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1. Introduction:

This document consist ESC/POS command specification, serial communication parameters setting for thermal Printer.

2. RS-232 Serial Interface:

2.1 Specifications:

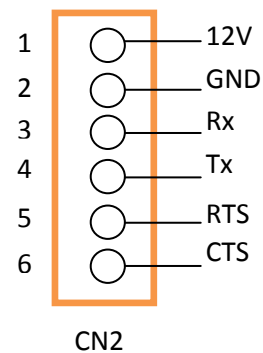
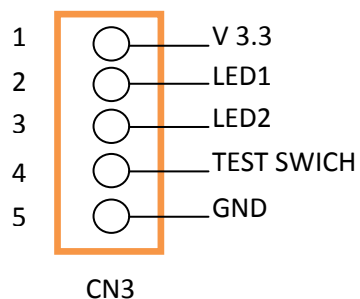
2.1.1 Electrical Specification:

Input voltage	9V - 27 V
Operating temp	-12°C -50°C

2.1.2 RS-232 Communication:

Data transmission method	Serial
Synch method	Start-Stop synchronization-method
Baud rate	9600bps
Bit length	8 bits
Parity	None
Stop bit	1 bit (Fixed)

2.2 Connector detail:



CN3:

V3.3- supply voltage 3.3V and POWER LED.

LED1- Used for indicating Paper status (present/absence) and also used to indicate for temperature is above 50°C

LED2- Used to indicate platen switch status (ON/OFF).

TEST SWITCH- To print a test message

Table 1

LED No.	Status	Description
PWR	ON	Power ON
	OFF	Power OFF
LED1	ON	PAPER_ABSENCE
	OFF	PAPER_PRESENCE
	TOGGLE	Over Temperature (T>50'C)
LED2	ON	PLATEN SW_OFF
	OFF	PLATEN SW_ON

3. Command Details:

3.1 Command table:

N o.	Command		Contents	Notes
1	HT	0x09	Horizontal Tab	
2	LF	0x0A	Line Feed	
3	FF	0x0C	New Page (feeds forms)	
4	ESC @	0x1B 0x40	Printer Initialization	
5	ESC RS	0x1B 0x1E	Sets reverse printing	
6	ESC US	0x1B 0x1F	Resets reverse printing	
7	ESC !n	0x1B 0x21 0x00	Set Print Mode	n=0 --> Large Font (16x24)
		0x1B 0x21 0x01		n=1 --> Small Font (12x17)
8	ESC - n	0x1B 0x2D 0x00 0x30	Cancel/Set underline mode	n=0,48 -> Cancel underline
		0x1B 0x2D 0x01 0x31		n=1,49 --> Sets to one-dot width underline
9	ESC A n	0x1B 0x41	Normal / Expand Font	n=0 --> Normal Font Height

	0x00	Height	
	0x1B 0x41		
	0x01		n=1 --> Expand Font Height

Table 2

4. Explanation of terms:

4.1 Reception buffer:

The buffer for storing data (reception data) received from the host, as it is called the reception buffer. Reception data is temporarily stored in the reception buffer, and then processed sequentially. The size of reception buffer is 512 bytes.

4.2 Print buffer:

The buffer for storing image data for printing is called the print buffer.

4.3 Print buffer full:

The state in which the buffer has no more space available is called print buffer full. When the print buffer is full in standard mode, data in the print buffer is printed and a line feed is performed when new print data is processed. This is the same as a LF. When the print buffer is full in the page mode, the printer move the print position to the head of the next line then starts with the new print data

4.4 Top of line:

The top of line is a state that satisfies the following conditions.

- 1) There is currently no print data in the print buffer.
- 2) There is no skipped portion using HT

4.5 Printable region:

This is the maximum printable area with the printer's specifications.

4.6 Print region:

This is the printing area specified by a command. (Print region \leq printable region)

5. FONT SIZE:

There are two types of font supported by this mechanism

1. Normal font:

Normal font has pixel size of 16X24.

2. Small font:

Small font has pixel size of 12X17.

6. Command Details:

6.1 Standard Commands:

6.1.1 HT

Name: Horizontal tab

Code:

ASCII:	HT
Hex.:	09
Decimal:	9

Function:

Moves print position to next horizontal tab position.

Details:

- This command is ignored if the next tab is not set.
- If the next tab position exceeds the print region, the print position is moved to [print region +1].
- When the print position is at the [print region + 1] position and this command is received, the current line buffer full is printed and a horizontal tab is executed from the top of the next line.
- The initial value of the horizontal tab position is every 8 characters of Font A (9th, 17th, 25th Positions, etc.)

6.1.2 LF

Name: Line feed

Code:

ASCII:	LF
Hex.:	0A
Decimal:	10

Function:

Prints the data in the print buffer and performs a line feed based on the set line feed amount.

Details:

After execution it makes the top of the line the next print starting position.

STAR:

When the setting for the line feed amount is smaller than the print data height:

- 1) If there is no print data, a line feed operation is executed according to the line feed amount.
- 2) If there is print data, a line feed operation is executed for the height of the print data.

6.1.3 FF

Name: Print and recover to page mode

Code:

ASCII:	FF
Hex.:	0C
Decimal:	12

Function:

Prints all buffered data to the print region collectively, and then recovers to the standard mode.

Details

- All buffer data is deleted after printing.
- Sets the print position to the beginning of the next line after execution.
- This command is enabled only in page mode.

6.1.4 ESC @

Name: Initialize printer

Code:

ASCII:	ESC	@
Hex.:	1B	40
Decimal:	27	64

Function:

Clears data from the print buffer and sets the printer to its default settings.

Details

- Data in the reception buffer is maintained.

6.1.5 ESC RS

Name: Set reverses printing

Code:

ASCII:	ESC	RS
Hex.:	1B	1E
Decimal:	27	30

Function:

It will print in dark background and font will be in light color

6.1.6 ESC US

Name: Reset reverses printing

Code:

ASCII:	ESC	US
Hex.:	1B	1F
Decimal:	27	31

Function:

It will print in light background and font will be in dark color.

6.1.7 ESC ! n

Name: Batch specify print mode

Code:

ASCII:	ESC	!	n	
Hex.:	1B	21	00	-Large font
	1B	21	01	-Small font
Decimal:	27	33	0	-Large font
	27	33	1	-Small font

Function:

Specifies batch print mode

6.1.8 ESC - n

Name: Specify/cancels underline mode

Code:

ASCII:	ESC	-	n	
Hex.:	1B	2D	00	30 -Cancel
	1B	2D	01	31 -Set
Decimal:	27	45	0	48 -Cancel
	27	45	1	49 -Set

Function:

Specifies or cancels underlines.

6.1.9 ESC A n

Name: Normal / Expand Font Height

Code:

ASCII:	ESC	A	n
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Hex.:	1B	41	00	-Normal
	1B	41	01	-Expand
Decimal:	27	45	0	-Normal
	27	45	1	-Expand

Function:

Font will be expanded with same height.

7. External Dimension:

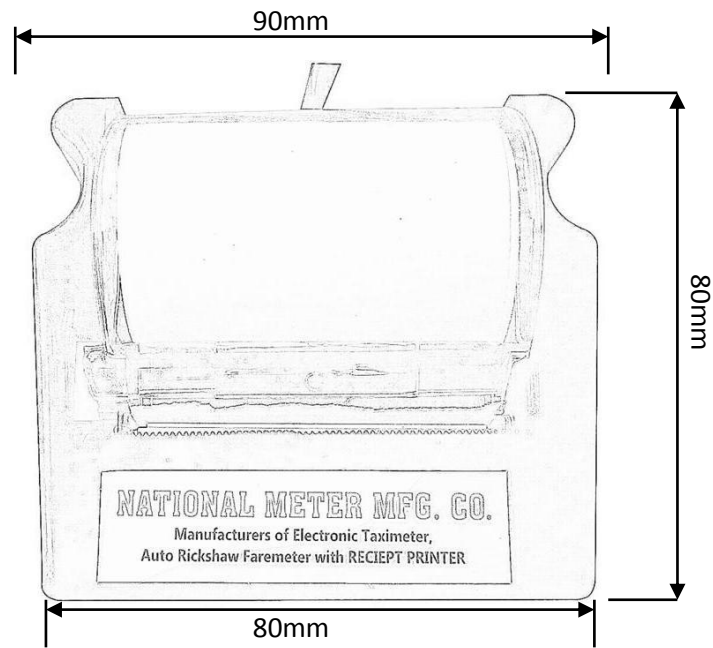


Figure 1

8. DOCUMENT HISTORY AND VERSION

Version	Date	Description
1.0	14 Nov 2013	Initial Release
1.1	16 Nov 2013	Added Table of contents
2.0	18 Nov 2013	Added more details

******* END OF DOCUMENT *******

