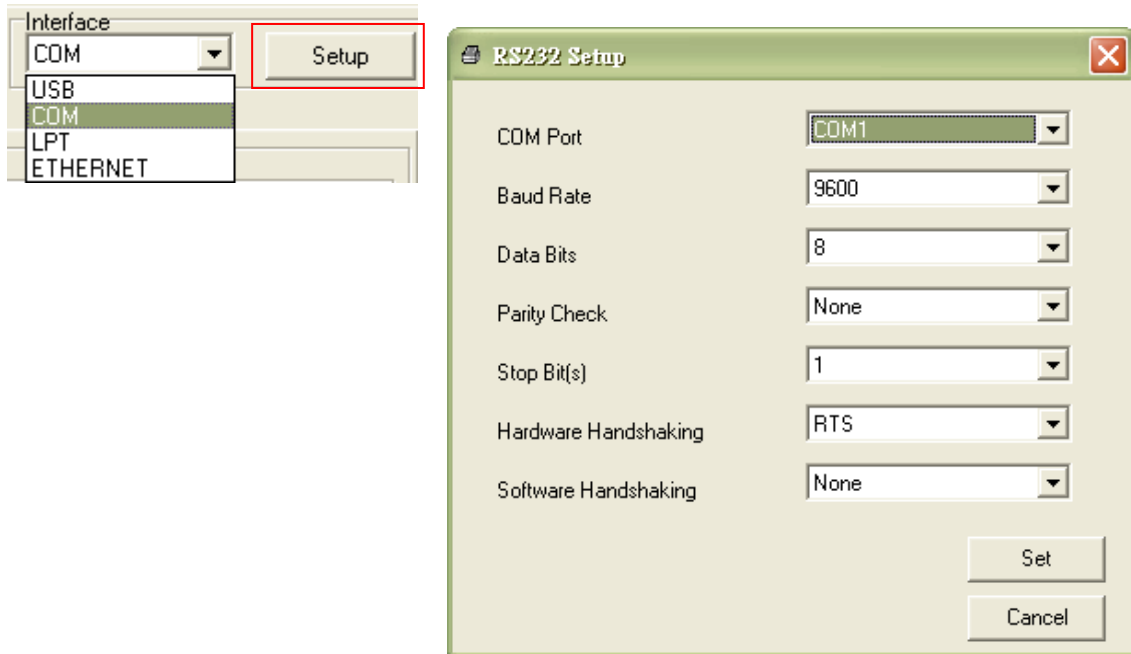


5. Click on the “Ethernet Setup” button from “Printer Function” group in Printer Configuration tab to setup the IP address, subnet mask and gateway for the on board Ethernet.

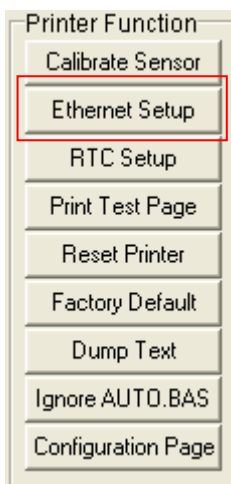


### 5.3.2 Using RS-232 interface to setup Ethernet interface

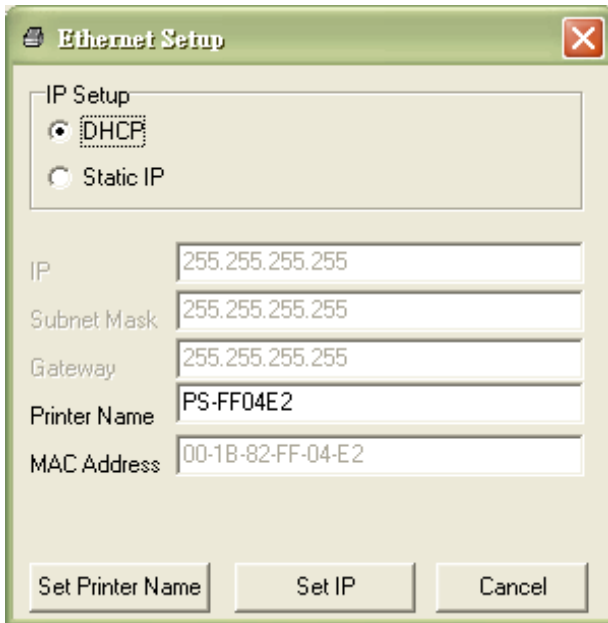
1. Connect the computer and the printer with a RS-232 cable.
2. Turn on the printer power.
3. Start the Diagnostic Utility by double clicks on the  icon.
4. Select “COM” as interface then click on the “Setup” button to setup the serial port baud rate, parity check, data bits, stop bit and flow control parameters.




5. Click on the “Ethernet Setup” button from printer function of Printer Configuration tab to setup the IP address, subnet mask and the gateway for the on board Ethernet.

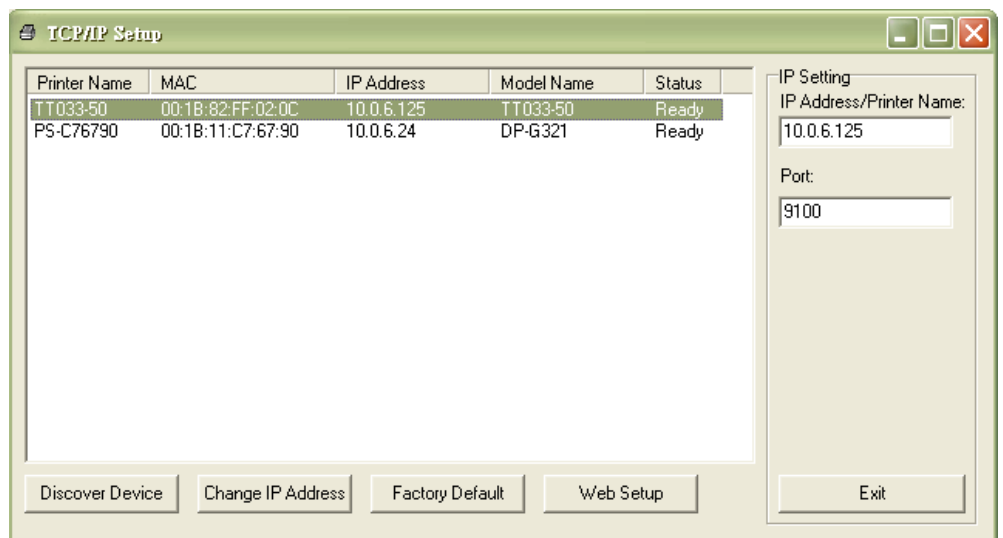
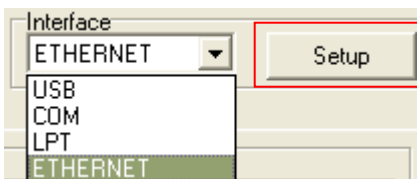






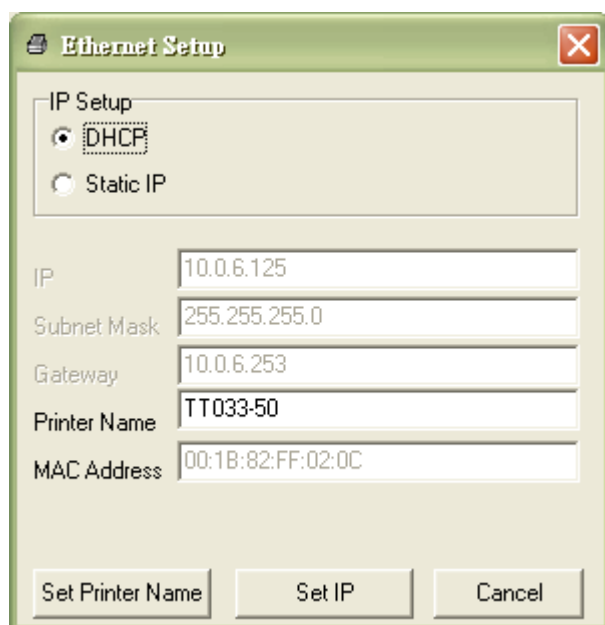
### 5.3.3 Using Ethernet interface to setup Ethernet interface

1. Connect the computer and the printer to the LAN.
2. Turn on the printer power.
3. Start the Diagnostic Utility by double clicks on the  icon.
4. Select “Ethernet” as the interface then click on the “Setup” button to setup the IP address, subnet mask and gateway for the on board Ethernet.



5. Click the “Discover Device” button to explore the printers that exist on the network.

6. Select the printer in the left side of listed printers, the correspondent IP address will be shown in the right side "IP address/Printer Name" field.
7. Click "Change IP Address" to configure the IP address obtained by DHCP or static.



The default IP address is obtained by DHCP. To change the setting to static IP address, click "Static IP" radio button then enter the IP address, subnet mask and gateway. Click "Set IP" to take effect the settings.

Users can also change the "Printer Name" by another model name in this fields then click "Set Printer Name" to take effect this change.

**Note: After clicking the "Set Printer Name" or "Set IP" button, printer will reset to take effect the settings.**

8. Click "Exit" button to exit the Ethernet interface setup and go back to Diagnostic Tool main screen.

Factory Default button

This function will reset the IP, subnet mask, gateway parameters obtained by DHCP and reset the printer name.

## Web setup button

Except to use the Diagnostic Utility to setup the printer, you can also explore and configure the printer settings and status or update the firmware with the IE or Firefox web browser. This feature provides a user friendly setup interface and the capability to manage the printer remotely over a network.

## 6. Troubleshooting

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The following guide lists the most common problems that may be encountered when operating this bar code printer. If the printer still does not function after all suggested solutions have been invoked, please contact the Customer Service Department of your purchased reseller or distributor for assistance.

### 6.1 LED Status

This section lists the common problems that according to the LED status and other problems you may encounter when operating the printer. Also, it provides solutions.

LED Status / Color	Printer Status	Possible Cause	Recovery Procedure
OFF	No response	No power	<ul style="list-style-type: none"><li>* Turn on the power switch.</li><li>* Check if the green LED is lit on power supply. If it is not lit on, power supply is broken.</li><li>* Check both power connections from the power cord to the power supply and from the power supply to the printer power jack if they are connected securely.</li></ul>
Solid Green	ON	The printer is ready to use	<ul style="list-style-type: none"><li>* No action necessary.</li></ul>
Green with blinking	Pause	The printer is paused	<ul style="list-style-type: none"><li>* Press the FEED button to resume for printing.</li></ul>
Red with blinking	Error	The out of label or the printer setting is not correct	<ul style="list-style-type: none"><li>1. Out of label<ul style="list-style-type: none"><li>* Load a roll of label and follow the instructions in loading the media then press the FEED button to resume for printing.</li></ul></li><li>2. Printer setting is not correct<ul style="list-style-type: none"><li>* Initialize the printer by instructions in “Power on Utility” or “Diagnostic Tool”.</li></ul></li></ul>

**Note:**

**Printer status can be easily shown on the Diagnostic Tool. For more information about the Diagnostic Tool, please refer to the instruction in the software CD disk.**

## 6.2 Print Problem

<b>Problem</b>	<b>Possible Cause</b>	<b>Recovery Procedure</b>
<b>Not Printing</b>	Check if interface cable is well connected to the interface connector.	Re-connect cable to interface.
	The serial port cable pin configuration is not pin to pin connected.	Please replace the cable with pin to pin connected.
	The serial port setting is not consistent between host and printer.	Please reset the serial port setting.
	The port specified in the Windows driver is not correct.	Select the correct printer port in the driver.
	The Ethernet IP, subnet mask, gateway is not configured properly.	Configure the IP, subnet mask and gateway.
<b>No print on the label</b>	Label loaded not correctly.	Follow the instructions in loading the media.
<b>Continuous feeding labels</b>	The printer setting may go wrong.	Please do the initialization and gap/black mark calibration.
<b>Paper Jam</b>	Gap/black mark sensor sensitivity is not set properly (sensor sensitivity is not enough)	Calibrate the gap/black mark sensor.
	Make sure label size is set properly.	Set label size exactly as installed paper in the labeling software or program.
	Labels may be stuck inside the printer mechanism near the sensor area.	Remove the stuck label.
<b>Poor Print Quality</b>	Top cover is not closed properly.	Close the top cover completely and make sure the right side and left side levers are latched properly.
	Wrong power supply is connected with printer.	Check if 24V DC output is supplied by the power supply.
	Check if supply is loaded correctly.	Reload the supply.
	Check if dust or adhesives are accumulated on the print head.	Clean the print head.
	Check if print density is set properly.	Adjust the print density and print speed.
	Check print head test pattern if head element is damaged.	Run printer self-test and check the print head test pattern if there is dot missing in the pattern.

## 7. Maintenance

This session presents the clean tools and methods to maintain your printer.

1. Please use one of following material to clean the printer.

- Cotton swab
- Lint-free cloth
- Vacuum / Blower brush
- 100% Ethanol or Isopropyl Alcohol

2. The cleaning process is described as following,

Printer Part	Method	Interval
<b>Print Head</b>	1. Always turn off the printer before cleaning the print head. 2. Allow the print head to cool for a minimum of one minute. 3. Use a cotton swab and 100% Ethanol or Isopropyl Alcohol to clean the print head surface.	Clean the print head when changing a new label roll.
<b>Platen Roller</b>	1. Turn the power off. 2. Rotate the platen roller and wipe it thoroughly with water.	Clean the platen roller when changing a new label roll
<b>Peel Bar</b>	Use the lint-free cloth with 100% ethanol to wipe it.	As needed
<b>Sensor</b>	Compressed air or vacuum	Monthly
<b>Exterior</b>	Wipe it with water-dampened cloth	As needed
<b>Interior</b>	Brush or vacuum	As needed

### Note:

- Do not touch printer head by hand. If you touch it careless, please use ethanol to clean it.
- Please use 100% Ethenol or Isopropyl Alcohol. DO NOT use medical alcohol, which may damage the printer head.
- Regularly clean the print head and supply sensors once change a new media to keep printer performance and extend printer life.

# Revise History

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Date	Content	Editor







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