TM-T82

Technical Reference Guide

EPSON®
EXCEED YOUR VISION
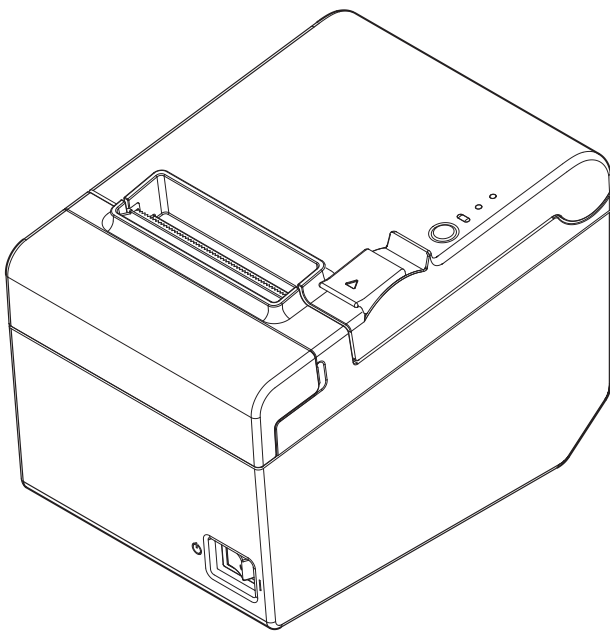
Product Overview

Describes features and general specifications for the product.

Setup

Describes setup and installation of the product and peripherals.

Application Development Information

Describes how to control the printer and necessary information when you develop applications.

Handling

Describes how to handle the product.

Appendix

Describes interfaces, connectors, setting conditions for software setting mode, and character code tables.

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Cautions

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ESC/POS® Command System

EPSON ESC/POS is a proprietary POS printer command system that includes patented or patent-pending commands. ESC/POS is compatible with most EPSON POS printers and displays.

ESC/POS is designed to reduce the processing load on the host computer in POS environments. It comprises a set of highly functional and efficient commands and also offers the flexibility to easily make future upgrades.

For Safety

The symbols in this manual are identified by their level of importance, as defined below. Read the following carefully before handling the product.

⚠ **WARNING**	You must follow warnings carefully to avoid serious bodily injury.
⚠ **CAUTION**	Provides information that must be observed to prevent damage to the equipment or loss of data. • Possibility of sustaining physical injuries. • Possibility of causing physical damage. • Possibility of causing information loss.
CAUTION	Provides information that must be observed to avoid damage to your equipment or a malfunction.
NOTE	Provides important information and useful tips.

Warnings

⚠️ **WARNING**	• To avoid risk of electric shock, do not set up this product or handle cables during a thunderstorm

⚠️
WARNING

- To avoid risk of electric shock, do not set up this product or handle cables during a thunderstorm
- **Never insert or disconnect the power plug with wet hands.**
  Doing so may result in severe shock.
- **Handle the power cable with care.**
  Improper handling may lead to fire or electric shock.
  * Do not modify or attempt to repair the cable.
  * Do not place any heavy object on top of the cable.
  * Avoid excessive bending, twisting, and pulling.
  * Do not place the cable near heating equipment.
  * Check that the plug is clean before plugging it in.
  * Be sure to push the plug all the way in.
- **Be sure to use the specified power source.**
  Connection to an improper power source may cause fire or shock.
- **Do not place multiple loads on the power outlet.**
  Overloading the outlet may lead to fire.
- **Shut down your equipment immediately if it produces smoke, a strange odor, or unusual noise**.
  Continued use may lead to fire. Immediately unplug the equipment and contact qualified service personnel.
- **Never attempt to repair this product yourself.**
  Improper repair work can be dangerous.
- **Never disassemble or modify this product.**
  Tampering with this product may result in injury or fire.
- **Do not allow foreign matter to fall into the equipment.**
  Penetration by foreign objects may lead to fire.
- **If water or other liquid spills into this equipment, do not continue to use it.**
  Continued use may lead to fire. Unplug the power cord immediately and contact qualified service personnel.
- **Do not use aerosol sprayers containing flammable gas inside or around this product.**
  Doing so may cause fire.

Cautions

⚠️ **CAUTION**	• **Do not connect cables in ways other than those mentioned in this manual.** Different connections may cause equipment damage or fire. • **Be sure to set this equipment on a firm, stable, horizontal surface.** The product may break or cause injury if it falls. • **Do not use this product in locations subject to high humidity or dust levels.** Excessive humidity and dust may cause equipment damage or fire. • **Do not place heavy objects on top of this product. Never stand or lean on this product.** Equipment may fall or collapse, causing breakage and possible injury. • **Take care not to injure your fingers on the manual cutter** ∗ When you remove printed paper ∗ When you perform other operations such as loading/replacing roll paper • **Do not open the roll paper cover without taking the necessary precautions, as this can result in injury from the autocutter fixed blade.** • **To ensure safety, unplug this product before leaving it unused for an extended period.**

Restriction of Use

When this product is used for applications requiring high reliability/safety, such as transportation devices related to aviation, rail, marine, automotive, etc.; disaster prevention devices; various safety devices, etc.; or functional/precision devices, etc., you should use this product only after giving consideration to including fail-safes and redundancies into your design to maintain safety and total system reliability. Because this product was not intended for use in applications requiring extremely high reliability/safety, such as aerospace equipment, main communication equipment, nuclear power control equipment, or medical equipment related to direct medical care, etc., please make your own judgment on this product's suitability after a full evaluation.

About this Manual

Aim of the Manual

This manual was created to provide information on development, design, and installation of POS systems and development and design of printer applications for developers.

Manual Content

The manual is made up of the following sections:

Contents

Product Overview 11

Product Overview

This chapter describes features and general specifications of the product.

Features

Printing

- High speed receipt printing is possible (150 mm/s maximum).
- Shifting from 80 mm width paper printing to 58 mm width paper printing is available.
- Paper-saving function is supported.

Handling

- Easy drop-in paper loading

Software

- Command protocol is based on the ESC/POS® Proprietary Command System.
- Windows printer drivers, OPOS ADK, OPOS for .NET ADK, JavaPOS ADK and other drivers (Linux CUPS, Mac driver) are available.
- Printing of bar codes and two-dimensional symbols are supported.
- A maintenance counter function is supported.
- 42-column mode is supported.
- TM-T81 emulation mode is supported.

Interface

- Serial, parallel, and Ethernet interface models are available.
- For serial or parallel interface models, USB interface is additionally available.

Others

- Various installation layouts (horizontal, vertical, and wall-hanging installation) are selectable.
- Optional external buzzer is available.

Product Configurations

Interface

- Serial + USB interface model
- Parallel + USB interface model
- Ethernet interface model

Colors

- ECW (Epson Cool White)
- EDG (Epson Dark Gray)

Accessories

Included

- Roll paper (for operation check)
- Power switch cover
- Power switch waterproof cover
- Wall hanging bracket
- Screws for wall hanging bracket
- Rubber feet for vertical installation
- Control panel label for vertical installation
- 58-mm width paper guide plate
- AC adapter
- USB cable (Except for Ethernet interface model)
- TM-T82 Software & Documents Disc
- Setup Guide
- Warranty certificate*

* May not be included depending on the model.

Options

- Affixing tape for fixing the printer (Model: DF-10)
- External buzzer unit (Model: OT-BZ20)

Part Names and Functions

Roll paper cover

Control panel

Error

Paper

Feed

Cutter cover

Cover open lever

Power switch cover

Manual cutter
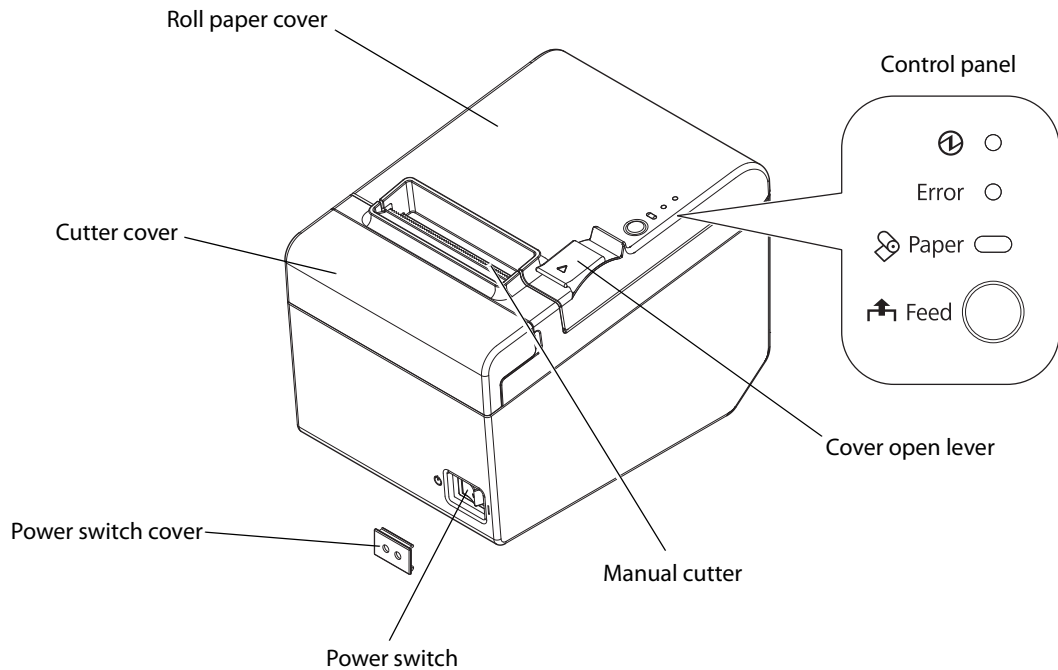
Power switch

Power Switch

Turns the printer on or off. The marks on the switch: (⏻ : OFF/ | : ON)

CAUTION To turn the printer on immediately after turning the printer off, wait until the LED lights go off, and then turn the power on.

NOTE Before turning the printer off, it is recommended to send a power-off command to the printer. If you use the power-off sequence, the latest maintenance counter values are saved. (Maintenance counter values are usually saved every two minutes.)
For information about ESC/POS commands, see the Product Specifications.

Roll paper cover/Cover open lever

• Use the cover open lever and open the roll paper cover to install or replace the roll paper.

• Do not open the roll paper cover while printing is in progress or the auto-cutter is in operation.

Control Panel

⊕	○——	Power LED
Error	○——	Error LED
⊗ Paper	⊂⇒——	Paper LED
⊕ Feed	◯——	Feed button
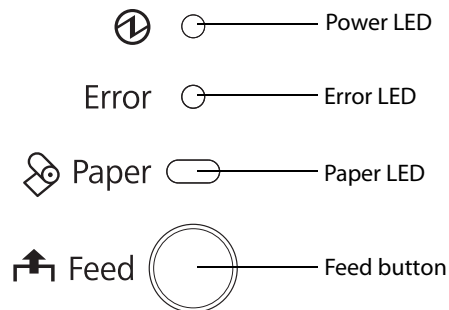
> **NOTE**
>
> When installing the printer vertically or hanging the printer on a wall, be sure to attach the included control panel label for vertical installation on the roll paper cover. The control panel label for vertical installation is upside down.

⊕ Power LED (green)

Lights when the power supply is on.

Error LED (orange)

- Lights after the power is turned on or after a reset (offline). Automatically goes out after a while to indicate that the printer is ready.
- Lights when printing has stopped (offline) due to paper end or paper near end.
- Lights when the roll paper cover is open (offline).
- Flashes when an error occurs. (For information about the flashing patterns, see "Error Status" on page 18.)

⊗ Paper LED (orange)

- Lights when the roll paper is nearly out or when the roll paper is out.
- Flashes when Self-test standby state.
- Flashes when macro execution standby state.

⊕ Feed button

Pressing this button once feeds the roll paper by one line. Holding this button down feeds the roll paper continuously.

> **NOTE**
> - Whether to let printing stop when the roll paper is nearly out can be selected by a command. For information about ESC/POS commands, see the Product Specifications.
> - Whether to let the Paper LED light when the roll paper is nearly out can be selected with the memory switch. To set the memory switch, see "Setting the Memory Switches/Receipt Enhancement" on page 54.
> - Enabling/disabling of Feed button can be selected by a command. If the command is set to disable this button, it does not function. For information about ESC/POS commands, see the Product Specifications.

Offline

The printer automatically goes offline under the following conditions:

- During power on until the printer is ready
- During the self-test
- While roll paper is fed using the Feed button
- When the roll paper cover is open
- When the printer stops printing due to a paper near end or paper end
- During a macro execution standby state
- When an error has occurred (See "Error Status" on page 18.)

> **NOTE**
> Whether to let printing stop when the roll paper is nearly out can be selected by a command. For information about ESC/POS commands, see the Product Specifications.

Connectors

All cables are connected to the connector panel on the lower rear of the printer.

For serial + USB models and parallel + USB models

UIB
(Universal interface board)

RS-232

IEEE 1284

DK (Drawer kick-out) connector

Power supply connector

USB
(Built-in)

For ethernet interface models

UIB
(Universal interface board)

10BASE-T/100BASE-TX

DK (Drawer kick-out) connector

Power supply connector
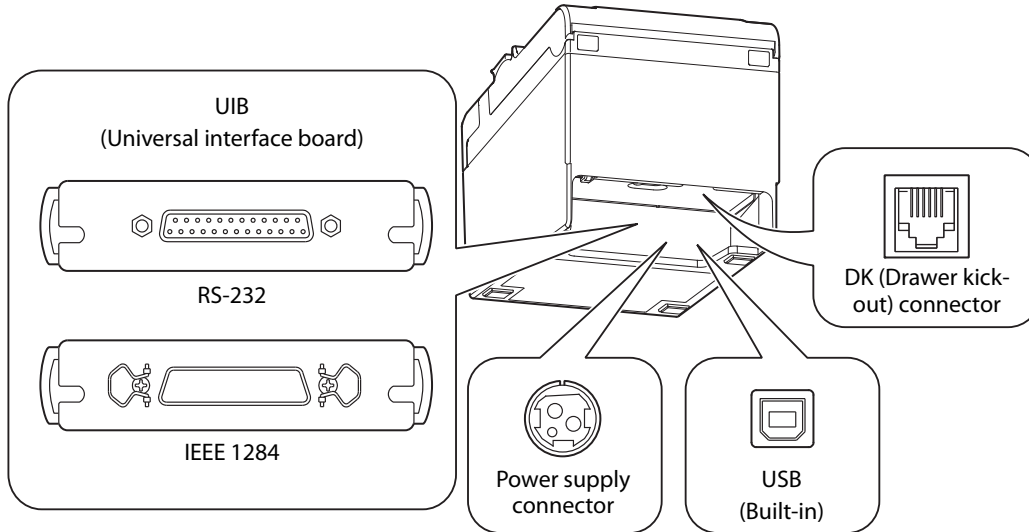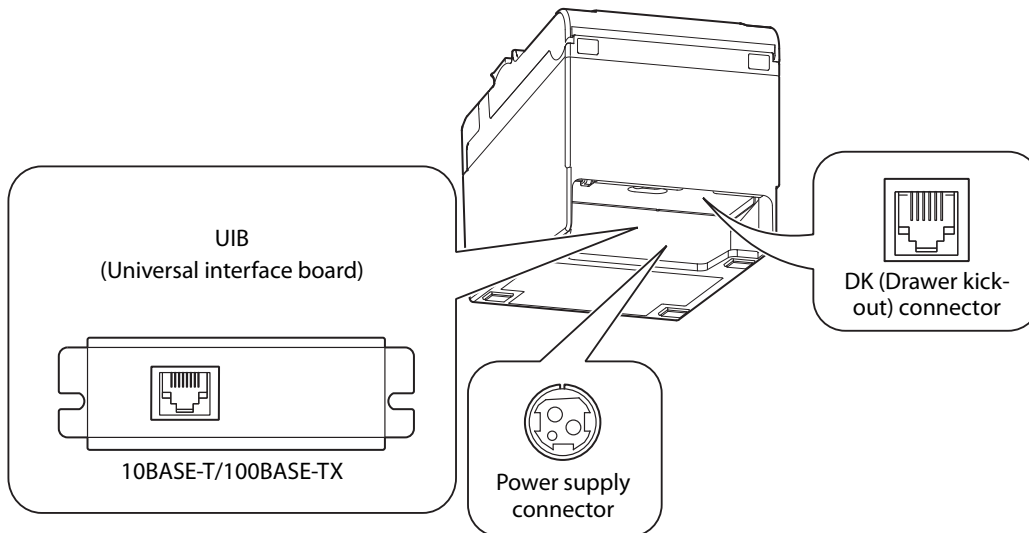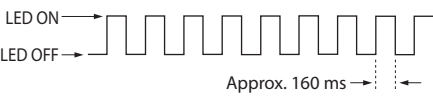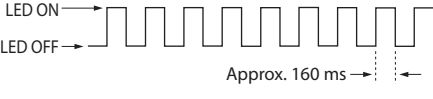
- DK (Drawer kick-out) connector:

  Connects the cash drawer or the optional external buzzer.

  See "Connecting the Cash Drawer" on page 68, and "Connecting the Optional External Buzzer" on page 66.

- Interface connector:

  Connects the printer with the host computer interface.

  See "Connecting the Printer to the Host Computer" on page 44.

- Power supply connector:

  Connect the AC adapter.

  See "Connecting to the Power Source" on page 52.

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Error Status

When an error occurs, the printer stops operating, goes offline, and flashes the Error LED. There are three possible error types: automatically recoverable errors, recoverable errors, and unrecoverable errors.
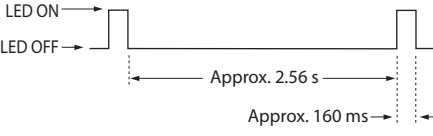
Automatically Recoverable Errors

They can be recovered easily, as described below.

Error	Error description	Error LED flashing pattern	Recovery measure
Roll paper cover open error	The roll paper cover was opened during printing.	LED ON / LED OFF — Approx. 160 ms	Recovers automatically when the roll paper cover is closed.
Print head temperature error	A high temperature outside the head drive operating range was detected.	LED ON / LED OFF — Approx. 160 ms	Recovers automatically when the print head cools.

Recoverable Errors

They can be recovered easily by turning the power on again or sending an error recovery command from the driver after eliminating the cause of the error.

Error	Error description	Error LED flashing pattern	Recovery measure
Autocutter error	Autocutter does not work correctly.	LED ON / LED OFF — Approx. 2.56 s — Approx. 160 ms	Remove the jammed paper or foreign matter in the printer, close the roll paper cover, send the error recovery command, or turn the power on again.
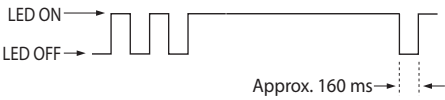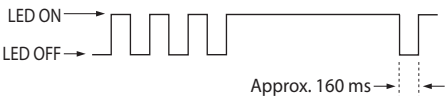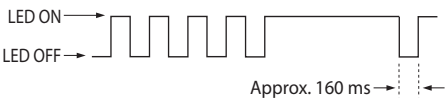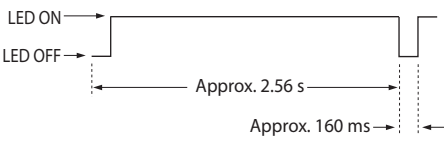
Unrecoverable Errors

If the same error occurs again even after turning the power back on, contact qualified service personnel.

⚠ **CAUTION**	**Turn off the power immediately when an unrecoverable error occurs.**

Error	Error description	Error LED flashing pattern
Memory R/W error	After R/W checking, the printer does not work correctly.	LED ON / LED OFF — Approx. 160 ms
High voltage error	The power supply voltage is extremely high.	LED ON / LED OFF — Approx. 160 ms
Low voltage error	The power supply voltage is extremely low.	LED ON / LED OFF — Approx. 160 ms
CPU execution error	The CPU is executing an incorrect address.	LED ON / LED OFF — Approx. 160 ms
Internal circuit connection error	Internal circuits are not connected correctly.	LED ON / LED OFF — Approx. 2.56 s — Approx. 160 ms

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NV Memory (Non-Volatile Memory)

The printer's NV memory stores data even after the printer power is turned off. NV memory contains the following memory areas for the user:

- NV graphics memory
- User NV memory
- Memory switches
- R/E (Receipt Enhancement)
- User-defined page
- Maintenance counter

> **CAUTION**   As a guide, NV memory rewriting should be used 10 times or less a day when you program applications.

NV Graphics Memory

Graphics, such as shop logos to be printed on receipts, can be registered. Even with a serial interface model whose communication speed is low, high speed graphic printing is possible.

Use the TM-T82 Utility to register graphics. You can also use the TM-T82 Utility or the NV graphics information print mode to print and confirm the registered graphics.

> **NOTE**
> - For information about the TM-T82 Utility, see the TM-T82 Utility User's Manual.
> - For information about how to use the NV graphics information print mode, see "NV Graphics Information Print Mode" on page 83.

User NV Memory

You can store and read text data for multiple purposes, such as for storing a note including customizing or maintenance information of the printer.

Use ESC/POS commands to store and read the text data.

> **NOTE**   For information about ESC/POS commands, see the Product Specifications.

Memory Switches

With the memory switches, which are software switches for the printer, you can configure various settings of the printer. For information about the memory switch, see "Setting the Memory Switches/Receipt Enhancement" on page 54.

R/E (Receipt Enhancement)

Graphics, such as shop logos can be printed on top or bottom of receipts by setting R/E (Receipt Enhancement). For information about R/E, see "Setting the Memory Switches/Receipt Enhancement" on page 54.

User-defined Page

You can store character data in the user-defined page (character code table: page 255) so that you can also print characters not resident in the printer.

> **NOTE**
> - For the character code table, see "Character Code Tables" on page 111.
> - User-defined page is not supported when Thai/Vietnamese is selected.

Maintenance Counter

With this function, printer information, such as the number of lines printed, the number of autocuts, and printer operation time after the printer starts working, is automatically stored in NV memory. You can read the information with the Status API of the APD, OPOS ADK, or ESC/POS commands to use it for periodical checks or part replacement.

> **NOTE**
> You can also check the head running length and number of times of autocutting with the self-test (see "Self-test Mode" on page 82.) and the TM-T82 Utility.

Product Specifications

Printing method		Thermal line printing
Printing direction		Unidirectional with friction feed
Paper feed speed		150 mm/s {5.90"/s} (continuous paper feeding with the Feed button)
Cutting method		Partial cut (cutting with one point in left edge left uncut)
Interface	Serial interface models	Serial (RS-232), USB [USB 2.0, Full-speed (12 Mbps)]
	Parallel interface models	Parallel (IEEE1284), USB [USB 2.0, Full-speed (12 Mbps)]
	Ethernet interface models	Ethernet (10BASE-T/100BASE-TX)
Buffers	Receive buffer	4 KB/45 bytes (selectable using the memory switch)
	Downloaded buffer (user-defined characters and user-defined images)	12 KB
	Macro buffer	2 KB
	NV graphics memory	256 KB
	Download graphics memory	208 KB
	User NV memory	1KB
Barcode/ two-dimensional symbol printing		UPC-A, UPC-E, JAN 8 (EAN 8), JAN 13 (EAN 13), CODE 39, ITF, CODABAR (NW-7), CODE 93, CODE 128, GS1-128, GS1 DataBar Omnidirectional, GS1 DataBar Truncated,GS1 DataBar Stacked, GS1 DataBar Stacked Omnidirectional,GS1 DataBar Limited, GS1 DataBar Expanded,GS1 DataBar Expanded Stacked, PDF417, QR CODE, MaxiCode, Composite Symbology
Operating voltage		DC 24V ± 7%
Life	Printer mechanism	15,000,000 lines (printing + paper feeding)
	Thermal head	100 million pulses,160 km
	Autocutter	1,500,000 cuts
	MTBF	360,000 hours
	MCBF	60,000,000 lines
Overall dimensions (H × W × D)		146 × 140 × 199 mm {5.75 × 5.51 × 7.83"}
Weight (mass)		Approx. 1.7 kg {3.74 lb}

Printing Specifications

		80 mm width paper printing	58 mm width paper printing
Printing method		Thermal line printing	
Dot density		203 × 203 dpi	
Paper width	Standard mode (initial setting)	72.0 mm {2.83"}, 576 dots	52.5 mm {2.07"}, 420 dots
	42 column mode	68.3 mm {2.69"}, 546 dots	47.3 mm {1.86"}, 378 dots
Character spacing	Standard mode (initial setting) Font A	0.25 mm {0.0098"} (2 dots)	
	Font B	0.25 mm {0.0098"} (2 dots)	
	Kanji font	0.00 mm (0 dot)	
	Special font A	0.25 mm {0.0098"} (2 dots)	
	Special font B	0.25 mm {0.0098"} (2 dots)	
	42 column mode Font A	0.38 mm {0.015"} (3 dots)	0.25 mm {0.0098"} (2 dots)
	Font B	0.25 mm {0.0098"} (2 dots)	0.25 mm {0.0098"} (2 dots)
	Kanji font	0.25 mm {0.0098"} (2 dots)	0.00 mm (0 dot)
	Special font A	0.38 mm {0.015"} (3 dots)	0.25 mm {0.0098"} (2 dots)
	Special font B	0.25 mm {0.0098"} (2 dots)	0.25 mm {0.0098"} (2 dots)
Line spacing		3.75 mm {1/5"} (initial setting, programmable by command)	
Maximum print speed*		150 mm/s {5.90"/s}	

dpi: dots per inch

*: when the printer prints with the standard print density level at 25°C {77°F} and 24V.

CAUTION

- To change the paper width, you need to install the 58-mm width paper guide plate and to make the paper width setting with the memory switch. For information about how to change the paper width, see "Changing the Paper Width" on page 41.
- The printing speed changes automatically depending on the applied voltage and head temperature.
- The maximum printing speed may not be achieved depending on the type of interface, the setting of data transmission speed, and the combination of control commands.
- If the data transmission speed is slower than the maximum printing speed, the printing speed may fluctuate and the print result may become shaded and/or dot displacement in paper feeding may occur.Furthermore, if the data transmission speed is much slower than the maximum printing speed, intermittent printing will occur.

NOTE

Especially when using a serial interface, low transmission speed may cause intermittent printing. It is recommended to transmit data to the printer as quickly as possible.

Character Specifications

Number of characters

Simplified Chinese	Font A Font B	• Alphanumeric characters: 95 • Extended graphics: 128 × 43 pages (including user-defined page) • International characters: 18 sets
	Kanji font	GB18030-2000: 28,553
Thai/ Vietnamese	Font A Font B Special font A Special font B	• Alphanumeric characters: 95 • Extended graphics: 128 × 42 pages (user-defined page is not supported) • International characters: 18 sets

Character structure

		80 mm width paper printing	58 mm width paper printing
Standard mode (initial setting)	Font A	12 × 24 (including 2-dot horizontal spacing)	
	Font B	9 × 17 (including 2-dot horizontal spacing)	
	Kanji font	24 × 24	
	Special font A	12 × 24 (including 2-dot horizontal spacing)	
	Special font B	9 × 24 (including 2-dot horizontal spacing)	
42 column mode	Font A[1]	13 × 24 (including 3-dot horizontal spacing)	9 × 17 (including 2-dot horizontal spacing)
	Font B	9 × 17 (including 2-dot horizontal spacing)	12 × 24 (including 2-dot horizontal spacing)
	Kanji font[2]	26 × 24 (including 2-dot horizontal spacing)	24 × 24
	Special font A[1]	13 × 24 (including 3-dot horizontal spacing)	9 × 24 (including 2-dot horizontal spacing)
	Special font B	9 × 24 (including 2-dot horizontal spacing)	12 × 24 (including 2-dot horizontal spacing)

[1]: 13 × 24 font is a font with a 1-dot horizontal space added to Font A or Special font A (12 × 24) of the standard mode. Therefore, the character size is the same as Font A or Special font A of the standard mode and the space between characters increases by 1 dot. When printing graphics characters, there is 1-dot space between characters.

[2]: 26 × 24 font is a font with a 2-dot horizontal space added to Kanji font A (24 × 24) of the standard mode. Therefore, the character size is the same as Kanji font of the standard mode and the space between characters increases by 2 dots.

Character size

		Standard/Double-height/Double-width/Double-width, double-height W × H	
		80 mm width paper printing	**58 mm width paper printing**
Standard mode	Font A	1.25 × 3.00 mm/1.25 × 6.00 mm/2.50 × 3.00 mm/2.50 × 6.00 mm {0.05 × 0.12"/0.05 × 0.24"/0.10 × 0.12"/0.10 × 0.24"}	
	Font B	0.88 × 2.13 mm/0.88 × 4.26 mm/1.76 × 2.13 mm/1.76 × 4.26 mm {0.03 × 0.08"/0.03 × 0.17"/0.07 × 0.08"/0.07 × 0.17"}	
	Kanji font	3.00 × 3.00 mm/3.00 × 6.00 mm/6.00 × 3.00 mm/6.00 × 6.00 mm {0.12 × 0.12"/0.12 × 0.24"/0.24 × 0.12"/0.24 × 0.24"}	
	Special font A	1.25 × 3.00 mm/1.25 × 6.00 mm/2.50 × 3.00 mm/2.50 × 6.00 mm {0.05 × 0.12"/0.05 × 0.24"/0.10 × 0.12"/0.10 × 0.24"}	
	Special font B	0.88 × 3.00 mm/0.88 × 6.00 mm/1.76 × 3.00 mm/1.76 × 6.00 mm {0.03 × 0.12"/0.03 × 0.24"/0.07 × 0.12"/0.07 × 0.24"}	
42 column mode	Font A	1.25 × 3.00 mm/1.25 × 6.00 mm/2.50 × 3.00 mm/2.50 × 6.00 mm {0.05 × 0.12"/0.05 × 0.24"/0.10 × 0.12"/0.10 × 0.24"}	0.88 × 2.13 mm/0.88 × 4.26 mm/1.76 × 2.13 mm/1.76 × 4.26 mm {0.03 × 0.08"/0.03 × 0.17"/0.07 × 0.08"/0.07 × 0.17"}
	Font B	0.88 × 2.13 mm/0.88 × 4.26 mm/1.76 × 2.13 mm/1.76 × 4.26 mm {0.03 × 0.08"/0.03 × 0.17"/0.07 × 0.08"/0.07 × 0.17"}	1.25 × 3.00 mm/1.25 × 6.00 mm/2.50 × 3.00 mm/2.50 × 6.00 mm {0.05 × 0.12"/0.05 × 0.24"/0.10 × 0.12"/0.10 × 0.24"}
	Kanji font	3.00 × 3.00 mm/3.00 × 6.00 mm/6.00 × 3.00 mm/6.00 × 6.00 mm {0.12 × 0.12"/0.12 × 0.24"/0.24 × 0.12"/0.24 × 0.24"}	
	Special font A	1.25 × 3.00 mm/1.25 × 6.00 mm/2.50 × 3.00 mm/2.50 × 6.00 mm {0.05 × 0.12"/0.05 × 0.24"/0.10 × 0.12"/0.10 × 0.24"}	0.88 × 3.00 mm/0.88 × 6.00 mm/1.76 × 3.00 mm/1.76 × 6.00 mm {0.03 × 0.12"/0.03 × 0.24"/0.07 × 0.12"/0.07 × 0.24"}
	Special font B	0.88 × 3.00 mm/0.88 × 6.00 mm/1.76 × 3.00 mm/1.76 × 6.00 mm {0.03 × 0.12"/0.03 × 0.24"/0.07 × 0.12"/0.07 × 0.24"}	1.25 × 3.00 mm/1.25 × 6.00 mm/2.50 × 3.00 mm/2.50 × 6.00 mm {0.05 × 0.12"/0.05 × 0.24"/0.10 × 0.12"/0.10 × 0.24"}

Note:

Space between characters is not included.

Characters can be scaled up to 64 times as large as the standard sizes.

Characters per line

		Standard/Double-height/Double-width/Double-width, double-height	
		80 mm width paper printing	**58 mm width paper printing**
Standard mode	Font A	48/48/24/24	35/35/17/17
	Font B	64/64/32/32	46/46/23/23
	Kanji font	24/24/12/12	17/17/8/8
	Special font A	48/48/24/24	35/35/17/17
	Special font B	64/64/32/32	46/46/23/23
42 column mode	Font A	42/42/21/21	42/42/21/21
	Font B	60/60/30/30	31/31/15/15
	Kanji font	21/21/10/10	15/15/7/7
	Special font A	42/42/21/21	42/42/21/21
	Special font B	60/60/30/30	31/31/15/15

1

Paper Specifications

		80 mm width paper printing	58 mm width paper printing
Paper types		Specified thermal paper	
Form		Roll paper	
Size	Roll paper diameter	83 mm {3.27"} maximum	
	Roll paper core	Inside: 12 mm {0.47"}, Outside: 18 mm {0.71"}	
	Roll width when taken up	80 + 0.5/-1.0 mm {3.15 + 0.02/-0.04"}	58 + 0.5/-1.0 mm {2.28 + 0.02/-0.04"}
	Paper width	79.5 ± 0.5 mm {3.13 ± 0.02"}	57.5 ± 0.5 mm {2.26 ± 0.02"}
Specified roll paper type		NTP080-80	NTP058-80
Specified original paper type		TF50KS-EY, TF60KS-E (NIPPON Paper Industries Co., Ltd.) PD160R, PD190R (OJI Paper Mfg. Co., Ltd.) P220AGB-1 (Mitsubishi Paper Mills Limited.) P35024 (Kanzaki Specialty Papers) AF50KS-E (Jujo Thermal Oy) F5041 (Mitsubishi HiTec) KT55FA, KT48FA (Koehler Paper Group)	

CAUTION	Paper must not be pasted to the roll paper core.

1

Printable Area

80 mm paper width printing

The maximum printable area of paper with a width of 79.5 ± 0.5 mm is 72.0 ± 0.2 mm (576 dots) and the approximate space is 3.0 mm on the left side on the left side and 4.5 mm on the right side.

79.5 ± 0.5 mm {3.13 ± 0.02″}

72.0 ± 0.2 mm {2.83 ± 0.008″}

3.0 mm {0.12″}   4.5 mm {0.18″}
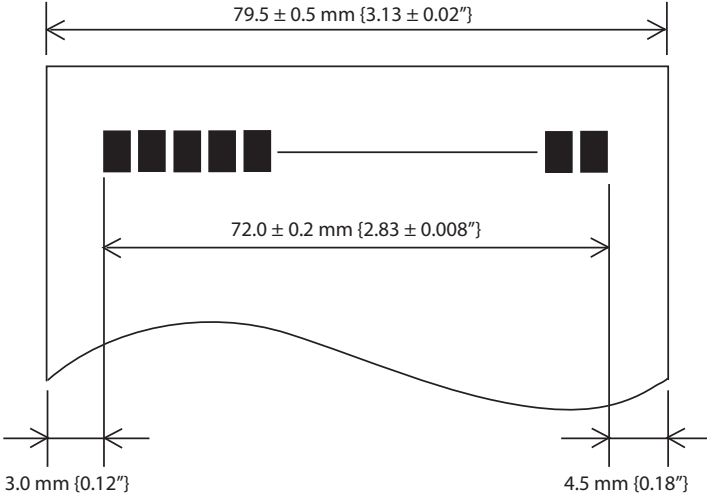
58 mm paper width printing

The maximum printable area of paper with a width of 57.5 ± 0.5 mm is 52.5 ± 0.2 mm (420 dots), and the approximate space is 3.0 mm on the left side and 2.0 mm on the right side.

57.5 ± 0.5 mm {2.26 ± 0.02″}

52.5 ± 0.2 mm {2.07 ± 0.008″}

3.0 mm {0.12″}   2.0 mm {0.079″}
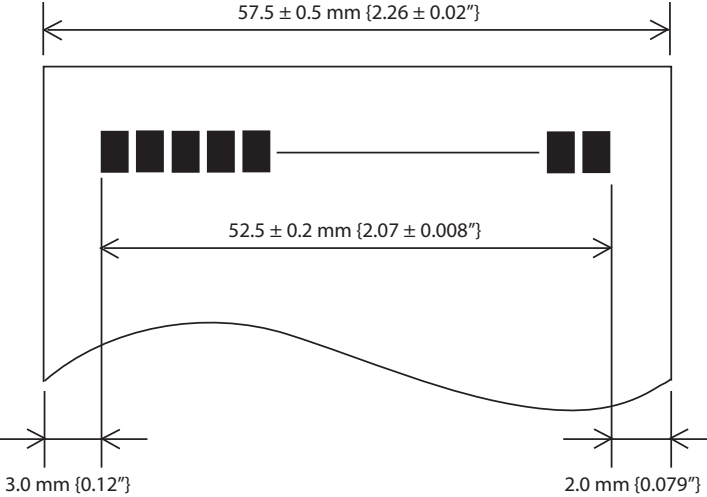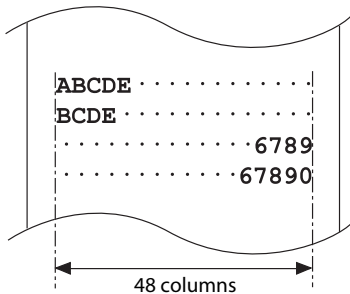
Printing and Cutting Positions

Manual-cutter position	
Autocutter blade position	Approx. 27.1 mm {1.07"}
Center of the print dotline	Approx. 10.5 mm {0.41"}

Paper feed direction
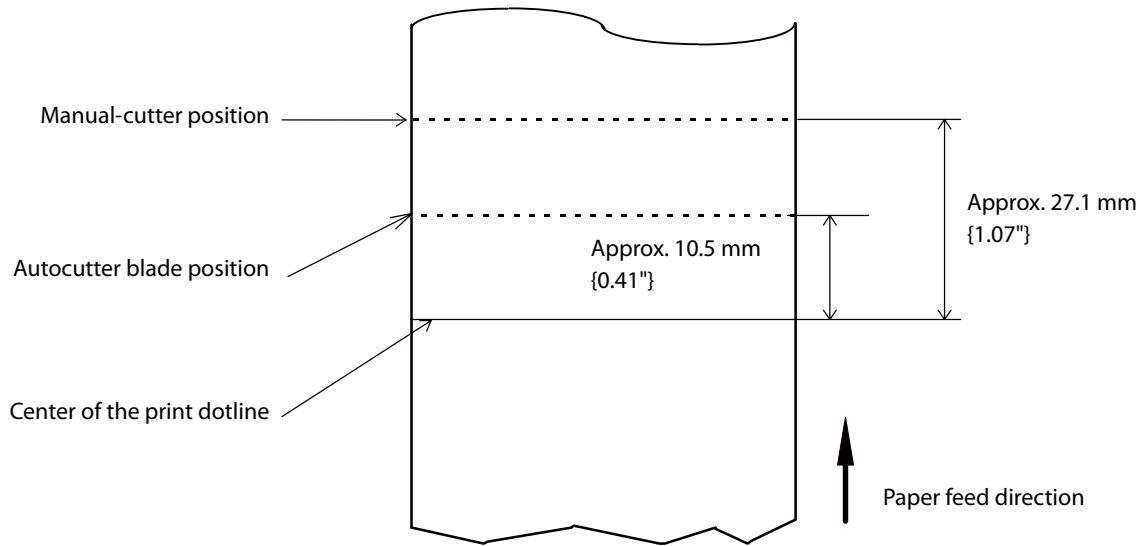
CAUTION The values above may vary slightly as a result of paper slack or variations in the paper. Take this into account when setting the cutting position of the autocutter.

30

Electrical Characteristics
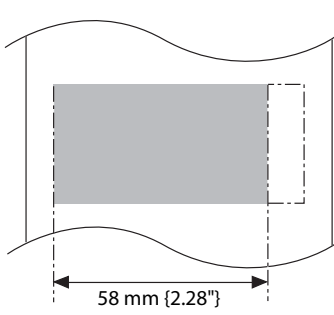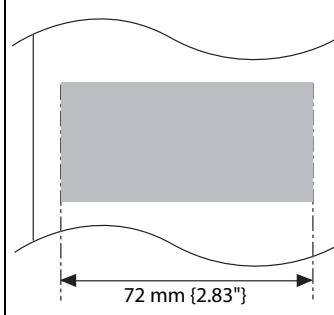
Operating voltage		DC 24V ± 7%
Current consumption (24V, 25°C, standard print density)	Standby	Mean: Approximately 0.1 A
	Operating	Mean: Approximately 1.5 A Note: When print ratio is approximately 18% • Continuous printing for 50 lines (repeating 20H-7FH) ∗ Font A, 48 columns, ASCII character • 5 line feeding • Autocutting ABCDE · · · · · · · · · · · · BCDE ·6789 · · · · · · · · · · ·67890 48 columns

CAUTION If printing is continuously performed with a high ratio, the overcurrent protection may be activated and result in uneven print density or a low voltage error. Therefore, the printing length must not exceed the following values when printing with high print ratio.
Print ratio: Number of dots being energized per one dot line/Total number of dots per one dot line (576 dots)

Print ratio	80%	100%
Print example	58 mm {2.28"}	72 mm {2.83"}
Print length	30 mm {1.18"}	20 mm {0.79"}

Environmental Conditions

Temperature/ Humidity	Operating	5 to 45℃ {41 to 113°F}, 10 to 90% RH (See the operating temperature and humidity range below.)
	Storage	-10 to 50℃ {14 to 122°F}, 10 to 90% RH (except for paper)
Acoustic noise (operating)		Approximately 55 dB (bystander position) Note: The values above are measured in the Epson evaluation condition. Acoustic noise differs depending on the paper used, printing contents, and the setting values, such as print speed or print density.

External Dimensions and Mass

- Height: Approximately 146 mm {5.75"}

- Width: Approximately 140 mm {5.51"}

- Depth: Approximately 199 mm {7.83"}

- Mass: Approximately 1.7 kg {3.74 lb} (except for roll paper)
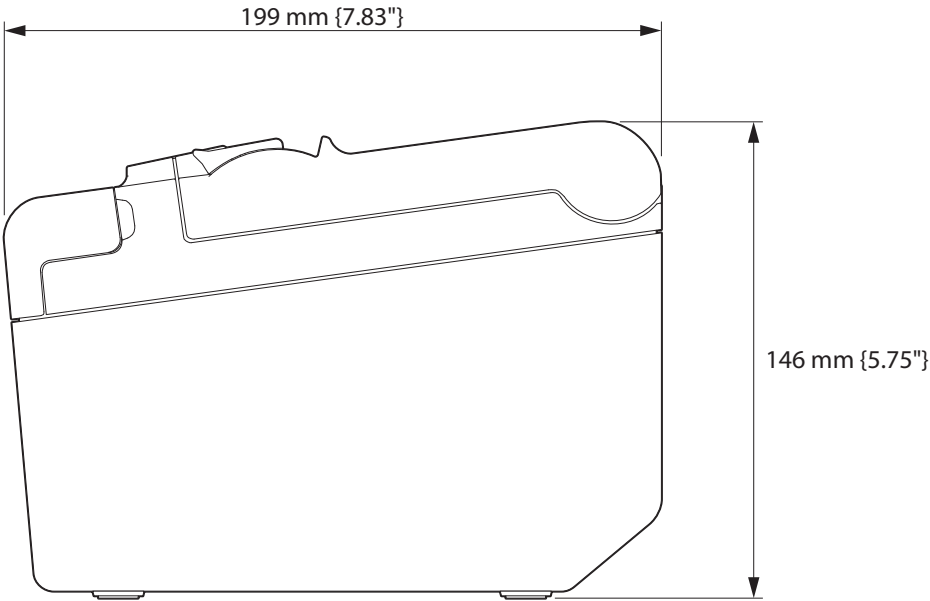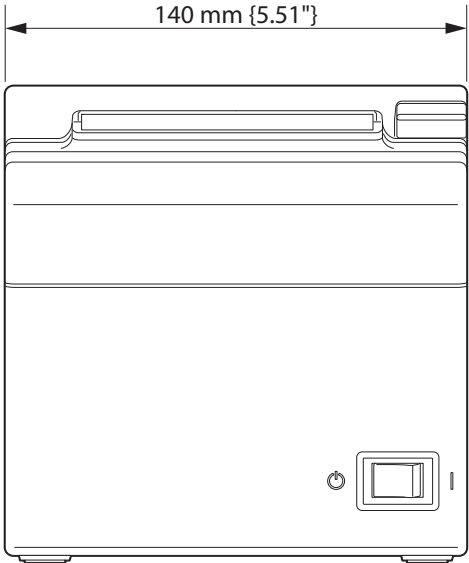
Setup

This chapter describes setup and installation of the product and peripherals.

Flow of Setup

This chapter consists of the following sections along with the setup flow of the product and peripherals.

1. **Installing the Printer (page 36)**

2. **Changing the Paper Width (page 41)**

3. **Adjusting the Paper Near-End Sensor (page 42)**

4. **Connecting the Printer to the Host Computer (page 44)**

5. **Connecting to the Power Source (page 52)**

6. **Setting the Memory Switches/Receipt Enhancement (page 54)**

7. **Connecting the Optional External Buzzer (page 66)**

8. **Connecting the Cash Drawer (page 68)**
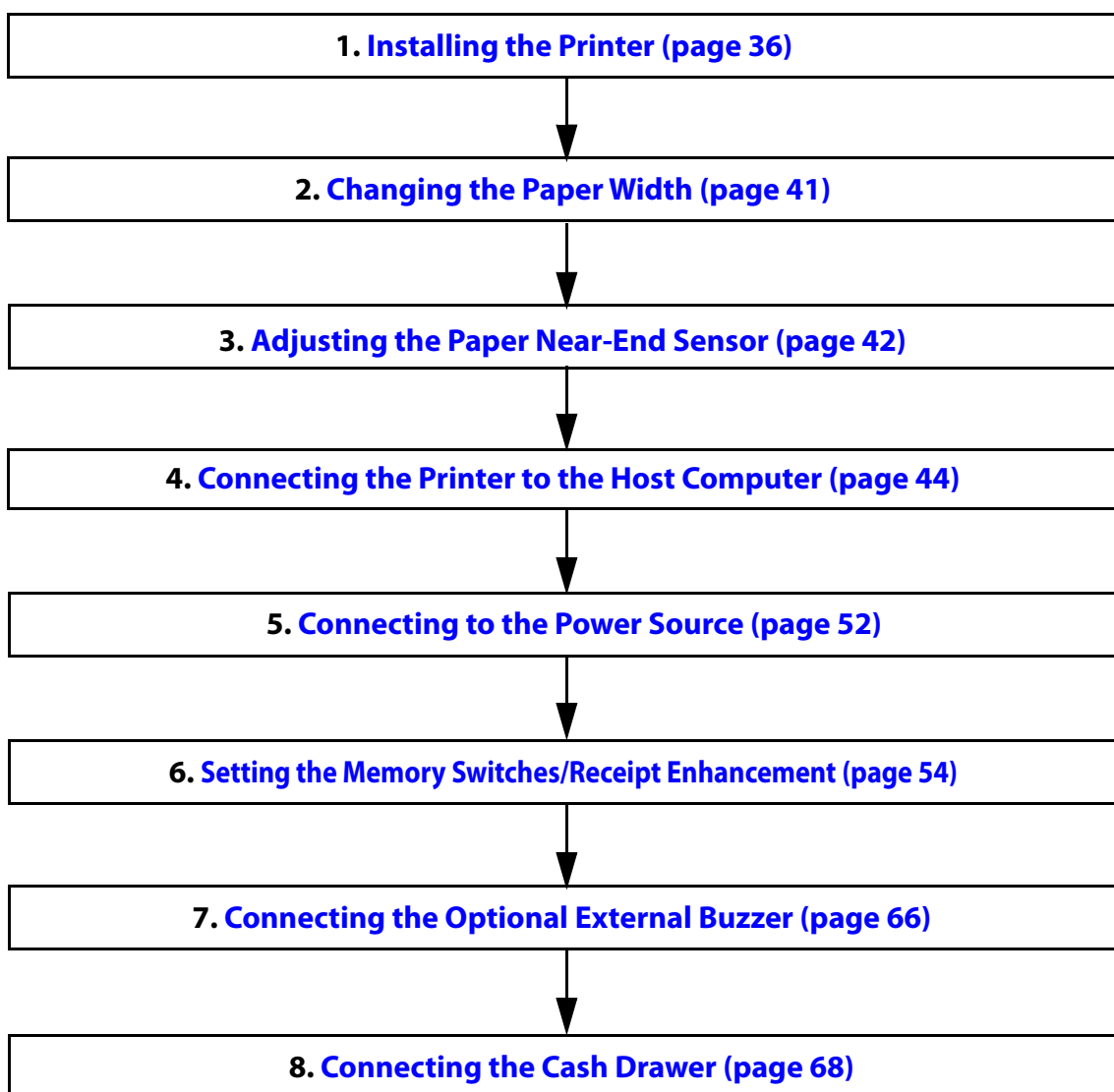
Installing the Printer

You can install the printer horizontally on a flat surface (with the paper exit on top) or vertically (with the paper exit at the front). Also, you can hang it on a wall using the included accessories.
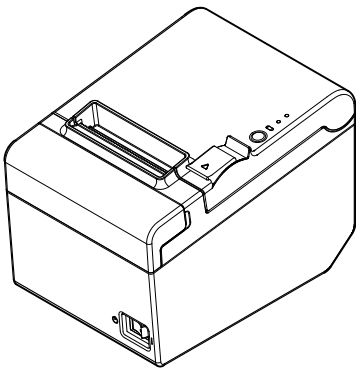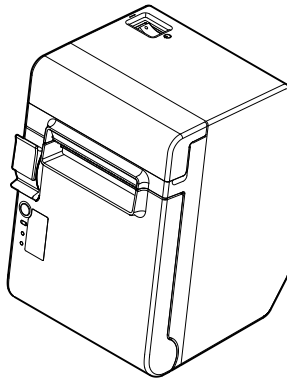
Horizontal installation   Vertical installation   Hanging on a wall
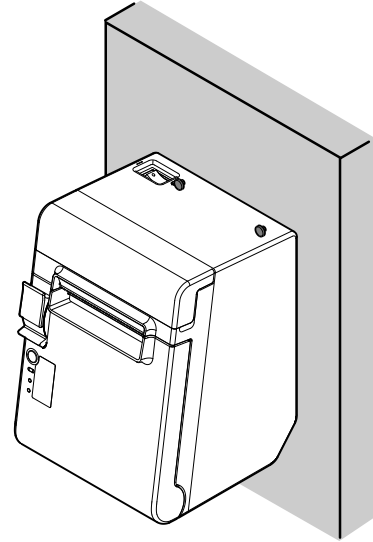
CAUTION	• You can use the paper near-end sensor only when you install the printer horizontally. When you install the printer vertically or hang it on a wall, be sure to disable the setting. Otherwise false detections occur. For information about the paper near-end sensor, see "Adjusting the Paper Near-End Sensor" on page 42. • Take measures to prevent the printer from moving by vibration during paper cutting and when using a drawer. Affixing tape (Model: DF-10) is provided as an option. • Do not place the printer in dusty locations. • Do not knock or strike the printer. This may cause defective print. • Do not catch cables or foreign matter under the printer.

Installing the Printer Vertically

When installing the printer vertically, be sure to attach the included control panel label for vertical installation on the roll paper cover, and attach 4 rubber feet in the rectangular indents in the printer case, as shown in the illustration below.

Control panel label for vertical installation

Rubber feet
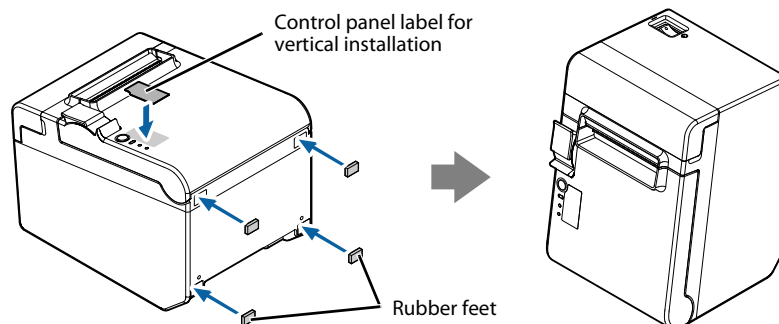
Vertical installation

You can install the printer so that the roll paper cover is upright to the mounting surface using the included wall hanging bracket.

1   Attach the control panel label for vertical installation on the roll paper cover.

2   Install the wall hanging bracket on the printer, and fix it using 2 included screws.

3   Attach 2 rubber feet in the rectangular indents in the printer case, and attach 2 rubber feet within the scribed line on the hanging bracket.

4   Place the printer with the wall-hanging-bracket-side down.

Control panel label for vertical installation

Rubber feet

207 mm {8.15"}

Wall hanging bracket
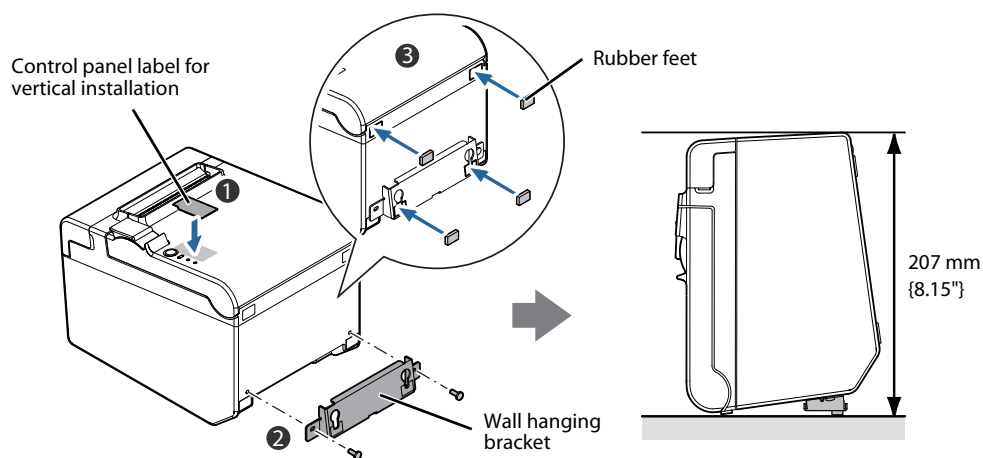
Hanging the Printer on a Wall

To hang the printer on the wall, follow the steps below.

> **CAUTION**
> - To fix the printer securely, hang the printer on a wall made of wood, concrete, or metal. The thickness of the wall should be 10 mm or more.
> - Be sure to use metallic screws.
> - The screws on the wall side must have a pull-out strength of 150 N (15.3 kgf) or more.

1 Attach the included control panel label for vertical installation on the roll paper cover.

Control panel label for vertical installation
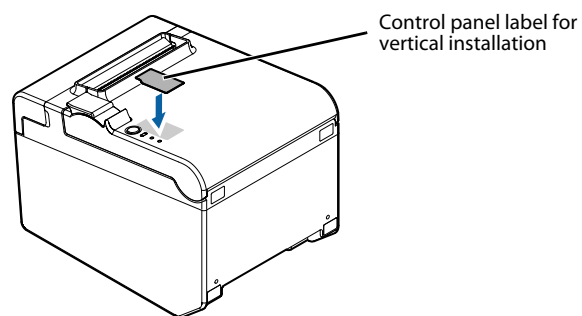
2 Install 2 screws (screw diameter: 4 mm, head diameter: 7 to 9 mm) in the wall at an interval of 80 mm.

Make sure the length of the screw's body in the wall is 10 mm or more, and the length outside the wall is 3 to 4 mm.

80 mm
{3.15"}

3 - 4 mm
{0.12 - 0.16"}

7 - 9 mm
{0.28 - 0.35"}

4 mm
{0.16"}

10 mm {0.39"} or more
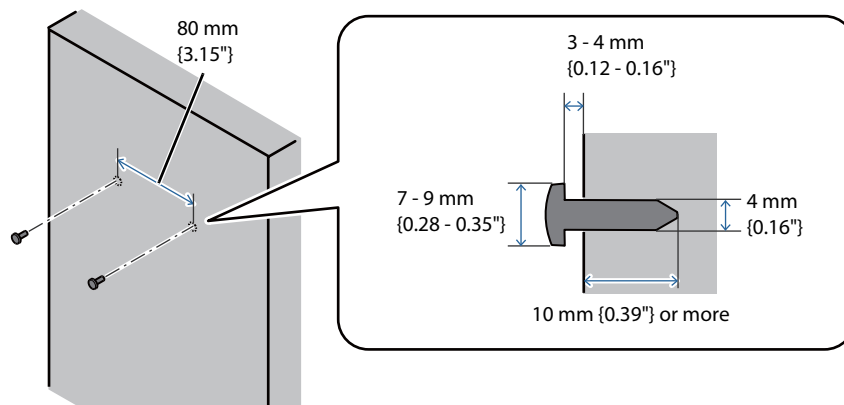
3   Remove the screws retaining the printer case, install the wall hanging bracket on the printer, and fix it using the screws.

Screws

Wall hanging bracket
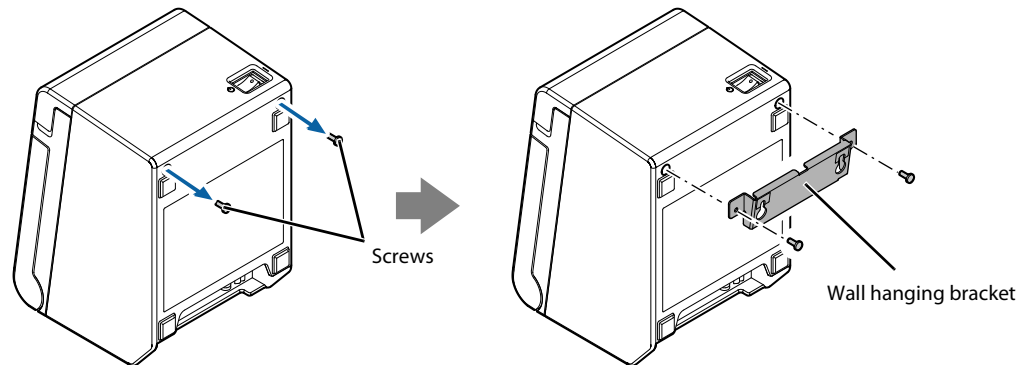
4   Align the holes in the wall hanging bracket with the screws on the wall, and hook it securely.

2
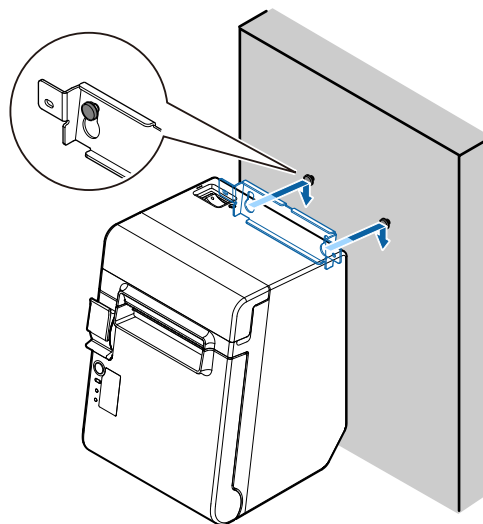
Attaching Cover on the Power Switch

Install the power switch cover that comes with the TM-T82 onto the printer to prevent inadvertent operation of the power switch and to prevent tampering. To reset the printer when the power switch cover is installed, insert a long, thin object (such as the end of a paper clip) into the hole in the power switch cover and press the power switch.

A waterproof cover for the power switch can also be attached.

⚠️ **WARNING**	**If an accident occurs with the power switch cover attached, unplug the AC cable immediately.** Continued use of the printer may cause fire or shock.

CAUTION	Use the power switch waterproof cover if the printer is installed in a humid location or exposed to water. If current leakage occurs, it could result in electric shock.

To use these covers, install them as shown in the illustration below.

Power switch cover

Power switch waterproof cover
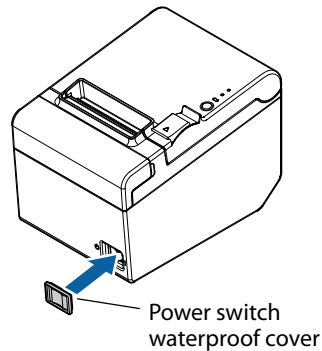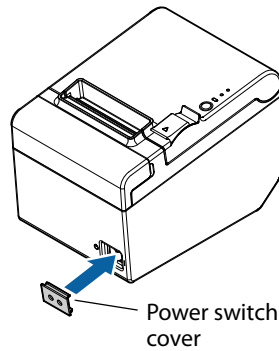
Changing the Paper Width

You can change the paper width from 80 to 58 mm by installing the included 58-mm width paper guide plate. Follow the steps below to change the paper width.

CAUTION	Once you have changed the paper width from 80 to 58 mm, do not change it back to 80 mm. A part of the print head and the auto-cutter may be damaged and you may not be able to print or cut the paper properly.

1 Open the roll paper cover.

2 Align 3 projections on the 58-mm width paper guide plate with the rectangular holes in the printer, and push it downwards.

58-mm width paper guide plate

Rectangular holes
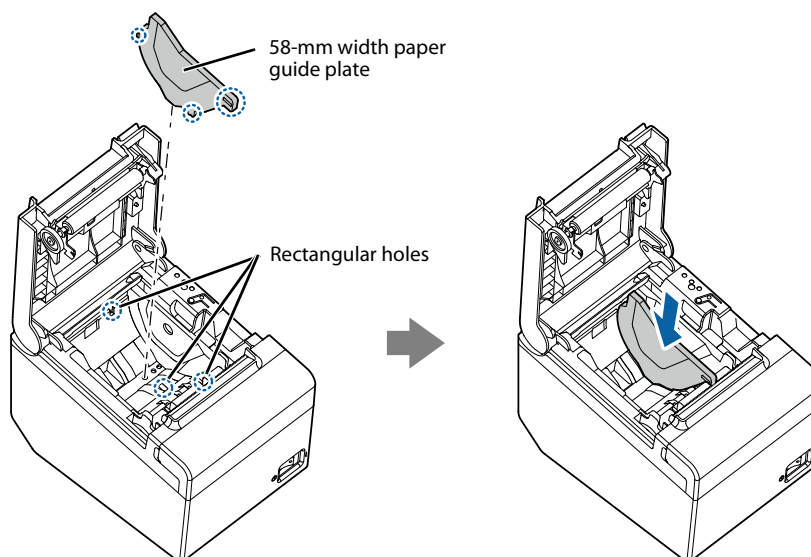
3 Make the setting for the paper width with the memory switch.
For information about the memory switch, see "Setting the Memory Switches/Receipt Enhancement" on page 54.

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Adjusting the Paper Near-End Sensor

When you install the printer horizontally, you can use the paper near-end sensor.

Below are two situations where a paper near-end sensor adjustment is required.

- To adjust the detection position to suit the diameter of the roll paper core used.

- To adjust the detection position of the remaining amount of roll paper.

CAUTION	- To use the paper near-end sensor, it needs to be enabled with the memory switch. To set the memory switch, see "Setting the Memory Switches/Receipt Enhancement" on page 54. - When you install the printer vertically or hang it on a wall, be sure to disable the paper near-end sensor. Otherwise false detections occur. - Since roll paper cores vary slightly in shape, depending on paper roll design and manufacturing tolerances, it is impossible to detect the remaining paper exactly. - Use roll paper with a core inner diameter of 12 mm and outer diameter of 18 mm so that the paper near-end sensor can detect the remaining paper as accurately as possible.

NOTE	- Whether to let printing stop when the roll paper is nearly out can be selected by a command. For information about ESC/POS commands, see the Product Specifications. - Whether to let the Paper LED light when the roll paper is nearly out can be selected with the memory switch. To set the memory switch, see "Setting the Memory Switches/Receipt Enhancement" on page 54. - Enabling/disabling of Feed button can be selected by a command. If the command is set to disable this button, it does not function. For information about ESC/POS commands, see the Product Specifications.

Follow the steps below to adjust the roll paper near-end sensor.

1   Open the roll paper cover.

2   Loosen the adjustment screw fastening the sensor, and align the upper edge of the positioning plate with the adjustment position.

Adjustment position	Remaining amount of paper (outer diameter)
Upper	Approx. 27 mm {1.06"}
Lower (Initial setting)	Approx. 23 mm {0.91"}

3   Tighten the adjustment screw.

4   Make sure that the detection lever operates smoothly.

Adjustment screw

Positioning plate

Detection lever
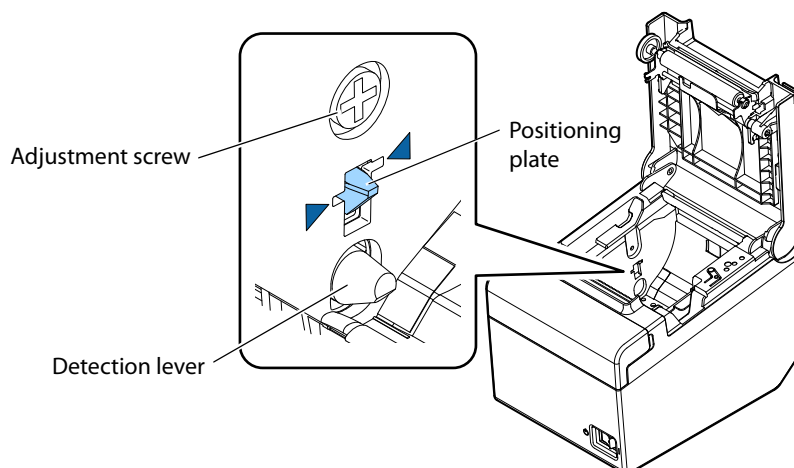
Connecting the Printer to the Host Computer

CAUTION	• The printer uses a modular connector specifically designed for the cash drawer. Do not connect the connector to a telephone line. • For USB interface models, do not turn on the printer before installing the printer driver. • For Ethernet interface models, do not connect a telephone line or DK cable to the Ethernet connector.

For Serial Interface

Serial interface connection diagram

When this printer is connected to a host computer by the serial interface, there are two connection methods; stand alone connection and pass-through connection.

Stand alone connection

This printer is connected to the host computer directly via the serial port. When a customer display (DM-D) is to be connected, connect it to the host computer via the serial port or USB port.
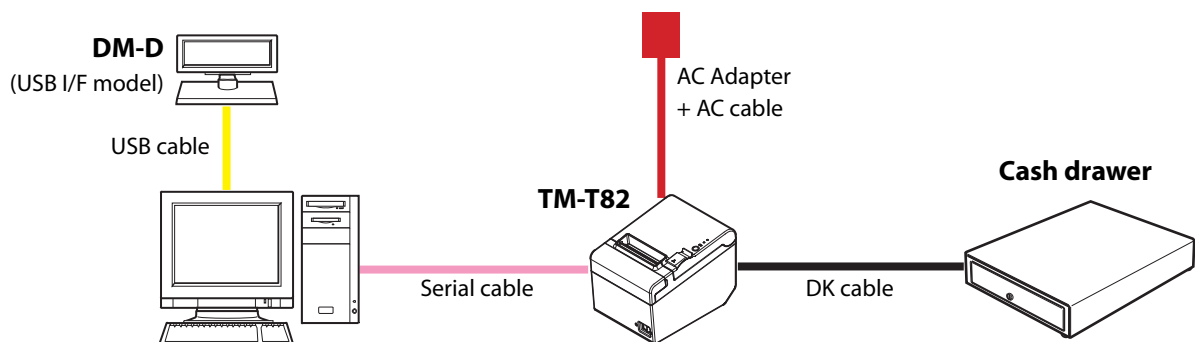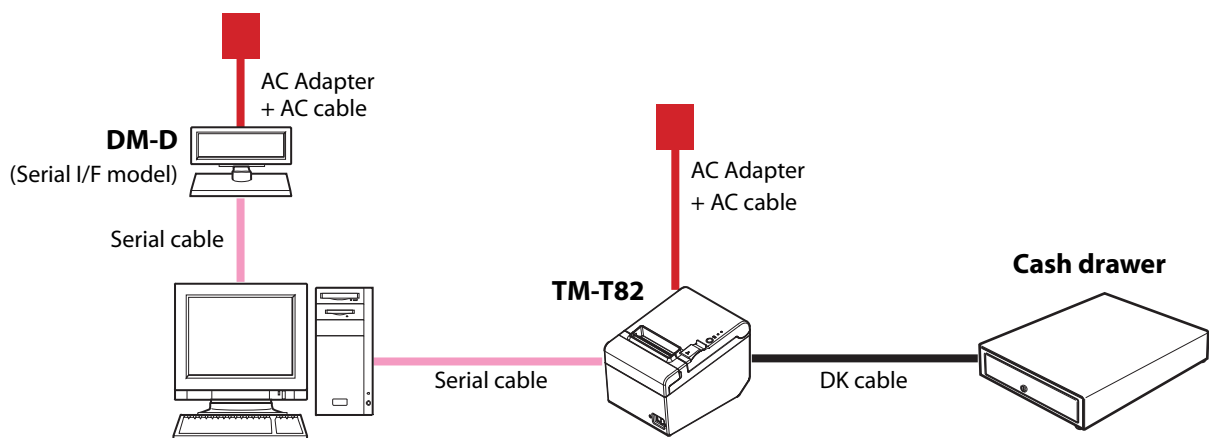
Pass-through connection

This printer is connected to the host computer through the serial interface via the customer display (DM-D).

AC Adapter
+ AC cable

AC Adapter
+ AC cable

Serial cable   Serial cable   DK cable

DM-D

TM-T82   **Cash drawer**
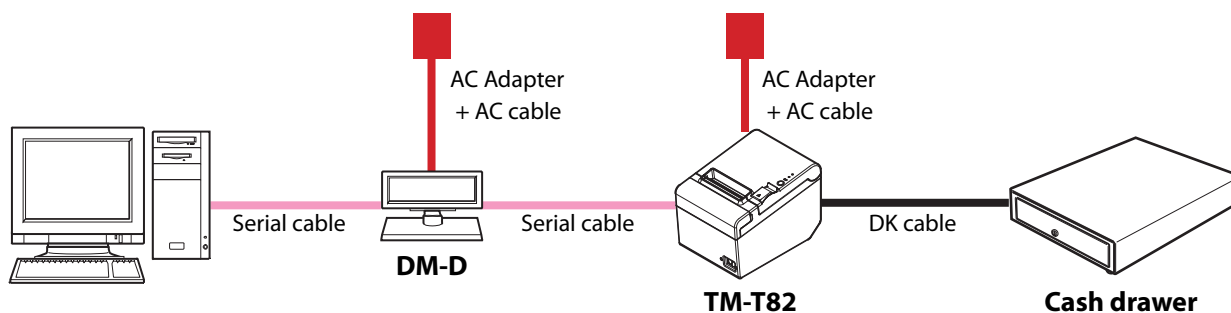
Connecting the serial interface (RS-232) cable

⚠ **WARNING**   **Be sure to turn off the power supply for both the printer and host computer before connecting the cables.**

1   Insert the serial cable connector firmly into the serial interface connector.

2   When using connectors equipped with screws, tighten them to secure the connectors firmly.

When using interface cables equipped with a grounding line, attach the ground line to the screw hole marked "FG" on the printer.
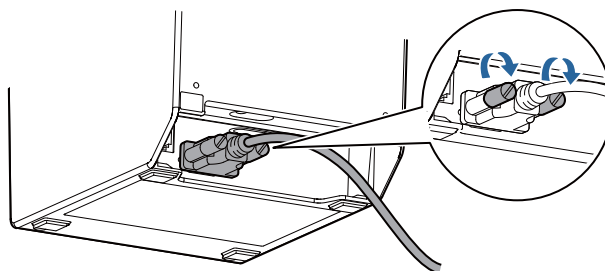
3   Connect the other end of the serial cable to the host computer.
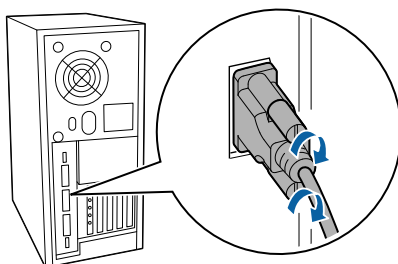
Parallel interface connection diagram

This printer is connected to the host computer via the parallel port. When a customer display (DM-D) is to be connected, connect it to the host computer via the serial port or USB port.
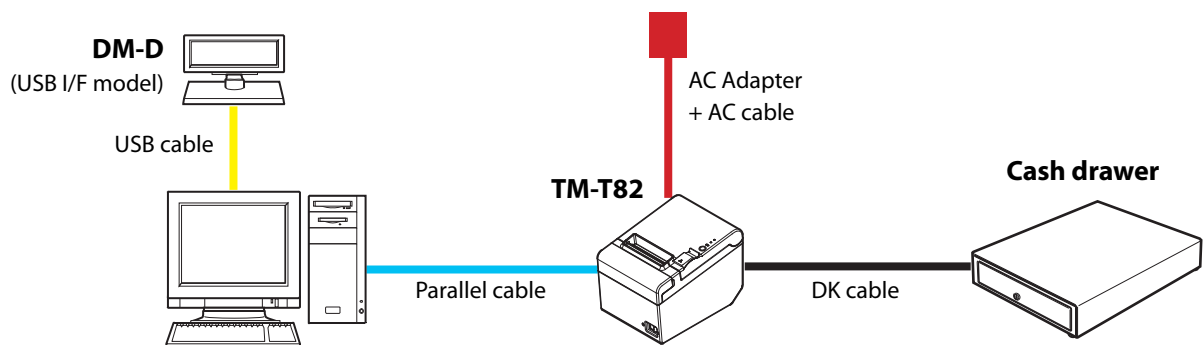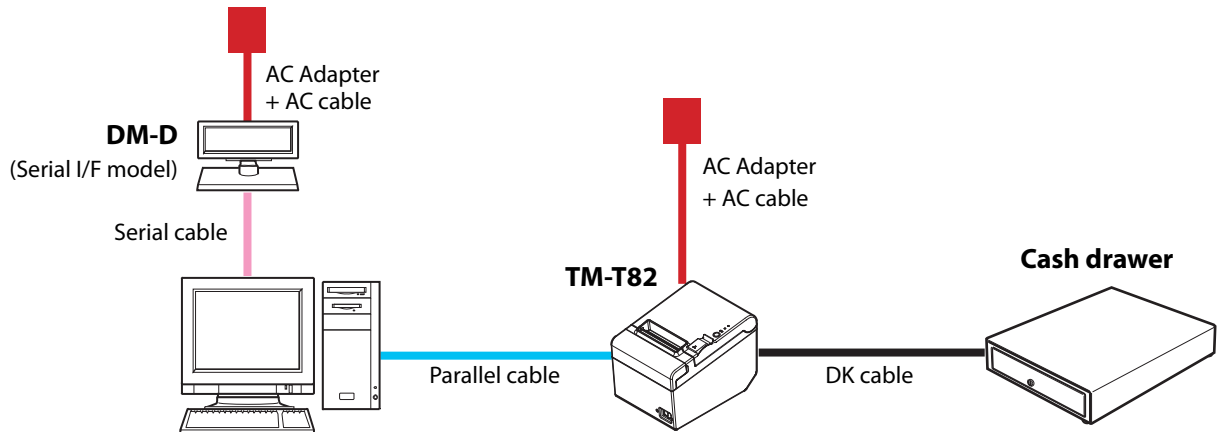
Connecting the parallel interface cable

1 Insert the interface cable connector firmly into the parallel interface connector of the printer.

2 Press down the clips on either side of the connector to lock it in place.

3 When using interface cables equipped with a ground line, attach the ground line to the screw hole marked "FG" on the printer.

4 Connect the other end of the interface cable to the host computer.
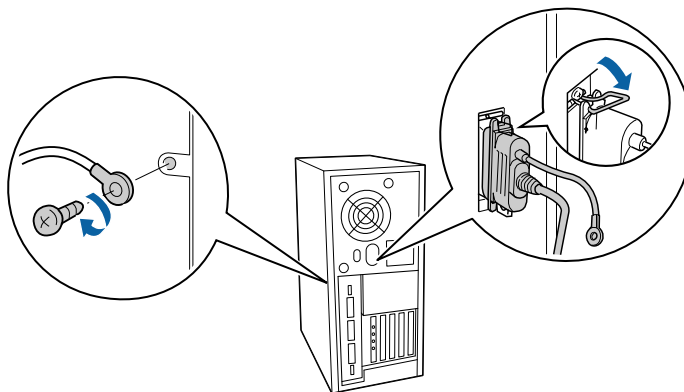
For USB Interface

USB interface connection diagram

This printer is connected to the host computer via the USB port. When a customer display (DM-D) is to be connected, connect it to the host computer via the serial port or USB port.
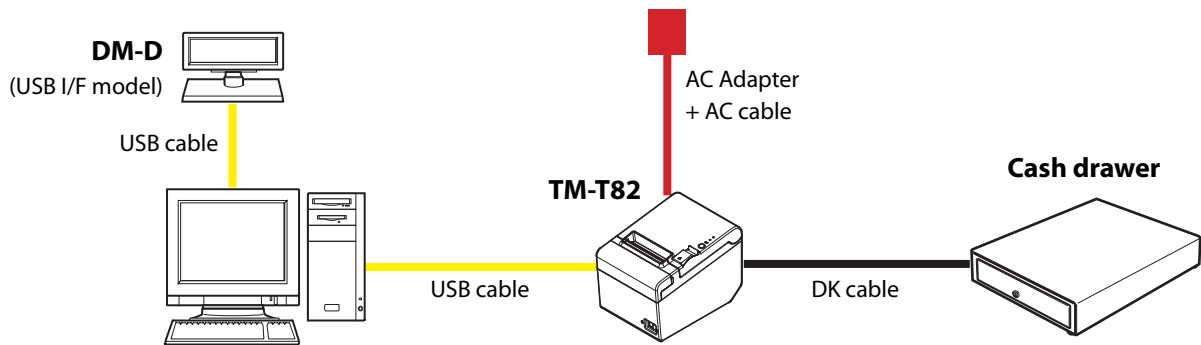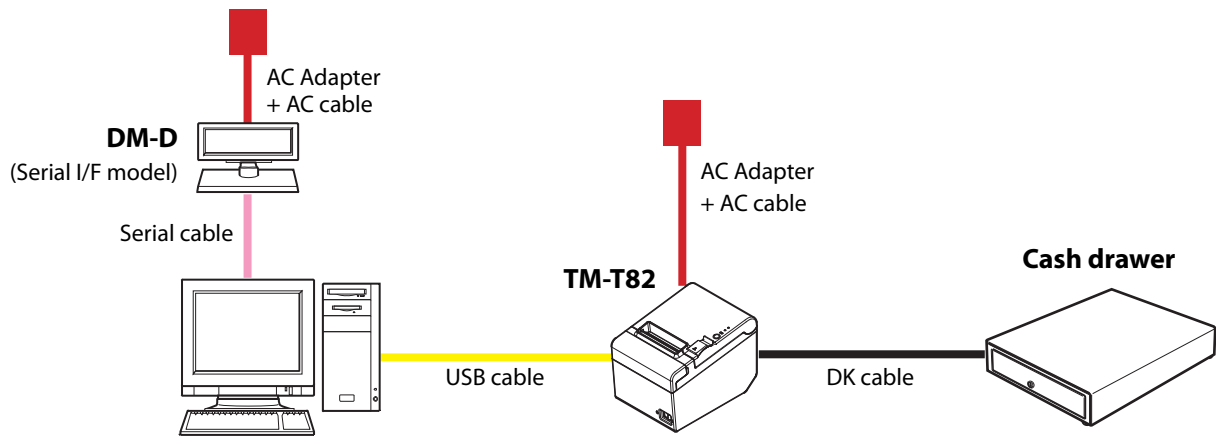
Connecting the USB interface cable

1 Insert the USB cable into the USB interface connector of the printer.

2 Put the USB cable through the locking wire saddle.

CAUTION	Putting the USB cable through the locking wire saddle, as shown in the figure below, prevents the cable from coming unplugged.

Locking wire saddle
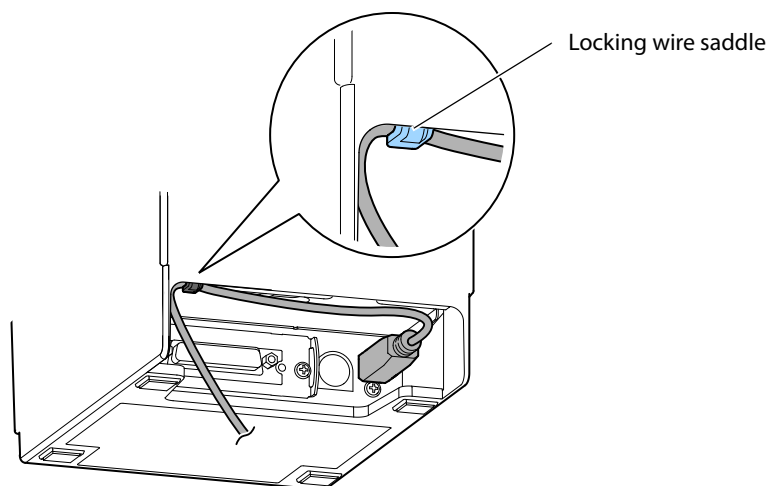
3 Connect the other end of the USB cable to the host computer.
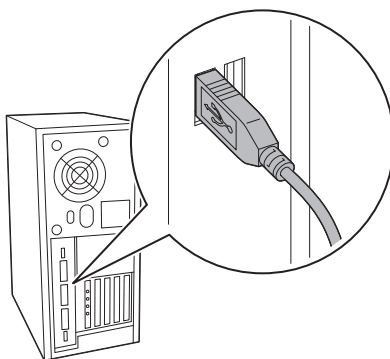
For Ethernet Interface

Connect the printer to a network by a LAN cable via a hub.

Ethernet interface connection diagram
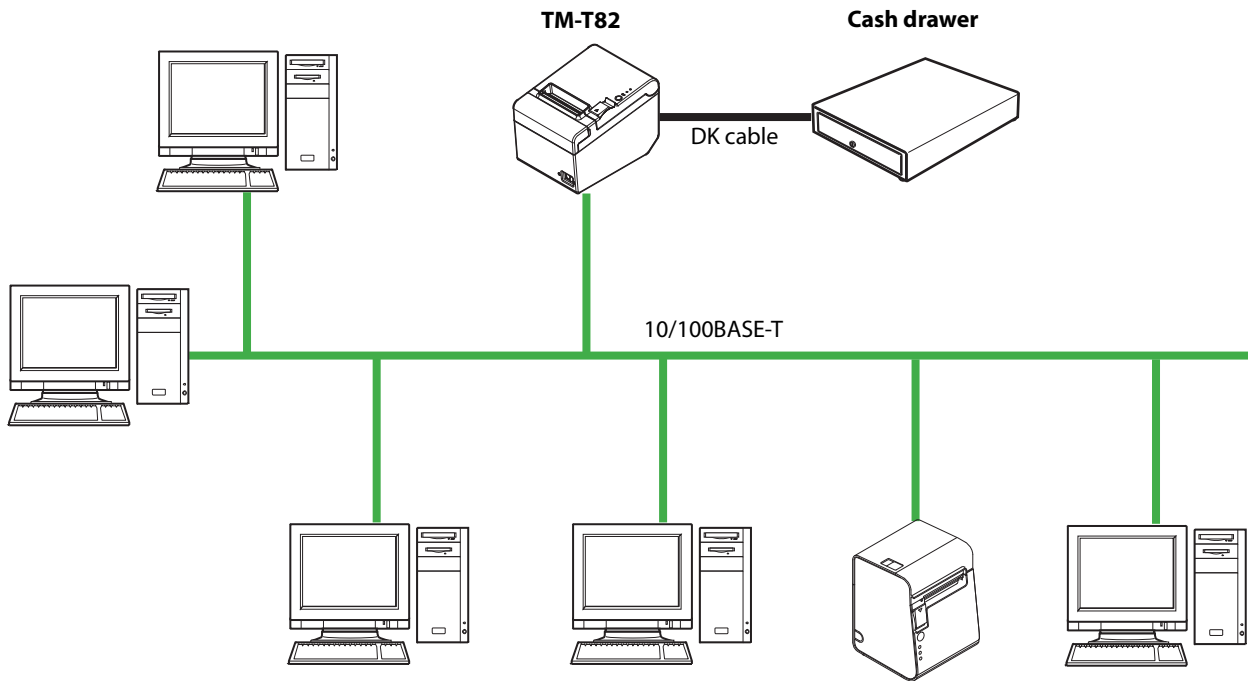
Connecting the LAN cable

CAUTION	• When LAN cables are installed outdoors, make sure devices without proper surge protection are cushioned by being connected through devices that do have surge protection. Otherwise, the devices can be damaged by lightning. • Never attempt to connect the customer display cable, DK cable, or a telephone line cable to the 10/100BASE-T LAN connector.

NOTE	• To use the Ethernet interface, EpsonNet Config is required. For detailed information about the setup methods, see the EpsonNet Config Operations Guide. • You can also use the EpsonNet Config (Web version). Start up a web browser and then input the printer's IP address in the address bar. On the authentication screen, input your user name and password. The default setting for the password varies depending on the model and firmware version.

Firmware version	User name	Password
Before 10.16 ESC/POS	"epson"	"epson"
10.16 ESC/POS or later	"epson"	Product serial number (10 alphanumeric characters, case sensitive)

You can check the firmware version using the self-test ().
You can check the product's serial number on the manufacturing nameplate attached to the product.

Connect a the LAN cable to the 10/100BASE-T LAN connector by pressing firmly until the connector clicks into place.

10/100BASE-T LAN interface connector

LED (Green)   LED (Yellow)   Button
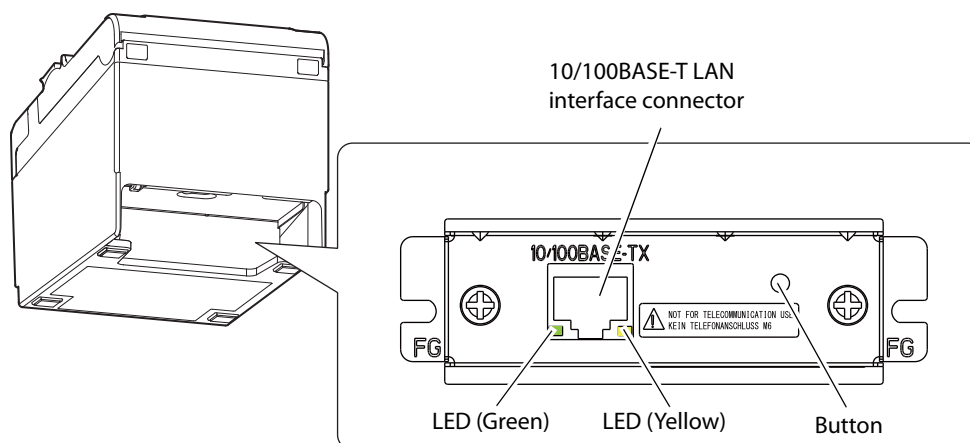
A push button is provided to perform the following functions.
• Status sheet printing
• Setting initialization

Connecting to the Power Source

⚠️ **WARNING**	• **Never insert the AC cable plug into a socket that does not meet the rated voltage requirements of the printer.** Doing so may result in damage to the printer. • **Should a fault ever occur, immediately turn off the power to the printer and unplug the AC cable from the wall socket.**

Connecting the AC cable

1   Make sure the printer is turned off.

2   Connect the AC cable to the AC adapter.
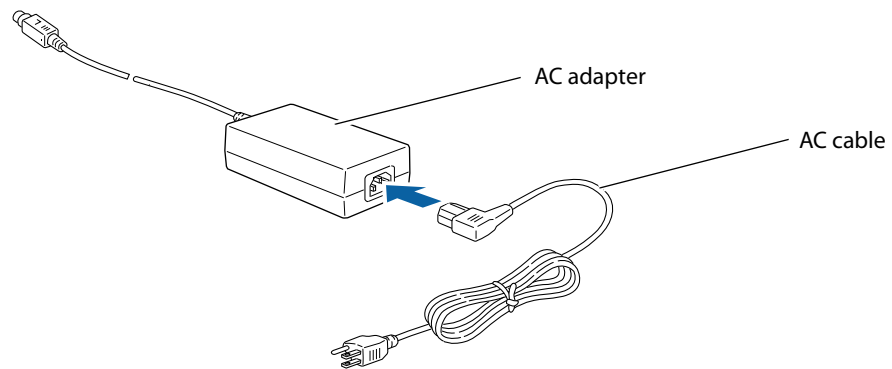
AC adapter

AC cable

3   Connect the DC cable of the AC adapter to the power supply connector.
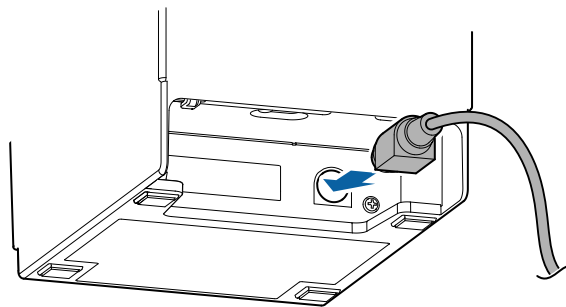
4   Insert the AC plug into a wall socket.
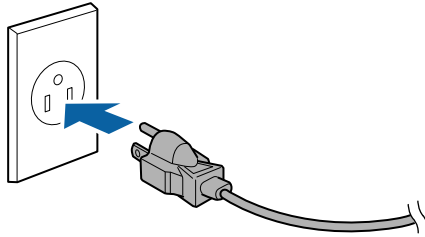
Setting the Memory Switches/Receipt Enhancement

With the memory switch and R/E (receipt enhancement) function, which are software settings for this printer, you can set the various functions.

For an outline of the functions, see the following section. Use the methods shown in the table below; TM-T82 Utility, Software Setting Mode, or ESC/POS commands, to set the memory switches and R/E functions.

	Item\Method	TM-T82 Utility	Software Setting Mode	ESC/POS Commands
Memory Switches	Receive buffer capacity		✔	✔
	BUSY condition		✔	✔
	Processing when data receive error		✔	✔
	Auto line feed		✔	✔
	USB power-saving function		✔	✔
	Release condition of receive buffer BUSY		✔	✔
	Paper sensor to output paper-end signals default*[1]		✔	✔
	Error signal output		✔	✔
	Paper near-end sensor	✔	✔	✔
	TM-T81 emulation mode		✔	
	Multi-Language Font		✔	
Customized Values	Paper width	✔	✔	✔
	Print density	✔	✔	✔
	Print speed	✔	✔	✔
	Thai character print mode*[2]		✔	✔
	Character code table default	✔	✔	✔
	International character default	✔	✔	✔
	Interface selection*[3]	✔	✔	✔
	Number of columns	✔	✔	✔
	Autocutting after closing cover	✔	✔	✔
	Paper reduction	✔	✔	✔
	Font A auto replacement		✔	✔
	Font B auto replacement		✔	✔
	Buzzer	✔	✔	✔
	Logo 180 dpi emulation mode	✔	✔	✔
	Communication condition of serial interface	✔	✔	✔
	Communication condition of USB interface	✔	✔	✔

Item\Method		TM-T82 Utility	Software Setting Mode	ESC/POS Commands
Receipt Enhancement	Auto top logo	✔*4		✔
	Auto bottom logo	✔		✔
	Auto top/bottom logo extended functions	✔*4		✔

dpi: dots per inch

*1: Enabled only for the parallel interface

*2: Disabled when Simplified Chinese is selected in the Multi-Language Font.

*3: Enabled only for serial + USB models, and parallel + USB models

*4: Excluding some function.

> **NOTE**
> - For information about the TM-T82 Utility, see the TM-T82 Utility User's Manual.
> - For information about how to use the software setting mode, see "Software Setting Mode" on page 87.
> - For information about ESC/POS commands, see the Product Specifications.

Functions

Receive buffer capacity

- 4KB (initial setting)
- 45 bytes

BUSY condition

- Receive buffer full/Offline (initial setting)
- Receive buffer full

Processing when data receive error

- Prints "?" (initial setting)
- Ignored

Auto line feed

- Always enabled (initial setting)
- Always disabled

USB power-saving function

- Disabled

- Enabled (initial setting)

> **NOTE** The USB power-saving function is valid only when the USB interface communication condition is set to the vendor-defined class and the system configuration is set so that the USB driver can support the USB power-saving function.

Release condition of receive buffer BUSY

- Releases when the remaining receive buffer capacity becomes 256 bytes (initial setting)

- Releases when the remaining receive buffer capacity becomes 138 bytes

> **NOTE** This function is enabled only when Receive buffer capacity is set to 4KB.

Paper sensor to output paper-end signals default (only for parallel interface models)

- Paper end sensor enabled, paper near-end sensor enabled (initial setting)

- Disabled

Error signal output

- Enabled (initial setting)

- Disabled

Paper near-end sensor

- Enabled

- Disabled (initial setting)

> **CAUTION**
> - You can use the paper near-end sensor only when you install the printer horizontally. When you install the printer vertically or hang it on a wall, be sure to disable the paper near-end sensor. Otherwise false detections occur.
> - You may need to adjust the paper near-end sensor. For information about how to adjust it, see "Adjusting the Paper Near-End Sensor" on page 42.

Chapter 2   Setup

TM-T81 emulation mode

- Disabled (initial setting)
- Enabled

NOTE	For information about TM-T81 emulation mode, see "TM-T81 Emulation Mode" on page 91.

Multi-Language Font

- Thai, Vietnam (initial setting)
- Simplified Chinese

Paper width

- 80 mm (initial setting)
- 58 mm

NOTE	To change the paper width, you need to install the 58-mm width paper guide plate. For information about how to change the paper width, see "Changing the Paper Width" on page 41.

Print density

Selectable from levels 1 to 7 (85% ~ 115%).

Initial setting: level 4 (100%)

Depending on the paper type, it is recommended to set the print density as shown in the table below for the best print quality.

Original Paper type	Density Level
TF50KS-EY, TF60KS-E, PD160R, PD190R, P220AGB-1, P35024, AF50KS-E, KT55FA, KT48FA	4 (100%)
F5041	5 (105%)

NOTE	When the print density level is increased, printing speed may be reduced.

Print speed

Selectable from levels 1 to 13 (Slow ~ Fast)

Initial setting: level 13

> **NOTE**
>
> Depending on print conditions, such as print duty, print head temperature, and data transmission speed, print speed is automatically adjusted, which may cause white lines due to intermittent print (the motor sometimes stops). To avoid this, keep the print speed constant by setting it lower, or set the transmission speed higher for the serial interface.

Thai character print mode (only for Thai/Vietnamese)

- Thai 3 pass
- Thai 1 pass (initial setting)

Character code table default

Selectable from 43 pages including user defined page

Initial setting: Page 0 (PC437: USA, Standard Europe)

> **NOTE**
>
> - For the character code table, see "Character Code Tables" on page 111.
> - User-defined page is not supported when Thai/Vietnamese is selected.

International character default

Selectable from 18 sets

Initial setting for Simplified Chinese: China

Initial setting for Thai/Vietnamese: USA

> **NOTE**
>
> For the character code table, see "International Character Sets" on page 155.

Interface selection (only for serial + USB models and parallel + USB models)

The tables below describe the modes you can set for the printer to control the dual interfaces.

Automatic selection:

The interface for UIB (Universal Interface Board) or Built-in USB to which data is transmitted first is selected.

The selected interface is enabled until the power is turned off or the printer is reset.

For serial + USB interface models

Interface mode	Serial	Built-in USB
Automatic selection (initial setting)	Available	Available
Fixed to serial	Available	Not available
Fixed to built-in USB	Not available	Available

For parallel + USB interface models

Interface mode	Parallel	Built-in USB
Automatic selection (initial setting)	Available	Available
Fixed to parallel	Available	Not available
Fixed to built-in USB	Not available	Available

Number of columns

- Standard mode (initial setting)

- 42 column mode

Autocutting after closing cover

- Cuts (initial setting)

- Does not cut

Paper reduction

Extra upper space reduction

- Disabled (initial setting)
- Enabled

Extra lower space reduction

- Disabled (initial setting)
- Enabled

Line space reduction rate

- Not reduced (initial setting)
- 25%
- 50%
- 75%

Line feed reduction rate

- Not reduced (initial setting)
- 25%
- 50%
- 75%

Barcode height reduction rate

- Not reduced (initial setting)
- 25%
- 50%
- 75%

Font A auto replacement

- Does not replace (initial setting)
- Font B

> **NOTE** — This function is enabled only when Number of columns is set to Standard mode.

Font B auto replacement

- Does not replace (initial setting)
- Font A

> **NOTE** — This function is enabled only when Number of columns is set to Standard mode.

Buzzer

> **NOTE**
> - For information about how to connect the optional external buzzer, see "Connecting the Optional External Buzzer" on page 66.
> - When the optional external buzzer is enabled, a cash drawer cannot be used. Be sure to disable it when you use a cash drawer.

Enables/disables

- Disabled (initial setting)
- Enabled

Buzzer frequency (Error)

- Does not sound
- Sounds 1 time
- Sounds continuously (initial setting)

Sound pattern (Autocut)

Selectable from Patterns A to E

Initial setting: Pattern A

Buzzer frequency (Autocut)

- Does not sound
- Sounds 1 time (initial setting)

Sound pattern (Pulse 1)

Selectable from Patterns A to E

Initial setting: Pattern A

Buzzer frequency (Pulse 1)

- Does not sound
- Sounds 1 time (initial setting)

Sound pattern (Pulse 2)

Selectable from Patterns A to E

Initial setting: Pattern B

Buzzer frequency (Pulse 2)

- Does not sound
- Sounds 1 time (initial setting)

Logo 180 dpi emulation mode

- Standard logo mode (initial setting)
- 180 dpi logo mode

NOTE	Set to 180 dpi logo mode when you register graphics for 180 dpi so that the print result (203 dpi) is the same as one printed with a 180 dpi printer.

Communication condition of serial interface

Transmission speed

- 2400 bps
- 4800 bps
- 9600 bps
- 19200 bps
- 38400 bps (initial setting)
- 57600 bps
- 115200 bps

[bps: bits per second]

Parity

- None (initial setting)
- Even
- Odd

Data bit

- 7 bits
- 8 bits (initial setting)

CAUTION	If set to 7 bits, printing from a printer driver is not possible.

Flow control

- DTR/DSR (initial setting)
- XON/XOFF

Communication condition of USB interface

- USB printer class (initial setting)
- USB vendor-defined class

Auto top logo

Key-code

Selectable from key-codes of registered logos

Alignment

- Left
- Center
- Right

Number of lines to be deleted below top logo

Auto bottom logo

Key-code

Selectable from key-codes of registered logos

Alignment

- Left
- Center
- Right

Auto top/bottom logo extended functions

Top logo print while paper feeding to the cutting position

- Disabled (initial setting)
- Enabled

Top logo print when printer is powered on

- Disabled (initial setting)
- Enabled

Top logo print when roll paper cover is closed

- Disabled
- Enabled (initial setting)

Top logo print while clearing the buffer to recover from a recoverable error

- Disabled
- Enabled (initial setting)

Top logo print after paper feeding with the Feed button has finished

- Disabled (initial setting)
- Enabled

2

Connecting the Optional External Buzzer

When the optional external buzzer (model: OT-BZ20) is connected to the DK connector of the printer, you can set the printer so that it beeps when you send commands, when an error occurs, when executed autocutting, and when detected paper end. Settings for sound patterns and frequency depending on the occasions the buzzer beeps are also available.

You need to set the memory switches for buzzer enable/disable setting, sound pattern setting, and frequency setting. For information about the memory switches, see "Setting the Memory Switches/Receipt Enhancement" on page 54.

CAUTION	• Be sure to turn off the printer before you connect/disconnect the optional external buzzer. • Do not connect both the optional external buzzer and the cash drawer to the printer at the same time by using a branched connector.

Volume adjustment knob
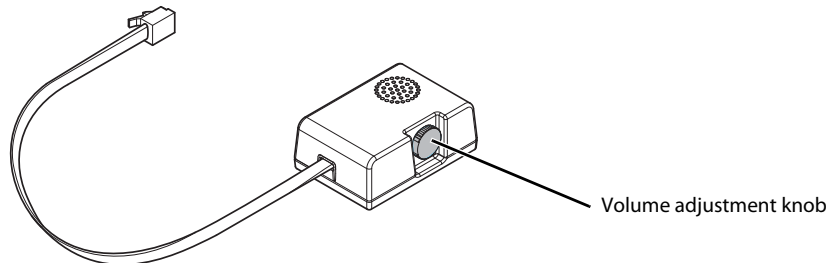
Connecting the Buzzer Unit

The buzzer unit is recommended to be installed in the following positions.

- When using the printer horizontally: either side
- When using the printer vertically: side or top
- When using the printer on the wall: side, top, or bottom

Horizontal installation   Vertical/Wall-hanging installation
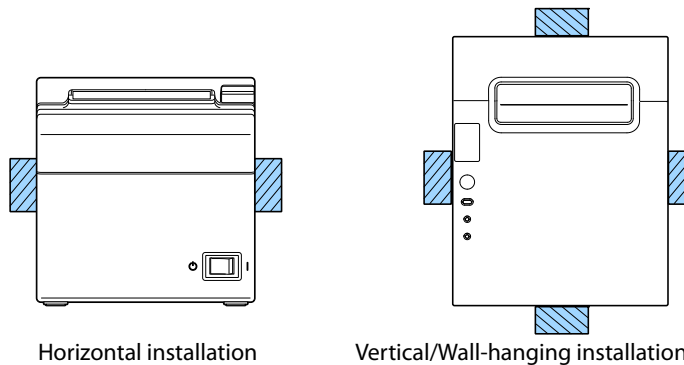
CAUTION	• Do not install the buzzer unit at the roll paper exit. • To prevent liquid from entering inside, it is recommended to install the buzzer unit so that the volume adjustment knob is positioned sideways or downward.

1 Turn off the printer.

2 Clean and dry the printer case where the buzzer unit will be installed.

3 With 2 included pieces of the affixing tape combined, peel off the backing paper on one side, and stick the tape in the center of the attaching surface of the buzzer unit.
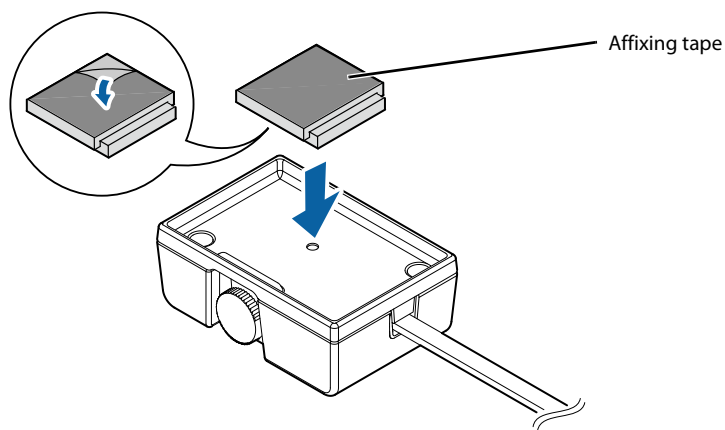
Affixing tape

4 Connect the cable of the buzzer unit to the DK connector on the printer.

DK connector

DK
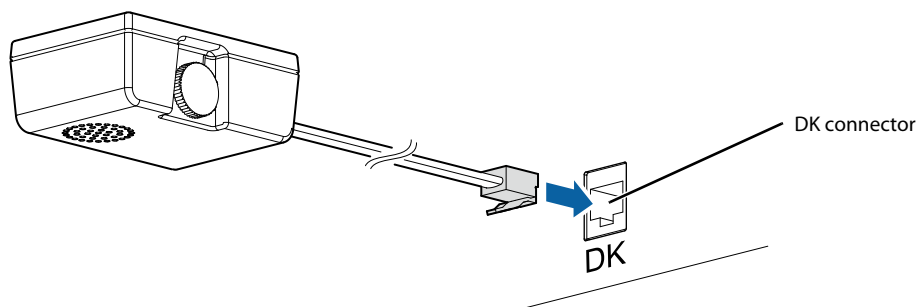
5 Peel off the backing paper on the other side of the affixing tape, and attach the buzzer unit to the printer case.

Printer case

2
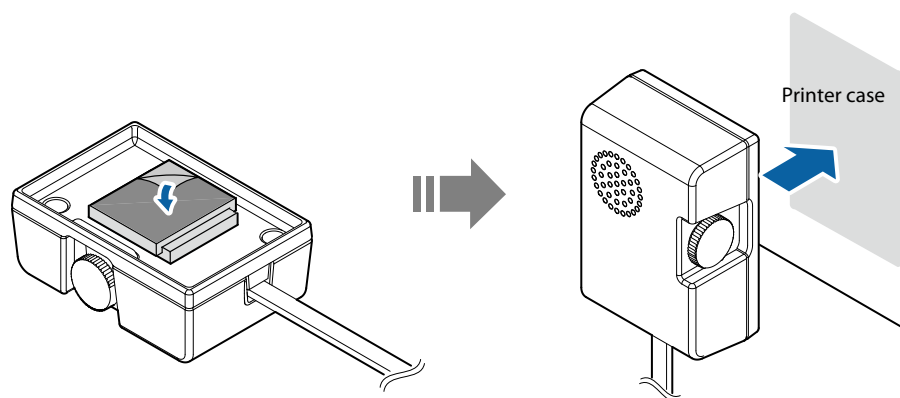
Connecting the Cash Drawer

> **CAUTION**
> - Do not connect both the optional external buzzer and the cash drawer to the printer at the same time by using a branched connector.
> - When the optional external buzzer is enabled with the memory switch (see "Setting the Memory Switches/Receipt Enhancement" on page 54), a cash drawer cannot be used. Be sure to disable it when you use a cash drawer.
> - Two driver transistors cannot be energized simultaneously.
> - Leave intervals longer than 4 times the drawer driving pulse when sending it continuously.

Required specifications of cash drawers

Specifications of drawers differ depending on makers or models. When you use a drawer other than specified, make sure its specification meets the following conditions.

Otherwise, devices may be damaged.

- The load, such as a drawer kick-out solenoid, must be connected between pins 4 and 2 or pins 4 and 5 of the DK connector.

- When the drawer open/close signal is used, a switch must be provided between DK connector pins 3 and 6.

- The resistance of the load, such as a drawer kick-out solenoid, must be 24 Ω or more or the input current must be 1A or less.

- Be sure to use the 24V power output on DK connector pin 4 for driving the equipment.

Drawer Connection Diagram
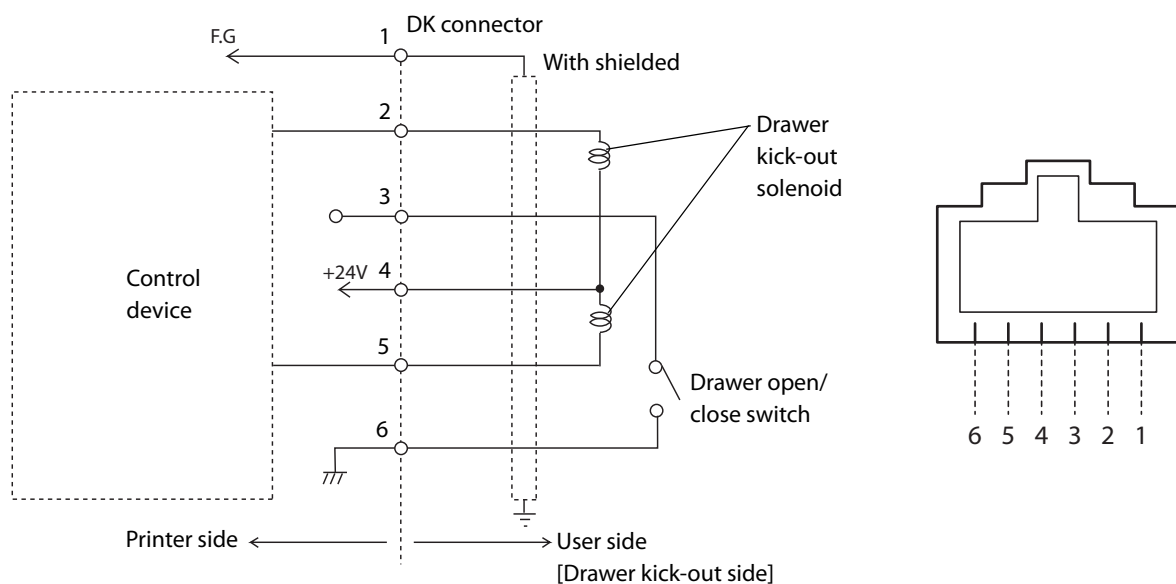
Connecting the DK cable

⚠ **WARNING**	• **Use a shield cable for the DK cable.** • **Do not insert a telephone line into the DK connector.** Doing so may damage the telephone line or printer.

Connect the DK cable to the DK connector by pressing firmly until the connector clicks into place.
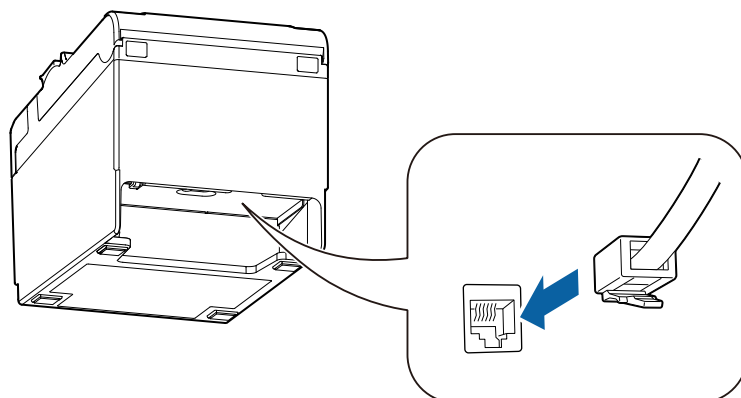
Application Development Information

This chapter describes how to control the printer and gives information useful for printer application development.

How to Control the Printer

Use a driver or ESC/POS commands to control the printer.

Selecting a Driver

Choose one of the drivers listed in "Printer Drivers" on page 79, depending on the application operating environment. You cannot control a single printer with more than one driver.

For information about the driver operating environment, see the installation manual for each driver.

When you newly develop an application

- Use APD if you want to print TrueType fonts or print many graphics.

- OPOS ADK is recommended for system extensibility. An OPOS driver is provided for various peripherals and it is a POS industry standard now. It enables POS system efficiency, reduction of development cost, and effective use of application assets.

> **NOTE**
> You can use all functions, including ones not supported by OPOS ADK or APD, by using ESC/POS commands through your driver. Use the DIRECT I/O function of OPOS ADK, the control A command of APD, or Status API to send ESC/POS commands from each driver. (See "ESC/POS command functions" on page 72.)

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ESC/POS Commands

ESC/POS is the Epson original printer command system. With ESC/POS commands, you can directly control all the TM printer functions, but detailed knowledge of printer specifications or combination of commands is required, compared to using a driver.

For information about ESC/POS commands, see the Product Specifications.

You need a non-disclosure agreement with Epson to get the Product Specifications.

Contact the dealer for more details.

The ESC/POS command functions are listed below. See the Product Specifications.

ESC/POS command functions

Print Commands	
LF	Print and line feed
FF (in page mode)	Print and return to standard mode (in page mode)
CR	Print and carriage return
ESC FF	Print data in page mode
ESC J	Print and feed paper
ESC d	Print and feed n lines
Line Spacing Commands	
ESC 2	Select default line spacing
ESC 3	Set line spacing
Character Commands	
CAN	Cancel print data in page mode
ESC SP	Set right-side character spacing
ESC !	Select print mode(s)
ESC -	Turn underline mode on/off
ESC E	Turn emphasized mode on/off
ESC G	Turn double-strike mode on/off
ESC M	Select character font
ESC R	Select an international character set
ESC V	Turn 90° clockwise rotation mode on/off
ESC t	Select character code table

ESC {	Turn upside-down print mode on/off
GS !	Select character size
GS B	Turn white/black reverse print mode on/off
GS b	Turn smoothing mode on/off
ESC %	Select/cancel user-defined character set
ESC &	Define user-defined characters
ESC ?	Cancel user-defined characters
Print Position Commands	
HT	Horizontal tab
ESC $	Set absolute print position
ESC D	Set horizontal tab positions
ESC T	Select print direction in page mode
ESC W	Set print area in page mode
ESC \	Set relative print position
ESC a	Select justification
GS $	Set absolute vertical print position in page mode
GS L	Set left margin
GS W	Set print area width
GS \	Set relative vertical print position in page mode
Paper Sensor Commands	
ESC c 3	Select paper sensor(s) to output paper-end signals
ESC c 4	Select paper sensor(s) to stop printing
Mechanism Control Commands	
GS V	Select cut mode and cut paper

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Bit Image Commands	
ESC *	Select bit-image mode
GS (L <Function 48>	Transmit the NV graphics memory capacity
GS (L <Function 50>	Print the graphics data in the print buffer
GS (L <Function 51>	Transmit the remaining capacity of the NV graphics memory
GS (L <Function 52>	Transmit the remaining capacity of the download graphics memory
GS (L <Function 64>	Transmit the key code list for defined NV graphics
GS (L <Function 65>	Delete all NV graphics data
GS (L <Function 66>	Delete the specified NV graphics data
GS (L <Function 67>	Define the NV graphics data (raster format)
GS (L <Function 69>	Print the specified NV graphics data
GS (L <Function 80>	Transmit the key code list for defined download graphics
GS (L <Function 81>	Delete all download graphics data
GS (L <Function 82>	Delete the specified download graphics data
GS (L <Function 83>	Define the downloaded graphics data (raster format)
GS (L <Function 85>	Print the specified download graphics data
GS (L <Function 112>	Store the graphics data in the print buffer (raster format)
GS *	Define downloaded bit image
GS /	Print downloaded bit image
GS D <Function 67>	Define Windows BMP NV graphics data
GS D <Function 83>	Define Windows BMP download graphics data
Panel Button Commands	
ESC c 5	Enable/disable panel buttons
Status Commands	
DLE EOT	Transmit real-time status
GS a	Enable/disable Automatic Status Back (ASB)
GS r	Transmit status

Bar Code Commands	
GS H	Select print position of HRI characters
GS f	Select font for HRI characters
GS h	Set bar code height
GS k	Print bar code
GS w	Set bar code width
Two-dimensional Code Commands	
GS (k <Function 065>	PDF417: Set the number of columns in the data region
GS (k <Function 066>	PDF417: Set the number of rows
GS (k <Function 067>	PDF417: Set the width of the module
GS (k <Function 068>	PDF417: Set the row height
GS (k <Function 069>	PDF417: Set the error correction level
GS (k <Function 070>	PDF417: Select the options
GS (k <Function 080>	PDF417: Store the data in the symbol storage area
GS (k <Function 081>	PDF417: Print the symbol data in the symbol storage area
GS (k <Function 082>	PDF417: Transmit the size information of the symbol data in the symbol storage area
GS (k <Function 165>	QR Code: Select the model
GS (k <Function 167>	QR Code: Set the size of module
GS (k <Function 169>	QR Code: Select the error correction level
GS (k <Function 180>	QR Code: Store the data in the symbol storage area
GS (k <Function 181>	QR Code: Print the symbol data in the symbol storage area
GS (k <Function 182>	QR Code: Transmit the size information of the symbol data in the symbol storage area
GS (k <Function 265>	MaxiCode: Select the mode
GS (k <Function 280>	MaxiCode: Store the data in the symbol storage area
GS (k <Function 281>	MaxiCode: Print the symbol data in the symbol storage area
GS (k <Function 282>	MaxiCode: Transmit the size information of the symbol data in the symbol storage area
GS (k <Function 367>	2-dimensional GS1 DataBar: Set the width of the module
GS (k <Function 371>	2-dimensional GS1 DataBar: GS1 DataBar Expanded Stacked maximum width setting

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GS (k <Function 380>	2-dimensional GS1 DataBar: Store data in the symbol storage area
GS (k <Function 381>	2-dimensional GS1 DataBar: Print the symbol data in the symbol storage area
GS (k <Function 382>	2-dimensional GS1 DataBar: Transmit the size information of the symbol data in the symbol storage area
GS (k <Function 467>	Composite Symbology: Set the width of the module
GS (k <Function 471>	Composite Symbology: GS1 DataBar Expanded Stacked maximum width setting
GS (k <Function 472>	Composite Symbology: Select HRI character font
GS (k <Function 480>	Composite Symbology: Store the data in the symbol storage area
GS (k <Function 481>	Composite Symbology: Print the symbol data in the symbol storage area
GS (k <Function 482>	Composite Symbology: Transmit the size information of the symbol data in the symbol storage area
Macro Function Commands	
GS :	Start/end macro definition
GS ^	Execute macro
Kanji Commands	
FS !	Select print mode(s) for Kanji characters
FS &	Select Kanji character mode
FS -	Turn underline mode on/off for Kanji characters
FS .	Cancel Kanji character mode
FS 2	Define user-defined Kanji characters
FS S	Set Kanji character spacing
FS W	Turn quadruple-size mode on/off for Kanji characters

Miscellaneous Commands	
DLE ENQ	Send real-time request to printer
DLE DC4 <Function 1>	Generate pulse in real-time
DLE DC4 <Function 2>	Execute power-off sequence
DLE DC4 <Function 3>	Sound buzzer in real-time
DLE DC4 <Function 8>	Clear buffer(s)
ESC =	Select peripheral device
ESC @	Initialize printer
ESC L	Select page mode
ESC S	Select standard mode
ESC p	Generate pulse
GS (A	Execute test print
GS (D	Enable/disable real-time command
GS I	Transmit printer ID
GS P	Set horizontal and vertical motion units
GS g 0	Initialize maintenance counter
GS g 2	Transmit maintenance counter
GS (H <Function 48>	Specifies the process ID response
GS (K <Function 48>	Select the print control mode
GS (K <Function 50>	Select the print speed
ESC (A <Function 97>	Model specific buzzer control (fn=97)
Receipt enhancement control	
FS (E <Function 60>	Cancel set values for top/bottom logo printing
FS (E <Function 61>	Transmit set values for top/bottom logo printing
FS (E <Function 62>	Set top logo printing
FS (E <Function 63>	Set bottom logo printing
FS (E <Function 64>	Make extended settings for top/bottom logo printing
FS (E <Function 65>	Enable/disable top/bottom logo printing

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Customize Commands	
GS (E <Function 1>	Change into the user setting mode
GS (E <Function 2>	End the user setting mode session
GS (E <Function 3>	Change the memory switch
GS (E <Function 4>	Transmit the settings of the memory switch
GS (E <Function 5>	Set the customized setting values
GS (E <Function 6>	Transmit the customized setting values
GS (E <Function 11>	Set the configuration item for the serial interface
GS (E <Function 12>	Transmit the configuration item for the serial interface
GS (E <Function 15>	Set conditions for USB interface communication
GS (E <Function 16>	Transmit conditions for USB interface communication
GS (E <Function 99>	Set internal buzzer patterns
GS (E <Function 100>	Transmit internal buzzer patterns
FS g 1	Write to NV user memory
FS g 2	Read from NV user memory

Software and Manuals

The following software and manuals are provided for application development.

Printer Drivers

Software	Manual
EPSON Advanced Printer Driver (APD): In addition to ordinary Windows driver functions, this driver has controls specific to POS, such as controls for paper cut, a cash drawer, and customer display. The Status API (Epson original DLL) that monitors printer status and sends ESC/POS commands is also attached to this driver.	• APD Install Manual • APD TM/BA/EU Printer Manual • APD Printer Specification • Status API Manual • Devmode API/PRINTERINFO Manual • Sample Program Guide • TM-T82 Software User's Manual
EPSON OPOS ADK: This OCX driver can control POS peripherals using OLE technology*[1]. Because controlling POS peripherals with original commands is not required on the application side, efficient system development is possible.	• OPOS Installation Manual • User's Manual • Application Development Guide • UnifiedPOS Retail Peripheral Architecture*[2] • Sample Program Guide
EPSON OPOS ADK for .NET: OPOS ADK for .NET allows you to develop applications that are compatible with Microsoft POS for .NET. When developing applications, use a separate development environment such as Microsoft Visual Studio .NET.	• OPOS ADK for .NET Installation Guide • User's Reference (SetupPOS) • Application Development Guide (POSPrinter TM-T82) • UnifiedPOS Retail Peripheral Architecture*[2]
EPSON JavaPOS ADK (Windows/Linux): JavaPOS is the standard specification which defines an architecture and device interface (API) to access various POS devices from a Java based system. Using JavaPOS standard API allows control with Java-based applications of functions inherent to each device. A flexible design with Java language and JavaPOS enables many different types of computer systems, such as stand alone or network configuration, to use a same application. You can use JavaPOS to build applications and drivers independently of platforms. This allows flexible configurations using thin clients to meet the system requirements.	JavaPOS ADK Installation Guide

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Software	Manual
EPSON TM Virtual Port Driver: This driver is a Serial-USB/Ethernet and Parallel-USB/Ethernet conversion driver to make an EPSON TM/BA/EU printer connected via USB/Ethernet accessible from a POS application through virtual COM ports and a virtual LPT port. Without making changes in the POS application that controls devices connected through serial or parallel interfaces, devices connected via USB/Ethernet can be directly controlled with ESC/POS commands.	TM Virtual Port Driver User's Manual
TM-T82 Mac Printer Driver: Mac printer driver allows you to control the TM-T82 using Common UNIX Printing System (CUPS) on Mac OS X. This is a full raster printer driver. It is able to print images, text, and vector graphics etc., that an application displays. With this driver many printer controls are possible, such as paper cut timing control, cash drawer control, printing speed control, blank line skip, and upside-down printing. It also provides API and dialogues for print setting, sample applications, and logo setting utility.	TM-T82 Mac Printer Driver User's Manual
Epson TM/BA Series Thermal Printer Driver: This driver allows you to control the TM-T82 using Common UNIX Printing System (CUPS) on GNU/Linux. This is a full raster printer driver. It is able to print images, text, and vector graphics etc., that an application displays. With this driver many printer control are possible, such as paper cut timing control, cash drawer control, printing speed control, blank line skip, and upside-down printing.	• Epson TM/BA Series Thermal Printer Driver Installation Manual • Epson TM/BA Series Thermal Printer Driver Manual • TM-T82 Thermal Printer Driver Manual

*1: OLE technology developed by Microsoft divides software into part blocks. The OPOS driver is presupposed to be used with a development environment such as Visual Basic, unlike ordinary Windows drivers. It is not a driver to be used for printing from commercial applications.

*2: This guide describes general information on how to control printers using the OPOS ADK (in the chapter "POS Printer" and "Appendix-A"). It does not describe Epson's specific functions.

Utilities

Software	Manual
TM-T82 Utility: Use for the following functions: • Checking current settings • Storing logos • Coupon settings • Electronic Journal • Paper reduction settings • Automatic paper cut settings • Printing control settings • Font settings • Buzzer settings • Communication I/F settings • Backup/restore • Operation check	• TM-T82 Software User's Manual • TM-T82 Utility User's Manual
EpsonNet Config: Use for IP address setting.	EpsonNet Config Operations Guide
EpsonNet Simple Viewer: Use for checking the status of EPSON printers connected to a network and EPSON TM/BA printers connected to computers on a network.	EpsonNet Simple Viewer User's Manual
TM/BA/EU Printer Remote Configuration Tool: This is a package of EpsonNet Simple Viewer and TM-T82 Utility. First install this software in the computer with the administrator's authority, and set up the firewall. Next, install the printer driver in each client computer and set up the firewall. Then you can check the status of and configure the printer connected to a client computer on the network from the computer with the administrator's authority.	TM/BA/EU Printer Remote Configuration Tool User's Manual

How to Get Drivers, Manuals, and the Utility

Drivers, manuals, and the TM-T82 Utility can be installed by the TM-T82 installer in the included TM-T82 Software & Documents Disc.

You can also obtain the software and manuals from the following URL.

www.epson-biz.com/

Setting/Checking Modes

Besides the ordinary print mode, the printer has the following modes to set or check settings of the printer.

- Self-test Mode
- NV Graphics Information Print Mode (page 83)
- Receipt Enhancement Information Print Mode (page 85)
- Software Setting Mode (page 87)
- Hexadecimal Dumping Mode (page 90)

Self-test Mode

In the self-test mode, the printer prints the current printer status and a rolling pattern test print of resident characters.

The current status print includes the following information:

- Control ROM version
- Interface type
- Receive buffer size
- BUSY condition
- Resident fonts
- Thai character print mode
- Auto line feed
- Print density
- Maintenance counter information (head running length, number of times of autocutting)
- Memory switch settings

Starting the self-test mode

Follow the steps below to run this mode.

1   Close the roll paper cover.

2   While pressing the Feed button, turn on the printer. (Keep pressing the Feed button until the printer starts printing.)

The printer starts printing current status of the printer.

When the printer finishes printing the printer status, the following message is printed and the Paper LED flashes. (The printer is now in the self-test wait mode.):

"Select Modes by pressing Feed button.

Continue SELF-TEST: Less than 1 second

Mode Selection: 1 second or more"

3   Press the Feed button to start the test print (less than 1 second).

The printer starts test printing. (A rolling pattern is printed using only the resident character set.)

> NOTE   If you select "Mode Selection," the printer goes to "NV Graphics Information Print Mode" (page 83), "Receipt Enhancement Information Print Mode" (page 85), or "Software Setting Mode" (page 87).

After the test printing has finished, the printer prints the following message, and then the printer is initialized and returned to the normal mode.

"*** completed***"

NV Graphics Information Print Mode

You can confirm the following information by running the NV graphics information print mode:

- Capacity of the NV graphics
- Used capacity of the NV graphics
- Unused capacity of the NV graphics
- Number of NV graphics that are registered
- Key code, number of dots in X direction, number of dots in Y direction, number of colors to be defined.
- NV graphics data

Starting the NV graphics information print mode

Follow the steps below to run this mode.

1 Close the roll paper cover.

2 While pressing the Feed button, turn on the printer. (Keep pressing the Feed button until the printer starts printing.)

The printer starts printing current status of the printer.

When the printer finishes printing the printer status, the following message is printed and the Paper LED flashes. (The printer is now in the self-test wait mode.):

"Select Modes by pressing Feed button.

Continue SELF-TEST: Less than 1 second

Mode Selection: 1 second or more"

3 Press the Feed button for 1 second or more to enter the Mode Selection.

The printer starts printing instructions.

```
              Mode Selection
Modes
   0: Exit and Reboot Printer
   1: NV Graphics Information
   2: Receipt Enhancement Information
   3: Customize Value Settings
   4: or more: None

Select Modes by executing following
procedure.
    step 1. Press the Feed button less
            than 1 second as many times
            as the selected mode number.
    step 2. Press Feed button for 1
            second or more.
```

4 Press the Feed button once, and then hold down the Feed button until the printer starts printing the NV graphics information.

5 Turn off the printer or select "Exit and Reboot Printer" to exit this mode.

Receipt Enhancement Information Print Mode

You can confirm the following information by running the R/E information mode:

• Automatic top logo setting

• Automatic bottom logo setting

• Extended settings for automatic top/bottom logo

Starting the R/E information print mode

Follow the steps below to run this mode.

1   Close the roll paper cover.

2   While pressing the Feed button, turn on the printer. (Keep pressing the Feed button until the printer starts printing.)

The printer starts printing current status of the printer.

When the printer finishes printing the printer status, the following message is printed and the Paper LED flashes. (The printer is now in the self-test wait mode.):

"Select Modes by pressing Feed button.

Continue SELF-TEST: Less than 1 second

Mode Selection: 1 second or more"

3 Press the Feed button for 1 second or more to enter the Mode Selection.

The printer starts printing instructions.

```
                Mode Selection
Modes
    0: Exit and Reboot Printer
    1: NV Graphics Information
    2: Receipt Enhancement Information
    3: Customize Value Settings
    4: or more: None

Select Modes by executing following
procedure.
    step 1. Press the Feed button less
            than 1 second as many times
            as the selected mode number.
    step 2. Press Feed button for 1
            second or more.
```

4 Press the Feed button twice, and then hold down the Feed button until the printer starts printing the R/E information.

5 Turn off the printer or select "Exit and Reboot Printer" to exit this mode.

Software Setting Mode

Starting the Software setting mode

Follow the steps below to run this mode.

1 Close the roll paper cover.

2 While pressing the Feed button, turn on the printer. (Keep pressing the Feed button until the printer starts printing.)

The printer starts printing current status of the printer.

When the printer finishes printing the printer status, the following message is printed and the Paper LED flashes. (The printer is now in the self-test wait mode.):

"Select Modes by pressing Feed button.

Continue SELF-TEST: Less than 1 second

Mode Selection: 1 second or more"

3 Press the Feed button for 1 second or more to enter the Mode Selection.

The printer starts printing instructions.

```
              Mode Selection
Modes
   0: Exit and Reboot Printer
   1: NV Graphics Information
   2: Receipt Enhancement Information
   3: Customize Value Settings
   4: or more: None

Select Modes by executing following
procedure.
   step 1. Press the Feed button less
           than 1 second as many times
           as the selected mode number.
   step 2. Press Feed button for 1
           second or more.
```
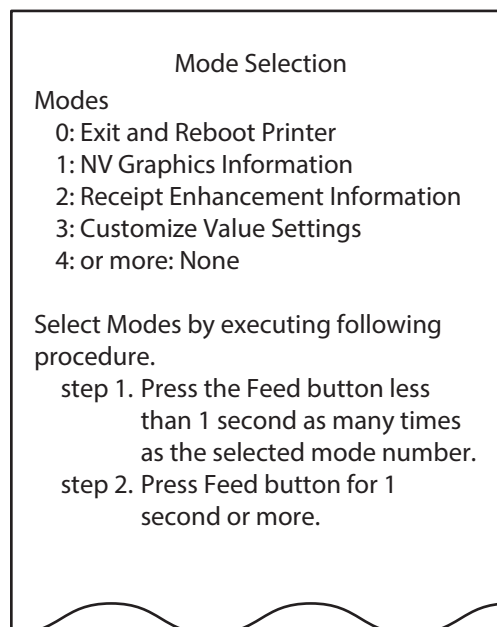
4   Press the Feed button three times, and then hold down the Feed button until the printer starts printing the setting instructions.

```
                    Customize Value Settings


            Modes
                0: Exit
                1: Print Current Settings
                2 : TM-T81 Emulation Mode
                3 : Multi-Language Font
                4 : Print Density
                5 : Printing Speed
                6 : Serial Interface Settings
                7 : Auto Paper Feed&Cut at cover close
                8 : Paper Width
                9 : Thai Character Composition
                10 : Default Character
                11 : Embedded Font Replacement
                12 : USB Interface Settings
                13 : Buzzer Control
                14 : Column Emulation
                15 : Interface Settings
                16 : Near-end Detection
                17 : Logo Emulation
                18 : Automatic Paper Reduction
                19 : Interface Selection

            Select Modes by executing following
            procedure.
                step 1. Press the Feed button less
                        than 1 second as many times
                        as the selected mode number.
                step 2. Press Feed button for 1
                        second or more.
```

5   Select the setting item by pressing the Feed button (no longer than 1 second) for the number of times indicated on the print.
Then hold down the Feed button until the printer starts printing the setting condition.

6 Select the setting condition by pressing the Feed button (no longer than 1 second) for the number of times indicated on the print.
Then hold down the Feed button until the printer starts printing the setting result.

When one setting has been completed, the printer stores the setting.
See "Setting Conditions for Software Setting Mode" on page 108 for the selectable items.

7 Turn off the printer or select "Exit" and "Exit and Reboot Printer" to exit this mode.

NOTE	• To select the item number 0, hold down the Feed button until the printer starts printing.
	• If you pressed the button for the number of times that is not listed on the print, the operation is invalid, and the same result is printed again.

Hexadecimal Dumping Mode

In the hexadecimal dumping mode, the printer prints the data transmitted from a host computer in hexadecimal numbers and their corresponding characters. It enables you to check if data is transmitted to the printer correctly.

Starting the hexadecimal dumping mode

Follow the steps below to run this mode.

> **CAUTION**
> - If there is no character corresponding to print data, "" is printed.
> - If print data is less than one line, press the Feed button to print the line.

1 Open the roll paper cover.

2 While pressing the Feed button, turn on the printer.

3 Close the roll paper cover.

The printer starts printing data received from then on in hexadecimal numbers and their corresponding characters.

Turn off the printer or press the Feed button three times to return to the normal mode.

Printing example:

```
Hexadecimal Dump
To terminate hexadecimal dump,
press FEED button three times.




1B 21 00 1B 26 02 40 40 1B 69 . ! . . & . @ @ . i
1B 25 01 1B 63 34 00 1B 30 31 . % . . c 4 . . 0 1
41 42 43 44 45 46 47 48 49 4A A B C D E F G H I J

            ***  completed  ***
```

TM-T81 Emulation Mode

This mode makes the TM-T81 users to be able to use the application software created for the TM-T81 as much as possible on this product.

Selecting the TM-T81 Emulation Mode

You can select the TM-T81 Emulation Mode from the Software Setting Mode.

1 Start the Software Setting Mode.

Start the Software Setting Mode with following the steps from 1 to 4 on the "Starting the Software setting mode" on page 87.

2 Select the TM-T81 Emulation Mode.

Select the "2: TM-T81 Emulation Mode" and then "Enable" with following the setting instructions that are printed.

3 Select the language.

When the "TM-T81 Emulation Mode" is selected, the initial setting value of the "Multi-Language Font" is "Thai, Vietnam".
To change the language into the "Simplified Chinese", select it from the "3: Multi-Language Font".

4 Exit the Software Setting Mode.

Turn off the printer or select "Exit" and "Exit and Reboot Printer" to exit the Software Setting Mode.

> NOTE
> - The 58 mm width paper printing is not supported by TM-T81 Emulation Mode. Make sure to use the 80 mm width roll paper.
> - The "42-column mode" is not supported by TM-T81 Emulation Mode.
> - Some of the initial setting values of the TM-T81 Emulation Mode differ from the normal mode. See "Setting Conditions for Software Setting Mode" on page 108.
> - For information about ESC/POS commands supported by TM-T81 Emulation Mode, see product specifications of the TM-T81.

Transferring the TM-T81 Setting

You can transfer the following setting values saved in the TM-T81 to the TM-T82 (TM-T81 Emulation Mode) with using the TM-T81 Utility included in the CD-ROM comes with this product.

- Logo setting
- Print density
- Print speed

| NOTE | Windows PC is necessary to use the TM-T81 Utility. |

Operation on the TM-T81 that is currently used

1 Confirm the communication condition of the TM-T81.

Run the self-test of the TM-T81 to confirm the communication interface and communication condition.

2 Install the TM-T81 Utility.

Execute the "TM-T81Utility***.exe" that stored in the following folder in the CD-ROM that comes with this product. (*** means the version number)

　　　\Windows\TM-T81 Utility

| NOTE | • Install it with the administrator authority.
• This utility is the upward-compatible version with additional Setting Backup/Restore functions to TM-T81 Utility included in the CR-ROM that comes with the TM-T81.
If the TM-T81 Utility is already installed, it will be overinstalled. |

3 Run the TM-T81 Utility.

Run the installed utility.
For Windows 7, select [Start] - [All Programs] - [EPSON] - [TM-T81 Software] - [TM-T81 Utility].
For information about the TM-T81 Utility, see TM-T81 Utility User's Manual that is installed with the utility.

4 Make settings of the TM-T81 Utility's communication condition.

With referring to the communication condition of the TM-T81 that is confirmed in the step 1, make the same settings on this utility.
For information, see Chapter 2 - Starting the TM-T81 Utility on the TM-T81 Utility User's Manual.

5 Save the setting values of the TM-T81.

Execute the Backup from Backup/Restore on the utility to save the TM-T81's setting values as a file.
For information, see Chapter 2 - Setting Backup/Restore - Saving the Printer Settings to a File on the TM-T81 Utility User's Manual.

Operation on the TM-T82 (this product)

6   Change to the TM-T81 Emulation Mode.

Follow the steps on the "Selecting the TM-T81 Emulation Mode" on page 91 above to select the "TM-T81 Emulation Mode".

7   Make the settings of the TM-T82's communication condition.

With referring to the communication condition of the TM-T81 that is confirmed in the step 1, make the same settings on the TM-T82.

You can make the IP address setting while using the Ethernet interface with using the EpsonNet Config. For information, see the EpsonNet Config Operations Guide.

In cases of using the serial interface or USB interface, you make setting on the Software Setting Mode.

> NOTE
>
> The initial setting values of selecting the TM-T81 Emulation Mode are below.
> Serial interface: Baud rate: 115200bps, Parity: None, Handshaking: DTR/DSR,
>   Data bits: 8 bits, Data receive error: Print "?"
> Ethernet interface: IP address: 192.168.192.168
> USB interface: Class: Vendor-defined class
> Parallel interface: (no specific setting)

8   Make settings of the TM-T81 Utility's communication condition.

With referring to the communication condition of the TM-T81 that is made in the step 7, make the same settings on the TM-T81 Utility.

For information, see Chapter 2 - Starting the TM-T81 Utility on the TM-T81 Utility User's Manual.

> NOTE
>
> When you use the same PC as the TM-T81 is connected, you can skip this step. The settings are already made on the step 4.

9   Write the TM-T81's setting values to the TM-T82.

Execute the Restore from Backup/Restore on the utility to write the setting values that are saved in step 5 to the TM-T82.

For information, see Chapter 2 - Setting Backup/Restore - Restore the Settings to the Printer on the TM-T81 Utility User's Manual.

10   Transfer the other setting values.

Following setting values cannot be transferred by TM-T81 Utility. Make the settings by the Software Setting Mode if necessary.

- Receive buffer capacity
- BUSY condition
- Release condition of receive buffer BUSY
- Thai character composition

3

Handling

This chapter describes basic handling of the printer.

Installing and Replacing Roll Paper

⚠ **CAUTION**	• **Do not open the roll paper cover during printing or autocutting.** The printer may be damaged. • **Do not touch the manual cutter with your hands when installing or replacing the roll paper.** Otherwise, you may be injured because the manual cutter blade is sharp.

CAUTION	• Use roll paper that meets the printer specification. For details about paper specification, see "Paper Specifications" on page 28. • Paper must not be pasted to the roll paper core.

1   Open the roll paper cover by using the cover open lever.

Cover open lever
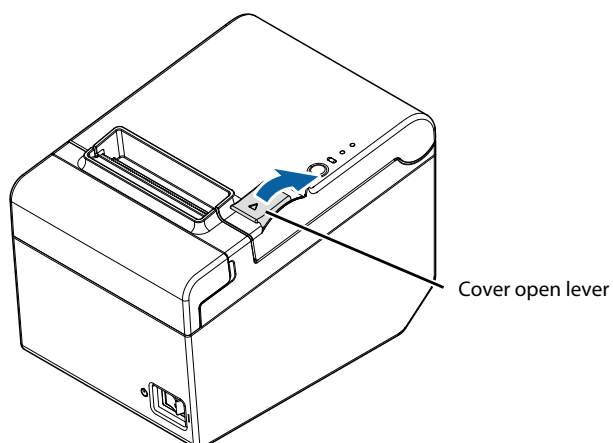
2   Remove the used roll paper core, if it is installed.

3 Install the roll paper in the correct direction.
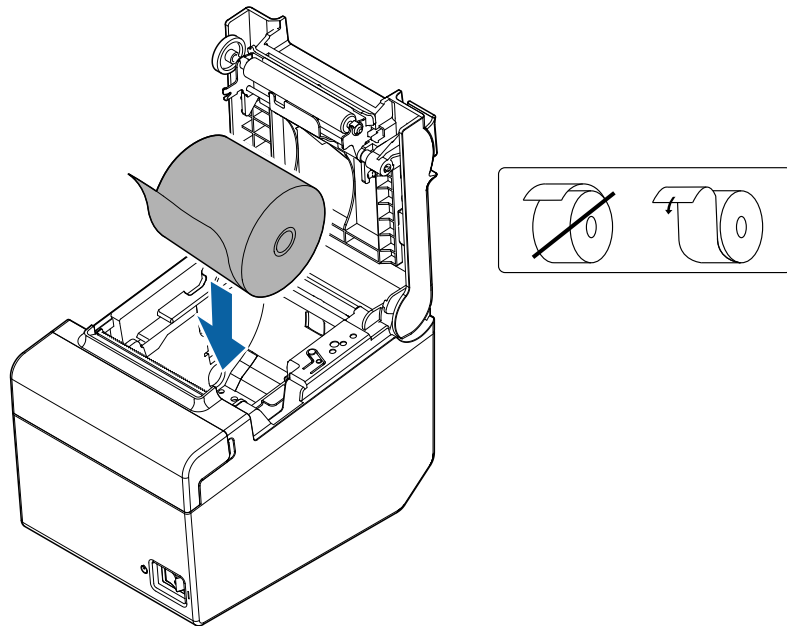
4 Pull out some roll paper, and close the roll paper cover.

When the printer power is on, the roll paper is automatically cut. (initial setting)
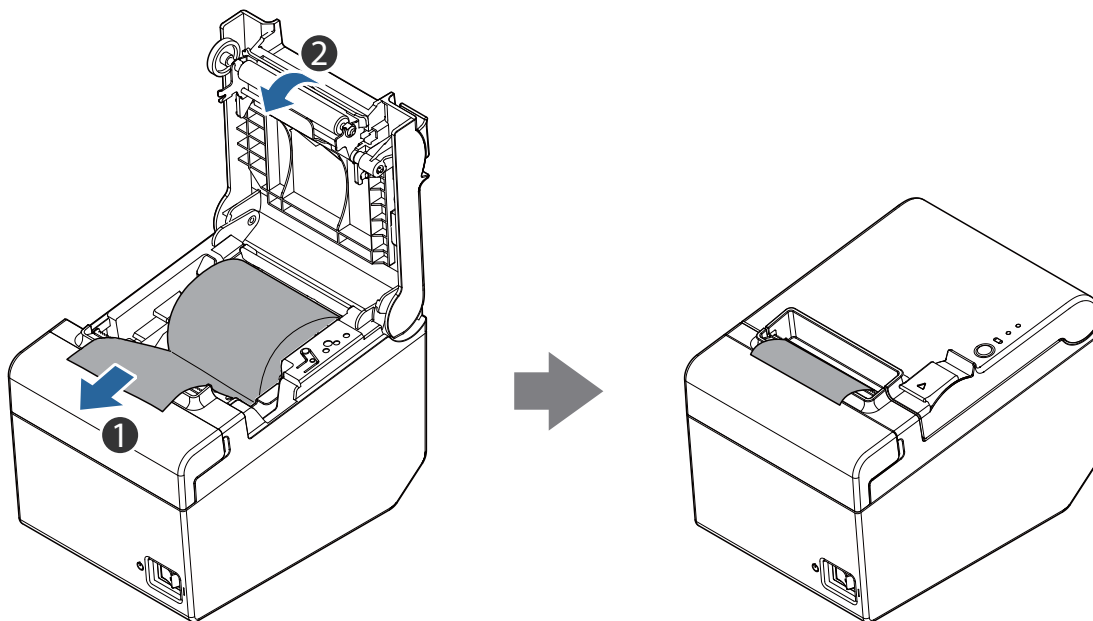
Removing Jammed Paper

⚠️ **CAUTION**	**Do not touch the thermal head.** (See "Cleaning the Printer" on page 99.) It can be very hot after printing.

CAUTION	When a paper jam occurs, never pull out the paper forcibly.

If a paper jam occurred, follow the steps below to recover.

1   Turn off the printer.

2   Open the roll paper cover by using the cover open lever.

Cover open lever

4

97
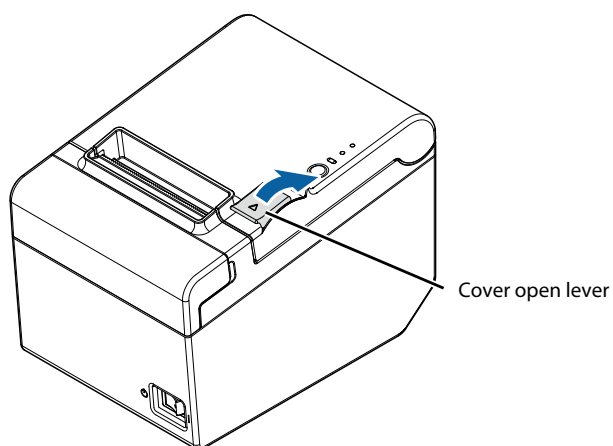
3 If the cover cannot be opened, move the stuck auto cutter blade with the following method.

Remove the cutter cover by sliding toward the front.
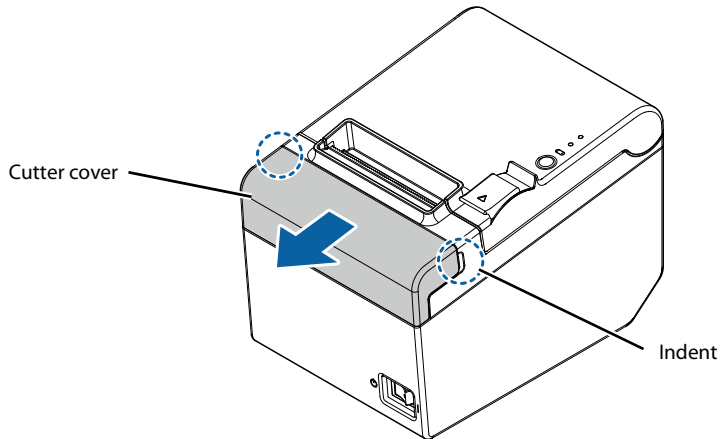
Turn the knob in the direction of the arrow until the triangle mark is appeared in the opening. (This returns the cutter blade to the standby position.)
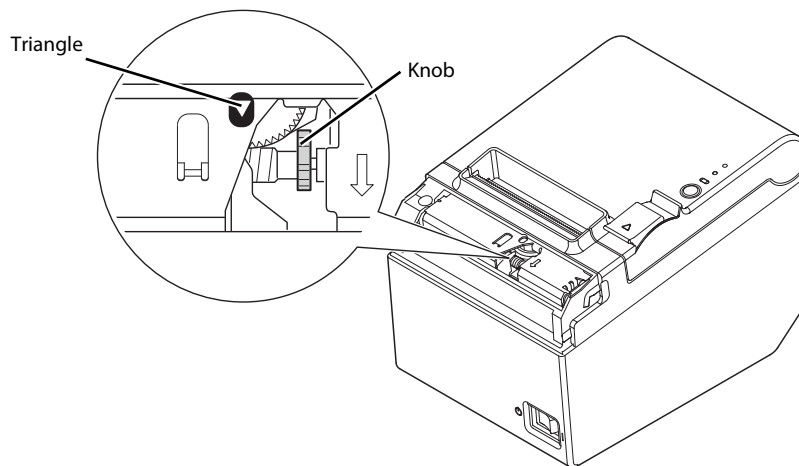
Attach the cutter cover.

4 Remove the jammed paper.

5 Close the roll paper cover and turn on the printer.

Cleaning the Printer

Cleaning the Printer Case

Be sure to turn off the printer, and wipe the dirt off the printer case with a dry cloth or a damp cloth.

⚠ **CAUTION**

Never clean the product with alcohol, benzine, thinner, or other such solvents.
Doing so may damage or break the parts made of plastic and rubber.

Cleaning the Thermal Head/Platen Roller

Epson recommends cleaning the thermal head periodically (generally every 3 months) to maintain receipt print quality.

Depending on the roll paper used, paper dust may stick to the platen roller and the paper may not be fed correctly. To remove the paper dust, clean the platen roller.

Turn off the printer, open the roll paper cover, and clean the thermal elements of the thermal head/platen roller with a cotton swab moistened with an alcohol solvent (ethanol or IPA).

⚠ **CAUTION**

- **After printing, the thermal head can be very hot. Do not touch it and let it cool before you clean it.**
- **Do not damage the thermal head by touching it with your fingers or any hard object.**

Thermal element of the thermal head

Platen roller

4
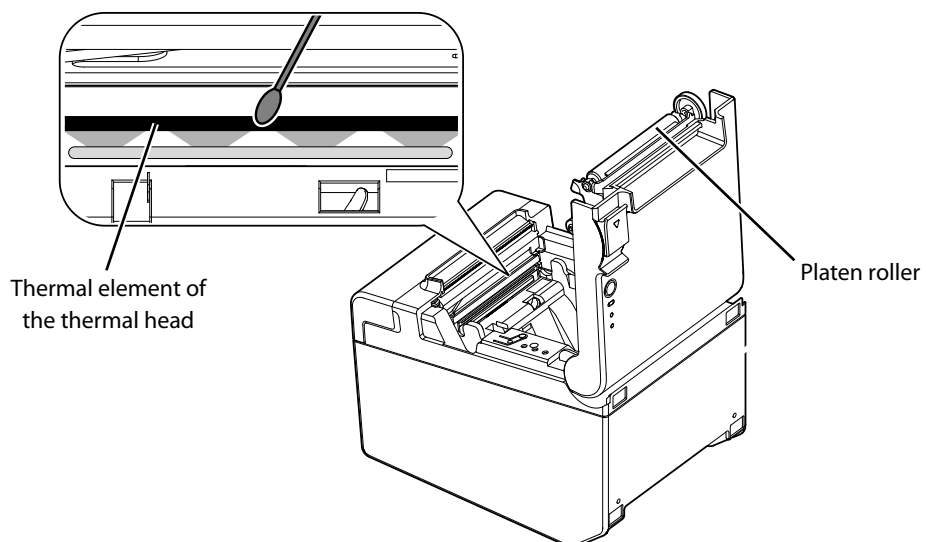
Preparing for Transport

Follow the steps below to transport the printer.

1   Turn off the printer.

2   Disconnect the AC cable from the socket.

3   Remove the roll paper.

4   Pack the printer upright.

Appendix

Specifications of Interface and Connector

USB (Universal Serial Bus) Interface

USB interface connector

Has a USB upstream port connector (USB type-B connector)

USB transmission specifications

USB function

Overall specifications		According to USB 2.0 specifications
Transmission speed		USB Full-Speed (12 Mbps)
Transmission method		USB bulk transmission method
Power supply specifications		USB self power supply function
Current consumed by USB bus		2 mA
USB packet size (with full-speed connection)	USB bulk OUT (TM)	64 bytes
	USB bulk IN (TM)	64 bytes
USB device class		Select USB printer class or USB vendor-defined class with the memory switch.

USB descriptor

		USB vendor-defined class	USB printer class
Vendor ID		04b8h	04b8h
Product ID		0202h	0E11h
String Descriptor	Manufacturer	EPSON	EPSON
	Product	TM-T82	TM-T82
	Serial number	Character string based on the product serial number	Character string based on the product serial number

RS-232 Serial Interface

Interface board specifications (RS-232-compliant)

Item		Specifications
Data transfer method		Serial
Synchronization		Asynchronous
Handshake		Select one of the following with the memory switch: • DTR/DSR • XON/XOFF
Signal level	MARK	-3V to -15V logic "1"/OFF
	SPACE	+3V to +15V logic "0"/ON
Transmission speed		Select one of the following with the memory switch: 2400/4800/9600/19200/38400/57600/115200 bps [bps: bits per second]
Bit length		Select one of the following with the memory switch: • 7 bit • 8 bit
Parity		Select one of the following with the memory switch: • None • Even • Odd
Stop bit		1 or more bits However, the stop bit for data transfer from the printer is fixed to 1 bit.
Connector		DSUB 25-pin (female) connector

Functions of each connector pin

Pin no.	Signal name	Signal direction	Function
1	FG	—	Frame ground
2	TXD	Output	Transmission data
3	RXD	Input	Reception data
4	RTS	Output	Equivalent to DTR signal
6	DSR	Input	This signal indicates whether the host computer can receive data. SPACE indicates that the host computer can receive data. MARK indicates that the host computer cannot receive data. When DTR/DSR control is selected, the printer transmits data after confirming this signal (except if transmitted using some ESC/POS commands). When XON/XOFF control is selected, the printer does not check this signal. The printer is reset when the signal remains MARK for a pulse width of 1 ms or more.
7	SG	—	Signal ground
20	DTR	Output	1) When DTR/DSR control is selected, this signal indicates whether the printer is BUSY. • SPACE status Indicates that the printer is ready to receive data. • MARK status Indicates that the printer is BUSY. Set BUSY conditions with the memory switch. 2) When XON/XOFF control is selected, the signal indicates that the printer is properly connected and ready to receive data from the host. The signal is always SPACE, except in the following cases: • During the period from when power is turned on to when the printer is ready to receive data. • During the self-test.
25	INT	Input	The printer is reset if the signal remains at SPACE for a pulse width of 1 ms or more.

XON/XOFF

When XON/XOFF control is selected, the printer transmits the XON or XOFF signals as follows.

The transmission timing of XON/XOFF differs, depending on the setting of the memory switch.

Signal	Printer status	Memory switch 1-3	
		1 (ON)	0 (OFF)
XON	1) When the printer goes online after turning on the power	Transmit	Transmit
	2) When the receive buffer is released from the buffer full state	Transmit	Transmit
	3) When the printer switches from offline to online	—	Transmit
	4) When the printer recovers from an error using some ESC/POS commands	—	Transmit
XOFF	5) When the receive buffer becomes full	Transmit	Transmit
	6) When the printer switches from online to offline	—	Transmit

Code

The hexadecimal numbers corresponding to the XON/XOFF codes are shown below.

- XON code: 11H

- XOFF code: 13H

CAUTION	• When the printer goes from offline to online and the receive buffer is full, XON is not transmitted. • When the printer goes from online to offline and the receive buffer is full, XOFF is not transmitted.

IEEE 1284 Parallel Interface

Modes

The IEEE 1284 parallel interface supports the following two modes.

Mode	Communication direction	Other information
Compatibility mode	Host → Printer communication	Centronics-compliant
Reverse mode	Printer → Host communication	Assumes a data transfer from an asynchronous printer

Compatibility Mode

Compatibility mode allows data transmission from host to printer only: Centronics-compatible.

Specification

Data transmission	8-bit parallel
Synchronization	Externally supplied nStrobe signals
Handshaking	nAck and BUSY signals
Signal levels	TTL-compatible connector
Connector	ADS-B36BLFDR176 (HONDA) or equivalent product

Reverse Mode

The transfer of status data from the printer to the host proceeds in the nibble or byte mode.

This mode allows data transfer from an asynchronous printer under the control of the host. Data transfers in the nibble mode are made via the existing control lines in units of four bits (a nibble). In the byte mode, data transfer proceeds by making the 8-bit data lines bidirectional. Both modes fail to proceed concurrently in the compatibility mode, thereby causing half-duplex transmission.

Interface signals

Pin	Source	Compatibility Mode	Nibble Mode	Byte Mode
1	Host	nStrobe	HostClk	HostClk
2	Host/Ptr	Data0 (LSB)	Data0 (LSB)	Data0 (LSB)
3	Host/Ptr	Data1	Data1	Data1
4	Host/Ptr	Data2	Data2	Data2
5	Host/Ptr	Data3	Data3	Data3
6	Host/Ptr	Data4	Data4	Data4
7	Host/Ptr	Data5	Data5	Data5
8	Host/Ptr	Data6	Data6	Data6
9	Host/Ptr	Data7 (MSB)	Data7 (MSB)	Data7 (MSB)
10	Printer	nAck	PtrClk	PtrClk
11	Printer	Busy	PtrBusy/Data3,7	PtrBusy
12	Printer	PError	AckDataReq/Data2,6	AckDataReq
13	Printer	Select	Xflag/Data1,5	Xflag
14	Host	nAutoFd	HostBusy k	HostBusy
15		NC	ND	ND
16		GND	GND	GND
17		FG	FG	FG
18	Printer	Logic-H	Logic-H	Logic-H
19		GND	GND	GND
20		GND	GND	GND
21		GND	GND	GND
22		GND	GND	GND
23		GND	GND	GND
24		GND	GND	GND
25		GND	GND	GND
26		GND	GND	GND
27		GND	GND	GND

Pin	Source	Compatibility Mode	Nibble Mode	Byte Mode
28		GND	GND	GND
29		GND	GND	GND
30		GND	GND	GND
31	Host	nInit	nInit	nInit
32	Printer	nFault	nDataAvail/Data0,4	nDataAvail
33		GND	ND	ND
34	Printer	DK_STATUS	ND	ND
35	Printer	+5V	ND	ND
36	Host	nSelectIn	1284-Active	1284-Active

NC: Not Connected

ND: Not Defined

CAUTION	- A prefix "n" to signal names indicates "L" active signals. For the host computer not provided with all of the signal lines listed above, bidirectional communication fails. - For interfacing, signal lines shall use twisted pair cables with the return sides connected to signal ground level. Follow the IEEE Std 1284 for the specifications of the interface cable. - Make sure the signals satisfy electrical characteristics. - Set the leading edge and trailing edge times to 0.5 ms or less. - Data transmission shall not ignore the signal nAck or Busy. An attempt to transmit data with either signal, nAck or Busy, ignored can cause data loss. - Interface cables shall be the minimum required length and as short in length as possible.

Ethernet Interface

For information about the ethernet interface, see the UB-E03 Technical Reference Guide.

Setting Conditions for Software Setting Mode

For information about setting the Software Setting Mode, see "Software Setting Mode" on page 87.

*1: When Thai/Vietnamese is selected

*2: When Simplified Chinese is selected

*3: When TM-T81 Emulation Mode is enabled

Setting Items			Selection of software settings
1st page	**2nd page**	**3rd page**	∗ The initial setting is underlined.
1: Print Current Settings			-
2: TM-T81 Emulation Mode			<u>Disable</u>, Enable
3: Multi-Language Font			<u>Thai/Vietnam</u>, Simplified Chinese
4: Print Density	1: Monochrome		85%, 90%, 95%, <u>100%</u>, 105%, 110%, 115%
5: Printing Speed			Level 1(Slow) to <u>Level 13</u>(Fast)
6: Serial Interface Settings	1: Baud Rate		2400bps, 4800bps, 9600bps, 19200bps, <u>38400bps</u>, 57600bps, <u>115200bps</u>*3
	2: Parity		<u>None</u>, Odd, Even
	3: Handshaking		<u>DTR/DSR</u>, XON/XOFF
	4: Data Bits		7 bits, <u>8 bits</u>
	5: Data Receive Error		<u>Print "?"</u>, Ignored
7: Auto Paper Feed&Cut at cover close			<u>Enable</u>, Disable
8: Paper Width			<u>80mm</u>, 58mm
9: Thai Character Composition			3 Pass, <u>1 Pass</u>
10: Default Character	1: Code Page	1: Western Europe, Southern Europe	<u>Page0:PC437(USA,Standard Europe)</u>, Page3:PC860(Portuguese), Page11:PC851(Greek), Page14:PC737(Greek), Page15:ISO8859-7(Greek), Page16:WPC1252, Page18:PC852(Latin2), Page19:PC858, Page34:PC855(Cyrillic), Page38:PC869(Greek), Page39:ISO8859-2(Latin2), Page40:ISO8859-15(Latin9), Page45:WPC1250, Page47:WPC1253

Setting Items			Selection of software settings
1st page	**2nd page**	**3rd page**	* The initial setting is underlined.
10: Default Character (Continued from the previous page)	1: Code Page (Continued from the previous page)	2: Eastern Europe, Northern Europe	Page5:PC865(Nordic), Page17:PC866(Cyrillic#2), Page33:WPC775, Page35:PC861(Icelandic), Page42:PC1118(Lithuanian), Page43:PC1119(Lithuanian), Page44:PC1125(Ukrainian), Page46:WPC1251, Page51:WPC1257
		3: USA Canada	Page0:PC437(USA,Standard Europe), Page4:PC863(Canadian-French)
		4: Asia	Page1:Katakana, Page20:KU42, Page21:TIS11(Thai), Page26:TIS18(Thai), Page30:TCVN-3(Vietnamese), Page31:TCVN-3(Vietnamese), Page52:WPC1258, Page53:KZ-1048(Kazakhstan)
		5: Turkey, Arabia, Israel	Page12:PC853(Turkish), Page13:PC857(Turkish), Page32:PC720, Page36:PC862(Hebrew), Page37:PC864(Arabic), Page41:PC1098(Farsi), Page48:WPC1254, Page49:WPC1255, Page50:WPC1256
		6: Others	Page2:PC850(Multilingual)
	2: International Character Set	1: The Americas, Europe	<u>USA</u>[*1], France, Germany, Britain, Denmark I, Sweden, Italy, Spain I, Norway, Denmark II, Spain II, Latin America, Slovenia/Croatia
		2: Asia, Arabia	Japan, Korea, <u>China</u>[*2], Vietnam, Arabia
11: Embedded Font Replacement	1: Font A Replacement		Font A(No Replacement), Font B, <u>Special Font A</u>, Special Font B
	2: Font B Replacement		Font A, Font B(No Replacement), Special Font A, <u>Special Font B</u>
12: USB Interface Settings	1: Class		<u>Vendor Class</u>[*3], <u>Printer Class</u>
	2: USB Power Saving		<u>Enabled</u>, Disabled

Setting Items			Selection of software settings
1st page	**2nd page**	**3rd page**	∗ The initial setting is underlined.
13: Buzzer Control	1: Option Buzzer		Enable, <u>Disable</u>
	2: Buzzer Frequency(Error)		<u>Continuous</u>, 1 time, No sound
	3: Sound Pattern(Autocut)		<u>Pattern A</u>, Pattern B, Pattern C, Pattern D, Pattern E
	4: Buzzer Frequency(Autocut)		<u>1 time</u>, No sound
	5: Sound Pattern(Pulse 1)		<u>Pattern A</u>, Pattern B, Pattern C, Pattern D, Pattern E
	6: Buzzer Frequency(Pulse 1)		<u>1 time</u>, No sound
	7: Sound Pattern(Pulse 2)		Pattern A, <u>Pattern B</u>, Pattern C, Pattern D, Pattern E
	8: Buzzer Frequency(Pulse 2)		<u>1 time</u>, No sound
14: Column Emulation			<u>Off</u>, 42 Column Mode
15: Interface Settings	1: Receive Buffer Capacity		<u>4KB</u>, 45 bytes
	2: BUSY Condition		<u>Receive Buffer Full or Offline</u>, Receive Buffer Full
	3: Auto Line Feed		<u>Always disabled</u>, Always enabled
	4: State to cancel buffer BUSY		<u>Not BUSY = 256 bytes</u>, Not BUSY = 138 bytes
	5: Output Paper-end Signals		<u>Paper End Sensor Enabled</u>, Disabled
	6: Error Signal		<u>Enabled</u>, Disabled
16: Near-end Detection			<u>Disable</u>, Enable
17: Logo Emulation			<u>Off</u>, 180 Dpi Logo Mode
18: Automatic Paper Reduction	1: Upper Margin		Enable, <u>Disable</u>
	2: Lower Margin		Enable, <u>Disable</u>
	3: Blank Line Spacing		25%, 50%, 75%, <u>Not Reduce</u>
	4: Blank Space		25%, 50%, 75%, <u>Not Reduce</u>
	5: Barcode Height		25%, 50%, 75%, <u>Not Reduce</u>
19: Interface Selection			UIB, Built-in USB, <u>Auto</u>

Character Code Tables

CAUTION	• The character code tables show only character configurations. They do not show the actual print pattern. • "SP" in the table shows a space.

Common to All Pages

When International character set (See) is USA:

HEX	0	1	2	3	4	5	6	7
0	NUL 0	DLE 16	SP 32	0 48	@ 64	P 80	` 96	p 112
1	1	XON 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114
3	3	XOFF 19	# 35	3 51	C 67	S 83	c 99	s 115
4	EOT 4	DC4 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	ENQ 5	NAK 21	% 37	5 53	E 69	U 85	e 101	u 117
6	ACK 6	22	& 38	6 54	F 70	V 86	f 102	v 118
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119
8	8	CAN 24	(40	8 56	H 72	X 88	h 104	x 120
9	HT 9	25	) 41	9 57	I 73	Y 89	i 105	y 121
A	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122
B	11	ESC 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	FF 12	FS 28	, 44	< 60	L 76	\ 92	l 108		124
D	CR 13	GS 29	– 45	= 61	M 77	] 93	m 109	} 125
E	14	RS 30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	15	31	/ 47	? 63	O 79	— 95	o 111	SP 127

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▓ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	é 130	Æ 146	ó 162	▒ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	• 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	ì 141	¥ 157	¡ 173	╜ 189	= 205	▌ 221	φ 237	² 253
E	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▄ 223	∩ 239	SP 255

Page 1 (Katakana)

HEX	8	9	A	B	C	D	E	F
0	─ 128	⊥ 144	SP 160	─ 176	タ 192	ミ 208	＝ 224	乄 240
1	▬ 129	┬ 145	° 161	ア 177	チ 193	ム 209	╠ 225	円 241
2	▬ 130	┤ 146	｢ 162	イ 178	ツ 194	メ 210	╪ 226	年 242
3	■ 131	├ 147	｣ 163	ウ 179	テ 195	モ 211	┨ 227	月 243
4	■ 132	─ 148	、 164	エ 180	ト 196	ヤ 212	◢ 228	日 244
5	■ 133	─ 149	・ 165	オ 181	ナ 197	ユ 213	◣ 229	時 245
6	■ 134	│ 150	ヲ 166	カ 182	ニ 198	ヨ 214	◥ 230	分 246
7	■ 135	│ 151	ア 167	キ 183	ヌ 199	ラ 215	◤ 231	秒 247
8	▏ 136	┌ 152	イ 168	ク 184	ネ 200	リ 216	♠ 232	〒 248
9	▎ 137	┐ 153	ウ 169	ケ 185	ノ 201	ル 217	♥ 233	市 249
A	▍ 138	└ 154	エ 170	コ 186	ハ 202	レ 218	♦ 234	区 250
B	▌ 139	┘ 155	オ 171	サ 187	ヒ 203	ロ 219	♣ 235	町 251
C	▋ 140	´ 156	ャ 172	シ 188	フ 204	ワ 220	● 236	村 252
D	▊ 141	ヽ 157	ュ 173	ス 189	ヘ 205	ン 221	○ 237	人 253
E	▉ 142	ヾ 158	ョ 174	セ 190	ホ 206	゙ 222	/ 238	▒ 254
F	┼ 143	ノ 159	ッ 175	ソ 191	マ 207	゚ 223	\ 239	SP 255

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▓ 176	└ 192	ð 208	Ó 224	240
1	ü 129	æ 145	í 161	▒ 177	┴ 193	Đ 209	ß 225	± 241
2	é 130	Æ 146	ó 162	▒ 178	┬ 194	Ê 210	Ô 226	= 242
3	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	õ 228	¶ 244
5	à 133	ò 149	Ñ 165	Á 181	┼ 197	ı 213	Õ 229	§ 245
6	å 134	û 150	ª 166	Â 182	ã 198	Í 214	µ 230	÷ 246
7	ç 135	ù 151	º 167	À 183	Ã 199	Î 215	þ 231	¸ 247
8	ê 136	ÿ 152	¿ 168	© 184	Ŀ 200	Ï 216	Þ 232	° 248
9	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Û 234	· 250
B	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	Ù 235	¹ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	ý 236	³ 252
D	ì 141	Ø 157	¡ 173	¢ 189	= 205	¦ 221	Ý 237	² 253
E	Ä 142	× 158	« 174	¥ 190	╬ 206	Ì 222	¯ 238	■ 254
F	Å 143	ƒ 159	» 175	┐ 191	¤ 207	▀ 223	´ 239	SP 255

Page 3 (PC860: Portuguese)

HEX	8		9		A		B		C		D		E		F	
0	Ç	128	É	144	á	160	▓	176	└	192	╨	208	α	224	≡	240
1	ü	129	À	145	í	161	▓	177	┴	193	╤	209	ß	225	±	241
2	é	130	È	146	Ó	162	▓	178	┬	194	╥	210	Γ	226	≥	242
3	â	131	Ô	147	ú	163	│	179	├	195	╙	211	π	227	≤	243
4	ã	132	õ	148	ñ	164	┤	180	─	196	╘	212	Σ	228	⌠	244
5	à	133	Ò	149	Ñ	165	╡	181	┼	197	╒	213	σ	229	⌡	245
6	Á	134	Ú	150	ª	166	╢	182	╞	198	╓	214	μ	230	÷	246
7	ç	135	ù	151	º	167	╖	183	╟	199	╫	215	τ	231	≈	247
8	ê	136	Ì	152	¿	168	╕	184	╚	200	╪	216	Φ	232	°	248
9	Ê	137	õ	153	Ò	169	╣	185	╔	201	┘	217	θ	233	•	249
A	è	138	Ü	154	¬	170	║	186	╩	202	┌	218	Ω	234	·	250
B	Í	139	¢	155	½	171	╗	187	╦	203	█	219	δ	235	√	251
C	Ô	140	£	156	¼	172	╝	188	╠	204	▄	220	∞	236	ⁿ	252
D	ì	141	Ù	157	¡	173	╜	189	=	205	▌	221	φ	237	²	253
E	Ã	142	₧	158	«	174	╛	190	╬	206	▐	222	ε	238	■	254
F	Â	143	Ó	159	»	175	┐	191	╧	207	▄	223	∩	239	SP	255

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	¦ 160	▓ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	È 145	´ 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	é 130	Ê 146	Ó 162	▒ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	â 131	Ô 147	Ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	Â 132	Ë 148	¨ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	Ï 149	¸ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	¶ 134	û 150	³ 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	Ç 135	ù 151	‾ 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	¤ 152	Î 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ô 153	┌ 169	╣ 185	╔ 201	┘ 217	Θ 233	• 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	= 141	Ù 157	¾ 173	╜ 189	= 205	▌ 221	φ 237	² 253
E	À 142	Û 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	§ 143	ƒ 159	» 175	┐ 191	┴ 207	▀ 223	∩ 239	SP 255

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Page 5 (PC865: Nordic)

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	░ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	• 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	ì 141	Ø 157	¡ 173	╜ 189	= 205	▌ 221	φ 237	² 253
E	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	Å 143	ƒ 159	¤ 175	┐ 191	╧ 207	▀ 223	∩ 239	SP 255

HEX	8	9	A	B	C	D	E	F
0	Ç 128	Ί 144	ϊ 160	▓ 176	└ 192	┬ 208	ζ 224	‒ 240
1	ü 129	SP 145	ΐ 161	▓ 177	┴ 193	Υ 209	η 225	± 241
2	é 130	Ð 146	ó 162	▓ 178	┬ 194	Φ 210	θ 226	υ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	Χ 211	ι 227	φ 243
4	ä 132	ö 148	A 164	┤ 180	─ 196	Ψ 212	κ 228	χ 244
5	à 133	Ύ 149	B 165	Κ 181	┼ 197	Ω 213	λ 229	§ 245
6	Ά 134	û 150	Γ 166	Λ 182	Π 198	α 214	μ 230	ψ 246
7	ç 135	ù 151	Δ 167	M 183	P 199	β 215	ν 231	΄ 247
8	ê 136	Ώ 152	E 168	N 184	Ⱡ 200	γ 216	ξ 232	° 248
9	ë 137	Ö 153	Z 169	╣ 185	╔ 201	┘ 217	ο 233	¨ 249
A	è 138	Ü 154	H 170	║ 186	╩ 202	Γ 218	π 234	ω 250
B	ï 139	ά 155	½ 171	╗ 187	╦ 203	█ 219	ρ 235	ϋ 251
C	î 140	£ 156	θ 172	╝ 188	╠ 204	▄ 220	σ 236	ϋ 252
D	Έ 141	έ 157	I 173	Ξ 189	= 205	δ 221	ς 237	ώ 253
E	Ä 142	ή 158	« 174	O 190	╬ 206	ε 222	τ 238	▀ 254
F	Ή 143	ί 159	» 175	┐ 191	Σ 207	▀ 223	΄ 239	SP 255

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Appendix

Page 12 (PC853: Turkish)

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	░ 176	└ 192	SP 208	Ó 224	– 240
1	ü 129	ċ 145	í 161	▒ 177	┴ 193	SP 209	ß 225	SP 241
2	é 130	Ċ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	ℓ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	ʼn 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	Ġ 228	˘ 244
5	à 133	ò 149	Ñ 165	Á 181	┼ 197	ı 213	ġ 229	§ 245
6	ĉ 134	û 150	ğ 166	Â 182	Ŝ 198	Í 214	µ 230	÷ 246
7	ç 135	ù 151	ğ 167	À 183	Ŝ 199	Î 215	Ħ 231	¸ 247
8	ê 136	İ 152	Ĥ 168	Ş 184	╚ 200	Ï 216	ħ 232	° 248
9	ë 137	Ö 153	ĥ 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	è 138	Ü 154	SP 170	║ 186	╩ 202	┌ 218	Û 234	· 250
B	ï 139	ĝ 155	½ 171	╗ 187	╦ 203	█ 219	Ù 235	SP 251
C	î 140	£ 156	Ĵ 172	╝ 188	╠ 204	▄ 220	Ŭ 236	³ 252
D	ì 141	Ĝ 157	Ş 173	Ż 189	= 205	SP 221	ŭ 237	² 253
E	Ä 142	× 158	« 174	Ż 190	╬ 206	Ì 222	• 238	■ 254
F	Ĉ 143	ĵ 159	» 175	┐ 191	¤ 207	▀ 223	´ 239	SP 255

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HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	░ 176	└ 192	º 208	Ó 224	– 240
1	ü 129	æ 145	í 161	▒ 177	┴ 193	ª 209	ß 225	± 241
2	é 130	Æ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	SP 242
3	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	õ 228	¶ 244
5	à 133	ò 149	Ñ 165	Á 181	┼ 197	€ 213	Õ 229	§ 245
6	å 134	û 150	Ğ 166	Â 182	ã 198	Í 214	µ 230	÷ 246
7	ç 135	ù 151	ğ 167	À 183	Ã 199	Î 215	SP 231	¸ 247
8	ê 136	İ 152	¿ 168	© 184	Ŀ 200	Ï 216	× 232	° 248
9	ë 137	Ö 153	® 169	╣ 185	╚ 201	┘ 217	Ú 233	¨ 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Û 234	· 250
B	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	Ù 235	¹ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	ì 236	³ 252
D	ı 141	Ø 157	¡ 173	¢ 189	= 205	¦ 221	ÿ 237	² 253
E	Ä 142	Ş 158	« 174	¥ 190	╬ 206	Ì 222	‾ 238	■ 254
F	Å 143	ş 159	» 175	┐ 191	¤ 207	▀ 223	´ 239	SP 255

Page 14 (PC737: Greek)

HEX	8	9	A	B	C	D	E	F
0	A (128)	P (144)	∟ (160)	░ (176)	└ (192)	⊥⊥ (208)	ω (224)	Ώ (240)
1	B (129)	Σ (145)	Κ (161)	▒ (177)	⊥ (193)	╤ (209)	ά (225)	± (241)
2	Γ (130)	Τ (146)	λ (162)	▓ (178)	┬ (194)	π (210)	έ (226)	≥ (242)
3	Δ (131)	Υ (147)	μ (163)	│ (179)	├ (195)	╙ (211)	ή (227)	≤ (243)
4	E (132)	Φ (148)	ν (164)	┤ (180)	─ (196)	╘ (212)	ϊ (228)	Ϊ (244)
5	Z (133)	Χ (149)	ξ (165)	╡ (181)	┼ (197)	╒ (213)	ί (229)	Ϋ (245)
6	H (134)	Ψ (150)	ο (166)	╢ (182)	╞ (198)	╓ (214)	ό (230)	÷ (246)
7	Θ (135)	Ω (151)	π (167)	╖ (183)	╟ (199)	╫ (215)	ύ (231)	≈ (247)
8	I (136)	α (152)	ρ (168)	╕ (184)	╚ (200)	╪ (216)	ϋ (232)	° (248)
9	K (137)	β (153)	σ (169)	╣ (185)	╔ (201)	┘ (217)	ώ (233)	• (249)
A	Λ (138)	γ (154)	ς (170)	║ (186)	╩ (202)	┌ (218)	Ά (234)	· (250)
B	M (139)	δ (155)	τ (171)	╗ (187)	╦ (203)	█ (219)	Έ (235)	√ (251)
C	N (140)	ε (156)	υ (172)	╝ (188)	╠ (204)	▄ (220)	Ή (236)	ⁿ (252)
D	Ξ (141)	ζ (157)	φ (173)	╜ (189)	= (205)	▌ (221)	Ί (237)	² (253)
E	O (142)	η (158)	χ (174)	╛ (190)	╬ (206)	▐ (222)	Ό (238)	■ (254)
F	Π (143)	θ (159)	ψ (175)	┐ (191)	⊥ (207)	▀ (223)	Ύ (239)	SP (255)

HEX	8	9	A	B	C	D	E	F
0	SP 128	SP 144	SP 160	° 176	ΐ 192	Π 208	Ϋ 224	π 240
1	SP 129	SP 145	' 161	± 177	Α 193	Ρ 209	α 225	ρ 241
2	SP 130	SP 146	' 162	² 178	Β 194	SP 210	β 226	ς 242
3	SP 131	SP 147	£ 163	³ 179	Γ 195	Σ 211	γ 227	σ 243
4	SP 132	SP 148	€ 164	΄ 180	Δ 196	Τ 212	δ 228	τ 244
5	SP 133	SP 149	₯ 165	΅ 181	Ε 197	Υ 213	ε 229	υ 245
6	SP 134	SP 150	¦ 166	Ά 182	Ζ 198	Φ 214	ζ 230	φ 246
7	SP 135	SP 151	§ 167	· 183	Η 199	Χ 215	η 231	χ 247
8	SP 136	SP 152	¨ 168	Έ 184	Θ 200	Ψ 216	θ 232	ψ 248
9	SP 137	SP 153	© 169	Ή 185	Ι 201	Ω 217	ι 233	ω 249
A	SP 138	SP 154	ͺ 170	Ί 186	Κ 202	Ϊ 218	κ 234	ϊ 250
B	SP 139	SP 155	« 171	» 187	Λ 203	Ϋ 219	λ 235	ϋ 251
C	SP 140	SP 156	¬ 172	Ό 188	Μ 204	ά 220	μ 236	ό 252
D	SP 141	SP 157	173	½ 189	Ν 205	έ 221	ν 237	ύ 253
E	SP 142	SP 158	SP 174	Ύ 190	Ξ 206	ή 222	ξ 238	ώ 254
F	SP 143	SP 159	— 175	Ώ 191	Ο 207	ί 223	ο 239	SP 255

Page 16 (WPC1252)

HEX	8	9	A	B	C	D	E	F
0	€ 128	SP 144	SP 160	° 176	À 192	Ð 208	à 224	ð 240
1	SP 129	' 145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	‚ 130	' 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	ƒ 131	" 147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	„ 132	" 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	… 133	• 149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	† 134	– 150	¦ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	‡ 135	— 151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	^ 136	~ 152	¨ 168	¸ 184	È 200	Ø 216	è 232	ø 248
9	‰ 137	™ 153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	Š 138	š 154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	‹ 139	› 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	Œ 140	œ 156	¬ 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
D	SP 141	SP 157	173	½ 189	Í 205	Ý 221	í 237	ý 253
E	Ž 142	ž 158	® 174	¾ 190	Î 206	Þ 222	î 238	þ 254
F	SP 143	Ÿ 159	¯ 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

HEX	8	9	A	B	C	D	E	F
0	А 128	Р 144	а 160	░ 176	└ 192	╨ 208	р 224	Ё 240
1	Б 129	С 145	б 161	▒ 177	┴ 193	╤ 209	с 225	ё 241
2	В 130	Т 146	в 162	▓ 178	┬ 194	╥ 210	т 226	Є 242
3	Г 131	У 147	г 163	│ 179	├ 195	╙ 211	у 227	є 243
4	Д 132	Ф 148	д 164	┤ 180	─ 196	╘ 212	ф 228	Ї 244
5	Е 133	Х 149	е 165	╡ 181	┼ 197	╒ 213	х 229	ї 245
6	Ж 134	Ц 150	ж 166	╢ 182	╞ 198	╓ 214	ц 230	ў 246
7	З 135	Ч 151	з 167	╖ 183	╟ 199	╫ 215	ч 231	ў 247
8	И 136	Ш 152	и 168	╕ 184	╚ 200	╪ 216	ш 232	° 248
9	Й 137	Щ 153	й 169	╣ 185	╔ 201	┘ 217	щ 233	• 249
A	К 138	Ъ 154	к 170	║ 186	╩ 202	┌ 218	ъ 234	· 250
B	Л 139	Ы 155	л 171	╗ 187	╦ 203	█ 219	ы 235	√ 251
C	М 140	Ь 156	м 172	╝ 188	╠ 204	▄ 220	ь 236	№ 252
D	Н 141	Э 157	н 173	╜ 189	═ 205	▌ 221	э 237	¤ 253
E	О 142	Ю 158	о 174	╛ 190	╬ 206	▐ 222	ю 238	■ 254
F	П 143	Я 159	п 175	┐ 191	╧ 207	▀ 223	я 239	SP 255

Page 18 (PC852: Latin2)

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▒ 176	└ 192	đ 208	Ó 224	– 240
1	ü 129	Ĺ 145	í 161	▓ 177	┴ 193	Đ 209	ß 225	˝ 241
2	é 130	ĺ 146	ó 162	▓ 178	┬ 194	Ď 210	Ô 226	˛ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ń 227	ˇ 243
4	ä 132	ö 148	Ą 164	┤ 180	─ 196	ď 212	ń 228	˘ 244
5	ů 133	Ľ 149	ą 165	Á 181	┼ 197	Ň 213	ň 229	§ 245
6	ć 134	ľ 150	Ž 166	Â 182	Ă 198	Í 214	Š 230	÷ 246
7	ç 135	Ś 151	ž 167	Ě 183	ă 199	Î 215	š 231	¸ 247
8	ł 136	ś 152	Ę 168	Ş 184	╚ 200	ě 216	Ŕ 232	° 248
9	ë 137	Ö 153	ę 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	Ő 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	ŕ 234	˙ 250
B	ő 139	Ť 155	Ź 171	╗ 187	╦ 203	█ 219	Ű 235	ű 251
C	î 140	ť 156	Č 172	╝ 188	╠ 204	▄ 220	ý 236	Ř 252
D	Ź 141	Ł 157	ş 173	Ż 189	= 205	Ţ 221	Ý 237	ř 253
E	Ä 142	× 158	« 174	ż 190	╬ 206	Ů 222	ţ 238	■ 254
F	Ć 143	č 159	» 175	┐ 191	¤ 207	▀ 223	´ 239	SP 255

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▓ 176	└ 192	ð 208	Ó 224	‑ 240
1	ü 129	æ 145	í 161	▓ 177	┴ 193	Ð 209	ß 225	± 241
2	é 130	Æ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	= 242
3	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	õ 228	¶ 244
5	à 133	ò 149	Ñ 165	Á 181	┼ 197	€ 213	Õ 229	§ 245
6	å 134	û 150	ª 166	Â 182	ã 198	Í 214	µ 230	÷ 246
7	ç 135	ù 151	º 167	À 183	Ã 199	Î 215	þ 231	¸ 247
8	ê 136	ÿ 152	¿ 168	© 184	Ŀ 200	Ï 216	Þ 232	° 248
9	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Û 234	· 250
B	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	Ù 235	¹ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	ý 236	³ 252
D	ì 141	Ø 157	¡ 173	¢ 189	= 205	¦ 221	Ý 237	² 253
E	Ä 142	× 158	« 174	¥ 190	╬ 206	Ì 222	‾ 238	■ 254
F	Å 143	ƒ 159	» 175	┐ 191	¤ 207	▀ 223	´ 239	SP 255

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Page 20 (KU42: Thai)

HEX	8	9	A	B	C	D	E	F
0	┌ 128	O 144	SP 160	ฌ 176	ย 192	เ 208	่ 224	๚ 240
1	┐ 129	๑ 145	ก 161	ญ 177	ร 193	แ 209	้ 225	๚ 241
2	└ 130	๒ 146	ข 162	ด 178	ฤ 194	โ 210	๊ 226	๚ 242
3	┘ 131	๓ 147	ค 163	ต 179	ล 195	ใ 211	๋ 227	๚ 243
4	│ 132	๔ 148	ฆ 164	ถ 180	ว 196	ไ 212	็ 228	๚ 244
5	─ 133	๕ 149	ง 165	ท 181	ศ 197	ๅ 213	์ 229	๚ 245
6	├ 134	๖ 150	จ 166	ธ 182	ษ 198	ๆ 214	๎ 230	๚ 246
7	┤ 135	๗ 151	ฉ 167	น 183	ส 199	๏ 215	๎ 231	๚ 247
8	┴ 136	๘ 152	ช 168	บ 184	ห 200	๎ 216	๎ 232	๚ 248
9	┬ 137	๙ 153	ซ 169	ป 185	ฬ 201	๎ 217	๎ 233	๚ 249
A	┼ 138	ฃ 154	ฌ 170	ผ 186	อ 202	๎ 218	๎ 234	๚ 250
B	■ 139	ฅ 155	ญ 171	ฝ 187	ฮ 203	๎ 219	๎ 235	๚ 251
C	← 140	๎ 156	ฎ 172	พ 188	๎ 204	๎ 220	๎ 236	๚ 252
D	↑ 141	๎ 157	ฏ 173	ฟ 189	ภ 205	๎ 221	๎ 237	๚ 253
E	→ 142	๎ 158	ฐ 174	ภ 190	ๅ 206	๎ 222	๎ 238	๚ 254
F	↓ 143	เ 159	ฑ 175	ม 191	ๅ 207	๎ 223	๎ 239	SP 255

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HEX	8	9	A	B	C	D	E	F
0	ุ่ 128	ั๋ 144	เ 160	ฐ 176	ภ 192	ั๊ 208	เ 224	๐ 240
1	ุ๊ 129	ั๋ 145	ก 161	ฑ 177	ม 193	ั 209	แ 225	๑ 241
2	ุ๊ 130	ั๋ 146	ข 162	ฒ 178	ย 194	ๅ 210	โ 226	๒ 242
3	ุ๋ 131	ั๊ 147	ฃ 163	ณ 179	ร 195	ๅ 211	ใ 227	๓ 243
4	ู่ 132	ั๋ 148	ค 164	ด 180	ฤ 196	ฺ 212	ไ 228	๔ 244
5	ู๊ 133	ฺ 149	ฅ 165	ต 181	ล 197	ฺ 213	ๅ 229	๕ 245
6	ู๊ 134	ฺ 150	ฆ 166	ถ 182	ฦ 198	ฺ 214	ๅ 230	๖ 246
7	ู๊ 135	ฺ 151	ง 167	ท 183	ว 199	ฺ 215	ฺ 231	๗ 247
8	ู๋ 136	ฺ 152	จ 168	ธ 184	ศ 200	ฺ 216	ฺ 232	๘ 248
9	ั่ 137	Γ 153	ฉ 169	น 185	ษ 201	ฺ 217	ฺ 233	๙ 249
A	ั๊ 138	ๅ 154	ช 170	บ 186	ส 202	ฺ 218	ฺ 234	ฏ 250
B	ั๊ 139	L 155	ซ 171	ป 187	ห 203	─ 219	ฺ 235	ฏ 251
C	ั๋ 140	┘ 156	ฌ 172	ผ 188	ฬ 204	┴ 220	ฺ 236	ฺ 252
D	ั่ 141	│ 157	ญ 173	ฝ 189	อ 205	┬ 221	ฺ 237	ฺ 253
E	ั๊ 142	├ 158	ฎ 174	พ 190	ฮ 206	┼ 222	ฺ 238	ฺ 254
F	ั๊ 143	┤ 159	ฏ 175	ฟ 191	ฯ 207	฿ 223	ฺ 239	SP 255

Page 26 (TIS18: Thai)

HEX	8	9	A	B	C	D	E	F
0	⌐ 128	～ 144	SP 160	ฐ 176	ภ 192	๎ 208	เ 224	0 240
1	ๅ 129	๑ 145	ก 161	ฑ 177	ม 193	๏ 209	แ 225	๑ 241
2	∟ 130	๋ 146	ข 162	ฒ 178	ย 194	๚ 210	โ 226	๒ 242
3	⌐ 131	๊ 147	ฃ 163	ณ 179	ร 195	๛ 211	ใ 227	๓ 243
4	│ 132	๎ 148	ค 164	ด 180	ฤ 196	⌐ 212	ไ 228	๔ 244
5	─ 133	๎ 149	ฅ 165	ต 181	ล 197	⌐ 213	ๅ 229	๕ 245
6	├ 134	๎ 150	ฆ 166	ถ 182	ฦ 198	⌐ 214	ๆ 230	๖ 246
7	┤ 135	๎ 151	ง 167	ท 183	ว 199	⌐ 215	๘ 231	๗ 247
8	┴ 136	๎ 152	จ 168	ธ 184	ศ 200	๎ 216	ฺ 232	๘ 248
9	┬ 137	๎ 153	ฉ 169	น 185	ษ 201	๎ 217	๎ 233	๙ 249
A	┼ 138	๎ 154	ช 170	บ 186	ส 202	๎ 218	๎ 234	๊ 250
B	■ 139	๎ 155	ซ 171	ป 187	ห 203	๎ 219	+ 235	๎ 251
C	← 140	๎ 156	ฌ 172	ผ 188	ฬ 204	๎ 220	๎ 236	๎ 252
D	↑ 141	๎ 157	ญ 173	ฝ 189	อ 205	๎ 221	° 237	๎ 253
E	→ 142	๎ 158	ฎ 174	พ 190	ฮ 206	๎ 222	๏ 238	๎ 254
F	↓ 143	เ 159	ฏ 175	ฟ 191	ๆ 207	฿ 223	๏ 239	SP 255

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HEX	8	9	A	B	C	D	E	F
0	SP 128	SP 144	SP 160	SP 176	SP 192	é 208	SP 224	SP 240
1	SP 129	SP 145	SP 161	SP 177	SP 193	ẹ 209	ỏ 225	ủ 241
2	SP 130	SP 146	SP 162	SP 178	SP 194	ê 210	õ 226	ũ 242
3	SP 131	SP 147	SP 163	SP 179	SP 195	ẻ 211	ó 227	ú 243
4	SP 132	SP 148	SP 164	SP 180	SP 196	ẽ 212	ọ 228	ụ 244
5	SP 133	SP 149	SP 165	à 181	SP 197	ế 213	ồ 229	ù 245
6	SP 134	SP 150	SP 166	ả 182	ặ 198	ệ 214	ỗ 230	ử 246
7	SP 135	SP 151	SP 167	ã 183	ẩ 199	ì 215	ỗ 231	ữ 247
8	SP 136	SP 152	ă 168	á 184	ẫ 200	ỉ 216	ố 232	ứ 248
9	SP 137	SP 153	â 169	ạ 185	ẵ 201	SP 217	ộ 233	ự 249
A	SP 138	SP 154	ê 170	SP 186	ấ 202	SP 218	ờ 234	ỳ 250
B	SP 139	SP 155	ô 171	ằ 187	ậ 203	SP 219	ở 235	ỷ 251
C	SP 140	SP 156	ơ 172	ẳ 188	è 204	ĩ 220	ỡ 236	ỹ 252
D	SP 141	SP 157	ư 173	ẵ 189	SP 205	í 221	ớ 237	ý 253
E	SP 142	SP 158	đ 174	ắ 190	ẻ 206	ị 222	ợ 238	y. 254
F	SP 143	SP 159	SP 175	SP 191	ẽ 207	ò 223	ù 239	SP 255

Page 31 (TCVN-3: Vietnamese)

HEX	8	9	A	B	C	D	E	F
0	SP 128	SP 144	SP 160	SP 176	SP 192	É 208	SP 224	SP 240
1	SP 129	SP 145	Ă 161	SP 177	SP 193	Ẹ 209	Ổ 225	Ủ 241
2	SP 130	SP 146	Â 162	SP 178	SP 194	Ê 210	Õ 226	Ũ 242
3	SP 131	SP 147	SP 163	SP 179	SP 195	Ể 211	Ó 227	Ú 243
4	SP 132	SP 148	SP 164	SP 180	SP 196	Ễ 212	Ọ 228	Ụ 244
5	SP 133	SP 149	SP 165	À 181	SP 197	Ế 213	Ô 229	Ư 245
6	SP 134	SP 150	SP 166	Ả 182	Ặ 198	Ệ 214	Ỗ 230	Ứ 246
7	SP 135	SP 151	Đ 167	Ã 183	Ầ 199	Ì 215	Ỡ 231	Ừ 247
8	SP 136	SP 152	SP 168	Á 184	Ẩ 200	Í 216	Ố 232	Ứ 248
9	SP 137	SP 153	SP 169	Ạ 185	Ẫ 201	SP 217	Ộ 233	Ụ 249
A	SP 138	SP 154	Ê 170	SP 186	Ấ 202	SP 218	Ở 234	Ỳ 250
B	SP 139	SP 155	Ô 171	Ằ 187	Ậ 203	SP 219	Ỡ 235	Ỷ 251
C	SP 140	SP 156	Ơ 172	Ẳ 188	È 204	Ĩ 220	Õ 236	Ỹ 252
D	SP 141	SP 157	Ư 173	Ẵ 189	SP 205	Í 221	Ớ 237	Ý 253
E	SP 142	SP 158	SP 174	Ắ 190	Ẻ 206	Ị 222	Ợ 238	Ỵ 254
F	SP 143	SP 159	SP 175	SP 191	Ẽ 207	Ò 223	Ù 239	SP 255

HEX	8	9	A	B	C	D	E	F
0	SP 128	SP 144	ب 160	▒ 176	└ 192	╨ 208	ض 224	≡ 240
1	SP 129	ۜ 145	ة 161	▓ 177	┴ 193	╤ 209	ط 225	ء 241
2	é 130	° 146	ن 162	▓ 178	┬ 194	╥ 210	ظ 226	ۿ 242
3	â 131	ô 147	ث 163	│ 179	├ 195	╙ 211	ع 227	ء 243
4	SP 132	¤ 148	ج 164	┤ 180	─ 196	╘ 212	غ 228	´ 244
5	à 133	─ 149	ح 165	╡ 181	┼ 197	╒ 213	ف 229	ء 245
6	SP 134	û 150	خ 166	╢ 182	╞ 198	π 214	µ 230	´ 246
7	ç 135	ù 151	د 167	╖ 183	╟ 199	╫ 215	ق 231	≈ 247
8	ê 136	ء 152	ذ 168	╕ 184	╚ 200	╪ 216	ك 232	° 248
9	ë 137	آ 153	ر 169	╣ 185	╔ 201	┘ 217	ل 233	• 249
A	è 138	أ 154	ز 170	║ 186	╩ 202	┌ 218	م 234	· 250
B	ï 139	ؤ 155	س 171	╗ 187	╦ 203	■ 219	ن 235	√ 251
C	î 140	£ 156	ش 172	╝ 188	╠ 204	▬ 220	ه 236	n 252
D	SP 141	إ 157	ص 173	╜ 189	═ 205	▮ 221	و 237	² 253
E	SP 142	ئ 158	« 174	╛ 190	╬ 206	▋ 222	ى 238	■ 254
F	SP 143	ا 159	» 175	┐ 191	╧ 207	▪ 223	ي 239	SP 255

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Page 33 (WPC775: Baltic Rim)

HEX	8	9	A	B	C	D	E	F
0	Ć 128	É 144	Ā 160	▓ 176	└ 192	ą 208	Ó 224	– 240
1	ü 129	æ 145	Ī 161	▓ 177	┴ 193	č 209	ß 225	± 241
2	é 130	Æ 146	Ó 162	▓ 178	┬ 194	ę 210	Ō 226	" 242
3	ā 131	ō 147	Ż 163	│ 179	├ 195	ė 211	Ń 227	¾ 243
4	ä 132	ö 148	ż 164	┤ 180	─ 196	į 212	õ 228	¶ 244
5	ģ 133	Ģ 149	Ź 165	Ą 181	┼ 197	š 213	Õ 229	§ 245
6	å 134	¢ 150	" 166	Č 182	Ų 198	ų 214	µ 230	÷ 246
7	ć 135	Ś 151	¦ 167	Ę 183	Ū 199	ū 215	ń 231	" 247
8	ł 136	ś 152	© 168	Ė 184	╚ 200	ž 216	Ķ 232	° 248
9	ē 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	ķ 233	• 249
A	Ŗ 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ļ 234	· 250
B	ŗ 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	ļ 235	¹ 251
C	ī 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	ņ 236	³ 252
D	Ź 141	Ø 157	Ł 173	Į 189	= 205	▌ 221	Ē 237	² 253
E	Ä 142	× 158	« 174	Š 190	╬ 206	▐ 222	Ņ 238	■ 254
F	Å 143	¤ 159	» 175	┐ 191	Ž 207	▀ 223	' 239	SP 255

HEX	8	9	A	B	C	D	E	F
0	ђ 128	Љ 144	а 160	▓ 176	└ 192	Л 208	Я 224	─ 240
1	Ђ 129	љ 145	А 161	▒ 177	┴ 193	л 209	р 225	Ы 241
2	ѓ 130	Њ 146	б 162	░ 178	┬ 194	М 210	Р 226	ы 242
3	Ѓ 131	њ 147	Б 163	│ 179	├ 195	м 211	с 227	З 243
4	ё 132	ћ 148	ц 164	┤ 180	─ 196	Н 212	С 228	з 244
5	Ё 133	Ћ 149	Ц 165	х 181	┼ 197	н 213	т 229	ш 245
6	є 134	Ќ 150	д 166	Х 182	к 198	о 214	Т 230	Ш 246
7	Є 135	ќ 151	Д 167	и 183	К 199	О 215	у 231	э 247
8	ѕ 136	ў 152	е 168	И 184	╟ 200	п 216	У 232	Э 248
9	Ѕ 137	Ў 153	Е 169	╣ 185	╚ 201	┘ 217	ж 233	щ 249
A	і 138	џ 154	ф 170	║ 186	╩ 202	г 218	Ж 234	Щ 250
B	І 139	Џ 155	Ф 171	╗ 187	╦ 203	■ 219	в 235	ч 251
C	ї 140	ю 156	г 172	╝ 188	╠ 204	■ 220	В 236	Ч 252
D	Ї 141	Ю 157	Г 173	й 189	═ 205	п 221	ь 237	§ 253
E	ј 142	ъ 158	« 174	Й 190	╬ 206	Я 222	Ь 238	■ 254
F	Ј 143	Ъ 159	» 175	┐ 191	¤ 207	■ 223	№ 239	SP 255

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Page 35 (PC861: Icelandic)

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	░ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	é 130	Æ 146	Ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	ä 132	ö 148	Á 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	þ 149	Í 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	å 134	û 150	Ó 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	ç 135	Ý 151	Ú 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	ý 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	• 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	Ð 139	Ø 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	ð 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	þ 141	Ø 157	¡ 173	╜ 189	= 205	▌ 221	φ 237	² 253
E	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	Å 143	ƒ 159	» 175	┐ 191	⊥ 207	▀ 223	∩ 239	SP 255

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HEX	8	9	A	B	C	D	E	F
0	א 128	] 144	á 160	▓ 176	└ 192	╨ 208	α 224	≡ 240
1	ב 129	∐ 145	í 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	ג 130	ע 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	ד 131	ף 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	ה 132	פ 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	ו 133	ץ 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	ז 134	צ 150	ª 166	╢ 182	╞ 198	╓ 214	μ 230	÷ 246
7	ח 135	ק 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ט 136	ר 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	י 137	ש 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	• 249
A	ך 138	ת 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	כ 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	ל 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	ם 141	¥ 157	¡ 173	╜ 189	= 205	▌ 221	φ 237	² 253
E	מ 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	ן 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	SP 255

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Page 37 (PC864: Arabic)

HEX	8	9	A	B	C	D	E	F
0	° 128	β 144	SP 160	• 176	¢ 192	ذ 208	─ 224	ﱡ 240
1	• 129	� 145	﹂ 161	١ 177	ء 193	ر 209	ف 225	ﱢ 241
2	• 130	φ 146	ﻹ 162	٢ 178	آ 194	ز 210	ﻗ 226	ن 242
3	√ 131	± 147	£ 163	٣ 179	أ 195	ﺳ 211	ك 227	ه 243
4	▒ 132	½ 148	¤ 164	٤ 180	ؤ 196	ﺵ 212	┘ 228	ﻪ 244
5	─ 133	¼ 149	ﺄ 165	٥ 181	ع 197	ﺻ 213	ﻤ 229	ى 245
6	│ 134	≈ 150	SP 166	٦ 182	ئ 198	ﺿ 214	ﻦ 230	ي 246
7	┼ 135	« 151	€ 167	٧ 183	ا 199	ط 215	ه 231	ﻍ 247
8	┤ 136	» 152	ﻝ 168	٨ 184	ﺑ 200	ظ 216	و 232	ق 248
9	┬ 137	ﻷ 153	ﺑ 169	٩ 185	ة 201	ع 217	ﻯ 233	ﻵ 249
A	├ 138	ﻹ 154	ت 170	ف 186	ﺗ 202	غ 218	ﺑ 234	ﻻ 250
B	┴ 139	SP 155	ﺙ 171	ء 187	ﺛ 203	ا 219	ﺿ 235	ل 251
C	┐ 140	SP 156	، 172	ﺳ 188	ﺟ 204	┌ 220	ﻋ 236	ﻚ 252
D	└ 141	ﻻ 157	ﺟ 173	ﺷ 189	ﺣ 205	÷ 221	غ 237	ﻳ 253
E	┌ 142	ﻼ 158	ﺣ 174	ﺻ 190	ﺧ 206	× 222	ﻎ 238	∎ 254
F	┘ 143	ﻋ 159	ﺧ 175	؟ 191	د 207	ﻉ 223	ﻡ 239	SP 255

HEX	8	9	A	B	C	D	E	F
0	SP 128	Ί 144	ϊ 160	▓ 176	└ 192	┬ 208	ζ 224	─ 240
1	SP 129	Ϊ 145	ΐ 161	▒ 177	┴ 193	Υ 209	η 225	± 241
2	SP 130	Ό 146	ό 162	░ 178	┬ 194	Φ 210	θ 226	υ 242
3	SP 131	SP 147	ύ 163	│ 179	├ 195	Χ 211	ι 227	φ 243
4	SP 132	SP 148	Α 164	┤ 180	─ 196	Ψ 212	κ 228	χ 244
5	SP 133	Ύ 149	Β 165	Κ 181	┼ 197	Ω 213	λ 229	§ 245
6	Ά 134	Ϋ 150	Γ 166	Λ 182	Π 198	α 214	μ 230	ψ 246
7	€ 135	© 151	Δ 167	Μ 183	Ρ 199	β 215	ν 231	΅ 247
8	· 136	Ϊ 152	Ε 168	Ν 184	╚ 200	γ 216	ξ 232	° 248
9	¬ 137	² 153	Ζ 169	╣ 185	╔ 201	┘ 217	ο 233	¨ 249
A	¦ 138	³ 154	Η 170	║ 186	╩ 202	┌ 218	π 234	ω 250
B	' 139	ά 155	½ 171	╗ 187	╦ 203	█ 219	ρ 235	ϋ 251
C	, 140	£ 156	θ 172	╝ 188	╠ 204	▄ 220	σ 236	ΰ 252
D	Έ 141	έ 157	Ι 173	═ 189	= 205	δ 221	ς 237	ώ 253
E	– 142	ή 158	« 174	Ο 190	╬ 206	ε 222	τ 238	■ 254
F	Ή 143	ί 159	» 175	┐ 191	Σ 207	▀ 223	΄ 239	SP 255

Page 39 (ISO8859-2: Latin2)

HEX	8	9	A	B	C	D	E	F
0	▒ 128	∟ 144	SP 160	° 176	Ŕ 192	Đ 208	ŕ 224	đ 240
1	▓ 129	⊥ 145	Ą 161	ą 177	Á 193	Ń 209	á 225	ń 241
2	▒ 130	⊤ 146	˘ 162	˛ 178	Â 194	Ň 210	â 226	ň 242
3	│ 131	├ 147	Ł 163	ł 179	Ă 195	Ó 211	ă 227	ó 243
4	┤ 132	─ 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	┘ 133	┼ 149	Ľ 165	ľ 181	Ĺ 197	Ő 213	ĺ 229	ő 245
6	┌ 134	■ 150	Ś 166	ś 182	Ć 198	Ö 214	ć 230	ö 246
7	█ 135	■ 151	§ 167	ˇ 183	Ç 199	× 215	ç 231	÷ 247
8	© 136	╙ 152	¨ 168	¸ 184	Č 200	Ř 216	č 232	ř 248
9	╡ 137	╓ 153	Š 169	š 185	É 201	Ů 217	é 233	ů 249
A	║ 138	╜ 154	Ş 170	ş 186	Ę 202	Ú 218	ę 234	ú 250
B	╖ 139	╥ 155	Ť 171	ť 187	Ë 203	Ű 219	ë 235	ű 251
C	╜ 140	╟ 156	Ź 172	ź 188	Ě 204	Ü 220	ě 236	ü 252
D	¢ 141	= 157	173	˝ 189	Í 205	Ý 221	í 237	ý 253
E	¥ 142	╫ 158	Ž 174	ž 190	Î 206	Ţ 222	î 238	ţ 254
F	┐ 143	® 159	Ż 175	ż 191	Ď 207	ß 223	ď 239	˙ 255

139

HEX	8	9	A	B	C	D	E	F
0	SP 128	SP 144	SP 160	° 176	À 192	Ð 208	à 224	ð 240
1	SP 129	SP 145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	SP 130	SP 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	SP 131	SP 147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	SP 132	SP 148	€ 164	Ž 180	Ä 196	Ô 212	ä 228	ô 244
5	SP 133	SP 149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	SP 134	SP 150	Š 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	SP 135	SP 151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	SP 136	SP 152	š 168	ž 184	È 200	Ø 216	è 232	ø 248
9	SP 137	SP 153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	SP 138	SP 154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	SP 139	SP 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	SP 140	SP 156	¬ 172	Œ 188	Ì 204	Ü 220	ì 236	ü 252
D	SP 141	SP 157	– 173	œ 189	Í 205	Ý 221	í 237	ý 253
E	SP 142	SP 158	® 174	Ÿ 190	Î 206	Þ 222	î 238	þ 254
F	SP 143	SP 159	‾ 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

Page 41 (PC1098: Farsi)

HEX	8	9	A	B	C	D	E	F
0	SP 128	ؤ 144	ـحـ 160	▓ 176	└ 192	غ 208	ک 224	ـ 240
1	SP 129	ئـ 145	خ 161	▓ 177	┴ 193	ء 209	کـ 225	ى 241
2	، 130	بـ 146	خـ 162	▓ 178	┬ 194	ـعـ 210	گ 226	يـ 242
3	؛ 131	ـبـ 147	د 163	│ 179	├ 195	غ 211	گـ 227	ـ 243
4	؟ 132	پ 148	ذ 164	┤ 180	─ 196	غ 212	ل 228	ه 244
5	ﹾ 133	ـپـ 149	ر 165	ض 181	┼ 197	غـ 213	ـل 229	١ 245
6	آ 134	ت 150	ز 166	ضـ 182	ظ 198	ـغـ 214	م 230	٢ 246
7	آ 135	تـ 151	ژ 167	ط 183	ع 199	ف 215	مـ 231	٣ 247
8	آ 136	ث 152	س 168	ط 184	╚ 200	فـ 216	ن 232	٤ 248
9	ا 137	ثـ 153	سـ 169	╣ 185	╔ 201	┘ 217	ـنـ 233	٥ 249
A	ا 138	ج 154	ش 170	║ 186	╩ 202	┌ 218	و 234	٦ 250
B	ا 139	جـ 155	شـ 171	╗ 187	╦ 203	█ 219	ه 235	٧ 251
C	ء 140	چ 156	ص 172	╝ 188	╠ 204	▄ 220	ه 236	٨ 252
D	أ 141	چـ 157	صـ 173	لا 189	═ 205	ق 221	ه 237	٩ 253
E	ﺈ 142	× 158	« 174	ظ 190	╬ 206	ق 222	ة 238	▀ 254
F	ﺝ 143	ح 159	» 175	┐ 191	SP 207	■ 223	ى 239	SP 255

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▓ 176	└ 192	ą 208	α 224	≡ 240
1	ü 129	æ 145	í 161	▓ 177	┴ 193	č 209	β 225	± 241
2	é 130	Æ 146	ó 162	▓ 178	┬ 194	ę 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	ė 211	π 227	≤ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	į 212	Σ 228	” 244
5	à 133	ò 149	Ñ 165	Ą 181	┼ 197	š 213	σ 229	“ 245
6	å 134	û 150	a 166	Č 182	Ų 198	ų 214	μ 230	÷ 246
7	ç 135	ù 151	o 167	Ę 183	Ū 199	ū 215	τ 231	≈ 247
8	ê 136	ÿ 152	¿ 168	Ė 184	╚ 200	ž 216	Φ 232	° 248
9	ë 137	Ö 153	┌ 169	╣ 185	╔ 201	┘ 217	θ 233	• 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	ì 141	¥ 157	¡ 173	Į 189	= 205	█ 221	φ 237	² 253
E	Ä 142	₧ 158	« 174	Š 190	╬ 206	▌ 222	ε 238	■ 254
F	Å 143	ƒ 159	» 175	┐ 191	Ž 207	▀ 223	∩ 239	SP 255

Page 43 (PC1119: Lithuanian)

HEX	8	9	A	B	C	D	E	F
0	А 128	Р 144	а 160	░ 176	└ 192	ą 208	р 224	Ё 240
1	Б 129	С 145	б 161	▒ 177	┴ 193	č 209	с 225	ё 241
2	В 130	Т 146	в 162	▓ 178	┬ 194	ę 210	т 226	≥ 242
3	Г 131	У 147	г 163	│ 179	├ 195	ė 211	у 227	≤ 243
4	Д 132	Ф 148	д 164	┤ 180	─ 196	į 212	ф 228	„ 244
5	Е 133	Х 149	е 165	Ą 181	┼ 197	š 213	х 229	" 245
6	Ж 134	Ц 150	ж 166	Č 182	Ų 198	ų 214	ц 230	÷ 246
7	З 135	Ч 151	з 167	Ę 183	Ū 199	ū 215	ч 231	≈ 247
8	И 136	Ш 152	и 168	Ė 184	╚ 200	ž 216	ш 232	° 248
9	Й 137	Щ 153	й 169	╣ 185	╔ 201	┘ 217	щ 233	• 249
A	К 138	Ъ 154	к 170	║ 186	╩ 202	┌ 218	ъ 234	· 250
B	Л 139	Ы 155	л 171	╗ 187	╦ 203	█ 219	ы 235	√ 251
C	М 140	Ь 156	м 172	╝ 188	╠ 204	▄ 220	ь 236	ⁿ 252
D	Н 141	Э 157	н 173	Į 189	= 205	▌ 221	э 237	² 253
E	О 142	Ю 158	о 174	Š 190	╬ 206	▐ 222	ю 238	■ 254
F	П 143	Я 159	п 175	┐ 191	Ž 207	▀ 223	я 239	SP 255

Page 44 (PC1125: Ukrainian)

HEX	8	9	A	B	C	D	E	F
0	А 128	Р 144	а 160	▒ 176	└ 192	╨ 208	р 224	Ё 240
1	Б 129	С 145	б 161	▒ 177	┴ 193	╤ 209	с 225	ё 241
2	В 130	Т 146	в 162	▒ 178	┬ 194	╥ 210	т 226	Ґ 242
3	Г 131	У 147	г 163	│ 179	├ 195	╙ 211	у 227	ґ 243
4	Д 132	Ф 148	д 164	┤ 180	─ 196	╘ 212	ф 228	Є 244
5	Е 133	Х 149	е 165	╡ 181	┼ 197	╒ 213	х 229	є 245
6	Ж 134	Ц 150	ж 166	╢ 182	╞ 198	╓ 214	ц 230	І 246
7	З 135	Ч 151	з 167	╖ 183	╟ 199	╫ 215	ч 231	і 247
8	И 136	Ш 152	и 168	╕ 184	╚ 200	╪ 216	ш 232	Ї 248
9	Й 137	Щ 153	й 169	╣ 185	╔ 201	┘ 217	щ 233	ї 249
A	К 138	Ъ 154	к 170	║ 186	╩ 202	┌ 218	ъ 234	÷ 250
B	Л 139	Ы 155	л 171	╗ 187	╦ 203	█ 219	ы 235	± 251
C	М 140	Ь 156	м 172	╝ 188	╠ 204	▄ 220	ь 236	№ 252
D	Н 141	Э 157	н 173	╜ 189	═ 205	▌ 221	э 237	¤ 253
E	О 142	Ю 158	о 174	╛ 190	╬ 206	▐ 222	ю 238	■ 254
F	П 143	Я 159	п 175	┐ 191	╧ 207	▀ 223	я 239	SP 255

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Page 45 (WPC1250: Latin 2)

HEX	8	9	A	B	C	D	E	F
0	€ 128	SP 144	SP 160	° 176	Ŕ 192	Đ 208	ŕ 224	đ 240
1	SP 129	' 145	ˇ 161	± 177	Á 193	Ń 209	á 225	ń 241
2	‚ 130	' 146	˘ 162	˛ 178	Â 194	Ň 210	â 226	ň 242
3	SP 131	" 147	Ł 163	ł 179	Ă 195	Ó 211	ă 227	ó 243
4	„ 132	" 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	… 133	• 149	Ą 165	µ 181	Ĺ 197	Ő 213	ĺ 229	ő 245
6	† 134	– 150	¦ 166	¶ 182	Ć 198	Ö 214	ć 230	ö 246
7	‡ 135	— 151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	SP 136	SP 152	¨ 168	¸ 184	Č 200	Ř 216	č 232	ř 248
9	‰ 137	™ 153	© 169	ą 185	É 201	Ů 217	é 233	ů 249
A	Š 138	š 154	Ş 170	ş 186	Ę 202	Ú 218	ę 234	ú 250
B	‹ 139	› 155	« 171	» 187	Ë 203	Ű 219	ë 235	ű 251
C	Ś 140	ś 156	¬ 172	Ľ 188	Ě 204	Ü 220	ě 236	ü 252
D	Ť 141	ť 157	- 173	˝ 189	Í 205	Ý 221	í 237	ý 253
E	Ž 142	ž 158	® 174	ľ 190	Î 206	Ţ 222	î 238	ţ 254
F	Ź 143	ź 159	Ż 175	ż 191	Ď 207	ß 223	ď 239	· 255

HEX	8	9	A	B	C	D	E	F
0	Ђ 128	ђ 144	SP 160	° 176	А 192	Р 208	а 224	р 240
1	Ѓ 129	' 145	Ў 161	± 177	Б 193	С 209	б 225	с 241
2	' 130	' 146	ў 162	І 178	В 194	Т 210	в 226	т 242
3	ѓ 131	" 147	Ј 163	і 179	Г 195	У 211	г 227	у 243
4	" 132	" 148	¤ 164	ґ 180	Д 196	Ф 212	д 228	ф 244
5	… 133	• 149	Ґ 165	µ 181	Е 197	Х 213	е 229	х 245
6	† 134	– 150	¦ 166	¶ 182	Ж 198	Ц 214	ж 230	ц 246
7	‡ 135	— 151	§ 167	· 183	З 199	Ч 215	з 231	ч 247
8	€ 136	SP 152	Ё 168	ё 184	И 200	Ш 216	и 232	ш 248
9	‰ 137	™ 153	© 169	№ 185	Й 201	Щ 217	й 233	щ 249
A	Љ 138	љ 154	Є 170	є 186	К 202	Ъ 218	к 234	ъ 250
B	‹ 139	› 155	« 171	» 187	Л 203	Ы 219	л 235	ы 251
C	Њ 140	њ 156	¬ 172	ј 188	М 204	Ь 220	м 236	ь 252
D	Ќ 141	ќ 157	– 173	Ѕ 189	Н 205	Э 221	н 237	э 253
E	Ћ 142	ћ 158	® 174	ѕ 190	О 206	Ю 222	о 238	ю 254
F	Џ 143	џ 159	Ї 175	ї 191	П 207	Я 223	п 239	я 255

Page 47 (WPC1253: Greek)

HEX	8	9	A	B	C	D	E	F
0	€ 128	SP 144	SP 160	º 176	Ϊ́ 192	Π 208	Ű 224	π 240
1	SP 129	' 145	΅ 161	± 177	Α 193	Ρ 209	α 225	ρ 241
2	‚ 130	' 146	Ά 162	² 178	Β 194	SP 210	β 226	ς 242
3	ƒ 131	" 147	£ 163	³ 179	Γ 195	Σ 211	γ 227	σ 243
4	„ 132	" 148	¤ 164	΄ 180	Δ 196	Τ 212	δ 228	τ 244
5	… 133	• 149	¥ 165	µ 181	Ε 197	Υ 213	ε 229	υ 245
6	† 134	– 150	¦ 166	¶ 182	Ζ 198	Φ 214	ζ 230	φ 246
7	‡ 135	— 151	§ 167	· 183	Η 199	Χ 215	η 231	χ 247
8	SP 136	SP 152	¨ 168	Έ 184	Θ 200	Ψ 216	θ 232	ψ 248
9	‰ 137	™ 153	© 169	Ή 185	Ι 201	Ω 217	ι 233	ω 249
A	SP 138	SP 154	ª 170	Ί 186	Κ 202	Ϊ 218	κ 234	ϊ 250
B	‹ 139	› 155	« 171	» 187	Λ 203	Ϋ 219	λ 235	ϋ 251
C	SP 140	SP 156	¬ 172	Ό 188	Μ 204	ά 220	μ 236	ό 252
D	SP 141	SP 157	173	½ 189	Ν 205	έ 221	ν 237	ύ 253
E	SP 142	SP 158	® 174	Ύ 190	Ξ 206	ή 222	ξ 238	ώ 254
F	SP 143	SP 159	— 175	Ώ 191	Ο 207	ί 223	ο 239	SP 255

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HEX	8	9	A	B	C	D	E	F
0	€ 128	SP 144	SP 160	° 176	À 192	Ğ 208	à 224	ğ 240
1	SP 129	' 145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	‚ 130	' 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	ƒ 131	" 147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	„ 132	" 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	… 133	• 149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	† 134	– 150	¦ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	‡ 135	— 151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	ˆ 136	˜ 152	¨ 168	¸ 184	È 200	Ø 216	è 232	ø 248
9	‰ 137	™ 153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	Š 138	š 154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	‹ 139	› 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	Œ 140	œ 156	¬ 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
D	SP 141	SP 157	173	½ 189	Í 205	İ 221	í 237	ı 253
E	SP 142	SP 158	® 174	¾ 190	Î 206	Ş 222	î 238	ş 254
F	SP 143	ÿ 159	¯ 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

Page 49 (WPC1255: Hebrew)

HEX	8	9	A	B	C	D	E	F
0	€ 128	SP 144	SP 160	° 176	ˑ 192	| 208	א 224	] 240
1	SP 129	' 145	˙ ¡ 161	± 177	ˑˑ 193	˙ 209	ב 225	‭ ‬ 241
2	‚ 130	' 146	¢ 162	² 178	ˑˑ 194	˙ 210	ג 226	ע 242
3	ƒ 131	" 147	£ 163	³ 179	ˑˑ 195	ˑ 211	ד 227	ף 243
4	„ 132	" 148	₪ 164	´ 180	· 196	‭ ‬ 212	ה 228	פ 244
5	… 133	• 149	¥ 165	µ 181	¨ 197	‭ ‬ 213	ו 229	ץ 245
6	† 134	– 150	¦ 166	¶ 182	ˑ 198	‭ ‬ 214	ז 230	צ 246
7	‡ 135	— 151	§ 167	· 183	ˑ 199	' 215	ח 231	ק 247
8	ˆ 136	~ 152	¨ 168	ˑ 184	ˑ 200	" 216	ט 232	ר 248
9	‰ 137	™ 153	© 169	¹ 185	· 201	SP 217	י 233	ש 249
A	SP 138	SP 154	× 170	÷ 186	SP 202	SP 218	ך 234	ת 250
B	‹ 139	› 155	« 171	» 187	ˑ 203	SP 219	כ 235	SP 251
C	SP 140	SP 156	¬ 172	¼ 188	· 204	SP 220	ל 236	SP 252
D	SP 141	SP 157	173	½ 189	ˑ 205	SP 221	ם 237	SP 253
E	SP 142	SP 158	® 174	¾ 190	‾ 206	SP 222	מ 238	SP 254
F	SP 143	SP 159	‾ 175	¿ 191	‾ 207	SP 223	ן 239	SP 255

HEX	8	9	A	B	C	D	E	F
0	€ 128	گ 144	SP 160	° 176	ˆ 192	ذ 208	à 224	ء 240
1	پ 129	' 145	، 161	± 177	ء 193	ر 209	ل 225	ﺅ 241
2	‚ 130	' 146	¢ 162	2 178	آ 194	ز 210	â 226	ئ 242
3	ƒ 131	" 147	£ 163	3 179	أ 195	ﺱ 211	م 227	´ 243
4	„ 132	" 148	¤ 164	´ 180	ؤ 196	ش 212	ن 228	Ô 244
5	… 133	• 149	¥ 165	µ 181	إ 197	ص 213	ه 229	ء 245
6	† 134	– 150	¦ 166	¶ 182	ئ 198	ض 214	و 230	¸ 246
7	‡ 135	— 151	§ 167	· 183	ا 199	× 215	ç 231	÷ 247
8	ˆ 136	ک 152	¨ 168	، 184	ب 200	ط 216	è 232	ﹽ 248
9	‰ 137	™ 153	© 169	1 185	ة 201	ظ 217	é 233	ù 249
A	ﭢ 138	ﮊ 154	ھ 170	؛ 186	ت 202	ع 218	ê 234	° 250
B	‹ 139	› 155	« 171	» 187	ث 203	غ 219	ë 235	Û 251
C	Œ 140	œ 156	¬ 172	¼ 188	ج 204	ـ 220	ى 236	ü 252
D	ﭲ 141	SP 157	173	½ 189	ح 205	ف 221	ي 237	SP 253
E	ژ 142	SP 158	® 174	¾ 190	خ 206	ق 222	î 238	SP 254
F	ﭞ 143	ں 159	¯ 175	؟ 191	د 207	ك 223	ï 239	ﻊ 255

Page 51 (WPC1257: Baltic Rim)

HEX	8	9	A	B	C	D	E	F
0	€ 128	SP 144	SP 160	° 176	Ą 192	Š 208	ą 224	š 240
1	SP 129	' 145	SP 161	± 177	Į 193	Ń 209	į 225	ń 241
2	‚ 130	' 146	¢ 162	² 178	Ā 194	Ņ 210	ā 226	ŋ 242
3	SP 131	" 147	£ 163	³ 179	Ć 195	Ó 211	ć 227	ó 243
4	„ 132	" 148	¤ 164	´ 180	Ä 196	Ō 212	ä 228	ō 244
5	… 133	• 149	SP 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	† 134	– 150	¦ 166	¶ 182	Ę 198	Ö 214	ę 230	ö 246
7	‡ 135	— 151	§ 167	· 183	Ē 199	× 215	ē 231	÷ 247
8	SP 136	SP 152	Ø 168	ø 184	Č 200	Ų 216	č 232	ų 248
9	‰ 137	™ 153	© 169	¹ 185	É 201	Ł 217	é 233	ł 249
A	SP 138	SP 154	Ŗ 170	ŗ 186	Ź 202	Ś 218	ź 234	ś 250
B	‹ 139	› 155	« 171	» 187	Ė 203	Ū 219	ė 235	ū 251
C	SP 140	SP 156	¬ 172	¼ 188	Ģ 204	Ü 220	ģ 236	ü 252
D	¨ 141	157	173	½ 189	Ķ 205	Ż 221	ķ 237	ż 253
E	ˇ 142	˛ 158	® 174	¾ 190	Ī 206	Ž 222	ī 238	ž 254
F	¸ 143	SP 159	Æ 175	æ 191	Ļ 207	ß 223	ļ 239	˙ 255

HEX	8	9	A	B	C	D	E	F
0	€ 128	SP 144	SP 160	° 176	À 192	Đ 208	à 224	đ 240
1	SP 129	' 145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	' 130	' 146	¢ 162	² 178	Â 194	' 210	â 226	· 242
3	ƒ 131	" 147	£ 163	³ 179	Ă 195	Ó 211	ă 227	ó 243
4	" 132	" 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	… 133	• 149	¥ 165	µ 181	Å 197	Ơ 213	å 229	ơ 245
6	† 134	– 150	¦ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	‡ 135	— 151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	ˆ 136	~ 152	¨ 168	˛ 184	È 200	Ø 216	è 232	ø 248
9	‰ 137	™ 153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	SP 138	SP 154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	‹ 139	› 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	Œ 140	œ 156	¬ 172	¼ 188	` 204	Ü 220	´ 236	ü 252
D	SP 141	SP 157	173	½ 189	Í 205	Ư 221	í 237	ư 253
E	SP 142	SP 158	® 174	¾ 190	Î 206	˜ 222	î 238	đ 254
F	SP 143	Ÿ 159	¯ 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

Page 53 (KZ1048: Kazakhstan)

HEX	8	9	A	B	C	D	E	F
0	Ђ 128	ђ 144	SP 160	º 176	А 192	Р 208	а 224	р 240
1	Ѓ 129	' 145	Ұ 161	± 177	Б 193	С 209	б 225	с 241
2	‚ 130	' 146	ұ 162	I 178	В 194	Т 210	в 226	т 242
3	ѓ 131	" 147	Ә 163	і 179	Г 195	У 211	г 227	у 243
4	„ 132	" 148	¤ 164	ө 180	Д 196	Ф 212	д 228	ф 244
5	… 133	• 149	Ө 165	µ 181	Е 197	Х 213	е 229	х 245
6	† 134	– 150	¦ 166	¶ 182	Ж 198	Ц 214	ж 230	ц 246
7	‡ 135	— 151	§ 167	· 183	З 199	Ч 215	з 231	ч 247
8	€ 136	SP 152	Ё 168	ё 184	И 200	Ш 216	и 232	ш 248
9	‰ 137	™ 153	© 169	№ 185	Й 201	Щ 217	й 233	щ 249
A	Љ 138	љ 154	Ғ 170	ғ 186	К 202	Ъ 218	к 234	ъ 250
B	‹ 139	› 155	« 171	» 187	Л 203	Ы 219	л 235	ы 251
C	Њ 140	њ 156	¬ 172	ə 188	М 204	Ь 220	м 236	ь 252
D	Қ 141	қ 157	173	Ң 189	Н 205	Э 221	н 237	э 253
E	һ 142	һ 158	® 174	ң 190	О 206	Ю 222	о 238	ю 254
F	Ұ 143	ұ 159	Ү 175	ү 191	П 207	Я 223	п 239	я 255

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Page 255 (User-Defined Page)

This page is not supported when Thai/Vietnamese is selected.

HEX	8		9		A		B		C		D		E		F	
0	SP	128	SP	144	SP	160	SP	176	SP	192	SP	208	SP	224	SP	240
1	SP	129	SP	145	SP	161	SP	177	SP	193	SP	209	SP	225	SP	241
2	SP	130	SP	146	SP	162	SP	178	SP	194	SP	210	SP	226	SP	242
3	SP	131	SP	147	SP	163	SP	179	SP	195	SP	211	SP	227	SP	243
4	SP	132	SP	148	SP	164	SP	180	SP	196	SP	212	SP	228	SP	244
5	SP	133	SP	149	SP	165	SP	181	SP	197	SP	213	SP	229	SP	245
6	SP	134	SP	150	SP	166	SP	182	SP	198	SP	214	SP	230	SP	246
7	SP	135	SP	151	SP	167	SP	183	SP	199	SP	215	SP	231	SP	247
8	SP	136	SP	152	SP	168	SP	184	SP	200	SP	216	SP	232	SP	248
9	SP	137	SP	153	SP	169	SP	185	SP	201	SP	217	SP	233	SP	249
A	SP	138	SP	154	SP	170	SP	186	SP	202	SP	218	SP	234	SP	250
B	SP	139	SP	155	SP	171	SP	187	SP	203	SP	219	SP	235	SP	251
C	SP	140	SP	156	SP	172	SP	188	SP	204	SP	220	SP	236	SP	252
D	SP	141	SP	157	SP	173	SP	189	SP	205	SP	221	SP	237	SP	253
E	SP	142	SP	158	SP	174	SP	190	SP	206	SP	222	SP	238	SP	254
F	SP	143	SP	159	SP	175	SP	191	SP	207	SP	223	SP	239	SP	255

International Character Sets

Country	ASCII code (Hex)													
	23	24	25	2A	40	5B	5C	5D	5E	60	7B	7C	7D	7E
USA	#	$	%	*	@	[	\	]	^	`	{	|	}	~
France	#	$	%	*	à	°	ç	§	^	`	é	ù	è	¨
Germany	#	$	%	*	§	Ä	Ö	Ü	^	`	ä	ö	ü	β
U.K.	£	$	%	*	@	[	\	]	^	`	{	|	}	~
Denmark I	#	$	%	*	@	Æ	Ø	Å	^	`	æ	ø	å	~
Sweden	#	¤	%	*	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Italy	#	$	%	*	@	°	\	é	^	ù	à	ò	è	ì
Spain I	Pt	$	%	*	@	¡	Ñ	¿	^	`	¨	ñ	}	~
Japan	#	$	%	*	@	[	¥	]	^	`	{	|	}	~
Norway	#	¤	%	*	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Denmark II	#	$	%	*	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Spain II	#	$	%	*	á	¡	Ñ	¿	é	`	í	ñ	ó	ú
Latin America	#	$	%	*	á	¡	Ñ	¿	é	ü	í	ñ	ó	ú
Korea	#	$	%	*	@	[	₩	]	^	`	{	|	}	~
Slovenia/Croatia	#	$	%	*	Ž	Š	Đ	Ć	Č	ž	š	đ	ć	č
China	#	¥	%	*	@	[	\	]	^	`	{	|	}	~
Vietnam	đ	$	%	*	@	[	\	]	^	`	{	|	}	~
Arabia	#	$	%	*	@	[	\	]	^	`	{	|	}	~