# SHARP

## POS Terminal
## RZ-E601/E701/E801
## Software User Guide
## Ver. 1. 0

## Introduction

This document is software user guide for RZ-E601/RZ-E701/RZ-E801.

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# Chapter 1. Software overview

## 1.1. Software

The software of the system is comprised the following software group.

* Windows10 IoT Enterprise 2016 LTSB (64 bit)
  Windows® 10 IoT Enterprise 2016 LTSB (64 bit) is embedded OS for retail based on Windows® 10.
  .NET Framework 3.5 and .NET Framework 4.6 are pre-installed.
  Internet Explorer 11 is pre-installed.

* Driver for POS device
  Device driver to control POS device.

* Driver for PC device
  Device driver to control PC device（COM, Video, Touch pane, LAN, Audio and so on）

* API for POS device
  Software to control POS device from application program.
  POS device is controlled by using property, method, the event of POS device object.
  CO means Controll object. SO means Service object. They are based on OPOS.

  RZ-E601/E701/E801 support 32 bit application only.

* Software

| | | RZ-E601/E701/E801 | |
|---|---|---|---|
| BIOS | | E601/E701: AMI UEFI BIOS with 16MB SPI Flask ROM<br>E801: AMI UEFI BIOS with 128 Mb SPI Flash ROM support<br>  AMT11.0 | |
| OS | | Windows® 10 IoT Enterprise 2016 LTSB (64 bits) | |
| .NET Framework | | .NET Framework 3.5, .NET Framework 4.6 | |
| Blowser | | Internet Explorer 11 | |
| Device Driver | | Chipset, Video, Audio, LAN, Touch | |
| OPOS Driver(**) | Customer Display | RZ-E1DP1 | OPOS 1.13 |
| | MSR | RZ-E1MR1 | OPOS 1.5 |
| | MSR+iButton | RZ-E1MT1 | OPOS 1.5 |
| | Scanner | Magellan1100i (2D) | Procure from vendor |
| | | Magellan3200VSi | Procure from vendor |
| Utility | | Firm setting tool<br>Test tool for OPOS driver | |

(**) OPOS driver supports 32 bit application only.

· (Reference) Hardware

| | | Specification | | | note |
|---|---|---|---|---|---|
| Model | | | | | |
| | | RZ-E601 | RZ-E701 | RZ-E801 | |
| Internal Model Name | | A3RZE601V4<br>A3RZE601V6 | A3RZE701V4<br>A3RZE701V6 | A3RZE801V4<br>A3RZE801V6 | |
| Color | | 2 tone (Black & White) | | | |
| CPU | | Intel® Celeron® Processor N3160<br>(2M Cache, up to 2.24 GHz) | Intel® Pentium® N3710<br>(1.6 GHz) | Intel® Core® i3-6100TE Processor<br>(2.7 GHz, 4M Cache, 35W) | |
| Main Memory | | 4GB (Max up to 8G)<br>1 x SO-DIMM Socket Support DDR3L (1.35V) 1600 MHz | | 4GB DDR4 (Max 16G)<br>1 x 260-pin DDR4 2133MHz<br>SO-DIMM | |
| Storage | | SSD MLC 64GB | | | |
| Sound | | Stereo Sound | | | |
| Operator Display | Size | 15 inch XGA (1024 x 768) | | | |
| | Type | TFT color LCD | | | |
| | Brightness | 300cd/m2 luminance (Without TouchPanel) | | 400cd/m2 luminance (Without TouchPanel) | |
| | Tilt | 15°～ 70° | | | |
| Touch | | Resistive 5 Wire | Projective Capacitive | | |
| Power switch | | 1 | | | |
| Indicator LED | | 2<br>(Power Switch, LAN) | | 3<br>(Power Switch, LAN, Storage) | |
| Interface (Rear Side) | USB | 4 | | | USB 2.0×2<br>USB 3.0×2 |
| | Powered USB | 12Vx 2<br>24Vx 1 | | | |
| | RS232C<br>( COM ) | 2 x standard RJ45<br>2 x powered RJ45(5V/12V/RI selectable by BIOS) | | | |
| | | COM1 / 2 : default is 5V,<br>COM3 / 4 : RI | | | |
| | | COM5: default is 5V<br>jumper setting on board | | COM5: default is 5V<br>BIOS setting | |
| | Drawer | 1 (RJ-11) | | | Default is 19V |
| | LAN | 1 (RJ-45)<br>( 10/100/1000Mb GbE ) | | | Support Wake on LAN (*) |
| | | Wake on LAN Default is Disable | Wake on LAN Default is Enable | Wake on LAN Default is Disable | |
| | Audio | 2 x 2 W Speaker | | | |
| | HDMI | 1 | | | |
| | | DC 12V Default is Disable | | DC 12V Default is Enable | |
| Internal Interface | Magnetic Stripe Reader | 1   (USB I/F for RZ-E1MR1, RZ-E1MT1)<br>(ISO Track1/2/3) | | | Optional |
| | Customer Display | 1 (COM5 I/F for RZ-E1DP1) | | | Optional |
| | iButton | 1 (USB I/F for RZ-E1MT1) | | | Optional |
| | Finger Print Scanner | 1 (USB I/F for RZ-E1FP1) | | | Optional |
| Compliance | | IP65 Front panel only, IP31 rear cover | | | |

(*) After the supply of the AC power is quitted (For example power loss in a moment), Wake On LAN
function doesn't work.

Then, please press power button manually once. Once power on, Wake On Lan function works again.

## 1.2. Software architecture

### 1.2.1. BIOS
BIOS conforms to the UEFI standard.

### 1.2.2. Windows 10 IoT Enterprise 2016 LTSB (64 bit)
Windows® 10 IoT Enterprise 2016 LTSB (64 bit) is an OS for embedded devices such as POS based on Windows® 10.

It is OS that supports graphics user interface, object oriented, multitasking, multithreaded network. And it performs basic system control and management such as device control, resource management, process management, network management, key input, display, file I/O etc..

OS and software are preinstalled on SSD of the main unit.

.NET Framework 3.5 and .NET Framework 4.6 are preinstalled.

Also Internet Explorer 11 is preinstalled.

### 1.2.3. Device drivers for PC device
It is a device driver for controlling PC devices (COM, video, touch panel, LAN, audio etc.).

### 1.2.4. POS Device API (OPOS sofotware)
It is software for using POS device from application program.

It controls the POS device using the properties, methods, and events of the POS device object.

CO is a control object, SO is an abbreviation of a service object, and it complies with OPOS.

OPOS supports 32-bit applications only.

Software overview

| Software | | RZ-E601/E701/E801 |
|---|---|---|
| BIOS | | AMI UEFI BIOS with 16MB SPI Flask ROM |
| OS | | Windows® 10 IoT Enterprise 2016 LTSB (64 bit) |
| .NET Framework | | .NET Framework 3.5, .NET Framework 4.6 |
| Web browser | | Internet Explorer 11 |
| Device driver | | Chipset, Video, Audio, LAN, Touch |
| POS Device | Customer Display (RZ-E1DP1) | OPOS 1.13 API(*), test tool, configuration tool |
| | MSR (RZ-E1MR1) | OPOS 1.5 API(*), test tool, configuration tool |
| | MSR, iButton (RZ-E1MT1) | OPOS 1.5 API(*), test tool, configuration tool |

(*) OPOS device API supports 32bit applications only.

# Chapter 2. Windows 10 IoT Enterprise 2016 LTSB

RZ-E601/E701/E801 install Microsoft Windows 10 IoT Enterprise 2016 LTSB.

## 2.1. Overview

Microsoft Windows 10 IoT Enterprise 2016 LTSB is Windows 10 operationg system for retail.

## 2.2. System Settings

### 2.2.1. Service

Windows Update service is disabled. So it is not possible to update Windows QFE. Just in case, when updating Windows QFE, please change to "Auto" or "Manual" as startup of Windwos Update service. After updating, please change to "Disabled".

### 2.2.2. Virtual Memory and Startup and Recovery

・Virtual Memory

"Automatically manager paging file size for all drives": Enabled


(Notice)

There is a possibility that paging file size fluctuates by used application.


・Startup and Recovery

| System failure | "Automatically restart!: Disabled<br>"Write an event to the system log": Enabled |
| --- | --- |
| Write debugging infomation | Compelete memory dump<br>C:¥WINDOWS¥MEMORY.DMP<br>"Overwrite any existing file": Enabled |

### 2.2.3. Power option

Default settings：RZ-E600 Series, RZ-E700 Series, RZ-E800 Series

| Hard disk | Turn of hard disk after | 0 min |
| --- | --- | --- |
| Internet Explorer | JavaScript Timer Frequency | Maximum Performance |
| Desktop background settings | Slide show | Available |
| Wireless Adapter Settings | Power Saving Mode | Maximum Performance |
| Sleep | Allow wake timers | Important Wake Timers Only |
| USB settings | USB selevtive suspend setting | Disabled |
| Intel(R) Graphics Settings | Intel(R) Graphics Power Plan | Maximum Performance |
| Power buttons and lid | Power button action | Do nothing |
| | Sleep button action | Do nothing |
| PCI Express | Link State Power Management | Off |
| Processor<br>power management | Minimum processor state | 5% |
| | System cooling policy | Active |
| | Maximum processor state | 100% |
| Display | Turn off display after | Never |
| | Display brightness | 100% |
| | Dimmed display brightness | 50% |
| | Enable adaptive brightness | Off |
| Multimedia settings | When sharing media | Prevent idling to sleep |
| | When playing video | Optimize video quality |

### 2.2.4. Local Security Policy, Account Policies

Maximum password age: 0 days

### 2.2.5. Event log

Maximum log size: 40960 KB (Application, Security, System)

### 2.2.6. Date and time

Time zone: （UTC-08:00）Pacific Time (US & Canada)

Set time automatically: On (Windows default setting)

### 2.2.7. Security Settings

Windows Firewall: Enabeld (Windows default setting)

Security and Maintenance:

Turn messages on or off: Enabled (Windows default setting)

Caution

If not displayed the balloon on task tray, please set to disabled after setup SHARP's original disk image.

Windows Defender: Enabeld (Windows default setting)

### 2.2.8. Other settings

| System Protection | Off |
|---|---|
| Remote | "Don't allow remote connections to this computer" (Windows default setting) |
| Offline Files | "Offline Files is currently disabled." (Windows default setting) |
| Optimize Drives | Run on a schedule: Disabled |
| User name / Organization name | User name: POSTERMINAL<br>Organization name: SHARP |
| Task bar settings | Lock the task bar: On (Windows default setting) |
| Computer name | When SHARP's original disk image is setup, it is assigned at random. |
| Work group | WORKGROUP |

### 2.2.9. User Account settings

| Account name | Administrator |
|---|---|
| Password | Password<br><br>(Notice)<br> "P" is capital letter. |
| Auto Logon | Enabled |

## 2.3. Disk constitution
### 2.3.1. Disk

| Drive | C: | D: |
|---|---|---|
| Use | Windows 10 IoT Enterprise 2016 LTSB | Some OPOS and language packs are copied. |
| File system | NTFS | NTFS |
| Capacity (It is displayed on Windows.) | 39.0 GB | 20.0 GB |
| Used space (It is displayed on Windows) | About 14.5 GB | About 2.5 GB |

(Caution)

When System error happens, complete dump file is created on C:¥WINDOWS¥.

To create complete dump file, it needs free space for paging file and complete dump file. Please secure enough free space of 8GB on C:¥ at least when the memory size is 4GB.

### 2.3.2. File

| C:¥ | C:¥bootmgr          Boot loader |
|---|---|
|  | C:¥pagefile.sys      Page file |
| C:¥WINDOWS | OS system file folder |
| C:¥Program Files | Program file folder |
| C:¥Program Files (x86) | Program file folder |
| C:¥Program Files (x86)¥POSUTIL | Configuration tool for RZ-E1DP1 |
| C:¥Users | Documents and settings on each user |
| C:¥CrashDumps | Crash dump file folder |
| D:¥Drivers | OPOS file folder |

## 2.4. Windows update

Windows update function of Windows 10 IoT Enterprise 2016 LTSB is same as Windows 10.

If needed to update, please verify carefully in advance on your side.

(Caution)

SHARP doesn't ensure to update Windows QFE automatically.

Windows Update service is disabled. So it cannot update Windows QFE on SHARP's original disk image.

## 2.5. Touch panel settings
### 2.5.1. Setting items, Default setting
Touch panel utility (Touch tool) is installed.
Please set touch panel settings on Touch tool.

Regarding RZ-E701/E801, please set "Pen and Touch" on Control Panel too when set Digitizer HID on HID mode.

[How to launch Touch tool]
  [Start](Windows logo on left lower) – [Touch tool kit] – [Touch tool]

The setting of SHARP's original disk image is as follows.

(Caution)
  After changing any check box or any slide bar in Touch tool, when canceling to change, please return the check box and the slide bar in the state before the change. And, please close Touch tool by clicking [Ok] button.
  Just in case, please confirm that all settings is correct by launching Touch tool.

[RZ-E701/E801]
【Touch tool】

| Settings | Default |
| --- | --- |
| HID mode | Digitizer HID (*1) |
| Touch mode | Disabled (*1) |
| Right-click settings | Disabled (*1) |
| Double click settings(Speed) | Disabled (*1) |
| Double click settings(area) | Disabled (*1) |
| Sound settings | Buzzer sound |

  (*1)
   - When set Digitizer HID on HID mode, right click settings and double click settings are controlled on "Pen and Touch" of Control Panel.
   - When set Mouse HID on HID mode, right click settings and double click settings are controlled on "Touch tool".

【Control Panel – Pen and Touch】(When set Digitizer HID on HID mode)

| Settings | Default |
| --- | --- |
| Double-tap | Enabled |
| Press and hold | Enabled |

[RZ-E601]
【Touch tool】

| Settings | Default |
| --- | --- |
| HID mode | Mouse HID (Fixed) |
| Touch mode | Drawing mode |
| Right-click settings | Enabled |
| Double click settings(Speed) | Far left |
| Double click settings(Area) | Far right |
| Sound settings | Buzzer sound |
| Edge compensation | All 10 |

### 2.5.2. Calibration (RZ-E601)
It is possible to execute calibration.

When the touch location and the cursor location have slipped, please execute calibration..

(Notice)
It is possible to execute on RZ-E601 only which uses Resistive.

How to execute calibration
① Open Touch tool.



② Click [9 pts linearization] button.



Please touch the center of flashing mark and hold.  15

③ Touch the center of flashing mark and hold.
④ After touching 9 points, click [save] button.
   Calibration information is saved.

## 2.6. How to install Language pack
It is possible to istall language pack.
Please install language pack, basic pack and fonts pack by the following procedure.

＜How to install language pack＞
 (1) Open Command Prompt.
 (2) Input "lpksetup" on Command Prompt.

(3) Press [Enter] key.

(4) Click [Install display languages].

(5) Click [Browse...] button.

(6) Select "D:¥MUI¥Language" folder.

(7) Click [OK] button.

　　 Language list is displayed a few minutes.

(8) Click the check box of the target language to install.

(9) Click [Next] button.

(10) Click [I accept the license terms.]

(11) Click [Next] button.

　　 For a while, language pack is being installed.

(12) After language pack is insltall, click [Close] button.


＜How to install lbasic pack fonts pack＞

As next step, it needs to install basic pack and fonts pack by dism command.


Notice

　　 This is not necessary by the target language.


(1) Input the command on Command Prompt.

　　 "dism /online /add-package /packagepath::D:¥MUI¥Feature_on_Demand¥****.cab"


　　 Example

　　 Please input the following on command prompt.


　　 "dism /online /add-package /packagepath:D:¥MUI¥Feature_on_Demand¥

　　 Microsoft-Windows-LanguageFeatures-Basic-fr-fr-Package.cab"


(2) Install the target language to be needed.


<Additional information>

* Language Pack & Language interface pack.

　　 Please check the following URL.

　　 https://technet.microsoft.com/en-us/library/cc766010(v=ws.10).aspx


　　 Example

　　 Please input the following on command prompt.


　　 "lpksetup.exe /i fr-FR /p Microsoft-Windows-Client-Language-Pack_x64_fr-fr.cab"


* Basic & Fonts

　　 Please check the following URL

　　 https://technet.microsoft.com/en-us/library/hh825679.aspx

# Chapter 3. Setup OPOS software

## 3.1. General

OPOS software will be set up on RZ-E601/E701/E801 and application development PC.

OPOS software installation is stored in D:¥Drivers folder. The OPOS software for the device to be used should be installed.

For the application development PC, the OPOS software for the device used by the application should be installed.

## 3.2. How to set up the OPOS software

Refer to the release notes for setup instructions.

## 3.3. Software update

In order to improve OPOS software and add functions, software modules may be updated.

Please follow the instructions in the release letter and release notes to perform the setup.

## 3.4. Notes

* RZ-E601/E701/E801

This OPOS software is only for RZ-E601/E701/E801.

Do not set up an OPOS software for another models to RZ-E601/E701/E801.

If an OPOS software for another model is set up incorrectly to RZ-E601/E701/E801, there is a possibility that the application program does not work properly or the OS does not start normally.

* Application development PC

Only one type of OPOS software for development can be set up on one development PC.

Therefore, it is not possible to set up multiple model POS application development environments on one development PC.

If other OPOS software for development has already been set up, please uninstall it and set up OPOS software for RZ-E601/E701/E801.

To delete the OPOS software, please use the "Programs and Features" of the control panel.

# Chapter 4.  Developing Applications

Visual C# / Visual Basic. NET on Visual Studio 2015 can be used for application development systems.
It corresponds to .NET Framework 3.5 / 4.6.
About the hardware and software environment used for developing applications, please refer to Microsoft product information.
As an application development environment, it is possible to use standard control, ActiveX control attached to Visual Studio 2015 (Update 3), POS device API for RZ-E601/E701/E801.
The POS device API for RZ-E601/E701/E801 can not be used for other models.

## 4.1.  Visual Studio 2015
### 4.1.1.  How to obtain Visual Studio 2015
To obtain Visual Studio 2015 newly, please purchase Visual Studio 2015 Professional Edition or higher.

### 4.1.2.  Features of Visual C# (Visual Studio 2015)
About the features of Visual C#, please refer to the information provided by Microsoft Corporation.

### 4.1.3.  Features of Visual Basic .NET(Visual Studio 2015)
About the features of Visual Basic .NET, please refer to the information provided by Microsoft Corporation.

# Chapter 5. Controlling POS devices

## 5.1. General

Describes how to control POS devices from application programs.

## 5.2. Devices controlled by Windows standard control

The following devices are controlled by Windows standard functions.

| Device | Function |
|---|---|
| Touch panel | Treatment similar to OS touch panel event function |
| Video display | Used as operator display |
| Option display(RZ-E1DP3) | Used as customer display via HDMI |

## 5.3. Devices controlled by POS device API for RZ-E601/E701/E801

| Device | Function |
|---|---|
| Customer display(RZ-E1DP1) | Display of alphanumeric characters and symbols |
| Magnetic Stripe Reader (RZ-E1MR1) | Read magnetic card(ISO track1/2/3) |
| Magnetic Stripe and iButton Key Reader (RZ-E1MT1) | Read magnetic card(ISO track1/2/3) and iButton key |

# Chapter 6. BIOS SETUP Utility

## 6.1. Outline

RZ-E601/E701/E801 have BIOS setup utility to write the setup information for system booting on ROM-BIOS.

Caution

When shipping the products, setup information is initialized. So please don't change any item which has no directions. If changed from the initialization without directions, the behavior isn't guaranteed. The system may not work definitely.

BIOS needs the initialization when added Physical memory or changed SSD or repaired board. About the details, please refer to "6.4 Setup information settings".

## 6.2. How to enter BIOS SETUP Utility

The procedure to enter BIOS SETUP Utility is as follows.
Please prepare USB-keyboard in advance.
1. Connect USB-keyboard.
2. Press power button.
   The system starts.
3. Press [Delete] key or [Esc] key more than once after SHARP logo is displayed.

## 6.3. How to operate the key

Pleae use the following key to change setup information on BIOS SETUP Utility.

| Used key | Operation |
|----------|-----------|
| ← / → | Select screen |
| ↑ / ↓ | Select item |
| **Enter** | Select or decide the value |
| **+ / -** | Change the value |
| **F3** | Optimizes defaults |
| **F4** | Save Changes and reset |
| **ESC** | Exit |

## 6.4. Setup information settings

BIOS needs the initialization when added Physical memory or changed SSD or repaired board or updated BIOS. In addition the system needs to change date and time.

After entering BIOS SETUP Utility, please initialize BIOS settings or change date and time.

## 6.5. How to initialize BIOS settings

The procedure to initialize BIOS is as follows.
 (1) Enter BIOS SETUP Utility.
 (2) Press [F3] key.
    [Load Optimized Defaults] screen is displayed.
 (3) Select [Yes]. Press [Enter] key.
 (4) BIOS setting is initialized.
 (5) Press [F4] key.
    [Save & reset] screen is displayed.
 (6) Select [Yes]. Press [Enter] key.
    BIOS setting is saved. The system reboots.

### 6.5.1. How to change date and time

The procedure to change date and time is as follows.

(1) Enter BIOS SETUP Utility.
(2) Select [System Date] or [System Time] by pressing [↓] key or[↑] key.
   [System Date] ··· Date
   [System Time] ··· Time
(3) Chang date and time by pressing [+] key or [-] key. (It is possible to use numeric key.)
(4) Press [F4] key.
   [Save & reset] screen is displayed.
(5) Select [Yes]. Press [Enter] key.
   Setting is saved. The system reboots.


### 6.5.2. How to change Voltage for Serial port

BIOS sets voltage for serial port.
Please change voltage when connectrd the device which needs power supply.

Caution
  * When the wrong supply voltage is established, there is fear that the products and the device connected to serial port are destroyed.
    Please change correct voltage after removing the device. And please connect the device.
  * Please don't connect the device which is not supported. There is fear that the products and the device are destroyed.

＜How to change voltage on RZ-E601/E701＞
(1) Enter BIOS SETUP Utility.
(2) Select [Advanced] menu by pressing [→] key or [←] key.
(3) Select [IT8786 Super IO Configuration] by pressing [↓] key or [↑] key.
(4) Press [Enter] key.
(5) Select the target [Serial Port N Configuration] by pressing [↓] key or [↑] key.
   "N" is port number.    (Example: COM2 is [Serial Port 2 Configuration].)
(6) Press [Enter] key.
(7) Select [Serial Port Pin 9 Voltage Select] by pressing [↓] key or [↑] key.
(8) Press [Enter] key.
(9) Select the target voltage by pressing [↓] key or [↑] key.
   [5V] ··· In case of taeget 5V
   [12V] ··· In case of taeget 12V
   [RI] ··· In case of No power supply
(10) Press [Enter] key.
(11) Check that [Serial Port Pin 9 Voltage Select] is set to designated voltage.
(12) Press [F4] key.
(13) [Save & reset] screen is displayed.
(14) Select [Yes]. Press [Enter] key.
(15) Setting is saved. The system reboots.

Regarding COM5 port, it is set by the jumper pin on the board.

＜How to change voltage on RZ-E801＞
  (1)  Enter BIOS SETUP Utility.
  (2)  Select [Advanced] menu by pressing [→] key or [←] key.
  (3)  Select [Super IO Configuration] by pressing [↓] key or [↑] key.
  (4)  Press [Enter] key.
  (5)  Select the target [Serial Port X/N Configuration] by pressing [↓] key or [↑] key.
       "X/N" is port number.     (Example: COM2 is [Serial Port B/2 Configuration].)
  (6)  Press [Enter] key.
  (7)  Select [Serial Port Pin 9 Voltage Select] by pressing [↓] key or [↑] key.
  (8)  Press [Enter] key.
  (9)  Select the target voltage by pressing [↓] key or [↑] key.
       [5V] ··· In case of taeget 5V
       [12V] ··· In case of taeget 12V
       [RI] ··· In case of No power supply
  (10)  Press [Enter] key.
  (11)  Check that [Serial Port Pin 9 Voltage Select] is set to designated voltage.
  (12)  Press [F4] key
  (13)  [Save & reset] screen is displayed.
  (14)  Select [Yes]. Press [Enter] key.
  (15)  Setting is saved. The system reboots.

  Regarding COM5 port, it is set on BIOS SETUP Utility.


## 6.6.  Caution
  Pleaes use the disk which supports USB 3.0 when booted by bootable disk from USB-CD/DVD drive.
  USB-mouse, USB-keyboard doesn't work when used the disk which doesn't support USB 3.0.

## Revision history

**Mar. 29, 2017  Rev. 1.0**

BIOS  SETUP  Utility