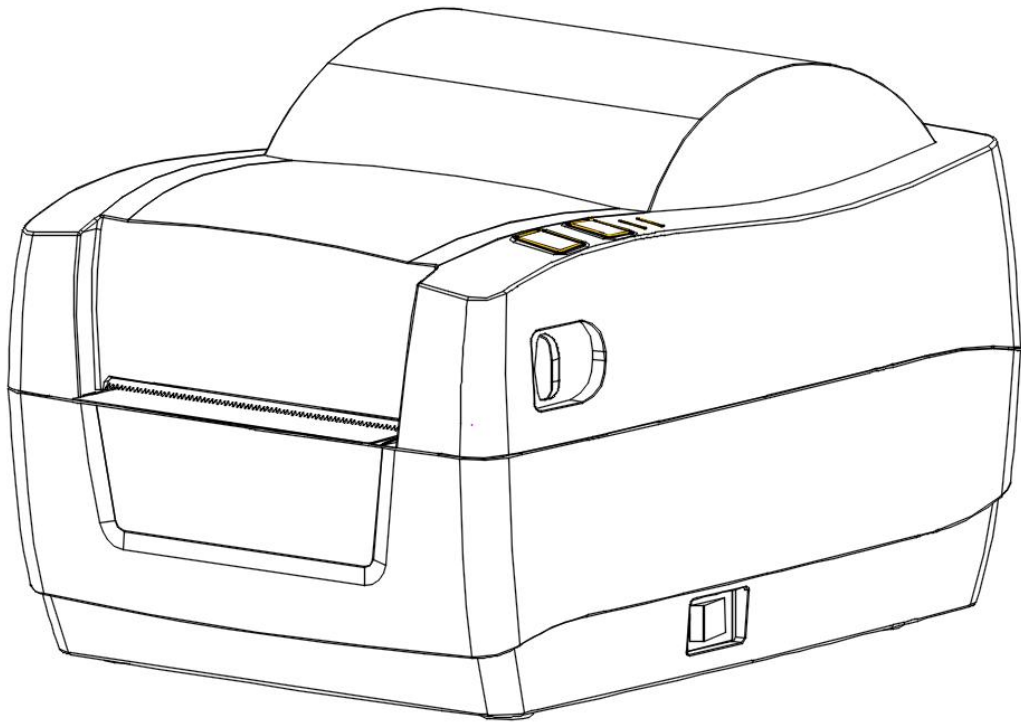


**SPRT®**

**SP-TL51  
THERMAL BARCODE PRINTER**



**Users' Manual (Ver 1.03)**

**Beijing Spirit Technology Development Co., Ltd**

# Content

Introduction.....	1
Chapter 1 Feature and Function.....	1
1.1 Printing Function.....	1
1.2 Print Paper.....	1
1.3 Print Font.....	2
1.4 Interface.....	2
1.5 Print Control Commands.....	2
1.6 Power Supply.....	3
1.7 Operation Environment.....	3
1.8 Outline Dimension.....	3
1.9 Model classification.....	3
Chapter 2 Operation Instruction.....	4
2.1 Printer Appearance.....	4
2.2 Paper Installation.....	5
2.2.1 Paper Loading.....	5
2.3 Interface Connection.....	6
2.3.1 Serial Interface Connection.....	6
2.3.2 Parallel Interface Connection.....	8
2.3.3 Power Connection.....	9
2.4 Indicators, Buzzer and Button Operation.....	10
2.6 Self-test.....	11
2.7 Hexadecimal Printing.....	11

# Introduction

TL51 printer is a new line thermal printer model, with high printing speed, low noise, high reliability, high printing quality, and ribbon needless, avoid daily maintenance trouble.

TL51 is with small size, simple operating method, and wide application field, especially for business field like warehousing, logistics, and courier express, etc.

## Statement

This is Grade A product, it may lead to Radio interference in life environment, so may need users to take practical measures under this situation.

## Chapter 1 Feature and Function

### 1.1 Printing Function

- Printing method: Direct thermal printing
- Printing width: Max 111.5±0.5mm, Min 40±0.5mm
- Printing density: 8 dot/mm, 864 dot/line
- Printing speed: 127mm/s(max)
- Reliability: TPH: 100km

Using condition:

\* Print 12X24 ASCII characters, print 50 lines each time, intermittent print repeatedly.

\* Use specified thermal paper

- Effective printing width: 108mm

### 1.2 Print Paper

- Thermal paper roll:

Paper Type ----- Normal Thermal Paper, Label Paper, Layer Paper, Black Mark Paper

Inner Diameter -----  $\phi$ 13mm (min)

Paper Thickness ----- Normal Thermal Paper and Black Mark Paper :0.06mm~0.20mm

Label Paper ----- 0.12mm~0.20mm(label length≥3cm, gap≥2mm)

## 1.3 Print Font

- ANK Character Set:

12\*24 dot, 1.5(W)\*3.00(H)mm, 9\*17dot, 1.125(W)\*2.125(H)mm

- Chinese characters:

24\*24dot, 3.00(W)\*3.00(H)mm

## 1.4 Interface

- RS—232CSerial Interface:

DB-25 socket (female), DB-9 socket (female), support XON/XOFF and DTR/DSR protocols.

Baud rate: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200bps adjustable.

Data structure: 1start bit + (7 or 8) data bits + 1 stop bit.

Parity checking: no parity or odd, even parity optional.

- Parallel Interface:

36-pin, 8-bit parallel interface, BUSY/ACK handshaking protocol, TTL signal level.

- Ethernet Interface: Standard Ethernet interface.

- USB interface: Standard USB interface.

## 1.5 Print Control Commands

- Character print commands: support double-width, double height printing of ANK characters, self-defined characters, and Chinese characters, the character line spacing is adjustable.

- Graphics print commands: support print of bit-map graphics and download bit-map graphics with different density.

- GS bar code print commands: support printing UPC-A, UPC-E, EAN-13, EAN-8, CODE39, ITF25, CODABAR, CODE93, CODE128, PDF417, QR Code, and DATA Matrix.

## 1.6 Power Supply

- DC24V±10%, 2A, A-1009-3P power socket.

## 1.7 Operation Environment

- Operation temperature: 5°C~50°C      Relative operation humidity: 10%~80%
- Storage temperature: -20°C~60°C      Relative storage humidity: 10%~90%

## 1.8 Outline Dimension&Weight

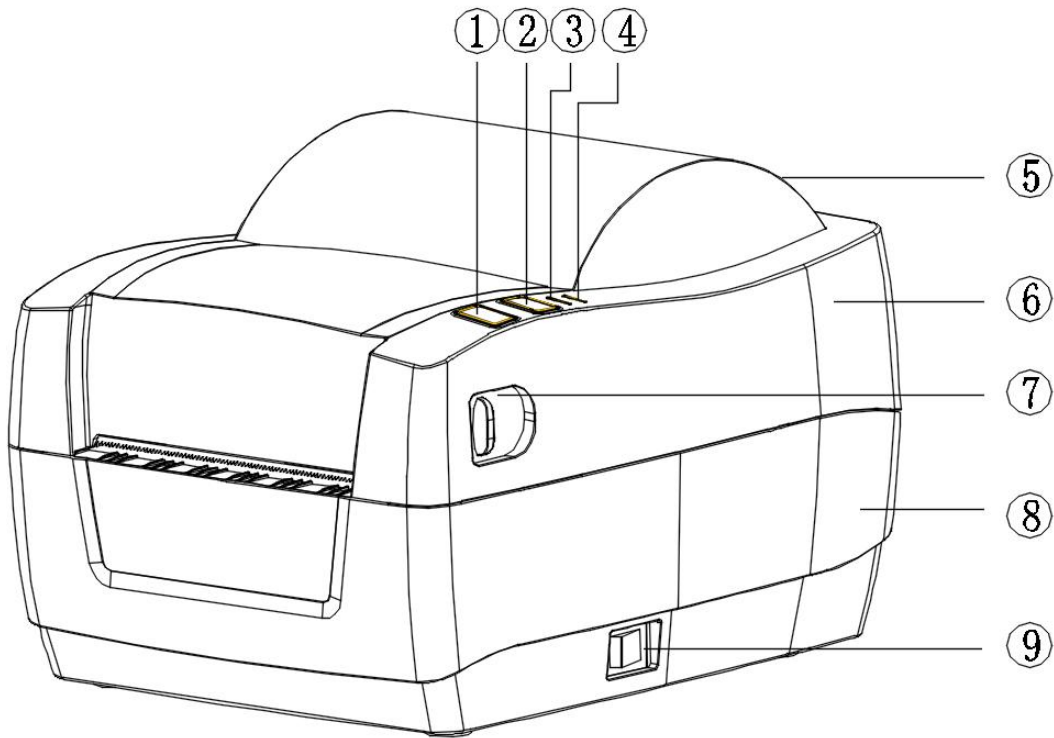
- Outline Dimension: 239mm(L)X180mm(W)X161mm(L)
- Weight: 1920g (not including paper roll)

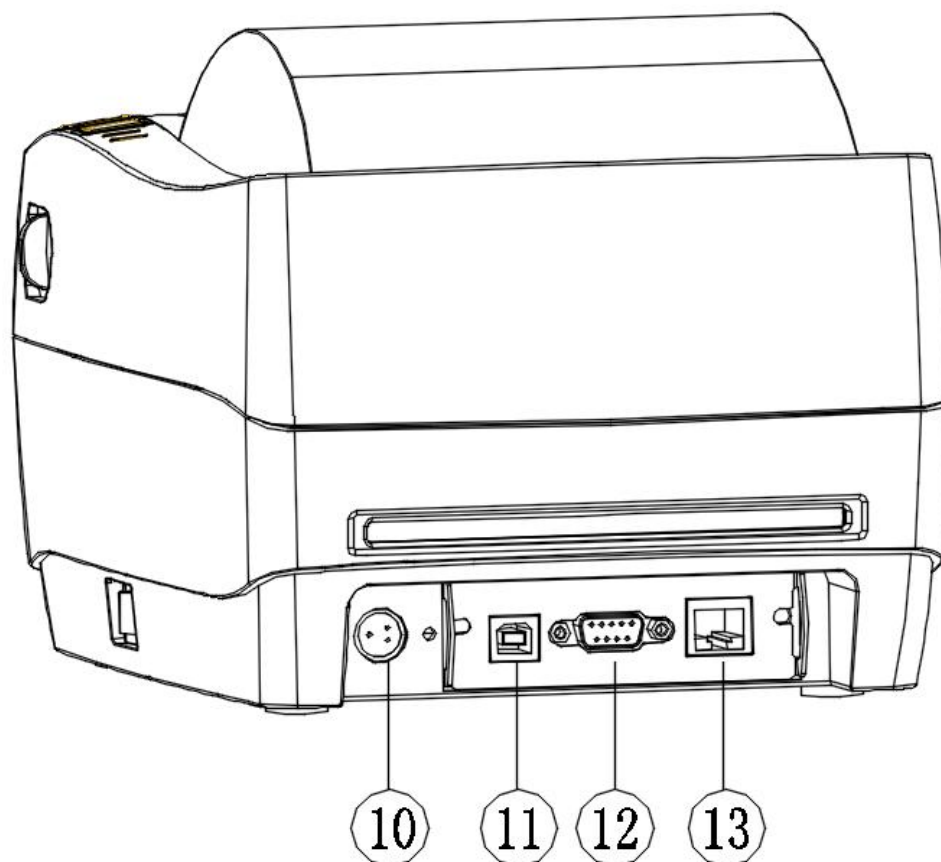
## 1.9 Model classification

Model	Interface
SP-TL51M	RS-232C (DB9 female), USB, Ethernet, 3 in 1
SP-TL51E	Only Ethernet(interface board not removable)
SP- TL51S	RS-232C(DB25 female)
SP- TL51P	Parallel
SP- TL51U	USB

# Chapter 2 Operation Instruction

## 2.1 Printer Appearance





- 1.Feed button    2. Pause button    3.Error light indicator    4.Power light indicator  
 5.Transparent paper house    6.Top enclosure body    7. Cover open button  
 8. Bottom enclosure body    9. Power switch    10. Power socket    11. USB interface  
 12. DB9 serial interface    13.Ethernet interface

Fig 2-1. Printer part name

## 2.2 Paper Installation

### 2.2.1 Paper Loading

TL51 printer uses thermal paper roll with  $111.5 \pm 0.5$ m width.

Thermal paper roll installation steps as below:

Press the upper cover button on the left side, open the movable upper cover, draw a certain length of the paper roll, put the paper end on the print head, close the upper cover and press it downwards lightly.



## Caution

1. Pay attention to the direction of loading paper, make the printing surface face to the print head.
2. Please don't feed or draw the paper forwards or backwards by hands.
3. Keep clean of the print head, avoid to influence the printing quality.

## 2.3 Interface Connection

### 2.3.1 Serial Interface Connection

The serial interface of TL51 printer is compatible with RS-232C, supports DTR/DSR and XON/XOFF handshake protocol, the interface socket is DB-25 socket (female) and DB-9 socket (female). The pin order of the serial port is as Fig 2-2, 2-3:

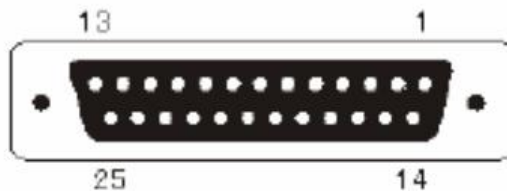


Fig 2-2 Pin order of DB-25socket (female)serial port

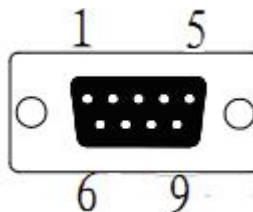


Fig 2-3 Pin order of DB-9socket(female) serial port



The pin assignment of serial interface is shown as 2-4, 2-5:

Pin No.	Signal Name	Signal Direction	Source	Description
1	FG	----	----	Cover ground
2	TXD	Output	Printer	Printer transmits control code X-ON/X-OFF and data to host
3	RXD	Input	Host	Printer receives data from host
4	RTS	Output	Printer	Same with 20pins DTR signal
6	DSR	Input	Host	Signal "MARK" means the host is busy and can not receive data. Signal "SPACE" means the host is ready to receive data.
7	GND	-----	-----	Signal Ground
20	DTR	Output	Printer	Signal "MARK" means the host is busy and can not receive data.Signal "SPACE" means the host is ready to receive data.

Fig. 2-4 Pin assignment of DB-25 socket serial port

Pin No.	Signal Name	Signal Direction	Source	Description
1	NC	----	----	
2	RXD	Input	Host	Printer receives data from host
3	TXD	Output	Printer	Printer transmits control code X-ON/X-OFF and data to host
4	DSR	Output	Printer	Signal "MARK" means the host is busy and can not receive data.Signal "SPACE" means the host is ready to receive data.
5	GND	----	----	Cover ground
6	DTR	Input	Host	Signal "MARK" means the host is busy and can not receive data.Signal "SPACE" means the host is ready to receive data.
7	CTS	Output	Printer	Same with DSR
8	RTS	Input	Host	Same withDTR
9	NC	----	----	

Fig. 2-5 Pin assignment of DB-9 hole socket(female) serial port

Note: (1)"Source" means the source where signal come from;

(2) Signal logic level is EIA.

The baud rate and data structure in serial interface mode is 9600bps, 8-bit data bits, no parity bit and 1 stop bit. The serial interface of SP-TL51 can be connected to standard

RS-232C interface. When it is connected to IBM PC or its compatible machine, connection can refer to Fig.2-6.

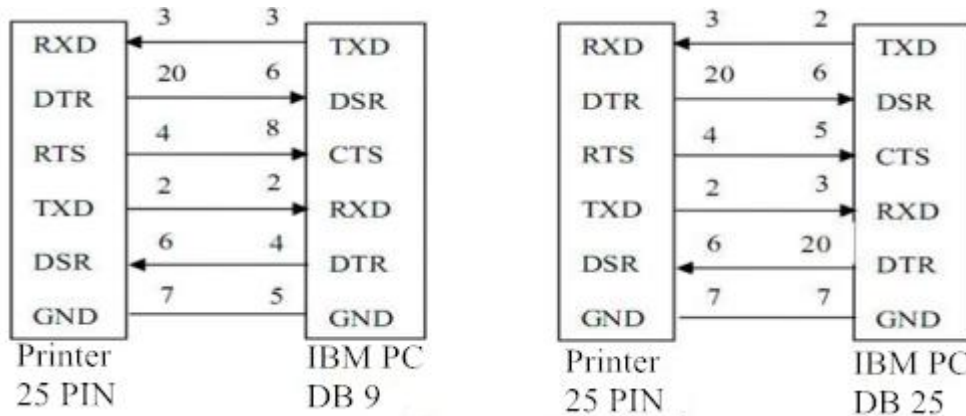


Fig.2-6 Connection between SP-TL51 and IBM PC Serial Interface Sketch Map

## 2.3.2 Parallel Interface Connection

The parallel interface of SP-TL51 printer is compatible with CENTRONICS, supports BUSY or ACK handshaking protocol. The pin assignment of 36 PIN parallel interface is as Fig. 2-7 shows:

Pin No.	Signal	Direction	Description
1	STROBE	In	Gated file-flop, reading data at the rising edge.
2	D1	In	These signals represent the 1st bit to 8th bit of the parallel data respectively, each signal is at HIGH level when data is logic 1, and LOW when data is logic 0.
3	D2	In	
4	D3	In	
5	D4	In	
6	D5	In	
7	D6	In	
8	D7	In	
9	D8	In	
10	ACK	Out	Response impulse, LOW level signal indicates that data has already been received and the printer gets ready to receive.
11	BUSY	Out	HIGH level signal indicates that the printer is BUSY and can not receive data.
12	PE	Out	HIGH level signal indicates that paper is end.

13	SEL	Out	Pull up to HIGH level signal by a resistor
17	FG	---	Signal Cover
18	Logic-H	---	Logic "1" level
32	nFault	Out	Low level means the printer is at fault
14,15,17 18,34,36	NC	---	No connection
16,19~30, 33	GND	---	Grounding, logical 0 level
35	+5V	---	+5V power

Fig.2-7 36 Pin assignment of parallel interface

The timing chart of interface signal for parallel interface is as Fig.2-8 shows:

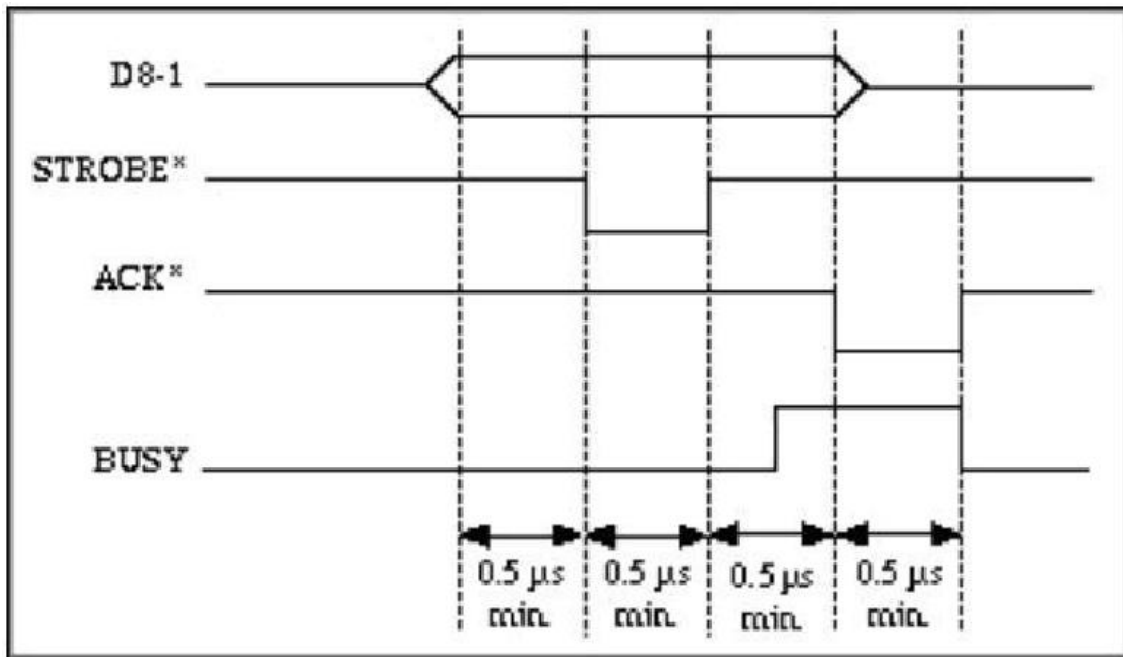
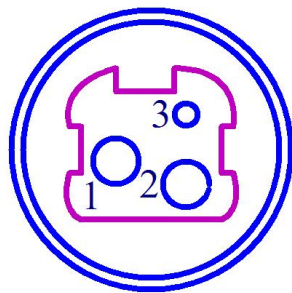


Fig.2-8 Signal Timing Chart of Parallel Interface

### 2.3.3 Power Connection

TL51 printer uses the external power supply adapter as  $24V \pm 10\%$ , 2.5A, power socket is A-1009-3P model, as Fig. 2-9 shows:

The pin assignment is as Fig. 2-9 below:



Pin No.	Signal
1	+24VDC
2	Ground
3	NC

Fig.2-9 Power socket and pin assignment

## 2.4 Indicators, Buzzer and Button Operation

There are two buttons on SP-TL51 printer, one built-in buzzer and two indicators (one power indicator, one error indicator).

【FEED】 is paper feeding button, the function of its enabling or disabling the button on/off can be set by print command, when the button is enabled, press 【FEED】 button, then the paper presenting driver starts up and paper fed into the printer; release 【FEED】 button, paper feeding stops.

【Pause】 is Pause Button. When printing, press once, pause the printing, and the status indicator will indicate the current working status. Press 【PAUSE】 again, the printer will return to normal working status, and print data received in the suspended status.

The buzzer is used to indicate the error status type. The buzzer can be set to ON or OFF by parameter setting. The error status type is the same as the ERROR indicator.

【Power INDICATOR】 indicates the power status. After power-on, the power indicator lights, otherwise it is in the off state.

【ERROR INDICATOR】 is the error status indicator. The indicator light indicates that the printer is out of paper. It can indicate the printer mechanism overheating and other error status.

## 2.5 Normal Power on status

Under printer off status, the paper cover closed, then turn on the power switch, the error indicator and power indicator light two times alternately, the printer enters into the normal operation.

## 2.6 Self-test

The self-test will check the condition of printer, if the printer prints out the self-test receipt correctly, it means the printer works normally, except interface with host. Otherwise it needs to repair.

The self-test will print out software version, manufacturer name, printer model, interface type, default parameter of the printer, 96 ANK characters in ASCII, default code page(language set to English) or Chinese characters stock name(if language set to Chinese), bar code type.

Self-test method: Keep pressing **【FEED】** button, and turn on the power, release the **【FEED】** button when buzzer remind power on, then self-test begins automatically at this moment.

## 2.7 Hexadecimal Printing

Keep pressing **【FEED】** button, turn on the power, when the buzzer beep reminds the printer powered on, release **【FEED】** button, the printer will print below instruction to enter Hexadecimal Printing mode:

Hexadecimal Dump

To terminate hexadecimal dump,

Press FEED button three times.

Under this mode, all input data will be printed out as HEX data, the printer will feed one line with single-click of “FEED” button, after 3 times, it will print out “\*\*\* Completed \*\*\*”,and exit hexadecimal printing mode.

**Manufacturer has right to revise this manual without prior statement**

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