CP103
Thermal Mini Printer

User Instructions
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1 General Information and Warnings

1.1 About this Manual

This manual is divided into chapters by the chapter number and the large text at the top of a page. Subsections are labeled as shown by the 1 and 1.1 headings shown above. The names of the chapter and the next subsection level appear at the top of alternating pages of the manual to remind you of where you are in the manual. The manual name and page numbers appear at the bottom of the pages.

1.1.1 Special Messages

Examples of special messages you will see in this manual are defined below. The signal words have specific meanings to alert you to additional information or the relative level of hazard.

NOTE: This is a Note symbol. Notes give additional and important information, hints and tips that help you to use your product.

1.2 Description

The CP103 Printer is a portable thermal printer which uses a power supply adapter. The communication interface is via RS-232 Serial. The CP103 printer can be used for a variety of instruments or handheld data printing.

Figure 1.1 Printer Description
1.3 Package and Accessories

- Portable Thermal Printer
- RS-232 Serial Data Cable
- Thermal Paper Roll
- Driver disc (for RS-232/USB)

1.4 Warnings

- Read all operating instructions carefully before use.
- Avoid lengthy exposure to extreme heat or cold. Your printer works best when operated at normal room temperature.

1.5 Prepare the Printer for Use

1. Install a roll of thermal paper in paper dispenser by lifting the dispenser cover and placing the paper in with the thermal side facing outward. Refer to Figure 1.1 for paper dispenser location.

1a. To test which side is thermal, run a fingernail across the paper. A mark should show on the paper. If no mark appears, try the other side of the paper.

2. With about 1/2 inch of paper sticking out, close the paper dispenser cover.

3. Connect RS-232 cable by plugging the PS/2 end of the cable to the printer. Refer to Figure 1.1 for PS/2 connector location.

4. Connect AC power adapter to the printer by plugging the adapter connector into the printer power supply plug. Refer to Figure 1.1 for power input location.

5. When ready, plug the other end of the AC adapter into a wall socket.

6. Plug the RS-232 serial cable in the host device.

7. Press the [POWER] button to turn on the printer.
### 1.6 Signal Light Status

#### 1.6.1 Power Light

<table>
<thead>
<tr>
<th>Power Light</th>
<th>Light Color</th>
<th>Printer Status Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steady red light</td>
<td>Red</td>
<td>In the process of recharging battery</td>
</tr>
<tr>
<td>Red light blinks one time slowly every one second</td>
<td>Red</td>
<td>Battery power is low, recharge battery</td>
</tr>
<tr>
<td>Steady green light</td>
<td>Green</td>
<td>Battery voltage is good</td>
</tr>
<tr>
<td>Blinks between red and green light</td>
<td>Red/Green</td>
<td>Battery failure</td>
</tr>
<tr>
<td>Blinks 3 times between red and green light</td>
<td>Red/Green</td>
<td>Printing is finished or printer is in power on mode</td>
</tr>
<tr>
<td>No light</td>
<td>None</td>
<td>No power is detected</td>
</tr>
</tbody>
</table>

#### 1.6.2 Feed Light

<table>
<thead>
<tr>
<th>Feed light</th>
<th>Light Color</th>
<th>Printer status specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steady red light</td>
<td>Red</td>
<td>Feed paper or receiving data</td>
</tr>
<tr>
<td>Red light blinks quickly (2 times/sec)</td>
<td>Red</td>
<td>No paper</td>
</tr>
<tr>
<td>Red light blinks 3 times and then stops</td>
<td>Red</td>
<td>Printer parameter setting is finished and ok</td>
</tr>
<tr>
<td>Steady green light</td>
<td>Green</td>
<td>Printer status is ok but not connected bluetooth</td>
</tr>
<tr>
<td>Always alternating blink between red and green light</td>
<td>Red/Green</td>
<td>Printer dead, the buffer is full or temperature of printhead is too high</td>
</tr>
</tbody>
</table>

### 1.7 Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension (W×D×H)</td>
<td>104×75×48mm</td>
</tr>
<tr>
<td>Weight</td>
<td>145g (without battery and paper roll)</td>
</tr>
<tr>
<td>Print Width</td>
<td>58mm</td>
</tr>
<tr>
<td>Print Speed</td>
<td>90mm/s (MAX)</td>
</tr>
<tr>
<td>Memory</td>
<td>10K byte buffer and 8M byte flash</td>
</tr>
<tr>
<td>Interface</td>
<td>RS-232 baud rate 4800 - 115200bps</td>
</tr>
<tr>
<td>Resolution</td>
<td>8 dot/mm (203dpi)</td>
</tr>
<tr>
<td>Language Support</td>
<td>Figure, English characters, bit-image, bar code, curve</td>
</tr>
<tr>
<td>Character Size</td>
<td>ANK: 12<em>24(dot), 1.5</em>3.0 (W<em>L, mm); Chinese Character: 24</em>24 (dot), 3.0<em>3.0 (W</em>L, mm)</td>
</tr>
<tr>
<td>Print Commands</td>
<td>ESC/POS compatible command set</td>
</tr>
<tr>
<td>Other Features</td>
<td>Paper auto-detection, power detection, thermal protection, with machine charging, automatic sleeping mode</td>
</tr>
<tr>
<td>Working Conditions</td>
<td>Temperature: 0° - 50°, Humidity 20% - 85%</td>
</tr>
<tr>
<td>Storage Conditions</td>
<td>Temperature: -20° - 70°, Humidity 5% - 95%</td>
</tr>
</tbody>
</table>
## 1.8 Paper Roll Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roll Width:</td>
<td>58mm</td>
</tr>
<tr>
<td>Roll Diameter:</td>
<td>≤ 43mm</td>
</tr>
<tr>
<td>Paper Thickness</td>
<td>0.06 - 0.08mm</td>
</tr>
<tr>
<td>Paper Type</td>
<td>Thermal</td>
</tr>
</tbody>
</table>
2 Communication

The CP103 Mini Thermal Printer uses a RS-232 serial interface connection with the host communication. If a serial port is unavailable on the host device, it is possible to use a serial / USB converter.

2.1 RS-232 Serial Interface

RS-232 is developed according to the EIA standard asynchronous transmission serial interface. The specifications are as following:

- Data transmission: serial interface
- Synchronization: asynchronous
- Signal Level: RS-232 level, logic 1: -5.4v, logic 0: +5.4v
- Hardware Flow Control: optional
- Baud rate: 4800 bps to 115200 bps
- Data word length: 8 bits
- Stop bit: 1bit
- Parity: None

The printer self-testing page will show the current baud rate. The default baud rate is 115200bps. Refer to Chapter 3 for details on the Printer Self Test.

2.2 CP103 Printer PS/2 Connector

The following drawing illustrates the PS2 socket pinout located on the CP103 printer. This connection is used for RS-232 communication with an indicator or computer and requires the PS2 to RS-232 interface cable (serial cable).

```
<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TXD - data output</td>
</tr>
<tr>
<td>2</td>
<td>no connection</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
</tr>
<tr>
<td>4</td>
<td>no connection (12V DC- IN is optional)</td>
</tr>
<tr>
<td>5</td>
<td>RXD - data input</td>
</tr>
<tr>
<td>6</td>
<td>no connection (12V DC- IN is optional)</td>
</tr>
</tbody>
</table>
```
2.3 Serial Cable Definition

<table>
<thead>
<tr>
<th>Wire Colors</th>
<th>PS2 Connector Pinout male</th>
<th>Pin Description</th>
<th>DB9 Pinout female</th>
</tr>
</thead>
<tbody>
<tr>
<td>white</td>
<td>1</td>
<td>TXD</td>
<td>2</td>
</tr>
<tr>
<td>blue</td>
<td>2</td>
<td>Null</td>
<td>8</td>
</tr>
<tr>
<td>black</td>
<td>3</td>
<td>GND</td>
<td>5</td>
</tr>
<tr>
<td>yellow</td>
<td>4</td>
<td>12 V Input</td>
<td>7</td>
</tr>
<tr>
<td>red</td>
<td>5</td>
<td>RXD</td>
<td>3</td>
</tr>
<tr>
<td>green</td>
<td>6</td>
<td>12 V Input</td>
<td>6</td>
</tr>
</tbody>
</table>
3  Printer Self Test and Cleaning

With the printer off, press and hold the [POWER] button until the printer begins to print a self-testing page and then release the [POWER] button.

The page gives specific information regarding version of firmware, interface type, print speed, default baud rate, etc.

3.1  Cleaning the Print Head

When the printer displays the following symptoms the print head should be cleaned:

- The printer does not print clearly and the thermal paper is good
- The page-test printing is not crisp and clear
- Paper feed is noisy

3.1.1  Steps for Cleaning Print Head

1. Turn off the power to the printer and open the paper dispenser cover. Remove the thermal paper roll.

1a. If the printer was just printing then wait for the print head to cool down.

2. With a soft cotton cloth dipped in rubbing alcohol (make sure there is no dripping), wipe the thermal printer head gently and remove any dust or debris.

3. Wait for the rubbing alcohol to evaporate completely and then place the thermal paper roll back in the printer. Close the paper dispenser cover and print a test page.
4 Programming

It is possible to make changes to the operation of the CP103 printer such as baud rate, company name and address, time and date. A communication utility program is needed and can be downloaded to a PC.

1. Connect the printer to the computer with the provided serial cable.
2. Open the PC communication utility program.

![Communication Utility Program](image)

*Figure 4.1 Communication Utility Program*

Refer to the following sections to perform certain changes to the CP103 Thermal Printer setup.
4.1 Communicate with the Printer

4.1.1 Select Printer Type

From the Set parameters tab under Select Printer Type, choose “Serial”.

4.1.2 Select COM Port

Select the PC communication port the printer is connected to.

Under Set Serial Port choose the correct COM port from the drop down choices.
4.1.3 Check Printer Baud Rate

Before selecting the baud rate in the communication utility, verify the baud rate of the printer if it is not known. The baud rate of the printer and computer need to match.

1. Perform a printer self test by turning off the printer with the [POWER] button.
2. With the printer off, press and hold the [POWER] button until the printer begins to print a self-testing page and then release the [POWER] button.
3. The “default baud rate” designates the current baud rate of the printer.

4.1.4 Select Baud Rate

Select the baud rate within the utility that matches the baud rate of the printer.

Under Set Serial Port choose the correct baud rate from the drop down choices.
4.2 Make Changes to Printer Configuration

Strings of data can be entered to make certain changes to the printer.

Figure 4.2 Change Baud Rate Example

4.2.1 Change Printer Baud Rate

Change the baud rate of the printer to match the host device.

1. Go to the Testing tab.

2. Under the CMD Testing window (the top window) enter the following command string:

   +CHANGE BAUD:n

   Where n is the number associated with the desired baud rate.

<table>
<thead>
<tr>
<th>n</th>
<th>Baud Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9600</td>
</tr>
<tr>
<td>1</td>
<td>14400</td>
</tr>
<tr>
<td>2</td>
<td>19200</td>
</tr>
<tr>
<td>3</td>
<td>38400</td>
</tr>
<tr>
<td>4</td>
<td>57600</td>
</tr>
<tr>
<td>5</td>
<td>115200</td>
</tr>
<tr>
<td>6</td>
<td>4800</td>
</tr>
</tbody>
</table>

3. Click on the box to the left of SendNewLine.

4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.
4.2.2 Time and Date

Make changes to time and date settings

Check Current Time and Date
1. Go to the Testing tab.
2. Under the CMD Testing window (the top window) enter the following command string:

   `+TIME?`
3. Click on the box to the left of SendNewLine.
4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.

Time and Date Setting
1. Go to the Testing tab.
2. Under the CMD Testing window (the top window) enter the following command string:

   `+TIME: year-month-day,hour-minute-second`

For example: `+TIME:2013-09-22,15:20:07`
3. Click on the box to the left of SendNewLine.
4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.

Set Time and Date Position on Page
1. Go to the Testing tab.
2. Under the CMD Testing window (the top window) enter the following command string:

   `+PRINT TIME ADD:n`

   Where n is the number associated with the desired time and date location.

<table>
<thead>
<tr>
<th>n</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>put date and time in page head</td>
</tr>
<tr>
<td>1</td>
<td>put date and time in page end</td>
</tr>
</tbody>
</table>
3. Click on the box to the left of SendNewLine.
4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.
4.2.3 **Company Information**

Enter company specific information.

**Open or Close Auto-print Company Information**

1. Go to the **Testing** tab.
2. Under the **CMD Testing** window (the top window) enter the following command string:

   \[+\text{SELECT COMPANY:}n\]

   Where \(n\) is the number associated with the desired time and date location.

3. Click on the box to the left of **SendNewLine**.
4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.

<table>
<thead>
<tr>
<th>(n)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>do not print company information</td>
</tr>
<tr>
<td>1</td>
<td>print company information</td>
</tr>
</tbody>
</table>

**Set Company Name**

1. Go to the **Testing** tab.
2. Under the **CMD Testing** window (the top window) enter the following command string:

   \[+\text{COMPANY:NAME}\]

   **NAME** is company name. Maximum is 12 bits

   For example input: +COMPANY: Major Technology

3. Click on the box to the left of **SendNewLine**.
4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.

**Set Company Address**

1. Go to the **Testing** tab.
2. Under the **CMD Testing** window (the top window) enter the following command string:

   \[+\text{ADDRESS:address}\]

   **address** is company the address. Maximum is 12 bits

   For example input: +ADDRESS: 222 Main Street

3. Click on the box to the left of **SendNewLine**.
4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.
Set Company Telephone Number

1. Go to the Testing tab.
2. Under the CMD Testing window (the top window) enter the following command string:

   **+TELEPHONE:NUM**

   **NUM** is telephone number. Maximum is 12 bits

   For example input: +TELEPHONE:123-456-7890
3. Click on the box to the left of SendNewLine.
4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.

### 4.2.4 Restore Default Baud Rate

Set factory default baud rate.

1. Go to the Testing tab.
2. Under the CMD Testing window (the top window) enter the following command string:

   **1f 40**

3. Click on the box to the left of HEX.
4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.

### 4.2.5 Underline Printing

Enable or disable all characters printed with an underline.

1. Go to the Testing tab.
2. Under the CMD Testing window (the top window) enter the following command string:

   **1f 2d n**

   Where **n** is the number associated with enable or disable underline printing.

<table>
<thead>
<tr>
<th>n</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>disable underline printing</td>
</tr>
<tr>
<td>01</td>
<td>enable all character in underline printing mode</td>
</tr>
</tbody>
</table>

3. Click on the box to the left of HEX.
4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.
4.2.6 Inverse Font

Enable or disable inverse font printing.

1. Go to the Testing tab.

2. Under the CMD Testing window (the top window) enter the following command string:

   \texttt{1f 49 \texttt{n}}

Where \texttt{n} is the number associated with enable or disable inverse font printing.

<table>
<thead>
<tr>
<th>\texttt{n}</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>disable inverse font printing</td>
</tr>
<tr>
<td>01</td>
<td>enable inverse font printing</td>
</tr>
</tbody>
</table>

3. Click on the box to the left of HEX.

4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.

4.2.7 Line Feed

Enable or disable line feed after printing.

1. Go to the Testing tab.

2. Under the CMD Testing window (the top window) enter the following command string:

   \texttt{1f 19 \texttt{n}}

Where \texttt{n} is the number associated with enable or disable inverse font printing.

<table>
<thead>
<tr>
<th>\texttt{n}</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>automatically feed 2 lines after printing</td>
</tr>
<tr>
<td>01</td>
<td>no line feed after print</td>
</tr>
</tbody>
</table>

3. Click on the box to the left of HEX.

4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.
4.2.8 Character Dot Choice

Choose the number of columns printed.

1. Go to the Testing tab.
2. Under the CMD Testing window (the top window) enter the following command string:

   1f 44 n

Where n is the number associated with the dot size and number of columns.

<table>
<thead>
<tr>
<th>n</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>12*24 dot, 32 columns (default)</td>
</tr>
<tr>
<td>01</td>
<td>8*16 dot, 48 columns</td>
</tr>
</tbody>
</table>

3. Click on the box to the left of HEX.
4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.

4.2.9 Font Choice

Choose between Arial and bold fonts.

1. Go to the Testing tab.
2. Under the CMD Testing window (the top window) enter the following command string:

   1f 46 n

Where n is the number associated with the type of font used for printing.

<table>
<thead>
<tr>
<th>n</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Arial (default)</td>
</tr>
<tr>
<td>01</td>
<td>bold</td>
</tr>
</tbody>
</table>

3. Click on the box to the left of HEX.
4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.
### 4.2.10 Time and Date Display Mode

Format the time and date.

1. Go to the **Testing** tab.

2. Under the *CMD Testing* window (the top window) enter the following command string:

   \[1f \ 54 \ n \  m\]

   Where \( n \) is the number associated with enable or disable time and date printing.

   Where \( m \) is the format of the time and date.

<table>
<thead>
<tr>
<th>( n )</th>
<th>( m )</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td></td>
<td>don’t print time and date after printing</td>
</tr>
<tr>
<td>01</td>
<td></td>
<td>print time and date after printing</td>
</tr>
<tr>
<td>00</td>
<td></td>
<td>format: month/day/year</td>
</tr>
<tr>
<td>01</td>
<td></td>
<td>format: day/month/year</td>
</tr>
<tr>
<td>02</td>
<td></td>
<td>format: year/month/day</td>
</tr>
</tbody>
</table>

3. Click on the box to the left of HEX.

4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.

### 4.2.11 Print Width

Choose between normal or double width print.

1. Go to the **Testing** tab.

2. Under the *CMD Testing* window (the top window) enter the following command string:

   \[1d \ 21 \ n\]

   Where \( n \) is the number associated with the width of font used for printing.

<table>
<thead>
<tr>
<th>( n )</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>normal</td>
</tr>
<tr>
<td>01</td>
<td>double width (default)</td>
</tr>
</tbody>
</table>

3. Click on the box to the left of HEX.

4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.
4.2.12 Upside Down Printing

Enable or disable upside down printing.

1. Go to the Testing tab.

2. Under the CMD Testing window (the top window) enter the following command string:

   1b 7b n

   Where n is the number associated with the orientation used for printing.

3. Click on the box to the left of HEX.

4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.

<table>
<thead>
<tr>
<th>n</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>upside down printing off (default)</td>
</tr>
<tr>
<td>01</td>
<td>upside down printing on</td>
</tr>
</tbody>
</table>
4.2.13 Logo Download

A logo can be added to the printed ticket. Before downloading the logo, the file must be sized to 300 DPI. The logo must be saved as a .bmp file.

1. Go to the Upgrade tab.
2. Under Download NV LOGO, click on the [Loading Logo file] button.

3. The Open file window will appear. Find the logo file to load and click the [Open] button.
4. If the logo is the correct size a window will appear with three different logo views. If the size is incorrect, an error will be displayed. Click the [OK] button to continue or [Cancel] to escape.

![Logo window](image)

5. The file path should be showing in the window. Click the [Download] button.

**Auto Print Logo**
1. Go to the **Testing** tab.
2. Under the **CMD Testing** window (the top window) enter the following command string:

   \[ +SELECT LOGO:n \]

   Where \( n \) is the number associated with the desired time and date location.

<table>
<thead>
<tr>
<th>( n )</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>do not print logo</td>
</tr>
<tr>
<td>1</td>
<td>print the first logo</td>
</tr>
<tr>
<td>2</td>
<td>print the second logo</td>
</tr>
</tbody>
</table>

3. Click on the box to the left of SendNewLine.
4. Click the [SEND] button. The typed in command string will be displayed in the bottom window if the command was sent.

### 4.2.14 Printer Escape Command Code Definitions

<table>
<thead>
<tr>
<th>Command</th>
<th>Print Formatted Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>(&lt;ESC&gt;) 0</td>
<td>HH:MM 24 hour format</td>
</tr>
<tr>
<td>(&lt;ESC&gt;) 1</td>
<td>HH:MM_.?M 12 hour format with AM or PM</td>
</tr>
<tr>
<td>(&lt;ESC&gt;) 2</td>
<td>MM/DD/YY month/day/year</td>
</tr>
<tr>
<td>(&lt;ESC&gt;) 3</td>
<td>DD-MM-YY day-month-year/numeric month</td>
</tr>
<tr>
<td>(&lt;ESC&gt;) 4</td>
<td>DD-MON-YY day-month-year with 3 letter abbreviation of the month</td>
</tr>
<tr>
<td>(&lt;ESC&gt;) 5</td>
<td>DOW day of week abbreviation</td>
</tr>
</tbody>
</table>
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