



# RD-EK32

Thermal label printer development manual



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## Overview

EK Series Thermal Printer Adopts fully closed, Easy Paper Loading Structure, Rectangle surface plate design, small size, big paper storage design which can fit Diameter  $\Phi 50\text{mm}$  paper roll, Embedded depth is only 54mm. Fashion outlook, delicate, light weight, high printing speed, fluent and clear printing, the printer can easily embed into client system.

RD-EK micro thermal printer are widely used in medical, fire fighting, electric power, weighing apparatus, GPS navigation and other industries.

## 1.1 Main Performance

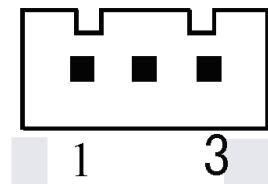
Performance	Model No.	EK32- P/S\485
	Printing Method	Thermal Printing
	Printing Speed	65mm/s (MAX)
	Resolution	8dot/mm, 384dot/line
	Effective Printing width	48mm
	Feeding Step	0.125mm
	Western Character	1.Support standard ASCII characters (96): 5×7, 2.Support extended ASCII characters (352): 6×8, 3. Support the User-defined character: 6×8. 4. User option: ASCII characters of 12x24& 8X16&8X12 5. Support the standard ASCII character (224) : 12×24.
	Chinese Character	Equip with the GBK character library of 24×24 (more than 20000 Chinese characters)
Detection	Out of paper detection	Yes
	Pressure detection	Yes
Control system	Interface	Parallel:26pin double line Serial: 5pin single line 485 Port: 5pin single line USB Port: 5pin single line
	Buffer	2k/64K
	Command system	ESC/P printing command, Compatible to IBM/EPSON ESC/P.
	Driver	WIN2000/NT/XP/WIN7
Power	Working pressure	DC5V, Option:DC6~9V Power supply
	Current	Average 1A~1.5A, Peak 2.5A。 or to be adjusted as per client requirement
Reliability	Printer head life	50km
Printing Paper	58±0.5mm paper width	Outer dia≤ $\Phi 50\text{mm}$
	Paper loading method	Front side paper loading, easy paper loading structure
	Paper cutting method	Manual Paper tearing

Physical property	Working temperature/Humidity	-10~55°C/10~80%RH
	Storage Temperature/Humidity	-20~60°C/10~90%RH
	Weight(Including paper)	about185g
	Embedded size (mm)	80x80x55 (W x H x D)
	Outlook size (mm)	86x86x56 (W x H x D)

## 1.2 Power connector

Power connector-----Pin width 2.54mm , 3PIN

Pin Name	Signal name	Detail
1	VCC	Power-Positive 5V
2	--	Null
3	GND	Power-Negative



### 12V-24V Power supply definition

Pin name	Signal name	Detail
1	--	Null
2	VPP	Power-positive12V-24V
3	GND	Power-Negative

## 1.3 Operation (Single button operating key)

There is an indication button on the printer's panel, and this button is not only an indicator but also a function key.

### 1.3.1 Indicator

Power light

When Power on, Indicator is on with Green light

Status light

When printer is out of paper, Indicator is flash with Green light

### 1.3.2 operating Button

Paper feeding button

Feeding button: Click the button and the printer feed paper one line. Hold down the button and the printer continuously feed paper.

o

### 1.3.3 Operation

Self test:

**Step 1:** The power of the printer is turned off.

**Step 2:** Press the indicator button

**Step 3:** Energize the printer for about 2 seconds and the printer will start the self-test.

1、 Paper loading:

(1) Open paper storage cover

(2) Put paper roll into the Storage, face smooth side up, show around 2cm paper end.

(3) Close the cover to press the paper end, paper loading is over

2、 Paper feeding: Under power up status, press the button is paper feeding.

Note: When label paper is used, the self test must be done in advance for the printer Identify the label seam, After the self test is done, press the button, if the paper roll automatically move to next label, It means the identification is succeed, power off then power on ,the data sheet printing operation go on.

## 二、 Communication interface

### 2.1 Serial interface

EK Serial interface adopts 5p white pin seat, Pin space is 2.54mm.

It adopts double serial ports. The side besides power connector is RS232, Other side is TTL port.

#### 2.1.1 Pin definition

Data transfer: Serial

Synchronization way: Asynchronous

Handshake way: CTS/RTS

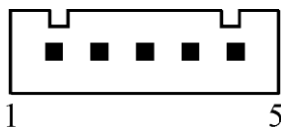
Baud Rate: 9600 (Parameter can be set up by button or command)

Data Length: 8Bit

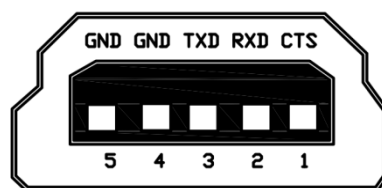
Parity: None

停止位stop bits: 1;

Interface: Side 5pins



Pin definition



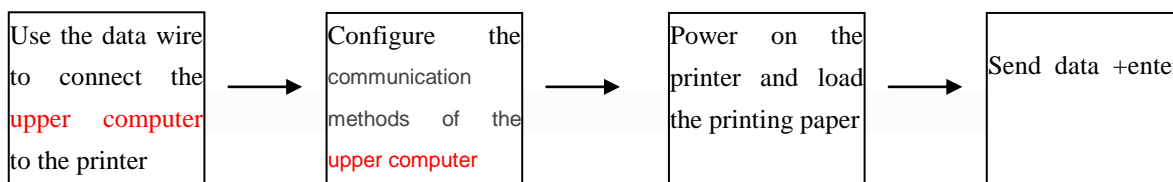
5 Core serial port	Signal	Signal source	Direction	details
1	-	-	-	Null
2	TXD	Printer	Output	Control board receive data from mainframe

3	RXD	Mainframe	Input	When using the 'X-ON/X-OFF' Handshake Protocol, the printer sends control code 'X-ON/X-OFF' to the computer. (RECEIVE DATA)
4	CTS	Printer	Output	When the signal is in a state of 'MARK', it means that the printer is busy and can't receive data. But when the signal is in a state of 'SPACE', it means that the printer is ready to receive data.
5	GND	—	—	Signal ground

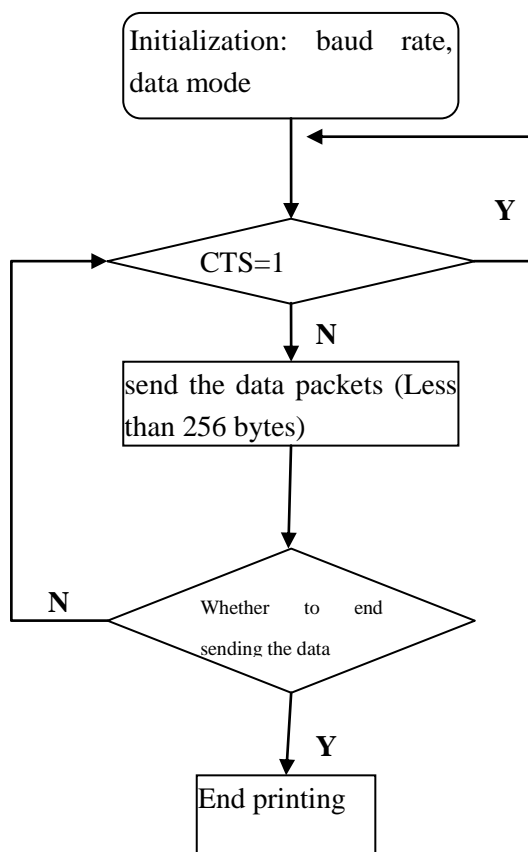
### 2.1.2 Serial port data transmission method

The receiving buffer of the printer is 2K

(1) When the number of sending data once is less than 2K, the data can be directly sent. And the sending method is as follows:



2) If large amounts of data once is sent, need to judge the mark 'CTS' when sending the data. When the mark is '1', the data can't be sent. When the mark is '0', the data can be sent. Data can be sent in the form of packets or byte. When the data is sent in the form of packets, each data packet can't exceed 256 bytes, and the sending flowchart is as follows:



## 2.2 Parallel Interface

The RD-EK system thermal parallel interface printer uses 26P double-row needle socket as the communication interface, and the spacing between the needles is 2.54mm. Figure 3-3 is the parallel interface figure.

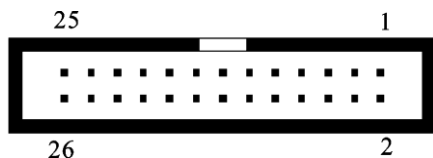


图 3-3

### 2.2.1 Data interface

26Cores double line	Signal	Direction	illustration	PC DB25 Parallel port
1	STB/	IN	Strobe pulse to latch data, reading occurs at falling edge.	1
3	DATA1	IN	8 data pins, the logic '0' indicates low, '1' indicates high	2
5	DATA2	IN		3
7	DATA3	IN		4
9	DATA4	IN		5
11	DATA5	IN		6
13	DATA6	IN		7
15	DATA7	IN		8
17	DATA8	IN		9
19	ACK/	Out	answer pulse, and "Low" level indicates that the data has been accepted	10
21	BUSY	Out	"High" level indicates that the printer is busy and can't receive data	11
23	PE	— —	Grounding ( <b>PERROR</b> )	— —
25	SEL	Out	"High" level indicates that the printer is On line	13
4	ERR/	Out	Printer error signal ,HIGH level signal indicates that printer no error.	15

2, 6, 8	NC	— —		— —
10~24	GND	— —	Signal ground	12、25

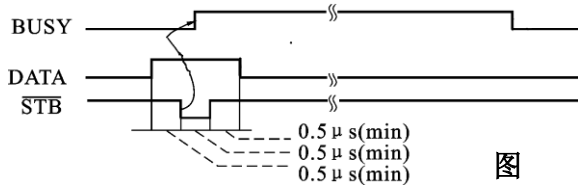
**Note:** ①The mainframe and printer in the item 'signal source' means the source of the signal sending out  
信号来源一项中的“打印机”和“主机”表示信入发出的来源。

②The signal logic level is EIA level.信号逻辑电平为 EIA 电平。

### 2.2.2 Parallel interface data transmission method

Using parallel interface to send data is more complicated than using serial interface, because using parallel interface to send data need the cooperation of the 'STB','BUSY' AND 'DATA' data wires. See figure 3-4

并口数据的发送相对来说比串口要麻烦些，需要 STB，BUSY 及 DATA 数据线之间的时序配合，才可以发送，图 3-4 为并口发送一字节的时序图。

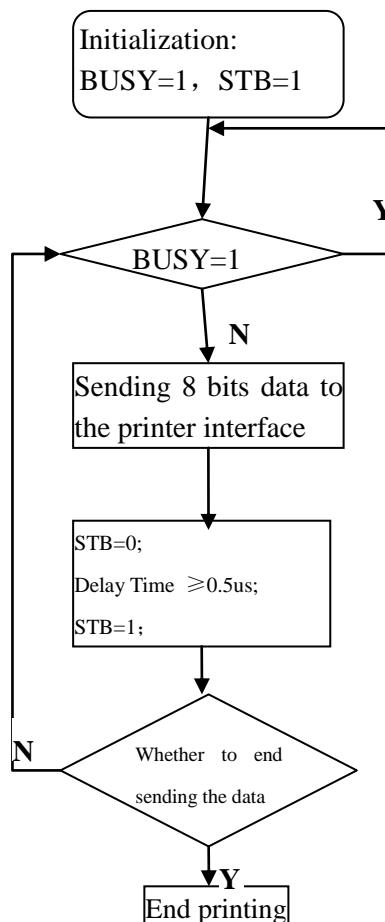


#### Sending step:

step1: using the appropriate data wire connects the printer to PC

step2:power on the printer and load the printing paper

step3:Begin to transmit data, and flow chart is as follows:





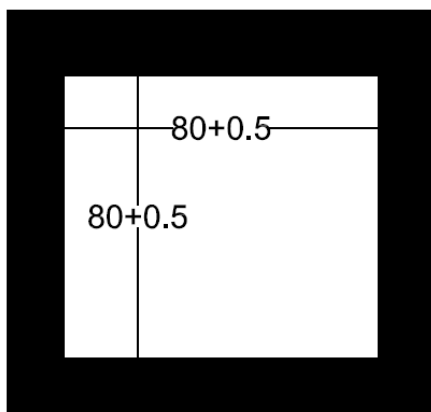
## 三、Command details

See RD Thermal printer label command manual book V1.1

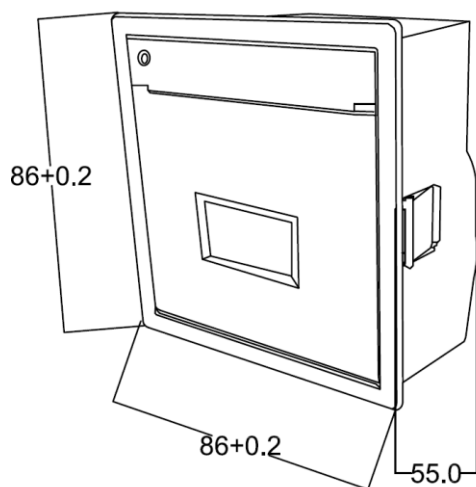
## 四、Installation

### 4.1 Size

**Embedded Size: 80mm\*80mm (W\*H)**



**Outlook: 86mm\*86mm\*55mm (W\*H\*D)**



## 4.2 Installation method

### 4.2.1 Operation

Please read following before the installation

- 1、 The material thickness of the panel should be 0.8mm~4.5mm
- 2、 The Printer is planarity structure, The panel need to be flat(not Cambered),The flatness should be within 0.15mm.
- 3、 When installing the printer, the fixed support should be screwed tight in case damage.

### 4.2.2 Installation operation

- 1、 The instrument panel square hole size should be 80x80mm
- 2、 Put the printer into the panel hole.
- 3、 Tight the screw clockwise, The fixed support will be spread by two sides, Clamp the panel
- 4、 When the screw is tight with resistance, it means the fixed support locked the panel, then stop the tightening.

### 4.2.3 Unloading Operation

- 1、 Rotate the screw counterclockwise, with the unscrew, the support will pack up inward
- 2、 Back out the screw around 7mm,the support will withdraw into the printer completely, then the printer can be taken out.

## 五、 Maintenance and Troubleshooting

**To ensure the printer to work normally, particularly note that we don't optionally remove the print head and do not make changes to the printer through ourselves. For users not using the printer shell, more particularly note protecting the printing head.**

1. If the printer is not used for a long time, we do not turn on the printer power.
2. If the printer is not working properly, please turn off the printer's power.
3. Power supply must meet the requirements, or it is unfavorable for the printing head, and even damages the printing head.
4. When replacing the paper roll, please note whether there are the paper scraps and dust on the printing head. If having paper scraps and dust, please gently remove. Note the thermal paper's obverse and reverse side, and if the reverse side is uncoated, the printer can't print out the handwriting.
5. When the printer is printing or paper feeding, we can't tear the paper, and can't more reversely drag the paper
6. Keep the printer control panel clean
7. When thermal printer prints unclearly, we can use the clean cotton ball soaked some alcohol to gently wipe the surface dirt on the print head chip heating element.
8. When we connect the printer to the host, we should connect the printer data cable, and then power on the printer.
9. To choose a good quality paper when we select the paper for the thermal printer can not only improve the printing quality, but also reduce the abrasion for thermal film.

**APPENDIX:**

**A. Character set 1、2**

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
2	!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/	
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	↑	←
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{		}	~	
8	0	-	二	三	四	五	六	七	八	九	十	元	角	分	月	日
9	£	¢	↓	→	^	±	÷	∞	≈	…	0	1	2	3	2	3
A	α	β	γ	δ	ε	ζ	η	θ	ι	κ	λ	μ	ν	ξ	π	ρ
B	σ	φ	ψ	ω	Γ	Δ	Π	Σ	Ψ	Ω	Ξ	Θ	Π	Φ	Ψ	Ω
C	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
D	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
E	'	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ
F	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'

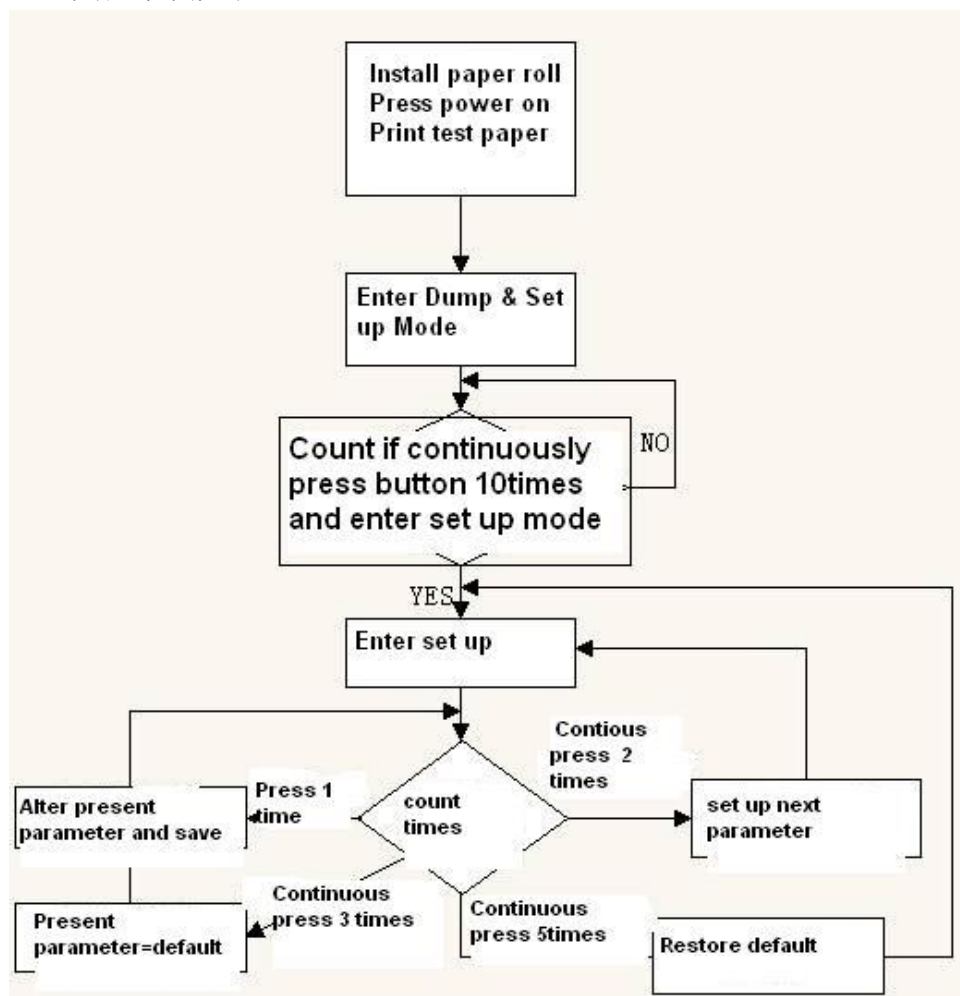
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
2	百	千	万	元	角	分	'	4	4	4	4	4	4	4	4	4
3	#		U	Π	⊕	⊖	⊗	⊘	⊙	⊚	⊛	⊜	⊝	⊞	⊟	⊠
4	∴	≡	≅	≈	≠	≡	≡	≡	≡	≡	≡	≡	≡	≡	≡	≡
5	*	⊕	(	)	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
6	⊕	ア	イ	ウ	エ	オ	カ	キ	ク	ケ	コ	サ	シ	ス	セ	ソ
7	夕	チ	ツ	テ	ト	ナ	ニ	ノ	ネ	ノ	ル	ロ	ハ	ヘ	ホ	マ
8	々	々	々	々	々	々	々	々	々	々	々	々	々	々	々	々
9	ン	フ	ウ	エ	オ	カ	キ	ク	ケ	コ	サ	シ	ス	セ	ソ	タ
A	ハ	ニ	ハ	ニ	ハ	ニ	ハ	ニ	ハ	ニ	ハ	ニ	ハ	ニ	ハ	ニ
B	φ	φ	ü	é	â	ä	à	å	é	ë	è	ï	î	ï	ä	å
C	â	é	æ	æ	ø	ø	ø	ø	ü	ö	ü	ç	ç	ç	ç	ç
D	í	ó	ú	ñ	ñ	ñ	ñ	ñ	ñ	ñ	ñ	ñ	ñ	ñ	ñ	ñ
E	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é	é
F	ÿ	ö	ü	ç	ç	ç	ç	ç	ç	ç	ç	ç	ç	ç	ç	ç

**B. International standard ASCII**

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
2	!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/	
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{		}	~	Δ
8	Ç	ü	é	â	ä	à	å	é	ë	è	ï	î	ï	Ä	Å	
9	É	æ	œ	ô	ö	ò	û	ù	ÿ	Ö	Ü	Ç	£	¥	℞	f
A	á	í	ó	ú	ñ	Ñ	ª	º	¿	¬	½	¼	¡	«	»	
B	⋮	⋮	⋮													

## C Set up mode operation procedure

1. Install the printing paper
2. 按住打印机 Feed 键(双键按 LF),接通电源.打印机打印自检.Press the Feed button(double button press LF),Power on, the printer start self printing test.
3. 打印机自检完成后,连续 10 次按下按键,打印机进入设置模式,并且打印出当前第一设置项的当前设置内容.After the self test finished, Press 10 times of button, the printer enter into set up mode, and print out the present setting.
4. 按键每按下一次,设置项的参数相应的进行更改,Press down the button each time, the parameter will change accordingly.
5. 如果要设置下一个项目的参数,连续按键 2 次,进入设置下一项目.If need to set the next item parameter, press the button 2times continuously and enter into next item set up
6. 连续多次(大于 10 次及以上)按下,打印机恢复默认值.Continuous repeat pressing button(over 10times),the printer restore default.
7. 打印机恢复默认值后,再次连续 2 次按下按键,进入设置状态 After restore default, again press 2times of button, the printer enter into set up status.
8. 断电打印机自动保存设置数据.When power off, the printer save the set up data automatically
9. 详细流程图如下:Detailed flow chart is as follows:



The set up mode is as follows:

Index	Item	Illustration
0	Baud rate adjustment	Set up Printer baud rate Word: serial Baud: xxxx; XXXX means baud rate e.g: serial Baud:9600
1	Parity adjustment	Set up parity adjustment Model: serial Baud:xxxx,x,x,x Example: serial Baud:9600, N,8,1 None, 8 Data bits, 1stop bits
2	Flow adjustment	Set up flow adjustment、XON/XOFF and CTS mode Word: flow ctrl:xxxxxx E.g: flow ctrl: hardware means hardware flow
3	Forward and reverse	Set up table sequence and panel sequence Word: forward printing or reverse printing forward printing means table, reverse printing means panel
4	adjust printing power consumption	set up printing current 0-6,High number means higher power rate, default is 5 word: energy consumption:5
5	Font set up	Font library is default, please consult technicians when set up this item