

ORTR V'V7: Thermal Line Printer
User's Manual

December 2010

Warning

No warranty will be provided for printer head damage, also for bad printing quality due to use of non-specified thermal.

No warranty will be provided if printer or control board has been disassembled or altered.

The contents of this manual are subject to change without notice.

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Introduction

ORTP V7: is a new type of thermal line printer. Unlike impact printers it needs no ribbon cassette. The special features of this printer are small in size, high in printing speed and low in noise. It comes to represent first class printing quality and high reliability."

ORTP V7: is easy to operate. It can be used in wide range of applications specially for printing .ECR(Electronic Cash Register) and POS(Point Of Sales) system and various receipt.

Chapter 1 Features and Specifications

1.1 Printing Features

Printing Method: Direct thermal line printing

Printing Paper Width: 57.5+/-0.5mm

Printing Density: 8 dots/mm, 384 dots/line

Printing Speed: 50mm/sec.

Reliability:

Printing head: 50km

Under condition:

*Not more than 50 lines each time for non-continuous printing with ANK character size of 12 x 24.

*Printing dots at same time per one dot line not more than 25% while vertical printing dots per one character line not more than 11 times.

*Using specified thermal paper.

Valid Printing Width: 48mm

Line Feed Speed: 50mm/sec.

1.2 Printing Paper

Thermal Paper Roll

Paper Width: 57.5 +/-0.5mm

ID: 10mm (min)

OD: 65 mm (max.)

Thickness: 53~60g/m²

1.3 Printing Character

ANK Character

12 x 24 dots, 1.25 mm(w) x 3.00 mm(h)

GB Chinese Level 1 & 2

24x 24 dots, 3.00 mm(w) x 3.00 mm(h)

1.4 Interface

Serial:

RS232C compatible, D-SUB 25 pin (female) connector, RTS/CTS handshaking

Baud Rate: 9600 bps

Data transfer format: 1 Start Bit + 8 Data Bits + 1 Stop Bit or more

Parallel:

8-bit parallel, D-SUB 25 pin (male) connector, BUSY handshaking, paper-end detector

Cash Drawer

DC12V, 1A, 6-line RJ-11 connector

1.5 Printing Commands

Character Printing Commands

Support printing in double width, and double height for ANK character, user defined character and Chinese character; and line space adjustment

Graphic Printing Commands

Support various density graphics printing and down-load graphics printing

1.6 Power Supply

DC12~24V, 2A

1.7 Working Environment

Operating temperature: 0° ~ 45° C

Relative humidity: 10 ~ 80%

temperature is 40° C, relative humidity <=58 %

While operating temperature is 34° C, relative humidity <=80%; while operating temperature is 40° C, relative humidity <=58 % .

1.8 Models

MPRINT T58SU Serial Interface /USB Interface

MPRINT T58P Parallel Interface

1.9 Weight

1.5KG (without paper roll)

1.10 Dimension

130 (W) x 226 (L) x 118 (H) mm

Chapter 2 Installation and Operation

2.1 Appearance



Fig2.1 Appearance

2.2 Control Panel

There are one buttons and three indicators on Panel of ORTIP V7: as below
Power Indicator, Error Indicator, Paper Out Indicator and Paper Feed Button, .

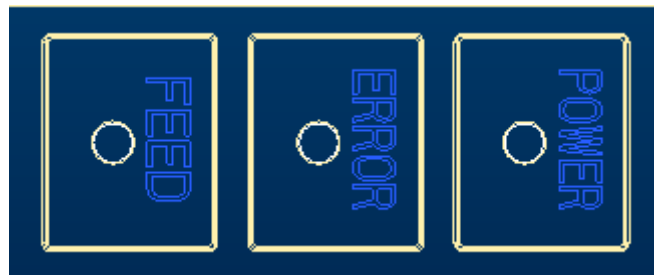


Fig2.2 ORTIP V7: Control Panel

2.3 Connecting of Power Supply

Please use included power supply shown as follows:

ORTIP V7: , Specified Power Supply, AC Main, IBM PC, Serial or Parallel Port.

1. Connecting the output plug of the power supply cable to ORTIP V7: first before plug the power supply cord into AC Main to avoid power supply output plug damage.
2. Using of improper type of power supply will cause printer damage.
3. Paper will be moved forward a little further automatically after power on. If no paper is loaded in indicator will flash.

2.4 Loading Paper

- (1) Open the removable upper cover of printer, place thermal paper roll on the paper holder.
- (2) Pull the paper out through paper-out slot on the upper cover and then close the cover.
- (3) Turn power on, press Paper Feed key under off-line status, paper will be automatically moved upwards to the paper-out slot on top of printer mechanism.
- (4) Press Paper Feed Button to feed paper to the proper position.

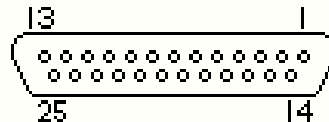
Suggestion:

Power off before loading paper for easy installation and protecting printing mechanism.

Caution:

1. Do not press Paper Feed Button while no paper in printer mechanism.
2. Do not pull paper forward or backward by hand. Press Paper Feed Button for paper release.

2.5 Connecting of Interface



2.5.1 Connecting of Serial Interface

Serial interface of ORTK V7: is compatible with RS232C which support RTS/CTS handshaking. Use a D-Sub 25 pin (female) socket. Pin order of serial port is as follows:

fig.2-5.1 Pin order of serial port

Pin Assignment of Serial Port

Pin No.	Signal	Source	Description
3	RXD	Host	Printer receives data from host
2	TXD	Printer	Printer send data to host
4	RTS	Printer	There are two states of this signal, "Mark" and "Space". "Mark" indicates that the printer is busy and unable to receive data; "Space" indicates that printer is ready to receive data.
7	GND	-----	Signal ground

Note:

1. "Source" represents signal source
2. Signal level is +/- 3V to +/-15V

Default setting of baud rate is 9600 bps, 8 data bit, 1 or more stop bit and none parity bit. Serial port can be connected with standard RS232C, such as IBM PC or compatible PC which is listed as follows:

Printer DB-25 Socket, IBM PC Serial Port DB-9

Printer DB-25 Socket, IBM PC Serial Port DB-25

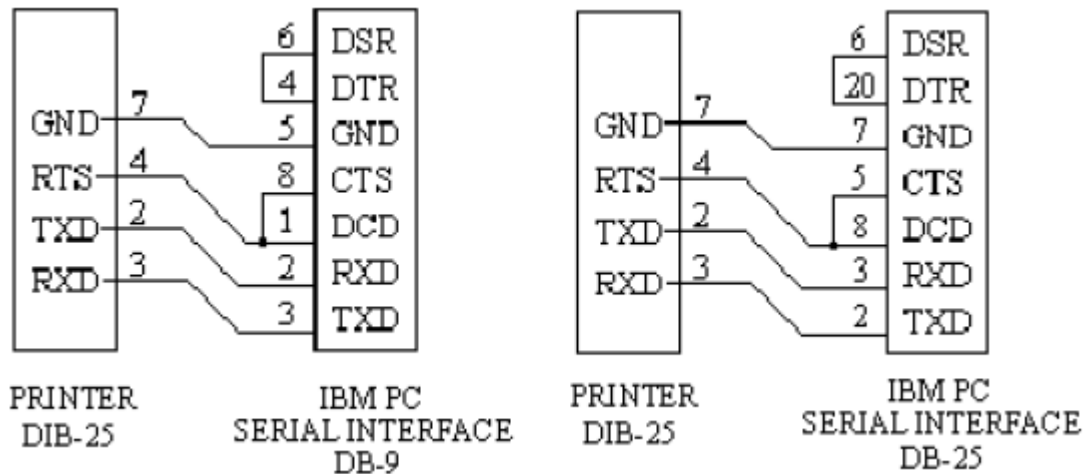


fig. 2-5.2 Connection between "ORTP V"V7: and IBM PC serial ports

2.5.2 Connecting of Parallel Interface

Parallel port of "ORTP V"V7: is 8-bit interface which support BUSY handshaking. Using a D-Sub 25 pin (male) socket. Pin order of parallel port is as follows:

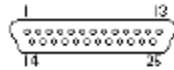


fig.2-5.3 Pin order of parallel port

Pin Assignment of Parallel Port as follows:

Pin No.	Signal	I/O	Description
1	/STB	In	Strobe pulse, to latch data. Reading occurs at falling edge
2	DATA 1	In	These signals represent the 1st bit to 8 bit of the parallel data respectively. Each bit of the parallel data respectively. Each signal is at HIGH level when data is logical 1 and LOW when data is logical 0.
3	DATA 2	In	
4	DATA 3	In	
5	DATA 4	In	
6	DATA 5	In	
7	DATA 6	In	
8	DATA 7	In	
9	DATA 8	In	
10	/ACK	Out	Pull up to HIGH logical level by a resistor.
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
13	SEL	Out	Pull up to HIGH logical level by a resistor.
15	/ERR	Out	Pull up to HIGH logical level by a resistor
14,16,17	NC	---	No connection
18-25	GND	---	Grounding, logical "0" level

Notes:

1. "In" represents input to printer, "Out" represents output from printer
 2. signal level is TTL standard.
- The timing chart for handshaking signals in parallel port is as follows:

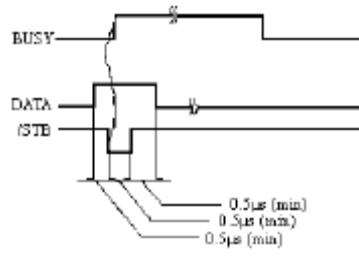


fig. 2-5.4 Signal timing chart of parallel port

2.5.3 Connecting of Cash Drawer



ORTP VV7: 'adopts RJ-11 6-line type cord with required power supply (VH) DC12V.

Fig.2-5.5 Cash drawer connection

Pin Assignment Definition:

Pin No.	Signal	Direction
1	structure grand	-----
2	cash-drawer driver signal	out
3	cash-drawer on/off status	in
4	+12V DC	out
5	N.C.	-----
6	cash-drawer on/off signal grand	-----

2.6 Self-test

Self-test checks condition of printer. If the printer prints out the Self-test sample correctly it is working normally. Self-test will print out in order of software version interface and 128 ANK characters.

To start Self-test, press and hold down Paper Outer button while power off until turn on power for 5 seconds then release the Paper Out Button, then Self-test sample will be printed.

2.7 Hexadecimal printing method

Hold down Paper Out button and turn power on into hexadecimal printing mode. Printer will print out all received data in hexadecimal format regardless of command code or ASCII coder.

2.8 Paper feed methods

Press Paper Out botton starting paper feeding; release it, stop paper feeding..

**ESC SO
Printing**

Set Double-width Character

Format:	ASCII:	ESC	SO
	Decimal:	27	14
	Hexadecimal:	1B	0E

Explanation:

All characters after ESC SO within one line will be printed out in double-width. For cancellation use DC4 or return key.

**ESC DC4
Printing**

Cancel Double-width Character

Format:	ASCII:	ESC	DC4
	Decimal:	27	20
	Hexadecimal:	1B	14

Explanation:

Resume normal printing.

**ESC % n
Character**

Enable/Disable User-defined

Format :	ASCII:	ESC	%	n
	Decimal:	27	37	n
	Hexadecimal:	1B	25	n

Explanation:

n=1, for enable user-defined character set value; n=0 for internal character set .Default value n=0.

ESC &

Define User-defined Characters

Format:	ASCII:	ESC	&	S n m [a [p](S x a)](m-n+ 1)
	Decimal:	27	38	S n m [a [p](S x a)](m-n+ 1)
	Hexadecimal:	1B	26	S n m [a [p](S x a)](m-n+ 1)

Explanation:

ESC & is used to define user-defined characters. This command is powerful and complicated. S=3, 32<=n<=m<=126, 0<=a<=12, 0<=p<=225

s is number of vertical bytes. Default value S=3

n is starting ASCII code for user-defined character

m is ending ASCII code for user-defined character.

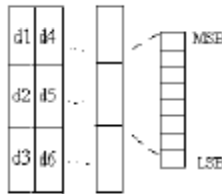
When define one character only, m=n, maximum number of user-defind charcters is 96

a is the number of the horizontal dots

p is the byte of total number of user-defined characters is m-n+1.

User-defined characters remain unchanged till redefining or printer turning off.

The User-defined Character's Bitmap Data as follows:



3.2.4 Special Control Commands

ESC c 5 n

On/off Switch Button

Function

Format : ASCII: ESC c 5 n
 Decimal: 27 99 53 n
 Hexadecimal: 1B 63 35 n

Explanation:

n=1 <SEL> & <LF> buttons functional, while n=0 <SEL> & <LF> buttons nonfunctional Default value n=1.

3.2.5 Graphic Printing Commands

ESC *

Set Bit-Map Graphics

Printing

Format: ASCII: ESC * m n1 n2 [d]k
 Decimal: 27 42 m n1 n2 [d]k
 Hexadecimal: 1B 2A m n1 n2 [d]k

Explanation:

m for setting bit-map graphics mode; n1 n2 for setting number of dots; [d]k for setting content of dots.

m=0, 1, 32, 33.; n1=0~255, n2=0~3; d=0~255;

k=n1 +256 x n2 (m=0,1); k=(n1+256 x n2) x 3 (m=32,33) n Horizontal dots is n1+256 x n2

Horizontal dots is n1+256 x n2

If the number of dot is more than one line, the extra portion will be ignored. (refer to following table)

d is data byte of the bit-map graphics. For 1 of b it means the related dot will be printed and for 0 of bit means the dot not printed. (k for number of data bytes).

m for selection of bit-map graphics mode.

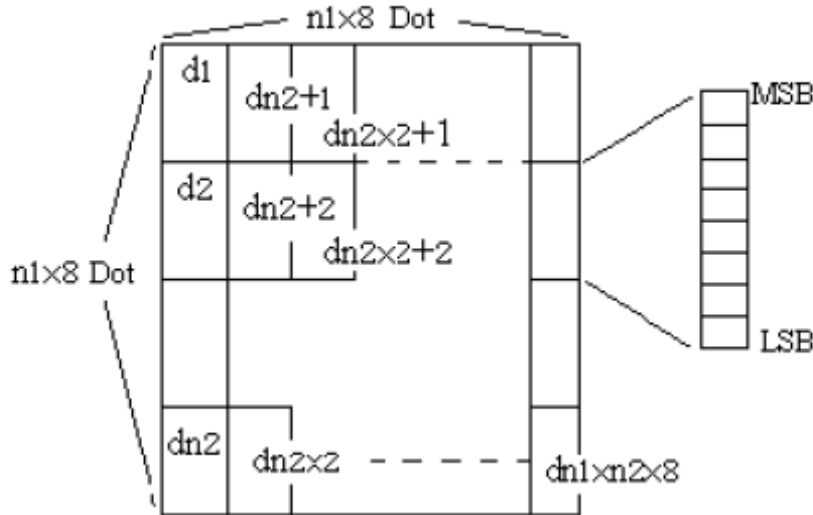
M	Mode	dot	Vertical dot density	Horizontal dot density	max.dot
0	8-dot single density	8	8	68DPI	101DPI
1	8-dot double density	8	68DPI	203DPI	384

$n1=1\sim 48, n2=1\sim 255, n1 \times n2 < 1200, k=n1 \times n2 \times 8$

d is data byte of the down-load bit-map graphics.

horizontal $n1 \times 8$ dots, vertical $n2 \times 8$ dots.

Setting of download bit-map graphics remain valid till new definition or power off.



3.2.6 Other Commands

ESC @
Printer

Initialize

Format:	ASCII:	ESC	@
	Decimal:	27	64
	Hexadecimal:	1B	40

Explanation:

This command initializes printer in following aspects:

- clear data in printing buffer;
- reinstate default value;
- select character printing mode;
- clear user-defined characters.

ESC p
Drawer

Control Cash

Format :	ASCII:	ESC	p	m	n1	n2
	Decimal:	27	112	m	n1	n2
	Hexadecimal:	1B	70	m	n1	n2

Explanation:

This command is to generate a pulse to trigger the opening of the cash drawer.

$n1$ and $n2$ define the duration of the trigger pulse

m=0, 0 < n1 <= n2 <=255

n1 x 2ms is the pulse width in high level for opening of drawer. n2 x 2ms is the pulse width in low level for closing of drawer.

ESC v

Send Printer Status To

Host

Format ASCII: ESC v

Decimal: 27 118

Hexadecimal: 1B 76

Explanation:

This function only valid to printer with RS232 interface. When printer receive the command, it transfers one byte through TXD line of the interface. Definition of said, byte is as follows:

Digit	Function	Value	
		0	1
0	not defined	-----	-----
1	not defined	-----	-----
2	paper test	with paper	without paper
3	not defined	-----	-----
4	not in use	0	0
5	not defined	-----	-----
6	not defined	-----	-----
7	not defined	-----	-----

ESC u

Send Equipment Status To

Host

Format ASCII: ESC u n

Decimal: 27 117 n

Hexadecimal: 1B 75 n

Explanation:

This function only valid to printer with RS232 interface. Default value n=0. When printer receive the command, it transfers one byte through TXD line of the interface. Definition of said byte is as follows:

Bit	Function	Value	
		0	1
0	Cash Drawer on/off Pin	low	high
1	not defined	-----	-----
2	not defined	-----	-----
3	not defined	-----	-----
4	not in use	0	-----
5	not defined	-----	-----
6	not defined	-----	-----
7	not defined	-----	-----

Appendix 1 Specifications

Printing Method: Direct thermal printing

Paper Width: 57.5+/-0.5mm

Printing Width: 48 mm

Printing Density: 8 dots/mm, 384 dots/line

Printing Speed: approx. 50mm/sec.

Reliability:

Printing head: 50km

Under condition:

*Not more than 50 lines each time for non-continuous printing with ANK character size of 12 x 24

*Printing dots at same time per one dot line not more than 25% while vertical printing dots per one character line not more than 11 times.

*Using specified thermal paper

Thermal Paper Roll

Paper Width: 57.5 +/-0.5mm

OD: 80 mm (max.)

ID: 10 mm (min.)

Thickness: 53~60g/m²

Printing Character

ANK Character

12 x 24 dots, 1.25 mm(w) x 3.00 mm(h)

GB Chinese Level 1 & 2

24 x 24 dots, 3.00 mm(w) x 3.00 mm(h)

Serial Interface

RS232C compatible, D-SUB 25 pin (female) connector, RTS/CTS handshaking.

Baud Rate: 9600 bps

Data transfer format: 1 Start Bit + 8 Data Bits + 1 Stop Bit or more

Parallel Interface

8-bit parallel, D-SUB 25 pin (male) connector, BUSY handshaking, paper-end detector.

Cash Drawer Interface

DC12V, 1A, 6-line RJ-11 connector.

Power Supply: 12/24v, 2A

Working Environment:

Operating temperature: 0~45°C Relative humidity: 10 ~ 80%

Storage temperature: -25~70°C Relative humidity: 10 - 90%

Appendix 2 Index of Printing Command

Quick reference	Command	Description
Printing command	LF	Print & Line feed
	ESC J	Print & n dot line feed
Line space command	ESC 2	Set line space at 1/6 inches
	ESC 3	Set line space to n dot (n/137 inches)
Character printing command	ESC !	Set character print mode
	ESC S0	Enable character double-width print
	ESC DC 4	Disable character double-width print
	ESC %	On/off user-defined characters
	ESC &	Set user-defined characters
Special control command	ESC c 5	On/off Push button function
Graph printing command	ESC *	Set bit-map graphics
	GS*	Set down-load bit-map graphics
	GS/	Print down-load bit-map graphics
Other command	ESC @	Initialize printer
	ESC p	Control cash drawer
	ESC v	Send printer status to Host
	ESC u	Send equipment status to Host

Appendix 3 Index of Printing Character

	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	ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	ä	å
9	é	æ	œ	ô	ö	ò	û	ù	ÿ	ö	ü	¢	£	¥	℞	f