FCL Components Thermal Printer
FTP-639USL100 series

FCL Components 3" 24V Driving Flexible Module Printer (FMP)

Overview

The FTP-639USL Series is 24V driven receipt printer unit with cutter for 3 inch wide paper. The unit has our high-speed FTP-639MCL mechanism, cutter and control board, with an integrated paper feed and built-in paper guide section.

The receipt printer unit is most suitable for applications such as Kiosk, ATM, receipt, label, and ticket issuing printers for various other equipment.

FTP-639USL104

Features

- External presenter option
- Ultra high-speed (200mm/sec.)
- Medium duty united (mounting is easy)
- Auto cutter included
- Paper near-end detection function
- Up to 10-inch paper roll diameter
- Rear paper auto loading
- Paper jam detection
- Prints 2-D barcodes

FTP-639USL114

■ Designation

Item		Part Number	Status	Comment
Printer module interface	USB (ver. 2.0)	FTP-639USL103	DISCONTINUED	without presenter and with paper arm
	Serial (RS-232C) / USB (ver. 2.0)	FTP-639USL104	ACTIVE	
	USB (ver. 2.0)	FTP-639USL113	DISCONTINUED	without presenter and without paper arm
	Serial (RS-232C) / USB (ver. 2.0)	FTP-639USL114	ACTIVE	
	USB (ver. 2.0)	FTP-639USL201	DISCONTINUED	with presenter and with paper arm
	Serial (RS-232C) / USB (ver. 2.0)	FTP-639USL202	DISCONTINUED	
Interface cable	USB interface	FTP-629Y301		
	RS-232C Interface	FTP-629Y302		
	Power for logic, head, motor	FTP-629Y603		

■ Specifications

Item			Specifications		
Part number			FTP-639USL103/104	FTP-639USL113/114	FTP-639USL201/202
Printing method			Thermal-sensitive line dot method		
Dot structure			576 dots/line		
Dot pitch (horizontal)			0.125 mm (dot density:8 dots/mm)		
Effective printing area			72 mm		
Paper	Width		80 mm (standard setting) 82.5 mm paper is available with optional paper guide)		
	Thickness		60 to 100 μm (depending on paper specifications)		
	Diameter		Φ150 mm (standard setting, inner diameter Φ 25.4 mm) *1		
Cutting type			Full or partial	Full or partial	Full
Power supply			24VDC ±10% approx. 5.7A*2		24VDC ±10% approx. 7A*2
Printing speed			Max. 200 mm/s (1600 dotlines/s) (High speed batch image printing, at 25°C)		
Printing digit number			Max. 72 (at 8 x 16 one byte characters)		
Printing specifications	Printing mode		Line mode		
	Charac-ter	Types	Alphanumeric KANA: 159, Registered: 94, International: 195, OCR I: 103, OCR II: 23, OCR IV: 103, JIS KANJI: approximately 6800, Extended: 11		
	Barcode types	1 dimension	UPC-A, UPC-E, JAN(EAN)13, JAN(EAN)8, CODE39, ITF, CODABAR, CODE128, GS1 DataBar-14, GS1 DataBar-14 Truncated		
		2 dimension	QR, PDF417, GS1 DataBar Limited, GS1 DataBar-14 stacked, GS1 DataBar-14 Omnidirectional, GS1 DataBar-14 Expanded		
Character composition, dimensions (H x W), Number of characters			24 x 12 dots (3.0 x 1.5 mm), 48 columns 24 x 24 dots (3.0 x 3.0 mm), 24 columns 16 x 8 dots (2.0 x 1.0 mm), 72 columns 16 x 16 dots (2.0 x 2.0 mm), 36 columns OCR I: 24 x 40, 24 columns OCR III: 24 x 45, 24 columns OCR IV: 36 x 60, 16 columns Extended: 24 x 48, 24 columns		
Interface			Serial (RS232C), USB		
Power supply	For head		24VDC ±5%, voltage Current: average*4 ( ): Peak 12.5% printing ratio 1.0 (2.0) A (at 200 mm/s printing speed,1 division image) 0.8 (1.1) A (at 125 mm/s printing speed, 2 divisions) 0.6 (1.0) A (at 80 mm/s printing speed, 2 divisions) 0.6 (2.0) A (at 80 mm/s printing speed, automatic divison)		
	For printer motor		24VDC ±5%, 1.3 A maximum, 1.0 A average		
	For presenter		24VDC ±5%, 1.3 A maximum, 1.0 A average		
	For cutter		24VDC ±5%, 1.4 A maximum		
	For logic		5VDC ±5%, 0.2 A maximum (converted from 24V)		
Dimensions (WxDxH)	No arm		n/a	112.6 x 94.5 x 75.1	n/a
	Arm vertical		112.6 x 119.8 x 75.1 mm	n/a	123.0 x 145.2 x 75.1 mm
	Arm horizontal		112.6 x 215.7 x 99.6 mm*3	n/a	123 x 264.5 x 99.6 mm)*3
Presenter (receipt length)			n/a	n/a	65 to 254 mm

*1: Φ 83 mm paper can be used by changing paper feed shaft. Max. Φ 254 mm (10-inch) paper can be used by using a bigger diameter paper holder.
*2: Super high speed mode, batch printing, at printing rate 25%
*3: Excludes protrusions (screws, dumper, etc.) and cables
*4 : There may be exceptions

Item			Specifications		
Weight (approximately, excluding paper)			990 g (with arm)	760 g (without arm)	1200 g (with arm & presenter)
Part number			FTP-639USL103/104	FTP-639USL113/114	FTP-639USL201/202
Expected life	Head	Pulse resistance	100 milion pulse/dot (using FCL Components' standard driving method)		
		Wear resistance	100 km (at max. 12.5% printing ratio, with PD150R (Oji) paper		
	Cutter		1, 000, 000 cuts with PD150R (Oji) paper, cutting frequency min. 3s/cut, at 20°C ± 5°C		
Environmental conditions	Operating temperature		-20°C to +60°C[5]	-20°C to +60°C[5]	0°C to +50°C[5]
	Operating humidity		10 to 85% RH (no condensation)		
	Storage temperature		-25°C to +65°C	-25°C to +65°C	-20°C to +60°C
	Storage humidity		5 to 90% RH (no condensation)		
Detection	Head temperature		By thermistor (applied energy control, abnormal temperature detection)		
	Paper out/Mark detect		By photointerrupter		
	Platen open		By photointerrupter		
	Near end paper		By mechanical switch		
Recommended thermal sensitive paper	Standard paper		TF-60KS-E (Nippon paper), FTP-020P0104 (58mm), PD150R (Oji paper), FTP-020P0701 (58mm)		
	Medium term paper		TF-60KS-F1 (Nippon paper), FTP-020P0102 (58mm) PD170R (Oji paper) P220VBB-1 (Mitsubishi paper)		
	Long term paper		PD160R-N (Oji paper)		
Paper diameter			Max. 150 mm		

[5] : Color density is guaranteed: +5°Cto +40°C with standard paper

■ Dimensions

• External dimension chart of the control board
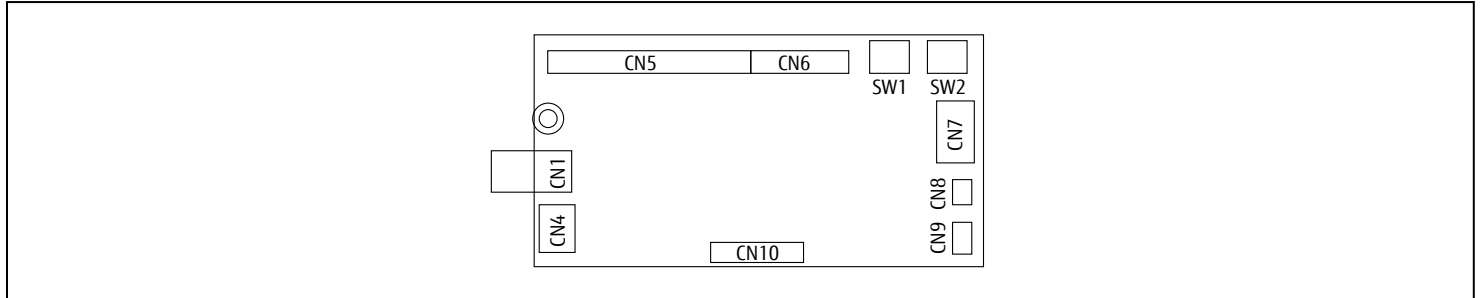
• Connector types of control board for printer and cutter

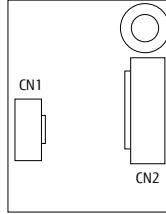| No.	Name	Function	Remarks
CN1	Power connector	Connect +24V power supply	-
CN2	RS-232 connector	Connect RS-232 interface	depends on model
CN4	USB interface connector	Connect USB interface	depends on model
CN5	Thermal head connector	Connect thermal head	-
CN6	Paper feed motor	Connect paper feed motor	-
CN7	Cutter motor connector	Connect cutter motor	-
CN8	Near end sensor connector	Connect near end switch or sensor	-
CN9	External sensor connector	Connect external sensor	optional
CN10	Presenter connector	Connect control board	depends on model

• Presenter control board dimension
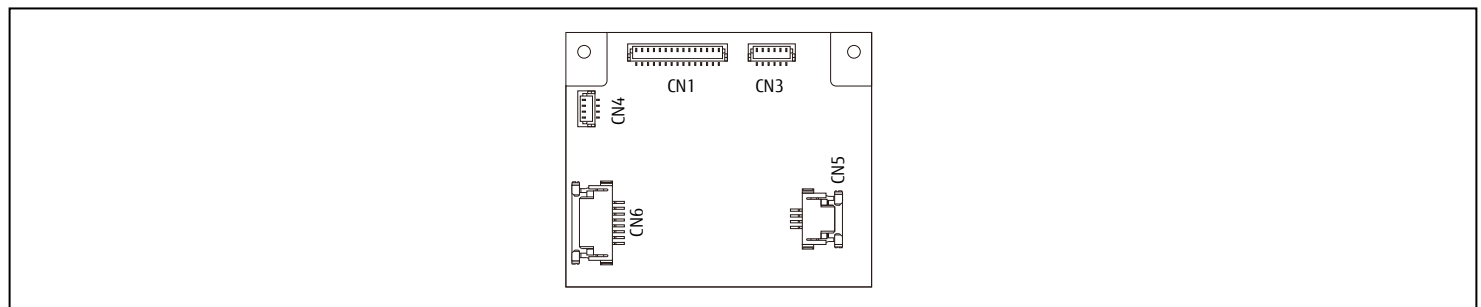
• Connector types of control board for presentor

No.	Name	Function	Remarks
CN1	Control board connector	Connect control to board	-
CN3	Paper sensor connector	Connect to paper feed sensor	-
CN5	Paper feed motor connector	Connect to paper feed motor	-
CN6	Motor and sensor connector	Connect to motor and sensor	-

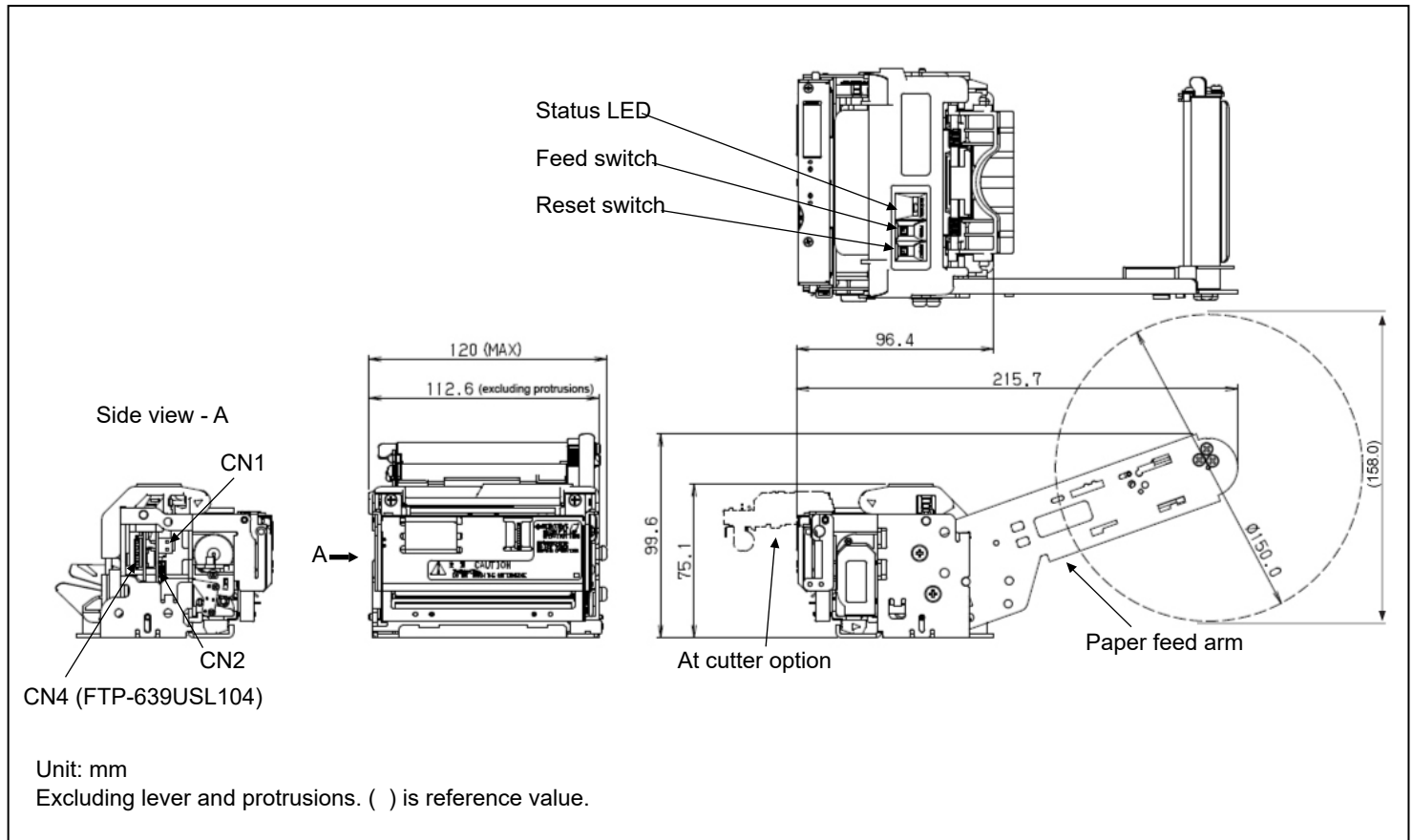- External view of the RS-232C interface circuit board

- RS-232C interface connector types

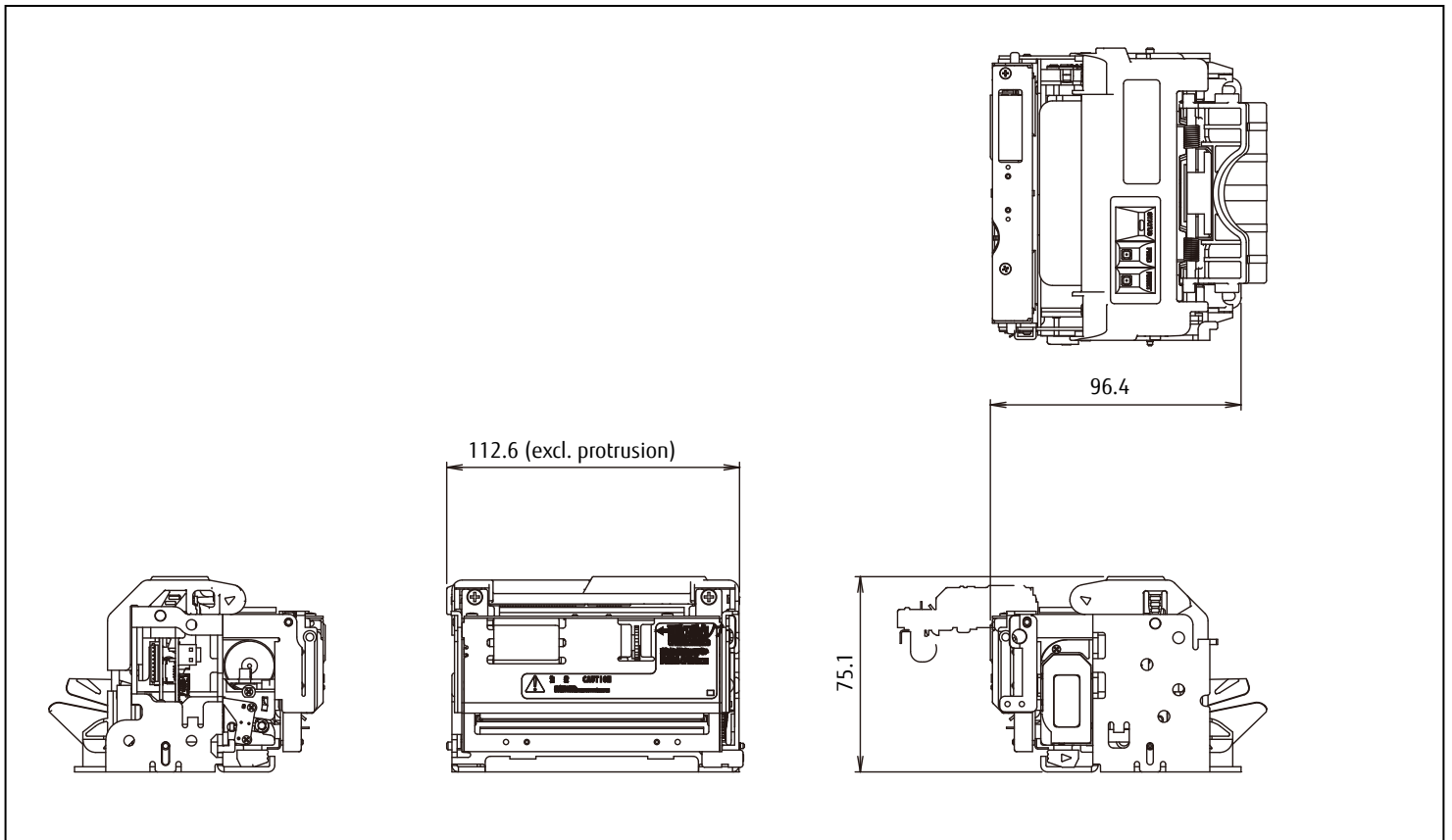| No.	Name	Function	Remarks
CN1	Internal connection connector	Connector for internal connection	-
CN2	RS-232C interface connector	Connector for connecting RS-232C interface	-

■ Dimensions
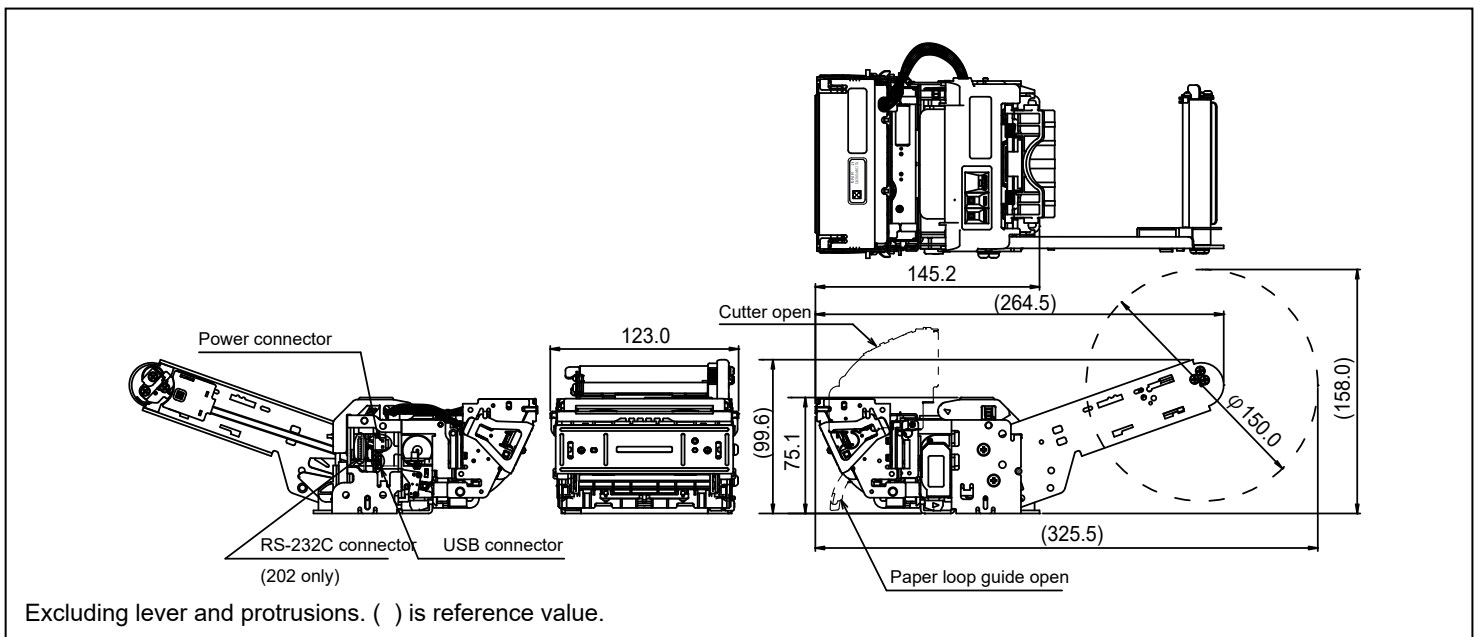
- Printer without presenter and standard arm - FTP-639USL103/104

Status LED

Feed switch

Reset switch

96.4

215.7

(158.0)

120 (MAX)

112.6 (excluding protrusions)

Side view - A

CN1

A→

99.6

75.1

Ø150.0

CN2

CN4 (FTP-639USL104)

At cutter option

Paper feed arm

Unit: mm
Excluding lever and protrusions. ( ) is reference value.

■ Dimensions
• Modular printer without presenter and standard paper roll - FTP-639USL113/114

112.6 (excl. protrusion)

96.4

75.1

■ Dimensions
• Modular printer with presenter - FTP-639USL201/202

Power connector

RS-232C connector   USB connector
(202 only)

123.0

145.2

Cutter open

(264.5)

(99.6)

75.1

Ø150.0

(158.0)

(325.5)

Paper loop guide open

Excluding lever and protrusions. ( ) is reference value.

■ Connector specifications

No.	Name
CN1	Power connector
CN2	USB interface connector
CN4	RS-232C interface connector

■ Connector pin as signment

• CN1: Power connector
   Connector used in the printer: B2PS-VH(LF)(SN) (JST)
   Recommended mating connector: VHR-2 (JST)

Pin no.	Signal	I/O	Description	Pin no.	Signal	I/O	Description
1	24V	I	Power supply	2	GND	-	Power ground

■ Connector pin assignment

• CN2: USB interface connector
   Connector used in the printer: 51387-0530 (Molex)
   Recommended mating connector: UX40-MB-5P (Hirose)

Pin no.	Signal	I/O	Description	Pin no.	Signal	I/O	Description
1	VBUS	I	Bus power supply	2	D-	I/O	Differential data input/output D-
3	D+	I/O	Differential data input/output D+	4	NC	-	Not connected
5	GND	-	Signal ground				

■ Connector pin assignment

• CN4: RS-232C interface connector
   Connector used in the printer: S9B-ZR-SM4A-TF (LF) (JST)
   Recommended mating connector: ZHR-9 (JST)

Pin no.	Signal	I/O	Description	Pin no.	Signal	I/O	Description
1	FG	-	Frame ground	2	RXD	I	Incoming data
3	TXD	O	Outgoing data	4	DTR	O	Request to send data (data terminal ready)
5	GND	-	Signal ground	6	DSR	I	Consent to send data (data set ready)
7	/STCLIN	I	Detection setting signal	8	/INPRM	I	Initialization requirement signal
9	/ATF	I	Paper feed signal				

· Please note that connectors used in this printer are subject to change without prior notice.
· Please confirm compatability when using equivalent mating connector(s).

■ Host interface specifications

Type	Specification
USB V2.0	Data transmission speed: Full speed mode 12Mbps Data input/output format: Differential input/output
RS-232C	Data transmission speed: 19,200 (460,800; 230,400; 155,200; 38,400; 9,600) bps. Setting can be changed with command Synchronization/transmission method: asynchronous method, full-duplex transmission Flow control: RTS(DTR)/CTS(DSR) signal or XON/XOFF. Can be changed with command Input/output level: RS-232C level

■ Connector pin assignments of printer mechanism (FPC)

No	Signal	Content
1	HT	Horizontal tab
2	LF	Line feed
3	FF	Forms feed
4	ESC FF	Data print in page mode
5	ESC EM n	Auto loading amount setting
6	ESC RS	Black-white reversed printing specification
7	ESC US	Black-white reversed printing cancellation
8	ESC SP n	Character spacing setting
9	ESC ! n	Printing mode setting
10	ESC $ nL nH	Horizontal absolute position setting
11	ESC % n	Downloaded character specification/cancellation
12	ESC & y c1 c2 x d1~dn	Downloaded character definition
13	ESC * m nL nH d1~dk	Bit image print
14	ESC - n	Underline setting
15	ESC 2	Set default line spacing
16	ESC 3 n	Line pitch setting
17	ESC ? n	Downloaded character deletion
18	ESC @	Printer reset
19	ESC A n	Line spacing setting
20	ESC C n	Page length setting in line mode
21	ESC D n1~nk NUL	Horizontal tab position setting
22	ESC E n	Emphasis printing specification/cancella-tion
23	ESC J n	Print and forward paper feed
24	ESC K n	Print and backward paper feed
25	ESC L	Page mode selection
26	ESC R n	International character specification
27	ESC S	Line mode selection
28	ESC T n	Print direction setting in page mode
29	ESC V n	90° clockwise rotation specification/cancellation
30	ESC W xL xH yL yH dxL dxH dyL dyH	Print area setting in page mode
31	ESC X m n	Motor off time setting
32	ESC \ nL nH	Horizontal relative position setting
33	ESC a n	Positional alignment
34	ESC c 1 n	Internal processing setting
35	ESC c 5 n	External input signal valid/ invalid setting
36	ESC d n	Print and feed paper n lines
37	ESC e n	Print and back forward feed paper n lines
38	ESC s n	Print speed mode setting
39	ESC t n	Character code table selection
40	ESC { n	Upside-down printing specification/cancellation

No	Signal	Content
41	ESC DEL n	Nonvolatile memory deletion
42	FS ! n	Kanji printing mode collective specification
43	FS &	Kanji printing mode specification
44	FS * m nL nH d1~dk	High-speed batch image print
45	FS - n	Kanji underline specification/cancellation
46	FS .	Kanji printing mode cancellation
47	FS 2 c1 c2 d1~dn	User defined character definition
48	FS 9 n	Detection function valid/invalid setting
49	FS C n	Kanji code system selection
50	FS E n	Standard energy setting
51	FS S n1 n2	Kanji spacing setting
52	FS W n	Specify/cancel double-tall, double wide Kanji characters
53	FS r n	Reply parameter setting
54	GS ! n	Select character size
55	GS $ nL nH	Vertical absolute position setting in page mode
56	GS & m x yL yH d1~dn	Downloaded image definition
57	GS ' m n	Downloaded image print
58	GS (E pL pH fn a b8~b1 (fn=3)	Memory switch setting
59	GS (E pL pH fn a b8~b1 (fn=4)	Memory switch transmission
60	GS (E pL pH fn d1~d9 (fn=67)	RS-232C communication setting
61	GS (E pL pH fn d1~d9 (fn=68)	USB communication setting
62	GS (E pL pH fn a n (fn=70, a=5)	Mark width setting
63	GS (E pL pH fn a n (fn=72, a=1)	Language model setting
64	GS (E pL pH fn a n (fn=73, a=1)	Language model transmission
65	GS (K pL pH fn	Print control setting
66	GS (K pL pH fn n (fn=49)	Print density setting
67	GS (K pL pH fn n (fn=50)	Print speed setting
68	GS (K pL pH fn n (fn=97)	Number of head division setting
69	GS (I pL pH fn a (fn=65, a=65)	Firmware information transmission
70	GS <	Mark detection execution
71	GS A m n	After-mark-detection head distance setting
72	GS E n	Print quality setting
73	GS H n	HRI character printing position selection
74	GS L nL nH	Left margin setting
75	GS V m n	Cut paper
76	GS W nL nH	Print area width setting
77	GS ¥ nL nH	Vertical relative position setting in page mode
78	GS a n	Automatic status transmission setting
79	GS e m n	Bar code width setting
80	GS f n	HRI character font selection
81	GS h n	Bar code height setting
82	GS k m n d1~dn	Bar code print
83	GS k m k1 k2 k3 k4 {p1 d(1,1)~d(1,j)}~{pi d(i,1)~d(i,j)} NUL	QR Code print

No	Signal	Content
84	GS k m k1 k2 k3 k4 nL nH d1~dn	PDF417 print
85	GS k m n k pL pH d1~dp	Bar code (GS1 DataBar) print
86	GS k m n k1 k2 k3 k4	Bar code (GS1 DataBar) setting
87	GS s	Paper check
88	GS t + n	Paper exit
89	GS w n	Set bar code horizontal size
90	GS x + n	Paper retracting
91	[1]GS y [2]GS z	[1] Preparation for paper exit [2] Retracting paper

■   Options

- Cables

Type		Part Number	Connector	Length
Interface cable	USB	FTP-629Y301	USB A - USB miniB	Approx. 1m (39.4 inches)
	RS-232C	FTP-629Y302	ZHR-9 (JST) Connector is assembled at one side (printer side)	Approx. 0.5m (19.4 inches)
Power supply cable		FTP-629Y603	VHR-2 (JST) Connector is assembled at one side (printer side)	Approx. 0.5m (19.4 inches)