

TM-T88V-i

TM-i Firmware Ver.4.0 or later

Technical Reference Guide

Product Overview

Describes features for the product.

Setup

Describes setup and installation of the product and peripherals.

Application Development Information

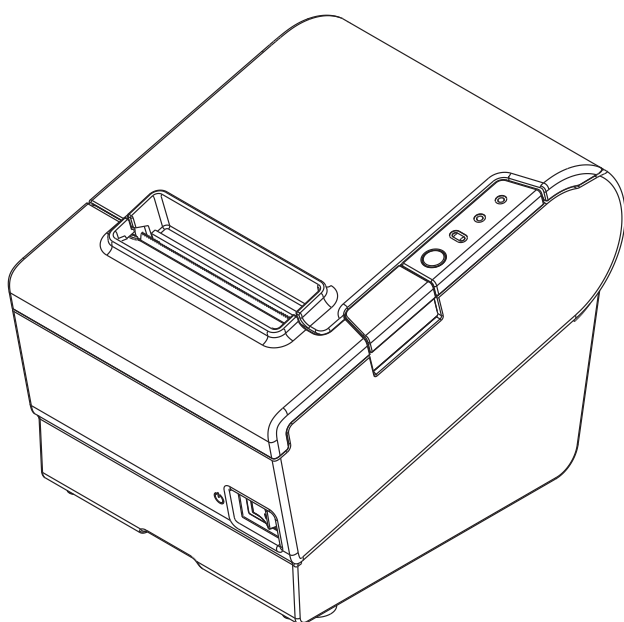
Describes how to control the printer and necessary information when you develop applications.

Handling

Describes how to handle the product.

Appendix

Describes general specifications and character code tables.



Cautions

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For Safety

Key to Symbols

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. <ul style="list-style-type: none">• 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**
- **Never insert or disconnect the power plug with wet hands.**
Doing so may result in electric 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 electric 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 your dealer or a Seiko Epson service center for advice.
- **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 your dealer or a Seiko Epson service center for advice.
- **If you open the DIP switch cover, be sure to close the cover and tighten the screw after adjusting the DIP switch.**
Using this product with the cover open may cause fire or electric shock.
- **Do not use aerosol sprayers containing flammable gas inside or around this product.**
Doing so may cause fire.

Cautions



- **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 auto-cutter fixed blade.**
- **To ensure safety, unplug this product before leaving it unused for an extended period.**
- **Do not knock or strike the printer. This may cause defective print.**
- **Do not catch cables or place foreign matter under the printer.**
- **Use the UL-approved peripherals (only for North American users).**

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

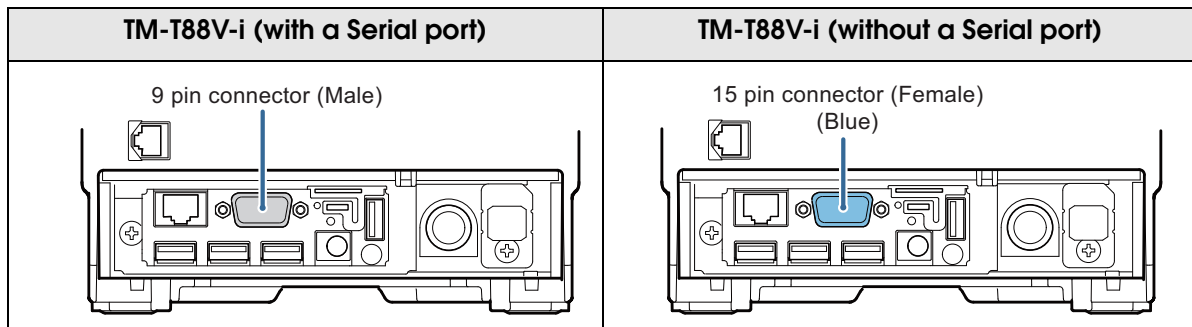
This manual aims to provide all the information necessary for the development, design, and installment of POS systems, order entry systems, and other receipt issuing systems that use TM-T88V-i.

TM-T88V-i provides different available functions depending on the product specification and TM-i Firmware version.

Refer to an appropriate Technical Reference Guide described in the following table.

| TM-T88V-i product specifications *1 | TM-i Firmware Version *2 | Technical Reference Guide to be used |
|--------------------------------------|--------------------------|---|
| TM-T88V-i (with a Serial port) | Ver.4.0 or later | TM-T88V-i (TM-i Firmware Ver.4.0 or later) Technical Reference Guide (This document) |
| TM-T88V-i (without a Serial port) | Ver.4.0 or later | TM-T88V-i (TM-i Firmware Ver.4.0 or later) Technical Reference Guide (This document) |
| | Ver.3.x or earlier | TM-T88V-i Technical Reference Guide |

*1: You can check the rear of the printer for the availability of serial ports.



*2: For TM-T88V-i (without Serial port), print a status sheet to confirm whether the version of TM-i Firmware is 4.0 or later. Make sure that this product is ready to print (the paper is set and the power is turned on), and hold down the push button at the rear of this product for at least 3 seconds before releasing it.

(See ["Confirming with a status sheet" on page 58.](#))

| TM-i Firmware Ver.4.0 or later | TM-i Firmware Ver.3.x or earlier |
|---|---|
| <pre>***** EPSON Status Sheet ***** <General Information> Firmware X.XX ePOS-Device X.XX Model TM-T88V-i</pre> <p>"Firmware" (TM-i Firmware Version) is printed under <General Information>.</p> | <pre>***** EPSON Status Sheet ***** <General Information> Software X.XX Model TM-T88V-i Time yyyy-mm-dd hh:nn:ss</pre> <p>"Software" (TM-i Firmware Version) is printed under <General Information>.</p> |

Manual Content

The manual is made up of the following sections:

| | |
|-----------|---|
| Chapter 1 | Product Overview |
| Chapter 2 | Setup |
| Chapter 3 | Application Development Information |
| Chapter 4 | Handling |
| Appendix | Product Specifications Option Specifications Setting Items for Software Setting Mode Character Code Tables |

Contents

| | |
|---|-----------|
| ■ For Safety | 3 |
| Key to Symbols | 3 |
| Warnings | 4 |
| Cautions | 5 |
| ■ Restriction of Use | 5 |
| ■ About this Manual | 6 |
| Aim of the Manual | 6 |
| Manual Content | 7 |
| ■ Contents | 8 |
| <hr/> | |
| Product Overview | 13 |
| ■ Features | 13 |
| ■ Product Configurations | 14 |
| Bundled items | 14 |
| Options | 14 |
| ■ Part Names and Functions | 15 |
| Power Switch | 15 |
| Power Switch Cover | 15 |
| Roll paper cover / Cover open button | 16 |
| Cutter cover | 16 |
| Control Panel | 16 |
| Interfaces | 17 |
| Push Button | 19 |
| Status LED | 19 |
| Wired LAN Status LED | 20 |
| Wireless LAN cable set (optional) LED | 20 |
| ■ Online and Offline | 21 |
| Online | 21 |
| Offline | 21 |
| ■ Error Status | 22 |
| Automatically Recoverable Errors | 22 |
| Recoverable Errors | 22 |
| Unrecoverable Errors | 23 |
| ■ NV Memory | 24 |
| NV Graphics Memory | 24 |
| Memory Switches (Customized Value) | 24 |
| R/E (Receipt Enhancement) | 24 |
| Maintenance Counter | 24 |
| <hr/> | |
| Setup | 25 |
| ■ Flow of Setup | 25 |
| ■ Installing the Product | 29 |
| Important Notes | 29 |

| | |
|---|-----------|
| ■ Setting the DIP Switches | 30 |
| Setting Procedure..... | 30 |
| Functions | 31 |
| ■ Changing the Paper Width | 33 |
| ■ Adjusting the Paper Roll Near-End Sensor | 35 |
| ■ Installing the microSD Card | 36 |
| ■ Connecting the Product to the Network | 37 |
| For Wired LAN connection | 37 |
| For Wireless LAN Interface | 37 |
| ■ Connecting the Peripherals | 40 |
| Connecting the Customer Display | 40 |
| Connecting the Optional External Buzzer | 42 |
| Connecting the Serial Communication Device | 45 |
| Key Input Device via a USB Interface..... | 45 |
| Connecting the Cash Drawer..... | 46 |
| ■ Connecting the AC Adapter | 48 |
| ■ Attaching the Connector Cover | 50 |
| ■ Attaching the Power Switch Cover | 52 |
| ■ Setting the Memory Switches (Customized Value) | 53 |
| Functions | 54 |
| ■ Network Setting | 56 |
| Confirming Network Setting | 58 |
| Initializing the Network Setting | 59 |
| ■ Enabling PHP | 60 |
| ■ Setting for Server Direct Print | 60 |
| ■ Setting for Connected Devices | 61 |
| ■ Registering Web Contents | 63 |
| Creating Web Contents | 63 |
| Registering Web Contents..... | 65 |
| <hr/> | |
| Application Development Information | 67 |
| ■ How to Control the Printer | 67 |
| ePOS-Device SDK for iOS | 68 |
| ePOS-Device SDK for Android | 69 |
| ePOS-Device SDK for JavaScript..... | 70 |
| ePOS-Device XML..... | 71 |
| Server Direct Print | 73 |
| Web Server | 74 |
| ■ Software and Manuals | 75 |
| How to Get Manuals and the Utility | 76 |
| ■ EPSON TMNet WebConfig | 77 |
| Starting EPSON TMNet WebConfig | 77 |
| Help Screen Display | 78 |
| Version Screen Display | 78 |
| General Information..... | 79 |
| Information - Wired - TCP/IP | 81 |

| | |
|---|------------|
| Information - Wireless - TCP/IP | 82 |
| Information - Web Contents..... | 83 |
| Information - Time | 84 |
| Web Service Settings - Device Admin - Printer..... | 85 |
| Web Service Settings - Device Admin - Customer Display | 86 |
| Web Service Settings - Device Admin - Key Input Device | 87 |
| Web Service Settings - Device Admin - Serial Communication Device | 88 |
| Web Service Settings - Device Admin - Search Printer | 89 |
| Web Service Settings - Web Contents - Update Settings..... | 90 |
| Web Service Settings - Server Access - Direct Print | 92 |
| Web Service Settings - Server Access - Status Notification..... | 93 |
| System Settings - Network - Wired | 94 |
| System Settings - Network - Wired - TCP/IP | 95 |
| System Settings - Network - Wireless | 96 |
| System Settings - Network - Wireless - TCP/IP | 97 |
| System Settings - Security - Authenticate Server..... | 98 |
| System Settings - Proxy - Proxy | 99 |
| System Settings - Time - Time | 100 |
| Admin Settings - Maintenance - Reset | 101 |
| Admin Settings - Administrator Information - Administrator | 102 |
| Admin Settings - Administrator Information - Password..... | 103 |
| PHP settings | 104 |
| ■ Status sheet..... | 105 |
| ■ Setting/Checking Modes | 110 |
| Self-test Mode | 110 |
| NV Graphics Print Mode | 111 |
| Receipt Enhancement Information Print Mode..... | 112 |
| Software Setting Mode | 113 |
| Hexadecimal Dumping Mode | 116 |
| ■ Easy Setup..... | 117 |
| ■ Checking/Updating TM-i Firmware | 118 |
| Checking the TM-i Firmware Version | 118 |
| Updating TM-i Firmware | 118 |

Handling **119**

| | |
|--|------------|
| ■ Installing and Replacing Roll Paper | 119 |
| ■ Removing Jammed Paper | 121 |
| ■ Cleaning the Thermal Head..... | 122 |
| ■ Preparing for Transport..... | 123 |

Appendix..... 125

| | |
|--|------------|
| ■ Product Specifications | 125 |
| Software Specifications..... | 126 |
| Controllable Peripherals..... | 127 |
| Printing Specifications..... | 128 |
| Character Specifications..... | 129 |
| Printable Area..... | 130 |
| Printing and Cutting Positions..... | 132 |
| Paper Specifications..... | 132 |
| Electrical Characteristics..... | 133 |
| Environmental Conditions..... | 134 |
| External Dimensions and Mass..... | 135 |
| AC Adapter, RA..... | 136 |
| ■ Option Specifications | 136 |
| Wireless LAN Cable Set (OT-WL01)..... | 136 |
| Customer Display (DM-D110)..... | 137 |
| ■ Setting Items for Software Setting Mode | 138 |
| ■ Character Code Tables | 141 |
| Common to All Pages..... | 141 |
| Page 0 (PC437: USA, Standard Europe)..... | 142 |
| Page 1 (Katakana)..... | 143 |
| Page 2 (PC850: Multilingual)..... | 144 |
| Page 3 (PC860: Portuguese)..... | 145 |
| Page 4 (PC863: Canadian-French)..... | 146 |
| Page 5 (PC865: Nordic)..... | 147 |
| Page 11 (PC851: Greek)..... | 148 |
| Page 12 (PC853: Turkish)..... | 149 |
| Page 13 (PC857: Turkish)..... | 150 |
| Page 14 (PC737: Greek)..... | 151 |
| Page 15 (ISO8859-7: Greek)..... | 152 |
| Page 16 (WPC1252)..... | 153 |
| Page 17 (PC866: Cyrillic #2)..... | 154 |
| Page 18 (PC852: Latin 2)..... | 155 |
| Page 19 (PC858: Euro)..... | 156 |
| Page 20 (Thai Character Code 42)..... | 157 |
| Page 21 (Thai Character Code 11)..... | 158 |
| Page 26 (Thai Character Code 18)..... | 159 |
| Page 30 (TCVN-3: Vietnamese)..... | 160 |
| Page 31 (TCVN-3: Vietnamese)..... | 161 |
| Page 32 (PC720: Arabic)..... | 162 |
| Page 33 (WPC775: Baltic Rim)..... | 163 |
| Page 34 (PC855: Cyrillic)..... | 164 |
| Page 35 (PC861: Icelandic)..... | 165 |
| Page 36 (PC862: Hebrew)..... | 166 |
| Page 37 (PC864: Arabic)..... | 167 |
| Page 38 (PC869: Greek)..... | 168 |
| Page 39 (ISO8859-2: Latin 2)..... | 169 |
| Page 40 (ISO8859-15: Latin 9)..... | 170 |
| Page 41 (PC1098: Farsi)..... | 171 |
| Page 42 (PC1118: Lithuanian)..... | 172 |
| Page 43 (PC1119: Lithuanian)..... | 173 |
| Page 44 (PC1125: Ukrainian)..... | 174 |
| Page 45 (WPC1250: Latin 2)..... | 175 |

| | |
|-------------------------------------|-----|
| Page 46 (WPC1251: Cyrillic) | 176 |
| Page 47 (WPC1253: Greek)..... | 177 |
| Page 48 (WPC1254: Turkish)..... | 178 |
| Page 49 (WPC1255: Hebrew)..... | 179 |
| Page 50 (WPC1256: Arabic)..... | 180 |
| Page 51 (WPC1257: Baltic Rim)..... | 181 |
| Page 52 (WPC1258: Vietnamese) | 182 |
| Page 53 (KZ1048: Kazakhstan) | 183 |
| Page 255..... | 184 |
| International Character Sets..... | 185 |

Product Overview

This chapter describes features of the product.

Features

TM-T88V-i is a receipt printer which can print directly from a smart device application or Web application.

This product supports ePOS-Device * and is capable of controlling POS peripherals or network compatible TM printers.

*: ePOS-Device: Epson original technology to control TM printers or POS peripherals via a smart device application or Web application. This technology is realized by ePOS-Device Service running on the products.

Functions

- Enables connection to peripherals (customer displays, barcode scanners, etc) via a USB or serial * interface.
- Provides ePOS-Device SDK for developing Web applications, applications for iOS and Android.
- Uses the communication box function to enable communications between applications. This function allows for communications, etc. between tablet terminals. (ePOS-Device SDK)
- Supports Server Direct Print that sends a request for print data from the product to the Web server at regular intervals.
- Equipped with Web server that supports the scripting language "PHP" and database "SQLite3".

*: Not available for TM-T88V-i (without a Serial port).

NOTE

For information on how to use these functions, see ["How to Control the Printer" on page 67.](#)

Product Configurations

Bundled items

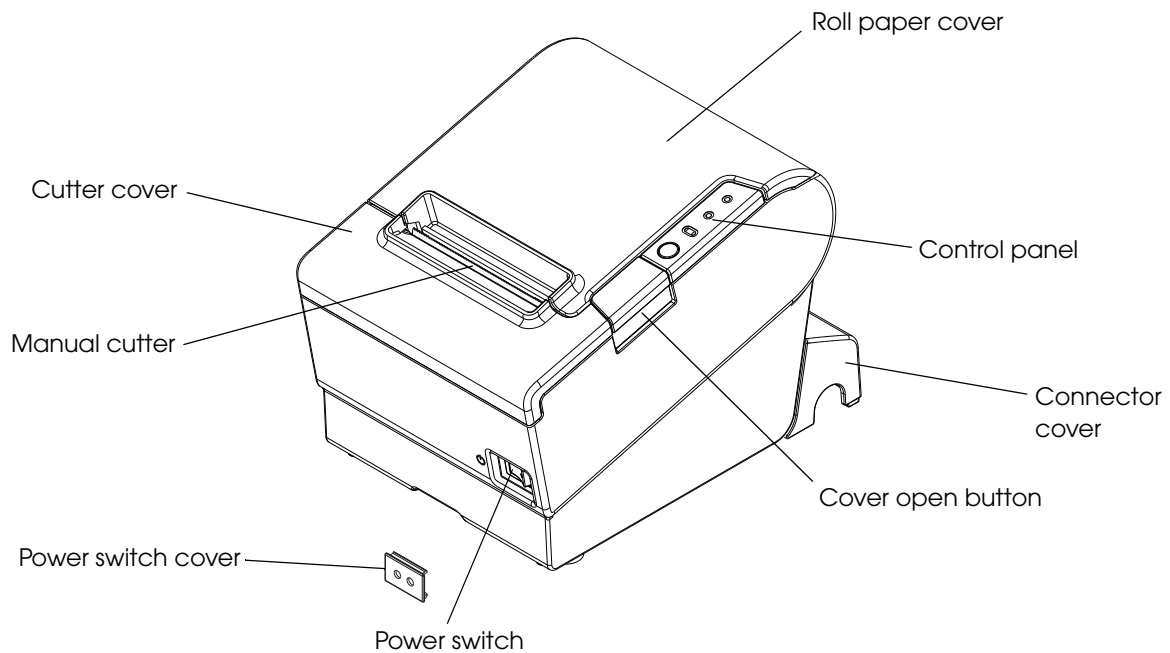
- AC adapter,RA
- AC cable *
- Roll paper (for operation check)
- Connector cover
- Power switch cover
- Roll paper guide for 58 mm width paper
- Two strips for the roll paper guide
- Screw for the roll paper guide
- Start Here
- Manual CD

* May vary based on specifications and region.


Options

- Affixing tape for fixing the printer (Model: DF-10)
- Buzzer unit (Model: OT-BZ20)
- Wireless LAN cable set (Model: OT-WL01)
- Customer display
 - Display unit (Model: DM-D110: USB Interface)
 - Option stand (Model: DP-110)

Part Names and Functions



Power Switch

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



Before turning on the product, be sure to check that the AC adapter is connected to the power supply.

CAUTION

After the product is turned on, it requires about 30 seconds until it is ready to print.

Power Switch Cover

Install the power switch cover that comes with the TM-T88V-i onto the printer to prevent inadvertent changing of the power switch, to prevent tampering, and to improve the appearance of the printer.

To operate the power switch, insert an object with a pointed tip such as a ballpoint pen into the hole on the power switch cover.



If an accident occurs with the power switch cover attached, unplug the power cord immediately.

Continued use of the printer may cause fire or electric shock.

Roll paper cover / Cover open button

When setting or replacing the roll paper, press the cover open button to open the roll paper cover.

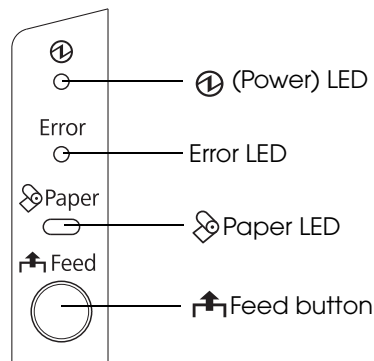
NOTE

Do not open the roll paper cover during printing or while the auto-cutter is operating.

Cutter cover

The auto-cutter is inside the cutter cover. Open the cover when roll paper is jammed in the printer or to return the cutter blade manually.

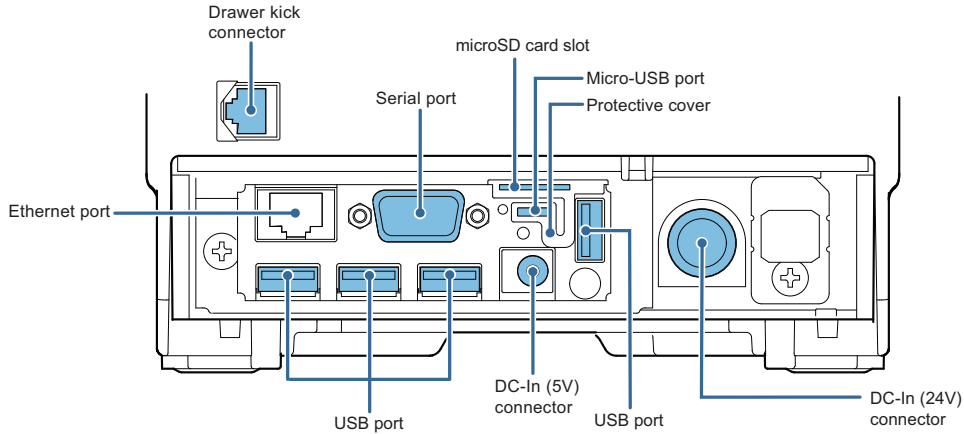
Control Panel



| Name | Status | Description |
|----------------|----------|--|
| ⚡ (Power) LED | On | Power is being supplied. |
| | Off | Power is not being supplied. |
| Error LED | Off | Normal operation (online) |
| | On | <ul style="list-style-type: none"> Immediately after the power is turned on or immediately after a reset (offline). Automatically goes off after a while to indicate that the printer is ready. The end of the roll paper is detected, and when printing has stopped (offline). If this happens, replace the roll paper. |
| | Flashing | An error has occurred (For details about the flash codes, see "Error Status" on page 22.) |
| 📄 Paper LED | Off | There is a sufficient amount of roll paper remaining. |
| | On | There is little or no roll paper remaining. |
| | Flashing | A self-test printing standby state and 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. |

Interfaces

With a Serial port



| Name | Description |
|--------------------------------|--|
| Drawer kick connector | Connects a cash drawer or the optional buzzer unit. |
| Ethernet port | Connect the LAN cable here to connect to the network. |
| USB port (Type A) | Connects peripherals via a USB interface. |
| Micro-USB port (Type Micro-AB) | Connects a computer when setting the product with TM-T88V Utility. |
| DC-In (5V) connector | Connects a AC adapter,RA. |
| DC-In (24V) connector | Connects a AC adapter,RA. |
| microSD card slot | When using the PHP function. |
| Serial port | Connects a serial communication device. |

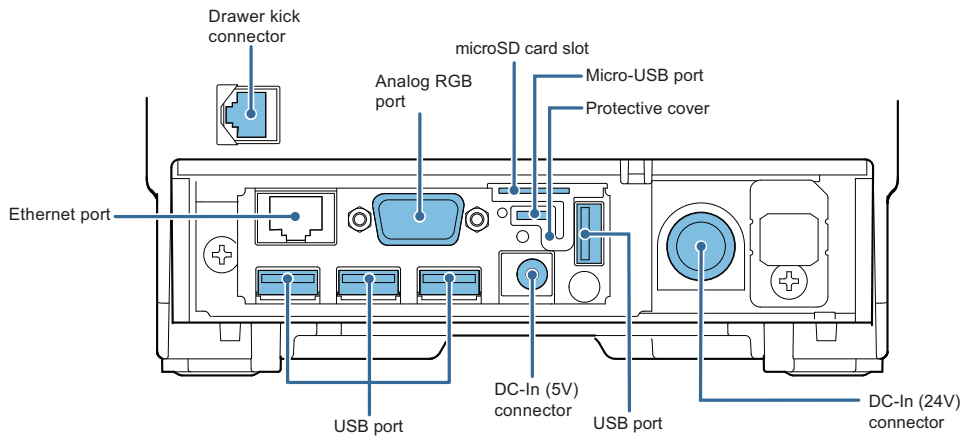


- When connecting USB interface devices, make sure to check the devices or manuals, etc. for current consumption. The total value should be 2.0 A or less. Never use devices that provide no information on current consumption.
- Make sure that the protective cover is securely fit into place while the product is operating.
- For Ethernet ports, make sure that the outdoor aerial LAN cables are connected through a surge protector. Failure to do so may lead to device error resulting from indirect lightning.



For the Micro-USB port, use a Micro-USB (Type Micro-AB) cable.

Without a Serial port



| Name | Description |
|--|---|
| Drawer kick connector | Connects a cash drawer or the optional buzzer unit. |
| LAN connector | Connect the LAN cable here to connect to the network. |
| USB connector (for optional products) | Connects optional products. |
| Micro-USB connector (for optional products) | Connects the product to a computer to set up the product. |
| Power supply connector for DC 5V | Connects a AC adapter,RA. |
| Power supply connector for DC 24V | Connects a AC adapter,RA. |
| microSD card slot | When using the PHP function with the firmware version 2.0 or later. |
| Analog RGB port | Currently not available. |

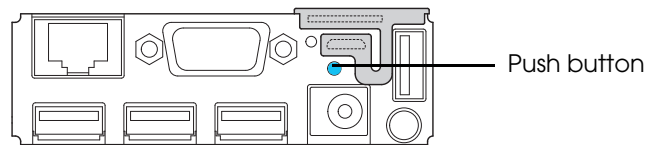


- **When connecting USB interface devices, make sure to check the devices or manuals, etc. for current consumption. The total value should be 2.0 A or less. Never use devices that provide no information on current consumption.**
- **Make sure that the protective cover is securely fit into place while the product is operating.**
- **For Ethernet ports, make sure that the outdoor aerial LAN cables are connected through a surge protector. Failure to do so may lead to device error resulting from indirect lightning.**



For the Micro-USB port, use a Micro-USB (Type Micro-AB) cable.

Push Button



Press the push button with a thin object such as a tweezers.

The push button has the following functions:

- **Status sheet printing:**
Make sure the product is turned on, press the push button for approximately 3 seconds. When you release the button, a status sheet on which network parameters are printed will be ejected. (See ["Confirming with a status sheet" on page 58.](#))
- **Initialization:**
Make sure the product is turned on, press the push button for approximately 10 seconds. When you release the button, network setting (Wired LAN/ Wireless LAN) will be initialized. (See ["Initializing the Network Setting" on page 59.](#))

CAUTION

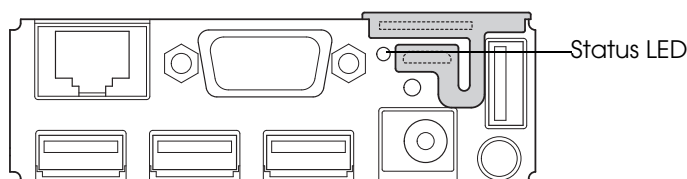
To print a status sheet, release the push button within 10 seconds. If the button is kept down for 10 seconds or more, the network setting will be initialized.

NOTE

- Press the push button after the status LED color has changed from orange to green. After the printer is turned on, it takes about 20 to 30 seconds until the status LED color changes to green.
- Even if the button is pressed while the status LED is on in orange, the button will not operate.

Status LED

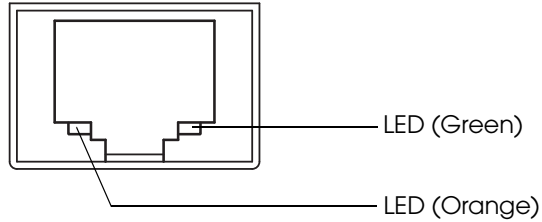
With the status LED on the rear of the product, you can check the interface board status.



| LED | Description |
|-------------|---|
| On (Green) | Operating normally. |
| On (Orange) | Starting up. If the status LED is on in orange even after 30 seconds have passed since the printer is turned on, repair is required. |
| Off | Power is not turned on. If the status LED is off even if the printer is turned on, repair is required. |

Wired LAN Status LED

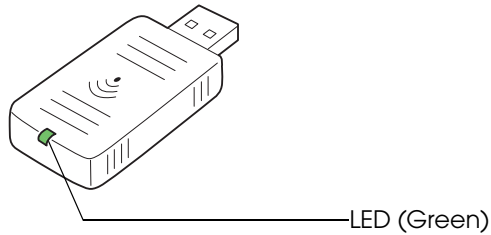
With the Wired LAN Status LED on the rear of the product, you can check the communication status of the product.



| LED | Description |
|--------|--|
| Green | Turns on when the link is established. |
| Orange | Turns on during communication. |

Wireless LAN cable set (optional) LED

With the LED on the wireless LAN unit, you can check the communication status of the product.



| LED | Description |
|----------|---|
| On | The wireless LAN unit is not connected to the product. Or the product power is OFF. |
| Off | This wireless LAN unit is connected to the product and is in operation. This unit is not communicating on a network. |
| Flashing | This wireless LAN unit is connected to the product and is in operation. This unit is communicating on a network. |

Online and Offline

Online

When no events to go offline have occurred, the printer is online and ready for normal printing.

Offline

The printer automatically goes offline under the following conditions:

- During power on (including resetting with the interface) until the printer is ready
- During the self-test
- When the roll paper cover is open.
- While roll paper is fed using the Feed button.
- When printing stops due to end of paper. (When the roll paper end sensor detects the end of paper or the printer is set so that printing stops upon detection of roll paper near-end.)
- Macro execution standby state
- When an error has occurred

Error Status

There are three possible error types: automatically recoverable errors, recoverable errors, and unrecoverable errors. Check the error LED flash code.

When connection to peripherals fails, check the status LEDs at the lower rear of the product.

Automatically Recoverable Errors

Printing is no longer possible when automatically recoverable errors occur. They can be recovered easily, as described below.

| Error | Error description | Error LED flash code | Recovery measure |
|------------------------------|---|----------------------|---|
| Roll paper cover open error | The roll paper cover was opened during printing. | | Recovers automatically when the roll paper cover is closed. |
| Print head temperature error | A high temperature outside the head drive operating range was detected. | | Recovers automatically when the print head cools. |

Recoverable Errors

Printing is no longer possible when recoverable errors occur. They can be recovered easily by turning the power on again after eliminating the cause of the error.

| Error | Error description | Error LED flash code | Recovery measure |
|-------------------|--------------------------------------|----------------------|--|
| Auto-cutter error | Auto-cutter does not work correctly. | | Remove the jammed paper or foreign matter in the printer, close the roll paper cover, and then turn the power on to recover. |

Unrecoverable Errors

If the same error occurs again even after turning the power back on, contact your dealer or a Epson service center.



Turn off the power immediately when unrecoverable errors occur.

| Error | Error description | Error LED flash code |
|-----------------------------------|--|----------------------|
| Memory R/W error | After R/W checking, the printer does not work correctly. | |
| High voltage error | The power supply voltage is extremely high. | |
| Low voltage error | The power supply voltage is extremely low. | |
| CPU execution error | The CPU is executing an incorrect address. | |
| Internal circuit connection error | Internal circuits are not connected correctly. | |

NV Memory

The product's NV memory (Non-Volatile Memory) stores data even after the product power is turned off. NV memory contains the following memory areas for the user:

- NV graphics memory
- Memory switches (customized value)
- R/E (Receipt Enhancement)
- Maintenance counter



As a guide, NV memory rewriting should be 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 stored.

Use the TM-T88V Utility to register graphics.

To check the registered graphics, select [Operation Check] - [Print Logo] in TM-T88V Utility.

NOTE

- For detailed information about the TM-T88V Utility, see the TM-T88V Utility User's Manual.
- For information about how to use the NV graphics memory print mode, see ["NV Graphics Print Mode" on page 111](#).

Memory Switches (Customized Value)

With the memory switches (customized value), which are software switches for the product, you can set paper width, print density, font, power supply unit capacity, automatic paper cut, and paper reduction. See ["Setting the Memory Switches \(Customized Value\)" on page 53](#).

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 detail, refer to the TM-T88V Utility User's Manual.

Maintenance Counter

With this function, printer information, such as the number of line feeds, the number of auto-cuts, and product operation time after the printer starts working, is automatically stored in NV memory. You can read the information with the TM-T88V Utility or in a self-test to use it for periodical checks or part replacement.

Setup

This chapter describes the installation and setup procedure of the product and peripherals required to use the product.

You can utilize "Easy Setup", which enables settings to the TM-i to be made in a simple manner using a USB memory that contains a file of EPSON TMNet WebConfig setting values.

For detail, refer the "TM-i series Easy Setup Guide".

Flow of Setup

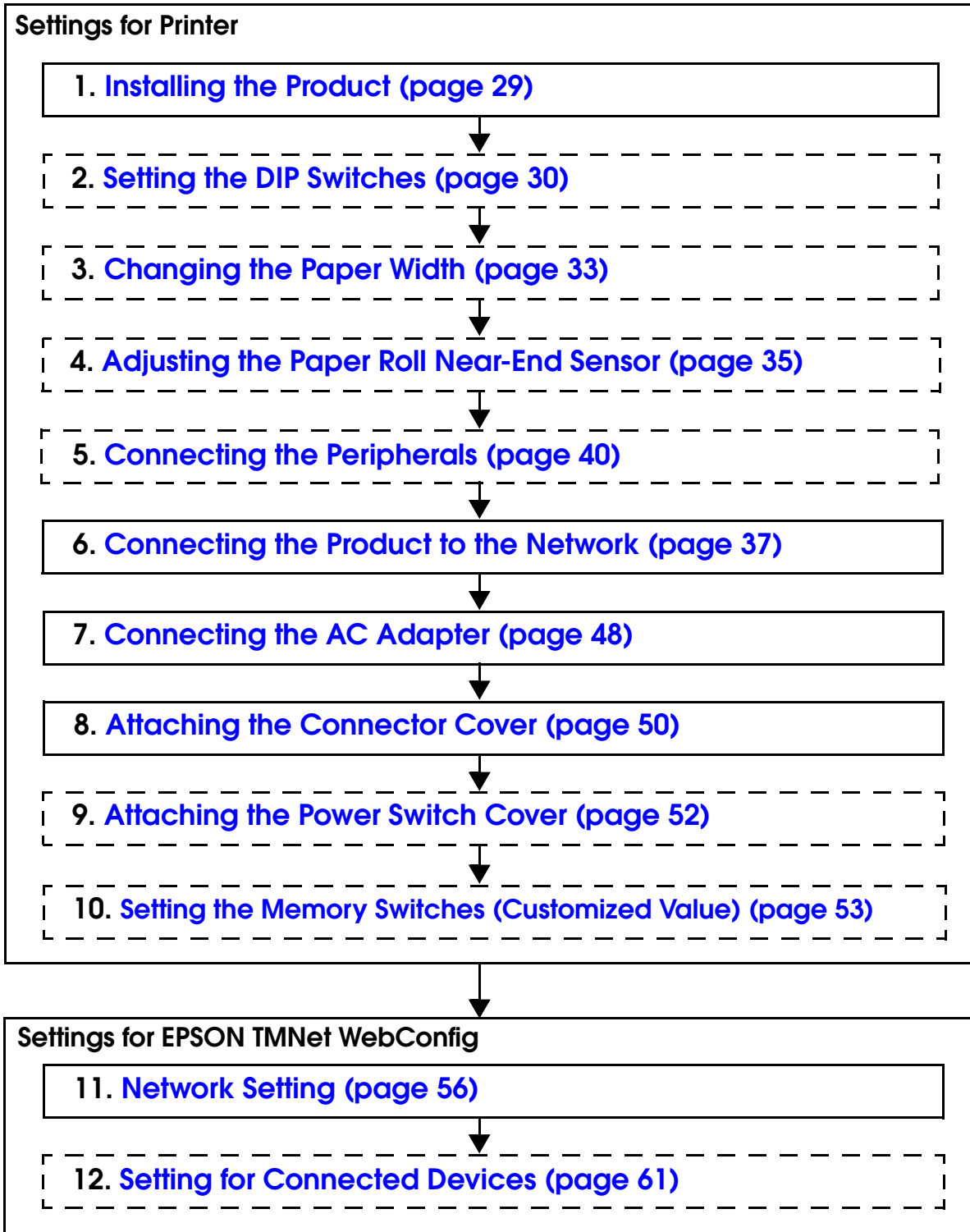
The setting items are different depending on the system to be used. Check the items by referring to "How to Control the Printer" on page 67.

- ePOS-Device SDK (iOS, Android, JavaScript), ePOS-Device XML (page 26)
- Server Direct Print (page 27)
- Using This Product as a Web Server (page 28)

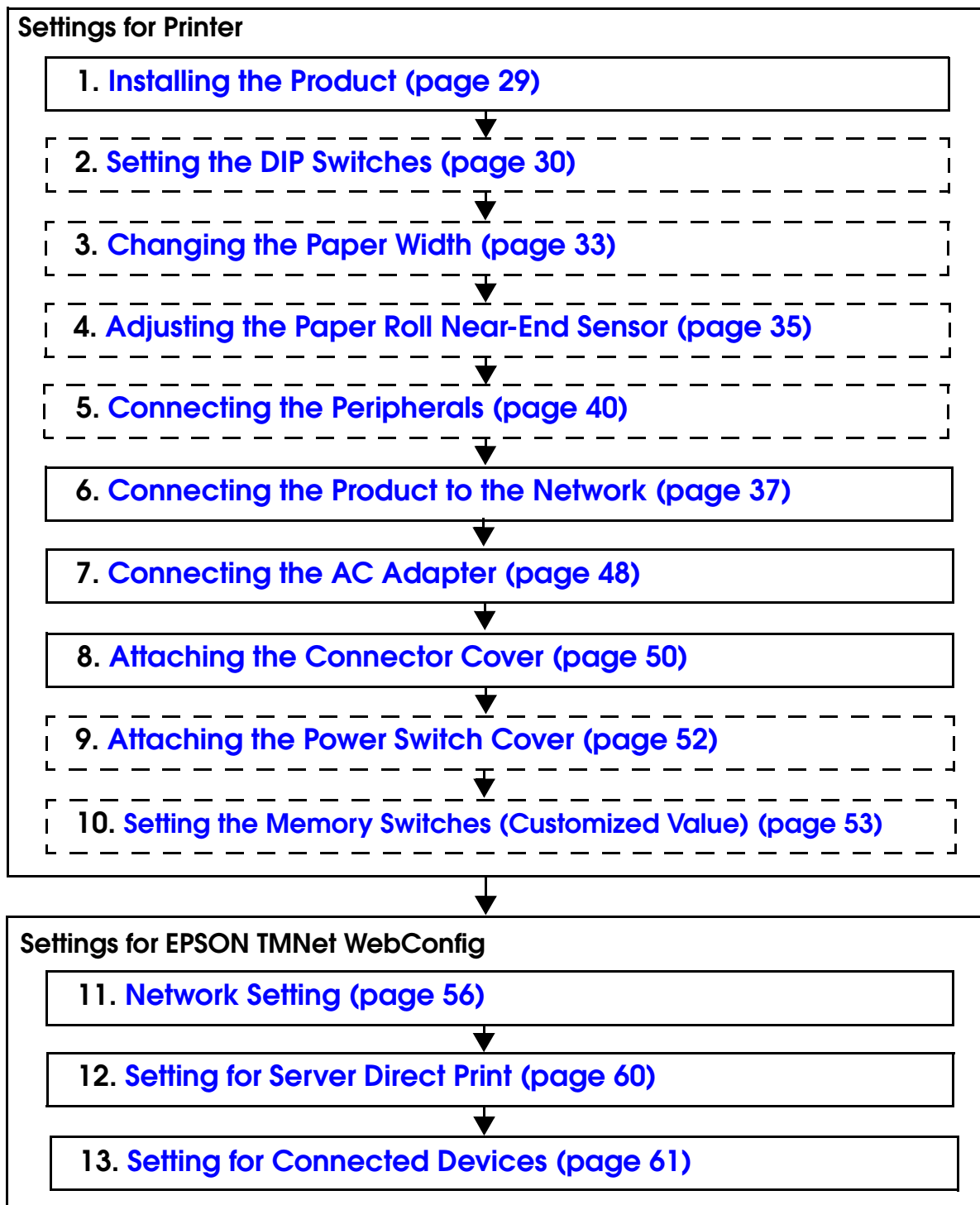
This chapter consists of the following sections along with the setup flow of the product and peripherals.

NOTE

In this setup flow, necessary items are in a frame with a solid line. Optional items are explained in an frame with a dotted line.



Server Direct Print



Using This Product as a Web Server

Settings for Printer

1. [Installing the Product \(page 29\)](#)

2. [Setting the DIP Switches \(page 30\)](#)

3. [Changing the Paper Width \(page 33\)](#)

4. [Adjusting the Paper Roll Near-End Sensor \(page 35\)](#)

5. [Connecting the Peripherals \(page 40\)](#)

6. [Installing the microSD Card \(page 36\)](#)

Available when PHP is enabled.

7. [Connecting the Product to the Network \(page 37\)](#)

8. [Connecting the AC Adapter \(page 48\)](#)

9. [Attaching the Connector Cover \(page 50\)](#)

10. [Attaching the Power Switch Cover \(page 52\)](#)

11. [Setting the Memory Switches \(Customized Value\) \(page 53\)](#)

Settings for EPSON TMNet WebConfig

12. [Network Setting \(page 56\)](#)

13. [Enabling PHP \(page 60\)](#)

14. [Registering Web Contents \(page 63\)](#)

Installing the Product

Important Notes

- The product must be installed horizontally on a flat surface (not tilted).
- Do not place the product in dusty locations.
- Do not catch cables or place foreign matter under the product.

Setting the DIP Switches

Follow the steps below to change the DIP switch settings.

Setting Procedure

Follow the steps below to change the DIP switch settings.

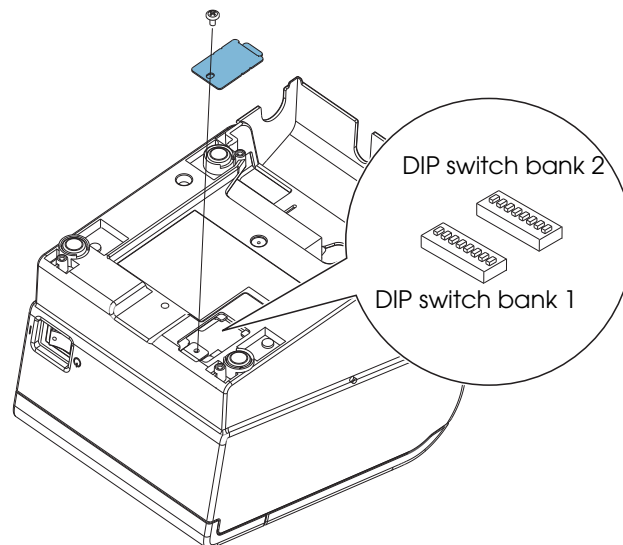


Before you remove the DIP switch cover, turn the product off.
Otherwise, a short-circuit may cause the product to malfunction.

CAUTION

DIP switch settings are enabled only when the power is turned on or the product is reset via the interface. If the settings are changed after that, the functions will not change.

- 1** Make sure the power supply for the product is turned off.
- 2** Unscrew the screw to remove the DIP switch cover from the base of the product.



- 3** Set the DIP switches, using the tip of a tool, such as a small screwdriver.
- 4** Replace the DIP switch cover, and screw it in place.

Functions

DIP Switch Bank 1

| SW | Function | ON | OFF | Initial setting |
|-----------|---|----------------|---|-----------------|
| 1-1 | Auto line feed | Always enabled | Always disabled | OFF |
| 1-2 | Receive buffer capacity | 45 bytes | 4 KB | OFF |
| 1-3 | Selects paper sensors to output paper-end signals (initial setting) | Disabled | Roll paper end sensor enabled, roll paper near-end sensor enabled | OFF |
| 1-4 | Error signal output | Disabled | Enabled | OFF |
| 1-5 ~ 1-8 | Undefined | — | | OFF |

DIP Switch Bank 2

| SW | Function | Function | ON | OFF | Initial setting |
|--------------|---|----------------------|--|--|-----------------|
| 2-1 | Reserved (Do not change setting) | | Fixed to ON | | ON |
| 2-2 | Reserved (Do not change setting) | | Fixed to OFF | | OFF |
| 2-3 | Selects print density | Standard | 2-3: OFF, 2-4: OFF | | OFF |
| | | Darker than standard | 2-3: ON, 2-4: OFF | | |
| 2-4 | Dark | | 2-3: OFF, 2-4: ON | | OFF |
| | Forbidden | | 2-3: ON, 2-4: ON | | |
| 2-5 | Sets the release condition of the receive buffer BUSY state. (This function is effective when DIP Switch 1-2 is set to off.) | | Releases the BUSY state when the remaining capacity of the receive buffer reaches 138 bytes. | Releases the BUSY state when the remaining capacity of the receive buffer reaches 256 bytes. | OFF |
| 2-6 ~ 2-7 | Reserved (Do not change settings) | | Fixed to OFF | | OFF |
| 2-8 | IF pin 31 reset signal (Do not change setting) | | Fixed to ON | | ON |

CAUTION

- Do not change the setting of DIP switches 2-1, 2-2, 2-6, 2-7, and 2-8. Otherwise, the printer may not operate normally.
- Set the print density using the DIP switches when the print density of the customized value is set to "Depends On Dip Switch" (Initial Settings).
- If the print density is set to "Darker than standard" or "Dark" level, printing speed may be reduced.

Changing the Paper Width

The printer is initially set to print on 80 mm width paper and you can change the printer to print on 58 mm width paper by installing the roll paper guide and changing the paper width setting with the customized value.

Follow the steps below to install the roll paper guide.

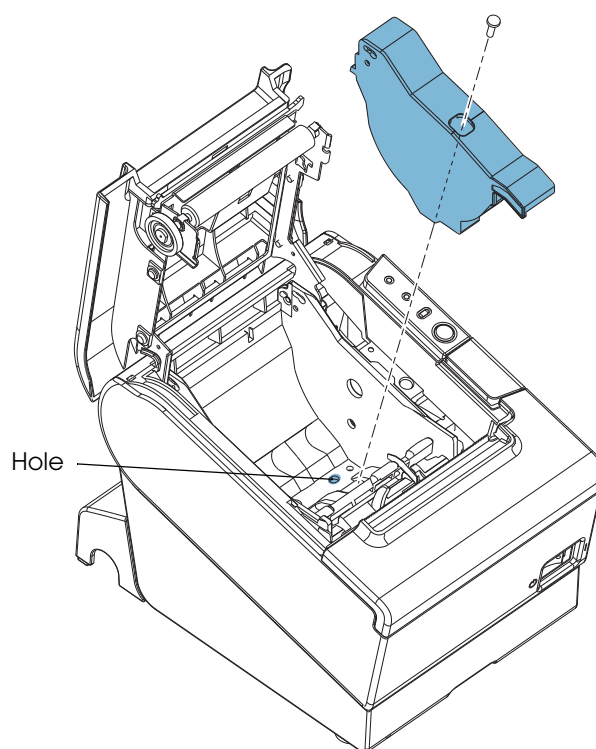
CAUTION

Once you change the paper width from 80 mm to 58 mm, you cannot change it back to 80 mm.

NOTE

To set the customized value, see "[Setting the Memory Switches \(Customized Value\)](#)" on [page 53](#).

- 1 Open the roll paper cover.
- 2 Install the roll paper guide so that the projection on its bottom is aligned with the hole at the right of the roll paper holder.

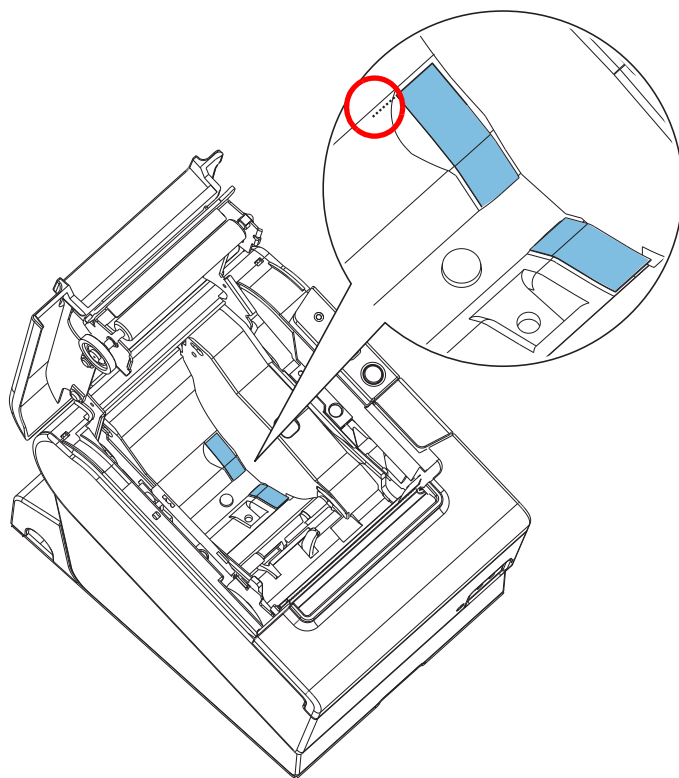


- 3 Tighten the enclosed screw to fix the roll paper guide.

- 4** Paste the enclosed 2 small strips along the roll paper guide on the bottom of the roll paper holder.

CAUTION

Make sure the space between the top edge of the strip and the line of the groove in the roll paper guide is 0.5 mm or less.



Adjusting the Paper Roll Near-End Sensor

Below are two situations where a roll 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 remaining amount of paper.

CAUTION

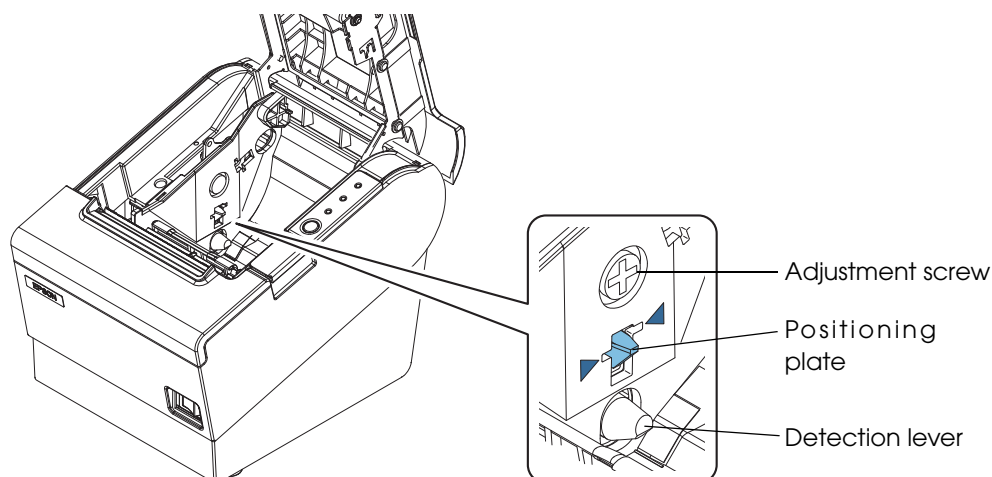
- Since roll paper cores vary slightly in shape, depending on paper roll design and manufacturing tolerances, it is impossible to detect the remaining paper exactly.
- Use roll paper with a core inner diameter of 12 mm {0.47"} and outer diameter of 18 mm {0.71"} so that the Near-End sensor can detect the remaining paper as accurately as possible.

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

- 1 Open the roll paper cover, and remove the roll paper.
- 2 Loosen the adjustment screw fastening the sensor, and align the upper edge of the positioning plate with the adjustment position.

| Adjustment position | Outer diameter of roll paper at near-end detection |
|-------------------------|--|
| Upper | Approx. 27 {1.06"} |
| Lower (Initial setting) | Approx. 23 {0.97"} |

- 3 Tighten the adjustment screw.
- 4 After adjustment, make sure that the detection lever operates smoothly.



Installing the microSD Card

Install the microSD card into the microSD card slot on the rear of the product.

CAUTION

Use a microSD card that has wear leveling functions

NOTE

The microSD card can only be used if the PHP function is enabled.

Installing the microSD Card

- 1 Open the protective cover on this product. Check the insertion direction of the microSD card and insert it into the microSD card slot.

NOTE

- Insert the microSD card with its metal side facing down.
- Push the microSD card to the bottom until it clicks.

- 2 Close the protective cover.

Removing the microSD Card

- 1 Open the protective cover on this product and gently push the microSD card into the slot.

NOTE

Push the microSD card to the bottom until it clicks.

- 2 When the microSD card is slightly ejected, pull it out carefully.
- 3 Close the protective cover.

Connecting the Product to the Network

For Wired LAN connection

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

Insert a 10BASE-T/100BASE-TX LAN cable into the LAN connector until it clicks.



- **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, drawer kick cable, or a standard telephone line cable to the LAN connector.**

For Wireless LAN Interface

The optional wireless LAN cable set (OT-W01) enables you to use the product with a wireless LAN connection.

Be sure not to connect a LAN cable when you use the wireless LAN cable set.



This product cannot be used with the LAN connection and wireless LAN connection at the same time. When the product is set and installed for both of them, only the LAN connection works.

Check whether the following items are included.

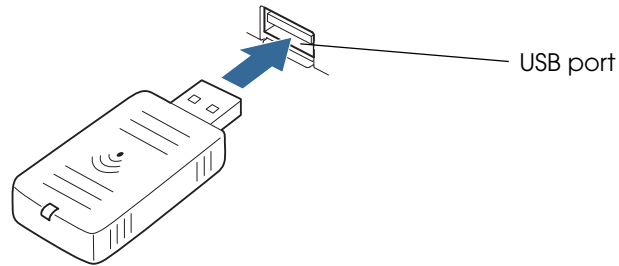
- Wireless LAN unit
- USB extension cable
- Affixing tape (1 pair, 2 pieces)
- Rubber cover
- Caution label
- User's manual

To connect the wireless LAN unit to the product, you can connect directly or use the USB extension cable.

If connecting the wireless LAN unit directly causes interference with other cables or bad communication, use the included USB extension cable.

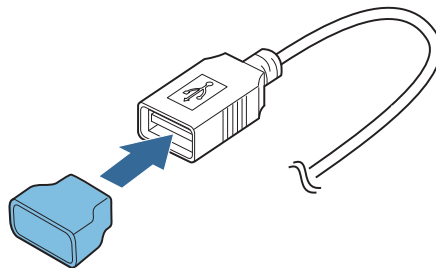
Connecting the unit directly with the product

Install the wireless LAN unit to a USB port of the product.

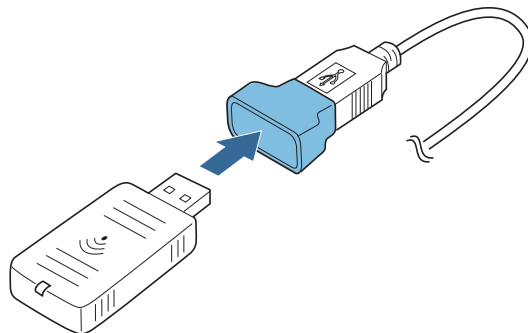


Using the USB extension cable

- 1** Attach the included rubber cover to the connector of the USB extension cable into which the wireless LAN unit will be inserted, to prevent the unit from coming off.



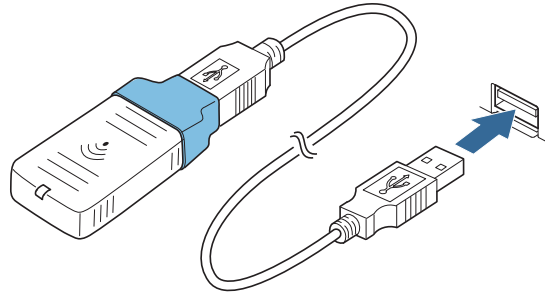
- 2** Insert the wireless LAN unit into the connector of the cable.



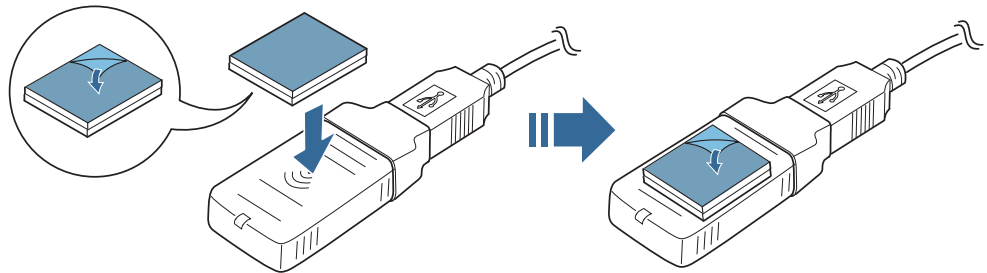
CAUTION

Adjust the position of the rubber cover so that the description on the label on the back side of the wireless LAN unit is not covered.

- 3** Connect the USB extension cable to the USB port of the product.

**NOTE**

If you want to fix the wireless LAN unit, cut the included affixing tape to fit and put on the unit, and fix the unit in a place with good communication.



Connecting the Peripherals

Connect each cable of a peripheral to a port or connector at the rear of the product.

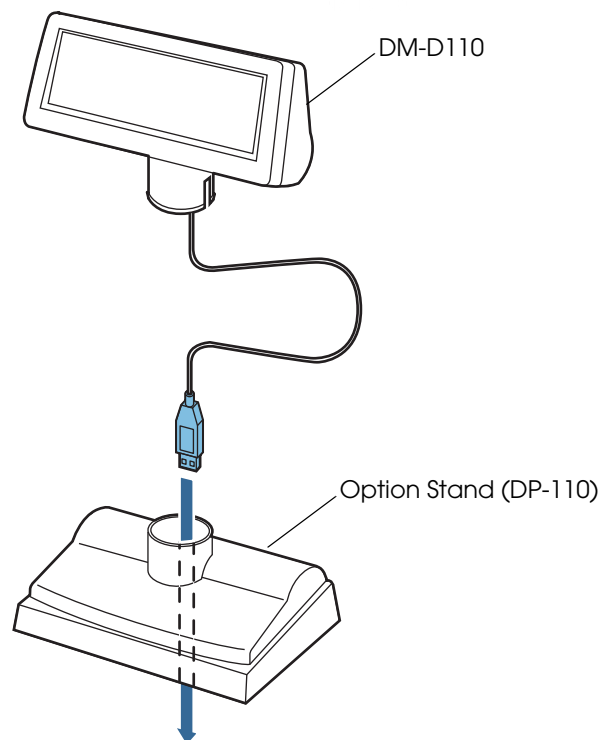


- When connecting USB interface devices, make sure to check the devices or manuals, etc. for current consumption. The total value should be 2.0 A or less. Never use devices that provide no information on current consumption.
- Make sure that the protective cover is securely fit into place while the product is operating.

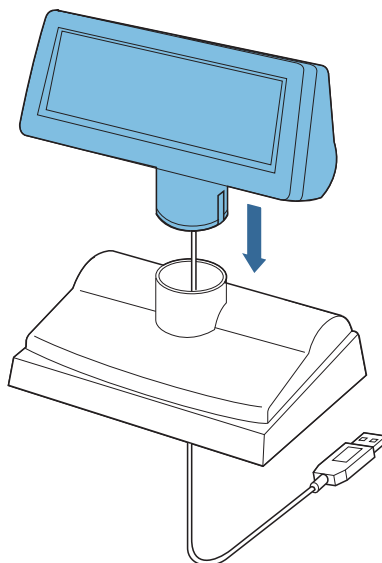
Connecting the Customer Display

Follow the steps below.

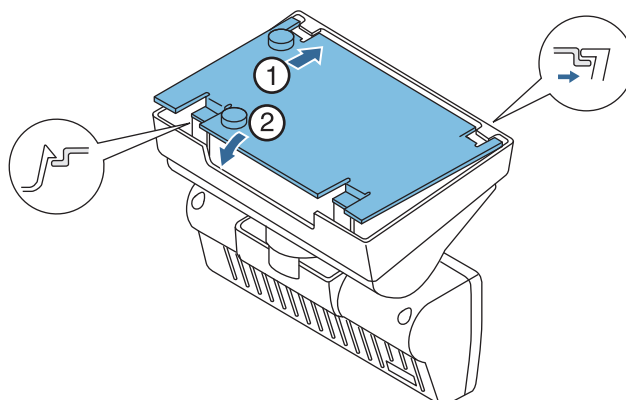
- 1 Put the connection cable of the customer display through the option stand (DP-110).



- 2** Push the display all the way into the option stand until it clicks into place.



- 3** Follow the order of the arrows described below to place the plate onto the option stand. Push the plate until it is secured with hooks.



- 4** Connect the USB port of the customer display to the USB port of this product.

Use EPSON TMNet WebConfig to configure customer display settings and perform display tests. For detail, refer to ["Setting for Connected Devices" on page 61](#).

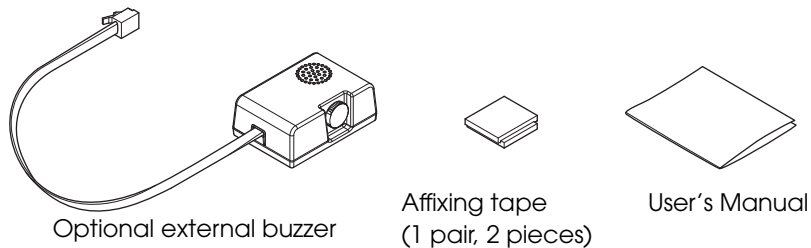
Connecting the Optional External Buzzer

You can use the optional external buzzer (OT-BZ20) by connecting it to the drawer kick connector.

CAUTION

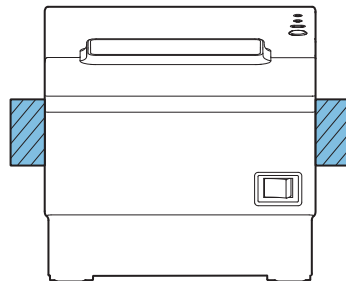
- The optional external buzzer and the drawer cannot be used together at the same time.
- If you configure the memory switch (customized value) setting to enable the optional external buzzer, the drawer cannot be opened because the pulse is not sent to the drawer kick connector pin.
- Make sure to use the accessory affixing tape (hook and loop fastener) to attach the optional external buzzer to the product.
- Be careful not to spill water, oil, solvent, or any other liquid over the product. Doing so may result in malfunction of the product.

Check whether the following items are included.



Installation Position

This product is recommended to be installed on either side of the product.



CAUTION

- Do not install the optional external buzzer at the roll paper exit.
- To prevent liquid from entering inside, it is recommended to install the optional external buzzer so that the volume adjustment knob is positioned sideways or downward. (For details of the volume adjustment knob, see ["Adjusting the Buzzer Volume" on page 44.](#))

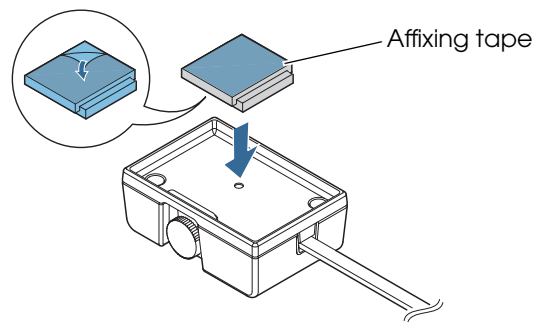
Installation Procedures

- 1 Turn off the product.

CAUTION

Connect and disconnect the optional external buzzer while the product is turned off. If you connect it while the product is turned on, the buzzer does not function correctly.

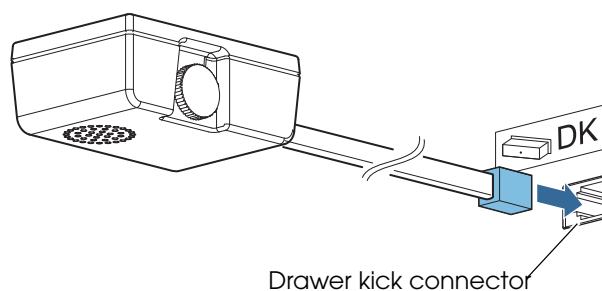
- 2 Clean and dry the printer case where the optional external buzzer will be installed.
- 3 With 2 pieces of the affixing tape combined, peel off the sticker on one side, and paste it around the center of the attaching surface of the optional external buzzer.



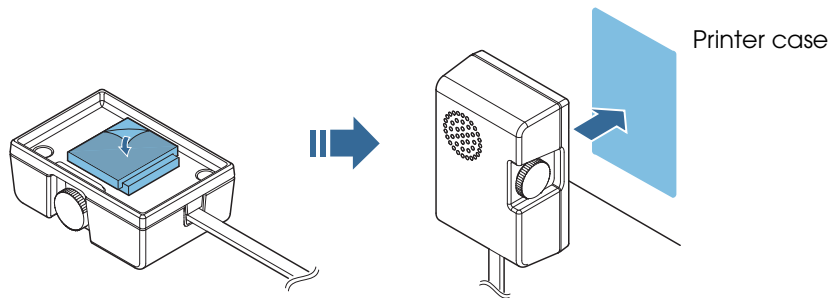
- 4 Connect the cable of the optional external buzzer to the drawer kick connector on the product.

CAUTION

Do not connect both the optional external buzzer and the drawer by using a splitter or similar device.



- 5 Peel off the sticker on the other side of the affixing tape, and attach and fix the optional external buzzer to the printer case.



- 6 Turn on the product.

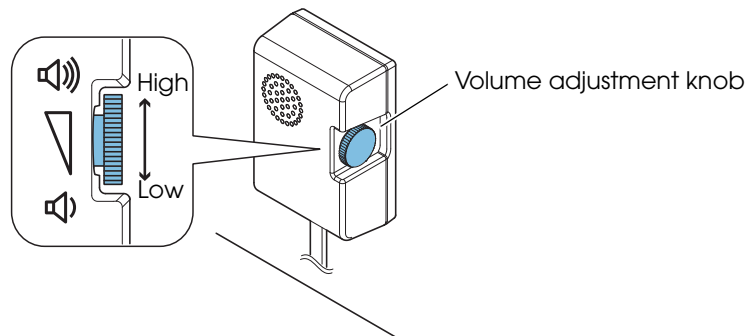
- 7 When and how to beep can be set by TM-T88V Utility or the product's customized value. (See ["Setting the Memory Switches \(Customized Value\)" on page 53](#))

CAUTION

- To use this product, be sure to enable the optional external buzzer with the product setting. For the details on the setting, see ["Setting the Memory Switches \(Customized Value\)" on page 53](#).
- When the optional external buzzer is enabled with the product setting, the drawer cannot be driven.

Adjusting the Buzzer Volume

Turn the volume adjustment knob to adjust the buzzer volume.



Connecting the Serial Communication Device

CAUTION

It is not available for TM-T88V-i (without a Serial port).

Use a serial cable to connect a device to the serial port of this product.

To communicate with a serial communication device, communication conditions of the device should match those of this product.

Refer to the manual for the serial communication device to check the following conditions.

- Communication Speed
- Data bit
- Parity
- Stop bit
- Flow control

The communication conditions of this product are configured using EPSON TMNet WebConfig.

For detail, refer to ["Setting for Connected Devices" on page 61](#).

Key Input Device via a USB Interface

For key input devices such as barcode scanners and keyboards, connect a USB cable of a device to the USB port at the rear of this product.

Use EPSON TMNet WebConfig to select a device control script and perform communication tests.

For detail, refer to ["Setting for Connected Devices" on page 61](#).

Connecting the Cash Drawer

When using a cash drawer, connect the cash drawer.

Using the optional product for TM printer is recommended.

If the optional external buzzer is used, you cannot use a cash drawer.

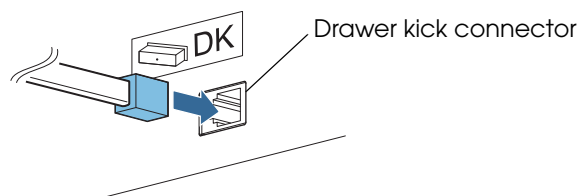


- **Specifications of drawers differ depending on makers or models. When you use a drawer other than specified, make sure its specification meets the following conditions.**

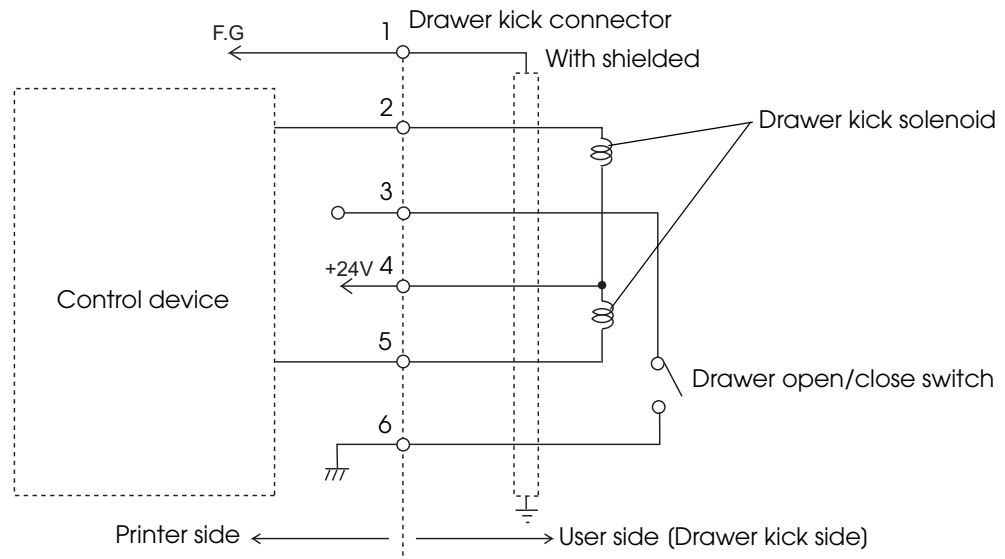
Otherwise, devices may be damaged.

- * The load, such as a drawer kick solenoid, must be connected between pins 4 and 2 or pins 4 and 5 of the drawer kick connector.
- * When the drawer open/close signal is used, a switch must be provided between drawer kick connector pins 3 and 6.
- * The resistance of the load, such as a drawer kick solenoid, must be $24\ \Omega$ or more or the input current must be 1A or less.
- * Be sure to use the 24V power output on drawer kick connector pin 4 for driving the equipment.
- **Use a shielded cable for the drawer connector cable.**
- **Two driver transistors cannot be energized simultaneously.**
- **Leave intervals longer than 4 times the drawer driving pulse when sending it continuously.**
- **Be sure to use the product power supply (connector pin 4) for the drawer power source.**
- **Do not insert a telephone line into the drawer kick connector.**
Doing so may damage the telephone line or product.

Connect the connector of the drawer kick cable to the product.



Drawer Connection Circuitry



Connecting the AC Adapter

Use AC adapter,RA as the power supply unit for this product.



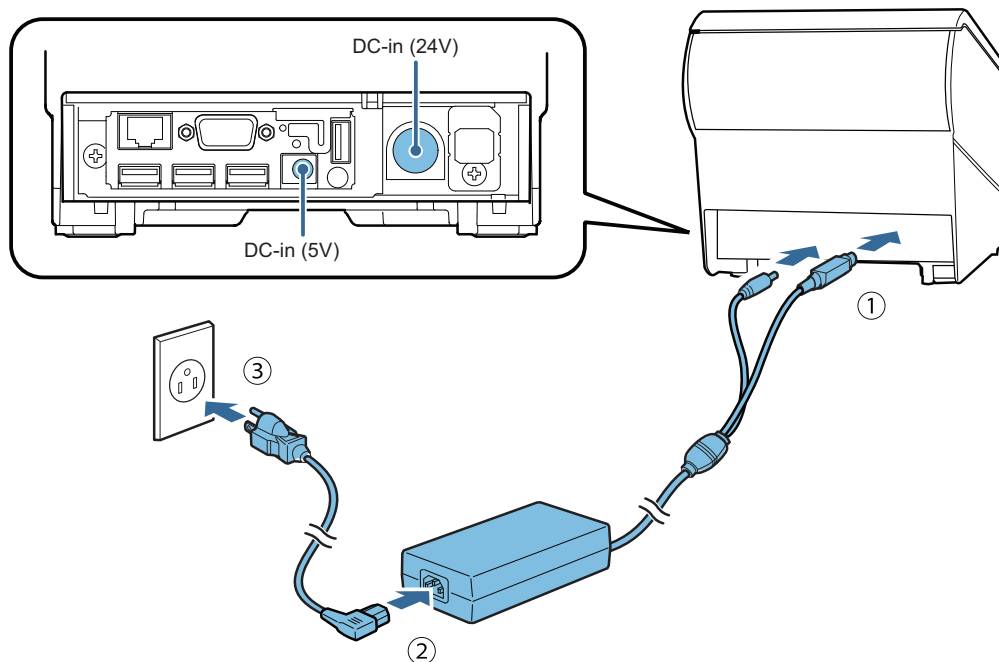
- **Be sure to use the included AC adapter as the power supply unit.**
Using a nonstandard power supply can result in electric shock and fire.
- **Should a fault ever occur in the included AC adapter, immediately turn off the power to the product and unplug the power supply cable from the wall socket.**
- **Be sure to unplug the power supply unit's cable from the wall socket whenever connecting or disconnecting the power supply unit to the product.**
Failure to do so may result in damage to the power supply unit or the product.
- **Make sure the wall socket power supply satisfies the rated voltage requirements of the power supply unit. Never insert the power supply cable plug into a socket that does not meet the rated voltage requirements of the power supply unit.**
Doing so may result in damage to both the power supply and the product.

CAUTION

When installing the DC 5 V cable through the cable exits on the back, fix the cables with the cable band to prevent the cables from coming off. (See ["Attaching the Connector Cover" on page 50.](#))

Make sure that the power is turned off, and connect the AC adapter,RA in the following steps.

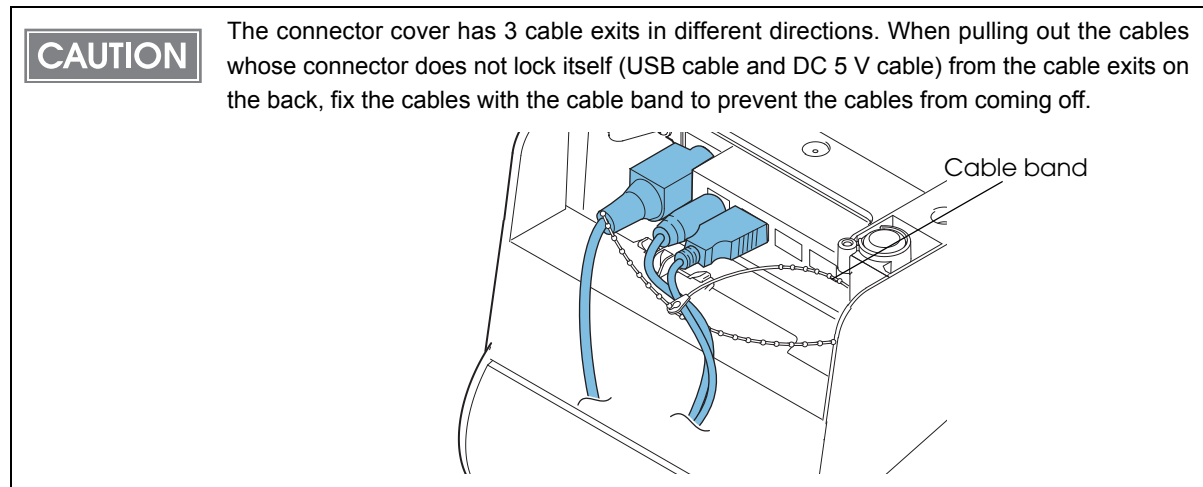
- 1 Push the DC connectors of the AC adapter all the way into the DC-In connectors (5V and 24V) of the product.



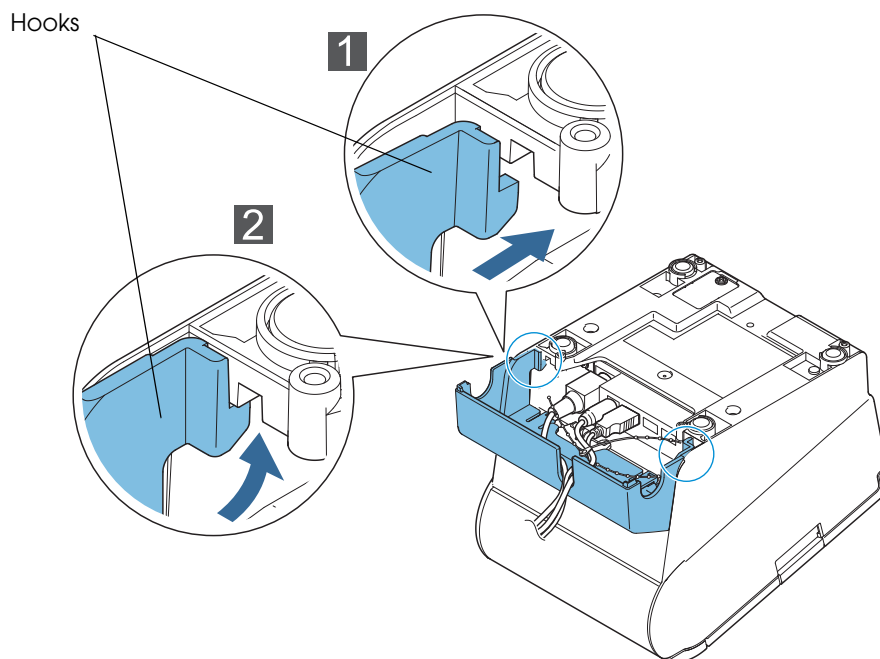
- 2** Push the connector of the power cord all the way into the AC inlet of the AC adapter.
- 3** Push the power plug all the way into the grounded outlet.
- 4** Place the AC adapter with the label facing down.

Attaching the Connector Cover

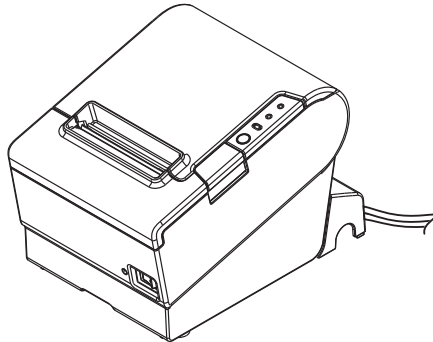
Follow the steps below to attach the connector cover to protect cables.



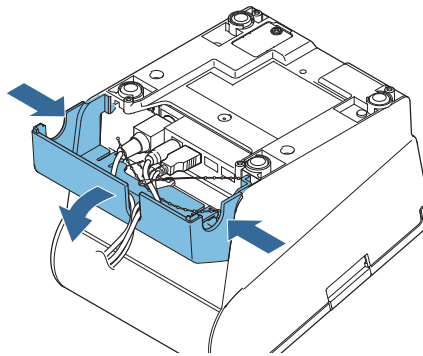
- 1** Turn over the product.
- 2** Position the two hooks on both sides of the connector cover so that they hook the printer case.
- 3** Push the connector cover down to click onto the printer case.



- 4 Pass each cable through the cable exits at the bottom of the connector cover.
If the cables are too many for one cable exit, use multiple exits.
- 5 Turn over the product and make sure the cables are not pinched.

**NOTE**

To remove the connector cover, turn the product over, and push the connector cover down while pushing both sides of the connector cover inward to detach the hooks from the printer case.

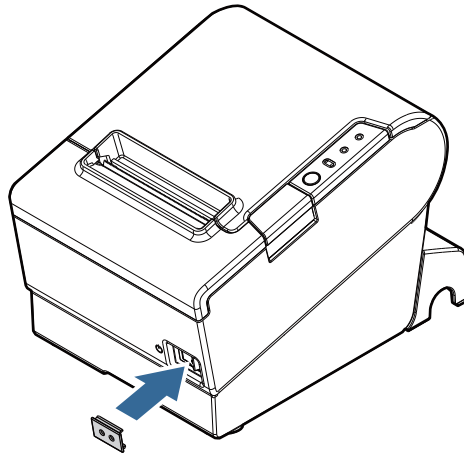


Attaching the Power Switch Cover

Install the power switch cover that comes with the TM-T88V-i onto the product to prevent inadvertent changing of the power switch, to prevent tampering, and to improve the appearance of the product.

To operate the power switch, insert an object with a pointed tip such as a ballpoint pen into the hole on the power switch cover.

To detach the cover, also use a sharp-pointed object.



WARNING

If an accident occurs with the power switch cover attached, unplug the power cord immediately.

Continued use of the product may cause fire or electric shock.

Setting the Memory Switches (Customized Value)

With the “memory switch (customized value),” a software switch for this product, you can set the functions shown in the table below.

The memory switches (customized value) are already set. Change the setting if necessary.

To change the memory switch settings, use the software setting mode or the TM-T88V Utility. The settings that can be changed with each of these are shown below.

| Function | Software Setting Mode | TM-T88V Utility |
|---|-----------------------|-----------------|
| Paper width | ✓ | ✓ |
| Print density | ✓ | ✓ |
| Multiple Tone print density | ✓ | ✓ |
| Print speed | ✓ | ✓ |
| Font <ul style="list-style-type: none"> • Code page • International character set • Font A/B replacement | ✓ | ✓ |
| Optional Buzzer | ✓ | ✓ |
| Number of head energizing parts | ✓ | - |
| Power supply unit capacity | ✓ | ✓ |
| Automatic paper cut | ✓ | ✓ |
| Paper reduction <ul style="list-style-type: none"> • Upper space reduction • Lower space reduction • Line space reduction rate • Line feed reduction rate • Barcode height reduction rate | ✓ | ✓ |

NOTE

- To directly configure the product in the software setting mode, see ["Software Setting Mode" on page 113](#).
- For detailed information about the TM-T88V Utility, see the TM-T88V Utility User's Manual.

Setting the paper width

- 80 mm (initial setting)
- 58 mm

CAUTION

- Be sure to install the roll paper guide when you select the 58 mm paper width. (See ["Changing the Paper Width" on page 33.](#))
- Once you change the paper width from 80 mm to 58 mm, you cannot change it back to 80 mm.

Setting the print density

Selectable from "Depends On Dip Switch", or levels 1 to 13 (70% ~ 130%)

CAUTION

When the print density is set to "Depends On Dip Switch" (Initial Settings), the Dip switch settings are applied. With other settings, the customized value settings are applied. (See ["Functions" on page 31.](#))

Setting the multiple tone print density

Selectable from levels 1 to 13 (70% ~ 130%) (initial setting: level 7)

CAUTION

- First change the print density, and then configure the multiple tone print density.
- If you set the density too high, the contrast becomes lower. Select the density level checking the overall tone balance of your image.

Setting the print speed

Selectable from levels 1 to 13 (Slow ~ Fast) (initial setting: level 13)

CAUTION

Depending on print conditions, such as print duty and print head temperature, 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.

Setting font

- Code page: Selectable from 43 pages
- International character set: Selectable from 18 sets
- Font A/B replacement

Optional Buzzer

When to sound the buzzer is selectable from the following occasions.

- When an error occurs
- When automatic paper cut activates
- When specified pulse 1 (2 pin) occurs
- When specified pulse 2 (5 pin) occurs

Setting the number of head energizing parts

- One-part energizing (initial setting)
- Two-part energizing
- Four-part energizing

NOTE

- Usually, the number of head energizing parts does not need to be changed.
- The maximum print speed can be performed only when one-part energizing is selected.

Setting the power supply unit capacity

Selectable from levels 1 to 3 (Low ~ High) (initial setting: level 3)

When a problem such as a low voltage error and power shutdown occurs due to the print pattern or the power supply environment, you might work around the problem by setting the power supply unit capacity.

If you cannot solve the problem by setting the power supply unit capacity to "level 1", you can try reducing the print speed, increasing the number of head energizing parts, or revising the print pattern (reducing the print volume).

Setting the automatic paper cut

- Not use this function (initial setting)
- Cut paper when the cover is closed
- Print logo when paper is cut

NOTE

"Printing logo when paper is cut" is not available with software setting mode.

Setting the paper reduction

- Extra upper space reduction: enabled or disabled (initial setting)
- Extra lower space reduction: enabled or disabled (initial setting)
- Line space reduction rate: not reduced (initial setting), 25%, 50%, or 75%
- Line feed reduction rate: not reduced (initial setting), 25%, 50%, or 75%
- Barcode height reduction rate: not reduced (initial setting), 25%, 50%, or 75%

Network Setting

There are following methods for network settings.

- EPSON TMNet WebConfig: Set from the computer's web browser
- EpsonNet Config: Set from EpsonNet Config, which is first installed on the computer.
- Easy Setup: Set from the USB memory where the configuration file is stored.
(TM-i firmware Ver.3.0 or later)

This section briefly explains how to set from EPSON TMNet WebConfig.



Though Easy Setup requires no network connection during setup, you must specify values for all the setting items available for EPSON TMNet WebConfig.

For about using EpsonNet Config, refer to the manual of EpsonNet Config.

For about Easy Setup, refer to "TM-i Series Easy Setup Guide".

1. Connect via a wired LAN

Connect this product and a PC for setting via a wired LAN.

To use a wireless LAN, connect the wireless LAN unit to the USB port on this product.

2. Check the IP address of this product

When this product is turned on and becomes ready for printing, it prints out the automatically acquired IP address.

If no IP address is printed, print a status sheet and check the IP address.

3. Start EPSON TMNet WebConfig

Access the address bar of the Web browser on the PC for setting to start EPSON TMNet WebConfig.

<http://TM-i's IP address/webconfig/>

For detail, see ["Starting EPSON TMNet WebConfig" on page 77](#).

4. Set up TCP/IP

Select the [System Settings] menu and then [Wired] - [TCP/IP] or [Wireless] - [TCP/IP], and set TCP/IP.

After setting, click [Apply] at the bottom of the screen. Then the settings are written to the product. If [Apply] is not clicked, the settings are not applied.

For detail, see ["System Settings - Network - Wired - TCP/IP" on page 95](#) or ["System Settings - Network - Wireless - TCP/IP" on page 97](#).

5. Set up a wireless LAN

For a wireless LAN, select the [System Settings] menu and [Wireless], and set the items such as SSID and Security Mode.

After setting, click [Apply] at the bottom of the screen. Then the settings are written to the product. If [Apply] is not clicked, the settings are not applied.

For detail, see "[System Settings - Network - Wireless](#)" on page 96.

NOTE

- Be sure to change the SSID from the default value.
- For security protection, encryption setting is strongly recommended.

6. Connect via a wireless LAN

To use a wireless LAN, disconnect the LAN cable from this product after setting is finished.

NOTE

This product cannot be used with the wired LAN connection and wireless LAN connection at the same time. The wired LAN connection has a priority.

Confirming Network Setting

You can confirm the network setting with a status sheet or EPSON TMNet WebConfig.

Confirming with a status sheet

Print a status sheet and check the following items.

- Wired TCP/IP
 - * Get IP Address
 - * Set using Automatic Private IP Addressing (APIPA)
 - * IP Address
 - * Subnet Mask
 - * Default Gateway
- Wireless
 - * Communication Standard
 - * Network Mode
 - * SSID
 - * Wireless LAN Frequency Region
 - * Ad-Hoc Channel
 - * Authentication Method
 - * Security Mode
- Wireless TCP/IP
 - * Get IP Address
 - * Set using Automatic Private IP Addressing (APIPA)
 - * IP Address
 - * Subnet Mask
 - * Default Gateway

About how to print the status sheet, see ["Status sheet" on page 105](#).

Confirming with EPSON TMNet WebConfig

Refer to the followings.

- ["General Information" on page 79](#)
- ["Information - Wired - TCP/IP" on page 81](#)
- ["Information - Wireless - TCP/IP" on page 82](#)

Initializing the Network Setting

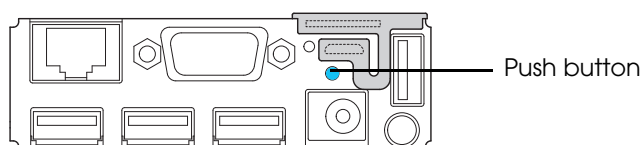
When network connection fails, follow the steps below to initialize the network setting to the default.

The EPSON TMNet WebConfig password is also initialized.

NOTE

Other settings such as device ID, style sheet, and Server Direct Print settings are not initialized.

- 1 Load the paper on the product and turn on the product.
- 2 Push and hold the push button for 10 seconds or longer.
The following initialization start message is printed.
Press the push button with a thin object such as a tweezers.



```
Resetting to Network Setting!
Please Wait...
```

```
WARNING: DO NOT
TURN OFF POWER
```

CAUTION

Do not turn off the power until the initialization is completed.

- 3 20 to 25 seconds later, the following message is printed, and a status sheet is printed out.

```
Reset to Network Setting Finished!
```

```
*****
EPSON Status Sheet
*****
```

Enabling PHP

To use PHP on this product, enable PHP using EPSON TMNet WebConfig. This section briefly explains the setup procedure.

1. Check the microSD card

Make sure that the microSD card is installed in the microSD card slot on this product.

2. Start EPSON TMNet WebConfig

Access the address bar of the Web browser on the PC for setting to start EPSON TMNet WebConfig.
<http://TM-i's IP address/webconfig/PHPSetting>

3. Enable PHP

Select [Enable] from "PHP".

After setting, click [Apply] at the bottom of the screen. Then the settings are written to the product. If [Apply] is not clicked, the settings are not applied.

Setting for Server Direct Print

Set up Server Direct Print using EPSON TMNet WebConfig. This section briefly explains the setup procedure.

1. Connect this product to a network

Connect this product to a network and turn on the product.

2. Start EPSON TMNet WebConfig

Access the address bar of the Web browser on the PC for setting to start EPSON TMNet WebConfig.
<http://TM-i's IP address/webconfig/>

For detail, see "[Starting EPSON TMNet WebConfig](#)" on page 77.

3. Set up Server Direct Print

Select the [Web Service Settings] menu and then [Direct Print], and set Server Direct Print settings.

After setting, click [Apply] at the bottom of the screen. Then the settings are written to the product. If [Apply] is not clicked, the settings are not applied.

For detail, see "[Web Service Settings - Server Access - Direct Print](#)" on page 92.

Setting for Connected Devices

The ePOS-Device XML, ePOS-Device SDK, and Server Direct Print systems identify controlled devices by the device ID. The device ID is registered in this product. Set the device ID using EPSON TMNet WebConfig.

This section briefly explains the setup procedure.

1. Connect the controlled devices

Physically connect (or connect via network) this product to all devices to be controlled by the product, and turn the power on.

For devices that can be controlled, see "[Software Specifications](#)" on page 126.

2. Check the information of the controlled devices

Check the type and IP address of devices to be controlled via this product.

In addition, check the device ID to be set for the controlled devices with the system administrator.

3. Start EPSON TMNet WebConfig

Access the address bar of the Web browser on the PC for setting to start EPSON TMNet WebConfig.

<http://TM-i's IP address/webconfig/>

For detail, see "[Starting EPSON TMNet WebConfig](#)" on page 77.

4. Register the controlled devices

From [Printer], [Customer Display], [Key Input Device], or [Serial Communication Device] in the [Configuration] menu, register and set up the controlled devices.

After setting, click [Apply] or [Add] at the bottom of the screen. Then the settings are written to the product. If [Apply] or [Add] is not clicked, the settings are not applied.

For detail, see the following information.

- Printer: For setting this product and TM printer on the network device IDs and performing test prints. ([page 85](#))
- Customer Display: For setting whether to use the Customer Display and performing test display. The communication settings of this product must be made to match the Customer Display's communication settings. The device ID is set to fixed, "local_display". ([page 86](#))
- Key Input Device: For setting device IDs for barcode scanners and key input devices, selecting control scripts, and performing operational tests. ([page 87](#))
- Serial Communication Device: For setting whether to use the Serial Communication Device, configuring communication settings, and performing communication tests. Communication settings of this product should match those of a serial communication device. The device ID is set to fixed, "local_serial". ([page 88](#))

5. Check the controlled devices

Update the browser and confirm that the devices registered in the Device List are displayed.

Check if the registered devices operate properly.

Changing Device ID of This Product

To change the device ID of this product, select "local_printer" from "Model", and enter the device ID to be applied in "Device ID".

This section briefly explains the setup procedure.

1. Start EPSON TMNet WebConfig

Access the address bar of the Web browser on the PC for setting to start EPSON TMNet WebConfig.

<http://TM-i's IP address/webconfig/>

For detail, see ["Starting EPSON TMNet WebConfig" on page 77](#).

2. Change the device ID

From [Printer] in the [Web Service Settings] menu, change the device ID of this product.

Select [local_printer] from "Model" and enter the device ID to be applied in [Device ID].

After setting, click [Add] at the bottom of the screen. Then the settings are written to the product. If [Add] is not clicked, the settings are not applied.

For detail, see ["Web Service Settings - Device Admin - Printer" on page 85](#).

3. Check the device ID

Update the browser and confirm that the device ID has been changed.

Registering Web Contents

To use this product as a Web server, register Web contents by following the steps below.

Creating Web Contents

Specifications of the file to be registered

- Contents such as HTML files, CSS files, PHP files, JavaScript files, certificate files, and image data.
- Zip the files to be registered all together. The zip file name is arbitrary.

NOTE

- Use one-byte alphanumeric characters (ASCII characters) for a zip file name and sub-folder name.
- The maximum size of the files before being zipped is 30 MB. Otherwise, registering fails.

Registering certificate files

You can register web contents or a style sheet together with the certificate files that are used when Authenticate Server is set to [Enable] in [Web Contents] - [Automatic Update Settings], in [Server Access] - [Direct Print], and in [Server Access] - [Status Notification].

- 1** Create the "ssltrustedcerts" folder, and include the certificate files.
- 2** Zip "ssltrustedcerts" folder.
- 3** Perform the Web Contents Automatic Update or the Web Contents Manual Update.

For detail, see "[Registering Web Contents](#)" on page 65.

Cautions for the files to be registered

- The specifications for registration of web contents will vary as shown below, depending on whether you set "Enable" or "Disable" for PHP.

| Item | Specification | |
|--|---|--------------------------------|
| | When enabling PHP: | When disabling PHP: |
| Content save location | microSD card | Inside this product |
| Registering Web contents | Simple overwrite | Replacement with existing file |
| Automatic updating of Web contents | Simple overwrite | Replacement with existing file |
| The maximum amount of Web content | Depends on the capacity of the microSD card | 30MB |
| The maximum amount of Web content that can be registered at once | 30MB | 30MB |

- Web contents cannot be registered additionally. All files are overwritten when registered. Compress all the Web contents to a zip file before registering.
- Locate the file as shown below.

<Example for sample program>

```
ePOS-Device_UM_E_Sample.zip ..... : Zip file
├── index.html
├── css
│   └── *.css
├── img
│   ├── *.bmp
│   ├── *.jpg
│   └── *.png
├── js
│   └── *.js
└── sample
    └── *.html
```

- To access the Web contents registered in this product from an input terminal or other device, the reference URL is different depending on the folder configuration of the zip file as shown below.

- ① [http://\[the product's IP address\]/index.html](http://[the product's IP address]/index.html)
- ② [http://\[the product's IP address\]/webpage/index.php](http://[the product's IP address]/webpage/index.php)

①

```
epsonsample.zip
├── index.html
├── css
│   └── *.css
├── img
│   ├── *.bmp
│   ├── *.jpg
│   └── *.png
├── ssltrustedcerts
│   └── certificate001.pem
├── js
│   └── *.js
└── sample
    └── *.html
```

②

```
epsonsample.zip
├── webpage ..... : A folder added
│   ├── index.php
│   ├── css
│   │   └── *.css
│   ├── img
│   │   ├── *.bmp
│   │   ├── *.jpg
│   │   └── *.png
│   ├── js
│   │   └── *.js
│   └── sample
│       └── *.html
```


Registering Web Contents

To register a web content in this product, the following methods are available:

- Manual Update: Web contents are registered manually by using EPSON TMNet WebConfig.
- Automatic Update: Web contents are saved in the Web server and automatically updated by the product referring to the files periodically.

Manual Update

1. Connect this product to a network

Connect this product to a network and turn on the product.

2. Start EPSON TMNet WebConfig

Access the address bar of the Web browser on the PC for setting to start EPSON TMNet WebConfig.

<http://TM-i's IP address/webconfig/>

For detail, see ["Starting EPSON TMNet WebConfig" on page 77](#).

3. Register the Web contents

From [Update Settings] in the [Web Service Settings] menu, register the Web contents to this product.

Click [Browse...], specify the zip file to be registered, and then click [Upload].

For detail, see ["Web Service Settings - Web Contents - Update Settings" on page 90](#).

Automatic Update

1. Connect this product to a network

Connect this product to a network and turn on the product.

2. Start EPSON TMNet WebConfig

Access the address bar of the Web browser on the PC for setting to start EPSON TMNet WebConfig.

<http://TM-i's IP address/webconfig/>

For detail, see ["Starting EPSON TMNet WebConfig" on page 77](#).

3. Set automatic update of Web contents

From [Update Settings] in the [Web Service Settings] menu, set automatic update of Web contents.

Select [Enable] from "Automatic Update".

Configure the settings such as the update frequency and timing of Web contents and the URL of the server where the file to be obtained is stored.

After setting, click [Apply] at the bottom of the screen. Then the settings are written to the product. If [Apply] is not clicked, the settings are not applied.

For detail, see ["Web Service Settings - Web Contents - Update Settings" on page 90](#).



Application Development Information

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

How to Control the Printer

The method for controlling the printer with your print application will depend on the system structure.

| Controlling method | System | Page |
|---|--------------------------------|-------------------------|
| Controlling printing and peripheral operations from iOS native applications | ePOS-Device SDK for iOS | page 68 |
| Controlling printing and peripheral operations from Android native applications | ePOS-Device SDK for Android | page 69 |
| Controlling printing and peripheral operations from Web applications | ePOS-Device SDK for JavaScript | page 70 |
| Controlling printing and peripheral operations from computer, smartphone, tablet terminals, and other devices | ePOS-Device XML | page 71 |
| Web server application prints by including print data in its responses to requests from the product | Server Direct Print | page 73 |
| Web system using this product as a Web server | Web Server | page 74 |

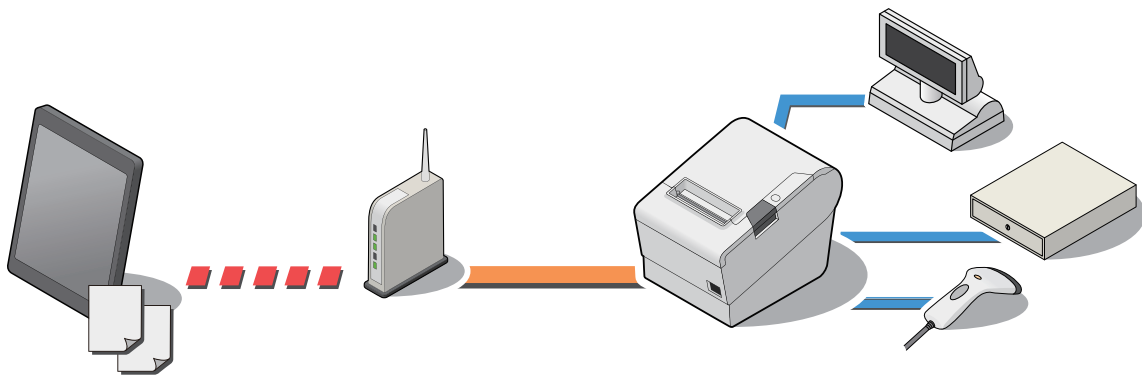
ePOS-Device SDK for iOS

ePOS-Device SDK for iOS is a SDK for developers to enable the use of this product from iOS applications. This provides an API that can be used from applications, and allows users to control printing and device controls from iOS terminals.

This SDK has the following features:

- It enables use of the following devices via this product:
 - Printing to TM printers on the network
 - Displaying to the customer display
 - Barcode scanner of USB interface, input via keyboard, etc.
 - Transmission/reception to/from serial communication device *

*: It is not available for TM-T88V-i (without a Serial port).



Operation environment

Refer to ePOS-Device SDK for iOS User's Manual for the following items.

- iOS Device
- iOS Version
- Development Environment
- Peripherals

The package includes:

- ePOS-Device SDK for iOS User's Manual
- Objective-C header files
- Library files for executing functions
- Sample program

How to obtain

Download from our web site.

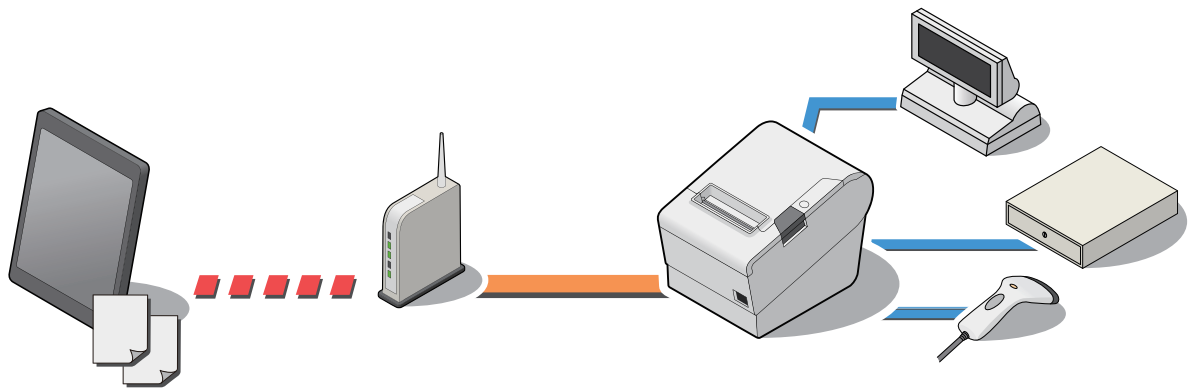
ePOS-Device SDK for Android

ePOS-Device SDK for Android is a SDK for developers to enable the use of this product from Android applications. This provides an API that can be used from applications, and allows users to control printing and device controls from Android terminals.

This SDK has the following features:

- It enables use of the following devices via this product:
 - Printing to TM printers on the network
 - Displaying to the customer display
 - Barcode scanner of USB interface, input via keyboard, etc.
 - Transmission/reception to/from serial communication device *

*: It is not available for TM-T88V-i (without a Serial port).



Operation environment

Refer to ePOS-Device SDK for Android User's Manual for the following items.

- Android Device
- Android Version
- Development Environment
- Peripherals

The package includes:

- ePOS-Device SDK for Android User's Manual
- Library files for executing functions
- Sample program

How to obtain

Download from our web site.

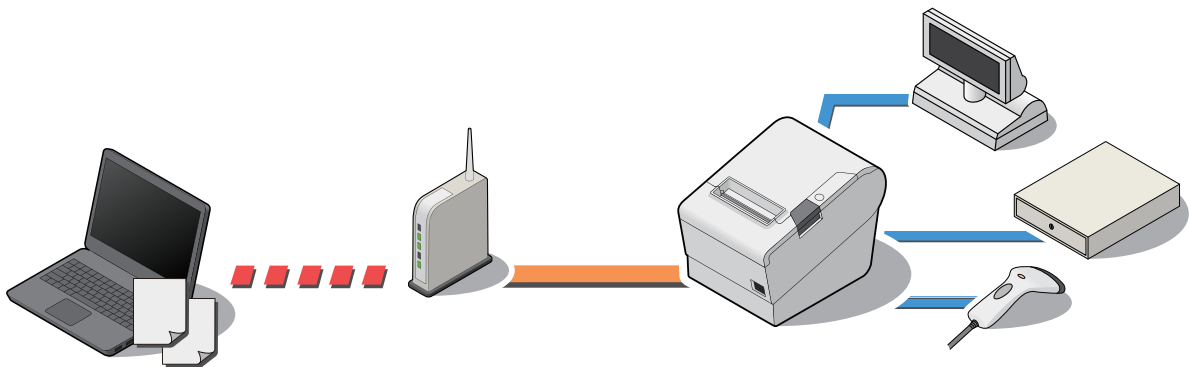
ePOS-Device SDK for JavaScript

ePOS-Device SDK for JavaScript is a SDK for developers to enable use of this product from JavaScript in Web browser, etc. This provides an API that can be used from applications, and allows users to control printing and device controls from the Web application.

This SDK has the following features:

- You can print directly from a device with an HTML5 compatible Web browser.
- No need to install drivers or plugins on the terminals.
- Information communicated with peripherals can be encrypted.
- It enables use of the following devices via this product:
 - Printing to TM printers on the network
 - Displaying to the customer display
 - Barcode scanner of USB interface, input via keyboard, etc.
 - Transmission/reception to/from serial communication device *

*: It is not available for TM-T88V-i (without a Serial port).



Operation environment

Refer to ePOS-Device SDK for JavaScript User's Manual for the following items.

- Web browser for terminals
- Peripherals

The package includes:

- ePOS-Device SDK for JavaScript User's Manual
- JavaScript file for integration for ePOS-Device SDK
- Sample program

How to obtain

Download from our web site.

ePOS-Device XML

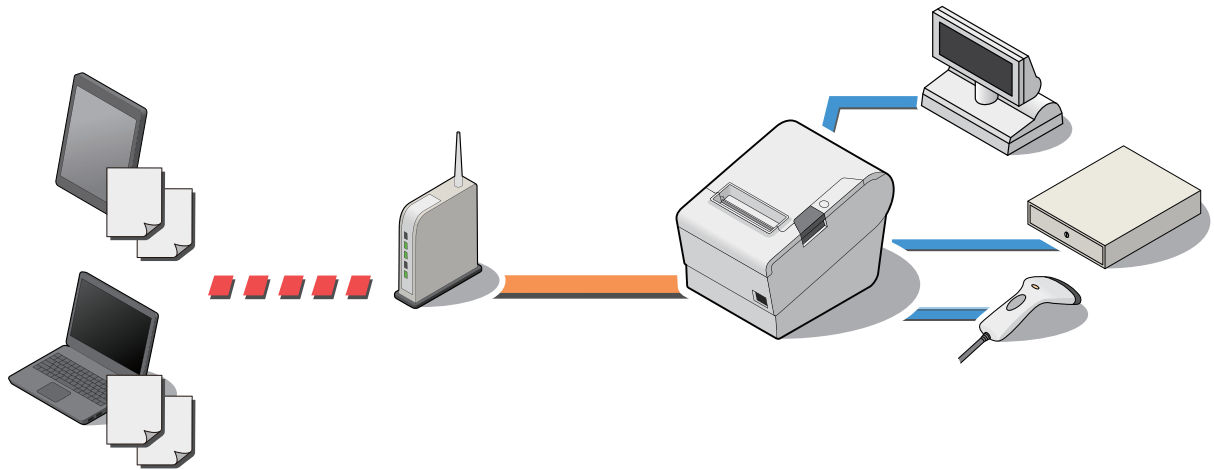
ePOS-Device XML is a command system that uses XML to define functions to control various POS peripherals (including this product printer unit) connected to this product. An application creates a request message in XML format and sends it to this product using socket communications.

This product executes control on peripherals and returns a response.

This command system has the following features:

- It enables use of the following devices via this product:
 - Printing to TM printers on the network
 - Displaying to the customer display
 - Barcode scanner of USB interface, input via keyboard, etc.
 - Transmission/reception to/from serial communication device *

*: It is not available for TM-T88V-i (without a Serial port).



Operation environment

Application

Environment capable of performing socket communications and handling XML documents

OS

Example: iOS, Android, Windows, Linux, MacOS, etc.

Terminal

Environment connected to the network and capable of performing socket communications

Example: Smartphone, tablet devices, computer, etc.

The package includes:

- ePOS-Device XML User's Manual
- Sample program

How to obtain

Download from our web site.

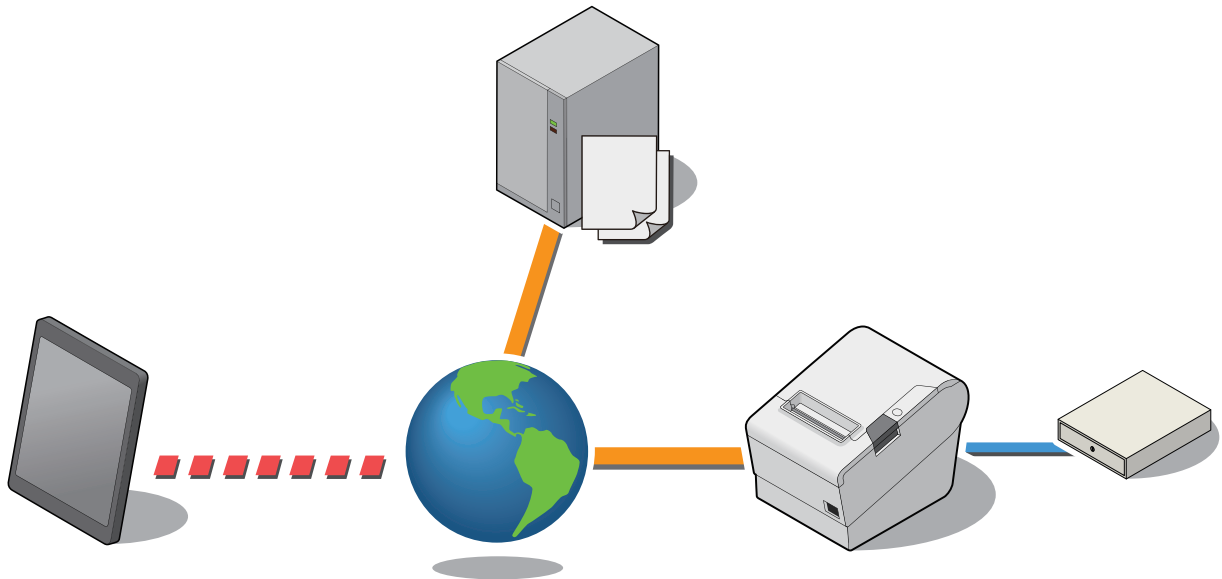
Server Direct Print

The Server Direct Print function is used to print the print data acquired by this product from the Web server.

Enables a web server application to print to this product or a TM printer on the network by including print data in its responses to requests from the product.

This function has the following features:

- Can acquire print data from three different URLs. Print data can be used in ePOS-Device XML format.
- Printable to TM printers on the network via TM-T88V-i.



The package includes:

- Server Direct Print User's Manual
- Sample programs in ePOS-Print format

How to obtain

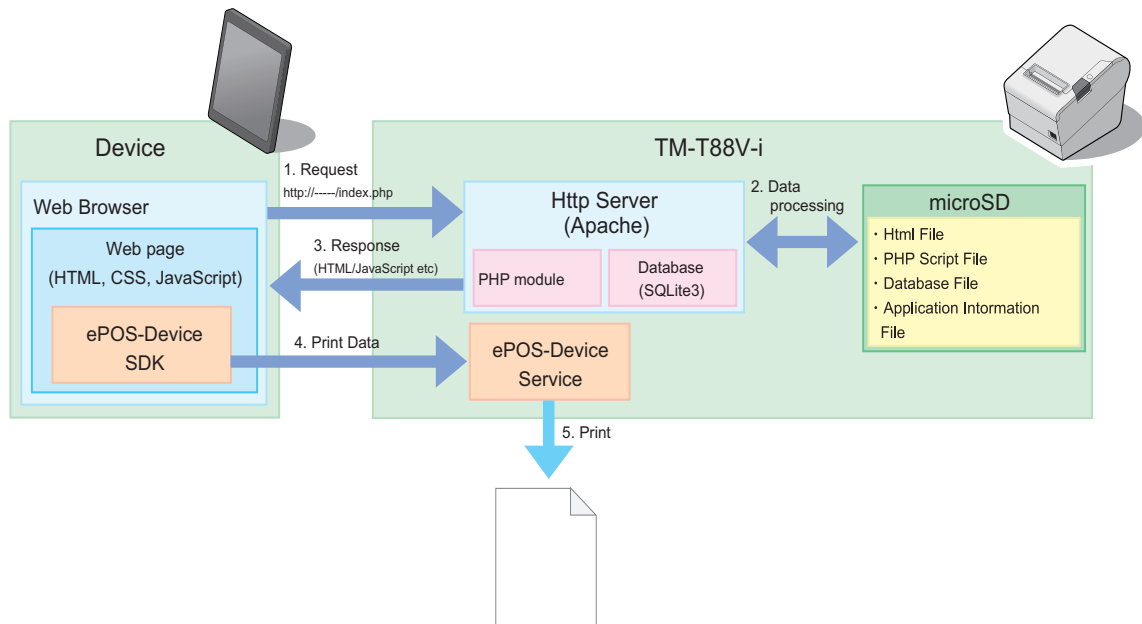
Download from our web site.

Web Server

Equipped with Web server that supports the scripting language "PHP" and database "SQLite3".
Using contents created with PHP, you can:

- Create dynamic Web pages.
- Manage user data by saving files and operating database.

The Web contents registered on this product can be automatically obtained or updated from a specified URL.



The package includes:

- PHP Setup Manual
- Sample program

How to obtain

Download from our web site.

Software and Manuals

The following software and manuals are provided for application development.

CAUTION

- To use the TM-T88V Utility, connect the product with a PC for setting via the Micro-USB cable or LAN cable. Connecting the product with a PC via an wireless LAN is not possible.
- After using the TM-T88V Utility, be sure to turn off the product, and then turn it on.

Software

| Software | Description | Manual |
|---------------------------|--|--|
| TM-T88V Utility | Windows-based software. Use this utility for the following functions: <ul style="list-style-type: none"> • Storing logos • Font settings • Printing control settings • Paper reduction settings • Automatic paper cut settings • Operation check • Setting backup/restore Coupon and Electronic Journal are unavailable. | TM-T88V Utility User's Manual (Installed along with TM-T88V Utility.) |
| EpsonNet Config | Software for configuring IP addresses, wireless LAN, etc. for Epson printers on the network. | EpsonNet Config User's Manual |
| ePOS-Device SDK | The ePOS-Device SDK package contains the following SDKs. | |
| | <ePOS-Device SDK for iOS> Sample program | ePOS-Device SDK for iOS User's Manual |
| | <ePOS-Device SDK for Android> Sample program | ePOS-Device SDK for Android User's Manual |
| | <ePOS-Device SDK for JavaScript> Sample program | ePOS-Device SDK for JavaScript User's Manual |
| ePOS-Device XML | Sample files are provided for ePOS-Device XML. | ePOS-Device XML User's Manual |
| Server Direct Print | Sample files are provided for Server Direct Print. | Server Direct Print User's Manual |
| TM-i Firmware Update Tool | Tool for updating the TM-i firmware. | - |

Manual

| Manual name | Description | Providing method |
|--|---|---------------------------|
| TM-T88V-i User's Manual | Describes how to use and set up this product. | Included with the product |
| TM-T88V-i Start Here | Describes points to be checked before using this product. | Included with the product |
| TM-T88V-i Technical Reference Guide (TM-i Firmware Ver.4.0 or later) | This document. Describes how to handle and set up this product. | Web |
| OT-WL01 User's Manual | Included in the wireless LAN cable set (OT-WL01). | Included with the product |
| TM-i series WebConfig API User's Manual | Packs an API for setting EPSON TMNet WebConfig for this product. Using this API, you can set and reference EPSON TMNet WebConfig values from your application. | Web |
| TM-i series Easy Setup Guide | Explains procedures that enable settings on the TM-i to be made in a simple manner. You make the settings using a USB memory that contains a file of EPSON TMNet WebConfig setting values. | Web |

How to Get Manuals and the Utility

You can obtain manuals and the TM-T88V Utility from one of the following URLs.

For customers in North America, go to the following web site:

<http://www.epsonexpert.com/> and follow the on-screen instructions.

For customers in other countries, go to the following web site:

<https://download.epson-biz.com/?service=pos>

EPSON TMNet WebConfig

EPSON TMNet WebConfig is a Utility to set the product on a web browser.

This section describes EPSON TMNet WebConfig using Internet Explorer as a browser.

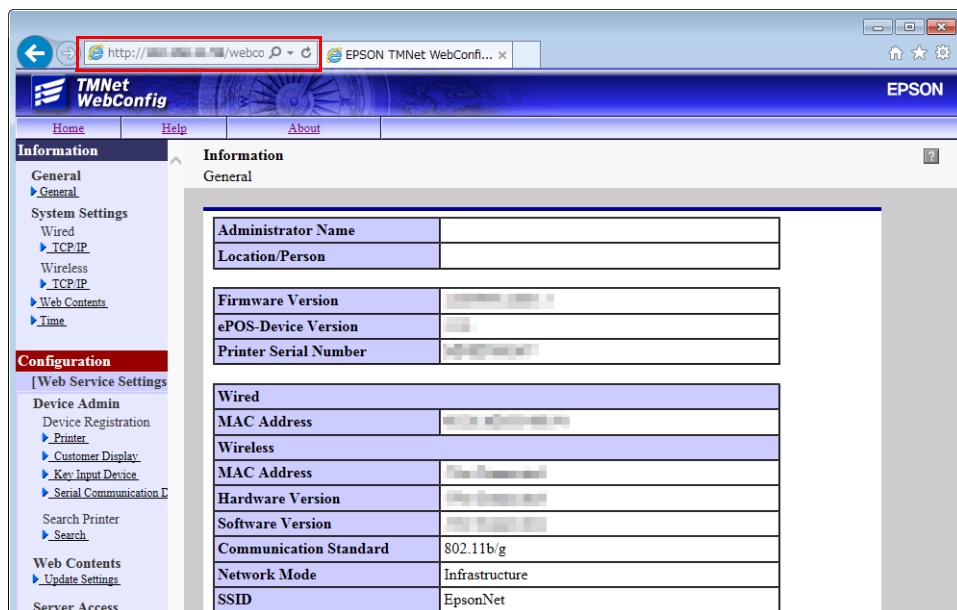
Starting EPSON TMNet WebConfig

Follow the steps below to start up EPSON TMNet WebConfig.

- 1 Start up a PC connected to the network.
- 2 Start up the web browser, and input the following.
<http://This product's IP address/webconfig>
 EPSON TMNet WebConfig starts.

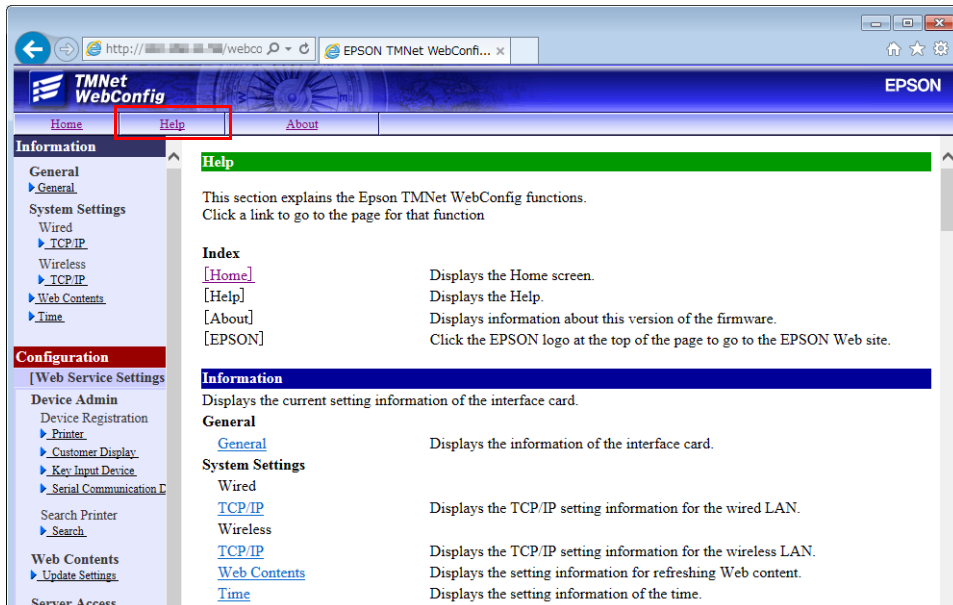
CAUTION

- For the product's IP address, see the status sheet. For the status sheet, see "[Confirming with a status sheet](#)" on page 58.
- A user name and a password will be required on the authentication screen. Enter "epson" for both the user name and the password. You can change the password on the [Password Setting] screen (see "[Admin Settings - Administrator Information - Password](#)" on page 103.).



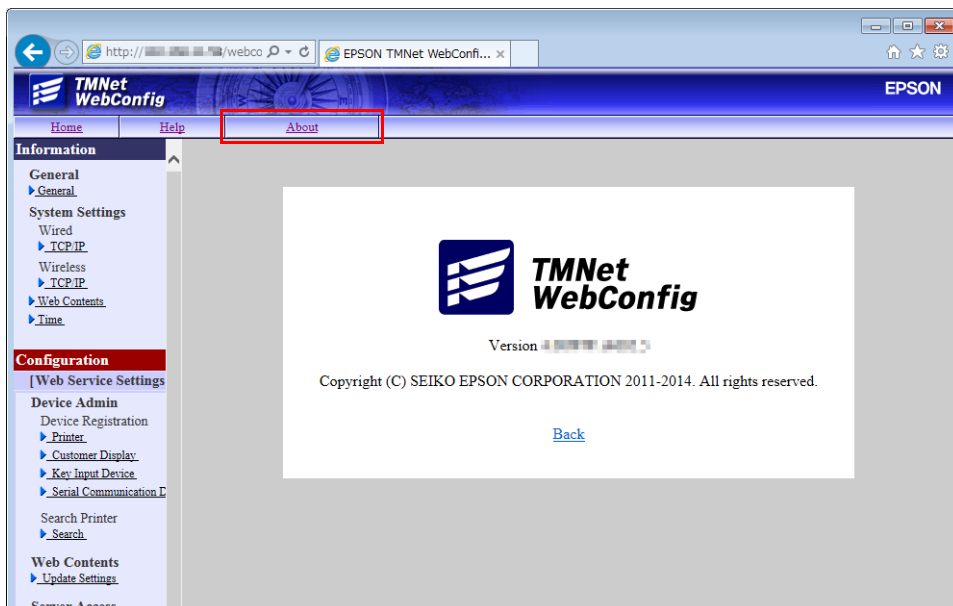
Help Screen Display

Click [Help] to display the help screen for EPSON TMNet WebConfig.



Version Screen Display

Click [About] to display the version screen for EPSON TMNet WebConfig.



General Information

You can check the general information of the TM-T88V-i.

The screenshot shows the TMNet WebConfig interface for an EPSON printer. The left sidebar contains a navigation menu with sections: Information (General, System Settings, Web Contents, Time), Configuration (Web Service Settings, Device Admin, Search Printer, Web Contents, Server Access), and System/Admin Settings. The main content area is titled 'Information - General' and displays the following fields:

- Administrator Name
- Location/Person
- Firmware Version
- ePOS-Device Version
- Printer Serial Number
- Wired MAC Address
- Wireless MAC Address
- Wireless Hardware Version
- Wireless Software Version
- Wireless Communication Standard: 802.11b/g
- Wireless Network Mode: Infrastructure
- Wireless SSID: EpsonNet
- Wireless LAN Frequency Region
- Wireless Ad-Hoc Channel: 1
- Wireless Access Point (MAC Address)
- Wireless Signal Condition
- Time: GMT+00:00

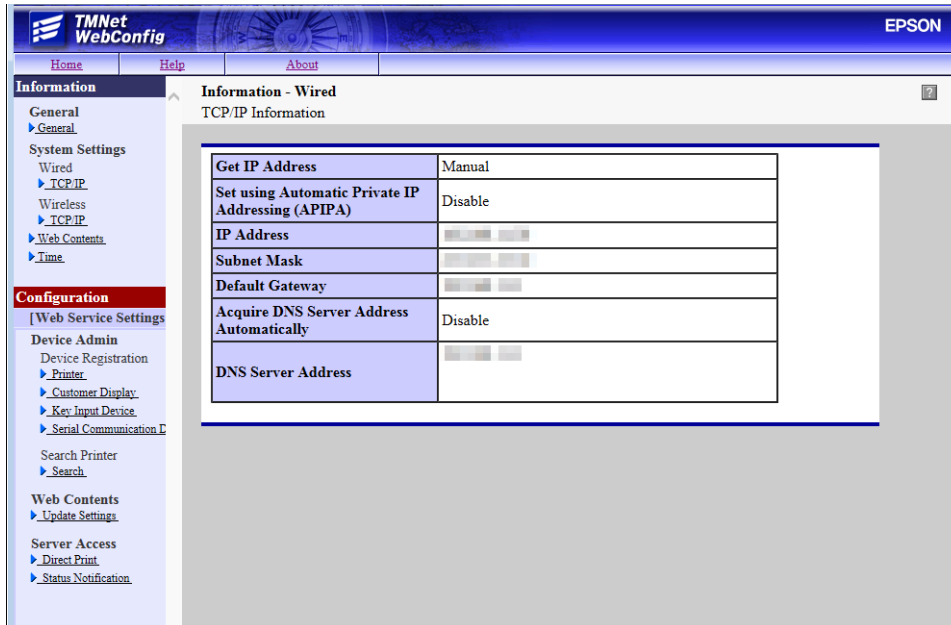
A 'Refresh' button is located at the bottom of the main content area.

| Item | | Description |
|-----------------------|-------------|---|
| Administrator Name | | Displays the administrator name set by the user. |
| Location/Person | | Displays the product's installation location set by the user. |
| Firmware Version | | Shows the TM-i firmware version of the TM-T88V-i. |
| ePOS-Device Version | | Shows the ePOS-Device version. |
| Printer Serial Number | | Shows the serial number of the TM-T88V-i. |
| Wired | MAC Address | Shows the MAC address for wired LAN. |

| Item | | Description |
|----------|-------------------------------|--|
| Wireless | MAC Address | Shows the MAC address for wireless LAN. |
| | Hardware Version | Shows the hardware version for wireless LAN. |
| | Software Version | Shows the software version for wireless LAN. |
| | Communication Standard | Shows the communication standard. |
| | Network Mode | Shows the communication mode. |
| | SSID | Shows the SSID. |
| | Wireless LAN Frequency Region | Shows region codes. |
| | Ad-Hoc Channel | Shows the ad-hoc channel. |
| | Access Point (MAC Address) | Shows the MAC address for the access point. |
| | Signal Condition | Shows the signal strength. |
| Time | | Shows the date and the present time. |
| Refresh | | Refreshes the information. |

Information - Wired - TCP/IP

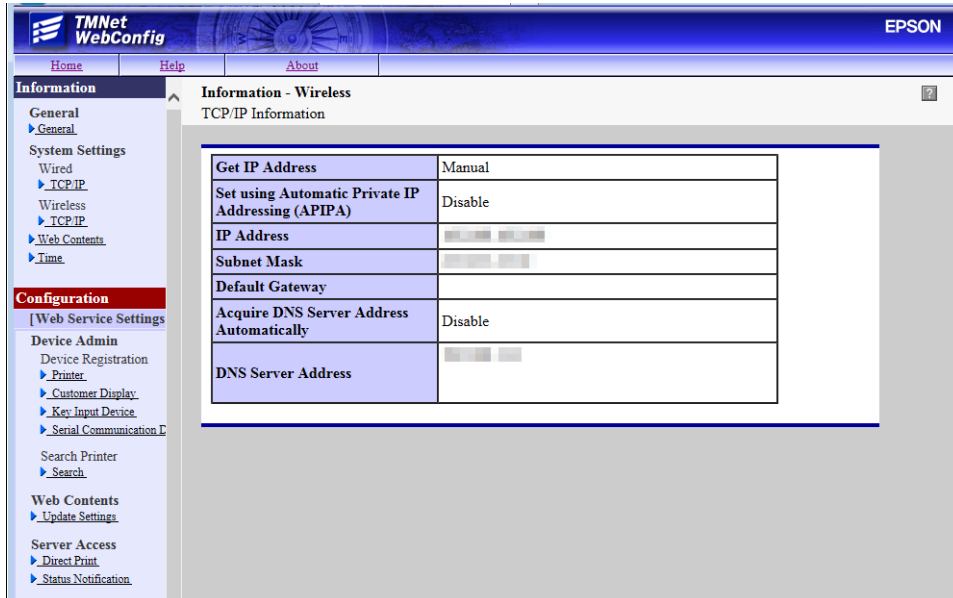
You can check the TCP/IP setting for a wired LAN.



| Item | Description |
|---|---|
| Get IP Address | Shows the method of getting the IP address. |
| Set using Automatic Private IP Addressing (APIPA) | Shows the APIPA setting. |
| IP Address | Shows the IP address set with the wired LAN. Nothing is shown when the wireless LAN is enabled. |
| Subnet Mask | Shows the subnet mask set with the wired LAN. Nothing is shown when the wireless LAN is enabled. |
| Default Gateway | Shows the default gateway set with the wired LAN. Nothing is shown when the wireless LAN is enabled. |
| Acquire DNS Server Address Automatically | Shows the method of getting the address of the DNS server. |
| DNS Server Address | Shows the addresses of the DNS server in order of usage when (Acquire DNS Server Address Automatically) is set to (Enable). |

Information - Wireless - TCP/IP

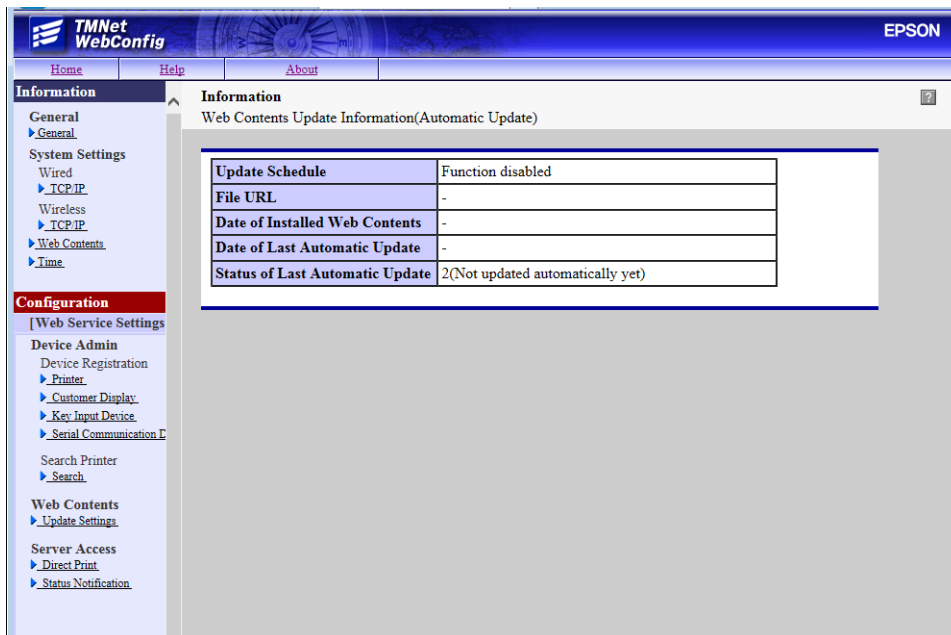
You can check the TCP/IP setting for a wireless LAN when the optional wireless LAN cable set (OT-WL01) is used.



| Item | Description |
|---|---|
| Get IP Address | Shows the method of getting the IP address. |
| Set using Automatic Private IP Addressing (APIPA) | Shows the APIPA setting. |
| IP Address | Shows the IP address set with the wireless LAN. Nothing is shown when the wired LAN is enabled. |
| Subnet Mask | Shows the subnet mask set with the wireless LAN. Nothing is shown when the LAN is enabled. |
| Default Gateway | Shows the default gateway set with the wireless LAN. Nothing is shown when the wired LAN is enabled. |
| Acquire DNS Server Address Automatically | Shows the method of getting the address of the DNS server. |
| DNS Server Address | Shows the addresses of the DNS server in order of usage when (Acquire DNS Server Address Automatically) is set to (Enable). |

Information - Web Contents

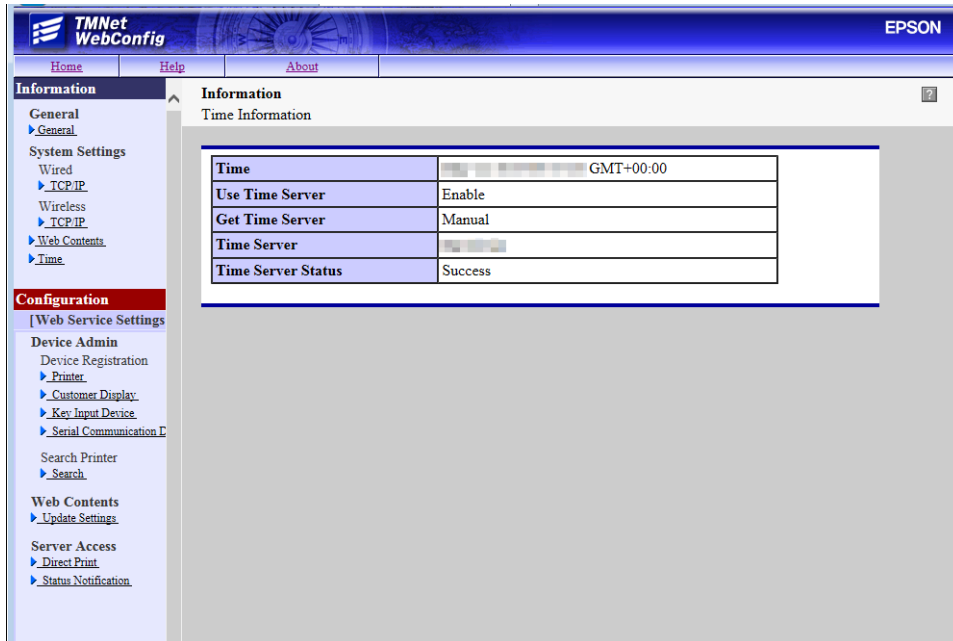
You can check the update setting for web contents.



| Item | Description |
|---------------------------------|--|
| Update Schedule | Shows whether to enable or disable automatic update of Web contents. Shows the automatic update schedule when automatic update is enabled. |
| File URL | Shows the URL for the web content file to update automatically. |
| Date of Installed Web Contents | When automatic update setting is enabled: Shows the date and time when the registered web contents were created. When manual update setting is disabled: Shows "-". |
| Date of Last Automatic Update | Shows the latest date and time when the web contents were installed on the TM-T88V-i automatically. |
| Status of Last Automatic Update | Shows the result of the last update of web contents on the TM-T88V-i. |

Information - Time

You can check the time setting.



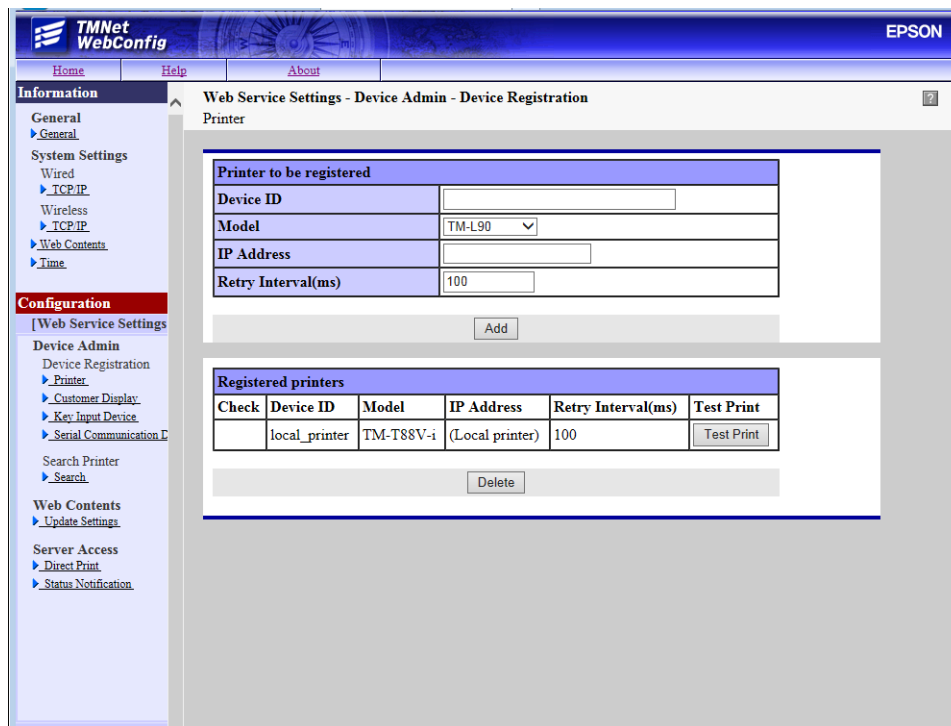
| Item | Description |
|--------------------|---|
| Time | Shows the date and the present time. |
| Use Time Server | Shows whether time server is used for time setting. |
| Get Time Server | Shows the method of getting time server. |
| Time Server | Shows the IP address or host name of the time server. |
| Time Server Status | Shows the result of communication with the time server. |

Web Service Settings - Device Admin - Printer

You can set printers or check their operation.

CAUTION

- This product cannot be deleted from a device.
- The "device ID" for this product can be changed. For detail, see to ["Changing Device ID of This Product"](#) on page 62.



| Item | | Description |
|--------------------------|---------------------|---|
| Printer to be registered | Device ID | Sets the ID of a printer to register. |
| | Model | Selects the model of a printer to register. |
| | IP Address | Sets the IP address of a printer to register. |
| | Retry Interval (ms) | Sets the retry interval of a printer to register. |
| | Add | Adds a printer to the Device List. |
| Registered printers | | Displays a list of registered printers. |
| | Test Print | Performs a test printing. |
| | Delete | Deletes a registered printer. |

Web Service Settings - Device Admin - Customer Display

You can use this to set communication with the customer display and check its operation.



| Item | | Description |
|-------------------------|----------------------------|---|
| Customer Display | | Set whether to use the Customer Display. |
| Communications settings | Communications speed (bps) | Set the communication speed. Usually, not required set. |
| | Data bit | Set the data bit length. Usually, not required set. |
| | Parity | Set the parity. Usually, not required set. |
| Brightness settings | | Set the brightness of the customer display. You can set 20%, 40%, 60%, or 100%. The maximum brightness is 100%. |
| Test display | | Performs a test display to the customer display. |
| Apply | | Saves settings to TM-T88V-i. |

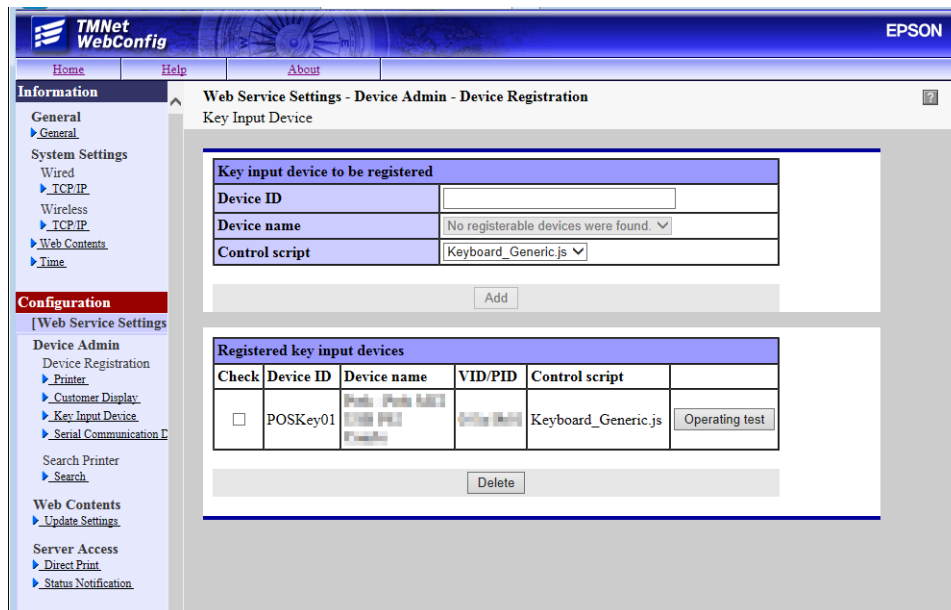
NOTE

Communication speed and other items must be set for this product in order to control the customer display as an RS232C-compliant serial communication device. Set these items to match the communication conditions of the customer display connected to.

- There is no need to install a USB RS232 conversion driver.
- If you use the default settings unchanged, there will be no need to alter the communication settings.

Web Service Settings - Device Admin - Key Input Device

You can set the key input device or check their operation.



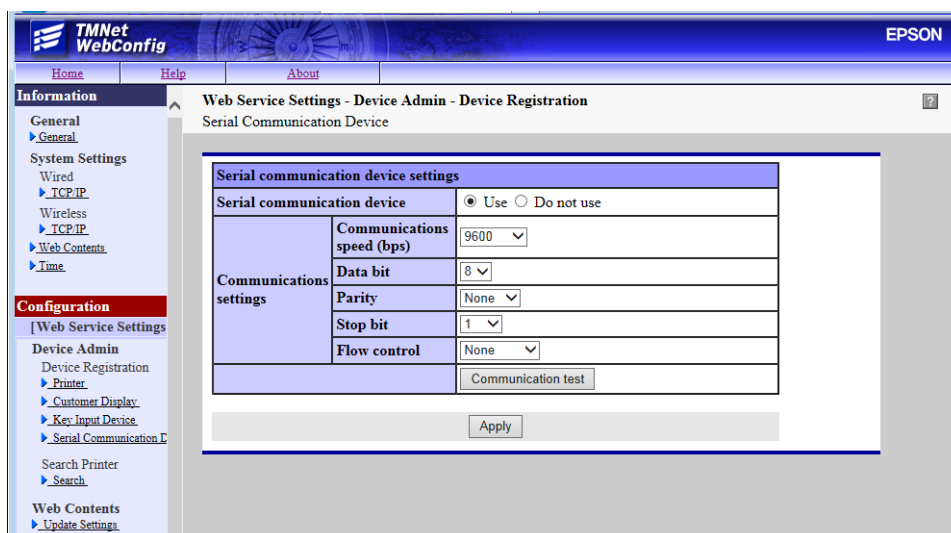
| Item | | Description |
|-----------------------------------|----------------|--|
| Key input device to be registered | Device ID | Set the ID for the key input device. |
| | Device name | Set the device name for the key input device. |
| | Control script | Set the device control script to control the key input device. |
| Add | | Adds a device to the Device List. |
| Registered key input devices | | Displays a list of registered key input devices. |
| | Operating test | Performs an operating test for a registered key input device. |
| | Delete | Deletes a registered key input device. |

Web Service Settings - Device Admin - Serial Communication Device

You can use this to set communication with a serial communication device and check its operation.

CAUTION

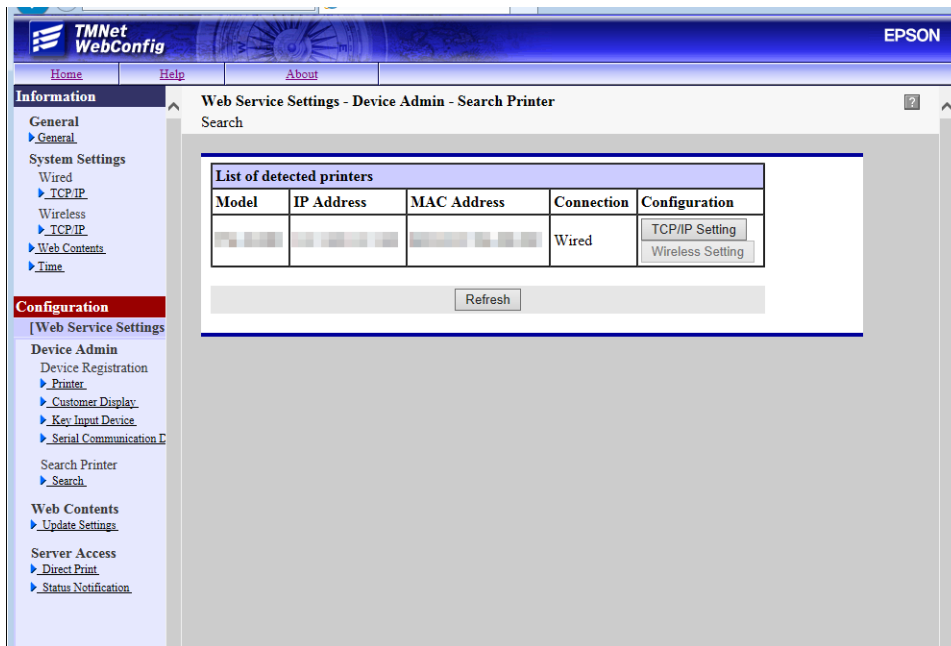
It is not available for TM-T88V-i (without a Serial port).



| Item | | Description |
|-----------------------------|----------------------------|---|
| Serial communication device | | Set whether to use the Serial communication device. |
| Communications settings | Communications speed (bps) | Set the communication speed. |
| | Data bit | Set the data bit length. |
| | Parity | Set the parity. |
| | Stop bit | Set the stop bit. |
| | Flow control | Set the flow control. |
| Communication test | | Performs a communication test. |
| Apply | | Saves settings to TM-T88V-i. |

Web Service Settings - Device Admin - Search Printer

You can search and configure printers connected to this product through the network.



| Item | | Description |
|---------------------------|----------------------|---|
| List of detected printers | Printer | Lists the printers connected to the same subnet network as this product, and their information. |
| | TCP/IP Setting | For making the TCP/IP setting for printers detected. |
| | Wireless LAN Setting | For making the wireless LAN setting for printers detected. |
| Refresh | | Updates information. |

Web Service Settings - Web Contents - Update Settings

You can use this to register web contents in this product and set updating for them.

See also "Registering Web Contents" on page 63.

| Item | | Description |
|---------------------------|------------------|--|
| Automatic Update Settings | Automatic Update | Selects the method of updating web contents. Selecting (Enable) enables "Automatic Update Settings". Selecting (Disable) enables "Web Contents Manual Update". |
| | Frequency | Sets the frequency of automatic update for web contents. |
| | Timing | Sets the timing of automatic update for web contents. |
| | Update Time | Sets the start time of automatic update for web contents. |
| | ID | Sets ID for identifying this product at the Web server when (Automatic Update) is set to (Enable). This ID will be the user ID used for Digest authentication. This set value will also be passed as an ID parameter value for the form data posted to the server. |
| | Password | Sets password used for Digest authentication when (Automatic Update) is set to (Enable). |

| Item | | Description |
|----------------------------|-----------------------------------|--|
| Automatic Update Settings | File URL | Specifies the URL for a file to update automatically. After specifying it, clicking (File Access Test) checks whether the URL is specified correctly. |
| | Authenticate Server | Sets whether the server authentication is performed with the registered certificate when accessed through https. |
| | Apply | Saves settings to TM-T88V-i. |
| Web Contents Manual Update | Web Contents Archive File (*.zip) | Specifies the web content files to register. |
| | Upload | Registers the specified web contents on the TM-T88V-i. |

Web Service Settings - Server Access - Direct Print

You can set server direct print for the TM-T88V-i.

The screenshot shows the 'Web Service Settings - Server Access' configuration page in the TMNet WebConfig interface. The page is titled 'Direct Print' and contains the following fields:

- Server Direct Print:** Radio buttons for 'Enable' (selected) and 'Disable'.
- ID:** A text input field.
- Password:** A text input field.
- Server1:** A table with two rows: 'URL' (with an 'Access Test' button) and 'Interval(s)' (with a value of '5').
- Server2:** A table with two rows: 'URL' (with an 'Access Test' button) and 'Interval(s)' (with a value of '5').
- Server3:** A table with two rows: 'URL' (with an 'Access Test' button) and 'Interval(s)' (with a value of '5').
- Authenticate Server:** Radio buttons for 'Enable' and 'Disable' (selected).

An 'Apply' button is located at the bottom of the configuration area.

| Item | Description |
|---------------------|--|
| Server Direct Print | Sets whether to use the Server Direct Print function or not. Select (Enable) or (disable). |
| ID | Set ID for the server-side program to identify TM-T88V-i when (Server Direct Print) is set to (Enable). This ID becomes the user ID used for Digest access authentication. The set value will also be passed as an ID parameter value for the form data posted to the server. |
| Password | Set your password used for Digest access authentication when (Server Direct Print) is set to (Enable). |
| Server1 to 3 | URL |
| | Interval(s) |
| Authenticate Server | Sets whether the server authentication is performed with the registered certificate when accessed through https. |
| Apply | Saves settings to TM-T88V-i. |

Web Service Settings - Server Access - Status Notification

You can set Status Notification for the TM-T88V-i.

The screenshot shows the 'Web Service Settings - Server Access' page in the TMNet WebConfig utility. The 'Status Notification' section is active, displaying the following configuration options:

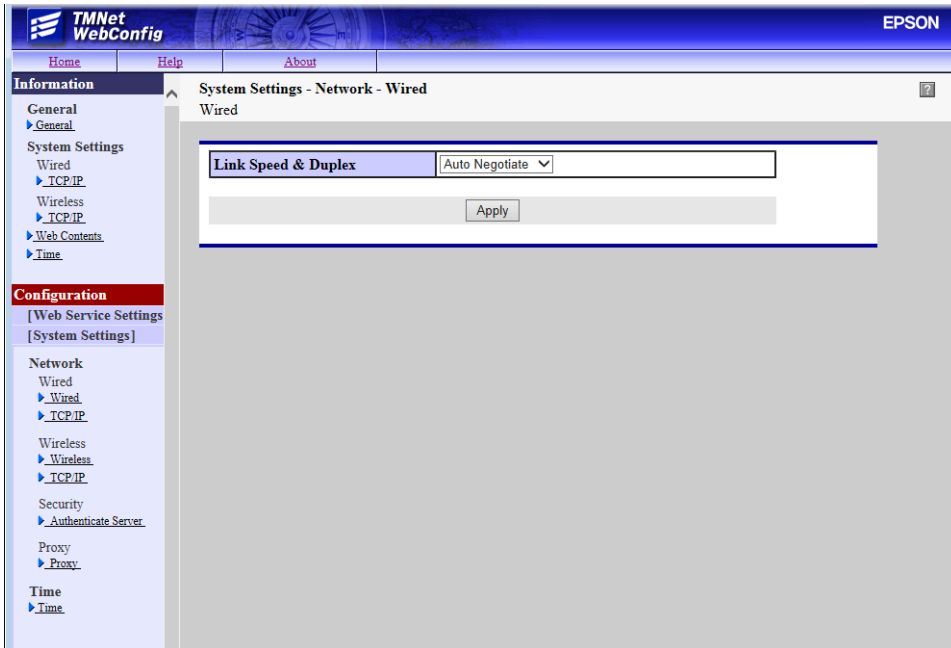
| | |
|---------------------|---|
| Status Notification | <input checked="" type="radio"/> Enable <input type="radio"/> Disable |
| ID | <input type="text"/> |
| Password | <input type="text"/> |
| URL | <input type="text" value="Access Test"/> <input type="button" value="Access Test"/> |
| Interval(s) | <input type="text" value="5"/> |
| Authenticate Server | <input type="radio"/> Enable <input checked="" type="radio"/> Disable |

An 'Apply' button is located at the bottom of the form.

| Item | Description |
|---------------------|---|
| Status Notification | Sets whether to use the Status Notification function or not. Select (Enable) or (disable). |
| ID | Set ID for the server-side program to identify TM-T88V-i when (Status Notification) is set to (Enable). This ID becomes the user ID used for Digest access authentication. The set value will also be passed as an ID parameter value for the form data posted to the server. |
| Password | Set your password used for Digest access authentication when (Status Notification) is set to (Enable). |
| URL | Specify the Test_print.php address of the Web server when (Status Notification) is set to (Enable). Example: http://(IP address of the Web Server)/Test_status.php Click the (Access Test) button to check if the address is accessible. |
| Interval(s) | Set the request interval when (Status Notification) is set to (Enable). |
| Authenticate Server | Sets whether the server authentication is performed with the registered certificate when accessed through https. |
| Apply | Saves settings to TM-T88V-i. |

System Settings - Network - Wired

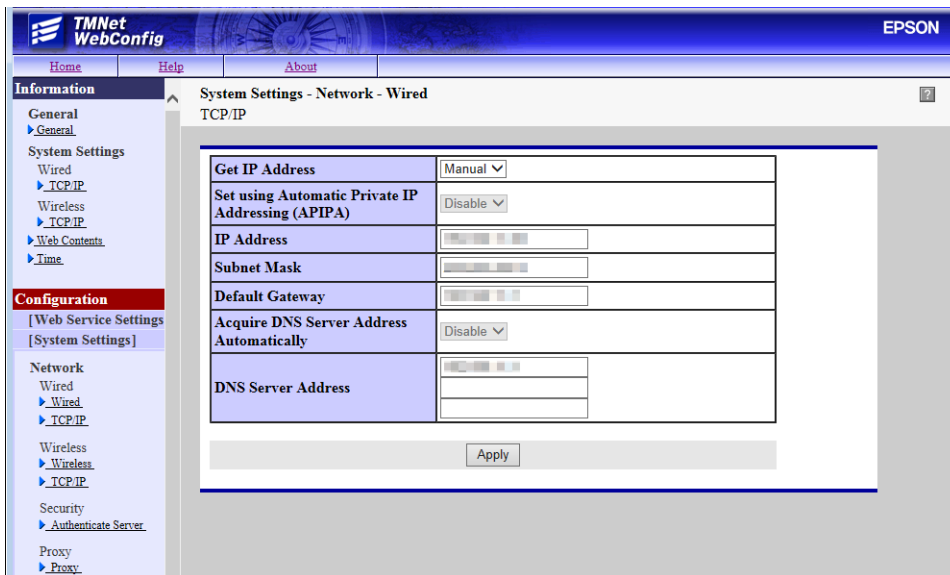
You can make settings for a wired LAN network.



| Item | Description |
|---------------------|------------------------------------|
| Link Speed & Duplex | Sets the speed of data link layer. |
| Apply | Saves settings to TM-T88V-i. |

System Settings - Network - Wired - TCP/IP

You can make settings for a wired LAN such as IP address.



| Item | Description |
|---|---|
| Get IP Address | Sets the method of getting the IP address. |
| Set using Automatic Private IP Addressing (APIPA) | Enables or disables the APIPA setting when (Get IP address) is set to (Auto). |
| IP Address | Sets the IP address when (Get IP Address) is set to (Manual). |
| Subnet Mask | Sets the subnet mask when (Get IP Address) is set to (Manual). |
| Default Gateway | Sets the default gateway when (Get IP Address) is set to (Manual). |
| Acquire DNS Server Address Automatically | Sets the method of getting the address of the DNS server. |
| DNS Server Address | Sets the addresses of the DNS server in order of usage when (Acquire DNS Server Address Automatically) is set to (Disable). |
| Apply | Saves settings to TM-T88V-i. |

System Settings - Network - Wireless

You can make settings for a wireless LAN network when the optional wireless LAN cable set (OT-WL01) is used.

The screenshot shows the 'System Settings - Network - Wireless' configuration page. The left sidebar contains a navigation menu with categories like Information, Configuration, Network, Security, Proxy, and Time. The main content area is titled 'Wireless' and contains the following settings:

- Network Mode:** Infrastructure (selected) / Ad-Hoc
- SSID:** EpsonNet
- Ad-Hoc Channel:** 1
- Communication Standard:** 802.11b/g
- Authentication Method:** Shared Key
- Security Mode:** WEP
- Default WEP Key:** WEP Key 1
- WEP Key 1-4:** Four empty text input fields.
- WPA/WPA2 Pre-Shared Key:** EpsonNet

An 'Apply' button is located at the bottom of the configuration area.

| Item | Description |
|-------------------------|---|
| Network Mode | Sets the communication mode. |
| SSID | Sets the SSID. |
| Ad-Hoc Channel | Sets the ad-hoc channel. (Available only in the ad-hoc mode) |
| Communication Standard | Sets the communication standard. |
| Authentication Method | Sets the authentication algorithm. |
| Security Mode | Sets the encryption algorithm. |
| Default WEP Key | Sets the WEP key to use. |
| WEP Key 1 | Sets the WEP key 1 when (Security mode) is set to (WEP). |
| WEP Key 2 | Sets the WEP key 2 when (Security mode) is set to (WEP). |
| WEP Key 3 | Sets the WEP key 3 when (Security mode) is set to (WEP). |
| WEP Key 4 | Sets the WEP key 4 when (Security mode) is set to (WEP). |
| WPA/WPA2 Pre-Shared Key | Enter the pass phrase of the pre-shared key when (Security mode) is set to "WPA" or "WPA2". |
| Apply | Saves settings to TM-T88V-i. |

CAUTION

- Initially, Authentication Method is set to Open System and Security Mode is set to None. To ensure security, be sure to change the settings before use.
- The following character types can be used for the SSID, WP key and WPA/WPA2 pre-shared key:
 - * ASCII characters, including spaces

System Settings - Network - Wireless - TCP/IP

You can change settings for a wireless LAN such as IP address when the optional wireless LAN cable set (OT-WL01) is used.

The screenshot shows the TMNet WebConfig interface for an EPSON device. The main content area is titled 'System Settings - Network - Wireless - TCP/IP'. It contains several configuration items:

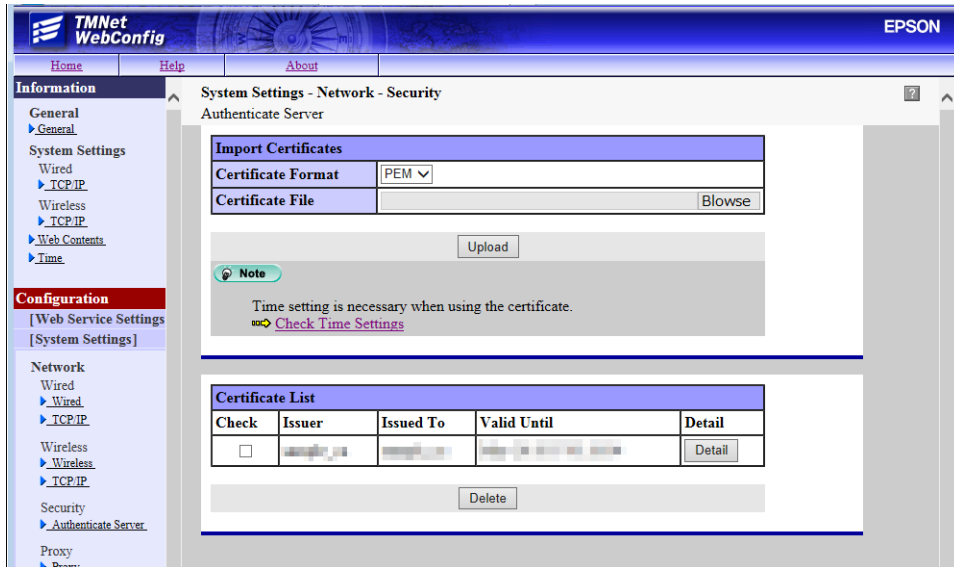
- Get IP Address:** A dropdown menu set to 'Manual'.
- Set using Automatic Private IP Addressing (APIPA):** A dropdown menu set to 'Disable'.
- IP Address:** A text input field containing '192.168.192.168'.
- Subnet Mask:** A text input field containing '255.255.255.0'.
- Default Gateway:** An empty text input field.
- Acquire DNS Server Address Automatically:** A dropdown menu set to 'Disable'.
- DNS Server Address:** A text input field containing '192.168.11.1'.

An 'Apply' button is located at the bottom of the configuration area.

| Item | Description |
|---|---|
| Get IP Address | Sets the method of getting the IP address. |
| Set using Automatic Private IP Addressing (APIPA) | Enables or disables the APIPA setting when (Get IP Address) is set to (Auto). |
| IP Address | Sets the IP address when (Get IP Address) is set to (Manual). |
| Subnet Mask | Sets the subnet mask when (Get IP Address) is set to (Manual). |
| Default Gateway | Sets the default gateway when (Get IP Address) is set to (Manual). |
| Acquire DNS Server Address Automatically | Sets the method of getting the address of the DNS server when (Get IP Address) is set to (Auto). |
| DNS Server Address | Sets the addresses of the DNS server in order of usage when (Acquire DNS Server Address Automatically) is set to (Disable). |
| Apply | Saves settings to TM-T88V-i. |

System Settings - Security - Authenticate Server

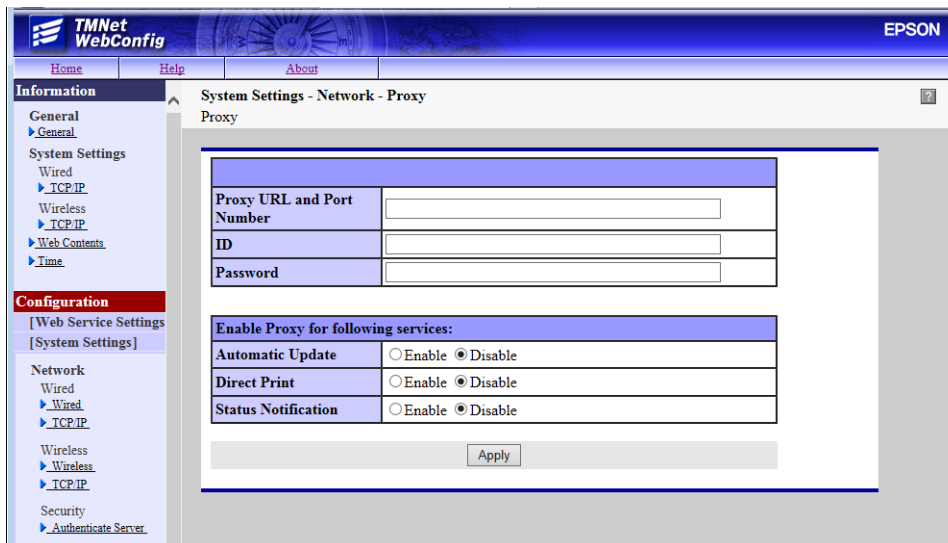
You can register certificates, configure the registered certificates, and delete them in this product.



| Item | | Description |
|---------------------|--------------------|---|
| Import Certificates | Certificate Format | Specifies the file format for root CA certificates to be registered in this product. You can only specify the PEM format. |
| | Certificate File | Specifies certificate files to be registered in this product. |
| | Upload | Registers the specified certificate files in this product. Up to 6 files can be registered. |
| Certificate List | Certificate | Displays a list of the certificate files registered in this product and detailed information. Place a check mark next to a certificate displayed in the list to allow for the "Delete" operation. |
| | Detail | For checking detailed information on the certificates. |
| | Delete | Deletes a checked certificate. |

System Settings - Proxy - Proxy

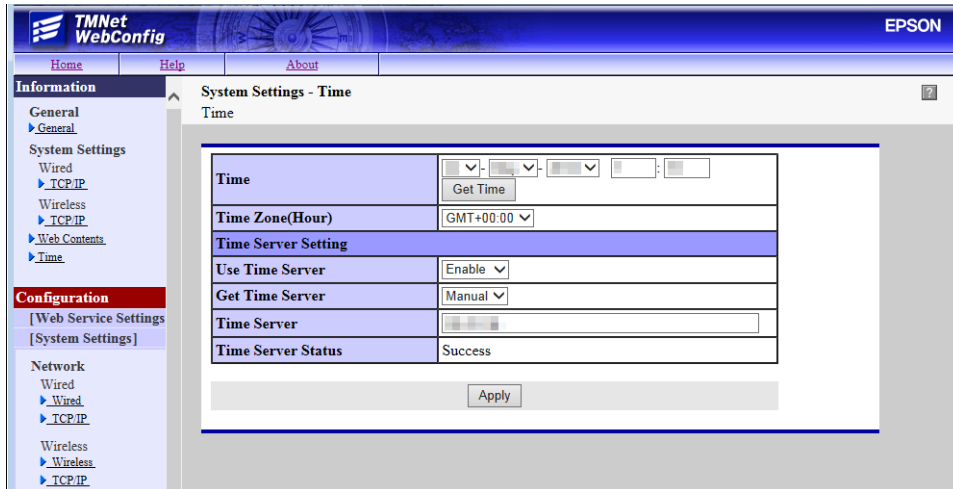
You can change the proxy settings and service settings using proxy.



| Item | | Description |
|--------------------------------------|---------------------|--|
| Proxy URL and Port Number | | Enter the proxy server URL and port number in the following: "http://host name: port number". Example: http://10.0.0.1:8008 |
| ID | | Registers the authentication ID for using proxy authentication. |
| Password | | Registers the authentication password for using proxy authentication. |
| Enable Proxy for following services: | Automatic Update | Sets whether the proxy is used for automatic update of Web contents. |
| | Direct Print | Sets whether the proxy is used for Server Direct Print. |
| | Status Notification | Sets whether the proxy is used for Status Notification. |
| Apply | | Saves settings to TM-T88V-i. |

System Settings - Time - Time

You can set the time for the TM-T88V-i.



| Item | | Description |
|---------------------|--------------------|--|
| Time | | Sets the time. Clicking (Get Time) shows the present time. |
| Time Zone (Hour) | | Sets the time zone. |
| Time Server Setting | Use Time Server | Sets whether to use the time server or not for time setting. |
| | Get Time Server | Sets the method of getting the IP address/host name for the time server. |
| | Time Server | Sets the IP address/host name for the time server when (Get Time Server) is set to (Manual). |
| | Time Server Status | Shows the result of last getting time from the time server. |
| Apply | | Saves settings to TM-T88V-i. |

Admin Settings - Maintenance - Reset

You can reset the network functions and restore the settings for EPSON TMNet WebConfig to the factory default settings.



| Item | Description |
|-----------------|--|
| Reset | Restarts the network functions while retaining the network setting values such as IP address. The settings for EPSON TMNet WebConfig other than the network settings are retained. |
| Factory Default | Restores the settings for EPSON TMNet WebConfig to the factory default settings. All the settings except for the internal time are initialized. |

Admin Settings - Administrator Information - Administrator

You can set the information for the administrator of the TM-T88V-i.

The screenshot shows the TMNet WebConfig interface for setting administrator information. The left sidebar contains a navigation menu with the following items:

- Information**
 - General
 - Wired
 - TCP/IP
 - Wireless
 - TCP/IP
 - Web Contents
 - Time
- Configuration**
 - Network
 - Wired
 - TCP/IP
 - Wireless
 - TCP/IP
 - Device
 - Search
 - Web Contents
 - Direct Print
 - Status Notification
 - Option**
 - Administrator
 - Time
 - Password
 - Reset

The main content area is titled "Configuration - Option Administrator Setting" and contains the following form fields:

- Administrator Name**: A text input field.
- Location/Person**: A text input field.
- Submit**: A button to save the settings.

| Item | Description |
|--------------------|--|
| Administrator Name | Sets the name of the administrator of the TM-T88V-i. |
| Location/Person | Sets the location where the TM-T88V-i is installed. |
| Apply | Saves settings to TM-T88V-i. |

Admin Settings - Administrator Information - Password

You can change a password of EPSON TMNet WebConfig.

| Item | Description |
|-------------------|--|
| Old Password | Enter the current password. |
| New Password | Enter the new password. |
| Re-input Password | Enter the new password for confirmation. |
| Apply | Saves settings to TM-T88V-i. |

CAUTION

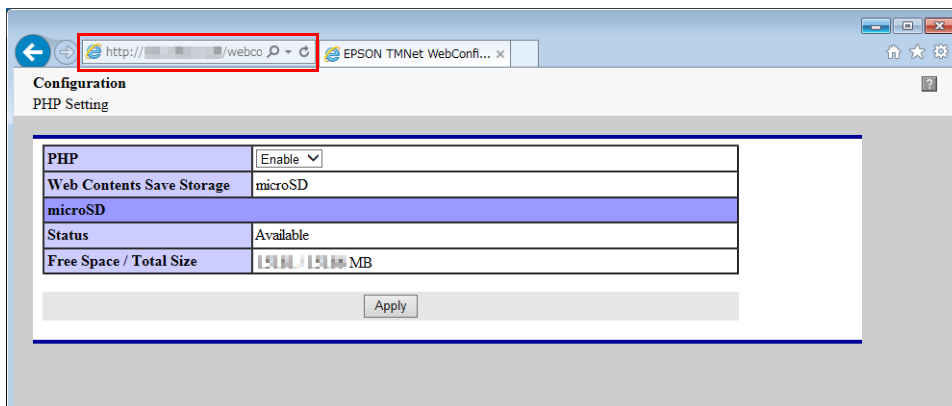
A user name and a password will be required on the authentication screen when you start up this utility and when you change settings. Enter "epson" for the user name and the password you set for the password.

PHP settings

Opening PHP Setting Screen

Follow the steps below to open the PHP Setting screen of EPSON TMNet WebConfig.

- 1 Start up a PC connected to the network.
- 2 Start up the Web browser, and input the following in the address bar.
`http://This product's IP address/webconfig/PHPSetting`



PHP settings

You can configure the PHP settings for this product.

| Item | | Description |
|---------------------------|-------------------------|--|
| PHP | | Enables/disables PHP function. |
| Web Contents Save Storage | | Shows the storage to save the Web contents. |
| microSD | Status | Displays whether microSD card can be used. |
| | Free Space / Total Size | Shows the free space and total size of the microSD card. |
| Apply | | Saves settings to TM-T88V-i. |

Status sheet

Make sure the product is turned on, press the push button at the interface part for approximately 3 seconds. When you release the button, a status sheet on which network parameters are printed will be ejected. With the status sheet, you can check the network settings.

Press the push button with a thin object such as a tweezers.

CAUTION

If you keep pressing the button for more than 10 seconds, the network settings are initialized.

Information on a status sheet

```

*****
      EPSON Status Sheet
*****

<General Information>
Firmware
  X.XX
ePOS-Device
  X.XX
Model
  TM-T88V-i
Time
  yyyy-mm-dd hh:nn:ss
  GMT+hh:nn
  ⋮

<Server Direct Print>
Use
  Disable
<Status Notification>
Status Notification
  Disable
<Syslog Storage>
Use microSD
  No

```

| Item | Description |
|---|---|
| General Information | Shows the product's TM-i firmware version, ePOS-Device version, product's name, and time. |
| Firmware | Shows the product's TM-i Firmware version. |
| ePOS-Device | Shows ePOS-Device Service version. |
| Model | Shows "TM-T88V-i". |
| Time | Shows the date, the present time, and the time difference. |
| Administrator Name | Shows the administrator name. |
| Location/Person | Shows the location and the user name. |
| Wired | Shows wired LAN settings. |
| MAC Address | Shows the MAC address. |
| Link Speed & Duplex | Shows the speed of data link layer. |
| Wired TCP/IP | Shows TCP/IP settings for wired LAN. |
| Get IP Address | Shows the method of getting the IP address. |
| Set using Automatic Private IP Addressing (APIPA) | Shows the APIPA setting. |
| IP Address | Shows the IP address. |
| Subnet Mask | Shows the subnet mask. |
| Default Gateway | Shows the default gateway. |
| Acquire DNS Server Address Automatically | Shows the method of getting the address of the DNS server. |
| DNS Server Address | Shows the address of the DNS server. |
| Wireless | Shows wireless LAN settings. |
| MAC Address | Shows the MAC address. |
| Hardware Version | Shows the hardware version of the wireless LAN cable set (OT-WL01). |
| Software Version | Shows the software version of the wireless LAN cable set (OT-WL01). |
| Communication Standard | Shows the wireless LAN communication standard. |
| Network Mode | Shows the network mode. |
| SSID | Shows the SSID. |
| Wireless LAN Frequency Region | Shows the frequency range. |
| Ad-Hoc Channel | Shows the ad-hoc channel. |
| Authentication Method | Sets the authentication method. |
| Security Mode | Shows the encryption scheme. |

| Item | Description |
|---|--|
| Wireless TCP/IP | Shows TCP/IP settings for wireless LAN. |
| Get IP Address | Shows the method of getting the IP address. |
| Set using Automatic Private IP Addressing (APIPA) | Shows the APIPA setting. |
| IP Address | Shows the IP address. |
| Subnet Mask | Shows the subnet mask. |
| Default Gateway | Shows the default gateway. |
| Acquire DNS Server Address Automatically | Shows the method of getting the address of the DNS server. |
| DNS Server Address | Shows the address of the DNS server. |
| Time Server Setting | Shows time settings. |
| Use Time Server | Shows whether to use the time server or not. |
| Get Time Server | Shows the method of getting the time server's IP address and host name. |
| Time Server | Shows the IP address of the time server's IP address and host name. |
| Time Server Status | Shows the result of communication with the time server. |
| Proxy Configuration | Shows proxy settings. |
| Proxy URL | Shows the proxy server URL. |
| ID | Shows the proxy authentication ID to be registered. |
| Web Contents Update UseProxy | Shows whether the proxy is used when automatic updating for Web contents. |
| Server Direct Print UseProxy | Shows whether the proxy is used for Server Direct Print. |
| Status Notification UseProxy | Shows whether the proxy is used for Status Notification. |
| Device | <p>Shows the following information of the devices registered for ePOS-Device.</p> <ul style="list-style-type: none"> • Device ID • Model number • IP address • Connection status |

| Item | Description |
|---|---|
| Customer Display | Shows the device ID ^{*1} and the followings customer display information that is registered in ePOS-Device. |
| Use | Shows whether using the customer display. |
| Communications speed ^{*1} | Shows the communication speed. |
| Data bit ^{*1} | Shows the data bit. |
| Parity ^{*1} | Shows the parity. |
| Brightness setting ^{*1} | Shows the brightness of the customer display. |
| KeyInput Device | Displays, for each device ID ^{*2} , the information below on key input devices registered in ePOS-Device. |
| Device name ^{*2} | Shows the device name and VID/PID. |
| Control script ^{*2} | Shows the control script of the key input device. |
| Serial Communication Device | Shows the device ID ^{*3} and following serial communication device information that is registered in ePOS-Device. |
| use | Shows whether using the serial communication device. |
| Communications speed (bps) ^{*3} | Shows the communication speed. |
| Data bit ^{*3} | Shows the data bit. |
| Parity ^{*3} | Shows the parity. |
| Stop bit ^{*3} | Shows the stop bit. |
| Flow Control ^{*3} | Shows the flow control. |
| Web Contents Update | Shows update settings for web contents. |
| Use Automatic Update | Shows whether automatic updating of web contents is enabled or disabled. |
| Date of Installed Web Contents ^{*4} | Automatic update setting: Shows time and date the Web contents (zip file) are created. Manual update setting: Shows time and date the Web contents are uploaded. |
| Date of Last Automatic Update ^{*4} | Shows last automatically updated time and date. |
| Status of Last Automatic Update ^{*4} | Shows last automatically updated results. |

| Item | Description |
|------------------------------------|---|
| Server Direct Print | Shows Server Direct Print settings. |
| Use | Shows Enable or Disable of Server Direct Print. |
| ID * ⁵ | Shows ID for the server-side program to identify TM-T88V-i. |
| Authenticate Server * ⁵ | Shows whether the server authentication is performed with the registered certificate when accessed through https. |
| Server1 to 3 * ⁵ | Shows the information of the registered web server. |
| URL * ⁵ | Shows the URL of the registered web server. |
| Access Test * ⁵ | To perform the test access to the Web server, and shows the results. |
| Interval(s) * ⁵ | Shows the request interval. |
| Status Notification | Shows Status Notification settings. |
| Status Notification | Shows Enable or Disable of Status Notification. |
| ID * ⁶ | Shows ID for the server-side program to identify TM-T88V-i. |
| URL * ⁶ | Shows the URL of the registered web server and path to the application. |
| Authenticate Server * ⁶ | Shows whether the server authentication is performed with the registered certificate when accessed through https. |
| Access Test * ⁶ | To perform the test access to the Web server, and shows the results. |
| Interval(s) * ⁶ | Shows the request interval. |
| Syslog Storage | Shows log registration destination settings. |
| Use microSD | Shows whether logs are registered in a microSD card. |

*1: Printed only when the customer display is registered to ePOS-Device (see [page 86](#)).

*2: Printed only when the key input devices are registered to ePOS-Device (see [page 87](#)).

*3: Printed only when the serial communication device is registered to ePOS-Device (see [page 88](#)).

*4: Printed only when the automatic update setting for web contents is enabled (see [page 90](#)).

*5: Printed only when the server direct print is enabled (see [page 92](#)).

*6: Printed only when the status notification is enabled (see [page 93](#)).

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
- Hexadecimal Dumping Mode
- NV Graphics Print Mode
- Receipt Enhancement Information Print Mode
- Software Setting Mode

Self-test Mode

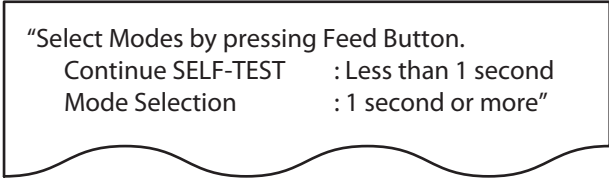
You can confirm the following information by running the self-test mode.

- Control software version
- Receive buffer size
- Busy conditions
- Built-in character sets
- Print density
- Maintenance Information (Print head running length, count of autocutting)
- DIP switch settings

Follow the steps below.

- 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.)

After the printer status is printed, the self-test printing continuance guidance is printed and Paper LED flashes.



```
"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 less than 1 second to continue the self-test. Built-in characters are printed with rolling printing. After printing "*** completed ***", the printer is initialized and enters the normal mode.

NV Graphics Print Mode

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

- Capacity of the NV graphics
- Used amount 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

Follow the steps below.

- 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.)

After the printer status is printed, the self-test printing continuance guidance is printed and Paper LED flashes.

| | |
|--|----------------------|
| "Select Modes by pressing Feed Button. | |
| Continue SELF-TEST | : Less than 1 second |
| Mode Selection | : 1 second or more" |

- 3 Hold down the Feed button for 1 second or more to move to mode selection.
The mode selection guidance is printed and Paper LED flashes.
- 4 Press the Feed button for less than 1 second and then hold down for more than 1 second to print the NV graphics information.
After the information is printed, the mode selection guidance is printed again.
- 5 To exit, turn off the printer or select "Exit and Reboot Printer".

Receipt Enhancement Information Print Mode

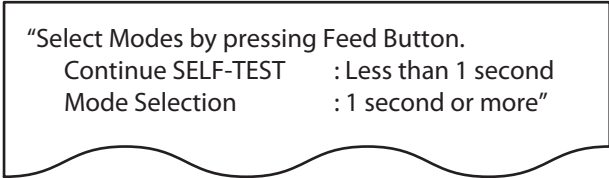
You can confirm the following information by running the R/E information mode:

- Automatic top logo setting
- Automatic bottom logo setting
- Extended settings for automatic top/bottom logo

Follow the steps below.

- 1** Close the roll paper cover.
- 2** While pressing the Feed button, turn the power on. (Keep pressing the Feed button until the printer starts printing.)

After the printer status is printed, the self-test printing continuance guidance is printed and Paper LED flashes.



"Select Modes by pressing Feed Button.
Continue SELF-TEST : Less than 1 second
Mode Selection : 1 second or more"

- 3** Hold down the Feed button for 1 second or more to move to mode selection.
The mode selection guidance is printed and Paper LED flashes.
- 4** Press the Feed button for less than 1 second two times and then hold down for more than 1 second to print the Receipt Enhancement Information.
After the information is printed, the mode selection guidance is printed again.
- 5** To exit, turn off the printer or select "Exit and Reboot Printer".

Software Setting Mode

You can configure the memory switches (customized values) of the product.

- Print density
- Auto reduction of the amount of paper to use
- Autocutting of paper while the cover is closed
- Paper width
- Default value of character code page/international character set
- Auto replacement of font
- Power supply capacity

NOTE

For detailed information about memory switches (customized value), see "[Setting the Memory Switches \(Customized Value\)](#)" on page 53.

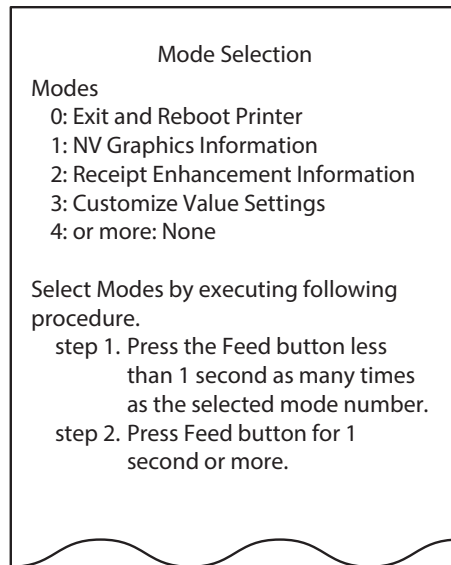
Follow the steps below.

- 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.)
After the printer status is printed, the self-test printing continuance guidance is printed and Paper LED flashes.

"Select Modes by pressing Feed Button.
Continue SELF-TEST : Less than 1 second
Mode Selection : 1 second or more"

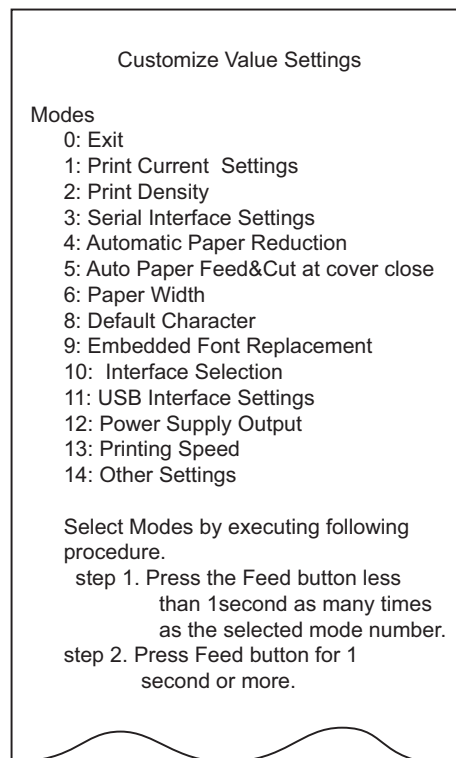
3 Hold down the Feed button for 1 second or more to move to mode selection.

The mode selection guidance is printed and Paper LED flashes.



4 Press the Feed button for less than 1 second three times and then hold down for more than 1 second to print the Receipt Enhancement Information.

After the information is printed, the mode selection guidance is printed again.



- 5** Press the Feed button for less than 1 second the number of times as shown in the print result and then hold down for more than 1 second to select the item to be set.
The specified value (option), currently set value, and initial value for the selected item are printed.
- 6** Select the setting value by pressing the Feed button for less than 1 second the corresponding number of times and confirm it by holding down the button for more than 1 second.
After the settings are saved, the Software Setting Mode guidance is printed and Paper LED flashes.
For some items, item selection continues before printing the values.
For details on the setting items, see ["Setting Items for Software Setting Mode" on page 138](#).
- 7** To exit the Software Setting Mode, turn off the printer, or select "Exit" to return to the mode selection guidance and then select "Exit and Reboot Printer".

NOTE

- To select the item No. "0", keep pressing the Feed button until the printer starts printing.
- If the button is pressed the number of times that is not shown on the guidance, the operation is invalid and the same guidance is printed.

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.

Follow the steps below to run this mode.

NOTE

- 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.
- Applications that confirm printer status may not work correctly during the hexadecimal dumping mode. The printer returns only the status for "Transmit real-time status."

Follow the steps below.

- 1** Open the roll paper cover.
- 2** While pressing the Feed button, turn on the printer. (Keep pressing the Feed button until the Error LED is flashing.)
- 3** Close the roll paper cover.
After this, all the data received by the printer is printed in hexadecimal numbers and their corresponding ASCII characters.

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 ***
```

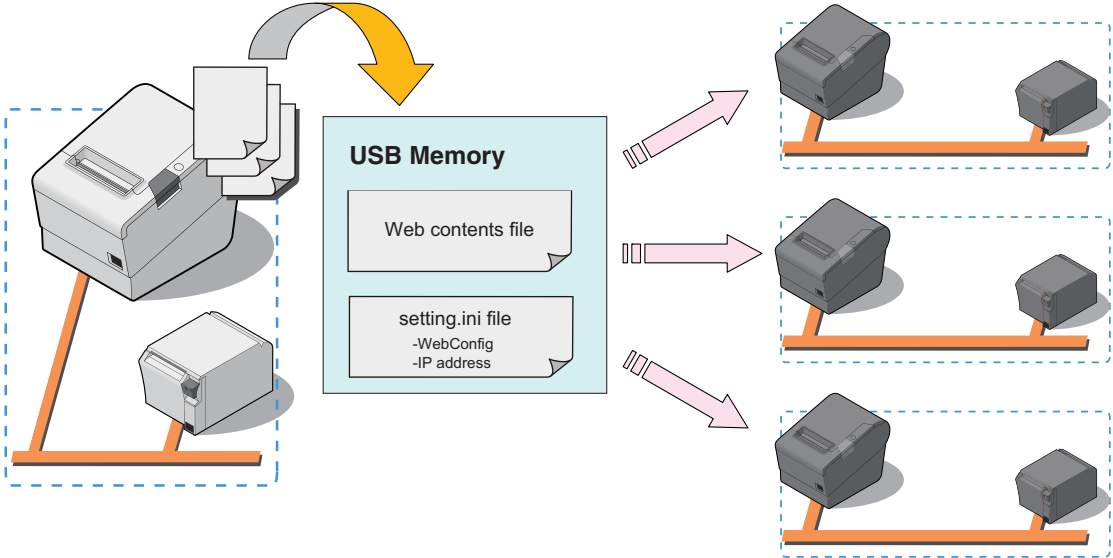
- 4** Turn off the printer or press the Feed button three times to return to the normal mode.

Easy Setup

Easy Setup is a function that enables setting of EPSON TMNet WebConfig just by inserting a USB memory in TM-i and turning the power on.

If you are using a network-connected TM printer, you can make the network settings at the same time with Easy Setup.

For detail, refer to “TM-i series Easy Setup Guide”.



Checking/Updating TM-i Firmware

Checking the TM-i Firmware Version

- Use "Software" in the status sheet ([page 58](#))
- Use "General" in EPSON TMNet WebConfig ([page 79](#))

Updating TM-i Firmware

You can use the TM-i Firmware Update Tool to do the update.

For detail, see "[Software](#)" on [page 75](#).

Handling

This chapter describes basic handling of the product.

Installing and Replacing Roll Paper



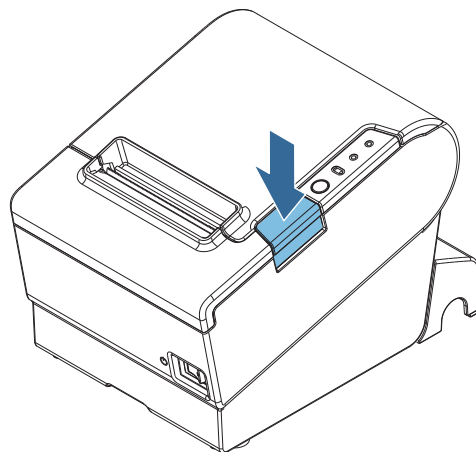
WARNING

- **Do not open the roll paper cover during printing.**
The product 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 product specification. For details about paper specification, see ["Paper Specifications" on page 132](#).
- Paper must not be pasted to the roll paper core.

- 1 Press the cover open lever to open the roll paper cover.

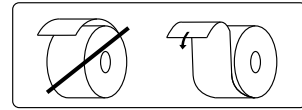
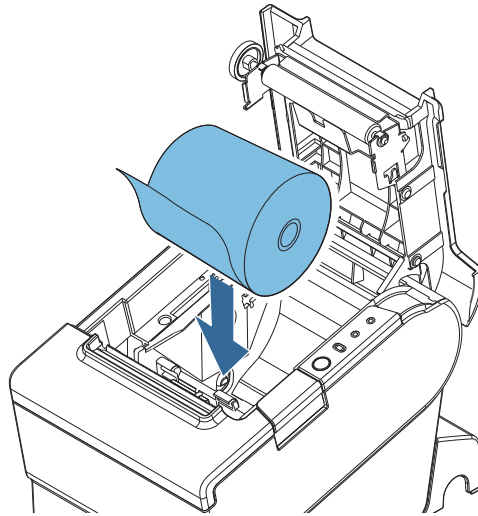


CAUTION

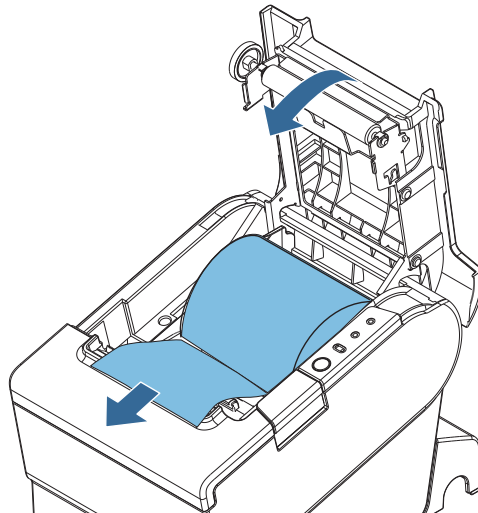
When the roll paper cover cannot be opened, see ["Removing Jammed Paper" on page 121](#).

- 2 Remove the used roll paper core, if any.

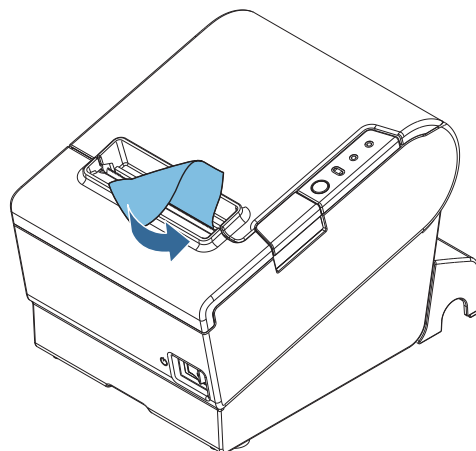
3 Install the roll paper in the correct direction.



4 Pull out some roll paper, and close the roll paper cover.



5 Tear off the roll paper with the manual cutter.



Removing Jammed Paper

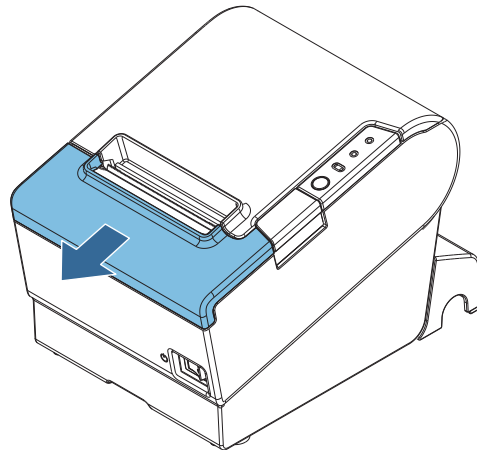
When a paper jam occurs, never pull out the paper forcibly. Open the roll paper cover and remove the jammed paper.

When the roll paper cover cannot be opened, follow the steps below to remove the jammed paper.

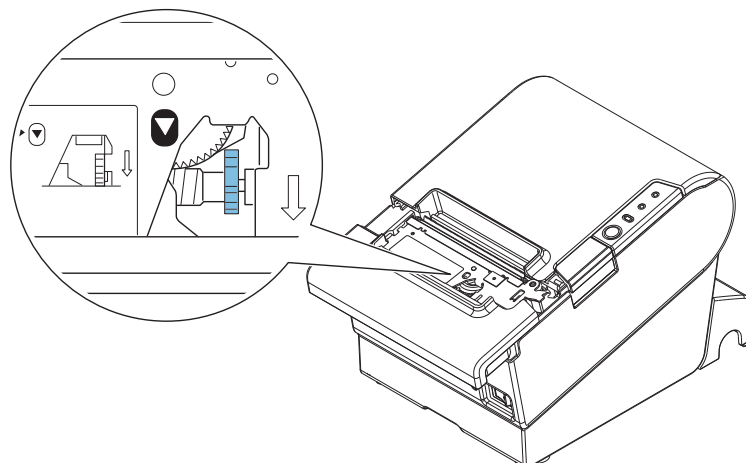


Do not touch the thermal head (See ["Cleaning the Thermal Head"](#) on page 122.) because it can be very hot after printing.

- 1** Turn off the product.
- 2** Slide the cutter cover toward the front to open it.



- 3** Turn the knob until you see a triangle in the opening.
This returns the cutter blade to the normal position. There is a label near the cutter to assist you.



- 4** Close the cutter cover.
- 5** Open the roll paper cover and remove the jammed paper.

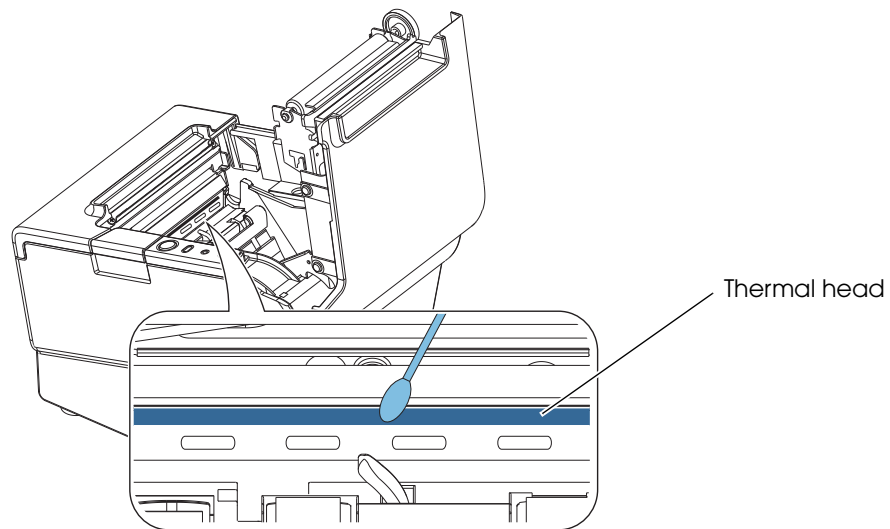
Cleaning the Thermal Head

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



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.

Turn off the product, open the roll paper cover, and clean the thermal elements of the thermal head with a cotton swab moistened with an alcohol solvent (ethanol or isopropyl alcohol).



Depending on the roll paper used, paper dust may stick to the platen roller and roll paper end sensor. To remove the paper dust, clean the platen roller and roll paper end sensor with a cotton swab moistened with water. Turn on the product power only after the water has completely dried.

Preparing for Transport

Follow the steps below to transport the product.

- 1** Turn off the product.
- 2** Remove the AC adapter.
- 3** Remove the roll paper.
- 4** Pack the product upright.



Appendix

Product Specifications

| | | 80 mm width paper printing | 58 mm width paper printing |
|---|----------------------------|--|------------------------------|
| Printing method | | Thermal line printing | |
| Cutting method | | Partial cut (cutting with one point in left edge left uncut) | |
| Roll paper (single-ply) width | | 79.5 ± 0.5 mm (3.13 ± 0.02") | 57.5 ± 0.5 mm (2.26 ± 0.02") |
| Interfaces | USB host port | <ul style="list-style-type: none"> Standards: USB2.0 (High/Full/Low speed) No. of ports: 5 ports Connector: Type A x 4, Micro-USB (Type Micro-AB) x 1 | |
| | USB device port | <ul style="list-style-type: none"> Standards: USB2.0 (High/Full/Low speed) No. of ports: 1 port (shared with the host port) Connector: Micro-AB | |
| | Serial ^{*1} | <ul style="list-style-type: none"> Flow control: XON/XOFF control or DTR/DSR control Baud rate: Maximum 115200 bps (bps: bits per second) Parity: Odd, Even, None Connector: D-sub 9 pin (Male) | |
| | microSD card | <ul style="list-style-type: none"> No. of slots: 1 slot Connector: <p>Make sure that the product power is turned off before inserting or removing a microSD card. Use a microSD card with wear leveling.</p> | |
| | Ethernet | 10Base-T/100Base-TX | |
| | Wireless LAN ^{*2} | IEEE802.11b/g/n | |
| | Drawer kick | <ul style="list-style-type: none"> Pin: 6 pin Connector: Modular (only for cash drawer or external optional buzzer) | |
| Buffers | Receive buffer | 4 KB/45 bytes (selectable using DIP switch 1-2) | |
| | Downloaded buffer | 12 KB (downloaded images) | |
| | NV graphics data | 256 KB | |
| Barcode/two-dimensional symbol/ printing | | JAN 8 (EAN 8), JAN 13 (EAN 13), UPC-A, UPC-E, CODE 39, ITF, CODABAR (NW-7), CODE 93, CODE 128, PDF417, QR CODE, MaxiCode, 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 | |
| Power supply | | AC adapter, RA (Model: M266A) | |

| | | 80 mm width paper printing | 58 mm width paper printing |
|----------------------|--------------|--|----------------------------|
| Life | Mechanism | 20 million lines | |
| | Thermal head | 150 million pulses 150 km | |
| | Auto-cutter | 2,000,000 cuts | |
| | MTBF | 360,000 hours | |
| | MCBF | 70,000,000 lines | |
| Temperature/humidity | | Operating: 5 to 45°C {41 to 113°F}, 10 to 90% RH Storage: -10 to 50°C {14 to 122°F}, 10 to 90% RH | |
| Overall dimensions | | 145 × 195 × 148 mm {5.71 × 7.68 × 5.83"} (W × D × H) | |
| Weight (mass) | | Approx. 1.6 kg {3.5 lb} (roll paper excluded) | |

*1: Not available for TM-T88V-i (without a Serial port).

*2: When the optional wireless LAN cable set (OT-WL01) is used.

Software Specifications

| | |
|---------------|--|
| Print control | ePOS-Device SDK for iOS, ePOS-Device SDK for Android, ePOS-Device SDK for JavaScript, ePOS-Device XML, Server Direct Print |
| Utility | <ul style="list-style-type: none"> • EPSON TMNet WebConfig * <ul style="list-style-type: none"> * Network setting (Ethernet/Wireless LAN) * Web contents registration * ePOS-Device setting * Server Direct Print/Status Notification setting * Printer's Device ID settings • Easy Setup <ul style="list-style-type: none"> * EPSON TMNet WebConfig settings <p>*: Settings can be changed or viewed through a Web browser on your computer or tablet terminal.</p> |

Controllable Peripherals

Network Printer

| Network printers \ TM-i model | ANK models | Traditional Chinese models | South Asia models | Simplified Chinese models |
|--|------------|----------------------------|-------------------|---------------------------|
| The following product's printers of TM-i | | | | |
| TM-T88V-i (TM-i Firmware Ver.4.0 or later) | ✓ | ✓ | ✓ | ✓ |
| TM-T70-i (TM-i Firmware Ver.4.0 or later) | ✓ | ✓ | ✓ | ✓ |
| TM-T20II-i | ✓ | - | - | - |
| TM-T82II-i | ✓ | ✓ | ✓ | ✓ |
| The following printers with the UB-E02, UB-E03, UB-R03, or UB-R04 embedded | | | | |
| TM-T88V | ✓ | ✓ | ✓ | - |
| TM-T88IV | ✓ | ✓ | ✓ | ✓ |
| TM-T70 | ✓ | ✓ | ✓ | ✓ |
| TM-T70II | ✓ | ✓ | ✓ | ✓ |
| TM-T90 | ✓ | ✓ | ✓ | - |
| TM-L90 | ✓ | ✓ | ✓ | ✓ |
| TM-T20 | ✓ | - | - | - |
| TM-T20II | ✓ | - | - | - |
| TM-T82II | ✓ | ✓ | ✓ | ✓ |
| TM-U220 | ✓ | ✓ | ✓ | ✓ |
| The following TM printers (Wi-Fi model) | | | | |
| TM-P60II (Including Peeler model) | ✓ | - | - | - |
| TM-P80 | ✓ | - | - | - |

Other Device

| | |
|-------------------------------|--|
| Customer Display | DM-D110 (USB Interface) |
| Key Input Device | Barcode scanner, Keyboard |
| Serial Communication Device * | Device that has a serial interface, such as a scale, cash recycler or CAT terminal. ePOS-Device SDK provides only an API that sends/receives commands. For control of a serial communication device, you will have to use an application of your own. |
| Cash drawer | Cash drawer |

*: Not available for TM-T88V-i (without a Serial port).

Printing Specifications

| | | 80 mm width paper printing | 58 mm width paper printing |
|-----------------------|------------------|--|----------------------------|
| Printing method | | Thermal line printing | |
| Dot density | | 180 × 180 dpi | |
| Printing direction | | Unidirectional with friction feed (Reverse feed is not supported.) | |
| Printing width | | 72.0 mm (2.83"), 512 dots | 50.8 mm (2.0"), 360 dots |
| Characters per line | Font A (12 × 24) | 42 | 30 |
| | Font B (9 × 17) | 56 | 40 |
| Maximum print speed * | | 200 mm/s for Simplified Chinese and Korean model 300 mm/s Other model | |
| Line spacing | | 4.23 mm {1/6"} (Initial setting) | |

dpi: dots per inch

*: When printing with the default print density level at 24V and 25°C {77°F}.

Character Specifications

| | | |
|----------------------|--------|--|
| Number of characters | | Alphanumeric characters: 95 Extended graphics: 128 × 43 pages International characters: 18 sets |
| Character structure | | Font A (default): 12 × 24 (including 2-dot horizontal spacing) Font B: 9 × 17 (including 2-dot horizontal spacing) |
| Character size | Font A | Standard: 1.41 × 3.39 mm Double-height: 1.41 × 6.77 mm Double-width: 2.82 × 3.39 mm Double-width, double-height: 2.82 × 6.77 mm |
| | Font B | Standard: 0.99 × 2.40 mm Double-height: 0.99 × 4.80 mm Double-width: 1.98 × 2.40 mm Double-width, double-height: 1.98 × 4.80 mm |

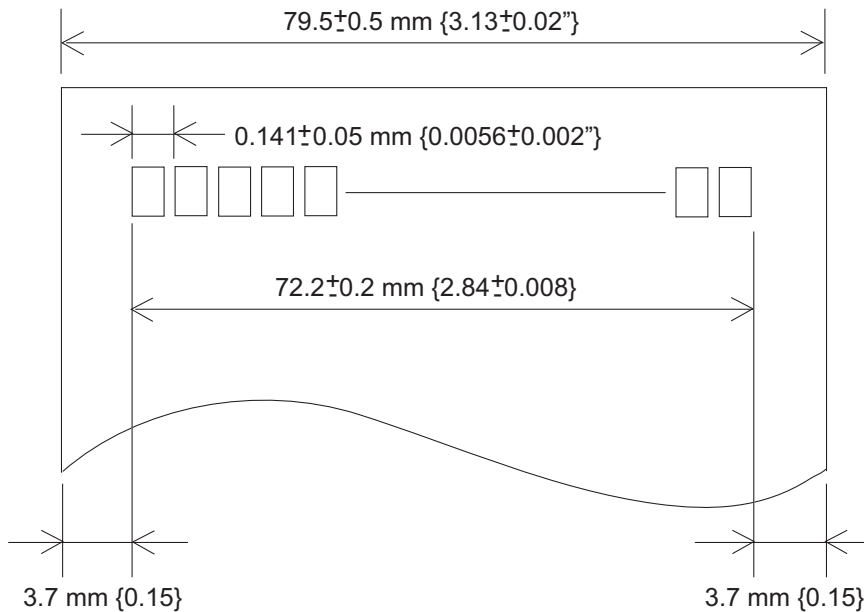
Note:

1. Space between characters is not included.
2. Characters can be scaled up to 64 times as large as the standard size.

Printable Area

80 mm paper width printing

The printable area of paper with a width of 79.5 ± 0.5 mm $\{3.13 \pm 0.02\}$ " is 72.2 ± 0.2 mm $\{2.84 \pm 0.008\}$ " (512 dots), and the space on the right and left sides is approximately 3.7 mm $\{0.15\}$ ".



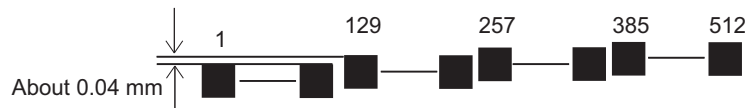
All the numeric values are typical.

CAUTION

- In 2-divided energizing, the print position within the printable area of the thermal elements for dots 1 to 256 and 257 to 512 is shifted approximately 0.07 mm $\{0.0028\}$ " in the paper feed direction as shown in the figure below.

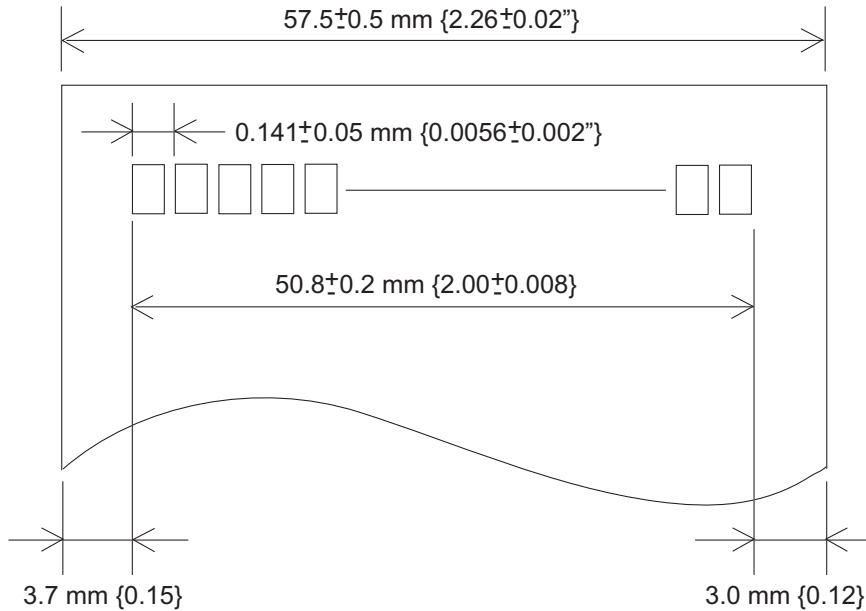


- In 4-divided energizing, the print position within the printable area of the thermal elements for dots 1 to 128, 129 to 256, 257 to 384, and 385 to 512 is shifted approximately 0.04 mm $\{0.0016\}$ " in the paper feed direction as shown in the figure below.



58 mm paper width printing

The printable area of paper with a width of 57.5 ± 0.5 mm $\{2.26 \pm 0.02\}$ " is 50.8 ± 0.2 mm $\{2.00 \pm 0.008\}$ " (360 dots), and the space on the left side is approximately 3.7 mm $\{0.15\}$ " and the space on the right side is approximately 3.0 mm $\{0.12\}$ ".



All the numeric values are typical.

CAUTION

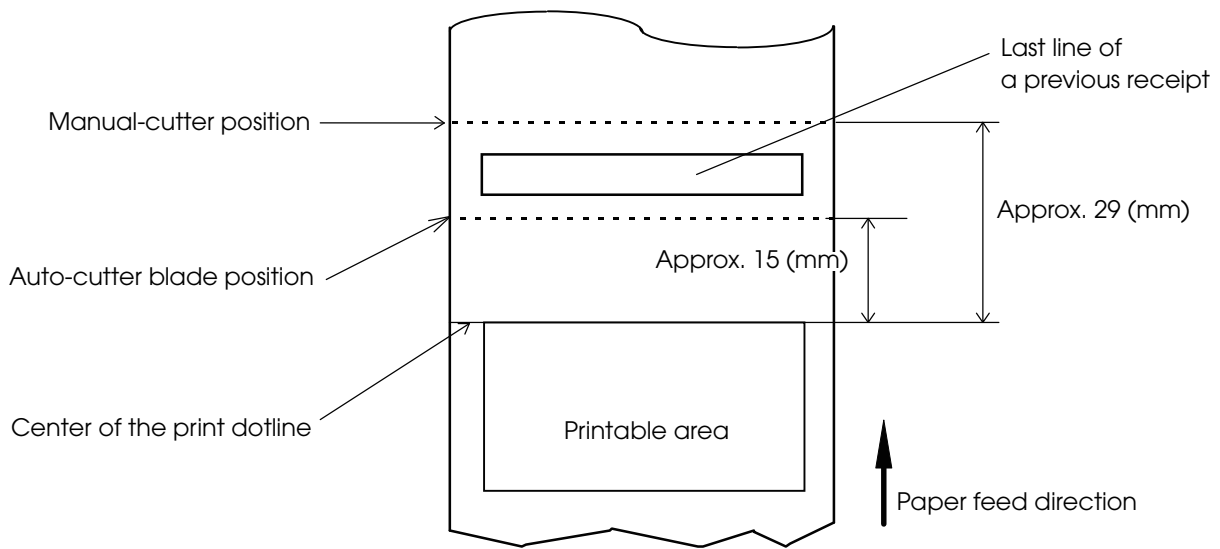
- In 2-divided energizing, the print position within the printable area of the thermal elements for dots 1 to 256 and 257 to 360 is shifted approximately 0.07 mm $\{0.0028\}$ " in the paper feed direction as shown in the figure below.



- In 4-divided energizing, the print position within the printable area of the thermal elements for dots 1 to 128, 129 to 256, and 257 to 360 is shifted approximately 0.04 mm $\{0.0016\}$ " in the paper feed direction as shown in the figure below.



Printing and Cutting Positions



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 auto-cutter.

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 | 58 + 0.5/-1.0 mm |
| | Paper width | 79.5 ± 0.5 mm | 57.5 ± 0.5 mm |
| Specified roll paper type | | NTP080-80 TRP080-80H | NTP058-80 TRP058-80H |
| Specified original paper type | | P300, P310, P350 (Kanzaki Specialty Papers) AF50KS-E (Jujo Thermal Oy) F5041 (Mitsubishi HiTec Paper Flensburg GmbH) KT55F20, KT48F20 (Koehler Paper Group) | |

CAUTION

- Paper must not be pasted to the roll paper core.
- The remaining amount of the roll paper when a roll paper near-end is detected differs depending on the core type.

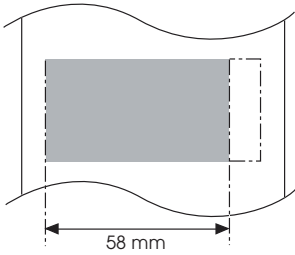
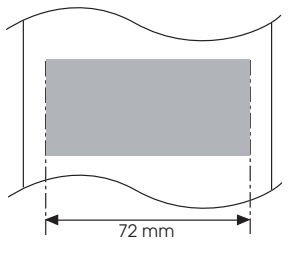
Electrical Characteristics

| | | |
|---------------------------------|----------------|--|
| AC adapter, RA | Input voltage | AC 90 V to 264 V (AC 100 V to 240 V) |
| | Output voltage | DC 24 V / DC 5 V (2 outputs) |
| Supply current from the product | USB | 5 V/2.0 A Maximum supply current of per port: 500 mA |
| | microSD | 3.3 V/80 mA |
| Consumed current (Rating) | | 24 V/1.8 A, 5 V/2.5 A |
| Consumed power | | When operating: 38.7W (230V/50Hz), 38.8W (115V/60Hz) When standby: 2.8W (230V/50Hz), 2.7W (115V/60Hz) When off: 0.43W (230V/50Hz), 0.30W (115V/60Hz) |
| Power supply On/Off | | Use the power switch on the product |

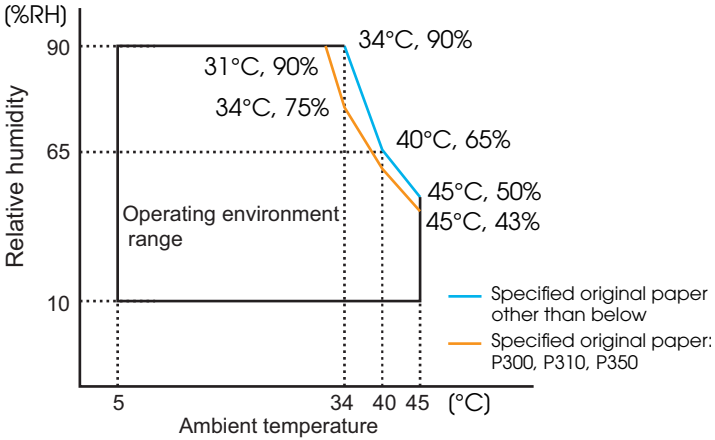
CAUTION

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 (512 dots)

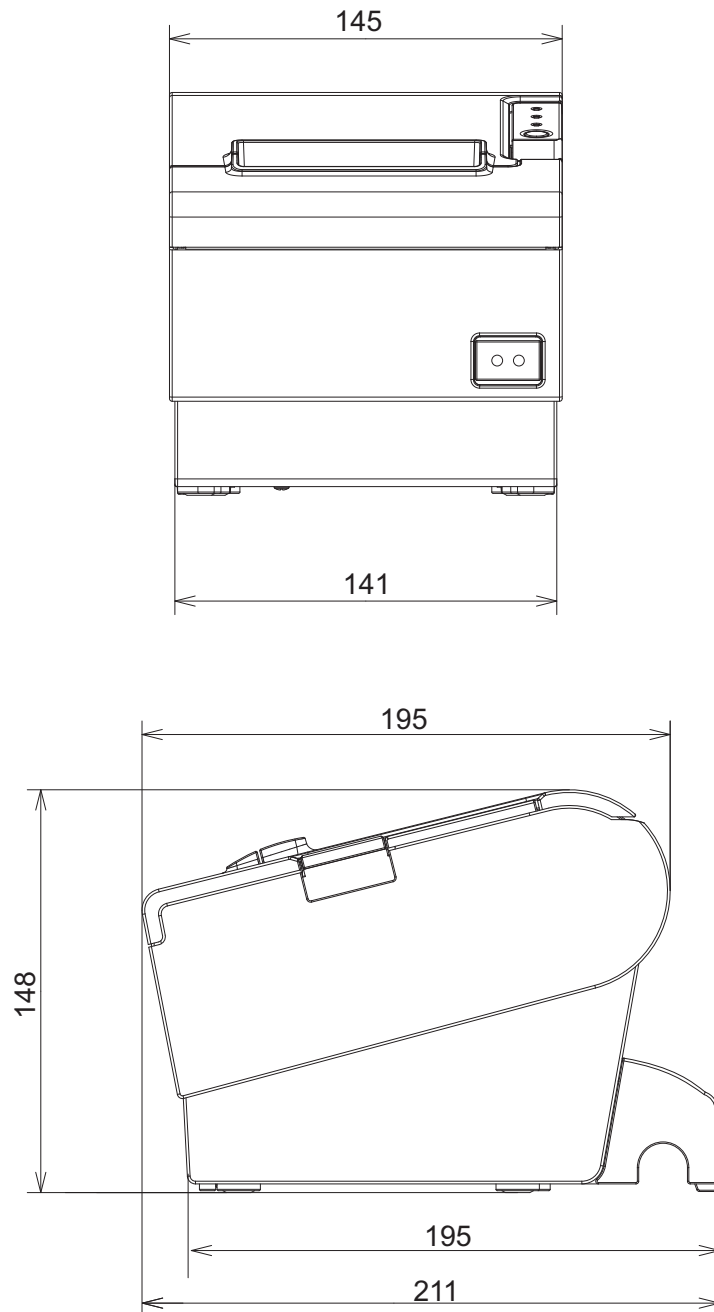
| Print ratio | 80% | 100% |
|---------------|--|---|
| Print example |  |  |
| Print length | 20 mm | 20 mm |

Environmental Conditions

| | | |
|----------------------------|------------------------------|--|
| Temperature/ Humidity | Operating | 5 to 45°C {41 to 113°F}, 10 to 90% RH (See the operating temperature and humidity range below.) |
| | Storage (Factory packing) | <p>-10 to 50°C {14 to 122°F}, 10 to 90% RH (except for paper)</p>  <p>— Specified original paper other than below — Specified original paper: P300, P310, P350</p> |
| Acoustic noise (operating) | | <p>Approximately 55 dB (bystander position)</p> <p>Note:</p> <p>The values above are measured in the Epson evaluation condition.</p> <p>Acoustic noise differs depending on the paper used, printing contents, and the setting values, such as print speed or print density.</p> |

External Dimensions and Mass

- Width: Approximately 145 mm {5.71"}
- Depth: Approximately 195 mm {7.68"}
- Height: Approximately 148 mm {5.83"}
- Mass: Approximately 1.6 kg {3.53 lb} (except for roll paper)



(Units: mm)

AC Adapter, RA

| | |
|-------------------|--|
| Input conditions | Input voltage: AC 100V to 240V |
| | Frequency: 50/60 Hz |
| | Input current (rating): 1.3A |
| Output conditions | Output voltage (rating): DC 24V \pm 5% |
| | Output current (rating): 2.1A |

Option Specifications

Wireless LAN Cable Set (OT-WL01)

| | |
|--|--|
| Wireless module | ELPAP07: 802. 11b/g/n wireless LAN Module (EPSON) |
| Standard | IEEE802.11b/g/n (Wi-Fi certificated) |
| SSID | 1 to 32 one-byte alphanumeric and numbers |
| Connection mode | Ad hoc mode, Infrastructure mode |
| Authentic method, Encryption algorithm | Open+WEP, Shared+WEP, WPA-PSK+TKIP, WPA-PSK+AES, WPA2-PSK+AES, WEP64, WEP128, TKIP, AES |
| Power voltage | DC 4.5V to 5.5V |
| Current consumption | 300 mA at maximum |
| Frequency range | 2.4 GHz band |
| Potential interference range | 40 m |
| Overall dimensions | Wireless LAN unit: Approx. 24 x 51 x 10 (W x D x H) USB extension cable: 1 m (length) |

Customer Display (DM-D110)

| | |
|--|---|
| Display format | Vacuum fluorescent display |
| Displayed number of characters | 40 characters (20 columns x2 lines, 5x7 dot matrix) |
| Display color | Green (505 nm) |
| Brightness | 690 cd/m ² |
| Types of characters | Alphanumeric characters: 95 characters International characters: 37 characters Graphic characters: 128 characters x12 pages |
| Character construction | 5 x 7 dot matrix, cursor |
| Character size | 3.5 x 5.0 mm |
| Character pitch | 5.2 mm |
| Interface | USB 2.0 Full speed |
| Reliability | 20000 hours (Expected Life) |
| Power source | DC 5 V 0.5 A (Maximum) |
| Power consumption | Approx. 2.5 W |
| External dimensions (with option stand) | 165 x 100 x 135 mm {6.50 x 3.94 x 5.31"} (W x D x H) |
| Weight (Mass) (with option stand) | Approx. 0.67 kg {1.48 lb} |
| Tilt angle | Maximum 48° (4 steps, 5 position) |
| Horizontal rotation angle | Maximum 90° |
| Power supply | Supplied from TM-T88V-i |

Setting Items for Software Setting Mode

For details about how to set the software setting mode, see ["Software Setting Mode" on page 113](#).

| Setting Item | | | Setting Values |
|---------------------------------------|-----------------------|------------------------------------|--|
| 1st page | 2nd page | 3rd page | * Underlined values are the initial settings. |
| 1: Print Current Settings | | | - |
| 2: Print Density | 1: Monochrome | | 100%, 105%, 110%, 115%, 120%, 125%, 130%, 70%, 75%, 80%, 85%, 90%, 95%, <u>Depends On Dip Switch</u> |
| | 2: Multi-Tone | | <u>100%</u> , 105%, 110%, 115%, 120%, 125%, 130%, 70%, 75%, 80%, 85%, 90%, 95% |
| 3: Baud Rate * ¹ | | | 2400bps, 4800bps, 9600bps, 19200bps, <u>38400bps</u> , 57600bps, 115200bps |
| 4: 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> |
| 5: Auto Paper Feed&Cut at cover close | | | Enable, <u>Disable</u> |
| 6: Paper Width | | | <u>80mm</u> , 58mm |
| 8: Default Character * ¹ | 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 |
| | | 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) |

| Setting Item | | | Setting Values * Underlined values are the initial settings. |
|--|--|---------------------------|--|
| 1st page | 2nd page | 3rd page | |
| 8: Default Character (Continued from the previous page) | 1: Code Page (Continued from the previous page) | 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> , France, Germany, Britain, Denmark I, Sweden, Italy, Spain I, Norway, Denmark II, Spain II, Latin America, Slovenia/Croatia |
| | | 2: Asia, Arabia | Japan, Korea, China, Vietnam, Arabia |
| 9: Embedded Font Replacement | 1: Font A Replacement | | <u>Font A(No Replacement)</u> , Font B |
| | 2: Font B Replacement | | Font A, <u>Font B(No Replacement)</u> |
| 10: Interface Selection *2 | | | UIB, Built-in USB, <u>Auto</u> |
| 11: USB Interface Settings *2 | 1: Class | | <u>Vendor Class</u> , Printer Class |
| 12: Power Supply Output | | | Level 1(Low), Level 2, <u>Level 3(High)</u> |
| 13: Printing Speed | | | Level 1(Slow), Level 2, Level 3, Level 4, Level 5, Level 6, Level 7, Level 8, Level 9, Level 10, Level 11, Level 12, <u>Level 13(Fast)</u> |

| Setting Item | | | Setting Values * Underlined values are the initial settings. |
|-------------------------------|--------------------------------|-------------------------------|---|
| 1st page | 2nd page | 3rd page | |
| 14: Other Settings | 1: Printer Model* ² | | <u>TM-T88V</u> , TM-T88IV |
| | 2: 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 | | |

*1: No settings are required.

*2: Do not change the settings.

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 ["International Character Sets" on page 185.](#)) 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 | | XON 17 | ! 33 | 1 49 | A 65 | Q 81 | a 97 | q 113 |
| 2 | | | " 34 | 2 50 | B 66 | R 82 | b 98 | r 114 |
| 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 | | & 38 | 6 54 | F 70 | V 86 | f 102 | v 118 |
| 7 | | | ' 39 | 7 55 | G 71 | W 87 | g 103 | w 119 |
| 8 | | CAN 24 | (40 | 8 56 | H 72 | X 88 | h 104 | x 120 |
| 9 | HT 9 | |) 41 | 9 57 | I 73 | Y 89 | i 105 | y 121 |
| A | LF 10 | | * 42 | : 58 | J 74 | Z 90 | j 106 | z 122 |
| B | | 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 | | RS 30 | . 46 | > 62 | N 78 | ^ 94 | n 110 | ~ 126 |
| F | | | / 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 | Ł 192 | ⋈ 208 | α 224 | ≡ 240 |
| 1 | Ü 129 | æ 145 | í 161 | ⋮ 177 | Ł 193 | Ƨ 209 | β 225 | ± 241 |
| 2 | é 130 | Æ 146 | ó 162 | ⋮ 178 | τ 194 | π 210 | Γ 226 | ≥ 242 |
| 3 | â 131 | ô 147 | ú 163 | l 179 | t 195 | ⋈ 211 | π 227 | ≤ 243 |
| 4 | ä 132 | ö 148 | ñ 164 | l 180 | - 196 | Ł 212 | Σ 228 | ƒ 244 |
| 5 | à 133 | ò 149 | ñ 165 | l 181 | † 197 | Ƒ 213 | σ 229 | Ƶ 245 |
| 6 | å 134 | û 150 | ä 166 | ll 182 | ƒ 198 | π 214 | μ 230 | ÷ 246 |
| 7 | ç 135 | ù 151 | ö 167 | π 183 | ll 199 | ll 215 | τ 231 | ≈ 247 |
| 8 | ê 136 | ÿ 152 | ı 168 | ƒ 184 | ⋈ 200 | ≠ 216 | φ 232 | ° 248 |
| 9 | ë 137 | ö 153 | ƒ 169 | ll 185 | ƒ 201 | Ƶ 217 | θ 233 | • 249 |
| A | è 138 | ü 154 | ƒ 170 | ll 186 | ⋈ 202 | ƒ 218 | Ω 234 | • 250 |
| B | ï 139 | ϕ 155 | ½ 171 | π 187 | π 203 | ■ 219 | δ 235 | √ 251 |
| C | î 140 | £ 156 | ¼ 172 | ll 188 | ll 204 | ■ 220 | ω 236 | n 252 |
| D | ï 141 | ¥ 157 | ı 173 | ll 189 | = 205 | l 221 | φ 237 | ² 253 |
| E | Ä 142 | ƒ 158 | « 174 | ƒ 190 | ll 206 | l 222 | ε 238 | ■ 254 |
| F | Å 143 | f 159 | » 175 | ƒ 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 | X 240 |
| 1 | ▬ 129 | ⊥ 145 | ◦ 161 | ア 177 | チ 193 | ム 209 | ト 225 | 円 241 |
| 2 | ▬ 130 | ⊥ 146 | ⌈ 162 | イ 178 | ツ 194 | メ 210 | キ 226 | 年 242 |
| 3 | ▬ 131 | ⊥ 147 | ┘ 163 | ウ 179 | テ 195 | モ 211 | ト 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 | ヤ 172 | シ 188 | フ 204 | ワ 220 | ● 236 | 村 252 |
| D | 141 | 、 157 | ユ 173 | ス 189 | ハ 205 | ソ 221 | ○ 237 | 人 253 |
| E | 142 | 、 158 | ヨ 174 | セ 190 | ホ 206 | ” 222 | / 238 | ☼ 254 |
| F | ⊥ 143 | ノ 159 | ツ 175 | リ 191 | マ 207 | ° 223 | ＼ 239 | SP 255 |

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

Page 3 (PC860: Portuguese)

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|
| 0 | Ç <small>128</small> | É <small>144</small> | á <small>160</small> | ☼ <small>176</small> | Ł <small>192</small> | ⋈ <small>208</small> | α <small>224</small> | ≡ <small>240</small> |
| 1 | ü <small>129</small> | À <small>145</small> | í <small>161</small> | ☼ <small>177</small> | ⊥ <small>193</small> | ⸗ <small>209</small> | β <small>225</small> | ± <small>241</small> |
| 2 | é <small>130</small> | È <small>146</small> | ó <small>162</small> | ☼ <small>178</small> | τ <small>194</small> | π <small>210</small> | Γ <small>226</small> | ≥ <small>242</small> |
| 3 | â <small>131</small> | ô <small>147</small> | ú <small>163</small> | ∣ <small>179</small> | † <small>195</small> | ⋈ <small>211</small> | π <small>227</small> | ≤ <small>243</small> |
| 4 | ã <small>132</small> | õ <small>148</small> | ñ <small>164</small> | ‡ <small>180</small> | – <small>196</small> | ⋈ <small>212</small> | Σ <small>228</small> | ∫ <small>244</small> |
| 5 | à <small>133</small> | ò <small>149</small> | Ñ <small>165</small> | ‡ <small>181</small> | † <small>197</small> | ƒ <small>213</small> | σ <small>229</small> | ∫ <small>245</small> |
| 6 | Á <small>134</small> | Ú <small>150</small> | á <small>166</small> | ∥ <small>182</small> | ƒ <small>198</small> | π <small>214</small> | μ <small>230</small> | ÷ <small>246</small> |
| 7 | ç <small>135</small> | ù <small>151</small> | o <small>167</small> | π <small>183</small> | ∥ <small>199</small> | ‡ <small>215</small> | τ <small>231</small> | ≈ <small>247</small> |
| 8 | ê <small>136</small> | ï <small>152</small> | ç <small>168</small> | ƒ <small>184</small> | ⋈ <small>200</small> | ‡ <small>216</small> | φ <small>232</small> | ° <small>248</small> |
| 9 | Ê <small>137</small> | Õ <small>153</small> | ò <small>169</small> | ∥ <small>185</small> | ƒ <small>201</small> | ∫ <small>217</small> | θ <small>233</small> | • <small>249</small> |
| A | è <small>138</small> | Ü <small>154</small> | ˘ <small>170</small> | ∥ <small>186</small> | ⋈ <small>202</small> | ∫ <small>218</small> | Ω <small>234</small> | • <small>250</small> |
| B | Í <small>139</small> | ϕ <small>155</small> | ½ <small>171</small> | ∫ <small>187</small> | ⸗ <small>203</small> | ■ <small>219</small> | δ <small>235</small> | √ <small>251</small> |
| C | Ô <small>140</small> | £ <small>156</small> | ¼ <small>172</small> | ∫ <small>188</small> | ∥ <small>204</small> | ■ <small>220</small> | ω <small>236</small> | n <small>252</small> |
| D | î <small>141</small> | Û <small>157</small> | ı <small>173</small> | ⋈ <small>189</small> | = <small>205</small> | ∣ <small>221</small> | φ <small>237</small> | ² <small>253</small> |
| E | Ǻ <small>142</small> | ϖ <small>158</small> | « <small>174</small> | ∫ <small>190</small> | ∥ <small>206</small> | ∣ <small>222</small> | ε <small>238</small> | ■ <small>254</small> |
| F | Â <small>143</small> | Ó <small>159</small> | » <small>175</small> | ∫ <small>191</small> | ⊥ <small>207</small> | ■ <small>223</small> | ∩ <small>239</small> | SP <small>255</small> |

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|-------|-------|--------|--------|--------|-------|--------|
| 0 | Ç 128 | É 144 | Ì 160 | ⋮ 176 | Ł 192 | ⍑ 208 | α 224 | ≡ 240 |
| 1 | Ü 129 | È 145 | Í 161 | ⋮ 177 | Ł̇ 193 | ṽ 209 | β 225 | ± 241 |
| 2 | é 130 | Ê 146 | Ó 162 | ⋮ 178 | ṽ 194 | π 210 | Γ 226 | ≥ 242 |
| 3 | â 131 | Ô 147 | Ú 163 | Ī 179 | ṽ 195 | ⍑ 211 | π 227 | ≤ 243 |
| 4 | Â 132 | Ë 148 | Û 164 | Ī̇ 180 | — 196 | Ł̇ 212 | Σ 228 | ∫ 244 |
| 5 | à 133 | Ï 149 | Ü 165 | Ī̇ 181 | † 197 | ƒ 213 | σ 229 | ∫ 245 |
| 6 | ¶ 134 | Û 150 | Ɔ 166 | Ī̇ 182 | ƒ 198 | π 214 | μ 230 | ÷ 246 |
| 7 | ç 135 | Ù 151 | — 167 | π 183 | Ī̇ 199 | ‡ 215 | τ 231 | ≈ 247 |
| 8 | ê 136 | Ɔ 152 | Î 168 | ƒ 184 | Ł̇ 200 | ‡ 216 | φ 232 | ° 248 |
| 9 | ë 137 | Û 153 | ƒ 169 | Ī̇ 185 | ƒ 201 | ∫ 217 | θ 233 | • 249 |
| A | è 138 | Ü 154 | ƒ 170 | Ī̇ 186 | ⍑ 202 | ƒ 218 | Ω 234 | • 250 |
| B | ï 139 | ϕ 155 | ½ 171 | π 187 | ṽ 203 | ■ 219 | δ 235 | √ 251 |
| C | î 140 | £ 156 | ¼ 172 | ⍑ 188 | Ī̇ 204 | ■ 220 | ω 236 | n 252 |
| D | = 141 | Û 157 | ¾ 173 | ⍑ 189 | = 205 | ∫ 221 | φ 237 | ² 253 |
| E | À 142 | Û 158 | « 174 | ∫ 190 | Ī̇ 206 | ∫ 222 | ε 238 | ■ 254 |
| F | § 143 | ƒ 159 | » 175 | ∫ 191 | ± 207 | ■ 223 | ∩ 239 | SP 255 |

Page 5 (PC865: Nordic)

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|-------|-------|-------|-------|-------|-------|--------|
| 0 | Ç 128 | É 144 | á 160 | ☼ 176 | Ł 192 | Ɑ 208 | α 224 | ≡ 240 |
| 1 | Ü 129 | æ 145 | í 161 | ☼ 177 | Ł 193 | Ṛ 209 | β 225 | ± 241 |
| 2 | é 130 | Æ 146 | ó 162 | ☼ 178 | Ṛ 194 | π 210 | Γ 226 | ≥ 242 |
| 3 | â 131 | ô 147 | ú 163 | ı 179 | ƒ 195 | Ɑ 211 | π 227 | ≤ 243 |
| 4 | ä 132 | ö 148 | ñ 164 | ı 180 | - 196 | Ł 212 | Σ 228 | ƒ 244 |
| 5 | à 133 | ò 149 | ñ 165 | ƒ 181 | † 197 | ƒ 213 | σ 229 | ƒ 245 |
| 6 | å 134 | û 150 | ä 166 | 182 | ƒ 198 | π 214 | μ 230 | ÷ 246 |
| 7 | ç 135 | ù 151 | o 167 | π 183 | 199 | 215 | τ 231 | ≈ 247 |
| 8 | ê 136 | ÿ 152 | ı 168 | ƒ 184 | Ɑ 200 | ≠ 216 | φ 232 | ° 248 |
| 9 | ë 137 | ö 153 | ƒ 169 | 185 | ƒ 201 | ƒ 217 | θ 233 | • 249 |
| A | è 138 | ü 154 | ƒ 170 | 186 | Ɑ 202 | ƒ 218 | Ω 234 | • 250 |
| B | ï 139 | ø 155 | ½ 171 | π 187 | π 203 | ■ 219 | δ 235 | √ 251 |
| C | î 140 | £ 156 | ¼ 172 | Ɑ 188 | 204 | ■ 220 | ω 236 | n 252 |
| D | ì 141 | Ø 157 | ı 173 | Ɑ 189 | = 205 | ı 221 | φ 237 | ² 253 |
| E | Ä 142 | ƒ 158 | « 174 | ƒ 190 | 206 | ı 222 | ε 238 | ■ 254 |
| F | Å 143 | f 159 | α 175 | ƒ 191 | Ɑ 207 | ■ 223 | ∩ 239 | SP 255 |

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|----------|--------|---------|------------|-------------|--------|--------|
| 0 | Ç 128 | Ɔ 144 | İ 160 | ⋮ 176 | Ł 192 | Ƨ 208 | Ʒ 224 | - 240 |
| 1 | Ü 129 | SP 145 | İ̇ 161 | ⋮̇ 177 | Ł̇ 193 | Ƨ̇ 209 | Ʒ̇ 225 | ± 241 |
| 2 | é 130 | Ɔ̇ 146 | ó 162 | ⋮̇̇ 178 | Ƨ̇̇ 194 | Ƨ̇̇̇ 210 | θ 226 | U 242 |
| 3 | â 131 | ô 147 | ú 163 | l 179 | ł 195 | χ 211 | ł 227 | φ 243 |
| 4 | ä 132 | ö 148 | á 164 | ł 180 | - 196 | ψ 212 | κ 228 | χ 244 |
| 5 | à 133 | Ɔ̇̇ 149 | β 165 | κ 181 | ł̇ 197 | Ω 213 | λ 229 | § 245 |
| 6 | À 134 | Û 150 | Γ 166 | Λ 182 | Π 198 | α 214 | μ 230 | ψ 246 |
| 7 | ç 135 | ù 151 | Δ 167 | Μ 183 | Ρ 199 | β 215 | ν 231 | · 247 |
| 8 | ê 136 | Ɔ̇̇̇ 152 | Ε 168 | Ν 184 | Ł̇̇ 200 | Ƨ̇̇̇ 216 | Ξ 232 | ° 248 |
| 9 | ë 137 | ö̇ 153 | Ζ 169 | Ψ 185 | Ƨ̇̇̇̇ 201 | Ƨ̇̇̇̇̇ 217 | ο 233 | ¨ 249 |
| A | è 138 | Û̇ 154 | Η 170 | Ψ̇ 186 | Ł̇̇̇ 202 | Ƨ̇̇̇̇̇̇ 218 | π 234 | ω 250 |
| B | ï 139 | á̇ 155 | ½ 171 | π 187 | π̇ 203 | ■ 219 | ρ 235 | Ü 251 |
| C | î 140 | £ 156 | θ 172 | Ψ̇̇ 188 | ł̇̇̇ 204 | ■̇ 220 | σ 236 | Û̇ 252 |
| D | Ě 141 | É 157 | Ι 173 | Ξ̇ 189 | = 205 | δ 221 | ς 237 | Ű 253 |
| E | Ä 142 | ň 158 | « 174 | Ο 190 | ł̇̇̇̇̇ 206 | ε 222 | τ 238 | ■̇ 254 |
| F | Ĥ 143 | ĺ 159 | » 175 | Γ̇ 191 | Σ 207 | ■̇̇ 223 | ´ 239 | SP 255 |

Page 12 (PC853: Turkish)

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|-------|--------|-------|-------|--------|-------|--------|
| 0 | Ç 128 | É 144 | á 160 | ⋮ 176 | Ł 192 | SP 208 | Ó 224 | - 240 |
| 1 | Ü 129 | Ĉ 145 | í 161 | ⋮ 177 | Ł 193 | SP 209 | ß 225 | SP 241 |
| 2 | é 130 | Ċ 146 | ó 162 | ⋮ 178 | Ƨ 194 | Ê 210 | Ô 226 | ℓ 242 |
| 3 | â 131 | ô 147 | ú 163 | l 179 | Ƨ 195 | Ë 211 | Ò 227 | ħ 243 |
| 4 | ä 132 | ö 148 | ñ 164 | l 180 | - 196 | È 212 | Ĝ 228 | ˘ 244 |
| 5 | à 133 | ò 149 | Ñ 165 | Á 181 | † 197 | l 213 | ğ 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 | ℥ 231 | · 247 |
| 8 | ê 136 | ï 152 | Ĥ 168 | Ş 184 | Ł 200 | İ 216 | ħ 232 | ° 248 |
| 9 | ë 137 | ö 153 | ĥ 169 | 185 | Ɔ 201 | Ɔ 217 | Ú 233 | ¨ 249 |
| A | è 138 | Û 154 | SP 170 | 186 | Ł 202 | Ɔ 218 | Û 234 | ˙ 250 |
| B | ï 139 | ĝ 155 | ½ 171 | 187 | Ɔ 203 | ■ 219 | Ù 235 | SP 251 |
| C | î 140 | £ 156 | Ĵ 172 | 188 | Ɔ 204 | ■ 220 | Û 236 | ³ 252 |
| D | ì 141 | Ĝ 157 | Ş 173 | Ž 189 | = 205 | SP 221 | Û 237 | ² 253 |
| E | Ä 142 | × 158 | « 174 | Ž 190 | Ɔ 206 | İ 222 | · 238 | ■ 254 |
| F | Ĉ 143 | Ĵ 159 | » 175 | Ƨ 191 | Ɔ 207 | ■ 223 | ˘ 239 | SP 255 |

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|-------|-------------------|-------|-------|-------|--------|-------------------|
| 0 | Ç 128 | É 144 | á 160 | ☼ 176 | Ł 192 | o 208 | Ó 224 | - 240 |
| 1 | ü 129 | æ 145 | í 161 | ☼ 177 | Ł 193 | a 209 | β 225 | ± 241 |
| 2 | é 130 | Æ 146 | ó 162 | ☼ 178 | Ƨ 194 | Ê 210 | Ô 226 | SP 242 |
| 3 | â 131 | ô 147 | ú 163 | l 179 | ł 195 | Ë 211 | Ò 227 | $\frac{3}{4}$ 243 |
| 4 | ä 132 | ö 148 | ñ 164 | ł 180 | - 196 | È 212 | Õ 228 | ¶ 244 |
| 5 | à 133 | ò 149 | Ñ 165 | Á 181 | † 197 | € 213 | Ö 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 | Ǻ 199 | Î 215 | SP 231 | · 247 |
| 8 | ê 136 | ï 152 | ı 168 | © 184 | ℔ 200 | İ 216 | × 232 | ° 248 |
| 9 | ë 137 | ö 153 | ® 169 | ¶ 185 | ℔ 201 | Ĵ 217 | Ú 233 | ¨ 249 |
| A | è 138 | ü 154 | ¬ 170 | ¶ 186 | ℔ 202 | ŕ 218 | Û 234 | • 250 |
| B | ï 139 | ø 155 | $\frac{1}{2}$ 171 | ¶ 187 | ƿ 203 | ■ 219 | Ü 235 | ¹ 251 |
| C | î 140 | £ 156 | $\frac{1}{4}$ 172 | ¶ 188 | ƿ 204 | ■ 220 | İ 236 | ³ 252 |
| D | ı 141 | Ø 157 | ı 173 | ¢ 189 | = 205 | ı 221 | ÿ 237 | ² 253 |
| E | Ǻ 142 | § 158 | « 174 | ¥ 190 | ¶ 206 | İ 222 | ¯ 238 | ■ 254 |
| F | À 143 | § 159 | » 175 | ł 191 | ¤ 207 | ■ 223 | ˘ 239 | SP 255 |

Page 14 (PC737: Greek)

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|-------|-------|-------|-------|-------|-------|--------|
| 0 | Α 128 | Ρ 144 | Λ 160 | ⋮ 176 | Λ 192 | ⋮ 208 | ω 224 | Ϟ 240 |
| 1 | Β 129 | Σ 145 | Κ 161 | ⋮ 177 | ⊥ 193 | ⊥ 209 | ά 225 | ± 241 |
| 2 | Γ 130 | Τ 146 | λ 162 | ⋮ 178 | τ 194 | π 210 | έ 226 | ≥ 242 |
| 3 | Δ 131 | Υ 147 | μ 163 | ⋮ 179 | ⊥ 195 | ⋮ 211 | ή 227 | ≤ 243 |
| 4 | Ε 132 | Φ 148 | ν 164 | ⊥ 180 | - 196 | ⊥ 212 | ϊ 228 | ϊ 244 |
| 5 | Ζ 133 | Χ 149 | Ξ 165 | ⊥ 181 | ⊥ 197 | ⊥ 213 | ί 229 | ÿ 245 |
| 6 | Η 134 | Ψ 150 | ο 166 | ⋮ 182 | ⊥ 198 | π 214 | ό 230 | ÷ 246 |
| 7 | Θ 135 | Ω 151 | π 167 | π 183 | ⋮ 199 | ⋮ 215 | ύ 231 | ≈ 247 |
| 8 | Ι 136 | α 152 | ρ 168 | ⊥ 184 | ⋮ 200 | ⊥ 216 | ü 232 | ° 248 |
| 9 | Κ 137 | β 153 | σ 169 | ⋮ 185 | ⊥ 201 | ⊥ 217 | ώ 233 | • 249 |
| A | Λ 138 | γ 154 | ς 170 | ⋮ 186 | ⋮ 202 | ⊥ 218 | ä 234 | • 250 |
| B | Μ 139 | δ 155 | τ 171 | ⋮ 187 | ⋮ 203 | ■ 219 | ë 235 | √ 251 |
| C | Ν 140 | ε 156 | υ 172 | ⋮ 188 | ⋮ 204 | ■ 220 | Ë 236 | η 252 |
| D | Ξ 141 | ζ 157 | φ 173 | ⋮ 189 | = 205 | ⋮ 221 | Ï 237 | ² 253 |
| E | Ο 142 | η 158 | χ 174 | ⊥ 190 | ⋮ 206 | ⋮ 222 | ö 238 | ■ 254 |
| F | Π 143 | θ 159 | ψ 175 | ⊥ 191 | ⊥ 207 | ■ 223 | ÿ 239 | SP 255 |

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-----------|-----------|-----------|----------|----------|-----------|----------|-----------|
| 0 | SP 128 | SP 144 | SP 160 | ° 176 | ĩ 192 | Π 208 | Û 224 | π 240 |
| 1 | SP 129 | SP 145 | ‘ 161 | ± 177 | À 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 | À 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 | ¸ 170 | Ί 186 | Κ 202 | Ï 218 | κ 234 | ϊ 250 |
| B | SP 139 | SP 155 | « 171 | » 187 | Λ 203 | ÿ 219 | λ 235 | ÿ 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 | Υ 190 | Ξ 206 | ή 222 | ξ 238 | ώ 254 |
| F | SP 143 | SP 159 | - 175 | Ω 191 | Ο 207 | ί 223 | ο 239 | SP 255 |

| 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 | ì 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 | f 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 | ï 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 | Л 192 | Ц 208 | р 224 | Ё 240 |
| 1 | Б 129 | С 145 | б 161 | ⌘ 177 | л 193 | Т 209 | с 225 | ё 241 |
| 2 | В 130 | Т 146 | в 162 | ⌘ 178 | т 194 | П 210 | т 226 | ё 242 |
| 3 | Г 131 | У 147 | г 163 | І 179 | т 195 | Ц 211 | у 227 | ё 243 |
| 4 | Д 132 | Ф 148 | д 164 | І 180 | — 196 | Е 212 | Ф 228 | ї 244 |
| 5 | Е 133 | Х 149 | е 165 | ѣ 181 | † 197 | Р 213 | Х 229 | ї 245 |
| 6 | Ж 134 | Ц 150 | ж 166 | 182 | ѣ 198 | П 214 | Ц 230 | ў 246 |
| 7 | З 135 | Ч 151 | з 167 | п 183 | 199 | 215 | Ч 231 | ў 247 |
| 8 | И 136 | Ш 152 | и 168 | ѣ 184 | Ц 200 | † 216 | Ш 232 | ° 248 |
| 9 | Й 137 | Щ 153 | й 169 | 185 | Р 201 | Ј 217 | Щ 233 | • 249 |
| A | К 138 | Ъ 154 | к 170 | 186 | Ц 202 | Г 218 | Ъ 234 | • 250 |
| B | Л 139 | Ы 155 | л 171 | П 187 | Т 203 | ■ 219 | Ы 235 | √ 251 |
| C | М 140 | Ь 156 | м 172 | Ц 188 | 204 | ■ 220 | Ь 236 | № 252 |
| D | Н 141 | Э 157 | н 173 | Ц 189 | = 205 | ■ 221 | Э 237 | ¤ 253 |
| E | О 142 | Ю 158 | о 174 | Ј 190 | 206 | ■ 222 | Ю 238 | ■ 254 |
| F | П 143 | Я 159 | п 175 | Г 191 | Ц 207 | ■ 223 | Я 239 | SP 255 |

Page 18 (PC852: Latin 2)

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|-------|-------|-------|-------|-------|-------|--------|
| 0 | Ç 128 | É 144 | á 160 | ⌘ 176 | Ł 192 | đ 208 | Ó 224 | - 240 |
| 1 | ü 129 | Í 145 | í 161 | ⌘ 177 | Ł 193 | Đ 209 | β 225 | ˘ 241 |
| 2 | é 130 | Í 146 | ó 162 | ⌘ 178 | τ 194 | Đ 210 | ô 226 | ˙ 242 |
| 3 | â 131 | ô 147 | ú 163 | ı 179 | ı 195 | Ě 211 | Ń 227 | ˘ 243 |
| 4 | ä 132 | ö 148 | À 164 | ı 180 | - 196 | ď 212 | ń 228 | ˘ 244 |
| 5 | û 133 | Ĺ 149 | ą 165 | Á 181 | † 197 | Ň 213 | ň 229 | § 245 |
| 6 | ć 134 | ĳ 150 | ž 166 | Â 182 | Ǻ 198 | í 214 | š 230 | ÷ 246 |
| 7 | ç 135 | Ś 151 | ž 167 | Ě 183 | ǻ 199 | î 215 | š 231 | ˙ 247 |
| 8 | ł 136 | Ś 152 | Ę 168 | Ş 184 | Ł 200 | ě 216 | Ř 232 | ° 248 |
| 9 | ë 137 | Ö 153 | ę 169 | ı 185 | ƒ 201 | ı 217 | Ú 233 | ¨ 249 |
| A | õ 138 | Ü 154 | € 170 | ı 186 | Ł 202 | ı 218 | ř 234 | ˙ 250 |
| B | õ 139 | Ť 155 | ž 171 | ı 187 | π 203 | ■ 219 | Ú 235 | Û 251 |
| C | î 140 | ť 156 | č 172 | ı 188 | ı 204 | ■ 220 | ý 236 | Ř 252 |
| D | ž 141 | ł 157 | Ş 173 | ž 189 | = 205 | ı 221 | ý 237 | ř 253 |
| E | Ǻ 142 | × 158 | « 174 | ž 190 | ı 206 | Ů 222 | ı 238 | ■ 254 |
| F | Ć 143 | č 159 | » 175 | ı 191 | ǻ 207 | ■ 223 | ˘ 239 | SP 255 |

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|-------|-------|-------|-------|-------|-------|--------|
| 0 | Ç 128 | É 144 | á 160 | ⋮ 176 | Ł 192 | ǒ 208 | Ó 224 | - 240 |
| 1 | Ü 129 | æ 145 | í 161 | ⋮ 177 | Ł 193 | Ɔ 209 | β 225 | ± 241 |
| 2 | é 130 | Æ 146 | ó 162 | ⋮ 178 | Ƨ 194 | Ê 210 | Ô 226 | = 242 |
| 3 | â 131 | ô 147 | ú 163 | 179 | Ƨ 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 | Ö 229 | § 245 |
| 6 | å 134 | û 150 | ä 166 | Â 182 | ã 198 | Í 214 | μ 230 | ÷ 246 |
| 7 | ç 135 | ù 151 | o 167 | À 183 | Ǻ 199 | Î 215 | þ 231 | · 247 |
| 8 | ê 136 | ÿ 152 | ¿ 168 | © 184 | Ł 200 | Ï 216 | Ɔ 232 | ° 248 |
| 9 | ë 137 | ö 153 | ® 169 | 185 | Ƨ 201 | Ɔ 217 | Ú 233 | ¨ 249 |
| A | è 138 | Ü 154 | ¬ 170 | 186 | Ł 202 | Ƨ 218 | Û 234 | • 250 |
| B | ï 139 | ø 155 | ½ 171 | ¶ 187 | π 203 | ■ 219 | Ü 235 | ¹ 251 |
| C | î 140 | £ 156 | ¼ 172 | ¶ 188 | Ƨ 204 | ■ 220 | Ý 236 | ³ 252 |
| D | ì 141 | Ø 157 | ı 173 | ¢ 189 | = 205 | ı 221 | Ÿ 237 | ² 253 |
| E | Ä 142 | × 158 | « 174 | ¥ 190 | ¶ 206 | Ï 222 | ˉ 238 | ■ 254 |
| F | Å 143 | f 159 | » 175 | ₯ 191 | ⱡ 207 | ■ 223 | ˘ 239 | SP 255 |

Page 20 (Thai Character Code 42)

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|-------|--------|-------|-------|-------|--------|--------|
| 0 | ┌ 128 | ๐ 144 | SP 160 | ฦ 176 | ย 192 | ไ 208 | · 224 | ๓ 240 |
| 1 | └ 129 | ๑ 145 | ก 161 | ฦ 177 | ร 193 | แ 209 | ๕ 225 | ๓+ 241 |
| 2 | ┌ 130 | ๒ 146 | ข 162 | ค 178 | ร 194 | โ 210 | ๖ 226 | ๓๔ 242 |
| 3 | └ 131 | ๓ 147 | ค 163 | ค 179 | ล 195 | ใ 211 | + 227 | ๓- 243 |
| 4 | ┌ 132 | ๔ 148 | ฦ 164 | ค 180 | ว 196 | ไ 212 | ๘ 228 | ๓๕ 244 |
| 5 | └ 133 | ๕ 149 | ง 165 | ท 181 | ศ 197 | ำ 213 | · 229 | ๓๖ 245 |
| 6 | ┌ 134 | ๖ 150 | จ 166 | ธ 182 | ช 198 | ำ 214 | ๐ 230 | ๓+ 246 |
| 7 | └ 135 | ๗ 151 | ฉ 167 | น 183 | ส 199 | ๐ 215 | ๑ 231 | ๓- 247 |
| 8 | ┌ 136 | ๘ 152 | ช 168 | บ 184 | ห 200 | ๑ 216 | ๑๑ 232 | ๓๕ 248 |
| 9 | └ 137 | ๙ 153 | ซ 169 | ป 185 | ฬ 201 | ๑ 217 | ๑๒ 233 | ๓๖ 249 |
| A | ┌ 138 | ๐ 154 | ฦ 170 | ผ 186 | อ 202 | ๑ 218 | ๑- 234 | ๓+ 250 |
| B | └ 139 | ๑ 155 | ฦ 171 | ผ 187 | ฮ 203 | ๑ 219 | ๑๑ 235 | ๓- 251 |
| C | ┌ 140 | ๒ 156 | ฎ 172 | ฝ 188 | ๕ 204 | ๑ 220 | ๑๒ 236 | ๓๕ 252 |
| D | └ 141 | ๓ 157 | ฎ 173 | ฝ 189 | ภ 205 | ๑ 221 | ๑๓ 237 | ๓๖ 253 |
| E | ┌ 142 | ๔ 158 | ฐ 174 | ภ 190 | ำ 206 | ๑ 222 | ๑- 238 | ๓+ 254 |
| F | └ 143 | ๕ 159 | ฑ 175 | ม 191 | ำ 207 | ๑ 223 | ๑๑ 239 | SP 255 |

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|--------|--------|-------|-------|-------|--------|-------|--------|
| 0 | ๕- 128 | ๕+ 144 | เ 160 | ๕ 176 | ภ 192 | ๕๕ 208 | เ 224 | ๐ 240 |
| 1 | ๕๕ 129 | ๕- 145 | ก 161 | ท 177 | ม 193 | ๕๖ 209 | แ 225 | ๑ 241 |
| 2 | ๕๖ 130 | ๕๕ 146 | ข 162 | ฒ 178 | ย 194 | า 210 | โ 226 | ๒ 242 |
| 3 | ๕+ 131 | ๕๖ 147 | ช 163 | ณ 179 | ร 195 | ำ 211 | ใ 227 | ๓ 243 |
| 4 | ๕- 132 | ๕+ 148 | ค 164 | ด 180 | ถ 196 | ๕ 212 | ไ 228 | ๔ 244 |
| 5 | ๕๕ 133 | ๐- 149 | ค 165 | ต 181 | ฉ 197 | ๕ 213 | า 229 | ๕ 245 |
| 6 | ๕๖ 134 | ๐๕ 150 | ฆ 166 | ถ 182 | ภ 198 | ๕ 214 | ำ 230 | ๖ 246 |
| 7 | ๕+ 135 | ๐๖ 151 | ง 167 | ท 183 | ว 199 | ๕ 215 | ๕ 231 | ๗ 247 |
| 8 | ๕๐ 136 | ๐+ 152 | จ 168 | ธ 184 | ศ 200 | ๐ 216 | ๐ 232 | ๘ 248 |
| 9 | ๕- 137 | ๐ 153 | ฉ 169 | น 185 | ช 201 | ๕ 217 | ๕ 233 | ๙ 249 |
| A | ๕๕ 138 | ๐ 154 | ช 170 | บ 186 | ส 202 | ๐ 218 | ๕ 234 | ๐ 250 |
| B | ๕๖ 139 | ๐ 155 | ช 171 | ป 187 | ท 203 | - 219 | + 235 | ๑ 251 |
| C | ๕+ 140 | ๐ 156 | ณ 172 | ผ 188 | ฬ 204 | ๐ 220 | ๕ 236 | ๒ 252 |
| D | ๕- 141 | ๐ 157 | ณ 173 | ผ 189 | อ 205 | ๐ 221 | ๐ 237 | ๓ 253 |
| E | ๕๕ 142 | ๐ 158 | ณ 174 | ผ 190 | ฮ 206 | ๐ 222 | ๕ 238 | ๔ 254 |
| F | ๕๖ 143 | ๐ 159 | ณ 175 | ผ 191 | ๐ 207 | ๐ 223 | ๐ 239 | SP 255 |

Page 26 (Thai Character Code 18)

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|--------|--------|-------|-------|--------|-------|--------|
| 0 | ┌ 128 | ๙ 144 | SP 160 | ๙ 176 | ภ 192 | ๕๕ 208 | ไ 224 | ๐ 240 |
| 1 | └ 129 | ๑ 145 | ก 161 | ท 177 | ม 193 | ๕๖ 209 | แ 225 | ๑ 241 |
| 2 | ┌ 130 | ๕- 146 | บ 162 | ฒ 178 | ย 194 | า 210 | โ 226 | ๒ 242 |
| 3 | └ 131 | ๕๕ 147 | ป 163 | ณ 179 | ร 195 | ำ 211 | ใ 227 | ๓ 243 |
| 4 | ┌ 132 | ๕๖ 148 | ค 164 | ด 180 | ถ 196 | ๗ 212 | ใ 228 | ๔ 244 |
| 5 | └ 133 | ๕+ 149 | ค 165 | ต 181 | ล 197 | ๘ 213 | า 229 | ๕ 245 |
| 6 | ┌ 134 | ๗- 150 | ฆ 166 | ถ 182 | ภ 198 | ๘ 214 | ำ 230 | ๖ 246 |
| 7 | └ 135 | ๗๕ 151 | ง 167 | ท 183 | ว 199 | ๘ 215 | ๕ 231 | ๗ 247 |
| 8 | ┌ 136 | ๗๖ 152 | จ 168 | ธ 184 | ศ 200 | ๑ 216 | ๑ 232 | ๘ 248 |
| 9 | └ 137 | ๗+ 153 | ฉ 169 | น 185 | ช 201 | ๑ 217 | ๕ 233 | ๙ 249 |
| A | ┌ 138 | ๗๑ 154 | ช 170 | บ 186 | ส 202 | ๑ 218 | ๕ 234 | ๑ 250 |
| B | █ 139 | ๗- 155 | ช 171 | ป 187 | ห 203 | ๗- 219 | + 235 | ๗- 251 |
| C | ← 140 | ๗๕ 156 | ฉ 172 | ผ 188 | ฬ 204 | ๗๕ 220 | ๕ 236 | ๗๕ 252 |
| D | ↑ 141 | ๗๖ 157 | ฉ 173 | ผ 189 | อ 205 | ๗๖ 221 | ๑ 237 | ๗๖ 253 |
| E | → 142 | ๗+ 158 | ฉ 174 | ผ 190 | ฮ 206 | ๗+ 222 | ๕ 238 | ๗+ 254 |
| F | ↓ 143 | ๗ 159 | ฉ 175 | ผ 191 | า 207 | ๗ 223 | ๑ 239 | SP 255 |

| 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 | ề 210 | õ 226 | ũ 242 |
| 3 | SP 131 | SP 147 | SP 163 | SP 179 | SP 195 | ễ 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 | ồ 229 | ừ 245 |
| 6 | SP 134 | SP 150 | SP 166 | ả 182 | ă 198 | ệ 214 | ỗ 230 | ử 246 |
| 7 | SP 135 | SP 151 | SP 167 | ã 183 | â 199 | ì 215 | ỗ 231 | ữ 247 |
| 8 | SP 136 | SP 152 | ă 168 | á 184 | ã 200 | ỉ 216 | ố 232 | ứ 248 |
| 9 | SP 137 | SP 153 | â 169 | ạ 185 | ã 201 | SP 217 | ộ 233 | ự 249 |
| A | SP 138 | SP 154 | ê 170 | SP 186 | ă 202 | SP 218 | ờ 234 | ỳ 250 |
| B | SP 139 | SP 155 | ô 171 | ã 187 | ạ 203 | SP 219 | ở 235 | ỷ 251 |
| C | SP 140 | SP 156 | ơ 172 | ã 188 | è 204 | ĩ 220 | ỡ 236 | ỹ 252 |
| D | SP 141 | SP 157 | ư 173 | ã 189 | SP 205 | í 221 | ở 237 | ý 253 |
| E | SP 142 | SP 158 | đ 174 | ã 190 | ẻ 206 | ị 222 | ợ 238 | ỵ 254 |
| F | SP 143 | SP 159 | SP 175 | SP 191 | ễ 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 | Ǻ 161 | SP 177 | SP 193 | Ě 209 | Ỏ 225 | Ủ 241 |
| 2 | SP 130 | SP 146 | Ǻ 162 | SP 178 | SP 194 | Ê 210 | Ỗ 226 | Ữ 242 |
| 3 | SP 131 | SP 147 | SP 163 | SP 179 | SP 195 | Ë 211 | Ó 227 | Ú 243 |
| 4 | SP 132 | SP 148 | SP 164 | SP 180 | SP 196 | Ë 212 | Ọ 228 | Ụ 244 |
| 5 | SP 133 | SP 149 | SP 165 | À 181 | SP 197 | Ë 213 | Ô 229 | Ữ 245 |
| 6 | SP 134 | SP 150 | SP 166 | Ả 182 | Ǻ 198 | Ê 214 | Ỗ 230 | Ữ 246 |
| 7 | SP 135 | SP 151 | Đ 167 | Ǻ 183 | Ǻ 199 | Ì 215 | Ỗ 231 | Ữ 247 |
| 8 | SP 136 | SP 152 | SP 168 | Á 184 | Ǻ 200 | Î 216 | Ỗ 232 | Ữ 248 |
| 9 | SP 137 | SP 153 | SP 169 | À 185 | Ǻ 201 | SP 217 | Ộ 233 | Ữ 249 |
| A | SP 138 | SP 154 | Ê 170 | SP 186 | Ǻ 202 | SP 218 | Ỗ 234 | Ỡ 250 |
| B | SP 139 | SP 155 | Ô 171 | Ǻ 187 | Ǻ 203 | SP 219 | Ỗ 235 | Ỡ 251 |
| C | SP 140 | SP 156 | Ớ 172 | Ǻ 188 | È 204 | Ï 220 | Ỗ 236 | Ỡ 252 |
| D | SP 141 | SP 157 | Ữ 173 | Ǻ 189 | SP 205 | Í 221 | Ớ 237 | Ỡ 253 |
| E | SP 142 | SP 158 | SP 174 | Ǻ 190 | Ê 206 | Ị 222 | Ớ 238 | Ỡ 254 |
| F | SP 143 | SP 159 | SP 175 | SP 191 | Ë 207 | Ò 223 | Ù 239 | SP 255 |

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-----------|-----------|----------|----------|----------|----------|----------|-----------|
| 0 | SP 128 | SP 144 | ب 160 | ⋮ 176 | ل 192 | ﻻ 208 | ض 224 | ≡ 240 |
| 1 | SP 129 | ء 145 | ة 161 | ⋮ 177 | ل 193 | ﻻ 209 | ط 225 | ° 241 |
| 2 | é 130 | ° 146 | ن 162 | ⋮ 178 | ت 194 | ﻻ 210 | ظ 226 | ° 242 |
| 3 | â 131 | ô 147 | ث 163 | 179 | ت 195 | ﻻ 211 | ع 227 | ° 243 |
| 4 | SP 132 | Ɑ 148 | ج 164 | ت 180 | - 196 | ل 212 | غ 228 | ' 244 |
| 5 | à 133 | - 149 | ح 165 | ت 181 | † 197 | ف 213 | ف 229 | ° 245 |
| 6 | SP 134 | û 150 | خ 166 | ﻻ 182 | ف 198 | ﻻ 214 | ﻻ 230 | ' 246 |
| 7 | ç 135 | ù 151 | د 167 | ﻻ 183 | ﻻ 199 | ﻻ 215 | ق 231 | ≈ 247 |
| 8 | ê 136 | ء 152 | ذ 168 | ك 184 | ﻻ 200 | ﻻ 216 | ك 232 | ° 248 |
| 9 | ë 137 | آ 153 | ر 169 | ﻻ 185 | ﻻ 201 | ل 217 | ل 233 | ° 249 |
| A | è 138 | أ 154 | ز 170 | ﻻ 186 | ﻻ 202 | ر 218 | م 234 | ° 250 |
| B | ï 139 | ؤ 155 | س 171 | ﻻ 187 | ﻻ 203 | ■ 219 | ن 235 | √ 251 |
| C | î 140 | £ 156 | ش 172 | ﻻ 188 | ﻻ 204 | ■ 220 | ه 236 | n 252 |
| D | SP 141 | ل 157 | ص 173 | ﻻ 189 | = 205 | ﻻ 221 | و 237 | 2 253 |
| E | SP 142 | ئ 158 | « 174 | ﻻ 190 | ﻻ 206 | ﻻ 222 | ي 238 | ■ 254 |
| F | SP 143 | ا 159 | » 175 | ﻻ 191 | ﻻ 207 | ■ 223 | ي 239 | SP 255 |

Page 33 (WPC775: Baltic Rim)

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|-------|-------|-------|-------|-------|-------|--------|
| 0 | Ć 128 | É 144 | Ā 160 | ⋮ 176 | Ł 192 | ą 208 | Ó 224 | - 240 |
| 1 | Ü 129 | æ 145 | Ī 161 | ⋮ 177 | Ł 193 | č 209 | β 225 | ± 241 |
| 2 | é 130 | Æ 146 | Ó 162 | ⋮ 178 | Т 194 | ę 210 | ō 226 | “ 242 |
| 3 | ā 131 | ō 147 | ž 163 | l 179 | t 195 | è 211 | Ń 227 | ¾ 243 |
| 4 | ä 132 | ö 148 | ž 164 | l 180 | - 196 | i 212 | õ 228 | ¶ 244 |
| 5 | ó 133 | Ǫ 149 | ž 165 | Ą 181 | † 197 | š 213 | õ 229 | § 245 |
| 6 | ǻ 134 | ϕ 150 | ” 166 | č 182 | U 198 | ų 214 | μ 230 | ÷ 246 |
| 7 | ć 135 | š 151 | ! 167 | ę 183 | Ū 199 | ū 215 | ń 231 | ” 247 |
| 8 | ł 136 | ś 152 | © 168 | ė 184 | Ł 200 | ž 216 | ķ 232 | ° 248 |
| 9 | ē 137 | ö 153 | ® 169 | 185 | ŕ 201 | ĵ 217 | ķ 233 | • 249 |
| A | ŕ 138 | ü 154 | ¬ 170 | 186 | Ł 202 | ŕ 218 | ł 234 | • 250 |
| B | ŕ 139 | ø 155 | ½ 171 | ¶ 187 | π 203 | ■ 219 |] 235 | ¹ 251 |
| C | ī 140 | £ 156 | ¼ 172 | ¶ 188 | ¶ 204 | ■ 220 | ŋ 236 | ³ 252 |
| D | ž 141 | ∅ 157 | ł 173 | ı 189 | = 205 | l 221 | Ē 237 | ² 253 |
| E | Ǽ 142 | × 158 | « 174 | š 190 | ¶ 206 | l 222 | Ń 238 | ■ 254 |
| F | Ǽ 143 | ɑ 159 | » 175 | ı 191 | ž 207 | ■ 223 | ' 239 | SP 255 |

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|-------|-------|-------|-------|-------|-------|--------|
| 0 | ђ 128 | љ 144 | а 160 | ѣ 176 | л 192 | л 208 | я 224 | - 240 |
| 1 | ђ 129 | љ 145 | А 161 | ѣ 177 | л 193 | л 209 | р 225 | ы 241 |
| 2 | ѓ 130 | њ 146 | б 162 | ѣ 178 | т 194 | м 210 | р 226 | ы 242 |
| 3 | ѓ 131 | њ 147 | Б 163 | ѣ 179 | т 195 | м 211 | с 227 | э 243 |
| 4 | ё 132 | ћ 148 | ц 164 | ѣ 180 | - 196 | н 212 | с 228 | э 244 |
| 5 | ё 133 | ћ 149 | Ц 165 | х 181 | † 197 | н 213 | т 229 | ш 245 |
| 6 | е 134 | ќ 150 | д 166 | х 182 | к 198 | о 214 | т 230 | ш 246 |
| 7 | Е 135 | ќ 151 | Д 167 | и 183 | к 199 | О 215 | у 231 | э 247 |
| 8 | ѕ 136 | ђ 152 | е 168 | и 184 | љ 200 | п 216 | у 232 | э 248 |
| 9 | Ѕ 137 | ђ 153 | Е 169 | ѣ 185 | ѓ 201 | Ј 217 | ж 233 | щ 249 |
| A | і 138 | џ 154 | ф 170 | ѣ 186 | љ 202 | г 218 | ж 234 | щ 250 |
| B | І 139 | џ 155 | Ф 171 | ѣ 187 | т 203 | ■ 219 | В 235 | Ч 251 |
| C | ї 140 | ј 156 | Г 172 | ѣ 188 | ѣ 204 | ■ 220 | В 236 | Ч 252 |
| D | İ 141 | Ј 157 | Г 173 | й 189 | = 205 | П 221 | ь 237 | § 253 |
| E | ј 142 | ѣ 158 | « 174 | Й 190 | ѣ 206 | Я 222 | Ь 238 | ■ 254 |
| F | Ј 143 | ѣ 159 | » 175 | Г 191 | ѣ 207 | ■ 223 | № 239 | SP 255 |

Page 35 (PC861: Icelandic)

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|-------|-------|--------|--------|--------|-------|--------|
| 0 | Ç 128 | É 144 | á 160 | ☼ 176 | Ł 192 | Ɑ 208 | ɑ 224 | ≡ 240 |
| 1 | Ü 129 | æ 145 | í 161 | ☼ 177 | Ł 193 | Ṛ 209 | β 225 | ± 241 |
| 2 | é 130 | Æ 146 | ó 162 | ☼ 178 | Ṛ 194 | π 210 | Γ 226 | ≥ 242 |
| 3 | â 131 | ô 147 | ú 163 | l 179 | Ṛ 195 | Ɑ 211 | π 227 | ≤ 243 |
| 4 | ä 132 | ö 148 | Á 164 | l 180 | - 196 | Ł 212 | Σ 228 | ƒ 244 |
| 5 | à 133 | þ 149 | Í 165 | l 181 | † 197 | ƒ 213 | σ 229 | Ɔ 245 |
| 6 | å 134 | û 150 | Ó 166 | ll 182 | ƒ 198 | π 214 | μ 230 | ÷ 246 |
| 7 | ç 135 | ý 151 | Ú 167 | π 183 | ll 199 | ll 215 | τ 231 | ≈ 247 |
| 8 | ê 136 | ÿ 152 | ı 168 | ƒ 184 | Ɑ 200 | ≠ 216 | φ 232 | ° 248 |
| 9 | ë 137 | ö 153 | ƒ 169 | ll 185 | ƒ 201 | Ɔ 217 | θ 233 | • 249 |
| A | è 138 | Ü 154 | ƒ 170 | ll 186 | Ɑ 202 | ƒ 218 | Ω 234 | • 250 |
| B | ð 139 | ø 155 | ½ 171 | ƒ 187 | Ṛ 203 | ■ 219 | δ 235 | √ 251 |
| C | ð 140 | £ 156 | ¼ 172 | Ɑ 188 | ll 204 | ■ 220 | ω 236 | n 252 |
| D | þ 141 | Ø 157 | ı 173 | Ɑ 189 | = 205 | l 221 | φ 237 | ² 253 |
| E | Ä 142 | ƒ 158 | « 174 | ƒ 190 | ll 206 | l 222 | ε 238 | ■ 254 |
| F | À 143 | f 159 | » 175 | ƒ 191 | ± 207 | ■ 223 | ∩ 239 | SP 255 |

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|-------|----------------------|-----------------------|----------------------|----------------------|-------------------------|-----------------------|
| 0 | Ⲡ 128 | ⲡ 144 | ⲓ́ 160 | ⲛ̄ 176 | Ⲍ 192 | ⲍ 208 | Ⲏ 224 | ⲏ̄ 240 |
| 1 | Ⲣ 129 | ⲣ 145 | ⲓ́̄ 161 | ⲛ̄̄ 177 | Ⲍ̄ 193 | ⲍ̄ 209 | Ⲏ̄ 225 | ⲏ̄̄ 241 |
| 2 | ⲣ 130 | Ⲥ 146 | ⲓ́̄̄ 162 | ⲛ̄̄̄ 178 | Ⲍ̄̄ 194 | ⲍ̄̄ 210 | Ⲏ̄̄ 226 | ⲏ̄̄̄ 242 |
| 3 | ⲥ 131 | ⲧ 147 | ⲓ́̄̄̄ 163 | ⲛ̄̄̄̄ 179 | Ⲍ̄̄̄ 195 | ⲍ̄̄̄ 211 | Ⲏ̄̄̄ 227 | ⲏ̄̄̄̄ 243 |
| 4 | Ⲩ 132 | ⲩ 148 | ⲓ̄̄̄̄ 164 | ⲛ̄̄̄̄̄ 180 | Ⲍ̄̄̄̄ 196 | ⲍ̄̄̄̄ 212 | Ⲏ̄̄̄̄ 228 | ⲏ̄̄̄̄̄ 244 |
| 5 | ⲫ 133 | Ⲫ 149 | ⲓ̄̄̄̄̄ 165 | ⲛ̄̄̄̄̄̄ 181 | Ⲍ̄̄̄̄̄ 197 | ⲍ̄̄̄̄̄ 213 | Ⲏ̄̄̄̄̄ 229 | ⲏ̄̄̄̄̄̄ 245 |
| 6 | ⲭ 134 | ⲫ 150 | ⲓ̄̄̄̄̄̄ 166 | ⲛ̄̄̄̄̄̄̄ 182 | Ⲍ̄̄̄̄̄̄ 198 | ⲍ̄̄̄̄̄̄ 214 | Ⲏ̄̄̄̄̄̄ 230 | ⲏ̄̄̄̄̄̄̄ 246 |
| 7 | Ⲯ 135 | Ⲭ 151 | ⲓ̄̄̄̄̄̄̄ 167 | ⲛ̄̄̄̄̄̄̄̄ 183 | Ⲍ̄̄̄̄̄̄̄ 199 | ⲍ̄̄̄̄̄̄̄ 215 | Ⲏ̄̄̄̄̄̄̄ 231 | ⲏ̄̄̄̄̄̄̄̄ 247 |
| 8 | ⲯ 136 | ⲭ 152 | ⲓ̄̄̄̄̄̄̄̄ 168 | ⲛ̄̄̄̄̄̄̄̄̄ 184 | Ⲍ̄̄̄̄̄̄̄̄ 200 | ⲍ̄̄̄̄̄̄̄̄ 216 | Ⲏ̄̄̄̄̄̄̄̄ 232 | ⲏ̄̄̄̄̄̄̄̄̄ 248 |
| 9 | Ⲱ 137 | Ⲯ 153 | ⲓ̄̄̄̄̄̄̄̄̄ 169 | ⲛ̄̄̄̄̄̄̄̄̄̄ 185 | Ⲍ̄̄̄̄̄̄̄̄̄ 201 | ⲍ̄̄̄̄̄̄̄̄̄ 217 | Ⲏ̄̄̄̄̄̄̄̄̄ 233 | ⲏ̄̄̄̄̄̄̄̄̄̄ 249 |
| A | ⲱ 138 | ⲯ 154 | ⲓ̄̄̄̄̄̄̄̄̄̄ 170 | ⲛ̄̄̄̄̄̄̄̄̄̄̄ 186 | Ⲍ̄̄̄̄̄̄̄̄̄̄ 202 | ⲍ̄̄̄̄̄̄̄̄̄̄ 218 | Ⲏ̄̄̄̄̄̄̄̄̄̄ 234 | ⲏ̄̄̄̄̄̄̄̄̄̄̄ 250 |
| B | Ⲳ 139 | Ⲱ 155 | ⲓ̄̄̄̄̄̄̄̄̄̄̄ 171 | ⲛ̄̄̄̄̄̄̄̄̄̄̄̄ 187 | Ⲍ̄̄̄̄̄̄̄̄̄̄̄ 203 | ⲍ̄̄̄̄̄̄̄̄̄̄̄ 219 | Ⲏ̄̄̄̄̄̄̄̄̄̄̄ 235 | ⲏ̄̄̄̄̄̄̄̄̄̄̄̄ 251 |
| C | ⲳ 140 | ⲱ 156 | ⲓ̄̄̄̄̄̄̄̄̄̄̄̄ 172 | ⲛ̄̄̄̄̄̄̄̄̄̄̄̄̄ 188 | Ⲍ̄̄̄̄̄̄̄̄̄̄̄̄ 204 | ⲍ̄̄̄̄̄̄̄̄̄̄̄̄ 220 | Ⲏ̄̄̄̄̄̄̄̄̄̄̄̄ 236 | ⲏ̄̄̄̄̄̄̄̄̄̄̄̄̄ 252 |
| D | Ⲵ 141 | Ⲳ 157 | ⲓ̄̄̄̄̄̄̄̄̄̄̄̄̄ 173 | ⲛ̄̄̄̄̄̄̄̄̄̄̄̄̄̄ 189 | Ⲍ̄̄̄̄̄̄̄̄̄̄̄̄̄ 205 | ⲍ̄̄̄̄̄̄̄̄̄̄̄̄̄ 221 | Ⲏ̄̄̄̄̄̄̄̄̄̄̄̄̄ 237 | ⲏ̄̄̄̄̄̄̄̄̄̄̄̄̄̄ 253 |
| E | ⲵ 142 | ⲳ 158 | ⲓ̄̄̄̄̄̄̄̄̄̄̄̄̄̄ 174 | ⲛ̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄ 190 | Ⲍ̄̄̄̄̄̄̄̄̄̄̄̄̄̄ 206 | ⲍ̄̄̄̄̄̄̄̄̄̄̄̄̄̄ 222 | Ⲏ̄̄̄̄̄̄̄̄̄̄̄̄̄̄ 238 | ⲏ̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄ 254 |
| F | Ⲷ 143 | Ⲵ 159 | ⲓ̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄ 175 | ⲛ̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄ 191 | Ⲍ̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄ 207 | ⲍ̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄ 223 | Ⲏ̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄ SP 239 | ⲏ̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄ 255 |

Page 37 (PC864: Arabic)

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|--------|--------|--------|--------|-------|--------|--------|
| 0 | ° 128 | β 144 | SP 160 | • 176 | ϕ 192 | ذ 208 | - 224 | ء 240 |
| 1 | • 129 | ∞ 145 | - 161 | ا 177 | ء 193 | ر 209 | فا 225 | ء 241 |
| 2 | • 130 | ϕ 146 | آ 162 | ر 178 | آ 194 | ز 210 | قا 226 | ن 242 |
| 3 | √ 131 | ± 147 | £ 163 | ر 179 | أ 195 | ع 211 | ك 227 | ه 243 |
| 4 | ☼ 132 | ½ 148 | α 164 | ع 180 | ؤ 196 | ش 212 | ل 228 | ه 244 |
| 5 | - 133 | ¼ 149 | ل 165 | ه 181 | ع 197 | ط 213 | م 229 | ي 245 |
| 6 | 134 | ≈ 150 | SP 166 | ٦ 182 | ث 198 | ظ 214 | نا 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 | قي 248 |
| 9 | ‡ 137 | لا 153 | ب 169 | ٩ 185 | ة 201 | ء 217 | ي 233 | لا 249 |
| A | ‡ 138 | لا 154 | ن 170 | ف 186 | تا 202 | غ 218 | با 234 | لا 250 |
| B | ‡ 139 | SP 155 | ث 171 | ؛ 187 | ثا 203 | ا 219 | ظ 235 | ل 251 |
| C | ٦ 140 | SP 156 | ، 172 | سر 188 | ج 204 | ر 220 | ط 236 | ك 252 |
| D | ٦ 141 | لا 157 | ج 173 | ش 189 | ح 205 | ÷ 221 | غ 237 | ي 253 |
| E | ل 142 | لا 158 | ح 174 | ص 190 | خ 206 | × 222 | غ 238 | ■ 254 |
| F | ل 143 | ح 159 | خ 175 | ؟ 191 | و 207 | ع 223 | م 239 | SP 255 |

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-----------|-----------|-----------|----------|-----------|----------|----------|-----------|
| 0 | SP 128 | Ι 144 | ϊ 160 | ⋯ 176 | Λ 192 | Τ 208 | Ζ 224 | - 240 |
| 1 | SP 129 | ϊ 145 | ϊ̄ 161 | ⋯ 177 | ⊥ 193 | Υ 209 | η 225 | ± 241 |
| 2 | SP 130 | ϐ 146 | ό 162 | ⋯ 178 | τ 194 | ϕ 210 | θ 226 | υ 242 |
| 3 | SP 131 | SP 147 | ύ 163 | ι 179 | † 195 | Χ 211 | λ 227 | φ 243 |
| 4 | SP 132 | SP 148 | Α 164 | ‡ 180 | - 196 | Ψ 212 | κ 228 | χ 244 |
| 5 | SP 133 | Υ 149 | Β 165 | Κ 181 | ‡ 197 | Ω 213 | λ 229 | § 245 |
| 6 | À 134 | ÿ 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 | Ω 152 | Ε 168 | Ν 184 | ℒ 200 | γ 216 | ξ 232 | ° 248 |
| 9 | ¬ 137 | ² 153 | Ζ 169 | ‡ 185 | ℞ 201 | ι 217 | ο 233 | ¨ 249 |
| A | ¡ 138 | ³ 154 | Η 170 | ‡ 186 | ℄ 202 | ρ 218 | π 234 | ω 250 |
| B | ‘ 139 | ά 155 | ½ 171 | π 187 | π̄ 203 | ■ 219 | ρ 235 | ü 251 |
| C | ’ 140 | £ 156 | θ 172 | ‡ 188 | ‡ 204 | ■ 220 | σ 236 | ÿ 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 | γ 191 | Σ 207 | ■ 223 | ´ 239 | SP 255 |

Page 39 (ISO8859-2: Latin 2)

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-------|-------|--------|-------|-------|-------|-------|-------|
| 0 | Š 128 | L 144 | SP 160 | ° 176 | Ř 192 | Đ 208 | ř 224 | đ 240 |
| 1 | Š 129 | Ł 145 | Ą 161 | ą 177 | Á 193 | Ń 209 | á 225 | ń 241 |
| 2 | Š 130 | T 146 | ˘ 162 | ˙ 178 | Â 194 | Ň 210 | â 226 | ň 242 |
| 3 | I 131 | ł 147 | Ł 163 | ł 179 | Ă 195 | Ó 211 | ă 227 | ó 243 |
| 4 | ł 132 | – 148 | ą 164 | ˘ 180 | Ä 196 | Ô 212 | ä 228 | ô 244 |
| 5 | J 133 | † 149 | Ĺ 165 | ĺ 181 | Ĺ 197 | Õ 213 | í 229 | õ 245 |
| 6 | ŕ 134 | ■ 150 | Ś 166 | ś 182 | Ć 198 | Ö 214 | ć 230 | ö 246 |
| 7 | ■ 135 | ■ 151 | § 167 | ˘ 183 | Ç 199 | × 215 | ç 231 | ÷ 247 |
| 8 | © 136 | Ł 152 | ¨ 168 | ˙ 184 | Č 200 | Ř 216 | č 232 | ř 248 |
| 9 | ł 137 | ŕ 153 | Š 169 | š 185 | É 201 | Û 217 | é 233 | û 249 |
| A | ł 138 | Ł 154 | Ş 170 | ş 186 | Ę 202 | Ú 218 | ę 234 | ú 250 |
| B | ł 139 | ŕ 155 | Ÿ 171 | ÿ 187 | Ě 203 | Ů 219 | ě 235 | ů 251 |
| C | ł 140 | ł 156 | Ž 172 | ž 188 | Ě 204 | Ü 220 | ě 236 | ü 252 |
| D | ¢ 141 | = 157 | - 173 | ˘ 189 | Í 205 | Ý 221 | í 237 | ý 253 |
| E | ¥ 142 | ł 158 | Ž 174 | ž 190 | Î 206 | Ï 222 | î 238 | ï 254 |
| F | ł 143 | ® 159 | Ž 175 | ž 191 | Ď 207 | ß 223 | ď 239 | · 255 |

| 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 | í 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 |

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-----------|-----------|----------|------------|-----------|----------|-----------|-----------|
| 0 | SP 128 | ق 144 | ح 160 | ۰ 176 | ل 192 | ع 208 | ک 224 | - 240 |
| 1 | SP 129 | ک 145 | خ 161 | ۰ 177 | ل 193 | ع 209 | ک 225 | ۰ 241 |
| 2 | ، 130 | ب 146 | خ 162 | ۰ 178 | ت 194 | ع 210 | ک 226 | پ 242 |
| 3 | ؛ 131 | ب 147 | د 163 | ا 179 | ت 195 | غ 211 | گ 227 | - 243 |
| 4 | ؟ 132 | پ 148 | ذ 164 | ا 180 | - 196 | غ 212 | ل 228 | ه 244 |
| 5 | ء 133 | پ 149 | ر 165 | فی 181 | ت 197 | غ 213 | ل 229 | ا 245 |
| 6 | آ 134 | ن 150 | ز 166 | ف 182 | ظ 198 | غ 214 | م 230 | ۲ 246 |
| 7 | آ 135 | نا 151 | ژ 167 | ط 183 | ع 199 | ف 215 | م 231 | ۳ 247 |
| 8 | آ 136 | ث 152 | س 168 | ط 184 | ل 200 | ف 216 | ن 232 | ۴ 248 |
| 9 | ا 137 | شا 153 | م 169 | ا 185 | ر 201 | ل 217 | نا 233 | ۵ 249 |
| A | ل 138 | چ 154 | ش 170 | ا 186 | ل 202 | ر 218 | و 234 | ۶ 250 |
| B | د 139 | چ 155 | ش 171 | ا 187 | ر 203 | ■ 219 | ه 235 | ۷ 251 |
| C | ء 140 | چ 156 | ص 172 | ک 188 | ر 204 | ■ 220 | ه 236 | ۸ 252 |
| D | أ 141 | چ 157 | ط 173 | وال 189 | = 205 | ق 221 | ه 237 | ۹ 253 |
| E | أ 142 | خ 158 | « 174 | ظ 190 | ر 206 | ف 222 | ه 238 | ■ 254 |
| F | ؤ 143 | ح 159 | » 175 | ا 191 | SP 207 | ■ 223 | ی 239 | SP 255 |

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|---|---|---|---|---|---|---|--|
| 0 | Ç 128 | É 144 | á 160 | ☼ 176 | Ł 192 | ą 208 | α 224 | ≡ 240 |
| 1 | ü 129 | æ 145 | í 161 | ☼ 177 | Ł 193 | č 209 | β 225 | ‡ 241 |
| 2 | é 130 | Æ 146 | ó 162 | ☼ 178 | τ 194 | ę 210 | Γ 226 | ≥ 242 |
| 3 | â 131 | ô 147 | ú 163 | l 179 | ł 195 | è 211 | π 227 | ≤ 243 |
| 4 | ä 132 | ö 148 | ñ 164 | ł 180 | - 196 | ì 212 | Σ 228 | ” 244 |
| 5 | à 133 | ò 149 | Ñ 165 | Ą 181 | ł 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 | č 168 | É 184 | Ł 200 | ž 216 | φ 232 | ° 248 |
| 9 | ë 137 | ö 153 | ƒ 169 | ł 185 | Ł 201 | Ĳ 217 | θ 233 | • 249 |
| A | è 138 | ü 154 | ƒ 170 | ł 186 | Ł 202 | ƒ 218 | Ω 234 | ˙ 250 |
| B | ï 139 | ¢ 155 | ½ 171 | ł 187 | Ł 203 | ■ 219 | δ 235 | √ 251 |
| C | î 140 | £ 156 | ¼ 172 | ł 188 | Ł 204 | ■ 220 | ω 236 | ⁿ 252 |
| D | ï 141 | ¥ 157 | ı 173 | ł 189 | = 205 | l 221 | φ 237 | ² 253 |
| E | Ä 142 | ƒ 158 | « 174 | š 190 | Ł 206 | l 222 | ε 238 | ■ 254 |
| F | Å 143 | f 159 | » 175 | ł 191 | ž 207 | ■ 223 | ∩ 239 | SP 255 |

Page 43 (PC1119: Lithuanian)

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|
| 0 | Ą <small>128</small> | Ą <small>144</small> | ą <small>160</small> | ⋯ <small>176</small> | Ľ <small>192</small> | ą <small>208</small> | ą <small>224</small> | ė <small>240</small> |
| 1 | Б <small>129</small> | С <small>145</small> | б <small>161</small> | ⋯ <small>177</small> | Ł <small>193</small> | č <small>209</small> | с <small>225</small> | ė <small>241</small> |
| 2 | В <small>130</small> | Т <small>146</small> | в <small>162</small> | ⋯ <small>178</small> | Ṭ <small>194</small> | ę <small>210</small> | т <small>226</small> | ≥ <small>242</small> |
| 3 | Г <small>131</small> | У <small>147</small> | г <small>163</small> | Ī <small>179</small> | Ṭ <small>195</small> | ė <small>211</small> | у <small>227</small> | ≤ <small>243</small> |
| 4 | Д <small>132</small> | Ф <small>148</small> | д <small>164</small> | † <small>180</small> | – <small>196</small> | į <small>212</small> | ф <small>228</small> | ” <small>244</small> |
| 5 | Е <small>133</small> | Х <small>149</small> | е <small>165</small> | Ą <small>181</small> | † <small>197</small> | š <small>213</small> | х <small>229</small> | “ <small>245</small> |
| 6 | Ж <small>134</small> | Ц <small>150</small> | ж <small>166</small> | Č <small>182</small> | Ū <small>198</small> | ų <small>214</small> | ц <small>230</small> | ÷ <small>246</small> |
| 7 | З <small>135</small> | Ч <small>151</small> | з <small>167</small> | Ę <small>183</small> | Ū <small>199</small> | ū <small>215</small> | ч <small>231</small> | ≈ <small>247</small> |
| 8 | И <small>136</small> | Ш <small>152</small> | и <small>168</small> | Ė <small>184</small> | Ł <small>200</small> | ž <small>216</small> | ш <small>232</small> | ° <small>248</small> |
| 9 | Й <small>137</small> | Щ <small>153</small> | й <small>169</small> | Į <small>185</small> | Г <small>201</small> | Ј <small>217</small> | щ <small>233</small> | • <small>249</small> |
| A | К <small>138</small> | Ь <small>154</small> | к <small>170</small> | Ĳ <small>186</small> | Ł <small>202</small> | г <small>218</small> | ь <small>234</small> | • <small>250</small> |
| B | Л <small>139</small> | Ы <small>155</small> | л <small>171</small> | Ṭ <small>187</small> | Ṭ <small>203</small> | ■ <small>219</small> | ы <small>235</small> | √ <small>251</small> |
| C | М <small>140</small> | Ь <small>156</small> | м <small>172</small> | Ṭ <small>188</small> | Ṭ <small>204</small> | ■ <small>220</small> | ь <small>236</small> | n <small>252</small> |
| D | Н <small>141</small> | Э <small>157</small> | н <small>173</small> | Ṭ <small>189</small> | = <small>205</small> | Ī <small>221</small> | э <small>237</small> | ² <small>253</small> |
| E | О <small>142</small> | Ю <small>158</small> | о <small>174</small> | Š <small>190</small> | Ṭ <small>206</small> | Ī <small>222</small> | ю <small>238</small> | ■ <small>254</small> |
| F | П <small>143</small> | Я <small>159</small> | п <small>175</small> | Ṭ <small>191</small> | Ž <small>207</small> | ■ <small>223</small> | я <small>239</small> | SP <small>255</small> |

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

Page 45 (WPC1250: Latin 2)

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-----------|-----------|-----------|----------|----------|----------|----------|----------|
| 0 | € 128 | SP 144 | SP 160 | ° 176 | Ř 192 | Đ 208 | ř 224 | đ 240 |
| 1 | SP 129 | ‘ 145 | ˇ 161 | ± 177 | Á 193 | Ň 209 | á 225 | ň 241 |
| 2 | , 130 | , 146 | ˇ 162 | ˘ 178 | Â 194 | Ň 210 | â 226 | ň 242 |
| 3 | SP 131 | “ 147 | Ł 163 | Ÿ 179 | Ă 195 | Ó 211 | ă 227 | ó 243 |
| 4 | ” 132 | ” 148 | ǫ 164 | ˘ 180 | Ä 196 | Ô 212 | ä 228 | ô 244 |
| 5 | … 133 | • 149 | À 165 | μ 181 | Ĺ 197 | Õ 213 | í 229 | õ 245 |
| 6 | † 134 | - 150 | ı 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 | Û 217 | é 233 | û 249 |
| A | Š 138 | Š 154 | Ş 170 | ş 186 | Ę 202 | Ú 218 | ę 234 | ú 250 |
| B | ‹ 139 | › 155 | « 171 | » 187 | Ě 203 | Ů 219 | ě 235 | ů 251 |
| C | Ś 140 | Ś 156 | ¬ 172 | Ľ 188 | Ě 204 | Ü 220 | ś 236 | ü 252 |
| D | Ÿ 141 | Ÿ 157 | - 173 | ˘ 189 | Í 205 | Ý 221 | í 237 | ý 253 |
| E | Ž 142 | Ž 158 | ® 174 | ř 190 | Î 206 | Ț 222 | î 238 | ț 254 |
| F | Ž 143 | Ž 159 | Ž 175 | ž 191 | Đ 207 | ß 223 | đ 239 | · 255 |

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|---|--|--|---|---|---|---|---|
| 0 | ћ 128 | ћ 144 | SP 160 | ° 176 | А 192 | Р 208 | а 224 | р 240 |
| 1 | ѓ 129 | ‘ 145 | ђ 161 | ± 177 | Б 193 | С 209 | б 225 | с 241 |
| 2 | , 130 | ’ 146 | ђ 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 | ѧ 164 | г 180 | Д 196 | Ф 212 | д 228 | ф 244 |
| 5 | … 133 | • 149 | Г 165 | μ 181 | Е 197 | Х 213 | е 229 | х 245 |
| 6 | † 134 | - 150 | і 166 | π 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 | Ѡ 143 | ѡ 159 | İ 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 | ° 176 | ĩ 192 | Π 208 | ü 224 | π 240 |
| 1 | SP 129 | ‘ 145 | “ 161 | ‡ 177 | Α 193 | Ρ 209 | α 225 | ρ 241 |
| 2 | , 130 | ’ 146 | Α 162 | ² 178 | Β 194 | SP 210 | β 226 | ς 242 |
| 3 | f 131 | “ 147 | £ 163 | ³ 179 | Γ 195 | Σ 211 | γ 227 | σ 243 |
| 4 | ” 132 | ” 148 | α 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 | α 170 | Ί 186 | Κ 202 | Ϊ 218 | κ 234 | ϊ 250 |
| B | < 139 | > 155 | « 171 | » 187 | Λ 203 | ÿ 219 | λ 235 | ÿ 251 |
| C | SP 140 | SP 156 | ¬ 172 | ο 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 | Υ 190 | Ξ 206 | ή 222 | ξ 238 | ώ 254 |
| F | SP 143 | SP 159 | - 175 | ϙ 191 | Ο 207 | ί 223 | ο 239 | SP 255 |

| 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 | İ 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 | f 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 | 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 | · 192 | । 208 | ℞ 224 | ן 240 |
| 1 | SP 129 | ‘ 145 | ı 161 | ± 177 | ∴ 193 | · 209 | ן 225 | ו 241 |
| 2 | , 130 | ’ 146 | ¢ 162 | 2 178 | ∴ 194 | · 210 | ן 226 | ו 242 |
| 3 | f 131 | “ 147 | £ 163 | 3 179 | ∴ 195 | · 211 | ן 227 | ן 243 |
| 4 | ” 132 | ” 148 | ¤ 164 | ´ 180 | · 196 | ן 212 | ן 228 | ן 244 |
| 5 | … 133 | • 149 | ¥ 165 | µ 181 | ∴ 197 | ן 213 | ן 229 | ן 245 |
| 6 | † 134 | - 150 | ı 166 | ¶ 182 | ∴ 198 | ” 214 | ן 230 | ץ 246 |
| 7 | ‡ 135 | - 151 | § 167 | · 183 | - 199 | ’ 215 | ן 231 | ך 247 |
| 8 | ^ 136 | ~ 152 | ¨ 168 | · 184 | ∴ 200 | ” 216 | ו 232 | ן 248 |
| 9 | ‰ 137 | ™ 153 | © 169 | 1 185 | · 201 | SP 217 | ן 233 | ו 249 |
| A | SP 138 | SP 154 | × 170 | ÷ 186 | SP 202 | SP 218 | ן 234 | ן 250 |
| B | < 139 | > 155 | « 171 | » 187 | ∴ 203 | SP 219 | ן 235 | SP 251 |
| C | SP 140 | SP 156 | ¬ 172 | $\frac{1}{4}$ 188 | · 204 | SP 220 | ן 236 | SP 252 |
| D | SP 141 | SP 157 | - 173 | $\frac{1}{2}$ 189 | · 205 | SP 221 | ו 237 | SP 253 |
| E | SP 142 | SP 158 | ® 174 | $\frac{3}{4}$ 190 | - 206 | SP 222 | ן 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 | ك 144 | SP 160 | ° 176 | ^ 192 | ذ 208 | à 224 | ˆ 240 |
| 1 | پ 129 | ‘ 145 | ‘ 161 | ± 177 | ء 193 | ر 209 | ل 225 | ˆ 241 |
| 2 | ’ 130 | ’ 146 | ¢ 162 | 2 178 | آ 194 | ز 210 | â 226 | ˆ 242 |
| 3 | f 131 | “ 147 | £ 163 | 3 179 | أ 195 | س 211 | م 227 | ˆ 243 |
| 4 | ” 132 | ” 148 | ¤ 164 | ˆ 180 | ؤ 196 | ش 212 | ن 228 | ô 244 |
| 5 | … 133 | • 149 | ¥ 165 | μ 181 | ل 197 | ص 213 | ه 229 | ˆ 245 |
| 6 | † 134 | - 150 | ¡ 166 | ¶ 182 | ئ 198 | ف 214 | و 230 | ˆ 246 |
| 7 | ‡ 135 | - 151 | § 167 | • 183 | ا 199 | x 215 | ç 231 | ÷ 247 |
| 8 | ^ 136 | ك 152 | ¨ 168 | ر 184 | ب 200 | ط 216 | è 232 | ˆ 248 |
| 9 | ‰ 137 | ™ 153 | © 169 | 1 185 | ة 201 | ظ 217 | é 233 | ù 249 |
| A | ث 138 | ل 154 | ه 170 | ؛ 186 | ن 202 | ع 218 | ê 234 | ° 250 |
| B | < 139 | > 155 | « 171 | » 187 | ث 203 | غ 219 | ë 235 | û 251 |
| C | £ 140 | œ 156 | ¬ 172 | $\frac{1}{4}$ 188 | ج 204 | - 220 | ى 236 | ü 252 |
| D | چ 141 | SP 157 | - 173 | $\frac{1}{2}$ 189 | ح 205 | ف 221 | ي 237 | SP 253 |
| E | ژ 142 | SP 158 | ® 174 | $\frac{3}{4}$ 190 | خ 206 | ق 222 | أ 238 | SP 254 |
| F | ڈ 143 | س 159 | - 175 | ? 191 | د 207 | ك 223 | آ 239 | ه 255 |

Page 51 (WPC1257: Baltic Rim)

| HEX | 8 | 9 | A | B | C | D | E | F |
|-----|-----------|-----------|-----------|----------|----------|----------|----------|----------|
| 0 | € 128 | SP 144 | SP 160 | ° 176 | À 192 | Š 208 | ą 224 | š 240 |
| 1 | SP 129 | ‘ 145 | SP 161 | ‡ 177 | Ī 193 | Ń 209 | į 225 | ń 241 |
| 2 | , 130 | ’ 146 | ¢ 162 | ² 178 | Ā 194 | Ņ 210 | ā 226 | ņ 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 | ı 166 | ¶ 182 | Ě 198 | Ö 214 | ę 230 | ö 246 |
| 7 | ‡ 135 | - 151 | § 167 | · 183 | Ě 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 | ® 170 | ʀ 186 | Ž 202 | Ś 218 | ż 234 | ś 250 |
| B | ‹ 139 | › 155 | « 171 | » 187 | È 203 | Ū 219 | è 235 | ū 251 |
| C | SP 140 | SP 156 | ¬ 172 | ¼ 188 | Ġ 204 | Ü 220 | ğ 236 | ü 252 |
| D | ¨ 141 | - 157 | - 173 | ½ 189 | Ķ 205 | Ž 221 | ķ 237 | ž 253 |
| E | ˘ 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 | ì 161 | ± 177 | Á 193 | Ñ 209 | á 225 | ñ 241 |
| 2 | , 130 | ’ 146 | ¢ 162 | ² 178 | Â 194 | ” 210 | â 226 | · 242 |
| 3 | f 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 | Õ 213 | å 229 | ơ 245 |
| 6 | † 134 | - 150 | ı 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 | SP 138 | SP 154 | à 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 | € 140 | œ 156 | ¬ 172 | ¼ 188 | Ì 204 | Ü 220 | ì 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 | ӧ 128 | ӧ 144 | SP 160 | ° 176 | А 192 | Р 208 | а 224 | р 240 |
| 1 | ғ 129 | ‘ 145 | Ұ 161 | ± 177 | Б 193 | С 209 | б 225 | с 241 |
| 2 | , 130 | ’ 146 | Ұ 162 | І 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 | ӑ 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 | і 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 | ӊ 138 | ӊ 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 | ӧ 140 | ӧ 156 | ҫ 172 | ә 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 | Ү 143 | Ү 159 | Ү 175 | ү 191 | П 207 | Я 223 | п 239 | я 255 |

| 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 | ß |
| 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 | \$ | % | * | @ | í | 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 | í | Ñ | ¿ | é | ` | í | ñ | ó | ú |
| Latin America | # | \$ | % | * | á | í | Ñ | ¿ | é | ü | í | ñ | ó | ú |
| Korea | # | \$ | % | * | @ | [| ₩ |] | ^ | ` | { | | } | ~ |
| Slovenia/Croatia | # | \$ | % | * | Ž | Š | Đ | Ć | Č | ž | š | đ | ć | č |
| China | # | ¥ | % | * | @ | [| ¥ |] | ^ | ` | { | | } | ~ |
| Vietnam | đ | \$ | % | * | @ | [| ¥ |] | ^ | ` | { | | } | ~ |
| Arabia | # | \$ | % | * | @ | [| ¥ |] | ^ | ` | { | | } | ~ |

