



Personal Computer

Model No. FZ-56 Series

Operating Instructions - Reference Manual



Panasonic Connect Co., Ltd.

Web Site : <https://docs.connect.panasonic.com/pc/>

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Introduction

Introduction

Disclaimer

- Computer specifications and manuals are subject to change without notice. Panasonic Connect Co., Ltd. assumes no liability for damage incurred directly or indirectly from errors, omissions or discrepancies between the computer and the manuals. Refer for the latest information about optional products to the catalogs, etc.
- Panasonic shall not be liable for loss of data or other incidental or consequential damages resulting from the use of this product.
- We recommend that this Reference Manual be printed.

Illustrations and Terminology in this manual

- This manual explains using the default setting.
- In principle, this manual explains based on the following conditions:
 - When the keyboard and touchpad are used for operation
- Some illustrations are simplified to help your understanding and may look different from the actual unit.
- Some types of software are automatically updated, and differences may occur from descriptions in this manual.
- If you do not sign in as an administrator, you cannot use some functions or cannot display some screens.
- This manual explains operation procedures using the touchpad or mouse as typical examples. In addition, you can touch the display screen to operate the computer (only for model with touchscreen).

When using the touch operation, please replace the terms as described below, and read the instructions.

Operation terms to be replaced:

- Click → Touch
- Double-click → Double-touch
- Right-click → Touch and hold (Long touch)
- This manual uses the included or accessory AC adaptor for explanations.

Terms and illustrations in these instructions.

- <<Enter>>: This means to press the <<Enter>> key.
- <<Fn>> + <<F7>>:
This means to press and hold <<Fn>> key, and then press <<F7>> key.
- The display of the key may be different from this manual according to the keyboard used. (e.g. "Delete" instead of "Del")
- Click  -  :
Click  (Start) and then click  (Power).

In these instructions, the names are referred as follows.

- "Windows 11 Pro" as "Windows" or "Windows 11"
- DVD MULTI drive, DVD-ROM drive and Blu-ray disc drive as "optical disc drive".
- Circular media including BD-ROM, DVD-ROM and CD-ROM as "discs".
- The Touch Screen as the "touchscreen" (only for model with touchscreen).
- The stylus as the "pen (specified)".
- The computer screen supporting touching methods (using stylus / your fingers) is referred to as the "screen" (only for model with touchscreen).

Regarding Windows 11

Screen Messages

Screen messages are explained in [English (United States)].

(Depending on the language preference, some screen messages in these instructions are different from the actual screen messages. For example, [Flight mode]/[WiFi] may be displayed instead of [Airplane mode]/[Wi-Fi] in some language preference)

Opening the Control Panel

1. Click  (Start) - [All]* - [Windows Tools].

*If [All] does not appear, search for the app in the search box and launch it.

2. Double-click [Control Panel].

Opening the Settings

1. Click  (Start) - [Settings].

Latest Information on Windows

This manual is explained in Windows 11 version 25H2.

When Windows is updated, the screen display or operation procedures may be changed.

For the latest information on Windows, see the following web page.

<https://global-pc-support.connect.panasonic.com/windows/11>

Sound and Video

- Sound (e.g. MP3, WMA) and video (e.g. MPG, WMV) recorded in microSD memory card may be interrupted during playback. If this happens, copy them to the flash memory drive and play back.
- Depending on the processing status on Windows, sound may be interrupted at Windows startup. You can mute the sound at startup.

The startup sound is muted as the factory default.

1. Right-click  (Speakers) on the system tray, and click [Sound settings] - [More sound settings] - [Sounds].
2. Remove the check mark from [Play Windows Startup sound], and click [OK].

Windows Update

You can update to the latest updates for Windows with the following menus.

1. Click  (Start) - [Settings] - [Windows Update].
2. Click [Check for updates].

Do not apply "Driver Updates" even if a message to update a driver appears. If a driver update is required, ask the system administrator.

Before Turning on the Computer

Rear Expansion Area

<Only for model without Discrete GPU>

You can select from the following options.

FZ-VCN551

- VGA Port / Serial Port / USB 3.2 Gen 1 (Type-A) Port
(➡ [External Display](#) / [Serial Port](#) / [USB Devices](#))

FZ-VCN552

- VGA Port / Serial Port / LAN Port
(➡ [External Display](#) / [Serial Port](#) / [LAN](#))

FZ-VCN554

- USB 3.2 Gen 1 (Type-C) Port / USB 3.2 Gen 1 (Type-A) Port
(➡ [USB Devices](#))

FZ-VCN561

- LAN (2.5G) Port / microSD Memory Card Slot
(➡ [LAN](#) / [microSD Memory Card](#))

Inserting an option to the rear expansion area

1. Turn off the computer and disconnect the AC adaptor.

IMPORTANT

- We recommend that you turn off the computer completely the following.
 1. Click  (Start) - [Settings] - [System] - [Recovery].
 2. Click [Restart now] in “Advanced startup”.
 3. Click [Restart now] on the “We’ll restart your device so save your work” screen.
 4. Click [Turn off your PC].

2. Turn your computer over and remove the battery pack. (➡ [Replacing the Battery Pack](#))

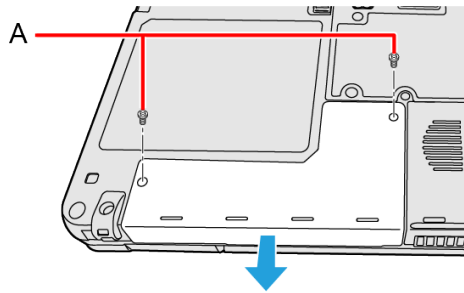
<When using second battery pack>

- Remove the second battery pack. (➡ [Replacing the Battery Pack](#))

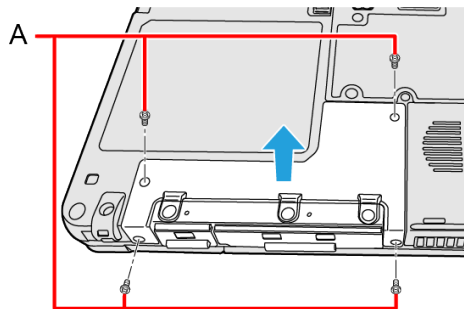
Make sure no foreign objects are under the computer.

3. Insert an option to the rear expansion area.

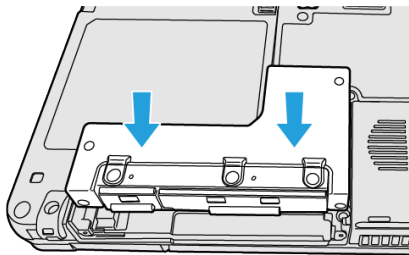
- The dummy cover may have been inserted.
1. Remove the screws (A), and remove an option to the arrow direction.
Use the PH 1 (PH #1) screwdriver.
<For dummy cover>



<For options>

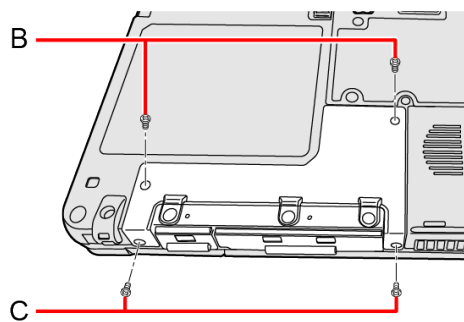


2. Press left and right from above to insert an option.



3. Tighten the screws (B) first, and then tighten the screws (C).

Use the PH 1 (PH #1) screwdriver.
Use 4 screws.



Recommended tightening torque

0.60 N•m $\pm$ 0.05 N•m (6.0 kgf•cm $\pm$ 0.5 kgf•cm)

4. Insert the battery pack. (➡ [Replacing the Battery Pack](#))

Right Expansion Area

You can select from the following options.

FZ-VZSU1HU / FZ-VZSU1HAU

- Second Battery Pack

FZ-VFP551

- Fingerprint Reader (Windows Hello)

(➡ [Fingerprint Reader](#))

FZ-VFP552 <Only for North America>

- Fingerprint Reader (Windows Hello, Multi User authentication)

(➡ [Fingerprint Reader](#))

FZ-VNF552 <Only for North America>

- Contactless Smart Card Reader

(➡ [Contactless Smart Card Reader](#))

FZ-VSC561

- Smart Card Reader

(➡ [Smart Card](#))

IMPORTANT

- <Only for model with Fingerprint Reader (Windows Hello, Multi User authentication)>

Before using the fingerprint reader (Windows Hello, Multi User authentication), you need to change following settings.

1. Click  (Start) - [Settings] - [System] - [Recovery].
2. Click [Restart now] in “Advanced startup”.
3. Click [Restart now] on the “We’ll restart your device so save your work” screen.
4. Click [Troubleshoot] - [Advanced options] - [UEFI Firmware Settings] - [Restart].
The computer restarts, and the Setup Utility screen appears.
5. Select the [Exit] menu, then select [Load Default Values] and press <<Enter>>.
If the “Load Optimized Defaults” is displayed, select [Yes] and press <<Enter>>.
6. Select the [Security] menu, and then confirm [Enhanced sign-in security] is set to [Disabled].
7. Select the [Exit] menu, then select [Save Values and Reboot] and press <<Enter>>.
If the “Save Values and Reboot” is displayed, select [Yes] and press <<Enter>>.

Inserting an option to the right expansion area

1. Turn off the computer and disconnect the AC adaptor.

IMPORTANT

- To insert a fingerprint reader, turn off the computer completely the following.
- Similarly for other options, we recommend that you turn off the computer completely the following.
 1. Click  (Start) - [Settings] - [System] - [Recovery].
 2. Click [Restart now] in “Advanced startup”.
 3. Click [Restart now] on the “We’ll restart your device so save your work” screen.
 4. Click [Turn off your PC].

2. Turn your computer over and remove the battery pack. (➡ [Replacing the Battery Pack](#))

<When using second battery pack>

- Remove the second battery pack. (➡ [Replacing the Battery Pack](#))

Make sure no foreign objects are under the computer.

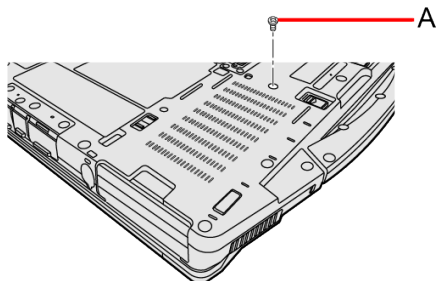
3. Insert an option to the right expansion area.

- The dummy pack may have been inserted.

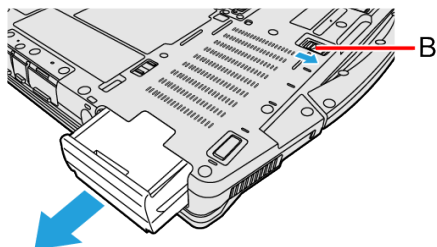
1. <When the screw is being used>

Remove the screw (A).

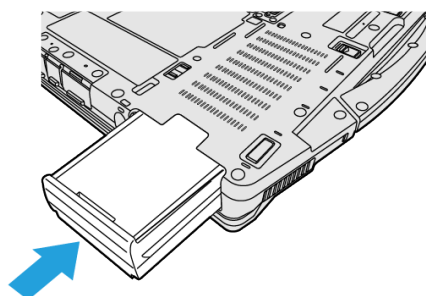
Use the Torx T8 (tamper-resistant compatible) screwdriver.



2. While sliding the latch (B), pull out an option.



3. Slide an option in parallel with the arrow direction until it clicks to the secured position.

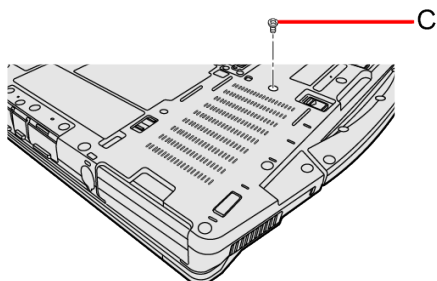


4. <When using fingerprint reader (FZ-VFP551)>

Tighten the screw (C) supplied with fingerprint reader.

Use the Torx T8 (tamper-resistant compatible) screwdriver.

Use 1 screw.



Recommended tightening torque

0.45 N•m ± 0.05 N•m (4.5 kgf•cm ± 0.5 kgf•cm)

4. Insert the battery pack. (➡ [Replacing the Battery Pack](#))

Left Expansion Area

<Only for model without Discrete GPU>

You can select from the following options.

FZ-VDM561

- DVD MULTI Drive Pack
(➡ [Optical Disc Drive](#))

FZ-VDM562

- DVD-ROM Drive Pack
(➡ [Optical Disc Drive](#))

FZ-VBD561 <Only for North America>

- Blu-ray Disc Drive Pack
(➡ [Optical Disc Drive](#))

FZ-V2S56

- SSD Pack
(➡ [SSD Pack](#))

FZ-V2F56 <Only for North America>

- SSD Pack
(➡ [SSD Pack](#))

FZ-VSC552

- Smart Card Reader
(➡ [Smart Card](#))

FZ-VBR552 <Only for North America>

- Barcode Reader
(➡ [Barcode Reader](#))

FZ-VLN561

- LAN (10G) Port
(➡ [LAN](#))

Inserting an option to the left expansion area

1. Turn off the computer and disconnect the AC adaptor.

IMPORTANT

- To insert a SSD pack, turn off the computer completely the following.
- Similarly for other options, we recommend that you turn off the computer completely the following.
 1. Click  (Start) - [Settings] - [System] - [Recovery].
 2. Click [Restart now] in “Advanced startup”.
 3. Click [Restart now] on the “We’ll restart your device so save your work” screen.
 4. Click [Turn off your PC].

2. Turn your computer over and remove the battery pack. (➡ [Replacing the Battery Pack](#))

<When using second battery pack>

- Remove the second battery pack. (➡ [Replacing the Battery Pack](#))

Make sure no foreign objects are under the computer.

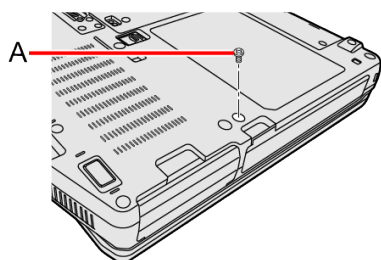
3. Insert an option to the left expansion area.

- The dummy pack may have been inserted.

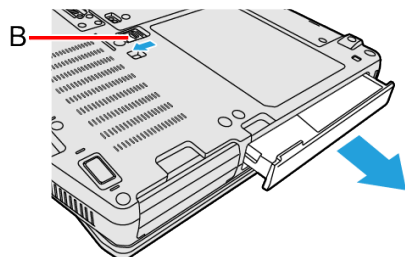
1. <When the screw is being used>

Remove the screw (A).

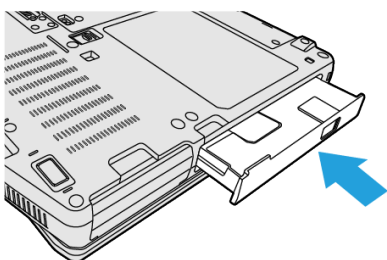
Use the PH 1 (PH #1) screwdriver.



2. While sliding the latch (B), pull out an option.



3. Slide an option in parallel with the arrow direction until it clicks to the secured position.

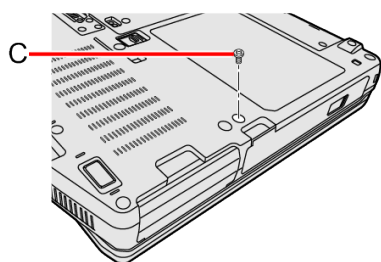


4. <When the screw is included with an option>

Tighten the screw (C) supplied with an option.

Use the PH 1 (PH #1) screwdriver.

Use 1 screw.



Recommended tightening torque

0.60 N•m ± 0.05 N•m (6.0 kgf•cm ± 0.5 kgf•cm)

4. Insert the battery pack. (➡ [Replacing the Battery Pack](#))

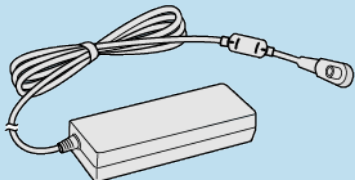
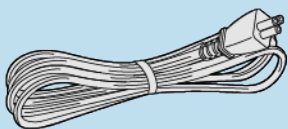
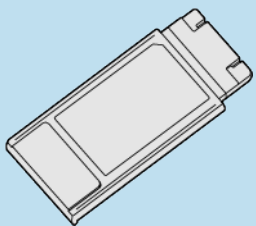
First-time Operation

First-time Operation

Preparation

Check and identify the supplied accessories.

If you do not find the described accessories, contact your support office.

Accessories	Model Number	Quantity
<Only for model with AC Adaptor> AC Adaptor (barrel-type) 	CF-AA5713A	1
<Only for model with AC Cord> AC Cord 	-	1
Battery Pack^{*1} 	FZ-VZSU1HU FZ-VZSU1HAU	1 or 2
<Only for model with Tether> Tether	-	1
<Only for model with Stylus> Stylus^{*1}	-	1
Quick Start Guide	-	1
OPERATING INSTRUCTIONS - Read Me First	-	1

^{*1} : Stored in the computer at the time of packing.

IMPORTANT

Inserting RAM module for expansion

- Use only the optional approved RAM module. Non-approved RAM modules may not operate properly, and may cause damage to your computer.
- When adding a RAM module, mount it using the specified method. (➡ [RAM Module](#))
Otherwise, the expected performance may not be achieved.

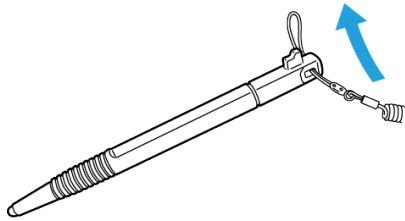
1. <When using the stylus and tether>

Use the tether to attach the pen (specified) to the computer.

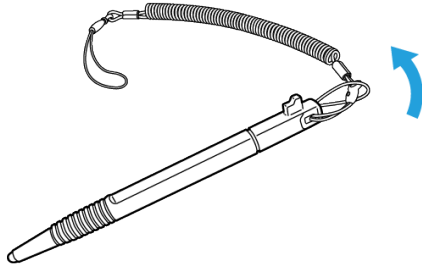
Use the tether to attach the pen (specified) to the computer so you will not lose it.

1. Detaching the pen (specified) from the computer. (➡ [Detaching the pen from the computer](#))

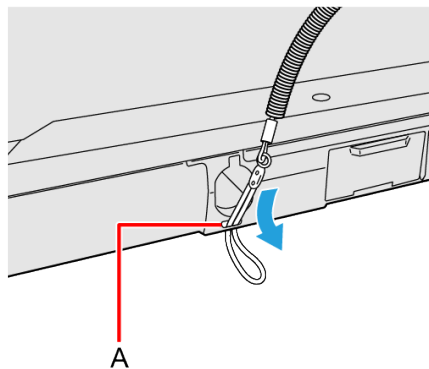
2. Pass one of the loops on the tether through the hole in the pen (specified).



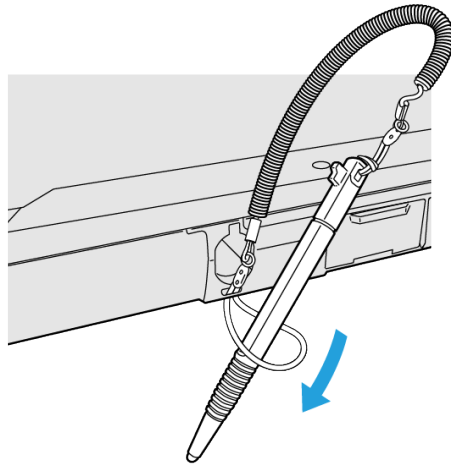
3. Pass one of the loops through another loop.



4. Thread the second loop on the tether through the tether hole (A) as illustrated.



5. Pass the pen (specified) and tether through the second loop.

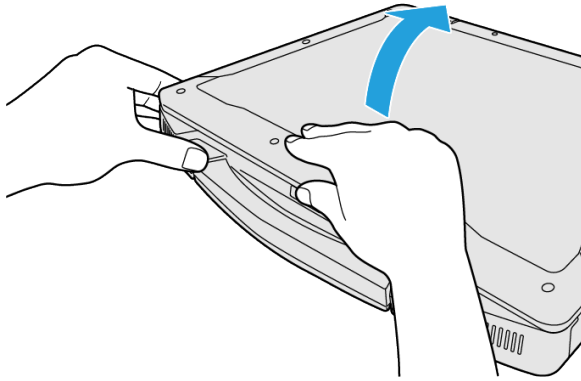


IMPORTANT

- Do not pull the tether with excessive force. The pen (specified) may hit the computer, person's body or other objects when released.

2. Open the display.

1. Hold the side/handle of the computer with either of your hands and then lift up the display to open.



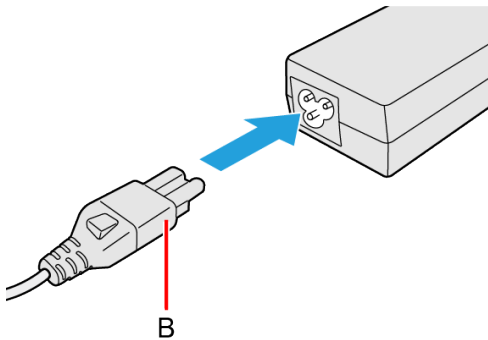
IMPORTANT

- Do not open the display wider than necessary (180° or more), and do not apply excessive pressure to the LCD. Do not open or close the computer holding the edge of the LCD segment.

3. Connect your computer to a power outlet.

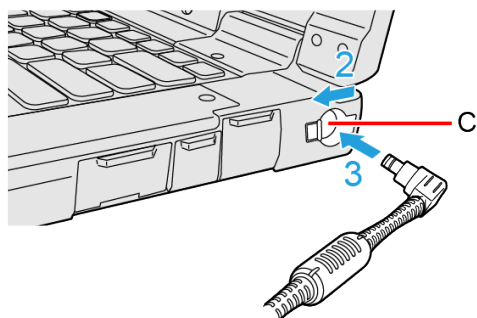
1. Connect the AC cord and AC adaptor.

Hold the plug (B) of the AC cord, and securely insert it straight to the end.



2. Slide the cover.

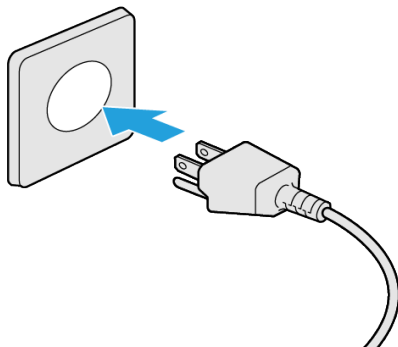
3. Connect the AC adaptor to the DC-IN jack (C) of the computer.



4. Connect the AC plug to an AC outlet.

The shape of AC plug and AC outlet depend on the country.

The battery charging starts automatically. (➡ [Battery Indicator](#))



IMPORTANT

- **Do not disconnect the AC adaptor until the first-time operation procedure is completed.**
- **When using the computer for the first time, do not connect any peripheral device except the battery pack and AC adaptor.**
- **Handling the AC adaptor**
Problems such as sudden voltage drops may arise during periods of thunder and lightning. Since this could adversely affect your computer, an uninterruptible power source (UPS) is highly recommended unless running from the battery pack alone.
- **When the AC adaptor is not connected to the computer, disconnect the AC cord from your AC outlet. Power is consumed simply by having the AC adaptor plugged into an AC outlet.**

4. Turn on the computer.

1. Press the power switch to turn on the power indicator  . (➡ [Description of Parts](#))

IMPORTANT

- **Do not press the power switch repeatedly.**
- **Once you turn off the computer, wait for 30 seconds or more before you turn on the computer again.**
- **Do not perform the following operation until the first-time operation procedure is completed.**
 - Disconnecting the AC adaptor
 - Pressing the power switch
 - Closing the display
 - Any changes from the default setting of the Setup Utility
- **When the CPU temperature is high, the computer may not start up to prevent overheating of the CPU. Wait until the computer cools down, and then turn the power on again. If the computer does not power on even after cooling down, contact Panasonic Technical Support.**

5. Setup Windows.

1. Follow the on-screen instructions.
 - The computer restarts several times. Do not touch the keyboard, touchpad, touchscreen (only for model with touchscreen) or external mouse, and wait until the drive indicator  has turned off.
 - After the computer is turned on, the screen remains black or unchanged for a while, but this is not a malfunction. Wait for a moment until the Windows setup screen appears.
 - The active network connection and your Microsoft account are required to complete the Windows setup.
 - When the "How would you like to set up this device?" screen appears, choose your setup method.
 - For further information (e.g. network connection, Microsoft account, Wi-Fi point, etc.), ask the system administrator.

6. Restart the computer.

1. Click  (Start).

2. Click  (Power) - [Restart].

NOTE

- When the “Emergency notification setting” screen appears, read the on-screen messages carefully. Follow the on-screen instructions. You can set the “Emergency notification setting” after the setup of Windows is complete.

NOTE

- To display the password input screen every time the computer is resumed from the sleep or hibernation, perform the following setting.
 1. Click  (Start) - [Settings] - [Accounts] - [Sign-in options].
 2. Select [Every Time] in “If you've been away, when should Windows require you to sign in again?”.
- **Set the key entry mode to English (“ENG”) and enter characters.**

The keyboard layout can be added or changed in the following steps.

 1. Click  (Start) - [Settings] - [Time & language] - [Language & region].
 2. Click  - [Language options] in the language.
 3. Click [Add a keyboard] in “Installed keyboards” and choose a keyboard from the list.
- **Remember your password. If you forget the password, you cannot use Windows. Creating a password reset disk beforehand is recommended.**

How to create a recovery disc

Connect to the Internet before creating a recovery disc.

Note that the Windows version of the recovery disc to be created may be newer than the version at the time of factory shipment.

For detailed information and creation method, see the following web page.

<https://global-pc-support.connect.panasonic.com/recv-dls-w11>

“Recovery Image Download Service”

Important Operation/Settings

About the Partition Structure

IMPORTANT

- Do not add or delete partitions in Windows 11, as the Windows area and recovery partition must be adjacent to each other in Windows 11.

Flash Memory Backup/Restore Function

Panasonic Connect Co., Ltd. will bear no responsibility for any damage suffered (including loss of data) as a result of the use of this function.

Creating a Backup of the Flash Memory Data

You can create a backup of the flash memory data, which can be used to recover from hardware failure.

This function creates a backup of the recent state of the flash memory. To return the factory default, use a recovery disc.

To create a backup of the flash memory to another storage media (e.g., external hard disk).

Connect the storage media, and follow the steps below.

1. Click  (Start) - [All]* - [Windows Tools].
*If [All] does not appear, search for the app in the search box and launch it.
2. Double-click [Control Panel].
3. Click [System and Security] - [Backup and Restore (Windows 7)].
4. Click [Create a system image].
Follow the on-screen instructions.

NOTE

- Connect the AC adaptor and do not remove it until backup is complete.

Restoring the Flash Memory Data

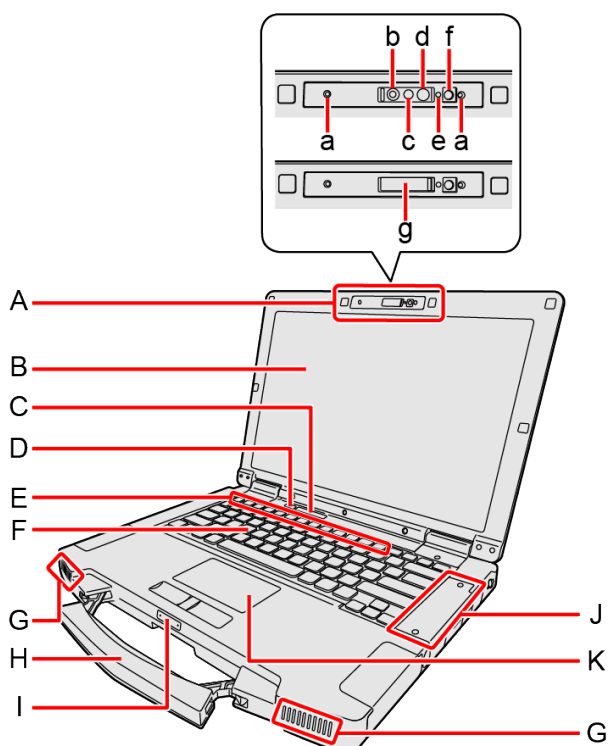
Connect the storage media that created the backup.

1. Click  (Start) - [Settings] - [System] - [Recovery].
2. Click [Restart now] in “Advanced startup”.
3. Click [Restart now] on the “We’ll restart your device so save your work” screen.
4. Click [Troubleshoot] - [Advanced options].
5. Click [See more recovery options].
6. Click [System Image Recovery].
Follow the on-screen instructions.

Description of Parts

Description of Parts

Front side



A. Camera

<Only for model with camera>

(➡ [Camera](#))

- a. **Microphone**
- b. **Camera Lens**
- c. **IR Camera**
- d. **IR Camera Light (RED)**
- e. **Camera Indicator**
- f. **Ambient Light Sensor**

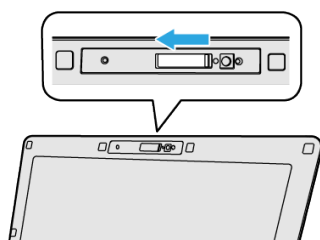
The ambient light sensor is equipped with an automatic brightness adjustment function that adjusts the display screen. (➡ [About the Ambient Light Sensor](#))

g. Camera Cover

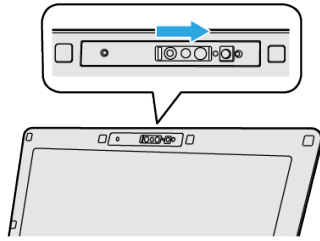
When using a camera, open the camera cover.

When opening and closing the camera cover, operate until it clicks to the secured position.

- To open the camera cover
 1. Slide the camera cover to the arrow direction.



- To close the camera cover
 1. Slide the camera cover to the arrow direction.



B. LCD

C. LED Indicator



: Power Indicator

- Off: Power off/Hibernation
- Green: Power on
- Blinking green: Sleep



: Caps Lock Indicator



: Num Lock (numeric lock) Indicator



: Scroll Lock Indicator



: Drive Indicator (Drive status)

D. Power Switch

E. Function (Fn) Keys

F. Keyboard

(➡ [Keyboard](#))

G. Speaker

H. Carrying Handle

Do not use the handle if the handle is worn or damaged.

I. LED Indicator



: Battery 1 Indicator



: Battery 2 Indicator^{*1}

^{*1}: When using second battery pack

J. Right Security Area

• **Contactless Smart Card Reader**

<Only for model with Contactless Smart Card Reader / Only for North America>

(➡ [Contactless Smart Card Reader](#))

• **Fingerprint Reader (Windows Hello)**

<Only for model with Fingerprint Reader (Windows Hello)>

(➡ [Fingerprint Reader](#))

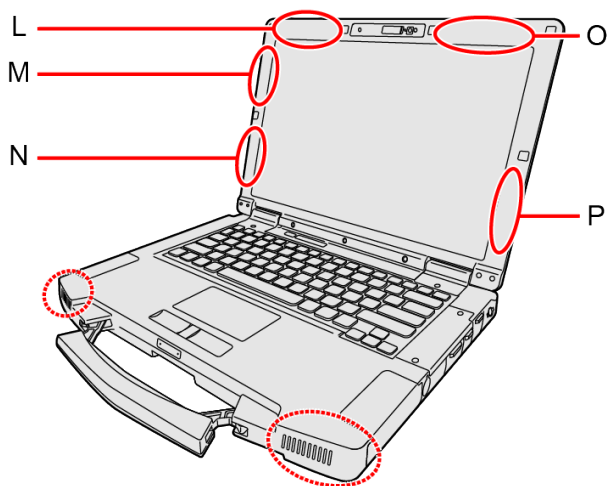
• **Fingerprint Reader (Windows Hello, Multi User authentication)**

<Only for model with Fingerprint Reader (Windows Hello, Multi User authentication)>

(➡ [Fingerprint Reader](#))

K. Touchpad

(➡ [Touchpad](#))



L. Wireless WAN Antenna

<Only for model with wireless WAN>

(➡ Cellular (Wireless WAN))

M. Wireless WAN Antenna / Dedicated GPS Antenna / GPS on Wireless WAN Antenna

<Only for model with wireless WAN>

(➡ Cellular (Wireless WAN))

<Only for model with dedicated GPS>

(➡ GPS)

<Only for model with GPS on wireless WAN>

(➡ GPS)

N. Wireless LAN Antenna / Bluetooth Antenna

<Only for model with wireless LAN>

(➡ Wi-Fi (Wireless LAN))

<Only for model with Bluetooth>

(➡ Bluetooth)

O. Wireless WAN Antenna / GPS on Wireless WAN Antenna

<Only for model with wireless WAN>

(➡ Cellular (Wireless WAN))

<Only for model with GPS on wireless WAN>

(➡ GPS)

P. Wireless WAN Antenna

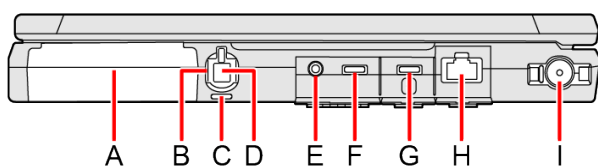
<Only for model with wireless WAN>

(➡ Cellular (Wireless WAN))

NOTE

- This computer contains a magnet and magnetic products at the locations dashed line circled in the illustration above. Keep metallic object, magnet, smart watch or magnetic media away from these areas.

Right side



A. Right Expansion Area

You can select an option to the right expansion area and install it later.

(➡ Right Expansion Area)

B. Pen Holder

<Only for model with touchscreen>

C. Tether Hole

D. Stylus

<Only for model with Stylus>

E. Headset Jack

A headset or headphone can be connected.

F. Thunderbolt™ 4 (Type-C) Port

Do not insert any foreign object into the USB port.

(➡ [USB Devices](#))

G. Thunderbolt™ 4 (Type-C) Port

Do not insert any foreign object into the USB port.

(➡ [USB Devices](#))

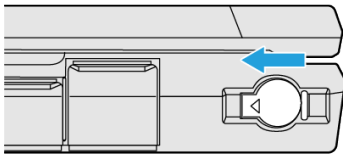
H. LAN Port

(➡ [LAN](#))

I. DC-IN Jack

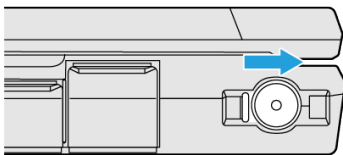
- To open the cover

1. Slide the cover to the arrow direction.

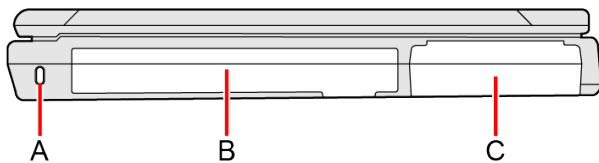


- To close the cover

1. Slide the cover to the arrow direction.



Left side



A. Security Slot

A Kensington cable can be connected. For further information, read the manual that comes with the cable.

B. Left Expansion Area

You can select an option to the left expansion area and install it later.

<Only for model without Discrete GPU>

(➡ [Left Expansion Area](#))

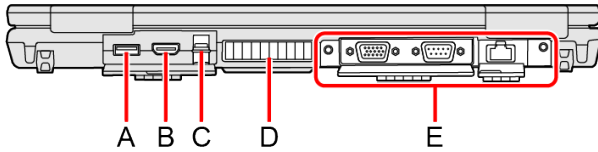
DVD MULTI Drive Pack / DVD-ROM Drive Pack / Blu-ray Disc Drive Pack <Only for North America>

<Only for model with Discrete GPU>

(➡ [Optical Disc Drive](#))

C. Battery Pack

Rear side

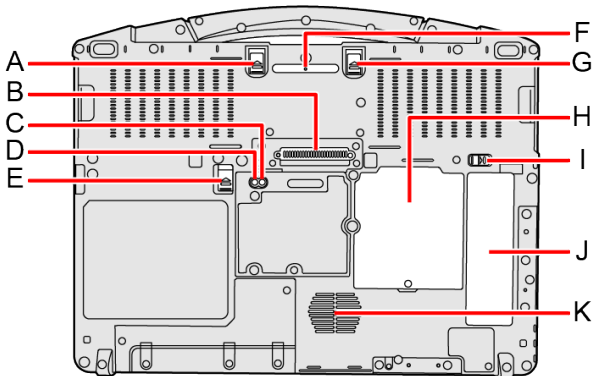


- A. **USB 3.2 Gen 1 (Type-A) Port**
(➡ [USB Devices](#))
- B. **HDMI Port**
(➡ [External Display](#))
- C. **nanoSIM Card Slot**
<Only for model with wireless WAN>
(➡ [Cellular \(Wireless WAN\)](#))
- D. **Ventilation Hole (Exhaust)**
- E. **Rear Expansion Area**
You can select an option to the rear expansion area and install it later.
<Only for model without Discrete GPU>
(➡ [Rear Expansion Area](#))

NOTE

- The model with discrete GPU cannot replace the options (including dummy cover) installed at the time of purchase.

Bottom side



- A. **Battery Pack Latch**
- B. **Expansion Bus Connector**
<Only for model with Expansion Bus Connector>
(➡ [Port Replicator \(FZ-VEB55 series\)](#))
- C. **External Antenna Connector (Channel 2)**
<Only for model with External Antenna Connector>
(➡ [Pass Through to External Antenna](#))
- D. **External Antenna Connector (Channel 1)**
<Only for model with External Antenna Connector>
(➡ [Pass Through to External Antenna](#))
- E. **Left Expansion Area Latch**
- F. **LED Indicator**
 - ⏏1: Battery 1 Indicator (replace)
 - P1/ ⏏2: Battery 2 Indicator (replace)*2
- G. **Right Expansion Area Latch**

*2: When using second battery pack

H. RAM Module Slot

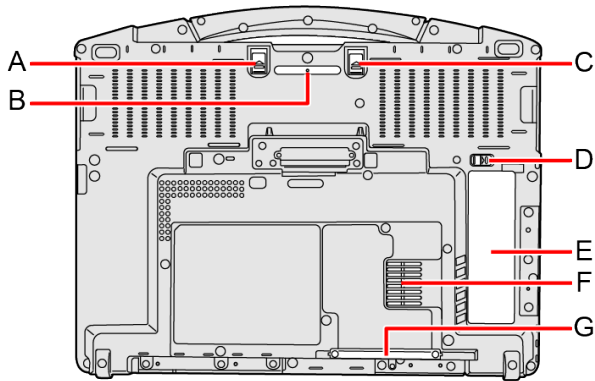
I. SSD Pack Latch

J. SSD Pack

(➡ SSD Pack)

K. Ventilation Hole (Intake)

<Only for model with Discrete GPU>



A. Battery Pack Latch

B. LED Indicator

Q1: Battery 1 Indicator (replace)

P1/ Q2: Battery 2 Indicator (replace)*3

*3: When using second battery pack

C. Right Expansion Area Latch

D. SSD Pack Latch

E. SSD Pack

(➡ SSD Pack)

F. Ventilation Hole (Intake)

G. Ventilation Hole (Exhaust)

Basic Operation

Turning On / Turning Off

Turning On

Press the power switch to turn on the power indicator  . ( [Description of Parts](#))

NOTE

- Do not press the power switch repeatedly.
- The computer will forcibly be turned off if you press and hold the power switch for 10 seconds or longer.
- Once you turn off the computer, wait for 30 seconds or more before you turn on the computer again.
- Do not perform the following operation until the drive indicator  turns off.
 - Connecting or disconnecting the AC adaptor
 - Pressing the power switch
 - Touching the keyboard, touchpad, touchscreen (only for model with touchscreen) or external mouse
 - Closing the display

Turning Off

Shut down the computer.

1. Click  (Start).
2. Click  (Power) - [Shut down].

NOTE

To turn off the computer completely, proceed as follows.

1. Click  (Start) - [Settings] - [System] - [Recovery].
2. Click [Restart now] in “Advanced startup”.
3. Click [Restart now] on the “We’ll restart your device so save your work” screen.
4. Click [Turn off your PC].

Precautions against Starting Up/Shutting Down

Do not do the following

- Connecting or disconnecting the AC adaptor
- Pressing the power switch
- Touching the keyboard, touchpad, touchscreen (only for model with touchscreen) or external mouse
- Closing the display

NOTE

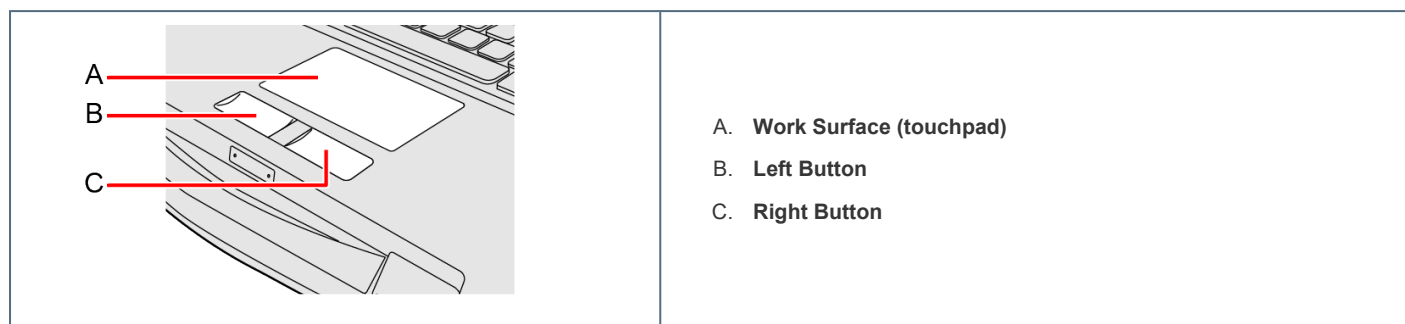
- To conserve power, the following power saving methods are set at the time of purchase.

- The screen automatically turns off after :
 - 5 minutes (when AC adaptor is connected) of inactivity
 - 3 minutes (when operating by battery power) of inactivity
- The computer automatically enters sleep^{*1} after :
 - 5 minutes (when AC adaptor is connected) of inactivity
 - 3 minutes (when operating by battery power) of inactivity

*1 : Refer to ["Sleep/Hibernation Functions"](#) about resuming from sleep.

Touchpad

Use the touchpad to move the cursor on the screen and perform computer operations.



You can change the settings of touchpad by performing the following operation.

1. Click  (Start) - [Settings] - [Bluetooth & devices] - [Touchpad].

Disabling/Enabling the Touchpad

1. Press **«Fn» + «Esc»**. (➡ [Key Combinations](#))

Displays the status of the touchpad when  on the system tray is clicked.

 : Touchpad is enabled.

 : Touchpad is disabled.

NOTE

- When the touchpad is disabled, it will remain disabled until you press **«Fn» + «Esc»** again, even if the computer restarts.
- This function cannot be used with this unit even if you perform the following operations.
 1. Click  (Start) - [Settings] - [Bluetooth & devices] - [Touchpad] - [Taps].
 2. Add the check mark to [Press the lower right corner of the touchpad to right-click].

Changing the Cursor Speed of Touchpad

- You can change the cursor speed of touchpad by performing the following operation.

1. Click  (Start) - [Settings] - [Bluetooth & devices] - [Touchpad].
2. Slide the bar in "Cursor speed".

When you move the slider to the left, the cursor speed is slow.

Handling the touchpad

- By design, the touchpad is to be used with a fingertip only. Do not place any object on the work surface or press down forcefully with sharp-pointed objects (e.g., nails) or hard objects that can leave marks (e.g., pencils and ball point pens).
- Try to avoid having any harmful substances, such as oil, come in contact with the touchpad. The cursor may not work properly in such cases.
- When the touchpad becomes dirty:

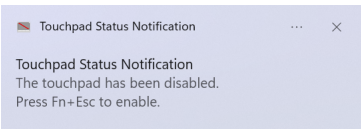
Wipe to remove dirt by using a dry soft cloth such as gauze or a soft cloth first applied with detergent diluted with water and then thoroughly wrung. Do not use benzene or thinner, or rubbing alcohol. Doing so may adversely affect the surface, e.g., discoloration. In addition, do not use commercially available household cleaners and cosmetics, as they may contain components harmful to the surface.

Keyboard

Key Combinations

NOTE

- Do not repeatedly press the keys in quick succession.
- Do not use the key combinations together with touchpad (external mouse), touchscreen (only for model with touchscreen) or other key operations.
- Do not use the key combinations before you sign in to Windows. Wait until the drive indicator  turn off. On the Setup Utility screen, you can use the key combinations of <<Fn>> + <<F1>> and <<Fn>> + <<F2>>.
- The key combinations may not work with some applications.
- The pop-up display shown in the table below appears after signing in to Windows. It may not appear in some application conditions.
- The key combination setting for the numeric key area can be changed with Setup Utility. ( [Setup Utility](#))

Key	Function	Pop-up display
<<Fn>> + <<Esc>> 	Touchpad on/off You can select on/off of the touchpad. NOTE • Displays the status of the touchpad when  on the system tray is clicked. ( Disabling/Enabling the Touchpad) • When the touchpad is disabled, it will remain disabled until you press <<Fn>> + <<Esc>> again, even if the computer restarts.	
<<Fn>> + <<F1>>*1 <<Fn>> + <<F2>>*1  	LCD brightness (<<Fn>> + <<F1>> = down / <<Fn>> + <<F2>> = up)	A slide bar appears.

Key	Function	Pop-up display
<<Fn>> + <<F3>> 	Display mode switching (➡ Switching the display mode) When an external display (a projector etc.) is connected, you can change the display mode. 1. Press <<Fn>> + <<F3>>. 2. Click the display mode. IMPORTANT - Do not press any keys until the display has finished switching. - Do not use this function: - When playing motion video such as DVD or MPEG. - When an external display is not connected. - When showing a game screen such as pinball.	"Project" appears.
<<Fn>> + <<F4>> ^{*1} 	Speaker on/off ^{*2} You can select on/off of speaker. You can check the status of speaker by seeing an icon on the system tray.	A slide bar appears.   : Mute
<<Fn>> + <<F5>> ^{*1} <<Fn>> + <<F6>> ^{*1}  	Volume (<<Fn>> + <<F5>> = down / <<Fn>> + <<F6>> = up) NOTE - When fine-tuning the sound volume, press and hold <<Fn>>, and press <<F5>> or <<F6>> intermittently. - This does not work on speakers connected to the USB port.	A slide bar appears.
<<Fn>> + <<F7>> 	Sleep (➡ Entering/Resuming from Sleep or Hibernation)	

Key	Function	Pop-up display
<<Fn>> + <<F8>> *3 	Concealed Mode on/off You can select on/off of indication status the following devices. • LCD Backlight • LED • Sound • Wireless Radio • Backlit Keyboard <Only for model with backlit keyboard> • Touchscreen <Only for model with touchscreen> (➡ Concealed Mode) NOTE • The camera indicator cannot be turned off. • [Concealed Mode] is set to [Enabled] as the factory default. • You can set the devices turned off in [Concealed Mode Configuration] with Setup Utility. • If you press <<Fn>> + <<F8>> in succession, the concealed mode may not be switched. More than 4 seconds interval is necessary to switch on/off.	
<<Fn>> + <<F9>> 	Remaining battery power (When the battery pack is inserted in the computer)	(➡ Checking the Remaining Battery Power)
<<Fn>> + <<F10>> 	Airplane Mode on/off You can select on/off of the Airplane Mode. (➡ Switching the airplane mode using <<Fn>>)	
<<Fn>> + <<F12>> 	<Only for model with backlit keyboard> Backlit keyboard on/off When you press the keys, the luminance of backlit keyboard is changed. (Four steps and off). NOTE • The one step is designed to be used in dark places. It does not appear to glow in bright places, but this is not a malfunction.	*4 
<<Fn>> + <<1>> 	Open "Panasonic PC Hub" You can change the functions.	
<<Fn>> + <<2>> 	<Only for model with backlit keyboard> Backlit keyboard color switching You can change the color of the backlit keyboard. You can change the functions. <Only for model without backlit keyboard> You can change the functions.	

Key	Function	Pop-up display
<<Fn>> + <<3>> 	Night Mode switching You can change the Night Mode. You can change the functions.	
<<Fn>> + <<4>> 	<Only for model with barcode reader> Read barcode You can change the functions. <Only for model without barcode reader> Concealed Mode on/off You can change the functions.	

*1 : When [LCD Backlight] and [Sound] are set to [OFF] on the [Concealed Mode Configuration] menu and the concealed mode is turned on, these key combinations are disabled.

*2 : When [Sound] is set to [OFF] on the [Concealed Mode Configuration] menu and the concealed mode is turned on, the sound volume setting of Windows does not show mute state.
However, audio from the speaker is not heard.

*3 : You can also turn on/off the concealed mode by pressing <<F8>> or right <<Alt>>.
Change the [Trigger Key] setting in the sub-menu of [Concealed Mode Configuration] in the [Main] menu of the Setup Utility.

*4 : When [Backlit Keyboard] is set to [OFF] on the [Concealed Mode Configuration] menu and the concealed mode is turned on, the pop-up display does not appear.

About << >> key

The function of the <<  >> key varies depending on the region.

For more information, see the following web page.

<https://aka.ms/Keysupport>

Screen Input Operation

<Only for model with touchscreen>

The screen of your computer allows you to perform the same operations as a mouse by touching its surface.

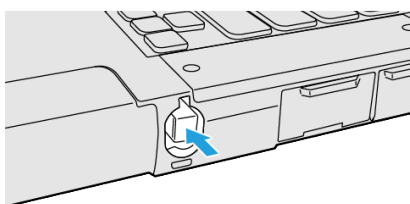
You can use the touchscreen function to perform the same operation as the touchpad and mouse. The computer supports, using your fingers and the pen (specified).

NOTE

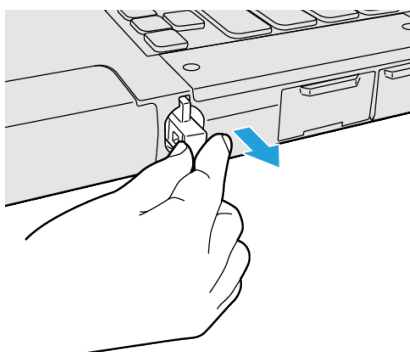
- Note that the touchscreen may respond to the following:
 - Putting the pen (specified) or finger close to the screen.
 - Liquid or metallic objects other than the pen (specified) or finger.

Detaching the pen from the computer

1. Press the pen so it comes out of the pen holder.



2. Draw the pen straight out.

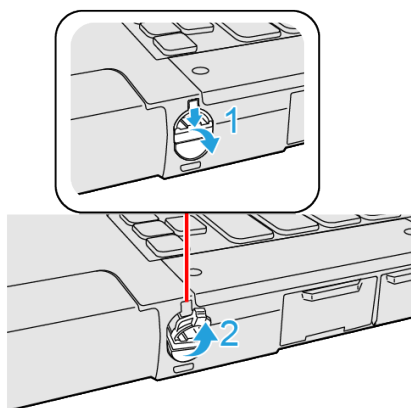


Attaching the pen to the computer

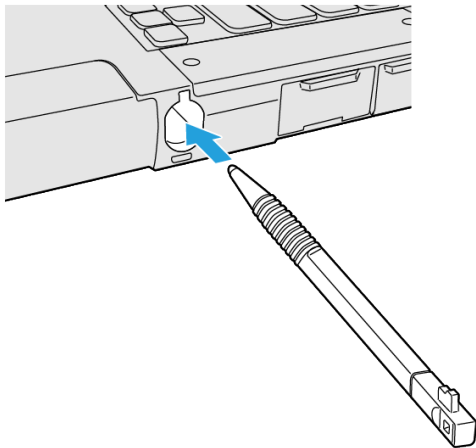
1. <When the pen holder has a cap>

Remove the cap.

1. While pushing down the cap, pull it in front.
2. Pull the cap out to the arrow direction.



2. Insert the pen into the pen holder until it clicks in place.

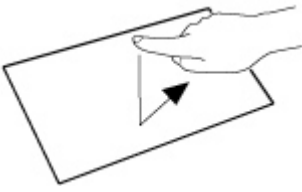
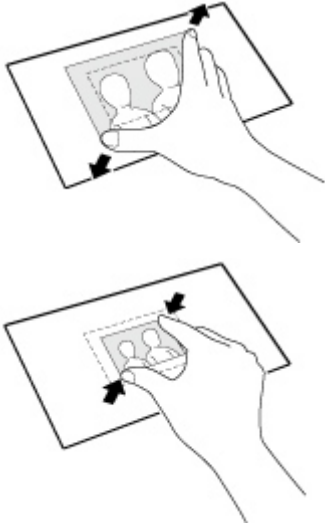
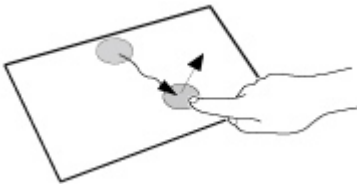
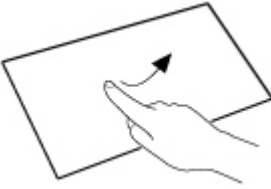


“Touch and hold” (“right-click”) operation

- Touch and hold the object with your fingers, or the pen (specified), and release it when a frame surrounding the object appears.

Operation by touching the screen

Instead of operating the screen with the pointer, you can use your fingers.

	Touch (Tap)	Touch the screen once with one finger.
	Spread / pinch	Touch an image or document with two fingers, and spread your fingers apart to zoom in or pinch them together to zoom out.
	Drag	Touch an object (file, icon, etc.) and drag your finger to the desired location before removing it to move the object.
	Swipe	Touch with a sweeping motion.
	Flick	Touch with a quick sweeping motion.

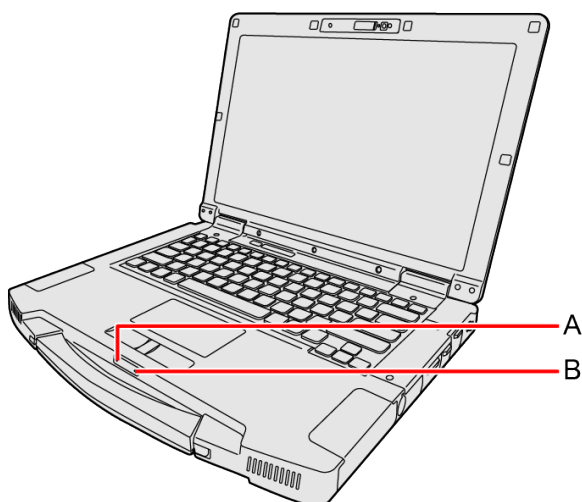
Battery Power

IMPORTANT

- The battery pack is a consumable item. The rate of battery deterioration depends on the usage environment, but as a guide, it will reach the end of its life after 1-3 years of use or 300-500 times of charging. If the battery pack swells or battery usage time is dramatically short even after being fully charged, we highly recommend replacing the battery.

Battery Indicator

Battery indicator (situation in use): **01** (A) and **02** (B)*¹

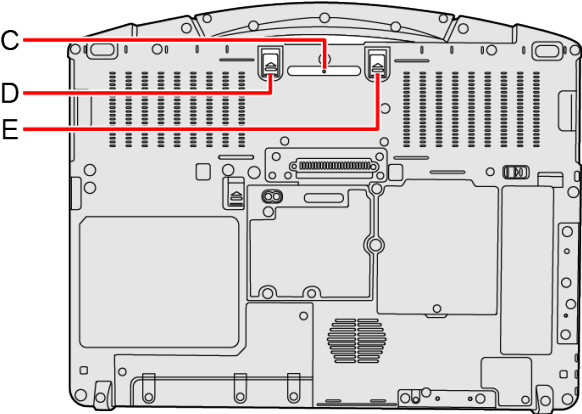


*1: When using second battery pack

Battery indicator (situation in use)	Battery status
Not lit	• The battery pack is not inserted or not being charged. • Concealed mode is set to ON.
Orange	Charging is in progress. If [Battery Charging Indicator] in the [Main] menu of the Setup Utility is set to [Flashing], the indicator will alternately become lighter and darker (Flashing).
Green	The battery is fully-charged.
Blinking green	In order to stop the battery from deteriorating, power supply from another battery or AC adaptor has been shut off, and the battery power is being consumed. Do not remove the battery pack in this status.
Red	The remaining battery is approximately 9 % or less.
Blinking red	The battery pack or the charging circuit is not operating properly. Remove the battery pack immediately.
Blinking orange	The battery cannot be charged temporarily due to the following reasons: • Its internal temperature is out of the acceptable range. • The power supply is not enough because software applications or peripheral devices are consuming a large amount of power. • When charging the computer using USB Power Delivery. The power of the connected USB Power Delivery-compatible device is insufficient.

Battery indicator (situation in use)	Battery status
Blinking green and orange alternately	The temperature is low and the computer is warming up to prevent the flash memory drive from malfunctioning. The computer will start automatically after warming-up.
Blinking orange slowly	When you set [Battery Charging Indicator] to [Flashing] on the [Main] menu of Setup Utility.

Battery indicator (replacing status): **P1/02 — • ——— 01 (C)**



When the latch (D) or (E) (only for model with second battery pack) is slid, the battery indicator (C) lights up as follows.

Battery indicator (replacing status)	Battery status
Green	The battery pack can be replaced without turning off the computer.
Blinking red	The battery packs can only be replaced with turning off the computer.
Not lit	- The battery pack can be replaced. (During shutdown, hibernation) - The battery pack is not inserted or not being charged or other than those above. Concealed mode is set to ON.

NOTE

- Once the battery is fully charged, the computer performs recharging only when the battery level becomes less than approximately 95 %, so overcharging is avoided.
- When [\[LED\]](#) is set to [\[OFF\]](#) on the [\[Concealed Mode Configuration\]](#) menu, LED does not light.

Charging

When connecting the computer to a power outlet, the battery charging starts automatically.

- The battery pack is not charged when you first purchase it. Be sure to charge it before using for the first time.
- Recharging will not commence if internal temperature of the battery pack is outside of the allowable temperature range (2 °C to 50 °C) {35.6 °F to 122 °F}. (➡ [Battery Indicator](#))
- Once the allowable range requirement is satisfied, charging begins automatically. Note that the recharging time varies based on the usage conditions. (Recharging takes longer than usual when the temperature is 10 °C {50 °F} or below.)

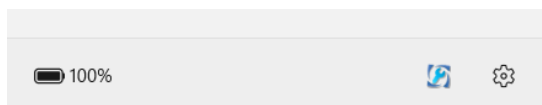
Checking the Remaining Battery Power

Checking the remaining battery power on the screen

1. Click  or  on the system tray.

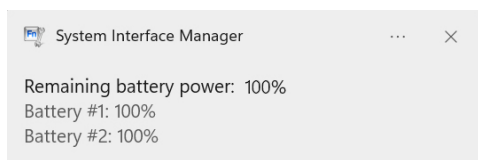
The remaining battery power is displayed.

(Example)



Alternatively, you can check the remaining battery power by <<Fn>> + <<F9>> key combination. (After signing in to Windows)

(Example)



NOTE

- The battery display may not correspond to the actual remaining battery power in the cases as below. To correct the display, perform the Battery Recalibration.
 - The battery indicator remains red.
 - The indicator lights orange and the display shows 99 % for a long time.
 - Low battery warning appears soon after a short time of use.This can occur when the computer is in sleep for a long time without power supply from the AC adaptor.
- The battery display may not be the same as that of system tray. This is not a malfunction.

Computer behavior with low battery

The default settings are as follows.

When the battery level becomes 10 % [Low battery level]	When the battery level becomes 5 % [Critical battery level]
• Displays a message that the battery level is low. ↓	• The computer enters hibernation. ↓
Charge the battery.	Connect the AC adaptor or replace the battery to start up the computer.
• Connect the AC adaptor immediately. If you do not have the AC adaptor, exit the running programs and Windows, then confirm that the power indicator is off. • If you have a fully charged spare battery, turn off the computer, replace the battery and turn the computer on again.	• Connect the AC adaptor and charge the battery. • If you have a fully charged spare battery, turn off the computer, replace the battery and turn the computer on again. When the computer enters hibernation with the battery down and you resume the operation without charging the battery, the Windows Resume Loader starts up. Follow the on-screen instructions. After that, however, Windows may not start up normally, or the [Low battery level]/[Critical battery level] function may not work normally.

NOTE

- Battery goes to hibernation if the battery level is about 5 %, may be displayed such as “Not exist” or “Not use” is not a malfunction.
Please wait for a while to connect the AC adaptor.

Battery duration

Note that the computer consumes electricity even when the computer power is off. If the battery pack is fully charged, the battery will fully discharge in the following period of time:

Status	Discharge Period
In hibernation	<Main Battery> (When [Power On by LAN] is set to [Deny]) Approx. 6.7 weeks (When [Power On by LAN] is set to [Allow]) Approx. 8 days <Main Battery + Second Battery> (When [Power On by LAN] is set to [Deny]) Approx. 13.4 weeks (When [Power On by LAN] is set to [Allow]) Approx. 16 days
When power is off	<Main Battery> (When [Power On by LAN] is set to [Deny]) Approx. 6.7 weeks (When [Power On by LAN] is set to [Allow]) Approx. 8 days <Main Battery + Second Battery> (When [Power On by LAN] is set to [Deny]) Approx. 13.4 weeks (When [Power On by LAN] is set to [Allow]) Approx. 16 days

- Battery duration is a reference value. Battery duration may vary depending on computer settings, recent usage, operating environment, etc.
- The battery duration while the USB port continuous charging function is not used.
- The above value is the holding time at room temperature.

Replacing the Battery Pack

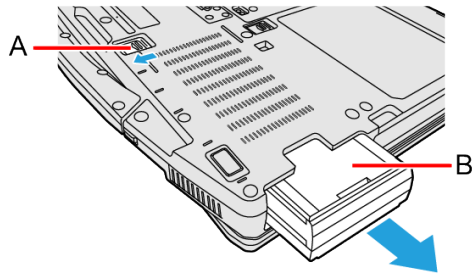
The battery pack is a consumable item so the replacement will be necessary. If the battery operation time becomes noticeably short and not recovered even after recalibrating the battery, replace with a new battery.

IMPORTANT

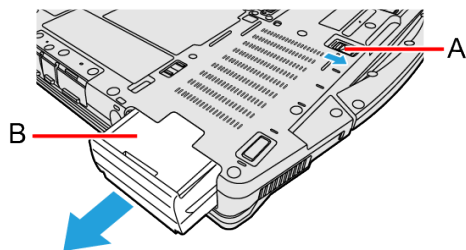
- The battery pack is not charged when you first purchase it. Be sure to charge it before using for the first time. Charging starts automatically when the AC adaptor is connected to the computer.
- Use only the specified battery pack with your computer.
- If the computer is wet, wipe them off and open the cover. Make sure to dry off the computer, replace/remove the battery pack.

When replacing the battery pack after turning off the computer

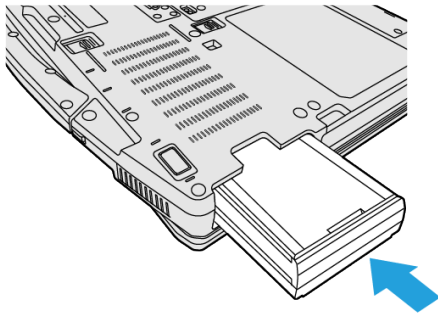
1. **Turn off the computer.**
Do not use the sleep function.
2. **Turn your computer over.**
Make sure no foreign objects are under the computer.
3. **While sliding the latch (A), pull out the battery pack (B).**



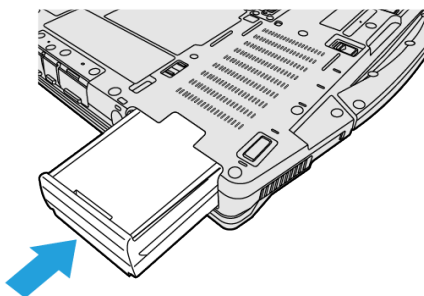
<When replacing the second battery pack>



4. **Slide the battery pack in parallel with the arrow direction until it clicks to the secured position.**



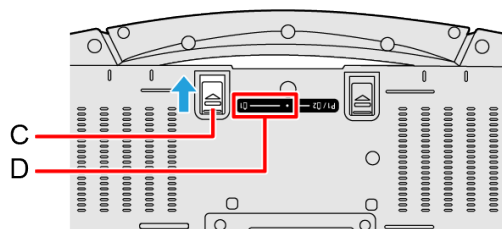
<When replacing the second battery pack>



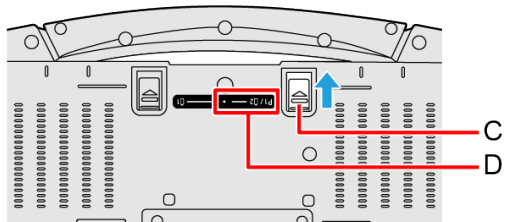
When replacing the battery pack without turning off the computer

1. **Turn your computer over.**
Make sure no foreign objects are under the computer.

2. Slide the latch (C), and check the status of battery indicator (D).



<When replacing the second battery pack>



If you are using the second battery pack and the other battery pack that is not being replaced has enough remaining power, or the AC adaptor is connected, you can replace the battery pack without turning off the computer.

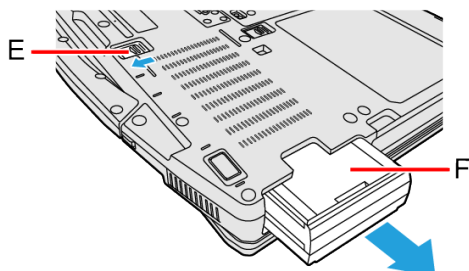
If a battery indicator lights green, you can replace the battery pack without turning off the computer.

If a battery indicator blinks red, you cannot replace the battery pack without turning off the computer. Turn off the computer before replace the battery pack.

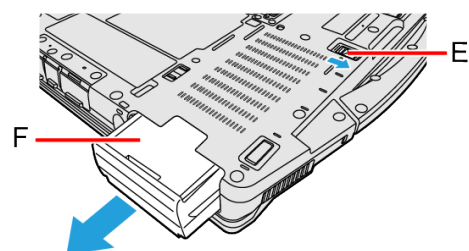
IMPORTANT

- When using two battery packs and replacing one of them, replace it quickly according to the level of batteries in use.

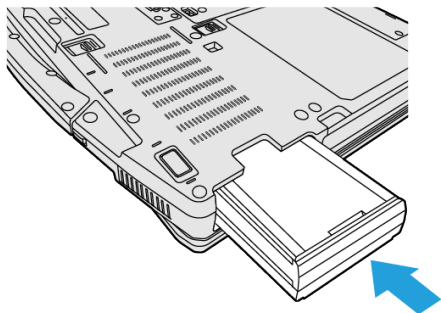
3. While sliding the latch (E), pull out the battery pack (F).



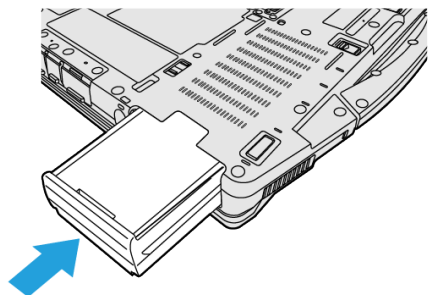
<When replacing the second battery pack>



4. Slide the battery pack in parallel with the arrow direction until it clicks to the secured position.



<When replacing the second battery pack>



IMPORTANT

- Make sure the latches are securely locked, otherwise the battery pack may fall when you carry the computer.
- Do not remove the battery pack forcibly when the latches are locked. Doing so may damage the battery pack.

Sleep/Hibernation Functions

Starting Up Your Computer Quickly

The sleep or hibernation functions allow you to shut off the computer without closing programs and documents. You can quickly return to the programs and documents that you were working on before sleep or hibernation.

The sleep mode of this computer supports the modern standby mode.

Function	Recovery time	Power supply
Sleep	Short	Required. (If power is not supplied, all data will be lost.)
Hibernation	Rather long	Not required. (However power is slightly consumed to keep the hibernation.)

Setting Sleep

Sleep

1. Click  (Start) - [Settings] - [System] - [Power & battery] - [Screen, sleep, & hibernate timeouts].
2. Select setting for "Make my device sleep after" in "Plugged in" or "On battery".

Precautions

- Connect the AC adaptor if the computer will be in sleep for a long period of time. If you cannot use the AC adaptor, use hibernation instead.
- Using sleep or hibernation repeatedly may cause malfunction of the computer. To stabilize computer operation, restart Windows regularly (about once a week) without using sleep or hibernation.
- Save the necessary data.
- Close files you have opened from removable disks and network drives.
- Do not enter sleep or hibernation in the conditions below, otherwise the data or file may be corrupted, sleep or hibernation may not work, or malfunction may occur in the computer or the peripheral devices.
 - When the extended desktop function is activated.
 - When the drive indicator  is on.
 - When playing/recording audio files or displaying motion video such as MPEG files.
 - When playing a DVD-Video. (only for model with optical disc drive)
 - When writing to a disc. (only for model with DVD MULTI Drive Pack/Blu-ray Disc Drive Pack)
 - When using communication software or network functions.
 - When using peripheral devices.

If the computer fails to work normally, restart the computer.

- The password you set in the Setup Utility will be requested upon resuming from hibernation (but not from sleep) or fast startup, if [\[Password on Resume\]](#) is set to [\[Enabled\]](#) in the [\[Security\]](#) menu of the Setup Utility. To disable it, set [\[Password on Resume\]](#) to [\[Disabled\]](#).

The [\[Password on Resume\]](#) setting is valid when you shut down the computer by clicking  (Start) -  (Power) - [\[Shut down\]](#).

- It may take 1 or 2 minutes to enter hibernation. Do not touch any key though the screen becomes dark.

IMPORTANT

The following problem will occur if you fail the password input (failing three times or leaving the computer unattended for one minute or more) while resuming from sleep or hibernation.

- **If you fail the password input while resuming from hibernation:**
 - Cannot resume from hibernation by the Task Scheduler or the operation to open the display.

Entering/Resuming from Sleep or Hibernation

The computer automatically enters sleep after:

- 5 minutes (when AC adaptor is connected) of inactivity (factory default)
- 3 minutes (when operating by battery power) of inactivity (factory default)

Entering sleep or hibernation

Using hardware functions

In order to enter sleep or hibernation by following procedure, change the power option settings first so that the “Power and sleep buttons and lid settings” operation is set to sleep or hibernation.

1. **Close the display, or press the power switch (A).**

Sleep: The power indicator (B) blinks green.

Hibernation: The power indicator (B) goes off.

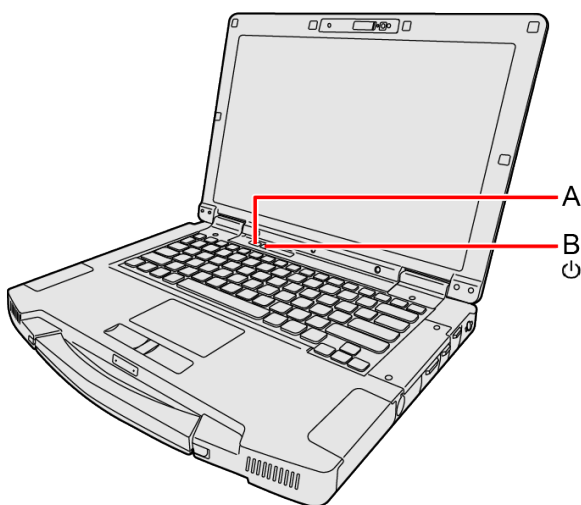
NOTE

- **Hibernation from the hardware functions is not available as the factory default. To enter hibernation from the hardware functions, the following setting is necessary.**

1. Click  (Start) - [All]* - [Windows Tools].

*If [All] does not appear, search for the app in the search box and launch it.

2. Double-click [Control Panel].
3. Click [System and Security] - [Power Options].
4. Click [Choose what the power buttons do].
5. Select [Hibernate] under “Power and sleep buttons and lid settings” and click [Save changes].



Using «Fn» + «F7»

If you press «Fn» + «F7», the computer enters sleep.

(➡ [Key Combinations](#))

Using Windows functions

You can enter sleep or hibernation using Windows functions.

1. Click  (Start) -  (Power).
2. Click [Sleep] or [Hibernate].

NOTE

- Hibernation from the Windows system menu is not available as the factory default. To enter hibernation from the Windows system menu, the following setting is necessary.

1. Click  (Start) - [All]* - [Windows Tools].
*If [All] does not appear, search for the app in the search box and launch it.
2. Double-click [Control Panel].
3. Click [System and Security] - [Power Options].
4. Click [Choose what the power buttons do] - [Change settings that are currently unavailable].
5. Add check mark for [Hibernate] and click [Save changes].

IMPORTANT

While the computer is entering sleep or hibernation

- Do not:
 - Touch the keyboard, touchpad, touchscreen (only for model with touchscreen) or power switch.
 - Use an external mouse or other peripheral devices.
 - Connect or disconnect the AC adaptor.
 - Close or open the display.
 - Insert and remove the microSD memory card (only for model with microSD memory card slot).

Wait until the power indicator blinks green (sleep) or goes off (hibernation).

- It may take 1 or 2 minutes to enter sleep or hibernation. Do not touch any key though the screen becomes dark.
- After releasing the power switch, do not operate it until the power indicator blinks or goes off.

If you press and hold the power switch for 4 seconds or longer, the "Slide to shut down your PC" screen will appear without the computer entering sleep or hibernation.

If you press and hold it for 10 seconds or longer, the computer will turn the power off (forcibly shut down). In this case, any unsaved data will be lost.

In sleep or hibernation

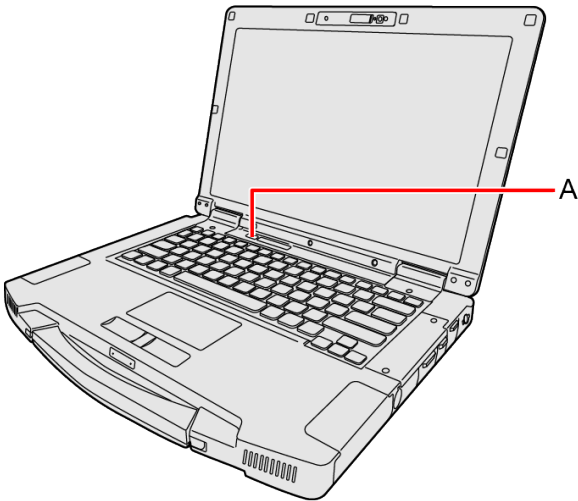
- Do not attach or remove peripheral devices. Doing so may cause malfunction.
- Power is consumed in sleep.

When power is exhausted, the data retained in memory will be lost. Connect the AC adaptor when the computer is in the sleep function for a prolonged time.

Resuming from sleep or hibernation

Perform one of the following operation.

- **Sleep**
 - Press the power switch (A).
 - Open the display.
 - Touch the keyboard or touchpad.
- **Hibernation**
 - Press the power switch (A).
 - Open the display.



IMPORTANT

- **Do not perform the following operations until resuming is complete. After the display is resumed, wait approximately 15 seconds (normally) or 60 seconds (when the computer is on a network).**
 - Touch the keyboard, touchpad, touchscreen (only for model with touchscreen) or power switch.
 - Use an external mouse or other peripheral devices.
 - Connect or disconnect the AC adaptor.
 - Close or open the display.
 - Shut down or restart Windows.
 - Enter sleep or hibernation.
 - Insert and remove the microSD memory card (only for model with microSD memory card slot).
- **If the computer enters sleep while an external keyboard or external mouse is connected, touching the external keyboard keys or external mouse will resume the computer.**

Setting the password input to resume from sleep or hibernation

NOTE

- **Set the password beforehand.** (➡ [Setting the Windows Password \(Sign-in Options\)](#))

1. **Sign in to Windows as an administrator.**
2. Click  (Start) - [Settings].
3. Click [Accounts] - [Sign-in options].
4. **Select the item in “If you’ve been away, when should Windows require you to sign in again?”.**
 - When [Facial recognition (Windows Hello)] or [Fingerprint recognition (Windows Hello)] is set, this is fixed to [Every Time].

Modern Standby

The sleep mode of this computer supports the modern standby mode. The modern standby mode enables applications to receive communication packets periodically even in the sleep state and also enable to resume from the low power state. Also, resume performance in modern standby mode is faster. Accordingly, more power is consumed in modern standby mode than in the conventional sleep function. When the computer is driven by the battery, it is recommended to switch the network connection as necessary.

NOTE

- The model with FZ-VLN561 (10G LAN) does not support modern standby mode.

It is recommended to shut down the computer when not in use for a long time, and to connect the AC adaptor when using the computer for a long time.

Setting the modern standby mode in battery-driven state

1. Click  (Start) - [Settings] - [Apps] - [Installed apps].
2. Click  - [Advanced options] of the app that you want to change the setting.
3. Select setting under “Let this app run in background”.
[Always]: Always enabled in the background.
[Power optimized (recommended)]: Disabled when the computer is driven by the battery.
[Never]: Disabled in the background.

NOTE

- To connect to the network in the sleep state, the application you are using needs to support the modern standby mode.
Check with the application provider whether or not the application supports the modern standby mode.
- When resuming from sleep, press the power switch.
- Even if the computer moves to the sleep state automatically or manually, depending on the OS state or application specifications, the application operation may continue with the display turned off.
- Unsaved data will be lost if the power supply is cut by removing both the battery pack and AC adaptor in the sleep state.
- The time from standby to hibernation depends on battery consumption. Therefore, battery duration is several days shorter than in hibernation.

Panasonic PC Hub

- This manual does not provide explanations about the features of Panasonic PC Hub. For operations related to Panasonic PC Hub, refer to the Panasonic PC Hub User Guide or other instructions.
- The functions described in this manual may be integrated into Panasonic PC Hub User Guide. In such cases, follow the instructions in the Panasonic PC Hub User Guide or other instructions.

Network

Features of the Supported Standards

■ Right side

- 10BASE-T/100BASE-TX/1000BASE-T

■ Rear Expansion Area

- 10BASE-T/100BASE-TX/1000BASE-T (FZ-VCN552)
- 10BASE-T_e/100BASE-TX/1000BASE-T/2.5GBASE-T (FZ-VCN561)

■ Left Expansion Area

- 100BASE-TX/1000BASE-T/2.5GBASE-T/5GBASE-T/10GBASE-T (FZ-VLN561)

Connecting LAN

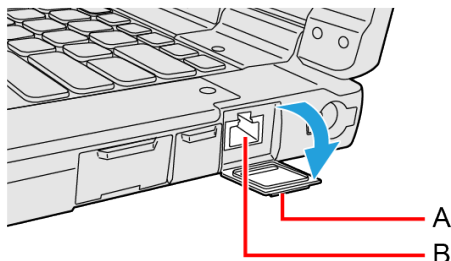
IMPORTANT

- Do not connect the telephone cable to the LAN port.

■ Right side

1. Open the cover (A) and connect the LAN cable.

- Connect the LAN port (B) and the network system (server, HUB, etc.) using a LAN cable.

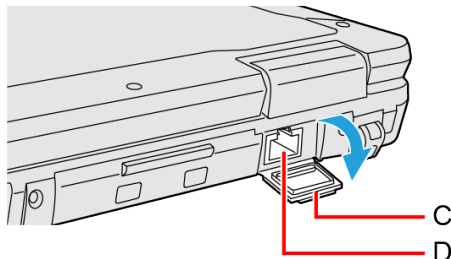


■ Rear Expansion Area

<Only for model with FZ-VCN552/FZ-VCN561>

1. Open the cover (C) and connect the LAN cable.

- Connect the LAN port (D) and the network system (server, HUB, etc.) using a LAN cable.

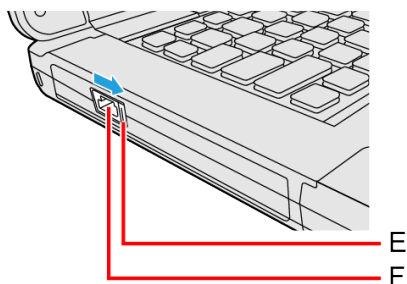


■ Left Expansion Area

<Only for model with FZ-VLN561>

1. Slide the cover (E) and connect the LAN cable.

- Connect the LAN port (F) and the network system (server, HUB, etc.) using a LAN cable.



Disabling/Enabling Wireless Communication

<Only for model with wireless LAN/Bluetooth/wireless WAN/GPS on wireless WAN/dedicated GPS>

There are several ways of disabling and enabling wireless communication.

- [Switching the airplane mode using <<Fn>>](#)
- [Using airplane mode](#)
- [Turning wireless communication on/off quickly](#)
- [Using Network & Internet settings](#)
- **Setting** [\[Wireless Configuration\]](#) in the **[Advanced]** menu of the Setup Utility

NOTE

- For further information about [Wireless LAN](#).
- For further information about [Bluetooth](#).
- For further information about [Wireless WAN](#).
- For further information about [GPS](#).

Switching the airplane mode using <<Fn>>

1. Press <<Fn>> + <<F10>>. ( [Key Combinations](#))

Using airplane mode

1. Click  (Start) - [Settings] - [Network & internet] - [Airplane mode].
2. To disable wireless communications, set "Airplane mode" to [On].
To enable wireless communications, set "Airplane mode" to [Off], and then;
 - set "Cellular" to [On] (for wireless WAN).
 - set "Wi-Fi" to [On] (for wireless LAN).
 - set "Bluetooth" to [On] (for Bluetooth).

Turning wireless communication on/off quickly

Turning on/off the Wi-Fi

1. Click  or  on the system tray.
2. To turn off the Wi-Fi, click  .
The icon changes to  , and then the icon  on the system tray changes to  .
To turn on the Wi-Fi, click  . Then the icon changes to  .

Turning on/off the airplane mode

1. Click  or  on the system tray.
2. To turn on the airplane mode, click  .
The icon changes to  , and then the icon  on the system tray changes to  .
To turn off the airplane mode, click  . Then the icon changes to  .

Using Network & Internet settings

1. Right-click  or  on the system tray.
2. Click [Network and Internet settings].
"Network & internet" screen appears.
3. Turn on/off each wireless function in "Wi-Fi", "Cellular" or "Airplane mode".

Wi-Fi (Wireless LAN)

<Only for model with wireless LAN>

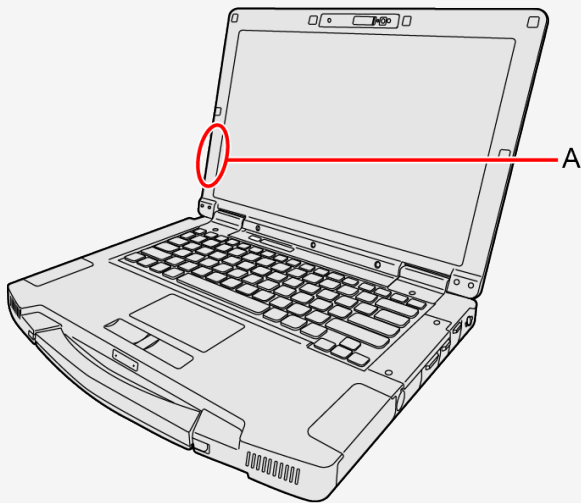
Using the wireless LAN allows for the use of network without cable connection.

IMPORTANT

- **Do not use wireless LAN on airplanes, in hospitals, or in other locations where wireless LAN signals may affect devices.**
Follow the instructions of airline companies and hospitals. If you use the computer in these locations, turn off the wireless LAN.
- **To avoid unauthorized access to the computer through wireless LAN.**
We recommend you to make security settings such as encryption before using wireless LAN.
Otherwise the disk data such as the shared files can be exposed to the risk of unauthorized access.

NOTE

- Communication is established through the wireless LAN antenna (A). Do not block the antenna area with your hand or body.



- When you connect this computer to a port replicator compatible with external antenna, you can switch the internal antenna to the external antenna, or vice versa.
- The transmission rate will be lower when a microwave oven is used near by.
- To use wireless LAN, set [Wi-Fi] to [Enabled] (default) in the sub-menu of [Wireless Configuration] in the [Advanced] menu of the Setup Utility.

Using the Wi-Fi (Wireless LAN) Function

Before using a wireless LAN, turn the wireless LAN communication on.

Turning on/off the wireless LAN communication

1. To enable the wireless communication. (➡ [Disabling/Enabling Wireless Communication](#))

Setting the wireless LAN access point

Preparation

Follow the instruction manual of the wireless LAN access point to make settings for the access point to recognize the computer.

1. Click  on the system tray.
2. Click  to turn the wireless LAN on.

3. Click  (Manage Wi-Fi connections).
4. Select an access point, and click [Connect].
5. Input the key you set for the access point to recognize the computer, and click [Next].

Wait for the computer to connect to the wireless LAN access point.

When the icon on the system tray is changed to , the wireless LAN setting is complete.

NOTE

- The settings depend on the network environment. For further information, ask the system administrator or the person in charge of the network.
- If you use the stealth type wireless LAN access point which restricts automatic detection of the wireless LAN access point, take the following procedure.
If you do not perform the procedure below, you may not be able to access the wireless LAN access point automatically or the wireless LAN access point may not be displayed.

1. Click  on the system tray.
2. Click  to turn the wireless LAN on.
3. Click  (Manage Wi-Fi connections).
4. Click [Hidden Network].
5. Click [Connect], enter the necessary information such as the network name (SSID), and click [Next].

For further information, ask the system administrator or the person in charge of the network.

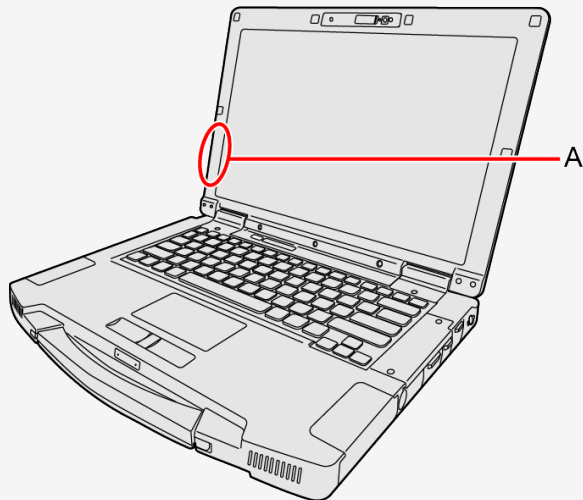
Bluetooth

<Only for model with Bluetooth>

You can access other Bluetooth devices without connecting cables.

NOTE

- Communication is established through the Bluetooth antenna (A). Do not block the antenna area with your hand or body.



- To use Bluetooth, set [Bluetooth] to [Enabled] (default) in the sub-menu of [Wireless Configuration] in the [Advanced] menu of the Setup Utility.
- The transmission rate will be lower when a microwave oven is used near by.
- When you uninstall the Bluetooth Driver, turn Bluetooth off.

Using the Bluetooth Function

Before using a Bluetooth, turn the Bluetooth communication on.

Turning on/off the Bluetooth communication

1. To enable the wireless communication. (➡ [Disabling/Enabling Wireless Communication](#))
2. Click  (Start) - [Settings] - [Network & internet] - [Airplane mode], and set “Airplane mode” to [Off].
3. To turn off the Bluetooth communication, set “Bluetooth” to [Off].
To turn on the Bluetooth communication, set “Bluetooth” to [On].

Checking the Bluetooth communication status

1. Click  (Start) - [Settings] - [Bluetooth & devices] - [Devices].

NOTE

- You can also clicking  on the system tray, and then click  (Bluetooth Devices) - [Show Bluetooth Devices] to check the communication status.

Cellular (Wireless WAN)

<Only for model with wireless WAN>

The model with wireless WAN allows for data communication using the incorporated communication module.

The computer is equipped with a nanoSIM card slot and an eSIM.

eSIM allows wireless communication without a nanoSIM card.

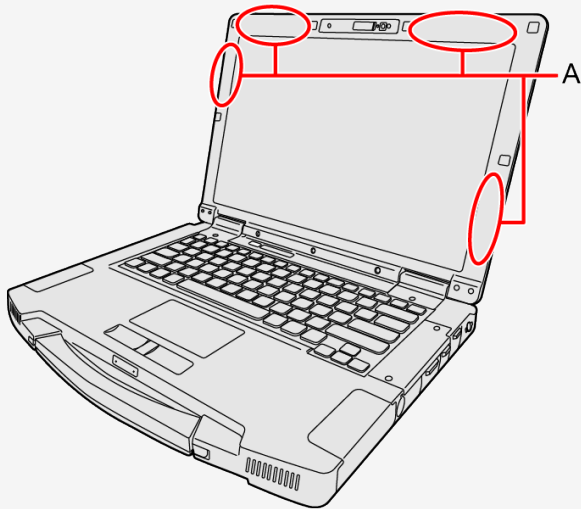
- This model is DSSS (Dual SIM Single Standby) and you can only make either nanoSIM Card or eSIM Active.

IMPORTANT

- After performing recovery, reselect eSIM or nanoSIM card before using a wireless WAN.
- When the eSIM is replaced due to repair, the computer is returned with an eSIM in default state. In this case, the customer needs to download the profile again.
Some telecommunications carriers may allow you to continue the contract with no additional cost to use the remaining capacity. For details, contact your telecommunications carrier. In doing so, it is recommended to put down the ICCID of the profile beforehand.
- When the wireless WAN module is replaced due to repair, it is necessary to configure the eSIM setting again.
- <Only for model with wireless WAN (5G)>
Use a nanoSIM card or eSIM that supports 5G.

NOTE

- Communication is established through the wireless WAN antenna (A). Do not block the antenna area with your hand or body.



- To use wireless WAN, set [\[Cellular \(WWAN\)\]](#) to [Enabled] (default) in the sub-menu of [Wireless Configuration] in the [Advanced] menu of the Setup Utility.
- If “Device driver software was not installed correctly.” (or a similar message) appears when starting the computer or resuming from sleep or hibernation.
 - When communication works normally, Wireless WAN is operating correctly.
 - If communication fails, the device may not be recognized correctly. In this case, restart the computer.
- Do not use the nanoSIM card adapter.
- Do not insert nanoSIM cards on which labels or stickers are affixed. Failure to obey may result in malfunction.

Inserting/Removing a nanoSIM (4FF) Card

<Only when using a nanoSIM card>

Before using the wireless WAN, set a nanoSIM card to the nanoSIM card slot.

IMPORTANT

- Be sure to turn off the computer before inserting or removing the nanoSIM card.

1. Turn off the computer and disconnect the AC adaptor.
2. Turn your computer over and remove the battery pack. (▶ [Replacing the Battery Pack](#))

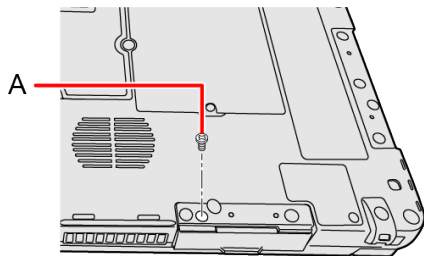
<When using second battery pack>

- Remove the second battery pack. (▶ [Replacing the Battery Pack](#))

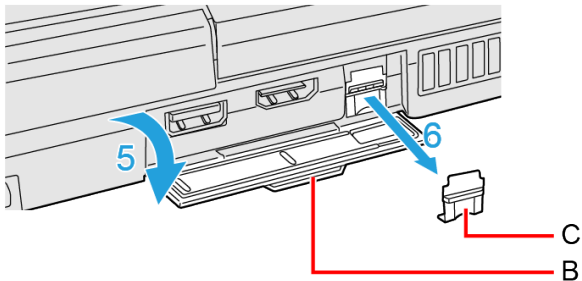
Make sure no foreign objects are under the computer.

3. Remove the screw (A).

Use the PH 1 (PH #1) screwdriver.



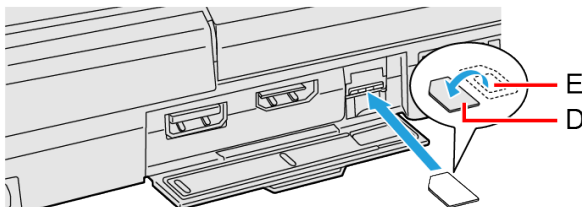
4. Turn over so that the computer is facing up.
5. Open the cover (B).
6. Remove the nanoSIM card slot cover (C).



7. Inserting/Removing a nanoSIM Card.

- To insert

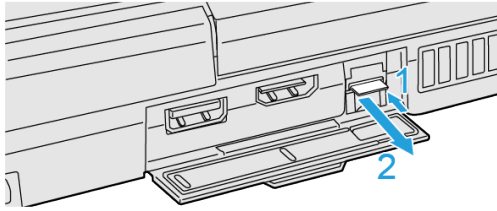
1. Insert the nanoSIM card (D) into the nanoSIM card slot with the contact side (E) facing downward and with the cut corner oriented as shown in the illustration.



IMPORTANT

- Do not insert the nanoSIM card upside down.

- To remove
 1. Push the nanoSIM card.
It will come out of the slot a little bit.
 2. Pull the card all the way out.



8. Close the nanoSIM card slot cover (C) and the cover (B).
9. Turn your computer over and tighten the screw (A) firmly.
Use the PH 1 (PH #1) screwdriver.
Use 1 screw.

Recommended tightening torque

0.45 N•m ± 0.05 N•m (4.5 kgf•cm ± 0.5 kgf•cm)

10. Insert the battery pack and connect the AC adaptor.

eSIM/nanoSIM Switching

1. Click  (Start) - [Settings] - [Network & internet].
2. Click [Cellular].
3. Click [SIM 1] or [SIM 2] in “Use this SIM for cellular data”.
[SIM 1]: nanoSIM
[SIM 2]: eSIM

Connect/Disconnect to a network

Connecting to a network

If the APN setting is completed automatically after inserting the nanoSIM card, Internet connection will be possible.

In such cases, the following settings are not necessary.

Adding an APN

If Internet connection via wireless WAN is not possible, perform the following to add an APN.

1. Click  (Start) - [Settings] - [Network & internet].
2. Click [Cellular].
3. Click [Mobile operator settings].
4. Click [Add APN].
5. Input detailed information such as APN, and then click [Save].
For APN type, select [Internet and attach].
If [Internet and attach] cannot be selected, select [Internet].
6. Click [Save].
Internet connection will be possible.

NOTE

- When “Use cellular whenever Wi-Fi is poor” is set to [On], wireless WAN connections will be established only when there is no Internet connection via Wi-Fi.
- When using wireless WAN, perform the following to disable Airplane mode.
 1. Click  (Start) - [Settings] - [Network & internet].
 2. Set [Airplane mode] to [Off].

Disconnecting to a network

1. Click  (Start) - [Settings] - [Network & internet] - [Cellular].
2. Click [Disconnect].

NOTE

- You can also click  on the system tray, and then click  (Manage Cellular connections) - [Disconnect].

GPS

<Only for model with dedicated GPS / GPS on wireless WAN>

This computer has the GPS function with the wireless WAN module, and the dedicated GPS function.

For the differences, refer to the table below.

Devices	Device name	Support system
GPS on wireless WAN	EM7595 / EM9291/ LN920A6	GPS / GLONASS / BeiDou / Galileo / QZSS
Dedicated GPS	u-blox NEO-M9 Series	GPS / GLONASS / BeiDou / Galileo / QZSS / SBAS

IMPORTANT

- <Only for model with EM7595>

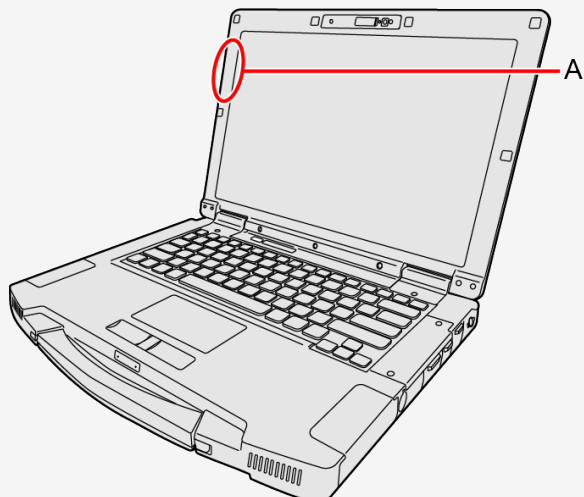
Set Location services to ON.

1. Click  (Start) - [Settings] - [Privacy & security] - [Location] - [Location services].
2. Change the setting.
3. Restart the computer.

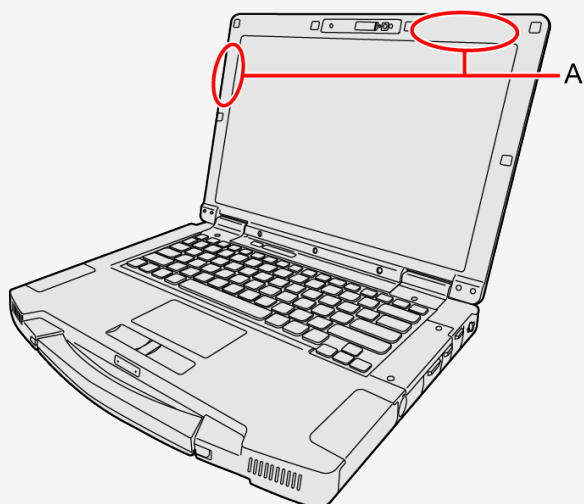
NOTE

- Communication is established through the GPS antenna (A). Do not block the antenna area with your hand or body.

<Only for model with dedicated GPS>



<Only for model with GPS on wireless WAN>



- Due to the effect of a phenomenon that weekly information transmitted by GPS is reset (GPS Week Number Rollover), wrong date values are output from the GPS module on and after the date shown on the table below. Because of this, apps, etc. that use date information from GPS will be affected by GPS Week Number Rollover.

Module	GPS Week Number Rollover transmission date
Wireless WAN (EM7595, LN920A6)	2032/12/12
Wireless WAN (EM9291)	2043/1/10
Dedicated GPS (u-blox NEO-M9 Series)	2040/3/18

Pass Through to External Antenna

<Only for model with External Antenna Connector>

This computer can utilize up to 2 external antenna signals such as wireless WAN that are passed through to the computer.

When [Wireless Antenna Switching] is set to [Auto] and the computer is connected to the vehicle dock, the external antenna signal passed through to the computer will be used. By default, the setting is set to [PC(built-in)] and will utilize the signals from this computer.

The default settings are bolded on the table below:

Channel	Only for model without dedicated GPS	Only for model with dedicated GPS
Channel 1	NONE WWAN-GPS WWAN-aux Wi-Fi	NONE Dedicated GPS
Channel 2	NONE WWAN-main	NONE WWAN-main Wi-Fi

NOTE

- When [Wireless Antenna Switching] is set to [PC(built-in)], the switch control of the vehicle dock is disabled.
- Channels that are not connected to an external antenna need to be set to [NONE].
- Sub-6 GHz 5G is only available on models equipped with a 5G modem.
- For more details, refer to the Setup Utility. (➡ [Setup Utility](#))

Advanced Operation

Saving Power

You can extend battery life and save power also during AC adaptor usage.

Reducing Power Consumption

Use the methods below to reduce power consumption.

- **Change the Power mode to [Best Power Efficiency].**
 1. Right-click  or  on the system tray, and click [Power and sleep settings].
 2. Click [Power Mode].
 3. Set "Plugged in" or "On battery" to [Best Power Efficiency].
- **Enable the energy saving function.**
 1. Right-click  or  on the system tray, and click [Power and sleep settings].
 2. Click [Energy saver].
 3. Set the "Always use energy saver" to [On].
- **Decrease the LCD brightness.**

Decrease the internal LCD brightness to reduce power consumption.

 1. Press <<Fn>> + <<F1>>.

Furthermore power saving options:

- **Turn off the computer when it is not in use.**

You can also turn off only the wireless LAN or wireless WAN power.
- **Disconnect external devices (USB devices, external mouse, etc.) that are not being used.**
- **Use Sleep.**

When you have to leave the computer, set the computer to sleep.
This shuts down computer operation to reduce power consumption.

 1. Press <<Fn>> + <<F7>>.
- **When using the battery, do not use applications that place a significant load on the CPU.**

Some application software may place a large burden on the CPU only with start-up and may consume power.
- **When you are using the screen saver with 3D graphics, change to another screen saver.**

To change the screen saver, right-click the desktop, click [Personalize] - [Lock screen] - [Screen saver] and click the title of the screen saver.

Configuring Power Saving Settings

1. Right-click  or  on the system tray, and click [Power and sleep settings].
2. Click [Power Mode].
3. Select the setting in "Plugged in" or "On battery".

Customizing the Power Setting

You can choose the optimum power setting for your operating condition by selecting a power plan. You can also create your own power plan.

Changing the Power Plan Setting

1. Click  (Start) - [All]* - [Windows Tools].

*If [All] does not appear, search for the app in the search box and launch it.

2. Double-click [Control Panel].
3. Click [System and Security] - [Power Options].
4. Click [Change plan settings] of the power plan you want to change.
5. Change the settings.
 - [Change advanced power settings]: You can make more detailed settings.
6. Click [Save changes].

Creating Your Own Power Setting

1. Click  (Start) - [All]* - [Windows Tools].

*If [All] does not appear, search for the app in the search box and launch it.
2. Double-click [Control Panel].
3. Click [System and Security] - [Power Options].
4. Click [Create a power plan], input the name of power plan.

The power plan is fixed to "Balanced".
5. Click [Next].
6. Change the settings and click [Create].
 - To change the settings or to make more detailed settings. ( [Changing the Power Plan Setting](#))

Deleting the Power Plan

1. Click  (Start) - [All]* - [Windows Tools].

*If [All] does not appear, search for the app in the search box and launch it.
2. Double-click [Control Panel].
3. Click [System and Security] - [Power Options].
4. Click [Change plan settings] of the power plan you wish to delete.

If the power plan you wish to delete is already selected, select another plan first.
5. Click [Delete this plan], and then click [OK] on the confirmation screen.

Security Measures

Use these features to protect your data.

Setting the Supervisor Password/User Password

Set the Supervisor Password before setting the User Password.

1. **Start up the Setup Utility.** (➡ [Starting the Setup Utility](#))
2. **Select [Security].**
3. **Select [Set Supervisor Password] or [Set User Password], and press <<Enter>>.**
4. **Enter your password in “Create New Password” and press <<Enter>>.**
 - When the password has been set, you need to enter your password in “Enter Current Password” and press <<Enter>>.
 - To disable the password, leave the input field empty and press <<Enter>>.
5. **Enter your password again in “Confirm New Password” and press <<Enter>>.**
6. **Press <<F10>>, select [Yes], and press <<Enter>>.**

IMPORTANT

- Do not forget your password. If you forget your Supervisor Password, you will not be able to use your computer. Contact Panasonic Technical Support.
- When running the Setup Utility, do not leave and go away from your computer even for a short time, since other people may set or change the password.
- <Only for model with Fingerprint Reader>

When the fingerprint is registered for Windows Hello Fingerprint authentication, the registered fingerprint can be used to authenticate the Supervisor Password.

1. When fingerprint authentication screen is displayed, touch the registered finger on the fingerprint reader.



2. When authenticated, the display of the fingerprint switches as shown below and sign in to the registered user account.



- If fingerprint authentication failed three times, the computer turns off.
- If you leave the fingerprint authentication screen for approximately 1 minute, it will switch to the password input screen.
- You can switch to password input by pressing the <<Esc>> key.
- The registered fingerprint data will be saved in the computer. Erase the fingerprint data when reinstalling Windows, disposing or transferring the computer.

NOTE

- The password will not be displayed on the screen.
- If the “Caution” screen appears when entering the password, check the status of Num Lock and Caps Lock.
- You can use up to 32 alphanumeric characters (including spaces).
 - The case (upper/lower) is distinguished.
 - Use only the upper horizontal row of numeric keys to input your password.
 - You cannot use <<Ctrl>> to input a password.
- Disabling the Supervisor Password also disables the User Password.

Setting the Windows Password (Sign-in Options)

Set a password to sign in to Windows with a local account.

The Windows password will be applied when you sign in to Windows, or resume the computer from the Lock screen.

To set the password, proceed as follows.

1. Click  (Start) - [Settings] - [Accounts] - [Sign-in options].
2. Click [Password] - [Add].

IMPORTANT

- Check the status of Num Lock and Caps Lock.

NOTE

- Set the key entry mode to English (“ENG”) and enter characters.

The keyboard layout can be added or changed in the following steps.

1. Click  (Start) - [Settings] - [Time & language] - [Language & region].
2. Click  - [Language options] in the language.
3. Click [Add a keyboard] in “Installed keyboards” and choose a keyboard from the list.

- Remember your password. If you forget the password, you cannot use Windows. Creating a password reset disk beforehand is recommended.

Windows Hello

This function is used to sign in to Windows quickly, or perform individual authentication. To use Windows Hello, you need to set the password and PIN for sign-in options.

Using Windows Hello Face Recognition

<Only for model with camera with IR sensor>

The face recognition for Windows Hello is supported. To use Windows Hello, perform the following steps for setup.

1. Click  (Start) - [Settings].
2. Click [Accounts] - [Sign-in options].
3. Click [Facial recognition (Windows Hello)] - [Set up].
4. Follow the on-screen instructions.

NOTE

- When the camera light turns on, it becomes hot. Do not touch the camera light when the light is on, and shortly after the light turns off.

Using Windows Hello Fingerprint Authentication

<Only for model with fingerprint reader>

The fingerprint recognition for Windows Hello is supported. To use Windows Hello, perform the following steps for setup.

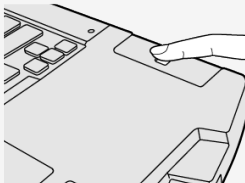
1. Click  (Start) - [Settings].
2. Click [Accounts] - [Sign-in options].
3. Click [Fingerprint recognition (Windows Hello)] - [Set up].
4. Follow the on-screen instructions.

NOTE

- Register at least two fingers. That way, if by any chance one finger is injured, another can be used.

IMPORTANT

- To prevent scanning errors, pay attention to the following.
 - Touch the fingerprint reader with the first joint of the finger you want to register.



- In the following cases, the fingerprint reader may fail to register or authenticate.
 - You touch the fingerprint reader while sliding your finger.
 - You touch the fingerprint reader with a finger at an angle.
 - The pressing force to touch the fingerprint reader is weak.
 - The finger is dirty or scarred.
 - The finger is too wet or too dry.

See ["Fingerprint Reader Handling"](#) for details.

- In rare cases, features necessary for fingerprint authentication may not be detected.
In such cases, try registering another finger.

Using Windows Hello PIN

A PIN is a PIN number that is set for each device such as the computer or smart phone. When you have added a PIN to the computer, you are requested to enter the PIN on the sign in screen. To use Windows Hello, perform the following steps for setup.

1. Click  (Start) - [Settings].
2. Click [Accounts] - [Sign-in options].
3. Click [PIN (Windows Hello)] - [Set up].
 - You must be connected to the Internet to set up a PIN for Microsoft account.
4. Follow the on-screen instructions.

Preventing Your Computer from Unauthorized Use

You can set a start-up password to protect your computer from unauthorized use.

1. **Set the password** (➡ [Setting the Supervisor Password/User Password](#)), and select **[Enabled]** in **[Password on Boot]** and/or **[Password on Resume]** in the **[Security]** menu of the **Setup Utility**.

NOTE

- The **[Password on Resume]** of Setup Utility is effective when the computer was once shut down, and not effective when the computer resume from sleep.
- If the Supervisor Password or User Password has been set, the password input screen will be displayed on starting-up of the Setup Utility even though **[Password on Boot]** and/or **[Password on Resume]** is set to **[Disabled]**. If you set **[Password on Boot]** to **[Enabled]** and set **[Password on Reboot]** to **[Same as Boot]**, password input will also be required at Windows restart. (**[Same as Boot]** is the default setting.)

Preventing Your Flash Memory Drive from Being Read or Written

The flash memory lock function protects the flash memory data from being read or written when the flash memory is attached to another computer. The data can be read/written when the flash memory is returned to the original computer. (Note that the flash memory lock does not guarantee complete protection of the data.)

1. **Select [Set Storage Password]** in the sub-menu of **[Storage Security Configuration (TCG)]** in the **[Security]** menu of the **Setup Utility**.
2. **Enter your password in “Create New Password” and press <<Enter>>.**
 - When the password has been set, you need to enter your password in “Enter Current Password” and press <<Enter>>.
 - To disable the password, leave the input field empty and press <<Enter>>.
3. **Enter your password again in “Confirm New Password” and press <<Enter>>.**

IMPORTANT

- You cannot use the flash memory lock function without setting the Supervisor Password. Set the Supervisor Password beforehand (➡ [Setting the Supervisor Password/User Password](#)).
- When you have your flash memory drive repaired.
 - Contact Panasonic Technical Support.
 - Before sending back the flash memory drive, be sure to disable the Storage Password and Supervisor Password.

NOTE

- The password will not be displayed on the screen.
- If the “Caution” screen appears when entering the password, check the status of Num Lock and Caps Lock.
- You can use up to 32 alphanumeric characters (including spaces).
 - The case (upper/lower) is distinguished.
 - Use only the upper horizontal row of numeric keys to input your password.
 - You cannot use <<Ctrl>> to input a password.
- The flash memory lock function works with the built-in flash memory. It does not work with the external hard disk.
- We recommend you to set **[Password on Boot]** to **[Enabled]** to ensure security though it is not required to enable the flash memory lock.
- Note that the flash memory lock does not guarantee complete protection of the data.
- When “Storage Password (TCG)” is displayed, enter the Storage Password.

<Only for model with optical disc drive>

Disabling Optical disc drive

Disable optical disc drive (optional) operation to prevent the drive from being read/written and from being used to start the computer.

1. Select **[Disabled]** in **[Optical Drive]** in the **[Advanced]** menu of the Setup Utility.

NOTE

- This does not work for commercially available optical drive.

Disabling USB Devices

Disable USB flash memory operation to prevent the drive from being read/written and from being used to start the computer.

You can protect your data from unauthorized access or accidental overwriting.

1. Select **[Disabled]** in **[USB Type-C Port]/[USB Type-A Port]/[Port Replicator]** in the **[Advanced]** menu of the Setup Utility.

Device encryption

<Only for model that supports TPM>

Using device encryption can protect folders or files from illegal accesses in the case the computer is lost or stolen. This computer supports the "Device encryption" function. This function is set to on as factory default, however, the encryption is not completed yet. To complete the encryption, you need to sign in with your "Microsoft account". Follow the instruction of the system administrator to complete the setting.

NOTE

- When you execute **[Create a system image]** while signed into your Microsoft account with "Device encryption" enabled, the "You have chosen to back up drive c: which is encrypted. The backup location will not be encrypted. Make sure the backup is kept in a physically secure location." warning message may appear.

When attempting to recover a backup created under the above conditions, the "System Image Recovery" screen will appear and entry of the recovery key will be required. In such cases, use the recovery key that you previously printed or saved to a file, or perform the following to acquire the recovery key.

1. Access the "<http://go.microsoft.com/fwlink/p/?LinkId=237614>" URL on a device connected to the Internet (e.g., another computer or tablet), and sign into your Microsoft account.

If multiple recovery keys are displayed, acquire the recovery key for the key ID that appears on the "System Image Recovery" screen.

- Backups created with **[Create a system image]** are not encrypted. Physically store the media on which the backup is stored in a safe location.
- The backup recovery procedure will complete when you connect to the Internet, and a new recovery key will be created at that point.
- Additionally, entry of the recovery key will be required when restoring restore points or during startup in safe mode, for example. In such cases, perform the above procedure to acquire the recovery key.

Other security measure

- **About Secure Boot**

“Secure Boot” is a function that protects your computer by prohibiting Operating System other than those permitted under factory default conditions from being executed during startup.

When performing [Clear Secure Boot Keys] to use Secure Boot.

<When using the function of Microsoft_DeviceGuard/CredencialGuard>

- Select [Install default Secure Boot keys (Device Guard Ready)].

<When not using the function of Microsoft_DeviceGuard/CredencialGuard>

- Select [Install default Secure Boot keys].

For further information, ask the system administrator.

- **About TPM**

<Only for model that supports TPM>

TPM (Trusted Platform Module) is a security chip aimed at high level cryptographic processing and secure storage of encryption keys (ex. BitLocker Drive Encryption).

In the file encryption using the TPM, encryption keys can be stored on a TPM chip separated from the internal disk. This will allow you to increase the security level.

Concealed Mode

You can make your computer inconspicuously using the concealed mode.

You can select on/off of LCD Backlight, LED, Sound, Wireless Radio, Backlit Keyboard (only for model with backlit keyboard) and Touchscreen (only for model with touchscreen).

IMPORTANT

- [Concealed Mode] is set to [Enabled] as the factory default.
- The camera indicator cannot be turned off.

Switching the concealed mode

1. Press «Fn» + «F8». (➡ [Key Combinations](#))

NOTE

- If you press keys in succession, the concealed mode may not be switched. More than 4 seconds interval is necessary to switch on/off.

Disabling/Enabling the concealed mode

This function is effective when the computer is restarted.

1. Set [\[Concealed Mode\]](#) to [Enabled] or [Disabled] in the sub-menu of [Concealed Mode Configuration] in the [Main] menu of the Setup Utility.

Change the settings

This function is effective when the computer is restarted.

1. You can change the devices turned on/off in [\[Concealed Mode Configuration\]](#) with Setup Utility. You can change the trigger key in [\[Trigger Key\]](#).

NOTE

- «Fn» + «F8» key is always enabled.
- When set [LCD Backlight] to [Minimum] and [LED] to [ON], the LED becomes dark.

Waves MaxxAudio

Waves MaxxAudio is an application that adjusts the sound output of speakers or headset jack using an equalizer function or noise reduction function.

NOTE

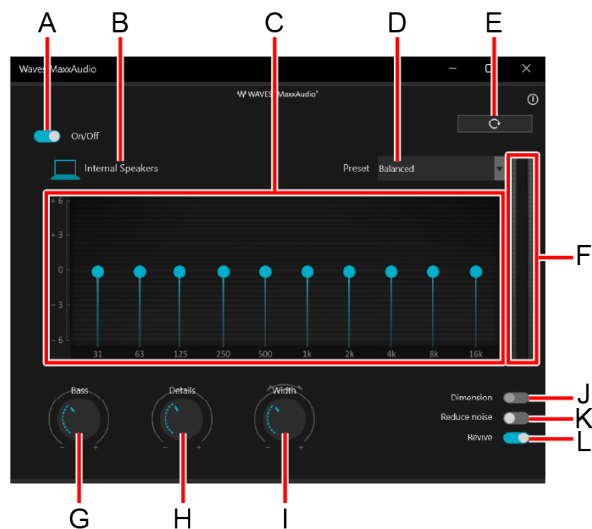
- Waves MaxxAudio is enabled as factory default, so it does not require the startup operation.
- On this computer, Realtek Audio Console to adjust the sound input/output has also been installed in addition to Waves MaxxAudio.

Use an appropriate application according to the purpose of use.

Starting Waves MaxxAudio

1. Click  (Start) - [All]* -  (Waves MaxxAudio).

*If [All] does not appear, search for the app in the search box and launch it.
The Waves MaxxAudio starts up, and the following screen is displayed.



A. ON/OFF Switch

Switches between ON and OFF of Waves MaxxAudio. If the sound adjusted with Waves MaxxAudio is not a preferred sound, this application can be turned off.

B. Sound Device

Displays the sound output device. Settings are stored for each sound output device.

C. Equalizer

The volumes can be adjusted for each frequency band. Move the slider () up and down to adjust the volume of each frequency band.

D. Preset

Click the preset menu to select a displayed preset according to the purpose of use.

Profiles selected as default are as follows.

- [Loud]: This setting places importance on the sound volume of conversation.
- [Balanced]: This setting places importance on the balance between sound volume and quality.
- [High-quality]: This setting places importance on the sound quality of conversation.

NOTE

- The preset cannot be changed while headphones are used.
- Depending on the model, the preset that is selected as default may differ.

E. **Reset Button**

Clicking this button restores each setting to the default state.

F. **Level Meter**

Displays the volume (left/right) meter.

G. **“Bass” adjustment dial**

While clicking the dial, move the dial up/down or left/right to adjust the volume of low-tone range. Turning the dial in “+” direction increases the volume of low-tone range.

H. **“Details” adjustment dial**

While clicking the dial, move the dial up/down or left/right to adjust the volume of high-tone range. Turning the dial in “+” direction increases the volume of high-tone range.

I. **“Width” adjustment dial**

While clicking the dial, move the dial up/down or left/right to adjust the direction of sounds output from the right and left speakers. Turning the dial in “+” direction spreads the right and left sounds.

Increasing the level of “Width” adjustment may cause the stereo sound only in the right side or left side to slightly come out from the counterpart speaker.

NOTE

- This dial does not support sound equipment connected to the headset jack.

J. **Dimension**

Turning on this switch while the headphones are in use gives you sound spread as if you are listening through speakers.

NOTE

- This function may not respond depending on the headphones to be used. In that case, the switch cannot be turned on.

K. **Reduce noise**

Turning on this switch reduces constant noises that generally occur from the microphone input, etc.

L. **Revive**

Electronically improves low bit-rate sound sources with relatively poor sound quality. This function is turned on as default. This function can be disabled by turning off the switch.

NOTE

- Depending on the headphones to be used, Waves MaxxAudio may not be supported, or some of the items may not be set.
- If other sound applications are used, the Waves MaxxAudio settings or functions may be affected.
- Depending on the application to be used, the sound adjustment by Waves MaxxAudio may not function.
- The Waves MaxxAudio function does not guarantee its effects or improvement of sound quality.

Setup Utility

You can make the settings of the computer's operating environment (password settings, startup drive selection, etc.)

Starting the Setup Utility

1. Click  (Start) - [Settings] - [System] - [Recovery].
2. Click [Restart now] in "Advanced startup".
3. Click [Restart now] on the "We'll restart your device so save your work" screen.
4. Click [Troubleshoot] - [Advanced options] - [UEFI Firmware Settings] - [Restart].

The computer restarts, and the Setup Utility screen appears.

When "Enter Password" is displayed, enter your password.

When you start the Setup Utility with Supervisor Password

- You can make the settings of all items of the Setup Utility.

When you start the Setup Utility with User Password

- Note the following:
 - In the [Advanced] and [Boot] menus, you cannot make the settings of all items.
 - In the [Security] menu, you can change only the User Password when [User Password Protection] is set to [No Protection]. You cannot delete the User Password.
 - In the [Exit] menu, you cannot make the setting of [Load Default Values] and [Boot Override].

NOTE

- Setup Utility screen is displayed on the internal LCD even when an external display is connected to the computer as the factory default. However, if the LID (display) is closed, it will come to be displayed on an external display.

Information Menu

Underlined items are the factory presets.

Language	<u>English</u> French Japanese
----------	--------------------------------------

Product Information

Model No. Serial No.	Computer information (cannot be changed.)
-------------------------	---

▶ Docking Device	Enter the sub-menu.
------------------	---------------------

Sub-menu (Docking Device)

Docking Device Information

Docking Device Model No. Serial No. EC USB PD Controller	Computer information (cannot be changed.)
--	---

► Expansion Areas	Enter the sub-menu.
-------------------	---------------------

Sub-menu (Expansion Areas)

■ Expansion Areas

Rear Expansion Area Model No. Serial No. When the option is not installed, "Model No." and "Serial No." will not be displayed.	Computer information (cannot be changed.)
---	---

Right Expansion Area Model No. Serial No. When the option is not installed, "Model No." and "Serial No." will not be displayed.	Computer information (cannot be changed.)
--	---

Left Expansion Area Model No. Serial No. When the option is not installed, "Model No." and "Serial No." will not be displayed.	Computer information (cannot be changed.)
---	---

Option Configuration ID	Computer information (cannot be changed.)
-------------------------	---

■ System Information

Processor Type Brand Type Memory Size Storage	Computer information (cannot be changed.)
--	---

■ BIOS Information

► Firmware Information	Enter the sub-menu.
------------------------	---------------------

Sub-menu (Firmware Information)

■ Firmware Information

BIOS BIOS Configuration EC Intel(R) ME Firmware LAN Firmware (NVM) Embedded Security (TPM) Intel(R) ISH Intel(R) ISH Profile Intel(R) USB4 Retimer USB PD Controller Camera Intel(R) Ethernet Connection(24) I219-LM Intel(R) Ethernet Controller I226-V (Only for model with LAN (2.5G))	Computer information (cannot be changed.)
---	---

Accumulative Operating Time Access Level	Computer information (cannot be changed.)
---	---

Main Menu

Underlined items are the factory presets.

System Date - Day of the Week, Month/Day/Year. - You can use <<Tab>> to move the cursor.	[xxx xx/xx/xxxx]
System Time 24-hr. style. - You can use <<Tab>> to move the cursor.	[xx:xx:xx]

Main Configuration

10-Key Mode - Select the behavior of the numeric key area of the keyboard. - When [NumLock] is selected, the numeric key area works as a number pad when Num Lock LED is on. - When [Fn Key] is selected, the numeric key area works as a number pad when the <<Fn>> key is held, and Num Lock LED is on.	<u>NumLock</u> Fn Key
---	--------------------------

LID Switch	Disabled <u>Enabled</u>
Battery Charging Indicator	<u>On Continuous</u> Flashing
Battery Charging Guard	<u>100%</u> 80% 60% Auto
Power On AC	<u>Disabled</u> Enabled
Power Off Charging of Peripherals	Disabled <u>Enabled</u>

Set Asset Tag	Enter the Asset Tag.
Show Asset Tag on Boot Logo Screen	Disabled <u>Enabled</u>

▶ Concealed Mode Configuration The sub-menu appears when this item is selected.	Enter the sub-menu.
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Sub-menu (Concealed Mode Configuration)

Concealed Mode Configuration

Concealed Mode	Disabled <u>Enabled</u>
----------------	----------------------------

LCD Backlight Can be changed only when [Concealed Mode] is set to [Enabled].	OFF <u>Minimum</u> ON
LED - Can be changed only when [Concealed Mode] is set to [Enabled]. - Except for the camera indicator and the LED of external devices.	OFF ON
Sound Can be changed only when [Concealed Mode] is set to [Enabled].	OFF ON
Wireless Radio Can be changed only when [Concealed Mode] is set to [Enabled].	OFF ON
Backlit Keyboard - Only for model with backlit keyboard. - Can be changed only when [Concealed Mode] is set to [Enabled].	OFF ON
Touchscreen - Only for model with touchscreen. - Can be changed only when [Concealed Mode] is set to [Enabled].	OFF ON

Trigger Key - Can be changed only when [Concealed Mode] is set to [Enabled]. - Select the key combination to turn on/off the concealed mode. - When [F8] is selected, pressing <<F8>> turns on/off the concealed mode. - When [Right Alt] is selected, pressing right <<Alt>> turns on/off the concealed mode.	Fn+F8 F8 Right Alt
---	--------------------------

▶ Fan Diagnostics	Enter the sub-menu. Press <<Enter>> to start fan test.
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▶ Backlit Keyboard Settings Only for model with backlit keyboard.	Enter the sub-menu.
---	---------------------

Sub-menu (Backlit Keyboard Settings)

■ Backlit Keyboard Settings

Toggle Color 1 This toggle color cannot be changed.	<u>White</u>
---	--------------

Toggle Color 2 This toggle color cannot be changed.	<u>Red</u>
---	------------

Toggle Color 3	Red <u>Green</u> Blue White Custom
----------------	--

Custom

Red Green Blue - Can be changed only when [Toggle Color 3] is set to [Custom]. - Specify [Red], [Green], and [Blue] colors with numbers from [0] to [255], or use <<F5>>/<<F6>> keys to set them.	0 to 255
Toggle Color 4	Red Green <u>Blue</u> White Custom

Custom

Red Green Blue - Can be changed only when [Toggle Color 4] is set to [Custom]. - Specify [Red], [Green], and [Blue] colors with numbers from [0] to [255], or use <<F5>>/<<F6>> keys to set them.	0 to 255
---	----------

Backlight Timeout (seconds)

On Battery Power When [On Battery Power] is set to [None] and the backlit keyboard is turned on, it is always lit.	None 5 10 15 <u>30</u> 60
Plugged in When [Plugged in] is set to [None] and the backlit keyboard is turned on, it is always lit.	<u>None</u> 5 10 15 30 60

► Optional Kit Configuration Normally do not change this setting.	Enter the sub-menu. A separately provided password is required to enter the sub-menu.
---	--

Advanced Menu

Underlined items are the factory presets.

► CPU Configuration The sub-menu appears when this item is selected.	Enter the sub-menu.
--	---------------------

Sub-menu (CPU Configuration)

CPU Configuration

Intel(R) Virtualization Technology - Can be changed only when [Intel(R) Trusted Execution Technology] is set to [Disabled]. - Can be changed only when [Intel(R) VT-d] is set to [Disabled].	Disabled <u>Enabled</u>
Intel(R) VT-d Can be changed only when [Intel(R) Trusted Execution Technology] is set to [Disabled].	Disabled <u>Enabled</u>
Intel(R) Trusted Execution Technology Can be changed only when [Intel(R) VT-d] is set to [Enabled].	Disabled <u>Enabled</u>
Intel(R) Total Memory Encryption	<u>Disabled</u> Enabled

Peripheral Configuration

▶ Serial Port Settings - The sub-menu appears when this item is selected. - Used to configure the serial port.	Enter the sub-menu.
---	---------------------

Sub-menu (Serial Port Settings)

Serial Port Settings

Serial Port Only for model with serial port.	Disabled Enabled <u>Auto</u>
Optical Drive Only for model with optical disc drive.	Disabled <u>Enabled</u>
LAN	Disabled <u>Enabled</u>
Power On by LAN Can be changed only when [LAN] is set to [Enabled].	<u>Deny</u> Allow
LAN (Rear) Only for model with LAN (2.5G).	Disabled <u>Enabled</u>
LAN (Left) Only for model with LAN (10G).	Disabled <u>Enabled</u>

▶ Wireless Configuration The sub-menu appears when this item is selected.	Enter the sub-menu.
---	---------------------

Sub-menu (Wireless Configuration)

Wireless Configuration

Airplane Mode Hotkey	Disabled <u>Enabled</u>
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Wi-Fi - Only for model with wireless LAN. - Can be changed only when [Bluetooth] is set to [Disabled].	Disabled <u>Enabled</u>
Bluetooth - Only for model with Bluetooth. - Can be changed only when [Wi-Fi] is set to [Enabled].	Disabled <u>Enabled</u>
Cellular (WWAN) Only for model with wireless WAN.	Disabled <u>Enabled</u>
Dedicated GPS Only for model with dedicated GPS.	Disabled <u>Enabled</u>

Wireless Antenna Switching Only for model without Discrete GPU.	<u>PC(built-in)</u> Auto
Channel 1 Can be changed only when [Wireless Antenna Switching] is set to [Auto].	<Only for model with External Antenna Connector> <u>NONE</u> WWAN-GPS WWAN-aux Wi-Fi
	<Only for model with dedicated GPS> <u>NONE</u> Dedicated GPS
Channel 2 Can be changed only when [Wireless Antenna Switching] is set to [Auto].	<Only for model with External Antenna Connector> <u>NONE</u> WWAN-main
	<Only for model with dedicated GPS> <u>NONE</u> WWAN-main Wi-Fi

Depending on the hardware constructions, the items described in the operating instructions may differ from the items actually displayed.

Touchscreen Only for model with touchscreen.	Disabled <u>Enabled</u>
microSD Card Slot Only for model with microSD memory card slot.	Disabled <u>Enabled</u>
USB Type-C Port	Disabled <u>Enabled</u>
USB Type-A Port	Disabled <u>Enabled</u>
Port Replicator	Disabled <u>Enabled</u>
Docking Device USB Ports	Disabled <u>Enabled</u>
Camera Only for model with camera.	Disabled <u>Enabled</u>

Microphone Only for model with microphone.	Disabled <u>Enabled</u>
--	----------------------------

Boot Menu

Underlined items are the factory presets.

Boot Mode If the startup from USB devices is not possible, set [Compatible] and retry. However, setting [Compatible] will require longer time to display the Windows boot screen than setting [Normal].	<u>Normal</u> Compatible
---	-----------------------------

UEFI Priorities

Boot Option #1 - #7	Windows Boot Manager Windows Recovery Environment Recovery Partition UEFI: PXE IPv4 Intel(R) Ethernet Connection (24) I219-LM UEFI: PXE IPv6 Intel(R) Ethernet Connection (24) I219-LM UEFI: PXE IPv4 Intel(R) Ethernet Controller I226-V (Only for model with LAN (2.5G)) UEFI: PXE IPv6 Intel(R) Ethernet Controller I226-V (Only for model with LAN (2.5G)) Disabled
---------------------	--

Depending on the hardware constructions, some device name are different.

UEFI Boot Device Control

Set whether to enable or disable the startup of each device.

UEFI Boot from Storage	Disabled <u>Enabled</u>
UEFI Boot from Optical Drive Only for model with optical disc drive.	Disabled <u>Enabled</u>
UEFI Boot from LAN	Disabled <u>Enabled</u>
UEFI Boot from USB and Others	Disabled <u>Enabled</u>

Changing the boot order

- [Boot Option] for [UEFI Boot Device Control] shows the boot device recognized by Firmware (BIOS).
- Boot from a device or not can be selected at [UEFI Priorities], device by device.
- You can select the boot device during start-up of the computer, too. Press <<Esc>> key soon after "Panasonic" boot screen is displayed. Boot Menu appears and you can select the device. To use this function, set [Boot Popup Menu] to [Enabled].

Security Menu

Underlined items are the factory presets.

Boot Prompt Configuration

Boot Popup Menu	<u>Disabled</u> Enabled
Password on Boot The shutdown when the fast startup is enabled, this function is ineffective.	Disabled <u>Enabled</u>
Password on Reboot	Disabled <u>Same as Boot</u>
Password on Resume - Can be changed only when [Password on Boot] is set to [Enabled]. - This function is effective when the computer is restarted after a shutdown (when fast startup is enabled) and when the computer resumes from hibernation, but not when it resumes from sleep.	Disabled <u>Enabled</u>

Set Supervisor Password	Enter the password.
User Password Protection	<u>No Protection</u> Protected
Set User Password Can be changed only when [Set Supervisor Password] is set.	Enter the password.
Enhanced sign-in security IMPORTANT <Only for model with Fingerprint Reader (Windows Hello)> For more information about the procedure for changing the settings, refer to "Fingerprint Reader".	Disabled <u>Enabled</u>

► Storage Security Configuration (TCG) - Can be changed only when [Set Supervisor Password] is set. - Sub-menu items: - Sub-Menu Protection - Security Policy - Set Storage Password - Storage Security Status (Depending on the models, this item is displayed differently.)	Enter the sub-menu.
--	---------------------

► Embedded Security (TPM) - Only for model that supports TPM. - Can be changed only when [Set Supervisor Password] is set. - Sub-menu items: - Sub-Menu Protection - TPM State (Depending on the models, this item is not displayed.) - Pending TPM Operation When [Clear TPM Owner] is selected, clear owner information in the TPM chip. Use for discarding and transferring this product. If you select [Clear TPM Owner] when the BitLocker is effective, you may need to reinstall OS. - Block SID Authentication (Depending on the models, this item is displayed differently.)	Enter the sub-menu.
► Fingerprint Security - Only for model with Fingerprint Reader (Windows Hello). - Can be changed only when [Set Supervisor Password] is set. - Sub-menu items: - Sub-Menu Protection - Power-on Security - Clear the fingerprint data	Enter the sub-menu.
► AMT Configuration - Only for model that supports Intel(R) AMT. - Can be changed only when [Set Supervisor Password] is set.	Enter the sub-menu.
► Manageability Configuration - Can be changed only when [Set Supervisor Password] is set. - Sub-menu items: - Sub-Menu Protection - Local Platform Erase Configuration Set each item ([Storage Device Erase] / [TPM Clear] / [Reset AMT Configuration] of [Platform Erase Operations]) to [Enabled] or [Disabled]. [Execute Platform Erase Operations] erases items set to [Enabled].	Enter the sub-menu.
► DFCI Configuration DFCI is a feature that allows remote control of some items in the Setup Utility via Microsoft Intune.	Enter the sub-menu.
► Secure Boot - The sub-menu appears when this item is selected. - If you change factory default setting, preinstalled-OS may not operate correctly.	Enter the sub-menu.
► Absolute Persistence(R) Module Absolute(R), formerly Absolute Computrace(R), is a service designed to help track devices and provide recovery services in the event a device is lost or stolen.	<u>Ready</u> Disabled Permanently Disabled*1

*1 : When [Permanently Disabled] is selected, this setting cannot be used again.

Exit Menu

Save Values and Reboot	To reboot the system after saving the changes.
Reboot Without Saving Changes	To reboot the system without saving the changes.

Save Options

Save Current Values	To save the changes for all Setup options.
Load Previous Values	To load previous values for all Setup options.
Load Default Values	To return the settings to the default values.

Boot Override

Windows Boot Manager	Boot from preinstalled OS.
Recovery Partition	Erase your flash memory or restore the computer to its original factory default image.
UEFI: PXE IPv4 Intel(R) Ethernet Connection (24) I219-LM	Boot from LAN device (IP4).
UEFI: PXE IPv6 Intel(R) Ethernet Connection (24) I219-LM	Boot from LAN device (IP6).
UEFI: PXE IPv4 Intel(R) Ethernet Controller I226-V (Only for model with LAN (2.5G))	Boot from LAN device (IP4).
UEFI: PXE IPv6 Intel(R) Ethernet Controller I226-V (Only for model with LAN (2.5G))	Boot from LAN device (IP6).
Windows Recovery Environment	Boot from Windows Recovery Environment.

Depending on the hardware constructions, some device name are different.

► Diagnostic Utility	Execute Diagnostic Utility.
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Handling and Maintenance

Operation environment

- Place the computer on a flat stable surface not subject to shock, vibration, and danger of dropping. Do not place the computer upright or turn it over. If the computer is exposed to an extremely strong impact, it may become damaged.

- Operating environment

Temperature:

- Operation : -10 °C to 50 °C {14 °F to 122 °F} (IEC60068-2-1, 2)*¹
- Storage : -20 °C to 60 °C {-4 °F to 140 °F}

Humidity:

- Operation : 30 % to 80 % RH (No condensation)
- Storage : 30 % to 90 % RH (No condensation)

Even within the above temperature/humidity ranges, operation for a long time in extreme environments, smoking nearby, or operation in places where oil is used or where there is a lot of dust will result in the product deterioration and will shorten the product life.

If the computer is wet in temperatures of 0 °C {32 °F} or below, freeze damage may occur. Make sure to dry off the computer in such temperatures.

*1 : Do not expose the skin to this product when using the product in a hot or cold environment. (➡ **OPERATING INSTRUCTIONS - Read Me First** "Safety Precautions")

- If the temperature is low, the operating time is shortened. Only use the computer within the allowable temperature range.
- Do not place the computer in the following areas, otherwise the computer may be damaged.
 - Near electronic equipment. Image distortion or noise may occur.
 - In extremely high or low temperature.
 - Near a television or radio receiver.
- As the computer can become hot during operation, keep it away from items that are sensitive to heat.
- Keep the computer away from magnets. Failure to do so may cause malfunction.

Handling cautions

This computer is designed to minimize shock to parts such as the LCD and the flash memory drive and equipped with a drip-proof keyboard, but no warranty is provided against any trouble caused by shock. Be extremely careful when handling the computer.

- When carrying the computer:
 - Turn off the computer.
 - Remove all external devices, cables and other protruding objects.
 - Remove a disc in the optical disc drive.
 - Do not drop or hit the computer against solid objects.
 - Do not leave the display open.
 - Do not grip the display part.
- Do not put anything (e.g., a piece of paper) between the display and keyboard.
- When you board an airplane, take the computer with you and never put it in your checked luggage.
- When using the computer on airplane, follow the airline's instructions.
- When carrying a spare battery, put it in a plastic bag to protect its terminals.
- Do not touch the terminals on the battery pack. The battery pack may no longer function properly if the contacts are dirty or damaged.
- The battery pack may become warm during recharging or normal use. This is completely normal.
- Be careful not to get injured by dropping or getting hit when carrying the computer.
- Use only the pen (specified) to touch the screen. Do not place any object on its surface and do not press down strongly with sharp-pointed or hard objects that may leave marks (e.g., nails, pencils and ball point pens).

- The touchpad is designed to be used by fingertip. Do not place any object on its surface and do not press down strongly with sharp-pointed or hard objects that may leave marks (e.g., nails, pencils and ball point pens).
- Avoid any harmful substances such as oil from getting into the touchpad. The pointer may not work correctly.
- Touch the screen with the pen (specified) or your fingers.

When touching the screen, use only the pen (specified) or your fingers on the surface.

Touching the screen with an object other than the pen (specified) or your fingertip (a fingernail or metal object, or other hard or sharp objects that may leave a mark) may scar or stain the surface, causing the malfunction.

- Do not apply too much pressure when operating the screen.

Only a light touch is required to operate the screen. Applying too much pressure may damage the surface.

- Do not use the screen when dust or dirt (e.g., oil) is on the screen.

Otherwise foreign particles on the screen/pen (specified) can scratch the screen surface or obstruct the pen (specified) operation.

Handling the screen

- Do not apply strong pressure to the screen outside of the LCD display.

Applying strong pressure to the screen outside of the display area may result in malfunctions or damage to the LCD screen.

- Do not apply excessive force to the screen.

Do not lift the computer while holding the LCD screen, or allow the screen to be twisted. Do not place any objects on the LCD screen. Any of the above may cause the screen glass to break, or may damage the LCD screen.

- Operation response may be slower in low temperature environments.

The screen may respond to operations more slowly when using the computer in temperatures less than 5 °C {41 °F}, but this is not a malfunction. Response time will return to normal when the computer is returned to room temperature.

Handling the pen (specified)

- Clean the pen (specified) tip and screen prior to operation.

Foreign particles can scratch the screen and impede the operation of the pen (specified).

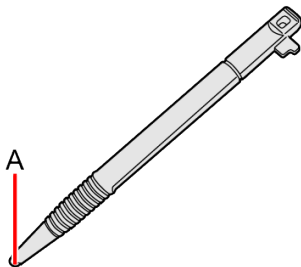
- Use only the pen (specified) to touch the screen.

Using it for any other purpose may damage the pen (specified) and result in scratches on the screen.

- The pointer cannot follow the pen (specified) movement if you move the pen (specified) too quickly.

- Do not apply excessive force to the tip of pen.

If excessive force is applied to the pen tip (A), the screen may be damaged, or the pen tip (A) will be easily damaged or deteriorate. Also, leaving the pen tip (A) for a long period of time with pressure applied may cause operational errors or deterioration. Do not apply excessive force to the pen tip (A) since it can be operated with light force.



When using peripheral devices

Follow these instructions and this manual to avoid any damage to the devices. Carefully read the instruction manuals of the peripheral devices.

- Use the peripheral devices conforming to the computer's specifications.
- Connect to the connectors in the correct direction.
- If it is hard to insert, do not try forcibly but check the connector's shape, direction, alignment of pins, etc.
- If screws are included, fasten them securely.
- Remove the cables when you carry the computer. Do not pull the cables forcibly.

Preventing your computer from unauthorized use via wireless LAN/Bluetooth/wireless WAN

<Only for model with wireless LAN/Bluetooth/wireless WAN>

- Before using wireless LAN/Bluetooth/wireless WAN, make the appropriate security settings such as data encryption.

When the battery indicator does not light on

The battery indicator may not light on even if the AC adaptor and the battery pack are correctly connected to the computer, due to the following reasons.

- The AC adaptor's protection function may be working. In this case, pull out the AC cord and wait for more than 1 minute before reconnecting the AC cord.

Maintenance

If drops of water or other stains get on the surface of the LCD panel, wipe them off immediately. Failure to do so may result in staining.

Cleaning the LCD panel

The screen is specially treated to prevent dirt from adhering to the surface. Also, to improve the outdoor visibility of the display, a low reflection coating has been added.

When removing the dirt on the screen surface, use a soft, dry cloth such as gauze in order to avoid scratches and peeling of the coating.

Before using the computer, be sure to read the instructions provided below.

- How to maintain
 - If the screen gets dirty with fingerprints, etc., or if the screen surface gets wet, wipe it with a soft, dry cloth.
 - Do not apply water or solvents to the soft cloth.
 - First, lightly wipe foreign particles and dust adhering to the LCD display on one side of the soft cloth. Do not use force, since the LCD surface may be damaged with the foreign particles or dust.
Next, wipe off fingerprint, etc., with the other side of the soft cloth.
 - Before wiping the LCD display, the computer must be turned off.
Cleaning the screen while the power is on may cause the computer to malfunction. Also, dirt on the screen is easier to see when the computer is powered off, and so is easier to clean.
- Check the following to prevent the surface of the screen from being scratched.
 - Are you using your fingers or the pen (specified) to operate the screen?
 - Is the surface clean?
 - Is the soft cloth clean?
 - Are your fingers clean?
 - Are you using the pen (specified) with the tip extended?
 - Is the tip of the pen (specified) clean?

Cleaning areas other than the LCD panel

Wipe with a soft dry cloth such as gauze. When using detergent, dip a soft cloth in water-diluted detergent and wring it thoroughly.

IMPORTANT

- Do not use benzene, thinner, or rubbing alcohol since it may adversely affect the surface causing discoloration, etc. Do not use commercially available household cleaners and cosmetics, as they may contain components harmful to the surface.
- Do not apply water or detergent directly to the computer, since liquid may enter inside of the computer and cause malfunction or damage.
- Use a soft, dry cloth to wipe droplets of water from the surface of the unit. Do not use a microwave to dry the unit. Doing so will result in malfunction or damage.

Extension

Optical Disc Drive

<Only for model with optical disc drive>

NOTE

- Connect the AC adaptor if writing operation takes a long time. If the remaining battery power becomes low and the power is not supplied, writing operation may not be completed.
- You can use Windows features to write to discs (➡ [Using Windows feature](#)).
- The quality of written data depends on the disc.

Handling Precautions

Optical disc drive handling care

- Do not expose the optical disc drive to excessive smoke that may leave a residue, e.g., oil smoke, or tobacco smoke. Doing so can shorten the life of the drive lens.
- We recommend cleaning the drive lens with an air puffer used for camera lenses. (Do not use any spray-type of lens cleaning products.)

When opening/closing the tray

- When the computer is on, use the eject button (➡ [Inserting/Removing a Disc](#)) or eject through Windows.
- When inserting or removing a disc, be careful not to touch the lens and other parts of the laser pickup.
- Do not leave the tray open and do not touch the lens.
The lens and disc can become dusty in some conditions. It may cause malfunction in reading or writing.
- Do not apply excessive force to the tray in the open position.
- Never insert a foreign object such as a paper clip into the optical disc drive.
Doing so may cause malfunction.
- Do not place items other than discs on the tray.
- Do not access the drive until after the tray is closed.
- Set this computer on a horizontal plane.

While the optical disc drive is being accessed

- Do not open the optical disc drive or move the computer while the optical disc drive is being accessed. Doing so could cause the disc to shift position and this may damage the disc, or cause the optical disc drive to malfunction.
- Do not shock the computer by removing or inserting cables and cards, etc. This may result in a read or write malfunction.
- In addition, after running an application involving access to a disc, close the application before opening the optical disc drive.
- Set this computer on a horizontal plane.

Disc handling care

- Do not use deformed, warped, or irregularly shaped discs.
- Reading of disc may not be possible depending on the disc conditions (cracks, dirt, modification, data recording quality, copy protection, recording equipment/software that was used to create the disc, etc.)
- Before using a disc, carefully read the operating/handling instructions and package of the disc.
- If the discs are not handled appropriately, they may become dirty or scratched. Furthermore the writing speed may get slower and the data may not be correctly written on or read from the disc. Other damage may cause a drive failure.

- **Note the following precautions.**

- Use an appropriate disc according to the write/rewrite speed. Check descriptions on the disc package and use an appropriate disc according to the write/rewrite speed. Some disc may not accept the specified write speed.

- Do not touch the disc surface (the side with no printing).

<How to hold a disc>

Correct



Incorrect



- Keep the disc surface clean and free from dirt, dust, fingerprints and scratches.
- Do not write on the surface of the disc with a ballpoint pen or other writing instrument.
- Do not attach stickers to discs.
- Do not drop, bend, or place heavy objects on top of discs.
- Do not place or store discs in locations exposed to heat, direct sunlight, humidity or dust.
- If a disc is brought from a cold to a warm location, condensation may form on the disc. For read-only discs, wipe off the condensation using a soft, dry, lint-free cloth before using the disc. For recordable/rewritable discs, wait until the condensation dries.
- When not using discs, keep them in their protective cases or cartridges.

Cleaning the discs

- <For read-only discs>

Wipe discs with a dry, soft cloth from the center toward the edge. If discs get very dirty, wipe with a moist, soft cloth from the center toward the edge, then wipe again with a dry cloth to take up remaining moisture.

Correct



Incorrect



- <For recordable/rewritable discs>

It is recommended to use the Panasonic disc cleaner.

Do not use a cloth.

Disc Information

Data transfer speeds indicate values measured by Panasonic Connect Co., Ltd.

Performance of CD-R, CD-RW, High-Speed CD-RW, Ultra-Speed CD-RW, DVD-RAM, DVD-R, DVD-R DL, DVD-RW, +R, +R DL, +RW, High Speed +RW, and M-DISC cannot be guaranteed depending on writing status and recording format. Also, some data cannot be played back depending on the disc, settings, and environment being used.

NOTE

- **Note that the operation may be problematic depending on the temperature of the operating environment. The guaranteed temperature for data writing on typical media is 5 °C to 55 °C {41 °F to 131 °F}.**

Reading*1

Disc	Continuous Data Transfer speed
CD-ROM	24 X (Max)
CD-R (XA Compatible)	24 X (Max)
CD-RW	24 X (Max)
High-Speed CD-RW	24 X (Max)
Ultra-Speed CD-RW	24 X (Max)
DVD-ROM (Single Layer, Dual Layer)	8 X (Max)
DVD-R*2 (1.4 GB, 2.8 GB, 3.95 GB, 4.7 GB)*3	8 X (Max)
DVD-R DL (8.5 GB)*3	8 X (Max)
DVD-RW (Ver.1.1/1.2 1.4 GB, 2.8 GB, 4.7 GB, 9.4 GB)*3	8 X (Max)
DVD-RAM*7 (1.4 GB, 2.8 GB, 4.7 GB, 9.4 GB)*3	5 X (Max)
+R (4.7 GB)*3	8 X (Max)
+R DL (8.5 GB)*3	8 X (Max)
+RW (4.7 GB)*3	8 X (Max)
High Speed +RW (4.7 GB)*3	8 X (Max)
M-DISC (4.7 GB)*3	8 X (Max)
BD-ROM*4	6 X (Max)
BD-R*4	6 X (Max)
BD-R DL*4	6 X (Max)
BD-R XL*4	6 X (Max)
BD-R LTH*4	4 X (Max)
BD-RE*4	6 X (Max)
BD-RE DL*4	6 X (Max)
BD-RE XL*4	4 X (Max)

Writing*5

Disc	Continuous Data Transfer speed	Recommended discs for writing	Discs you can use for writing
CD-RW	4 X	Verbatim Japan Ltd.	
High-Speed CD-RW	10 X		
Ultra-Speed CD-RW	16 X (Max)	None	

Disc	Continuous Data Transfer speed	Recommended discs for writing	Discs you can use for writing
DVD-R ^{*2}	8 X (Max)	Verbatim Japan Ltd.	DVD-R for General: 1-8X-SPEED (4.7 GB) 1-16X-SPEED (4.7 GB)
DVD-R DL	6 X (Max)		DVD-R DL 2-8X-SPEED (8.5 GB)
DVD-RW ^{*6}	6 X (Max)		1-2X-SPEED (4.7 GB/9.4 GB) 2-4X-SPEED (4.7 GB/9.4 GB) 2-6X-SPEED (4.7 GB/9.4 GB)
DVD-RAM ^{*7}	5 X (Max)	None	2-3X-SPEED (4.7 GB/9.4 GB) 2-5X-SPEED (4.7 GB/9.4 GB)
+R	8 X (Max)	Verbatim Japan Ltd.	1-8X-SPEED (4.7 GB) 1-16X-SPEED (4.7 GB)
+R DL	6 X (Max)		2.4-8X-SPEED (8.5 GB)
+RW	4 X (Max)		1-4X-SPEED (4.7 GB)
High Speed +RW	8 X (Max)		3.3-8X-SPEED (4.7 GB)
M-DISC	4 X (Max)	Millenniata, Inc.	
BD-R ^{*4}	6 X (Max)	Verbatim Japan Ltd.	1-2X-SPEED (25 GB) 1-4X-SPEED (25 GB) 1-6X-SPEED (25 GB)
BD-R DL ^{*4}	6 X (Max)		1-2X-SPEED (50 GB) 1-4X-SPEED (50 GB) 1-6X-SPEED (50 GB)
BD-R XL ^{*4}	4 X (Max)		2-4X-SPEED (100 GB)
BD-R LTH ^{*4}	4 X (Max)	None	1-2X-SPEED (25 GB) 1-4X-SPEED (25 GB) 1-6X-SPEED (25 GB)
BD-RE ^{*4}	2 X (Max)	Verbatim Japan Ltd.	1-2X-SPEED (25 GB)
BD-RE DL ^{*4}	2 X (Max)		1-2X-SPEED (50 GB)
BD-RE XL ^{*4}	2 X (Max)	Sony Corporation	1-2X-SPEED (100 GB)

*1 : If an unbalanced disc (e.g., a disc with which the balance has been displaced from the center) is inserted, the speed may become slower if there are large vibrations while the disc is rotating.

*2 : Does not support writing to DVD-R (for Authoring). DVD-R (for Authoring) playback is compatible with discs recorded using Disc-at-Once recording.

*3 : 1 MB = 1,000,000 bytes / 1 GB = 1,000,000,000 bytes. Your operating system or some application software will report as fewer GB.

*4 : Only for model with Blu-ray disc drive.

*5 : Depending on the disc, the writing speed may become slower.

*6 : Does not support DVD-RW Ver.1.0.

*7 : DVD-RAM: Only non-cartridge type or removable cartridge type can be used. Does not support writing to DVD-RAM 2.6 GB.

Using DVD/BD media

To play DVD-Video/BDMV (only for model with Blu-ray disc drive), you need to use DVD/BD playback software.

DVD discs created using a DVD recorder

The following restrictions apply:

- When playing videos recorded on rewritable discs, approx. 40 to 50 seconds may be required to recognize the disc. Wait for the required time.
- Depending on the condition (record quality, cracks, dirt, modification, copy protection, type of drive/disc maker used when creating the disc, etc.) of a disc, it may not be possible to be read or play it correctly.
- In order to play discs other than DVD-RAM, they must be finalized (a process that enables it to play on other DVD players, etc.). For information on the finalizing method used by your DVD recorder, refer to its operating instructions.
- This computer does not include an application or DVD drive for playing AVCREC format or AVCHD format or CPRM format media. As a result, this computer cannot play back DVD media recorded in AVCREC format or AVCHD format or CPRM format.

Region codes

DVD-Video/BDMV is allocated to region codes according to where they are sold. To play the DVD-Video/BDMV, the player's software and the drive must have the corresponding region code.

The region code setting can be changed up to 5 times, including the first time (changing from region [2] to region [2], for example, is not counted).

After the fifth time, the region code setting will be locked and cannot be changed again, even if you reinstall Windows. Be very careful when configuring this setting, as you (the user) are fully responsible for any problems arising from unintended settings.

Region code settings

IMPORTANT

- **DVD-Video sold in certain regions include region code restrictions that require the region code settings of the DVD disc and drive to match in order to play back video. However, some discs include multiple region code settings or are region free.**

The region code of this computer's drive is not set under factory default conditions. As a result, the region code settings screen will appear the first time you attempt to play back a DVD-Video/BDMV (only for model with Blu-ray disc drive).

The region code must be set at this time, even when playing multi-region or region-free discs.

After setting the region code for the first time, the region code settings screen will appear each time a disc of a different region is inserted in the drive.

Checking the region code

You can check the current region setting and the remaining number of times the setting can be changed by following the procedure below.

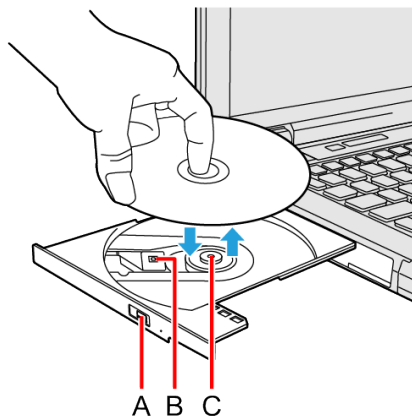
1. Right-click  (Start) - [Device Manager].
2. Double-click [DVD/CD-ROM drives].
3. Double-click the device name of the optical disc drive (ex: HL-DT-ST DVDRAM GUD1N).
4. Click [DVD Region].

The current region and the number of changes remaining are displayed.

Inserting/Removing a Disc

1. Turn on the computer.
2. Press the eject button (A) and slowly pull out the tray.

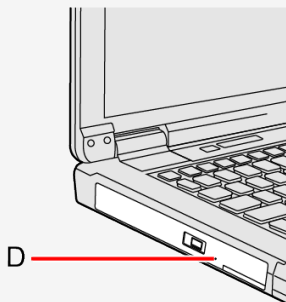
When inserting or removing a disc, be careful not to touch the lens and other parts of the laser pickup (B). Do not touch the disc surface (the side with no printing).



3. Insert/Remove a disc.
 - To insert
Set the disc with the label side up and press the center of the disc until it clicks in place.
 - To remove
Press on the center spindle (C) and carefully lift up the edge of the disc.
4. Close the tray.
Do not press the eject button (A).

NOTE

- To remove a disc when the computer is powered off, insert a pin of 1.3 { ± 0.05 } mm in diameters into the emergency hole (D). (When the diameter of the pin is smaller than this, insert the pin slightly downward.) Pushing it to the end allows the tray to come out.



- For AutoPlay CD/DVD/BD:
 - If an AutoPlay CD/DVD/BD does not start after the computer resumes from sleep or hibernation, remove the disc from the drive and then reinsert it after waiting 15 seconds.
 - An AutoPlay CD/DVD/BD may start during file access depending on the status of the disc.
- When playing back motion video from a disc, playback may not be smooth in some conditions.

Power-saving mode

If the optical disc drive is not accessed for 30 seconds, the drive motor will automatically be shut down to reduce the power consumption. When the optical disc drive is accessed again, the drive motor is turned on. In this case, reading of the disc data will take approximately 30 seconds.

Writing to CD/DVD/BD

Applicable media

- Refer to the [Disc Information](#).

About Copies

When writing to discs, make sure that you are not infringing upon any copyrights. It is illegal to copy commercially available audio CDs for non-personal use.

When backing up software, make sure that you are not infringing upon any software copyrights for that product.

Using Windows feature

1. **Insert a disc you can use for writing.**
2. **In the [AutoPlay] screen, click [Burn files to disc].**
 - Alternatively:
 1. Right-click  (Start) - [File Explorer].
 2. Click [This PC].
 3. Double-click [DVD RW Drive] or [BD-RE Drive].
 - Follow the on-screen instructions.

Using DVD-RAM

Formatting must be executed to write a file to a DVD-RAM. It is possible to write a file to a formatted DVD-RAM in the same way as writing a file to a flash memory.

Format type

There are following types of DVD-R/DVD-RW/DVD-RAM formats, as shown below. We recommend that you choose the format type depending on the application.

Format	Feature
FAT32	This format is supported by Windows 95 (OSR2) / 98 / Me / 2000 / XP / Vista / 7 / 8.1 / 10. DVD-RAM discs in FAT32 format cannot be used on Windows 95 (other than OSR2) / Windows NT.
UDF1.02	This format is supported by Windows 98 / Me / 2000 / XP / Vista / 7 / 8.1 / 10, and compatible with the Video mode of DVD-ROM / DVD-R / DVD-RW / +R / +RW.
UDF1.50	Standard format for DVD-RAM. Data with large file sizes (video or audio data) can be written at high speed. We recommend this format when using DVD-RAM for storing data.
UDF2.00/2.01	This format is used for DVD video recorders conforming to "Video Recording Standards" as established by the DVD Forum, or for PC recording software conforming to the same standards.
UDF2.5	This format is supported by Windows 7 / 8.1 / 10, and is used for Blu-ray recorders or PC recording software conforming to "Video Recording Standards" as established by the Blu-ray Disc Association. This format cannot be used for DVD recorders conforming to "Video Recording Standards" as established by the DVD Forum, or for PC recording software conforming to the same standards.

There are following types of BD-R/BD-RE formats, as shown below.

Format	Feature
UDF2.5	Standard format for BD-RE discs as established by the Blu-ray Disc Association is supported by the Windows Vista / 7 / 8.1 / 10. This format is used for Blu-ray recorders or PC recording software conforming to "Video Recording Standards" as established by the Blu-ray Disc Association. DVD-RAM discs in UDF2.5 format cannot be used for DVD recorders conforming to "Video Recording Standards" as established by the DVD Forum, or for PC recording software conforming to the same standards.
UDF2.6	Standard format for BD-R discs as established by the Blu-ray Disc Association is supported by the Windows 11. This format is used for Blu-ray recorders or PC recording software conforming to "Video Recording Standards" as established by the Blu-ray Disc Association.

Formatting method

When formatting is executed, data recorded on the disc is erased. Back up data as required.

1. **Set the disc in the optical disc drive.**
2. **Close all applications that use the disc.**
3. **Right-click  (Start) - [File Explorer].**
4. **Click [This PC].**
5. **Right-click the optical disc drive, and click [Format...].**
6. **Select the settings and click [Start].**
 - It may take long time if you removed the check mark from [Quick Format].
 - Do not cancel formatting partway. Otherwise the disc may no longer accept writing.

microSD Memory Card

<Only for model with microSD memory card slot>

The microSD memory card slot on this computer accepts microSD/microSDHC/microSDXC memory cards.

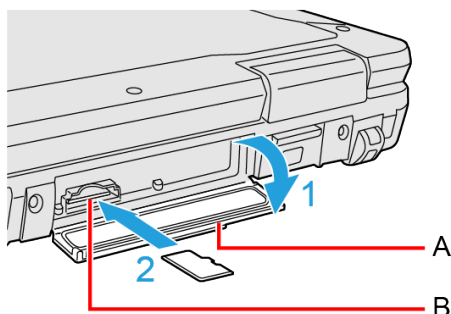
Inserting/Removing the microSD Memory Card

IMPORTANT

- Do not remove or insert the microSD memory card until Windows has completed loading.
- Do not remove the card or turn off the computer in the following cases, otherwise the data may be corrupted.
 - While the computer is in sleep or hibernation.
 - While data is being read from or written to the card.
 - Immediately after the writing operation, this computer may still continue the access to the card. If you remove the card before the operation is completed, the data may be damaged or the card access may no longer be performed normally.
- Note that Panasonic assumes absolutely no liability for any loss of data recorded by the user, or any other damages, direct or indirect.
- Keep microSD memory cards away from infants and small children.

Inserting the card

1. Open the cover (A).
2. Insert the microSD memory card to the microSD memory card slot (B).



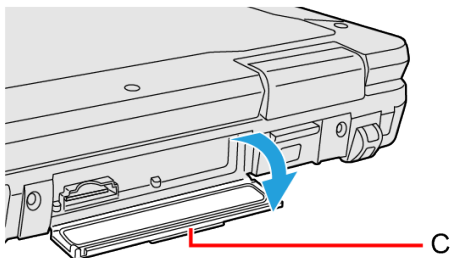
3. Close the cover (A).

Removing the card

Preparation

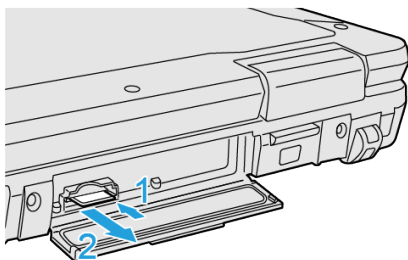
- Save the data and close all applications.
1. Disable the card function.
 1. Click  on the system tray and click .
 2. Select the card.
 - These steps are not necessary when:
 - Removing the card after turning off the computer.
 -  is not displayed.
 - The card does not appear in the list.

2. Open the cover (C).



3. Remove the card.

1. Press the card so it comes out of the slot.
2. Draw it straight out.



4. Close the cover (C).

IMPORTANT

- After pressing the microSD memory card, do not release your finger suddenly. The microSD memory card may jump out.

Attaching/Detaching the SSD Pack

You can replace the SSD pack.

IMPORTANT

- Back up all the important data before detaching the SSD pack.
- Carefully attach/detach the SSD pack since the SSD pack is extremely sensitive to shock. Note that static electricity may affect some internal components.

1. Turn off the computer and disconnect the AC adaptor.

- Do not use sleep or hibernation.

Perform the following steps to turn off the computer.

1. Click  (Start) - [Settings] - [System] - [Recovery].
2. Click [Restart now] in "Advanced startup".
3. Click [Restart now] on the "We'll restart your device so save your work" screen.
4. Click [Turn off your PC].

2. Turn your computer over and remove the battery pack. (➡ [Replacing the Battery Pack](#))

<When using second battery pack>

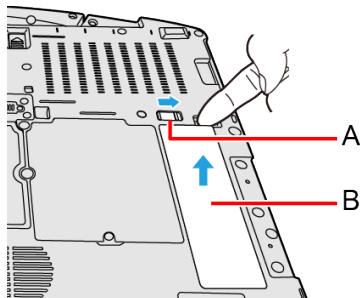
- Remove the second battery pack. (➡ [Replacing the Battery Pack](#))

Make sure no foreign objects are under the computer.

3. Attach/Detach the SSD pack.

- To detach

1. While sliding the latch (A), lift the SSD pack (B) and pull it out of the slot.

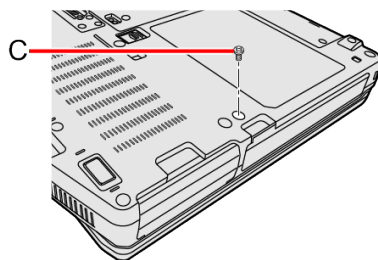


<Only for model with 2nd SSD pack>

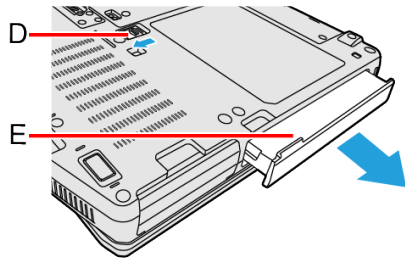
1. <When the screw is being used>

Remove the screw (C).

Use the PH 1 (PH #1) screwdriver.

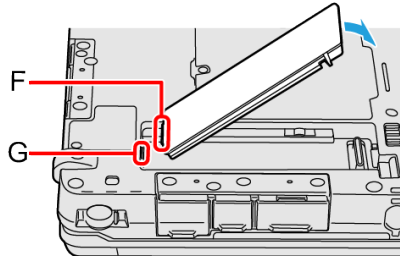


2. While sliding the latch (D), pull out the SSD pack (E).



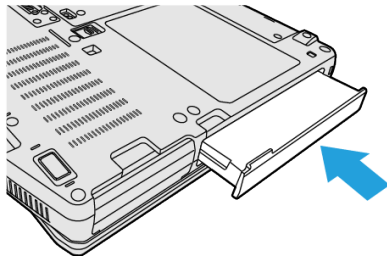
- To attach

1. Insert the projection part (F) of the SSD pack into the (G) part, and attach it while lowering until it clicks.

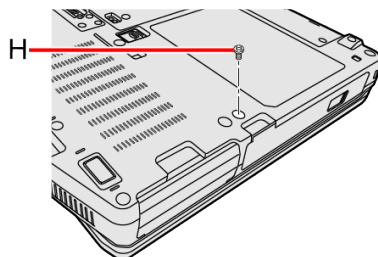


<Only for model with 2nd SSD pack>

1. Slide the SSD pack in parallel with the arrow direction until it clicks to the secured position.



2. <When the screw is included with an option>
Tighten the screw (H) supplied with an option.
Use the PH 1 (PH #1) screwdriver.
Use 1 screw.



Recommended tightening torque

0.60 N•m $\pm$ 0.05 N•m (6.0 kgf•cm $\pm$ 0.5 kgf•cm)

4. Insert the Battery Pack.

IMPORTANT

- Confirm that the latch is surely locked so that the SSD pack does not fall when you carry the computer.
- Be sure to attach the SSD pack for use.

NOTE

- You can check that the SSD pack is recognized or not in the [\[Information Menu\]](#) of the Setup Utility. If the SSD pack is not recognized, turn off the computer and insert it again.

Erasing SSD Pack Data

You can erase the data before changing the SSD pack.

1. Select [Local Platform Erase Configuration] in the sub-menu of [Manageability Configuration] in the [Security] menu of the Setup Utility.
2. Set [Storage Device Erase] to [Enabled] and select [Execute Platform Erase Operations].

RAM Module

<Only for model without Discrete GPU>

You can use the optional approved RAM module (FZ-BAZ24 series).

IMPORTANT

- Use only the optional approved RAM module.
- RAM modules are extremely sensitive to static electricity (ESD). When inserting and removing RAM modules, do not touch the terminals or internal components, and do not allow foreign particles to enter the slots. Doing so may cause damage, fire, or electric shock.
- When adding RAM modules, although not required, it is recommended to use the RAM modules in the same size for optimal performance (e.g., 16 GB + 16 GB).
- Please closely follow the instructions for installing and removing RAM modules, not doing so may cause damage to the unit and/or to the RAM modules.
- The product warranty does not cover damages caused by improper installation or removal of the RAM modules.

Inserting/Removing the RAM Module

1. Turn off the computer and disconnect the AC adaptor.

- Do not use sleep or hibernation.

Perform the following steps to turn off the computer.

1. Click  (Start) - [Settings] - [System] - [Recovery].
2. Click [Restart now] in "Advanced startup".
3. Click [Restart now] on the "We'll restart your device so save your work" screen.
4. Click [Turn off your PC].

2. Turn your computer over and remove the battery pack. (➡ [Replacing the Battery Pack](#))

<When using second battery pack>

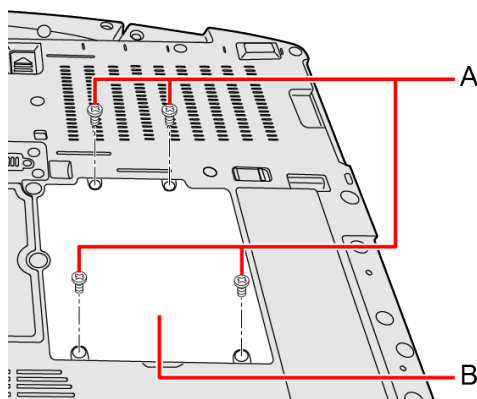
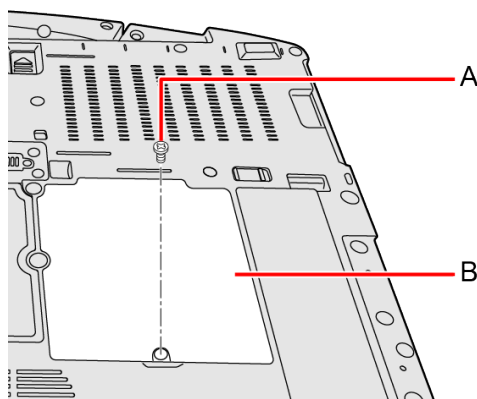
- Remove the second battery pack. (➡ [Replacing the Battery Pack](#))

Make sure no foreign objects are under the computer.

3. Remove the screw (A) and the cover (B) on the bottom of the computer.

- The number of screws varies depending on the model.

Use the PH 1 (PH #1) screwdriver.



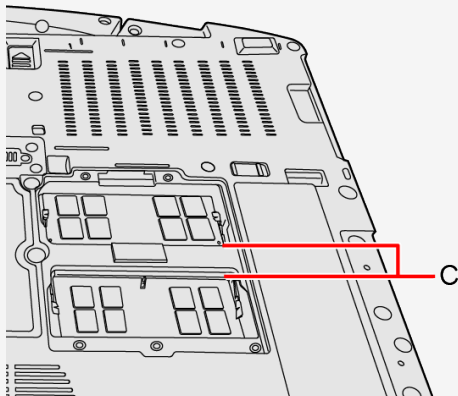
NOTE

- Some illustrations are simplified to help your understanding and may look different from the actual unit.

4. Insert/Remove the RAM module.

NOTE

- This computer has 2 RAM module slots (C) inside of back cover.

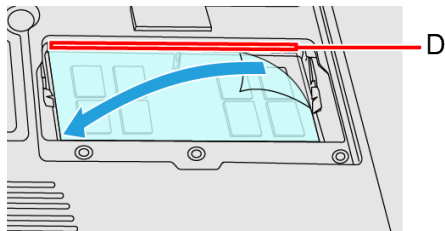


Removing the RAM Module

IMPORTANT

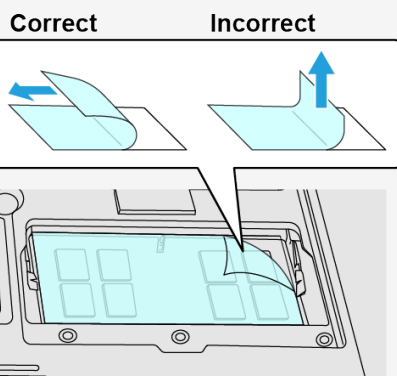
- The removed RAM module is not guaranteed.
- Do not use metal tools. A device failure may occur.

1. Remove the protective sheet from the connector side (D) in the direction of the arrow.

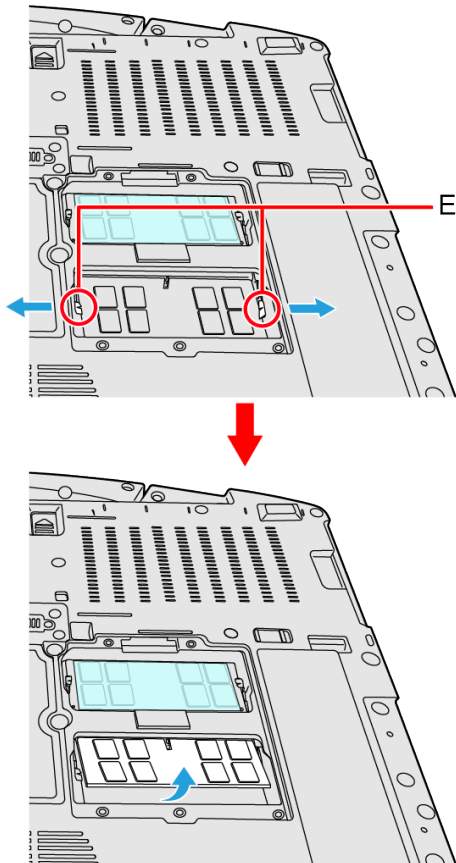


NOTE

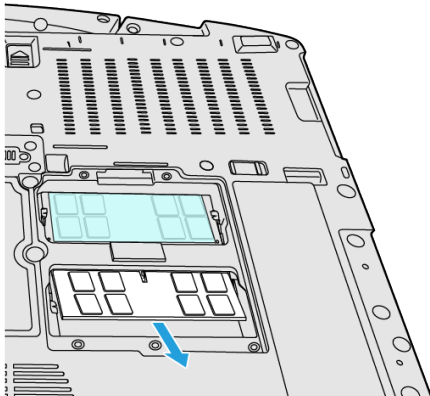
- When removing the protective sheet, do not pull it up. Pull the protective sheet slowly parallel to the RAM module for removal. Pulling the protective sheet straight up may strain the RAM module, circuit board, etc., resulting in damage.



2. Carefully release the right and left hooks (E) in the directions of the arrow simultaneously.
The RAM module will rise.

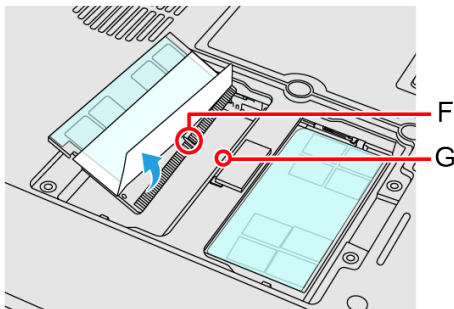


3. Carefully remove the RAM module from the slot.

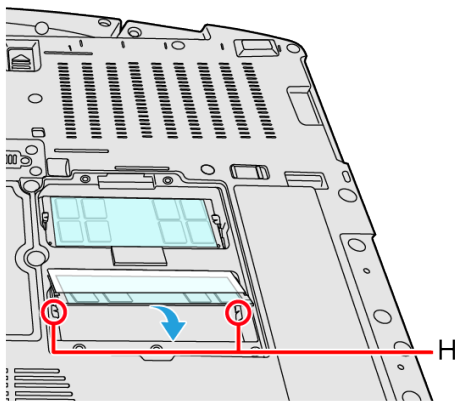


Inserting the RAM Module

1. While lifting the release paper on the RAM module, align the cutout (F) with the projection (G), then tilt the RAM module slightly and insert it into the slot.

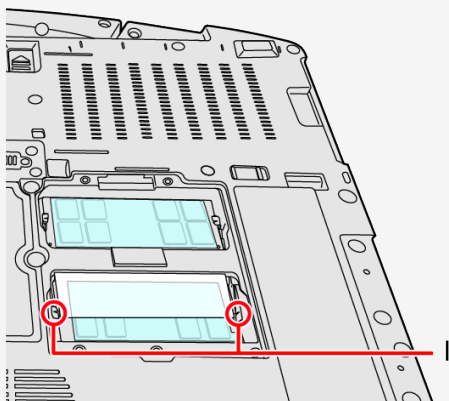


2. Press down the RAM module so that the right and left hooks (H) are locked.

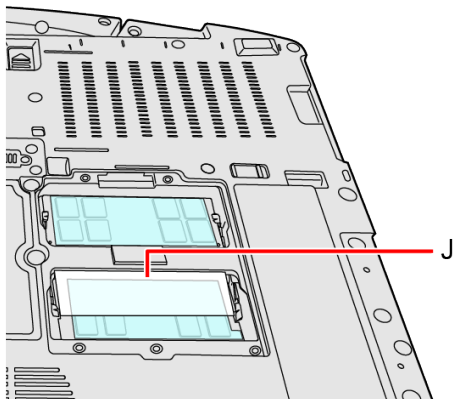


NOTE

- Confirm that the RAM module is fixed with the hooks (I) as shown below.



3. Remove the release paper (J) from the protective sheet affixed to the RAM module.
Attach the protective sheet as it covers the connectors and RAM module.



5. **Set the cover, screw and the battery pack(s).**

Use the PH 1 (PH #1) screwdriver.

Recommended tightening torque

0.45 N•m $\pm$ 0.05 N•m (4.5 kgf•cm $\pm$ 0.5 kgf•cm)

IMPORTANT

- Set the cover and the battery pack(s) correctly so that they do not fall when you carry the computer.

NOTE

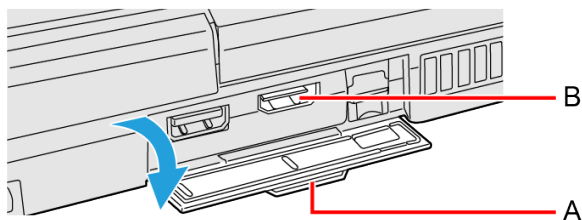
- If it is hard to insert or to press down the RAM module, do not try forcibly but check the module's direction.
- Use an appropriate screwdriver so as not to strip the thread of the screw.
- If the RAM module is recognized correctly, the total size of the main unit memory and RAM module memory is displayed on the [\[Information Menu\]](#) of the Setup Utility.
If the RAM module is not recognized, power off the computer and insert it again.

External Display

HDMI Port

You can switch the output destination to an external HDMI display.

1. Open the cover (A) and connect the HDMI port (B) and the HDMI display using an HDMI cable.

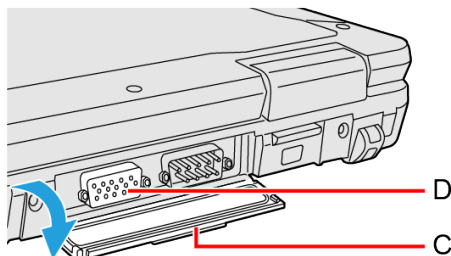


VGA Port

<Only for model with VGA port>

You can switch the output destination to an external analog display.

1. Open the cover (C) and connect the VGA port (D) and the external display using a VGA cable.



NOTE

- If you connect VGA display after connecting high resolution HDMI display, such as 4K display, images could not be displayed. In such cases, connect VGA display first, and then connect high resolution HDMI display.

<Only when connected to port replicator>

You can switch the output destination to an external HDMI/VGA display.

Before switching the computer on, connect the HDMI/VGA display to the HDMI/VGA port and the AC adaptor to the DC-IN jack on the port replicator. For further information of the connection with terminals, refer to "[Port Replicator \(FZ-VEB55 series\)](#)".

USB Type-C Port

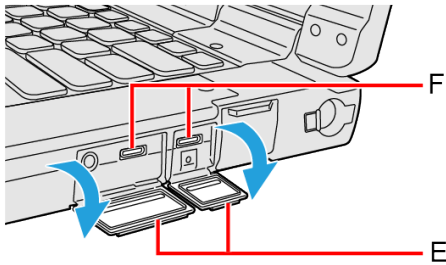
<Only for USB Type-C port on the right side>

You can switch the output destination to an external display.

The USB Type-C port of this computer complies with the following standards.

- **Thunderbolt 4**
This is one of the Alternate Modes, extended standard of USB. Data can be transferred at a maximum of 40 Gbps (theoretical value).
- **DisplayPort Alternate Mode**
A standard to transfer digital video signals to an LCD, etc. Using USB Alternate Mode, images can be displayed on the external display from the USB Type-C port.
- **USB Power Delivery** (➡ [USB Power Delivery](#))

1. Open the cover (E) and connect the USB Type-C port (F) and the external display using a USB Type-C cable.



NOTE

- When using a Thunderbolt 4-compatible display, use a cable that supports Thunderbolt 4. Depending on the cable, output may not be performed correctly.
- When using a DisplayPort Alternate Mode-compatible display, connect with a DisplayPort Alternate Mode supported USB Type-C cable.
- For connection with an external display, read the operating instructions supplied with the display as well.

Switching the display mode

Using key function

1. Press <<  >> key + <<P>> or <<Fn>> + <<F3>>.
2. Select the display mode.

Using the [Display settings]

1. Click  (Start) - [Settings] - [System] - [Display].
2. Select the display mode.

NOTE

- After switching the display mode, the display resolution may change.
- After resuming from sleep or hibernation, or restarting the computer, the output destination may not be the same as selected in the previous status.
- When you change the display after Windows starts up, do not press any key until switching is complete.
- Until Windows startup is completed (during Setup Utility, etc.), the display cannot be switched in the simultaneous display.
- Do not connect or remove the external display during sleep or hibernation.
- It may take some time to switch between displays depending on the displays used.
- When you use the external display only, set the suitable number of colors, resolution, or refresh rate separately from when you use the internal LCD only or when you use the simultaneous display.
Depending on the settings, some external displays may be distorted or may not display the mouse pointer correctly. In this case, set the settings to lower value.
- When you use the simultaneous display, MPEG files and other motion image files may not be played back smoothly.
- Carefully read the instruction manual of the external display.
- When connecting an external display that does not conform to the Plug & Play standards, select the display driver accordingly in the following menu, or use the driver disc supplied with the monitor.
 1. Click  (Start) - [Settings] - [System] - [Display] - [Advanced display].
 2. Click [Display adapter properties for Display *].
* is a display number.
 3. Click [Monitor] - [Properties] - [Driver] - [Update Driver].
 4. Following on-screen instructions.

IMPORTANT

- The screen may become distorted due to the following operations. In this case, restart the computer.
 - Disconnecting an external display for which you have set high resolution or high refresh rate.
 - Connecting/disconnecting an external display during computer operations.

Extended Desktop

NOTE

- It may not be possible to use the extended desktop with some software applications.
- When you click the maximize button, the window is displayed on one of the displays. You cannot move the maximized window to the other display.
- The pop-up displayed by «Fn» key combination appears only on the primary display.
- While using an extended desktop or [Second screen only], you cannot operate the external display screen with touch operation.
- Set the internal LCD to the primary display when using the touchscreen (only for model with touchscreen). The cursor will move on the primary display when you touch the internal LCD.

USB Devices

Features of the Supported Standards

■ Right side

- Thunderbolt 4 (Type-C) port × 2
 - USB Power Delivery (➡ [USB Power Delivery](#))
 - Thunderbolt 4
 - DisplayPort Alternate Mode

■ Rear side

- USB 3.2 Gen 1 (Type-A) port

■ Rear Expansion Area

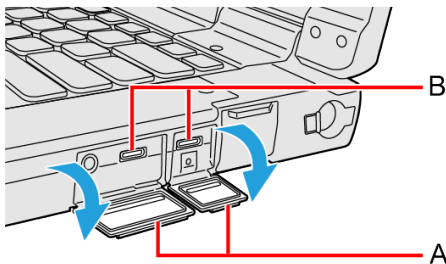
- USB 3.2 Gen 1 (Type-A) port (FZ-VCN551/FZ-VCN554)
- USB 3.2 Gen 1 (Type-C) port (FZ-VCN554)

Connecting/Removing USB Devices

■ Connecting the USB device

■ Right side

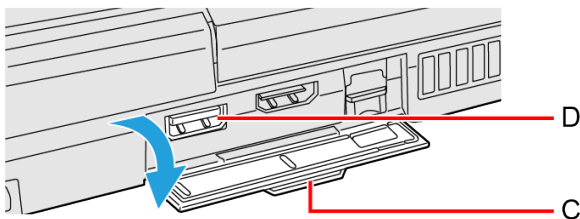
1. Open the cover (A) and connect the USB device to the USB Type-C port (B) on the computer.



To check whether the connected device supports USB Type-C, refer to the operating instructions supplied with the device.

■ Rear side

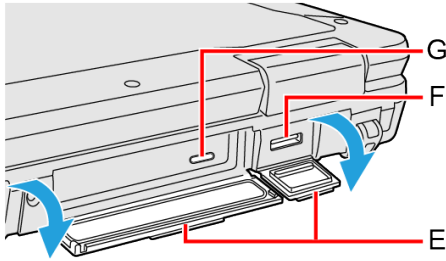
1. Open the cover (C) and connect the USB device to the USB 3.2 (Type-A) port (D) on the computer.



Rear Expansion Area

<Only for model with FZ-VCN551/FZ-VCN554>

1. Open the cover (E) and connect the USB device to the USB 3.2 (Type-A) port (F) or the USB 3.2 (Type-C) port (G) on the computer.



Removing the USB device

1. Disable the USB device.

1. Click  on the system tray and click .
2. Select the USB device.
 - These steps are not necessary when;
 - Removing the device after turning off the computer.
 -  is not displayed.
 - The device does not appear in the list in step 2.

2. Remove the USB device.

NOTE

- You may need to install the driver for the USB device. Follow the on-screen instructions or refer to the instruction manual of the USB device.
- You may need to install the driver again when connecting the device to another port.
- When a USB device is connected, sleep or hibernation may not function normally. If the computer does not start up normally, remove the USB device and restart the computer.
- When the USB device is removed and then inserted while the computer is on,  may appear in the Device Manager and the device may not be correctly recognized. In this case, remove and connect the device again, or restart the computer.
- When a USB device is connected, power consumption increases. Remove the USB device when it is not in use, especially when operating by battery power.
- If the computer enters sleep while an external keyboard or external mouse is connected, touching the external keyboard keys or external mouse will resume the computer.

Charging USB Devices

The computer comes with a USB port to provide efficient charging to smart phones or portable devices that can use USB port charging.

Charging with USB Type-C port

<Only for USB Type-C port on the right side>

These ports support a maximum output of 22.5 W in total (7.5 or 15 W on each port). If a USB device requires more than 7.5 W of power and is connected to one of these ports, the other USB Type-C port will automatically be set to a maximum output of 7.5 W. Restoring that port to 15 W requires both USB Type-C ports be disconnected.

Please note that rebooting or unplugging just one of these ports will not restore the maximum output to 15 W.

The USB Type-C port enables charging even if the computer is turned off.

IMPORTANT

- When using a USB Power Delivery-compatible device, use a cable that supports USB Power Delivery.
Depending on the cable, power may not be supplied to the connected device properly.

USB Power Delivery

<Only for USB Type-C port on the right side>

Connect the USB device to the USB Type-C port.

USB Power Delivery is a standard that allows up to 100 W of power supply using a USB cable.

- Power supply from USB Power Delivery-compatible devices to this computer:
The battery can be charged from USB Power Delivery-compatible devices with the following power supply capabilities.
Power ON or Modern standby: 60 W or more
Power OFF or Hibernation: 15 W or more
- Power supply from this computer to USB Power Delivery-compatible devices:
Up to 15 W
- Use a cable that supports USB Power Delivery.
It is recommended to use a cable that supports 5 A. When using a cable that does not support 5 A, this computer may not receive sufficient power from USB Power Delivery-compatible devices.

Driving/Charging the computer using USB Power Delivery

The USB Type-C port of this computer supports the USB Power Delivery.

IMPORTANT

- Connect a cable that supports USB Power Delivery.

NOTE

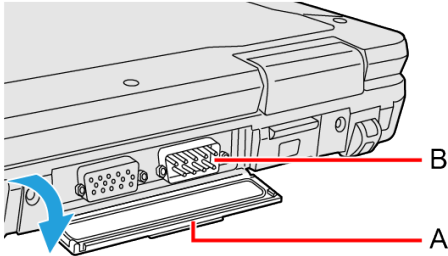
- If the battery level is less than 5 %, the computer cannot be started up.
- The following functions cannot be performed.
 - Updating firmware such as BIOS
 - Battery Recalibration
- If the battery indicator blinks orange or turns off, check the status of the battery indicator. (➡ [Battery Indicator](#))

Serial Port

<Only for model with Serial Port>

Connecting Serial device

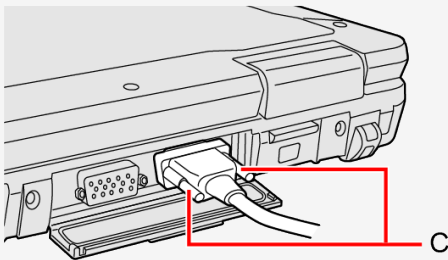
1. Open the cover (A) and connect the serial cable to the serial port (B).



2. Connect the serial device to the connector of the serial cable.

NOTE

- When connecting a cable, be sure to secure it with screws (C).



- Plug size thickness: Max. 15.5 mm

Camera

<Only for model with camera>

Using the Camera

For the camera position and functions, refer to “[Description of Parts](#)”.

NOTE

- When the camera is in use, the Camera Indicator lights up. (Even if [Concealed Mode] is set to [Enabled] and [LED] to [OFF], the camera indicator cannot be turned off.)
- When the computer is moved from hot and humid environment to low temperature environment, dew condensation may form on the lens. This is not a malfunction. Wait until the lens dries out.

About the Ambient Light Sensor

The ambient light sensor is used to adjust the display screen brightness automatically.

To configure the automatic adjustment function, proceed as follows.

1. Click  (Start) - [Settings] - [System] - [Display] - [Brightness].
2. Set “Change brightness automatically when lighting changes” to [On].

Panasonic PC Camera Utility

The Panasonic PC Camera Utility can be used to shoot photos and videos.

When you use pictures and videos recorded using this utility at Web conferences, or other services, use specialized applications accordingly.

NOTE

- If you use this utility and other multi-media software at the same time, an error may occur. Close all multi-media software including this utility and restart this utility.
- If an error message appears and nothing is displayed, restart this utility.
- When the computer has resumed from sleep and hibernation, an error may appear and the connection with the camera device may be lost. If this occurs, restart this utility.
- Panasonic PC Camera Utility only with the built-in camera. It does not support a camera connected to the computer.

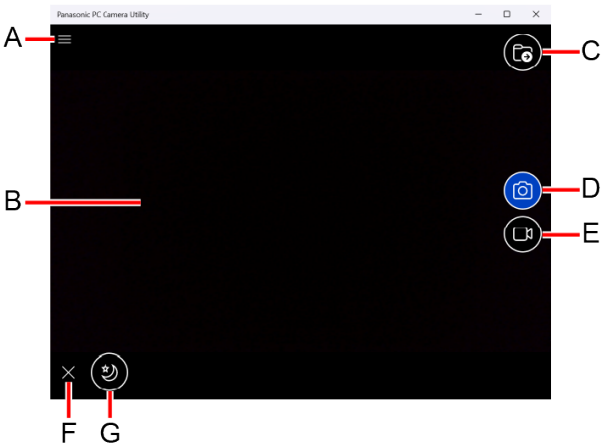
Starting up

1. Click  (Start) - [All]* -  (Panasonic PC Camera Utility).

*If [All] does not appear, search for the app in the search box and launch it.

The Panasonic PC Camera Utility starts up, and the following screen is displayed.

- When the utility is running, do not remove or insert audio devices (such as microphones and speakers). Also, do not enable or disable such devices.



- A. Open the camera settings
- B. Preview screen
- C. Display the folder where recorded data is saved
- D. Shoot photos
- E. Start/Stop shooting videos
- F. Hide the mode menu
- G. Night Mode switching

Shooting Photos and Videos

Shoot photos

1. Click  .
 - You cannot shoot photos when the save destination storage space is less than 10 MB.

Start/Stop shooting videos

1. Click  .
The camera switches to the video shooting mode.
2. Click  .
During shooting, the icon is shown as  .
3. To stop shooting, click  .
 - If the save destination storage space becomes less than 100 MB during video shooting, shooting will automatically stop.

NOTE

- Shooting will stop when you minimize the application window, or put the computer into the sleep mode during video shooting.

Turn the Night Mode ON

To make the dark viewing image brighter

1. Click  .
When using the Night Mode, the icon is shown as  .

NOTE

- Updating the preview screen may be delayed when using the Night Mode.
- CPU utilization increases when using the Night Mode. If you leave the computer for long hours, the area around the exhaust vent may be heated.

Display the recorded image or video files

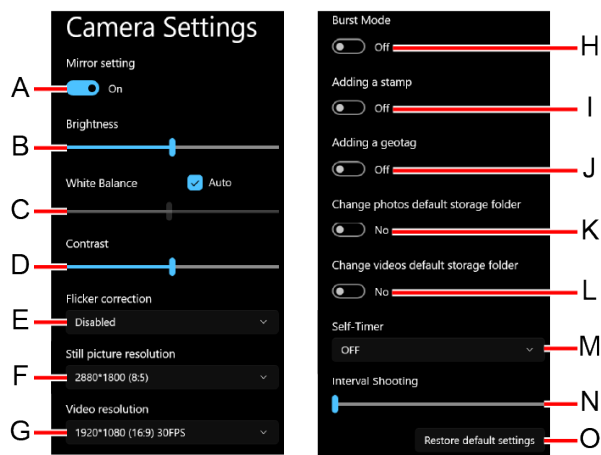
1. Click .

The recorded data will be saved in the displayed folder named the recording date.

Changing the Settings

1. Click  - .

The "Setting" menu is displayed.



A. Mirror setting

Make the preview screen mirror-reversed (flip horizontal). (Recorded images will not be reversed)

B. Brightness

Change the brightness of camera images.

C. White Balance

Change the white balance of camera images. To set manually, uncheck the [Auto] option.

D. Contrast

Change the contrast of camera images.

E. Flicker correction

Set the flickering correction of camera images.

F. Still picture resolution

Change the still picture resolution. Perform touch operation or mouse click to select the resolution. The resolution may not be correctly specified if you use the keyboard cursor keys.

G. Video resolution

Change the video resolution. Perform touch operation or mouse click to select the resolution. The resolution may not be correctly specified if you use the keyboard cursor keys.

- Note that the described FPS values are theoretical. They may be decreased depending on the actual use conditions.

H. Burst Mode

Press and hold the photo shooting button to shoot continuously while the button is pressed. The maximum number of continuous shooting is 20.

- You cannot shoot continuously when using the Night Mode.

I. Adding a stamp

Add geolocation and time stamps to still images.

J. Adding a geotag

Add geotagging to the Exif data of still images.

K. Change photos default storage folder

Specify the destination of recorded photo data to save. The default value is the "Pictures" folder.

L. Change videos default storage folder

Specify the destination of recorded video data to save. The default value is the "Videos" folder.

- If you specify the FAT32 formatted storage as destination to save, video files cannot be correctly created when the storage data capacity exceeds 4 GB.

M. Self-Timer

Specify the time period until shooting starts after the button is pressed. (OFF/5 sec./10 sec.)

N. **Interval Shooting**

When you move the slider to the right, and specify the value except [0], the camera automatically repeats shooting at intervals of specified seconds. The maximum 10 photos can be shot continuously.

O. **Restore default settings**

Return all the settings to the default values.

To close the “Setting” menu, click  on the upper left of the screen, or click the preview screen.

NOTE

- To specify the save destination folder, select the folder you have the access right to. If a writing error occurs, change the specified folder.
- The drive that appears by performing the following procedure will be used as the location in which the “Pictures” and “Videos” folders will be stored.

Click  (Start) - [Settings] - [System] - [Storage] - [Advanced storage settings] - [Where new content is saved].

Barcode Reader

<Only for model with Barcode Reader>

Preparation

<To make a BEEP sound when reading a barcode>

1. Click  (Start) - [All]* -  (Panasonic PC 2D Barcode Key Emulator).

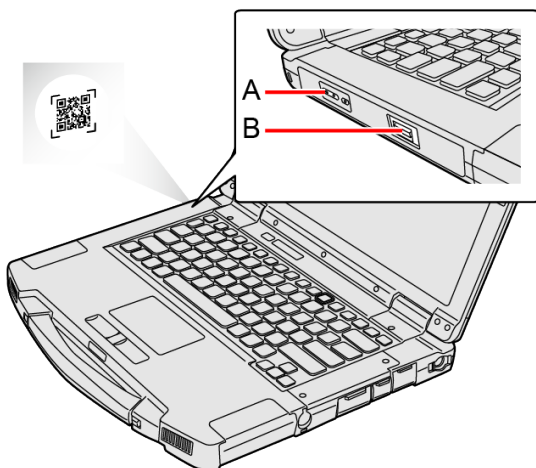
*If [All] does not appear, search for the app in the search box and launch it.

2. Click  on the system tray, and then click  (Panasonic PC 2D Barcode Key Emulator) - [Connection to Barcode (Always-On)].

Reading Barcodes

IMPORTANT

- Do not look directly into the reading window.
DO NOT LOOK DIRECTLY AT THE BARCODE READER LIGHT.



1. Open the software for reading a barcode, and put the cursor on it.
2. Aim the Barcode Reader (A) at the barcode.
3. Press the button (B).

The Barcode Reader lights red to indicate the reading position.

If the barcode is read successfully, the code appears where the cursor is placed.

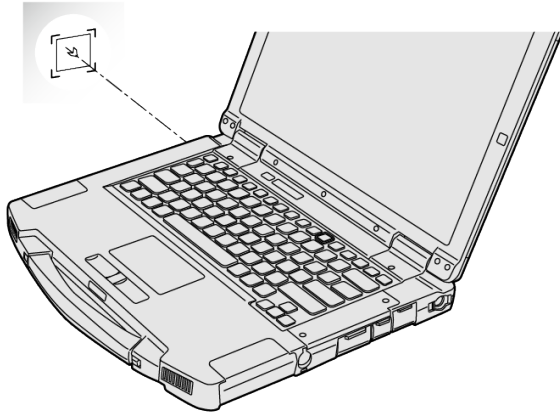
NOTE

- When the barcode read operation is finished, please wait about 3 seconds to start the next reading. You may press the button immediately, even if you set to release, it takes several seconds to light to light actually.
- If an error message appears and nothing is displayed, restart this utility.

Observe the Following to Correctly Read a Barcode with This Computer

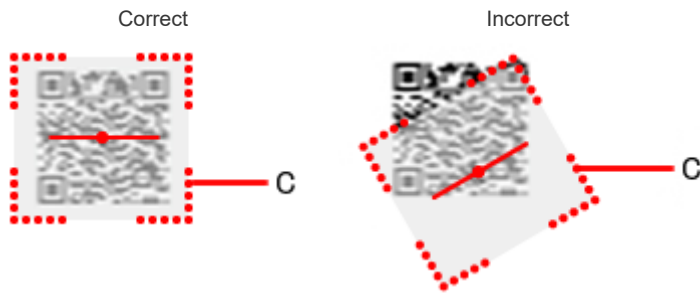
- **The reading angle is important factor.**

Perform reading at the angle indicated in the figure. We recommend you to set at approximately 2° to 3° angle from the perpendicular position.



- Hold the reader farther away when reading a larger barcode, and closer in when reading a smaller barcode.
- Perform reading so that the entire symbol falls within the center of the red Barcode Reader light.
- The reader can still read a barcode even if the barcode is not in the center of the red Barcode Reader light.

However, if a part of the barcode lies outside the Barcode Reader light, the barcode cannot be read. Make sure the entire barcode is inside the Barcode Reader light.



C. Barcode Reader Light

Cleaning the Reading Window

If the reading window is dirty, gently wipe the reading window with a cloth or a cotton swab moistened with water.

Do not allow materials that can easily scratch the reading window to touch the window, such as sandpaper or metal object.

For parts other than the reading window, please read "[Handling and Maintenance](#)".

Decode Capabilities

Following symbologies are supported as the factory default.

Codabar, Code 128, GS1-128, Code 39, Code 93, DataMatrix, Interleaved 2 of 5, PDF417, QR Code, GS1 Databar, GS1 Databar Limited, GS1 Databar Expanded, UPC-A, UPC-E, EAN-8, EAN-13, Aztec

Following symbologies also can be used.

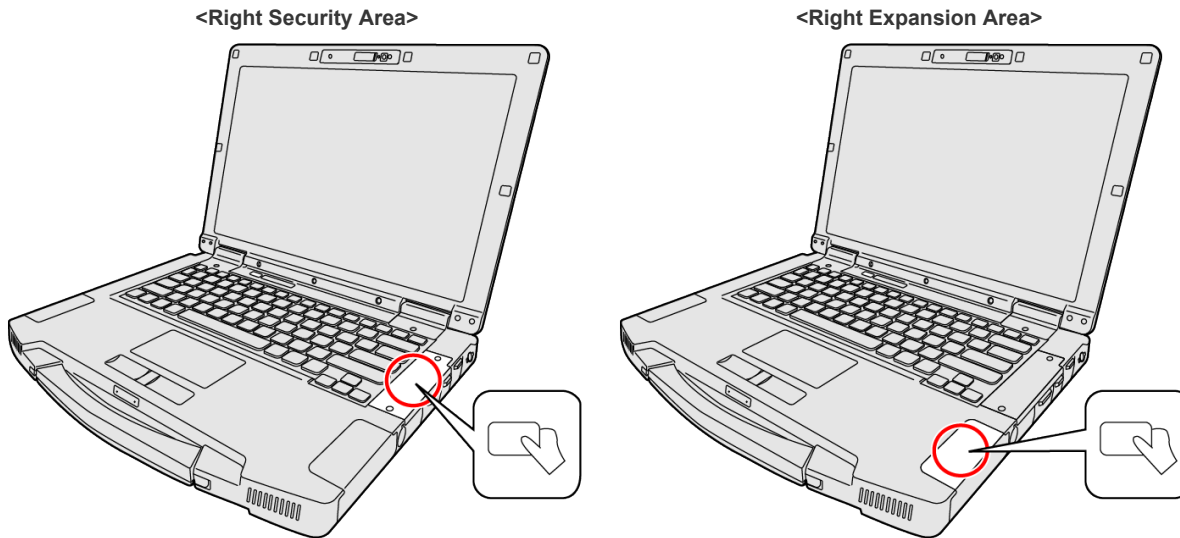
Codablock A, Codablock F, Code 11, ISBT 128, GS1 Composite CC-A/B, GS1 Composite CC-C, ISBN, ISMN, ISSN, Matrix 2 of 5, Maxicode, MicroPDF417, MSI, Plessey, Standard 2 of 5, Telepen, UPC-E1, TLC 39, HanXin, Australian Post, BPO, Dutch Post, Japan Post, Planet, Postnet, Canada Post, Infomail, Sweden Post

Contactless Smart Card Reader

<Only for model with Contactless Smart Card Reader>

You can read the data from RFID (Radio Frequency Identification) tags / Contactless Smart Card.

Contactless Smart Card Reader Location



If the right security area and the right expansion area are equipped with the contactless smart card reader, the right expansion area takes priority.

Precautions

NOTE

- This reader is typically used with specialized applications. For further information, ask the system administrator.

1. Aim the center of RFID tag / Smart Card at the Contactless Smart Card Reader.
 - Continue operation by using the specialized applications.

NOTE

- Wave cards one at a time. If multiple cards are waved simultaneously, proper reading will not be possible.
- If the chip device is held outside of the contactless smart card reader area or at an angle, or waved incorrectly, proper reading may not be possible.
- Operation distance depends on RFID tag / Smart Card.

Smart Card

<Only for model with Smart Card slot>

You need software to use a Smart Card.

IMPORTANT

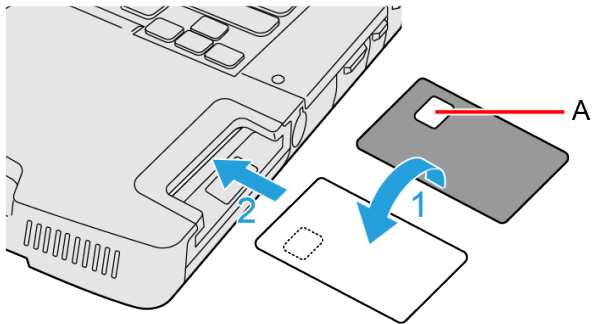
- **Do not:**
 - Hit, bend, or drop the card.
 - Touch the contact part with fingers or metal object.
 - Place the card in very hot location for a long time.
 - Remove the card immediately after inserting it.

Inserting/Removing the Smart Card

Inserting the card

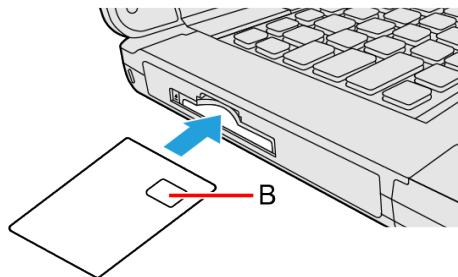
Right Expansion Area

1. **Reverse the Smart Card.**
2. **Insert the Smart Card until it surely fits in the slot.**
 - Smart Card must be inserted with the chip portion (A) down.



Left Expansion Area

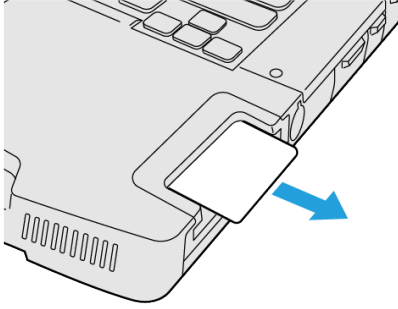
1. **Insert the Smart Card until it surely fits in the slot.**
 - Smart Card must be inserted with the chip portion (B) facing up.



Removing the card

Right Expansion Area

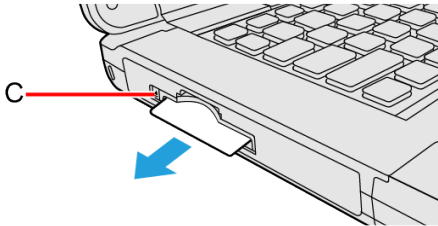
1. Draw the card straight out using your fingers.



Left Expansion Area

1. Press the eject button (C).

The Smart Card pops out.



Fingerprint Reader

<Only for model with Fingerprint Reader>

Fingerprint Authentication Function

Use fingerprint authentication to improve security and convenience by replacing the conventional password entry required to sign in to Windows.

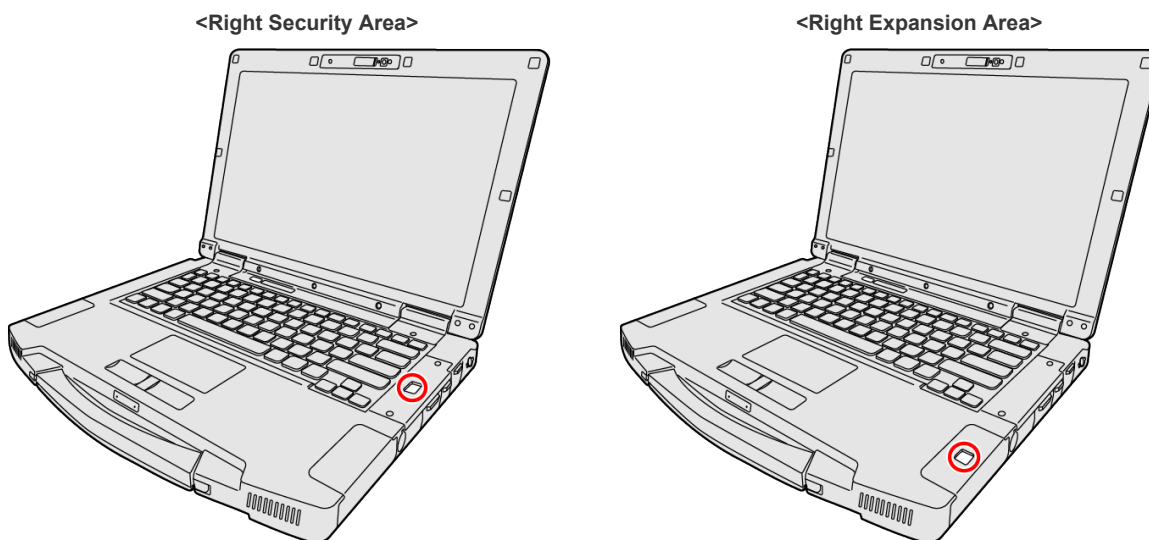
NOTE

- <Only for model with Fingerprint Reader (Windows Hello)>

If you change [Enhanced sign-in security], perform the following steps.

1. Click  (Start) - [Settings] - [Accounts] - [Sign-in options].
2. For Microsoft accounts, set "For improved security, only allow Windows Hello sign-in for Microsoft accounts on this device (Recommended)" to [Off].
3. Click [PIN (Windows Hello)] - [Remove] - [Remove].
 - If the "First, verify your account password." is displayed, enter your account password and click [OK].
4. Right-click  (Start) - [File Explorer].
5. Click [This PC] - [Windows (C:)] - [util] - [drivers] - [fngprint] - [support].
6. <When changing to [Enabled]>
Right-click [on_fingerprint_ess.bat], and click [Run as administrator].
<When changing to [Disabled]>
Right-click [off_fingerprint_ess.bat], and click [Run as administrator].
7. Click  (Start) - [Settings] - [System] - [Recovery].
8. Click [Restart now] in "Advanced startup".
9. Click [Restart now] on the "We'll restart your device so save your work" screen.
10. Click [Troubleshoot] - [Advanced options] - [UEFI Firmware Settings] - [Restart].
The computer restarts, and the Setup Utility screen appears.
11. Change [Enhanced sign-in security] in the [Security] menu.
12. Select the [Exit] menu, then select [Save Values and Reboot] and press <<Enter>>.
If the "Save Values and Reboot" is displayed, select [Yes] and press <<Enter>>.
13. Click  (Start) - [Settings] - [Accounts] - [Sign-in options].
14. Set up [Facial recognition (Windows Hello)], [Fingerprint recognition (Windows Hello)] and [PIN (Windows Hello)] again.

Fingerprint Reader Location



If the right security area and the right expansion area are equipped with the fingerprint reader, the right expansion area takes priority.

Fingerprint Authentication Function Features

You can use the fingerprint authentication function by using the Windows Hello.

- **Pre-boot authentication (PBA)**
Perform fingerprint authentication before the computer starts up. Set the Supervisor Password for the Setup Utility beforehand.
- **Sign in fingerprint authentication**
Use fingerprint authentication to unlock your computer and sign in to Windows.

IMPORTANT

For Security When Using Fingerprint Authentication

- **Fingerprint authentication does not guarantee complete user authentication and identification. Please note that we cannot accept liability for any loss or damage incurred from your use or inability to use fingerprint authentication. Please be forewarned.**
- **We cannot accept liability for any loss of data due to malfunction of the fingerprint reader.**
- **Registration may be impossible if there is insufficient fingerprint or other information to identify an individual.**

Erasing Fingerprint Data

There are following erase methods.

- **To delete Windows Hello Fingerprint authentication for an account:**
 1. Click  (Start) - [Settings] - [Accounts] - [Sign-in options] - [Fingerprint recognition (Windows Hello)] - [Remove].
- **To delete Windows Hello Fingerprint authentication and Windows Hello Face recognition for an account:**
 1. Click  (Start) - [Settings] - [Accounts] - [Sign-in options].
 2. For Microsoft accounts, set "For improved security, only allow Windows Hello sign-in for Microsoft accounts on this device (Recommended)" to [Off].
 3. Click [PIN (Windows Hello)] - [Remove] - [Remove].
 - If the "First, verify your account password." is displayed, enter your account password and click [OK].
- **To erase all fingerprint data when transferring or disposing the computer:**
 1. Select [Clear the fingerprint data] in [Fingerprint Security] in the [Security] menu of the Setup Utility, and select [Yes].

Fingerprint Reader Handling

- **Avoid the following. Failure to do so may result in malfunction or damage to the fingerprint reader.**
 - Do not rub or scratch the reader with hard materials or poke it with small pointed objects that could cause scratches.
 - Do not touch the surface with dirty fingers.
 - Do not soil or cover the reader with a sticker.
- **In the following cases, fingerprint reader sensitivity may be degraded, impeding or preventing authentication and registration.**
 - If the surface of the fingerprint reader is soiled with dirt, skin oil, or sweat
 - If the surface of the fingerprint reader is wet by moisture or condensation
 - If your finger is too wet or too dry
 - If your finger is wounded or inflamed
 - If your fingerprint grooves have become too shallow due to wear
 - If you touch the fingerprint reader while sliding your finger
 - If you touch the fingerprint reader with a finger at an angle
 - If the pressing force to touch the fingerprint reader is weak
 - If your finger is swollen, such as from bathing
 - If your fingerprint has changed due to weight loss or gain
- **Fingerprint reader sensitivity may be restored by the following.**
 - Wipe the fingerprint reader with a soft cloth.
 - Wash and wipe your hands.
 - Use another finger for registration and authentication.
 - If your finger is extremely dry, moisten it using hand cream.
- **Static electricity can cause the fingerprint reader to malfunction. To discharge static electricity, touch a metal surface before touching the fingerprint reader. Be especially careful about static electricity in the winter and in other dry conditions.**
- **When a faulty fingerprint reader is repaired, previously saved passwords may be reset in the process. Please be forewarned.**

Discrete GPU

<Only for model with Discrete GPU>

Precautions

For the users of the model with Discrete GPU

Your computer is equipped with graphics processing units (GPUs). When you launch an application program requiring high graphics display performance, the discrete GPU is activated to execute applications with higher performance.

In this manual, refer to the sections preceded by the following descriptions, whenever they appear.

Always activating or deactivating the discrete GPU

Since the discrete GPU for high graphics display performance is activated and deactivated automatically, you do not have to worry about which of the GPUs are currently used. You can also specify whether or not to automatically activate the discrete GPU by program. Perform the procedure below.

1. Click  (Start) - [Settings] - [System] - [Display].
2. Click [Graphics].
3. Click the displayed application.
 - If the application you want to set is not listed, select [Add Microsoft Store app] in “Add an app”.
Select the application you want to add.
 - If the application you want to set is not listed, select [Add desktop app] in “Add an app”.
Select the .exe file you want to add, click [Add].
4. Choose whether to run applications on the [High Performance], [Power Saving] or [Let Windows decide].

Accessories

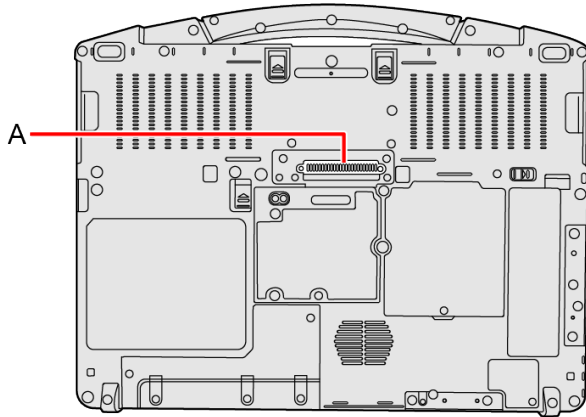
Port Replicator (FZ-VEB55 series)

<Only for model with Expansion Bus Connector>

You can use an optional port replicator. This device frees you from being bothered by a lot of cable connections when you carry the computer. It also allows you to connect various peripherals.

Connect the port replicator to the expansion bus connector (A) on the bottom of the computer.

Read the instruction manual of the port replicator before using.



IMPORTANT

- Connect the AC adaptor always when using the port replicator.
- The driver of the port replicator is preinstalled in the computer.
- Connect or disconnect the port replicator while the computer power is turned off.
- To boot the computer from a commercially available optical drive, be sure to connect the USB drive to the USB port on the computer, not to the USB port on the port replicator.

NOTE

- Use only the specified port replicator.

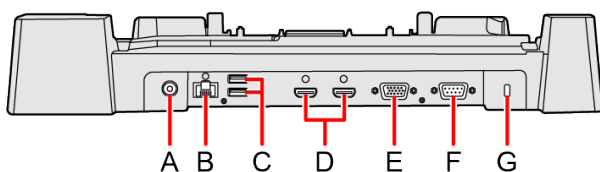
Description of Parts

Read carefully this manual that described for each device when connecting each device to the port replicator.

IMPORTANT

- Do not touch the expansion bus connector or pins of the port replicator.

Rear side



- A. DC-IN Jack
- B. LAN Port
- C. USB 3.2 Gen 1 (Type-A) Ports (2 ports)

D. HDMI Ports (2 ports)

Connect the HDMI compatible digital display.

- On the monitor connected to the HDMI port or VGA port of the port replicator, content protection images by HDCP (High-bandwidth Digital Content Protection system) cannot be displayed.
- It is not compatible with the analog display.
- The display specifications of the maximum resolution, etc. that can be output differ according to the specifications of the device connected. For details, refer to the specifications of the device connected.

E. VGA Port

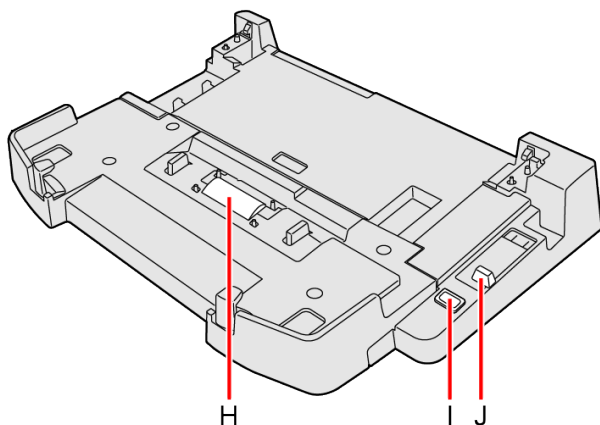
F. Serial Port

G. Security Slot

A Kensington cable can be connected.

- For more information, read the manual that comes with the cable.

Front side



H. Expansion Bus Connector

This connects to the expansion bus connector on the bottom of the computer.

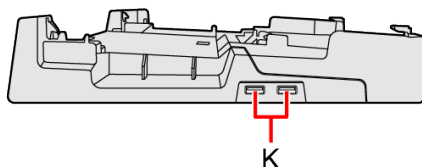
I. Power Switch

This operates identically to the power switch on the computer.

J. Lever

Slide the lever all the way back to release the computer.

Left side



K. USB 2.0 (Type-A) Ports (2 ports)

Connecting/Disconnecting the Computer

IMPORTANT

- If an external display is connected to both the computer and port replicator, the computer may not be shut down properly.

Connecting

1. Turn off the computer.
2. Disconnect all the devices and cables and close the terminal cover and close the display.

3. **Connect the AC adaptor to DC-IN jack of the port replicator.**

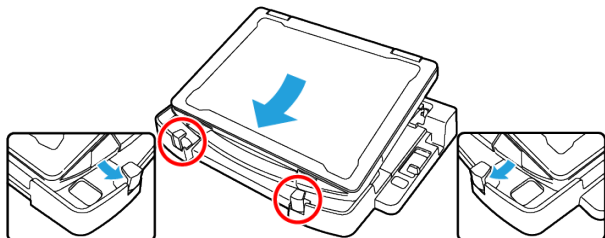
Connect the AC cord to the AC adaptor, and connect to an AC outlet.

IMPORTANT

- Refer to the *OPERATING INSTRUCTIONS - Read Me First* accompanying computer for information on proper handling of the AC adaptor and AC cord.

4. **Set firmly the front corners of the computer in the latches of the port replicator.**

- Do not attempt to make connections if there is any object between the computer and the port replicator. Doing so could damage the computer and the port replicator.

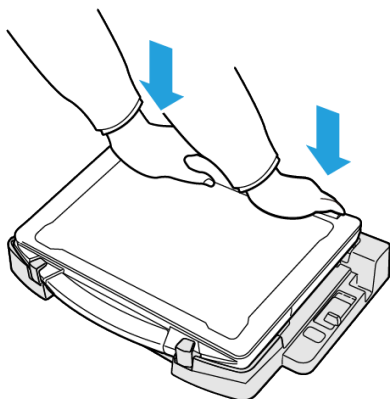


5. **Dock straight down.**

- Press the computer in the direction of the arrow and set firmly against the port replicator.

IMPORTANT

- When you connect the computer at an angle to the port replicator, it may not be set correctly.
- Do not allow your hand to get caught between the computer and the port replicator when setting the computer.



IMPORTANT

- Do not attempt to move the port replicator while the computer is being connected to the port replicator.
- If the computer malfunctions while the port replicator is attached, disconnect the port replicator and check to see if the computer operates normally. If the computer operates normally, the port replicator may be malfunctioning. Contact Panasonic Technical Support.

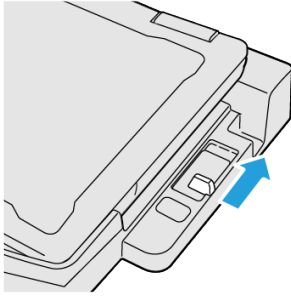
NOTE

- See other chapters in this manual for connecting and setting USB devices, external displays and LAN.
- If the image of the external display connected to the port replicator has stopped, remove the computer from the port replicator, and then reconnect it.

Disconnecting

1. Turn off the computer.
2. Disconnect all the devices and cables and close the terminal cover and close the display.
3. Slide the lever all the way back.

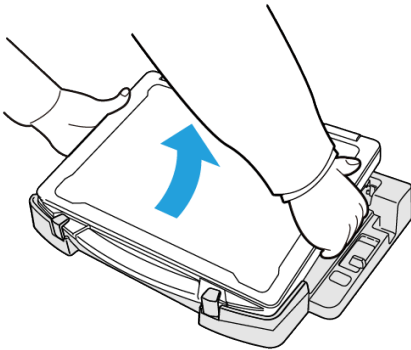
The computer's connector disengages the expansion bus connector of the port replicator.



IMPORTANT

- After sliding the lever, do not suddenly release it. The lever may relock. Do not slide the lever while pressing the computer from above. Doing so could damage the computer.
- If the computer malfunctions while the port replicator is attached, disconnect the port replicator and check to see if the computer operates normally. If the computer operates normally, the port replicator may be malfunctioning. Contact Panasonic Technical Support.

4. Lift up the computer to remove it from the port replicator.



NOTE

- If it is difficult to disconnect the computer, push the lever while holding the computer from top for easy disconnection.

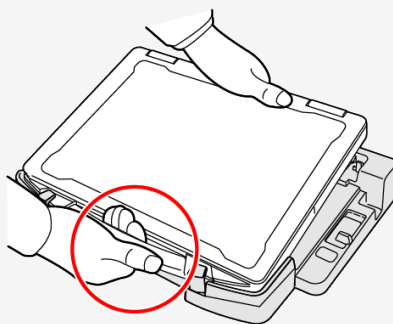
IMPORTANT

- When disconnecting the computer, do not hold the handle (see the location circled in the illustration).

Correct



Incorrect

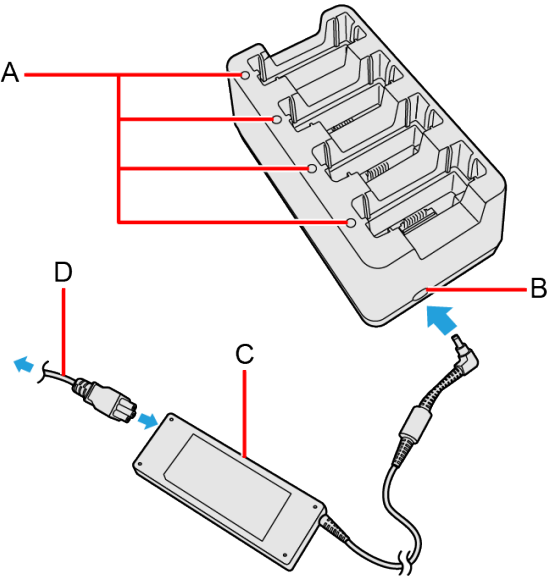


Battery Charger

The battery charger is designed for charging the battery pack for the Panasonic computer series. To recharge a battery pack, you will need the AC adaptor and AC cord included with this product.

Read both this operating instructions and the operating instructions of the battery charger before using.

Description of Parts



- A. **Battery Indicator (1 to 4)**
- B. **DC-IN Jack**
- C. **AC adaptor**
Clean the dust and other debris of the connector regularly.
- D. **AC cord**

IMPORTANT

- The AC cord may vary depending on the country.
- Use only the specified AC adaptor with this product.

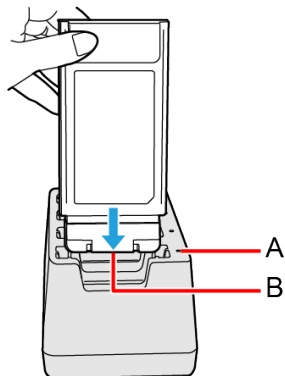
Indicators

Battery Indicator	Battery status
Not lit	The battery pack is not inserted or not being charged.
Orange	Charging is in progress.
Green	The battery is fully-charged.
Blinking red	The battery pack or the charging circuit is not operating properly.
Blinking orange	The battery cannot be charged temporarily due to the following reasons: • Its internal temperature is out of the acceptable range.

Charging the battery pack

1. **Connect the AC adaptor.**
2. **Insert the battery pack(s).**

Insert the battery pack firmly with its battery connector (B) facing the indicator (A) of the charger.

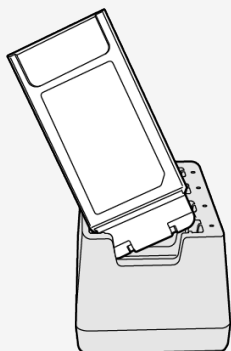


Four battery packs can be inserted simultaneously. Each of them can be inserted in any slot.
Charging begins automatically.

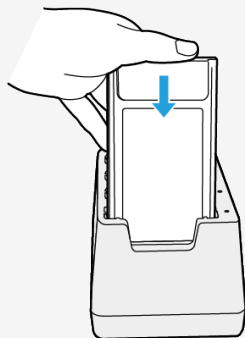
IMPORTANT

- Do not insert the battery pack at an angle. The terminal of the battery charger may be damaged.

Incorrect



- If the battery pack got lodged in the slots, push the middle of the battery pack.



NOTE

- The battery indicator lights when the battery pack is properly inserted with the AC adaptor connected.
- When removing the battery pack, pull it out in the opposite direction of attaching the battery pack.
- The battery pack or battery charger will become somewhat warm during normal use. This is not a malfunction.

Troubleshooting

Troubleshooting

Refer to the following instructions when a problem occurs. If the remedies indicated in the chart do not solve the problem, contact Panasonic Technical Support.

For a software problem, refer to the instruction manual of the software.

Starting Up / Sleep / Hibernation / Resume

Cannot start up. The power indicator or battery indicator is not lit.	• Connect the AC adaptor. • Insert a fully charged battery. • Remove the battery pack and the AC adaptor, and then connect them again. • Even if the AC adaptor and battery pack are correctly connected, if the battery indicator is not lit, the AC adaptor protection function may be operating. Disconnect the AC cord, wait 3 minutes or more, and reconnect the AC cord. • If you are charging the computer for the first time or have not used it for a while, it may take a several minutes for the battery indicator to light up after connecting the AC adaptor. Wait for a while. • If a device is connected to the USB port, disconnect the device. • Turn off the concealed mode.
Cannot turn on the computer. The computer does not resume from sleep. (The battery indicator blinks green and orange alternately.)	• Leave it in an environment of 5 °C {41 °F} or higher temperature for about an hour, then turn on the power again.
It takes time for the power indicator to light up.	• If the power switch is pressed immediately after the battery pack has been mounted on the computer, and while the AC adaptor is not connected, it may take about 5 seconds before the power indicator lights up and the computer turns on. This is because the computer is checking the remaining battery charge; it is not a malfunction.
"Remove disks or other media. Press any key to restart" or a similar message appears.	• If a device is connected to the USB port, disconnect the device, or set [USB Type-C Port], [USB Type-A Port] or [Port Replicator] to [Disabled] in the [Advanced] menu of the Setup Utility. • If the problem persists after removing the disk, it may be a flash memory failure. Contact Panasonic Technical Support.
Windows startup and operation is slow.	• Start the Setup Utility ( Setup Utility) to return the Setup Utility settings (excluding the passwords) to the default values. Start the Setup Utility and make the settings again. (Note that the processing speed depends on the application software, so this procedure may not make Windows faster.) • If you installed a resident software after purchase, turn off the residence.
Cannot resume.	• One of the following operations may have been carried out. Press the power switch turn on the computer. Data not saved will be lost. • In sleep mode, the AC adaptor or battery pack was disconnected, or a peripheral was connected or disconnected. • The power switch was pressed for 10 seconds or longer to forcibly turn off the computer. • The battery is exhausted. Sleep and hibernation consumes some power.

Other startup problems.	- Start in the Setup Utility (➡ Setup Utility) to return the Setup Utility settings (excluding the passwords) to the default values. Start the Setup Utility and make the settings again. - Remove all peripheral devices. - Check to see if there was a disk error. - Remove all peripheral devices including an external display. - Right-click  (Start) - [File Explorer]. - Click [This PC]. - Right-click [Windows (C:)], and click [Properties]. - Click [Tools] - [Check]. - A standard user needs to enter an administrator password. - Follow the on-screen instructions.
Cannot turn off the computer.	- Remove all peripheral devices. - It may take 1 or 2 minutes to turn off the computer.
Cannot enter sleep or hibernation.	- Remove USB devices temporarily. If the problem persists, restart the computer. - It may take 1 or 2 minutes to enter sleep or hibernation. - The computer does not enter sleep or hibernation immediately after resuming. Wait approximately 1 minute.
Cannot enter sleep or hibernation automatically.	- Remove peripheral devices. - If you connect to a network using wireless LAN function, select the profile and connect to the access point (➡ Disabling/Enabling Wireless Communication). - If you do not use wireless LAN function, turn off wireless LAN function (➡ Disabling/Enabling Wireless Communication). - Make sure that you are not using any software that regularly accesses the flash memory.

Entering Password

Forgot the password.	- Supervisor Password or User Password: Ask the system administrator. - Administrator password: - If you have a password reset disk, you can reset the administrator password. Set the disk and enter any wrong password, then follow the on-screen instructions and set a new password. - If you do not have a password reset disk, reinstall (➡ Installing Software) and set up Windows, and then set a new password.
Even after entering the password, password input screen is displayed again.	- The computer may be in ten-key mode. If the Num Lock indicator  lights, press <<Num Lock>> to disable the ten-key mode, and then input. - The computer may be in Caps Lock mode. If the Caps Lock indicator  lights, press <<Caps Lock>> to disable the Caps Lock mode, and then input. - Enter the password using the same keyboard that was used to set the administrator password or user password, as the key layouts of the on-screen keyboard and some external keyboards may differ.
"Enter Password" does not appear when resuming from hibernation.	Select [Enabled] in [Password on Resume] in the [Security] menu of the Setup Utility.

Cannot sign in to Windows using the face recognition for Windows Hello outdoors.	- If you have registered the face recognition indoors, you may not sign in to Windows using the face recognition outdoors. In such cases, please add Windows Hello face recognition outdoors. Perform the following procedure. - Sign in to Windows. - Click  (Start) - [Settings] - [Accounts] - [Sign-in options]. - Click [Facial recognition (Windows Hello)] - [Improve recognition]. - When the "Windows Hello setup" screen is displayed, click [Get started]. "Making sure it's you" is displayed, input PIN number. - Since additional registration of face recognition starts, follow the on-screen instructions. - If you cannot register the face recognition outdoors properly, try to take the following measures. - In the shade, register your face with your back against the wall that does not reflect the light.
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Display

No display.	- The external display is selected. Press <<Fn>> + <<F3>> or << >> + <<P>> to switch the display. Then click the display mode. - When using an external display, - Check the cable connection. - Turn on the display. - Check the settings of external display. - The display is turned off by the power-saving function. The screen returns to the original state when you operate keyboard, touchpad, or touchscreen (only for model with touchscreen). When operating the keyboard, press a key that does not affect the computer operation, such as <<Ctrl>>. - The computer entered sleep or hibernation by the power-saving function. To resume, press the power switch.
The screen is dark.	- Press <<Fn>> + <<F2>> and adjust the brightness. As you increase the brightness, battery consumption increases. - Turn off the concealed mode. - Under factory default settings, the brightness of the display screen will adjust automatically based on the ambient light detected by the ambient light sensor. You can adjust the settings for this sensor. (➡ About the Ambient Light Sensor)
The screen is disordered.	- Changing the number of display colors and resolution may affect the screen. Restart the computer. - Connecting/disconnecting an external display may affect the screen. Restart the computer. - Resuming from sleep or hibernation may affect the screen of the external display. Restart the computer.
During Simultaneous display, one of the screens becomes disordered.	When using the Extended Desktop, use the same display colors for the external display as those used by the LCD. If you continue to experience problems, try changing the display.
The external display does not work normally.	- If the external display does not support the power saving function, it may not work normally when the computer enters the power saving mode. Turn off the external display. - Simultaneous display cannot be used until Windows startup is complete (during Setup Utility, etc.).
The screen does not become bright.	The brightness is set low to avoid malfunction where surrounding temperature is high. For proper operating temperature (➡ Specifications).
There are red, green, or blue dots on the screen, or there is unevenness in colors and brightness on the screen.	The following are not malfunctions. - Although advanced high-precision technologies are used in the production of color LCD screens, 0.002 % or less of the picture elements may be dark or remain constantly lit (i.e., more than 99.998 % of elements function properly). - Due to the natural characteristics of LCD screens, you may notice unevenness in colors and brightness depending on your angle of view. Hues may also vary by product.

Image persistence occurs.	- When the same image is displayed on the screen for a long time, previous images may remain faint even if you switch the image to the new one. This phenomenon is called "image persistence". You can suppress the image persistence by the following measures. - Use the screen saver. - Right-click the desktop, and then click [Personalize] - [Lock screen] - [Screen saver]. - Select any screen saver. - Set the time to turn off the display. - Click  (Start) - [Settings] - [System] - [Power & battery] - [Screen, sleep, & hibernate timeouts]. - Change the setting.
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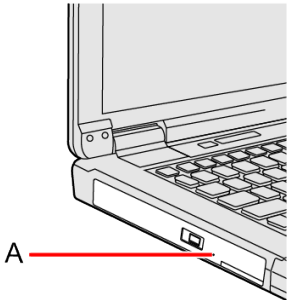
Sound

No sound.	- Press «Fn» + «F4» or «Fn» + «F6» to cancel mute. - Turn off the concealed mode. - Restart the computer. - Beeping sounds are not emitted by this device.
Distorted sound.	Performing «Fn» key combinations sometimes causes sound distortion. Stop and restart playback.
Cannot change the volume by pressing «Fn» + «F5» or «Fn» + «F6».	Activate the Windows sound function. When it is not active, the volume does not change even if slide bar is displayed.
The microphone volume is small/large.	- Adjust the volume of the microphone according to the following steps.: - Right-click  (Speakers) on the system tray, and click [Sound settings] - [More sound settings]. - Click [Recording] - [Microphone Array] - [Properties], and then move the slider () to adjust the volume of [Microphone Array] in [Levels].
Cannot record with microphone.	- Set [Microphone] to [Enabled] in the [Advanced] menu of the Setup Utility. - Use a condenser microphone.
When signing in (e.g., resuming the computer), audio is distorted.	- Perform the following steps to change the audio settings to prevent audio output. - Right-click  (Speakers) on the system tray, and click [Sound settings] - [More sound settings] - [Sounds]. - Remove the check mark from [Play Windows Startup sound].
The feedback noise may occur.	- To stop microphone's monitoring output. - Right-click  (Speakers) on the system tray, and click [Sound settings] - [More sound settings]. - Click [Recording] - [Microphone Array] - [Properties], and then remove a check mark for [Listen to this device] in [Listen].

Keyboard

Only numbers can be input.	When the indicator  is on, the keyboard is in ten-key mode. Press «Num Lock» to cancel.
Only capital letters can be input.	When the indicator  is on, the keyboard is in Caps Lock mode. Press «Caps Lock» to cancel.
Cannot enter special characters (ß, à, ç, etc.) and symbols.	- Use the character map. - Click  (Start) - [All]* - [Windows Tools]. *If [All] does not appear, search for the app in the search box and launch it. - Double-click [Character Map].

Disc Operation (only for model with optical disc drive)

The optical disc drive does not work normally.	- Set [Optical Drive] to [Enabled] in the [Advanced] menu of the Setup Utility. - Clean the lens. (➡ Optical disc drive handling care) - Check the disc condition. (➡ Disc handling care)
Cannot play back TV programs recorded on a commercial DVD recorder.	Finalize the disc on the DVD recorder when the program was recorded in video mode on DVD-R/RW or in VR mode on DVD-RW.
A blue background appears on the screen when playing an MPEG image.	You opened the optical disc drive or removed the MPEG disc while it was operating. Re-insert the MPEG disc and close the optical disc drive.
The optical disc drive vibrates excessively or makes noise.	- Insert the disc correctly. - Check the disc condition. (➡ Disc handling care)
Cannot eject a disc.	- Turn on the computer. - To remove a disc when the computer is powered off, insert a pin of 1.3 {±0.05} mm in diameter into the emergency hole (A). (When the diameter of the pin is smaller than this, insert the pin slightly downward.) Pushing it completely to the end will free the tray so that it can be pulled out.  A - If a disc with fingerprints or other dirt is used, you may not be able to remove it. Use a clean disc. (➡ Cleaning the discs)
The disc tray does not close.	Do not touch the eject button when closing the tray.
Other disc operation problems.	Use another drive or media.

Network

Cannot connect to a network.	Set the device ([LAN], [LAN (Rear)], [LAN (Left)] or [Wi-Fi] / [Cellular (WWAN)] of [Wireless Configuration]) to [Enabled] in the [Advanced] menu of the Setup Utility.
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Cannot check the computer's MAC address.	- Follow the steps below. - Click  (Start) - [Settings]. - Click [Network & internet] - [Advanced network settings] - [Hardware and connection properties]. Properties of each device appears. Write down the 12-digit address (alphanumeric) that appears for "Physical address (MAC):" rows of each devices. The names of each of the devices are as follows. <table border="1" data-bbox="687 353 1489 761"> <thead> <tr> <th>Device</th><th>Connection name</th></tr> </thead> <tbody> <tr> <td>LAN</td><td>Ethernet</td></tr> <tr> <td>LAN (Rear)</td><td>Ethernet 2</td></tr> <tr> <td>LAN (Left)</td><td>Ethernet 3</td></tr> <tr> <td>Wireless LAN</td><td>Wi-Fi</td></tr> <tr> <td>Bluetooth</td><td>Bluetooth Network Connection</td></tr> <tr> <td>Wireless WAN</td><td>Cellular</td></tr> </tbody> </table> *The content displayed will vary depending on the device and model. - Click  to close the window.	Device	Connection name	LAN	Ethernet	LAN (Rear)	Ethernet 2	LAN (Left)	Ethernet 3	Wireless LAN	Wi-Fi	Bluetooth	Bluetooth Network Connection	Wireless WAN	Cellular
Device	Connection name														
LAN	Ethernet														
LAN (Rear)	Ethernet 2														
LAN (Left)	Ethernet 3														
Wireless LAN	Wi-Fi														
Bluetooth	Bluetooth Network Connection														
Wireless WAN	Cellular														

Wireless Communication (only for model with wireless LAN/Bluetooth/wireless WAN)

Cannot connect to a network.	- Set the device ([Wi-Fi] / [Cellular (WWAN)] of [Wireless Configuration]) to [Enabled] in the [Advanced] menu of the Setup Utility (➡ Wireless Configuration). - Confirm the airplane mode is Off. To turn off the airplane mode (➡ Using airplane mode). - Restart the computer.
Access point is not detected.	- Shorten the distance between the computer and the access point, and try the detection again. - Set the device ([Wi-Fi] of [Wireless Configuration]) to [Enabled] in the [Advanced] menu of the Setup Utility (➡ Wireless Configuration). - Check the channel being used by the access point.
<Only for model with wireless WAN> Cannot communicate.	- Set the device ([Cellular (WWAN)] of [Wireless Configuration]) to [Enabled] in the [Advanced] menu of the Setup Utility (➡ Wireless Configuration). - Confirm that the nanoSIM card is inserted correctly. - If you cannot be connected to the network after inserting the nanoSIM card, confirm "eSIM/nanoSIM Switching". If communication is not established after proceeding with the above remedies, the wireless WAN device may not be correctly recognized. Restart the computer.

Connecting Peripherals

An error occurs when installing the driver.	When you install a driver of card or peripheral device, make sure that the driver is compatible with the operating system. If it is not compatible, malfunction may occur. For information about the driver, contact the manufacturer of the peripheral device.
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A peripheral device does not work.	• Install the driver. • Contact the manufacturer of the device. • When operation resumes from sleep or hibernation, devices such as an external mouse and cards may not function properly. In this case, restart the computer or reinitialize the device. • When  is displayed in the Device Manager, remove and insert the device. If the problem persists, restart the computer. • When you set [Port Replicator] to [Disabled] in the [Advanced] menu of the Setup Utility, USB ports of port replicator are also disabled. • The computer may not recognize the connection/removal of some devices, or may not operate normally with some devices. 1. Right-click  (Start) - [Device Manager]. 2. Select the device, and remove the check mark for [Allow the computer to turn off this device to save power] in [Power Management]. (This item may be unavailable for some types of devices.) • In the case that a USB device does not work, remove the USB device and connect it again or connect the USB device to another port.
The connected mouse does not work.	• Check the mouse connection. • Install the driver compatible with the connected mouse.
The RAM module is not recognized.	• Insert the RAM module correctly. • Use the optional approved RAM module. • Check the [Information Menu] in the Setup Utility. If the RAM module is not recognized, turn off the computer and reinsert the RAM module.
You do not know the address map for IRQ, I/O port address, etc.	• You can check with the following procedure. 1. Right-click  (Start) - [Device Manager]. 2. Click [View] - [Resources by type].
<Only for model with serial port> The device connected to the serial port does not work.	• Check the connection. • The device driver may not work. Refer to the instruction manual of the device. • Set [Serial Port] to [Auto] in the sub-menu of [Serial Port Settings] in the [Advanced] menu of the Setup Utility. • The I/O and IRQ you can use vary depending on the device. If the setting does not work, try other settings in the Setup Utility.
<Only for model with dedicated GPS / GPS on wireless WAN> GPS does not work.	• You can check the GPS status. ( GPS) • Set airplane mode to OFF. • Airplane mode • Confirm that Cellular (Wireless WAN) is [On].
<Only for model with wireless LAN> Wireless LAN does not work.	• You can check the Wireless LAN status. ( Wi-Fi (Wireless LAN)) • Set airplane mode to OFF. • Airplane mode • Confirm that Wi-Fi (Wireless LAN) is [On].
<Only for model with Bluetooth> Bluetooth does not work.	• You can check the Bluetooth status. ( Bluetooth) • Set airplane mode to OFF. • Airplane mode • Confirm that Bluetooth is [On].
<Only for model with LAN> LAN transmission speed slows down noticeably. <Only for model with wireless LAN> Wireless LAN connection is cut.	• Change the power mode to [Best Performance]. ( Configuring Power Saving Settings)

Touchpad / Touchscreen (only for model with touchscreen)

The pointer does not work.	• Connect the external mouse correctly. • Restart the computer using the keyboard. • If the computer does not respond to keyboard commands, read "No response".
Cannot input using the touchpad.	• The touchpad may be disabled by some mouse drivers. Check your mouse's operating instructions. • The touchpad is disabled. Press <<Fn>> + <<Esc>> to enable.

microSD Memory Card (only for model with microSD memory card slot)

Cannot use a microSD Memory Card.	• Set [microSD Card Slot] to [Enabled] in the [Advanced] menu of the Setup Utility. • This computer does not support the maximum speed some types of microSD / microSDHC / microSDXC memory cards guarantee.
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Smart Card (only for model with Smart Card slot)

Cannot use a Smart Card.	• Insert the Smart Card correctly. • To use a Smart Card, you need a specified software and driver.
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Barcode Reader (only for model with Barcode Reader)

Reading is not possible.	• Confirm that the barcode is readable (without damage, etc.). Confirm that the barcode (symbology) is readable. • Confirm the area for reading. The distance from the reader to the barcode is important. As a rule of thumb, a farther distance should be used for a larger symbol to allow the light to cover the symbol. In addition, a closer distance should be used for a thinner symbol. • Be sure the barcode is not placed closer than necessary to the reader.
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Fingerprint Reader (only for model with Fingerprint Reader)

The reader does not enroll or authenticate my fingerprint.	• If pop-up or other messages appear on the desktop screen, fingerprint entry may be inhibited temporarily. In such cases, click outside of the Fingerprint Authentication window, and then click again back inside it. • The reader enrolls or authenticates no fingerprint, or performs authentication poorly, despite the correct way of finger touching when your finger is in any of the conditions stated below: • Rough skin, or injured finger (with a cut or a skin inflammation) • Extremely dry • Soiled with mud or oil • Fingerprint has been worn and has faded • Wet with water or sweat <You can improve enrolling and authentication sensitivity by taking the following steps when any of the conditions described above exists> • Wash your hands or wipe them dry. • Use a different finger for registration or authentication. • Treat your finger with a hand cream when it is rough skin or dry. • Clean the fingerprint reader. For further information, refer to Fingerprint Reader Handling. • The fingerprint reader may be malfunctioning when it continues to perform poorly after the steps described above have been performed. Contact Panasonic Technical Support.
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User cannot use enrolled finger. (e.g. injury)	- If none of your enrolled fingers can be used, follow this procedure: - When fingerprint authentication screen is displayed, switch to password input by pressing the <<Esc>> key. - Sign in to Windows. You can always access the computer by using your Windows sign in password. - Add another finger, or uninstall the fingerprint authentication function.
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User Switching

Some applications do not work properly.	When switching to a different user without signing out, some applications do not work properly. In this case, sign out the other users.
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Others

Although the computer is turned on, the following problems occur. - The indicators does not light. - No sound. - Screen is dark.	Concealed mode is set to ON (➡ Concealed Mode).
No response.	- Open Task Manager and close the software application. - Right-click  (Start) - [Task Manager]. - An input screen (e.g., password input screen at startup) may be hidden behind another window. Use <<Alt>> + <<Tab>> to check. - Shut down by pressing and holding the power switch for 10 seconds or longer, and turn on the computer and open the application again. - If Windows runs correctly, but the application software does not start, uninstall the failing application software, then reinstall it. To uninstall, perform the procedure below. - Right-click  (Start) - [Installed apps]. - Click ... - [Uninstall] for the program you want to uninstall.
A motion image file cannot be played using Windows Media Player and the message "Codec required" appears.	Some motion image files require a Codec that is not installed as standard. In this case, connect to the Internet and try playback of the file again. The Codec may automatically be downloaded so you may be able to play it.
The date and time are incorrect.	- Make the correct settings. - Click  (Start) - [Settings] - [Time & language] - [Date & time], and select [Off] in "Set time automatically". - Click [Change] in "Set the date and time manually", and then set the day and time. - Click [Change], and select [On] in "Set time automatically". - If the problem persists, the internal clock battery may need to be replaced. Contact Panasonic Technical Support.
"Battery not exist" is displayed.	Battery goes to hibernation if the battery level is about 5 %, may be displayed such as "Not exist" or "Not use" is not a malfunction. Connect the AC adaptor for a while.

Hardware Diagnostics

If it appears that the hardware installed in this computer is not operating properly, you can use the PC-Diagnostic Utility to determine whether or not there is a problem.

If the utility discovers a problem in the hardware, contact Panasonic Technical Support.

Software cannot be checked using this utility.

Regarding the PC-Diagnostic Utility

- We recommend that you use the touchpad for operations. When not using the touchpad, you can operate using the internal keyboard instead. Do not use the touchscreen.

Operations	Touchpad/External mouse operations	Internal keyboard operations
Select icon	Place the cursor above the icon	Press <<→>>, <<←>>, <<↑>> or <<↓>>
Click the icon	Touch or click (right click cannot be used)	Press <<Space>> above the icon
Complete the PC-Diagnostic Utility and then restart the computer	Click  (close)	Press <<Ctrl>> + <<Alt>> + <>

- If the touchpad does not operate properly, press <<Ctrl>> + <<Alt>> + <> to restart the computer, or press the power switch to turn the power off, and then restart the PC-Diagnostic Utility.

NOTE

- When the video diagnostic check is running, the display may be distorted. This is not malfunction.
- When the sound diagnostic check is running a loud beep will sound, so do not use headphones as this time. (The beep will not sound if mute is using in Windows or [Sound] is turned off in [Concealed Mode Configuration].)

Running the Diagnostic Check

Run this utility using the default settings in the Setup Utility.

If the Setup Utility or other settings will not allow hardware to be executed, the hardware icon will not be displayed or will be displayed in gray.

1. Connect the AC adaptor, and be enabled the wireless function.

During the diagnostic check, do not remove the AC adaptor, or attach any peripheral devices.

2. Start the Setup Utility.

1. Click  (Start) - [Settings] - [System] - [Recovery].
2. Click [Restart now] in "Advanced startup".
3. Click [Restart now] on the "We'll restart your device so save your work" screen.
4. Click [Troubleshoot] - [Advanced options] - [UEFI Firmware Settings] - [Restart].

The computer restarts, and the Setup Utility screen appears.

- If the password is requested, enter the Supervisor Password.
- If you are using the computer after changing the settings from the status at the time of purchase, we recommend that you make a note of the settings that are changed.

3. Press <<F9>>.

At the confirmation message, select [Yes] and press <<Enter>>.

4. Press <<F10>>.

At the confirmation message, select [Yes] and press <<Enter>>.

The computer will restart.

5. Press «F2» or «Del» while “Panasonic” boot screen is displayed.

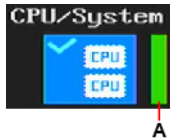
The Setup Utility starts up.

- If the password is requested, enter the Supervisor Password.

6. Select the [Exit] menu, and then select [Diagnostic Utility].

When the PC-Diagnostic Utility starts up, it will automatically begin the diagnostic check for all hardware components.

- The touchpad and the internal keyboard may not be used when each hardware checking is running. While checking is in process, a vertical green progress bar (A) is displayed on the right side of the hardware icon.



- You can perform the following operations by selecting the icons on the screen:
 -  : Start the diagnostic check from the beginning.
 -  : Stop the diagnostic check (After the process is stopped, you cannot resume it by selecting ).
 -  : Display help (click the screen or press «Space» to return to the original screen).
- You can check the status and results of the diagnostic check via the progress bar displayed on the right of the hardware icon.
 - When the bar is progressing: The diagnostic check is in progress.
During memory diagnostic check, the display may stop for a long period of time. Wait until the process is complete.
 - When the bar is green: No problems discovered.
 - When the bar is red: Problems discovered.
 - When the bar is yellow: The diagnostic check has been stopped or canceled.

NOTE

- Using the following procedure, you can run a diagnostic check on a specified hardware component, or run an extended diagnostic check (The extended diagnostic check is only specified). The extended diagnostic check is more detailed, and so requires a longer period of time to run.

1. Click  to stop the diagnostic check, and click the hardware icon to configure the diagnostic.

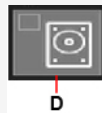
- Standard display (B): Perform diagnostic check.



- “Full” display (C): Perform extended diagnostic check. (“Storage”, “Keyboard”, “Touch Pad” and “Touch Screen” only)

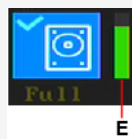


- Gray display (D): Do not perform diagnostic check.



2. Click  to start the diagnostic check.

- Display during diagnostic check (E): Diagnostic check is in progress.



7. **When all the hardware check is complete, confirm the diagnostic check results.**

If the display is red and the message "TEST FAILED" is displayed, you can assume that there is a problem with the computer's hardware. Confirm which hardware component is displayed as red, and contact Panasonic Technical Support.

If the display is green and the message "TEST PASSED" is displayed, the computer's hardware is operating normally. Continue using the computer as it is. If the computer still does not operate properly, reinstall the software (➡ [Installing Software](#)).

NOTE

- If you run a memory diagnostic check after installing a new approved RAM module (optional) and the message "TEST FAILED" is displayed:

Remove the additional RAM module and run the diagnostic check again. If the message "TEST FAILED" is still displayed, you can assume that there is a problem with the internal RAM module.

8. **After the diagnostic check is complete, click (close), or press <<Ctrl>> + <<Alt>> + <> to restart the computer.**

When the Icon Becomes Invisible or Gray, and the Corresponding Device Cannot Be Checked

- **The device is disabled in the Setup Utility:**
Set the device to [Enabled] in the Setup Utility.
- **When "Cellular (WWAN)" and "Bluetooth" are grayed out:**
Turn on the wireless function.

Reset your computer

If operations on the unit become unstable, we recommend refreshing Windows. This involves reinstalling the operating system with personal files and settings retained (Personalization).

Preparation

- Remove all peripherals and microSD memory card, etc.
- Connect the AC adaptor and do not remove it until installation is complete.

1. Click  (Start) - [Settings] - [System] - [Recovery].
2. Click [Reset PC] in “Reset this PC”.
3. Click [Keep my files] or [Remove everything] on the “Choose an option” screen.

[Keep my files]

- Remove all applications and programs that did not come with this computer.
- Restore settings to default.
- Reinstall Windows without removing your personal files.

[Remove everything]

- Remove all applications, programs and personal files.
- Restore settings to default.

4. If you are connected to the Internet, click [Cloud download] or [Local reinstall] on the “How would you like to reinstall Windows?” screen.

[Cloud download]

- Download the latest Windows installation file from Microsoft and reinstall Windows.
- You will need at least 4 GB of free space.

[Local reinstall]

- Reinstall Windows from this computer.

5. Click [Change settings] or [Next] on the “Additional settings” screen.
 - When [Keep my files] is selected in step 3, you can change the settings of “Restore preinstalled apps?” by clicking [Change settings].
 - When [Remove everything] is selected in step 3, you can change the settings of “Clean data?”, “Delete eSIM profiles?” (displayed only for some models) and “Delete workplace resources?” (displayed only for some models) by clicking [Change settings].
 - If you are connected to the Internet, you can change the settings of “Download Windows?” by clicking [Change settings].

6. When the “Ready to reset this PC” screen appears, confirm on-screen information, and click [Reset].

After the reinstallation, the computer will restart.

- Do not interrupt installation, for example by turning off the computer or performing other operation. Otherwise installation may become unavailable as Windows may not start up or the data may be corrupted.

7. Perform Setup Windows. (➡ [First-time Operation](#))

NOTE

- The date and time, and the time zone may not be correct. Be sure to set them correctly.

Installing Software

Installing software will return the computer to the default condition. When you install the software, the internal SSD data will be erased.

Back up important data to other media or an external flash memory before installation.

IMPORTANT

- **Do not delete the recovery partition on the SSD. If it has been deleted, reinstallation from the SSD cannot be performed.**

To check the recovery partition, perform the following methods.

1. Right-click  (Start) - [Disk Management].
 - A standard user needs to enter an administrator password.

Disk recovery

You can reinstall the OS that was pre-installed at the time of purchase.

IMPORTANT

- **If the recovery partition is deleted, you cannot perform flash memory recovery.**

If reinstallation using the method described in “Reset this PC” is not successful, follow the steps below.

Preparation

- Remove all peripherals and microSD memory card, etc.
- Connect the AC adaptor and do not remove it until installation is complete.

1. Start the Setup Utility.

1. Click  (Start) - [Settings] - [System] - [Recovery].
2. Click [Restart now] in “Advanced startup”.
3. Click [Restart now] on the “We’ll restart your device so save your work” screen.
4. Click [Troubleshoot] - [Advanced options] - [UEFI Firmware Settings] - [Restart].

2. Write down all of the contents of the Setup Utility and press <<F9>>.

At the confirmation message, select [Yes] and press <<Enter>>.

3. Press <<F10>>.

At the confirmation message, select [Yes] and press <<Enter>>.

The computer will restart.

4. <Only for model with TPM> Clear TPM.

1. Click  (Start) - [Settings] - [Privacy & security] - [Windows Security] - [Device security].
2. Click [Security processor details] under “Security processor”.
3. Click [Security processor troubleshooting].
4. Click [Select] and select a reason.
5. Click [Clear TPM].
6. Click [Clear and restart] on the “Reset your security processor (Clear TPM)” screen.

- If the “User Account Control” is displayed, click [Yes].

5. Press <<F2>> or <> while “Panasonic” boot screen is displayed.

The Setup Utility starts up.

- If the password is requested, enter the Supervisor Password.

6. **Select the [Exit] menu, then select [Recovery Partition] and press «Enter».**

Computer will restart.

7. **Click [Recovery].**

Click [CANCEL] to abort the operation.

8. **Confirm the contents of “EULA”, and click [Accept.] if you continue.**

9. **Click [Quick Release Storage Drive : xxxxx].**

10. **Click [Recovery ALL Partitions.].**

Installation starts according to the instructions on the screen. (It will take approximately several tens of minutes.)

- Do not interrupt installation, for example by turning off the computer or performing other operation. Otherwise installation may become unavailable as Windows may not start up or the data may be corrupted.

11. **When the Ending process screen is displayed, click [Shutdown.] to turn off the computer.**

12. **Turn on the computer.**

- If the password is requested, enter the Supervisor Password.

13. **Perform Setup Windows. (➡ [First-time Operation](#))**

14. **Start the Setup Utility and change the settings as necessary.**

Using Recovery Disc

In the following cases, reinstall using the recovery disc.

- Installation is not complete. The recovery partition in the flash memory may be broken.

When the computer is reinstalled using the recovery disc, the Windows included on the recovery disc is installed.

For information on the creation method of recovery discs, see the following web page.

<https://global-pc-support.connect.panasonic.com/recv-dls-w11>

“Recovery Image Download Service”

Error Message

Follow the instructions below when an error message appears. If the problem persists or if the error message is not shown here, contact Panasonic Technical Support.

Error Message	Solution
Bad System CMOS	An error has occurred in the memory of system settings. This occurs when the memory content is changed by an unexpected program operation, etc. - Start the Setup Utility and return the settings to the default values, and then change the settings as necessary. - If the problem persists, the internal clock battery may need to be replaced. Contact Panasonic Technical Support.
System CMOS Checksum Error	
Invalid Year. System date restored to 01/01/20XX	The date and time settings are not correct. - Start the Setup Utility and set the correct date and time. - If the problem persists, the internal clock battery may need to be replaced. Contact Panasonic Technical Support.
Press F2 for Setup / F12 for LAN	Write down the error details and press <<F2>> or <> to start the Setup Utility. Change the settings if necessary.
Warming up the system (up to 30 minutes)	The computer is warming up before start up. Wait for the computer to start up (takes up to 30 minutes). If "Cannot warm up the system" is displayed, the computer failed to warm up and does not start. In this case, turn off the computer, leave it in an environment of 5 °C {41 °F} or higher temperature for about an hour, and then turn on the power once more.
Remove disks or other media. Press any key to restart	- If a device is connected to the USB port, disconnect the device, or set [USB Type-C Port], [USB Type-A Port] or [Port Replicator] to [Disabled] in the [Advanced] menu of the Setup Utility. - If the problem persists after removing the disk, it may be a flash memory failure. Contact Panasonic Technical Support.
Reboot and Select proper Boot device or Insert Boot Media in selected Boot device and press a key	The operating system is not properly installed in the flash memory that you are going to boot from. - If you cannot start up the OS from the internal disk, check if the internal disk is properly recognized on the "Information" menu of the Setup Utility. - If it is recognized ("xxx GB" is displayed.), perform the reinstallation. - If not ("Empty" is displayed.), contact Panasonic Technical Support. - If a device is connected to the USB port, disconnect the device, or set [USB Type-C Port], [USB Type-A Port] or [Port Replicator] to [Disabled] in the [Advanced] menu of the Setup Utility.
Disk error Press any key to restart	
Please use the recommended AC adaptor	Use the specified AC adaptor.

Appendix

Technical Information

Network Connections and Communications Software

The sleep mode of this computer supports the modern standby mode. (➡ [Modern Standby](#))

- When an application supports the modern standby mode, it can periodically connect to the network even during sleep.
- If the computer enters sleep or hibernation while you are using an application that does not support the modern standby mode, the network connection may be interrupted or the performance may be adversely affected. If that happens, set the power saving function to [Never]. (➡ [Setting Sleep](#))

About Fast startup

The fast startup is enabled as the factory default.

If the computer shut down by the following steps, the fast startup will be disabled at next boot-up.

1. Click  (Start) - [Settings] - [System] - [Recovery].
2. Click [Restart now] in “Advanced startup”.
3. Click [Restart now] on the “We’ll restart your device so save your work” screen.
4. Click [Turn off your PC].

If you perform the following steps, the fast startup function becomes always disabled.

1. Click  (Start) - [All]* - [Windows Tools].
*If [All] does not appear, search for the app in the search box and launch it.
2. Double-click [Control Panel].
3. Click [System and Security] - [Power Options].
4. Click [Choose what the power buttons do] - [Change settings that are currently unavailable].
5. Remove check mark from [Turn on fast startup (recommended)] in “Shutdown settings”.
6. Click [Save changes].

Regulatory Information

This is additional information.

For details, refer to the *OPERATING INSTRUCTIONS - Read Me First*.

FCC

Only for model with external antenna connector

This equipment is provided with external antenna connector(s) for connection to optional Car Mounter for mobile external mounted antenna(s).

External antenna(s) must be professionally installed and cannot exceed recommended maximum antenna gain as described below.

User must maintain minimum 20 cm spacing between external antenna(s) and all person's body (excluding extremities of hands, wrist and feet) during wireless modes of operation.

<External antenna for wireless LAN>

(Only for model with the wireless LAN module BE201D2W)

External antenna(s) cannot exceed recommended maximum antenna gain as described below.

Type		Monopole
Gain [dBi]	2400 - 2483.5 MHz	2.45
	5150 - 5350 MHz	3.88
	5470 - 5725 MHz	4.21
	5725 - 5850 MHz	4.07
	5850 - 5895 MHz	3.68

<External antenna for wireless WAN>

(Only for model with the wireless WAN module EM9291)

External antenna(s) cannot exceed recommended maximum antenna gain as described below.

Port		WWAN-main	WWAN-aux	WWAN-3rd	WWAN-4th
Gain [dBi]	663 - 698 MHz (Band 71)	-0.62	N/A	N/A	N/A
	699 - 716 MHz (Band 12)	0.14	N/A	N/A	N/A
	704 - 716 MHz (Band 17)	0.14	N/A	N/A	N/A
	777 - 787 MHz (Band 13)	0.40	N/A	N/A	N/A
	788 - 798 MHz (Band 14)	0.54	N/A	N/A	N/A
	814 - 849 MHz (Band 5, 26)	0.74	N/A	N/A	N/A
	1695 - 1710 MHz (Band 70)	1.36	N/A	N/A	N/A
	1710 - 1780 MHz (Band 4, 66)	2.43	N/A	N/A	N/A
	1850 - 1915 MHz (Band 2, 25)	2.07	N/A	N/A	N/A
	2500 - 2570 MHz (Band 7)	2.76	N/A	N/A	N/A
	2496 - 2690 MHz (Band 41)	2.83	0.80	4.44	3.30
	3550 - 3700 MHz (Band 48)	1.78	-0.34	1.76	2.15
	3450 - 3980 MHz (Band 77)	2.01	0.33	2.44	2.61

<External antenna for wireless WAN>

(Only for model with the wireless WAN module EM7595)

External antenna(s) cannot exceed recommended maximum antenna gain as described below.

Port		WWAN-main
Gain [dBi]	663 - 698 MHz (Band 71)	-0.62
	699 - 716 MHz (Band 12)	0.14
	777 - 787 MHz (Band 13)	0.40
	788 - 798 MHz (Band 14)	0.54
	814 - 849 MHz (Band 5, 26)	0.74
	896 - 901 MHz (Band 106)	0.21
	1710 - 1780 MHz (Band 4, 66)	2.43
	1850 - 1915 MHz (Band 2, 25)	2.07
	2500 - 2570 MHz (Band 7)	2.76
	3400 - 3700 MHz (Band 42, 48)	1.78

Only for model with external antenna connector

This equipment is provided with external antenna connector(s) for connection to optional Car Mounter for mobile external mounted antenna(s).

The required antenna impedance is 50 ohms.

<External antenna for wireless LAN>

(Only for model with the wireless LAN module BE201D2W)

This radio transmitter [IC: 216H-CFWL24A] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated.

Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

User must maintain minimum 20 cm spacing between external antenna(s) and all person's body (excluding extremities of hands, wrist and feet) during wireless modes of operation.

Type		Monopole
Gain [dBi]	2400 - 2483.5 MHz	2.45

<External antenna for wireless WAN>

(Only for model with the wireless WAN module EM9291)

External antenna(s) cannot exceed recommended maximum antenna gain as described below.

User must maintain minimum 20 cm spacing between external antenna(s) and all person's body (excluding extremities of hands, wrist and feet) during wireless modes of operation.

Port		WWAN-main	WWAN-aux	WWAN-3rd	WWAN-4th
Gain [dBi]	663 - 698 MHz (Band 71)	-0.62	N/A	N/A	N/A
	699 - 716 MHz (Band 12)	0.14	N/A	N/A	N/A
	704 - 716 MHz (Band 17)	0.14	N/A	N/A	N/A
	777 - 787 MHz (Band 13)	0.40	N/A	N/A	N/A
	788 - 798 MHz (Band 14)	0.54	N/A	N/A	N/A
	814 - 849 MHz (Band 5, 26)	0.74	N/A	N/A	N/A
	1710 - 1780 MHz (Band 4, 66)	2.43	N/A	N/A	N/A
	1850 - 1915 MHz (Band 2, 25)	2.07	N/A	N/A	N/A
	2500 - 2570 MHz (Band 7)	2.76	N/A	N/A	N/A
	2496 - 2690 MHz (Band 38, 41)	2.83	0.80	4.44	3.30
	3400 - 3600 MHz (Band 42)	1.78	-1.20	1.84	1.96
	3450 - 3980 MHz (Band 43, 77, 78)	2.01	0.33	2.44	2.61

<External antenna for wireless WAN>

(Only for model with the wireless WAN module EM7595)

External antenna(s) cannot exceed recommended maximum antenna gain as described below.

User must maintain minimum 20 cm spacing between external antenna(s) and all person's body (excluding extremities of hands, wrist and feet) during wireless modes of operation.

Port		WWAN-main
Gain [dBi]	663 - 698 MHz (Band 71)	-0.62
	699 - 716 MHz (Band 12)	0.14
	777 - 787 MHz (Band 13)	0.40
	788 - 798 MHz (Band 14)	0.54
	814 - 849 MHz (Band 5, 26)	0.74
	1710 - 1780 MHz (Band 4, 66)	2.43
	1850 - 1915 MHz (Band 2, 25)	2.07
	2500 - 2570 MHz (Band 7)	2.76
	3400 - 3700 MHz (Band 42, 48)	1.78

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<Only for model with Contactless Smart Card Reader (FZ-VNF552)>

About FCC ID number / ISED certification number

To find the FCC ID number / ISED certification number for the RFID module of the FZ-VNF552, first remove the FZ-VNF552 from the computer.

The FCC ID number / ISED certification number is printed on the nameplate of the FZ-VNF552.

Erasing data when disposing or transferring the computer

When disposing the computer or transferring the ownership, erase all flash memory drive data in order to avoid data leakage. Even if you erase the data or initialize the flash memory drive using normal Windows commands, the data can be read with some special software.

Note that transferring of the ownership without uninstalling the commercial software will be a violation of the software's license agreement.

It is recommended to use commercially available dedicated software or services to erase the data.

You can also use the recovery disc to erase the data recorded in the SSD in such a way that it is difficult to restore.

For more information, see the following web page.

<https://global-pc-support.connect.panasonic.com/recv-dls-w11>

"Recovery Image Download Service"

Dispose of Computer

Preparation

- Remove all peripherals and microSD memory card, etc.
- Erase the stored data. (➡ [Erasing data when disposing or transferring the computer](#))

When disposing of this product, accord with your national legislation.

Specifications

This page provides the specifications for the basic model.

The model number is different according to the unit configuration.

To check the model number:

Check the bottom of the computer or the box the computer came in at the time of purchase.

To check CPU speed, memory size and the flash memory drive (SSD) size:

Run the Setup Utility ( [Setup Utility](#)) and select "Information" menu.

[Processor Type]: CPU speed, [Memory Size]: Memory size, [Storage]: SSD size

Main Specifications

CPU	Intel® Core™ Ultra 5 processor 235H powering Intel vPro® (P-core: Max Turbo Frequency 5 GHz, E-core: Max Turbo Frequency 4.4 GHz, Total cores: 14 cores, 18 MB ^{*1} cache) / Intel® Core™ Ultra 7 processor 265H powering Intel vPro® (P-core: Max Turbo Frequency 5.3 GHz, E-core: Max Turbo Frequency 4.5 GHz, Total cores: 16 cores, 24 MB ^{*1} cache)	
Chip Set	Built-in CPU	
Video Controller	Intel® Graphics (Built-in CPU) Support Intel® Arc™ graphics when equipped with 2 DIMMs	
Main Memory ^{*1*2}	16 GB / 32 GB, DDR5 SDRAM (64 GB Max.)	
Storage ^{*3}	512 GB / 1 TB / 2 TB (Opal SSD) Approx. 25 GB is used as a partition with disk recovery tools. (Users cannot use this partition.) Approx. 1 GB ^{*4} is used as a partition with system tools. (Users cannot use this partition.)	
Display Method	14.0" WUXGA (1920 × 1200 dots), Aspect ratio 16:10	
	Internal LCD ^{*5}	Max. 16,777,216 colors (1920 × 1200 dots)
	External Display (HDMI/USB Type-C) ^{*6}	Max. 16,777,216 colors (4096 × 2160 dots)
Wireless LAN ^{*7}	Intel® Wi-Fi 7 BE201 ( Wireless LAN)	
Bluetooth ^{*7*8}	( Bluetooth)	
LAN	IEEE 802.3 10BASE-T / IEEE 802.3u 100BASE-TX / IEEE 802.3ab 1000BASE-T	
Sound	Intel® High Definition Audio subsystem support, Stereo speaker	
Security Chip	TPM (TCG V2.0 compliant)	
RAM Module Slot (For extension) ^{*9}	× 1, DDR5 SDRAM, 262-pin, 5 V, SO-DIMM, PC5-5600B Compliant	
Interface	USB Ports (USB 3.2 Gen 1 (Type-A) port × 1 / USB Type-C port (with USB Power Delivery, DisplayPort™ Alternate Mode, Thunderbolt™ 4) × 2) ^{*10} / LAN Port (RJ-45) × 1 / HDMI Port (Type A) × 1 ^{*11} / 3.5 mm Headset jack, Stereo Headphone: 4 mW/ch (32 Ω, 1 kHz), CTIA Monaural Microphone / Expansion Bus Connector (Dedicated 24-pin female) ^{*12} / External Antenna Connector × 2 ^{*13}	

Keyboard / Pointing Device		82 keys / 83 keys ^{*14} / Touchpad	82 keys / 83 keys ^{*14} / Touchpad / Touchscreen: 10 Finger touch (Capacitive) / Φ4 Passive Stylus
Power Supply		AC adaptor or Battery pack	
AC Adaptor ^{*15}		Input: 100 V - 240 V AC, 50 Hz/60 Hz, Output: 15.6 V DC, 7.05 A	
Battery Pack		Li-ion 10.8 V, 6300 mAh	
		Operating Time ^{*16}	Approx. 12 hours
		Charging Time ^{*17}	Power Off: Approx. 3 hours Power On: Approx. 3 hours
Power Consumption ^{*18}		Approx. 110 W (maximum when recharging in the ON state)	
Physical Dimensions (W × D × H) ^{*19}		345.0 mm × 272.0 mm × 36.3 mm {13.6" × 10.7" × 1.4"} (without protruding parts)	
Weight ^{*19}		Approx. 2.12 kg {Approx. 4.67 lbs.} Starting at 2.00 kg {Starting at 4.42 lbs.}	Approx. 2.27 kg {Approx. 5.00 lbs.}
Environment	Operating Temperature	-10 °C to 50 °C {14 °F to 122 °F} (IEC60068-2-1, 2) ^{*20*21}	
	Operating Humidity	30 % to 80 % RH (No condensation)	
	Storage Temperature	-20 °C to 60 °C {-4 °F to 140 °F}	
	Storage Humidity	30 % to 90 % RH (No condensation)	

Software

Operating System ^{*22}	Windows 11 Pro
Pre-installed Software	• PC Information Viewer • Microsoft Office Trial^{*23} • Emergency Notification Setting • Panasonic PC Camera Utility^{*24} • Panasonic PC Hub • Panasonic PC 2D Barcode Key Emulator^{*25}
	• Aptio Setup • PC-Diagnostic Utility

Wireless LAN^{*7}

Data Transfer Rates ^{*26}	IEEE802.11a : 54 Mbps IEEE802.11b : 11 Mbps IEEE802.11g : 54 Mbps IEEE802.11n : HT20 : 144.4 Mbps HT40 : 300 Mbps IEEE802.11ac : VHT20 : 173.3 Mbps VHT40 : 400 Mbps VHT80 : 866.7 Mbps VHT160 : 1.73 Gbps IEEE802.11ax : HE20 : 287 Mbps HE40 : 574 Mbps HE80 : 1.2 Gbps HE160 : 2.4 Gbps IEEE802.11be : EHT20 : 344 Mbps EHT40 : 688 Mbps EHT80 : 1.442 Gbps EHT160 : 2.882 Gbps EHT320 : 5.764 Gbps
Standard Supported	IEEE802.11a / IEEE802.11b / IEEE802.11g / IEEE802.11n / IEEE802.11ac / IEEE802.11ax ^{*27} / IEEE802.11be ^{*27}
Transmission Method	OFDM system, OFDMA system, DSSS system

Bluetooth^{*7*8}

Bluetooth	Bluetooth v5.4 ^{*28}
	Classic mode / Low Energy mode
Transmission Method	FHSS system
Wireless Channels Used	Classic mode: Channels 0 to 78 / Low Energy mode: Channels 0 to 39
RF Frequency Band	2.402 GHz - 2.480 GHz

Optional Devices

Wireless WAN ^{*29*30}	LTE / 5G
Dedicated GPS ^{*30}	Chip: u-blox NEO-M9 Series GPS/GLONASS/BeiDou/Galileo/QZSS/SBAS Support
Camera	Video: 2880 × 1800 pixels, 30 fps Still: 2880 × 1800 pixels Ambient light sensor / 2 Microphones for Enhanced Voice Recognition / with Camera Cover
nanoSIM Card Slot ^{*31}	× 1
Fingerprint Reader (Windows Hello)	× 1, Image Size : 7.4 × 6.0 mm, Image Resolution : 363 DPI
Fingerprint Reader (Windows Hello, Multi User authentication)	× 1, Image Size : 11.9 × 16.9 mm, Image Resolution : 385 DPI
Contactless Smart Card Reader	× 1, RF frequency: 13.56 MHz, compatible with ISO/IEC14443 Type-A, ISO/IEC14443 Type-B, ISO/IEC18092, ISO/IEC15693

Discrete GPU	AMD Radeon™ PRO W7500M
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Rear Expansion Area^{*32}

VGA Port	× 1
True Serial Port	× 1
USB 3.2 Gen 1 (Type-A) Port ^{*10}	× 1
USB 3.2 Gen 1 (Type-C) Port ^{*10}	× 1
LAN Port	IEEE 802.3 10BASE-T / IEEE 802.3u 100BASE-TX / IEEE 802.3ab 1000BASE-T
LAN (2.5G) Port	IEEE 802.3az 10BASE-T _e / IEEE 802.3u 100BASE-TX / IEEE 802.3ab 1000BASE-T / IEEE 802.3bz 2.5GBASE-T
microSD Memory Card Slot ^{*33}	microSDXC, UHS-I

Right Expansion Area^{*34}

Smart Card Slot	×	1
Fingerprint Reader (Windows Hello)	×	1, Image Size : 7.4 × 6.0 mm, Image Resolution : 363 DPI
Fingerprint Reader (Windows Hello, Multi User authentication)	×	1, Image Size : 11.9 × 16.9 mm, Image Resolution : 385 DPI
Contactless Smart Card Reader	×	1, RF frequency: 13.56 MHz, compatible with ISO/IEC14443 Type-A, ISO/IEC14443 Type-B, ISO/IEC18092, ISO/IEC15693
Battery Pack (Second Battery)		Li-ion 10.8 V, 6300 mAh
	Operating Time ^{*16}	Approx. 24 hours
	Charging Time ^{*17}	Power Off: Approx. 6 hours (with Main Battery + Second Battery) Power On: Approx. 6 hours (with Main Battery + Second Battery)

Left Expansion Area^{*35}

Storage (2nd SSD)	512 GB / 1 TB / 2 TB (SSD)
Optical Disc Drive	DVD MULTI Drive / DVD-ROM Drive / Blu-ray Disc Drive Buffer underrun error prevention function: Supported Further information, refer to "Optical Disc Drive"
Smart Card Slot	× 1
Barcode Reader	× 1
LAN (10G) Port	IEEE 802.3u 100BASE-TX / IEEE 802.3ab 1000BASE-T / IEEE 802.3bz 2.5GBASE-T / IEEE 802.3bz 5GBASE-T / IEEE 802.3an 10GBASE-T

*1: 1 MB = 1,048,576 bytes / 1 GB = 1,073,741,824 bytes

*2: Memory size depends on the model.

*3: 1 MB = 1,000,000 bytes / 1 GB = 1,000,000,000 bytes / 1 TB = 1,000,000,000,000 bytes. Your operating system or some application software will report as fewer GB.

*4: Space used may increase when system update is performed.

*5: A 16,777,216 color display is achieved by using the dithering function.

*6: Maximum resolution depends on the specifications of the external display. Display may be impossible using some connected external displays.

- *7: Only for model with wireless LAN. The specifications may differ depending on the model.
- *8: Does not guarantee operation of all Bluetooth peripherals.
- *9: Memory configuration depends on the model and may not be expanded.
- *10: Does not guarantee operation of all USB-compatible peripherals.
- *11: Does not guarantee operation of all HDMI-compatible peripherals.
- *12: Only for model with Expansion Bus Connector.
- *13: Only for model with External Antenna Connector.
- *14: Only for Europe model.
- *15: Each country has different requirements for the AC cord voltage rating and the shapes and structures of plugs and cords. If the AC cord supplied with this product is used in a country other than the country of purchase, it may not comply with the regulations of that country.

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- *16: Measured by MobileMark® 30.
Varies depending on the usage conditions, or when an optional device is attached.
- *17: Varies depending on the usage conditions, CPU speed, etc.
- *18: Approx. 0.3 W when the battery pack is fully charged (or not being charged) and the computer is off.
Even when the AC adaptor is not connected to the computer, power is consumed (Max. 0.15 W) simply by having the AC adaptor plugged into an AC outlet.
- *19: Typical value. May differ depending on models and options.
- *20: Do not expose the skin to this product when using the product in a hot or cold environment. (➡ *OPERATING INSTRUCTIONS - Read Me First*)
When using in hot or cold environment, some peripherals may fail to work properly. Check the operation environment of the peripherals.
Using this product continuously in a hot environment will shorten the product life. Avoid use in these types of environments. When using in low temperature environment, startup may become slow or battery operation time may become short.
The computer consumes power when the SSD is warming up during startup. Therefore, if you are using battery power and the remaining power is low, the computer may not start up.
- *21: <Only for North America>
UL 62368-1 Evaluated for use at ambient temperatures up to 35 °C {95 °F} when used with optional AC Power Adaptor and 40 °C {104 °F} when used without AC power adaptor.
- *22: Operations of this computer are not guaranteed except for the pre-installed OS and the OS which is installed by using the flash memory recovery and the recovery disc.
- *23: To continue using this software after the end of the trial, purchase a license by following the on-screen instructions.
- *24: Depending on the models, this application software is not installed.
- *25: Only for model with Barcode Reader.
- *26: These are speeds specified in IEEE802.11a+b+g+n+ac+ax+be standards. Actual speeds may differ.
- *27: In some countries, a 6 GHz wireless LAN can be used.
- *28: The Bluetooth version depends on the Windows OS version.
- *29: Only for model with wireless WAN. The specifications may differ depending on the model. There are models that support eSIM.
- *30: The model with dedicated GPS cannot use the function with GPS on wireless WAN.
- *31: Only for model with wireless WAN. When using a nanoSIM card, a nanoSIM card (8.8 mm {0.35"} × 12.3 mm {0.48"}) must be inserted in the nanoSIM card slot.



- *32: Option for Rear Expansion Area. Exclusively configurable by selecting one from VGA Port/Serial Port/USB 3.2 Gen 1 (Type-A) Port, VGA Port/Serial Port/LAN Port, USB 3.2 Gen 1 (Type-C) Port/USB 3.2 Gen 1 (Type-A) Port or LAN (2.5G) Port/microSD Memory Card Slot.
- *33: Operation on all microSD equipment is not guaranteed.
- *34: Option for Right Expansion Area. Exclusively configurable by selecting one from Smart Card Slot, Fingerprint Reader (Windows Hello), Fingerprint Reader (Windows Hello, Multi User authentication), Contactless Smart Card Reader or Second Battery.
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Version 2, June 1991

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