

Thermal Printer RP203



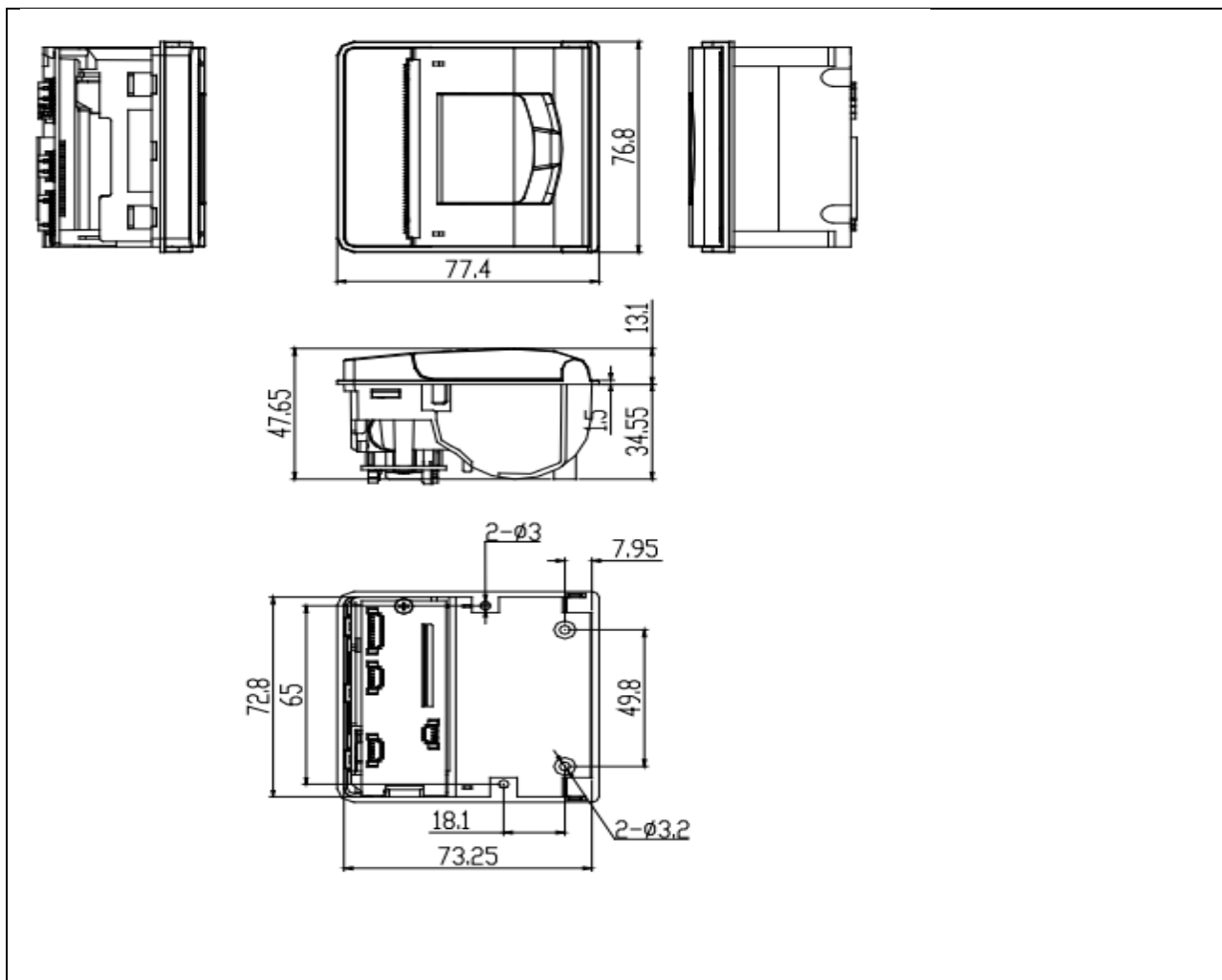
Thermal printers are dot-matrix printers that operate by driving heated pins against special heat-sensitive paper to “burn” the image onto the paper. The printer sends an electric current to the heating elements of the thermal head, which generate heat. The heat activates the thermo-sensitive coloring layer of the thermosensitive paper, which changes color where heated. Such a printing mechanism is known as a thermal system or direct system. Thermal Printer built in USB, Serial, Ethernet, Parallel, USB Host interfaces. Featuring high volume and high quality label printing, industrial thermal printer is ideal for manufacturing, logistics, shipping, and product identification.

FEATURES:

- Printing Method: Thermal
- Paper Width: 57.5mm
- Paper Diameter: 55mm
- Resolution: 203DPI
- Printing Speed: Up to 90mm/s
- Barcode Supported: 125,UPC-A,UPC-E,EAN-8,EAN-13,Codebar, Code39,Code93,Code128,Code11,MSI
- Font: ASCII(12x24)

- Graphic printing: Direct bitmap printing
- Paper Sensor: Photo-sensor
- Head temperature detection: Thermistor
- Communication Interface: RS232 or RS232 with TTL level
- Power supply: 12V/3A MAX
- Head Life: 50km
- Printing width: 48mm
- Operation condition: 5~45°C, 20~90%RH(40°C)
- Storage condition: -40~60°C, 20~93%RH(40°C)

OPERATING FUNCTIONS:



- **Printing test:** After power up, connect JP4 and disconnect, one test page will be printed.
- **On board LED:** There is one LED on board to indicate the status of the board. The indicator is as follows:

Blink one: Work well

Blink two: No printer is detected

Blink three: No paper is detected

Blank five: Printer mechanism is overheat.

- **CONNECTOR: 1. Serial communication connector**

The EPM203-MRS printer integrates 2 serial communication connectors. The RS232 connector is especially dedicated to the full RS232 protocol(+/-12V levels). When the TTL connector is designed to handle TTL levels (0/5V levels).

Logic Signal	Voltage Level on RS232 Connector	Voltage Level on TTL Connector
0	From +3V to +12V	From 0V to 0.2V
1	From -3V to -12V	From 2 to 5V

2. Power Connector

EPM device connector J5	User side matching connector
Molex 53047 Series 9 contacts(male)	Molex 51021 Series (female)

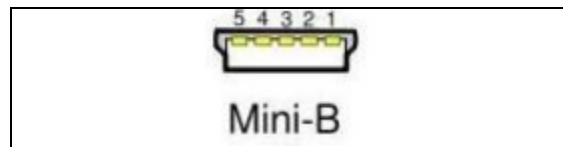
Pin Number	Signal Name
1	Ground
2	
3	
4	
5	
6	Power
7	
8	
9	

3. RS232 Connector

EPM device connector J4	User side matching connector
Molex, 53047 Series 5 contacts (male)	Molex 51021 Series (female) Contacts: 50079/50058

Pin Number	Signal Number
1	Ground
2	Transmit data (Txd, printer output)
3	Receive data (Rxd, printer input)
4	CTS/DSR (printer input)
5	RTS/DTR (printer output)

4. USB Connector



Pin Number	Signal Number
1	VBUS
2	D-
3	D+
4	ID
5	GND

5. TTL Connector

EPM device connector J3	User side matching connector
Molex, 53047 Series 5 contacts (male)	Molex 51021 Series (female) Contacts: 50079/50058

Pin Number	Signal Number
1	Ground
2	Transmit data (Txd, printer output)
3	Receive data (Rxd, printer input)

4	CTS/DSR (printer input)
5	RTS/DTR (printer output)

COMMAND MODE:

Type	Command	Name
Print Command	LF	Print and line feed
	CR	Print and carriage return
	HT	JMP to the next TAB position
	ESC D n	Set horizontal tab positions
	ESC J n	Print and Feed n dots paper
	ESC d n	Print and Feed n lines
	ESC =n	Toggle the printer online or offline
Line Spacing Command	ESC 2	Select default line spacing
	ESC 3 n	Set line spacing
	ESC a n	Select justification
	ESC SO	Select Double Width mode
	ESC DC4	Disable Double Width mode
	GS L nLnH	Set the left blank margin with dots
	ESC \$ nLnH	Set absolute print position
Character Command	ESC B n	Set Left Space
	ESC ! n	Select print mode(s)
	GS ! n	Set or Cancel the double width and height
	GS B	Turn white/black reverse printing mode
	ESC V n	Turn 90°clockwise rotation mode on/off
	ESC v n	Transmit paper sensor status
	ESC G n	Turn on/off double-strike mode
	ESC E n	Set or Cancel bold font
	ESC SP n	Set the space between chars
	ESC { n	Turn upside-down printing mode on/off
	ESC – n	Set the underline dots(0,1,2)
	ESC % n	Select/Cancel user-defined characters
	FS &	Select Chinese mode
	FS .	Select character mode
	FS!	Set print mode for Kanji characters
	ESC &	Define user-defined characters
	ESC ? n	Cancel user-defined characters
ESC R n	Select and internation character set	
ESC t n	Select character code table	

Bit Image Command	ESC *	Select bit-image mode
	GS *	Define downloaded bit image
	GS /	Print downloaded bit image
	GS v	Print the bitmap with width and height
	FS p n m	Print NV bitmap
	FS q n	Define NV bitmap
Initialize Command	ESC @	Initialize printer
Status Command	GS r n	Transmit status
	GS a n	Enable/Disable ASB
Bar Code Command	GS H	Select printing position of human readable characters
	GS h	Set bar code height
	GS w	Set bar code width
	GS k	Print bar code
	GS x	Set barcode printing left space
Miscellaneous Function Commands	ESC 7 n1 n2 n3	Setting Control Parameter Command
	ESC 8 n1 n2	Sleep parameter
	ESC 9 n	Select Chinese code format
	DC2 T	Printing test page
	ESC p	Generate pulse (For drawer)
	ESC u	Transmit peripheral device status (For drawer)
	ESC c 5	Enable/disable panel buttons (For button)

- **Print Command:**

1. **LF:**

Format: ASCII LF

Decimal 10

Hexadecimal 0A

Description: LF prints the data in the print buffer and feeds one line. When the print buffer is empty, LF feeds one line.

2. **ESC J n:**

Format: ASCII ESC J n

Decimal 27 74 n

Hexadecimal 1B 4A n

Description : n = 0-255, ESC J prints the data in the print buffer and feeds n dots. The command will not change the setting set by command ESC 2, ESC 3.

- **Line spacing setting command:**

- 1. ESC 2:**

Format: ASCII ESC 2

Decimal 27 50

Hexadecimal 1B 32

Description: ESC 2 sets the line space to default value (30dots)

- 2. ESC 3 n:**

Format: ASCII ESC 3 n

Decimal 27 51 n

Hexadecimal 1B 33 n

Description: n = 0-255 ESC 3 n sets the line spacing to n dots. The default value is 30.

- 3. ESC a n:**

Format: ASCII ESC a n

Decimal 27 97 n

Hexadecimal 1B 61 n

Description: Default is 0

$0 \leq m \leq 2$ or $48 \leq m \leq 50$

Align left: n=0, 48

Align middle: n=1, 49

Align right: n=2, 50

- 4. ESC B n:**

Format: ASCII ESC B n

Decimal 27 66 n

Hexadecimal 1B 42 n

Description: Default is $0 \leq m \leq 47$

- **Character command:**

- 1. ESC ! n:**

Function: ASCII ESC ! n

Decimal 27 33 n

Hexadecimal 1B 21 n

Description: The default value is 0.

This command is effective for all characters.

BIT0:

BIT1:

BIT2:

BIT3: 1: Emphasized mode selected

0: Emphasized mode not selected

BIT4: 1: Double Height mode selected

0: Double Height mode not selected

BIT5: 1: Double Width mode selected

0: Double Width mode not selected

BIT6: 1: Delete line mode selected

0: Delete line mode not selected

BIT7: 1: Underline mode selected

0: Underline mode not selected

- 2. ESC SO:**

Format: ASCII ESC SO

Decimal 27 14

Hexadecimal 1B 0E

Description: Select Double Width mode To turn double width off, use LF or DC4 command.

3. ESC DC4:

Format: ASCII ESC DC4

Decimal 27 20

Hexadecimal 1B 14

Description: Disable Double Width mode

4. ESC { n:

Format: ASCII ESC { n

Decimal 27 123 n

Hexadecimal 1B 7B n

Description: n=1: Enable Updown mode

n=0: Disable Updown Mode

Default value is 0

5. GS B n:

Format: ASCII ESC B n

Decimal 29 66 n

Hexadecimal 1D 42 n

Description: n=1: Enable white/black reverse mode

n=0: Disable white/black reverse mode

Default value is 0

6. ESC % n:

Format: ASCII ESC % n

Decimal 27 37 n

Hexadecimal 1B 25 n

Description: n=1:Enable User-defined character

n=0:Disable User-defined character

7. ESC & s n m w:

Format: ASCII ESC & s n m w d1 d2 ... dx

Decimal 27 38 s n w m d1 d2 ... dx

Hexadecimal 1B 26 s n w m d1 d2 ... dx

Description: The command is used to define user-defined character. Max 64 user chars can be defined.

s= 3, $32 \leq n \leq m < 127$

s: Character height bytes, =3(24dots)

w: Character width 0~12(s=3)

n: User-defined character starting code

m: User-defined characters ending code

dx:data, $x=s*w$

8. ESC ? n:

Format: ASCII ESC ? n

Decimal 27 37 n

Hexadecimal 1B 25 n

Description: ESC ? n disable user-defined characters, printer will use the internal character.

9. ESC R n:

Format: ASCII ESC R n

Decimal 27 82 n

Hexadecimal 1B 52 n

Description: Select an internal character set n as follows:

0:USA 1:France

2:Germany 3:U.K.

4:Denmark 5:Sweden

6:Italy 7:Spain1

8:Japan 9:Norway

10:Denmark 11:Spain

12:Latin 13:Korea

10. ESC t n:

Format: ASCII ESC t n

Decimal 27 116 n

Hexadecimal 1B 74 n

Description: Select a page n from the character code table as follows: :

0:437 1:850

- **Bit Image Command:**

1. **ESC * m nL nH d1 d2...dk:**

Format: ASCII ESC * m nL nH d1 d2 ... dk

Decimal 27 42 m nL nH d1 d2 ... dk

Hexadecimal 1B 2A m nL nH d1 d2 ... dk

Description: This command selects a bit image mode using m for the number of dots specified

by

$(nL+nH*256) m = 0,1,32,33.$

nL=0-255

nH=0-3

dx=0-255

$k = nL + 256 * nH$ (m=0,1)

$k = (nL + 256 * nH) * 3$ (m=32,33)

The modes selected by m are as follows:

0 : 8dots single density, 102dpi

1: 8dots double density, 203dpi

31:24 dots single density,102dpi

32:24 dots double density,203dpi

The bit image format is the same as user-defined character

2. GS / n:

Format: ASCII GS / n

Decimal 29 47 n

Hexadecimal 1D 2F n

Description: This command prints a downloaded bit image using the mode specified by n as specified in the chart. In standard mode, this command is effective only when there is data in the print buffer. This command is ignored if a downloaded bit image has not been defined.

n=0-3, 48-51: Specify bit image mode

n	Pattern Mode	Vertical DPI	Horizontal DPI
0,48	Normal	203DPI	203DPI
1,49	Double width	203DPI	101DPI
2,50	Double height	101DPI	203DPI
3,51	Quadruple	101DPI	101DPI

3. GS * x y d1...dk:

Format: ASCII GS * x y d1 ... dk

Decimal 29 42 x y d1 ... dk

Hexadecimal 1D 2A x y d1 ... dk

Description: This command defines a downloaded bit image by using $x*8$ dots in the horizontal direction and $y*8$ dots in the vertical direction. Once a downloaded bit image has been define, it is avaiable until

Another definition is made

ESC & or ESC @ is executed

The power is turned off

The printer is reset $x=1\sim 48$ (width), $y=1\sim 255$ (height), $x*y < 1200$, $k=x*y*8$

- **Key control command:**

1. **ESC c 5 n:**

Format: ASCII ESC c 5 n

Decimal 27 99 53 n

Hexadecimal 1B 63 35 n

Description: This command has no effection.

n=1, Disable the panel key

n=0, Enable the panel key(Default)

- **Init command:**

1. **ESC @:**

Format: ASCII ESC @

Decimal 27 64

Hexadecimal 1B 40

Description: Initializes the printer:

The print buffer is cleared.

Reset the param to default value.

return to standard mode

Delete user-defined characters

- **Status Command:**

1. **ESC v:**

Format: ASCII ESC v n

Decimal 27 118 n

Hexadecimal 1B 76 n

Description: Transmits the status of the paper sensor as 1 byte of data.

2. **GS a n:**

Format: ASCII GS a n

Decimal 29 97 n

Hexadecimal 1D 61 n

Description: When ASB is enabled, the printer will send the changed status to PC automatically.

3. **ESC u n:**

Format: ASCII ESC u n

Decimal 27 117

Hexadecimal 1B 75

Description: This command is not supported.

Return status bytes definition :

bit0: Drawer status.

bit4: 0 Always return 0 back.

- **Bar Code Command:**

1. GS H n:

Format: ASCII GS H n

Decimal 29 72 n

Hexadecimal 1D 48 n

Description: $0 \leq n \leq 3$

$48 \leq n \leq 51$

This command selects the printing position for human readable characters when printing a barcode. The default is $n=0$. Human readable characters are printed using the font specified by GS fn. Select the printing position as follows:

n Printing Position

0,48: Not printed

1,49: Above the barcode

2,50: Below the barcode

3,51: Both above and below the barcode

2. GS h n:

Format: ASCII GS h n

Decimal 29 104 n

Hexadecimal 1D 68 n

Description: This command selects the height of a barcode. n specifies the number of dots in the vertical direction.

The default value is 50 $1 \leq n \leq 255$

3. GS w n:

Format: ASCII GS w n

Decimal 29 119 n

Hexadecimal 1D 77 n

Description: This command selects the horizontal size of a barcode.

$n = 2,3$

The default value is 3

4. GS k m d1 d2 ... dk

5. NUL

GS k m n d1 d2 ... dn:

Format1: ASCII GS k m d1 d2 ... dk NUL

Decimal 29 107 m d1 d2 ... dk 0

Hexadecimal 1D 6B m d1 d2 ... dk 00

Format2: ASCII GS k m n d1 d2 ... dn

Decimal 29 107 m n d1 d2 ... dn

Hexadecimal 1D 6B m n d1 d2 ... dn

Description: m : barcode type

Format 1 : $0 \leq m \leq 10$

Format 2 : $65 \leq m \leq 75$

n : barcode length

- **Control Parameter Command:**

1. ESC 7 n1 n2:

Format: ASCII : ESC 7 n1 n2 n3

Decimal : 27 55 n1 n2 n3

Hexadecimal : 1B 37 n1 n2 n3

Description: Set “max heating dots”, “heating time”, “heating interval”

n1 = 0-255 Max printing dots, Unit(8dots), Default:7(64 dots)

$n2 = 3-255$ Heating time, Unit(10us),Default:80(800us)

$n3 = 0-255$ Heating interval, Unit(10us), Default:2(20us)

The more max heating dots, the more peak current will cost when printing, the faster printing speed.

The max heating dots is $8*(n1+1)$ The more heating time, the more density , but the slower printing speed. If heating time is too short, blank page may occur. The more heating interval, the more clear, but the slower printing speed.

2.ESC 8 n1:

Format: ASCII : ESC 8 n1

Decimal : 27 56 n1

Hexadecimal : 1B 38 n1

Description: Setting the time for control board to enter sleep mode.

$n1 = 0-255$ The time waiting for sleep after printing finished,

Unit(Second), Default:0(don't sleep)

When control board is in sleep mode, host must send one byte(0xff) to wake upcontrol board. And waiting 50ms, then send printing command and data.

NOTE : The command is useful when the system is powered by battery.

3.ESC 0 n1 n2 n3 d1 ... :

Format: ASCII : ESC 0 n1 n2 n3 d1 d2 ... dk

Decimal : 27 48 n1 n2 n3 d1 d2 ... dk

Hexadecimal : 1B 30 n1 n2 n3 d1 d2 ... dk

Description: Setting bluetooth baudrate , name, password

$n1 = 0-4$ baudrate, Default:0

0: 9600

1: 19200

2: 38400

3: 57600

4: 115200

n2 = the length of control board name for bluetooth

n3 = the length of control board password for bluetooth

d1...dk k=n2+n3

Note : The command is valid only when the control board is Bluetooth type control board.