DENSO

Barcode Handy Terminal

BHT-904B/BHT-914B

User's Manual

Preface

Thank you for using the BHT-904B/BHT-914B DENSO WAVE Barcode Handy Terminal.

Please read this manual thoroughly prior to operation to ensure full use of the product's functionality, and store safely in a convenient location for quick reference even after reading.

Liability Limitations

- DENSO WAVE INCORPORATED does not assume any product liability (including damages for lost profits, interruption of operations, or the loss of business-related information) arising out of, or in connection with, the use of, or inability to use the BHT system software or related manuals.
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Customer Registration and Inquiries

Customer Registration

To allow us to provide our customers with comprehensive service and support, we request that all customers complete a Member Registration Form. Registered members will be offered the following privileges.

- The latest upgrade information
- Free exhibition and event information for new products
- Free Web-information service “QBdirect”.

QBdirect Service Contents

Information search service (FAQ)	Offers detailed information on each product.
Download service	Offers downloads of repair modules for the latest BHT Series systems or software, and sample programs.
E-mail inquiries	Product related queries can be sent in by e-mail.

* Please note that these privileges may be subject to change without prior notice.

◆ How to Register

Access the URL below and follow the instructions provided.

http://www.qbdirect.net/

Inquiries

◆ Technical Inquiries (QBdirect)

- BHT product programming method
- Product setup method, usage
- Other technical questions

Inquires relating to the above can be made at our exclusive Web site for registered users (QBdirect). Access the link below to log on or register.

http://www.qbdirect.net/

About this Manual

- Due to improvements and so on, the content of this manual may be subject to change without prior notice.
- The reproduction or duplication of the whole or part of this manual is strictly prohibited without prior consent.
- Every attempt has been made to ensure that the content of this manual is thorough and up to date, however, we kindly ask that any questionable content, mistakes, or omissions be reported to DENSO WAVE.
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Manual Composition

This manual is made up of the following 9 chapters.

Chapter 1 Outline

Describes the BHT system and provides an overall outline of the BHT.

Chapter 2 BHT Preparation

Describes information required by the user and procedures that must be performed prior to commencing operation.

Chapter 3 Basic Operation

Describes basic operations performed by the operator and how to make basic changes to settings such as the beeper volume

Chapter 4 System Operation

Describes how to initialize and update the system, start up a user program, and operate System Mode.

Chapter 5 Communication

Describes interfaces and communication specifications.

Chapter 6 Maintenance

Describes battery replacement and daily procedures for taking care of the BHT.

Chapter 7 Error Messages

Describes causes and countermeasures for error messages expected to occur during basic operation.

Chapter 8 Specifications

Describes specifications for hardware, readable barcodes, and interfaces.

Chapter 9-1 CU-900, CH-900 Specifications (Option)

Describes the main specifications for the CU-900, CH-900 Series (option).

Chapter 9-2 When File Transfer is Not Possible Using the Transfer Utility

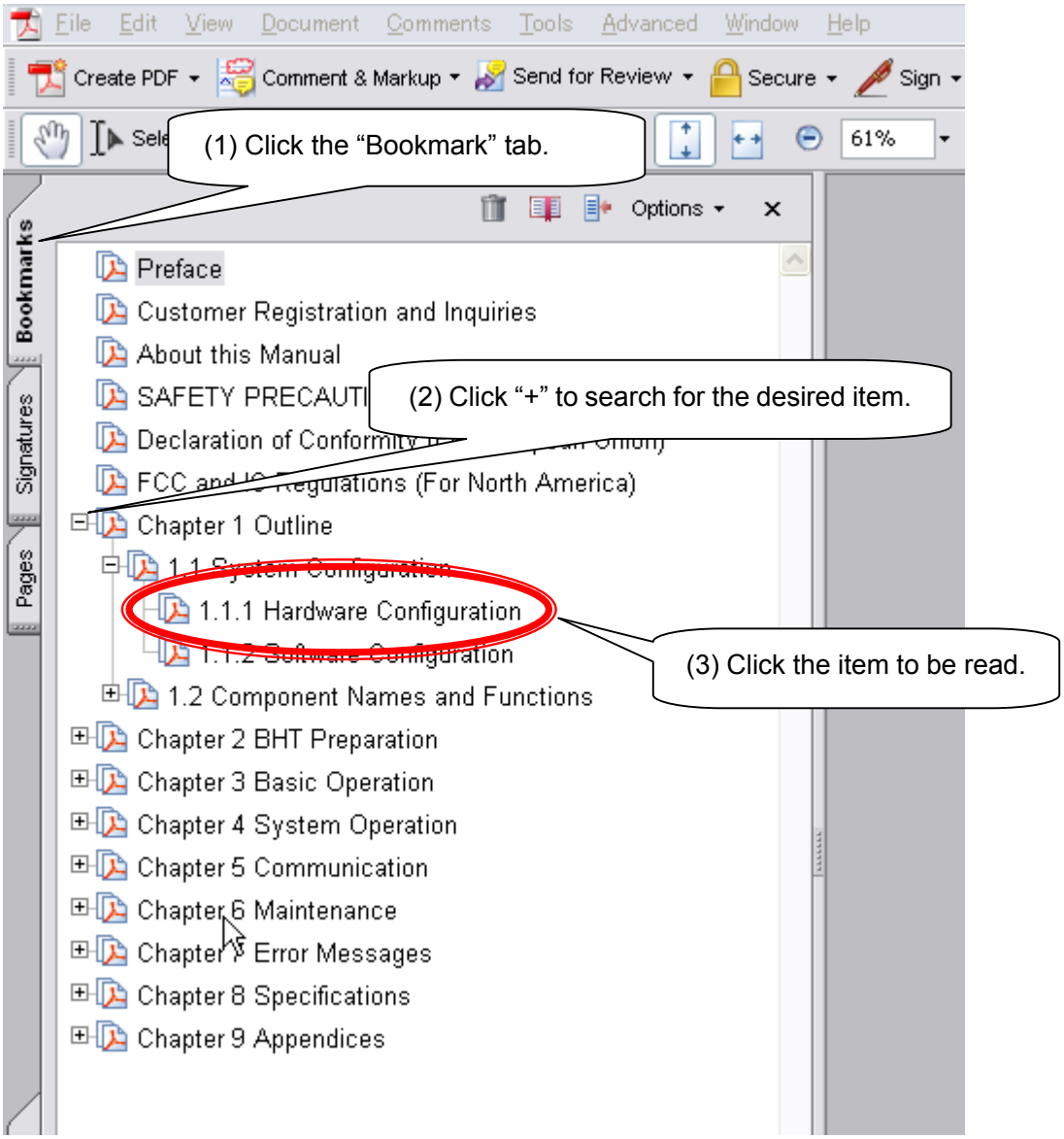
Describes causes and countermeasures when unable to transfer files.

Viewing this Manual

◆ About the Bookmark

The PDF Bookmark function can be used to jump to the Contents page.

<Procedure>
(1) Click the “Bookmark” tab.
(2) Click “ ⊞” to search for the desired item.
(3) Click the item to be read.



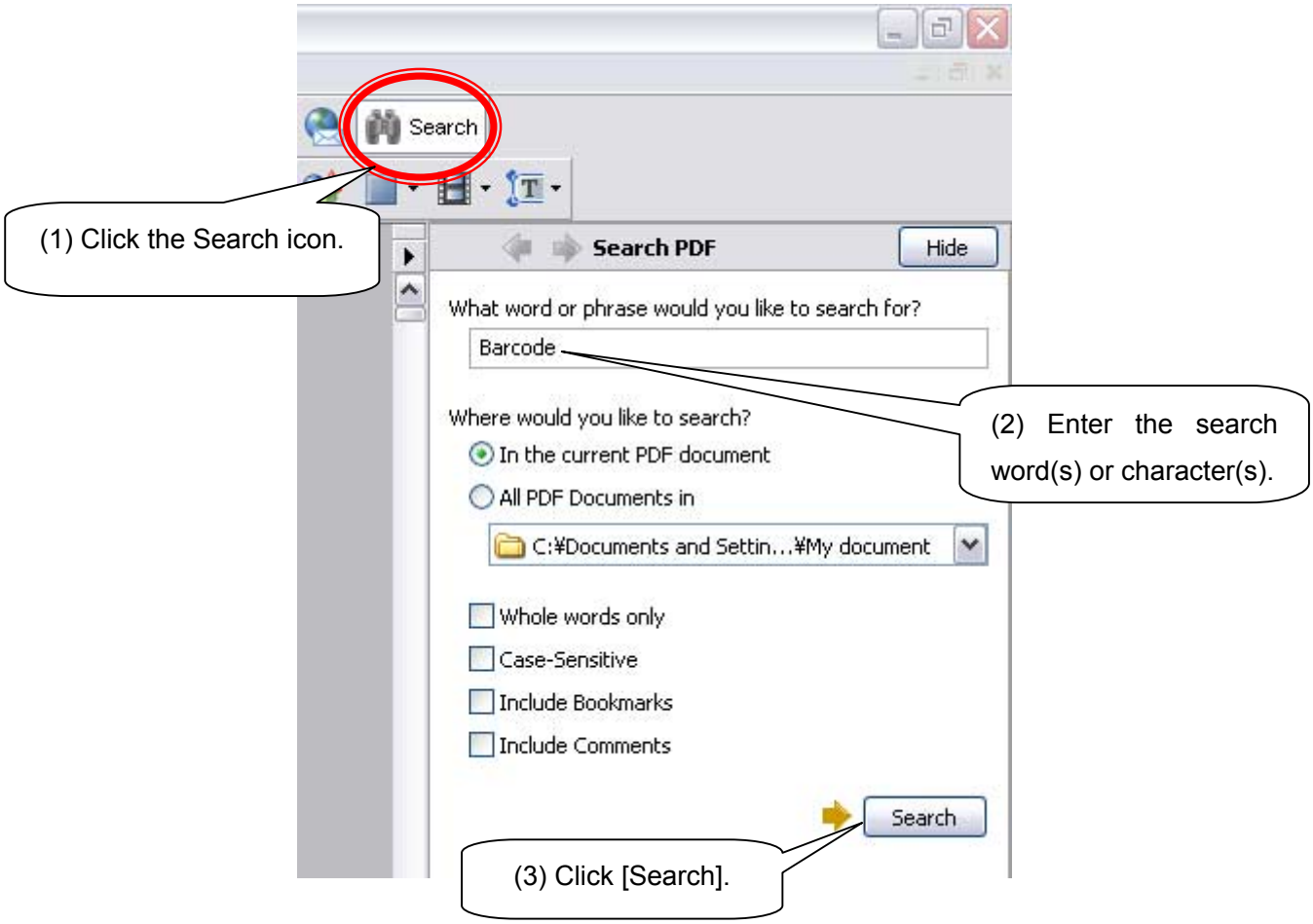
◆ Searching by Word

The PDF search function can be used to jump to the target page by entering words or characters related to the item being searched.

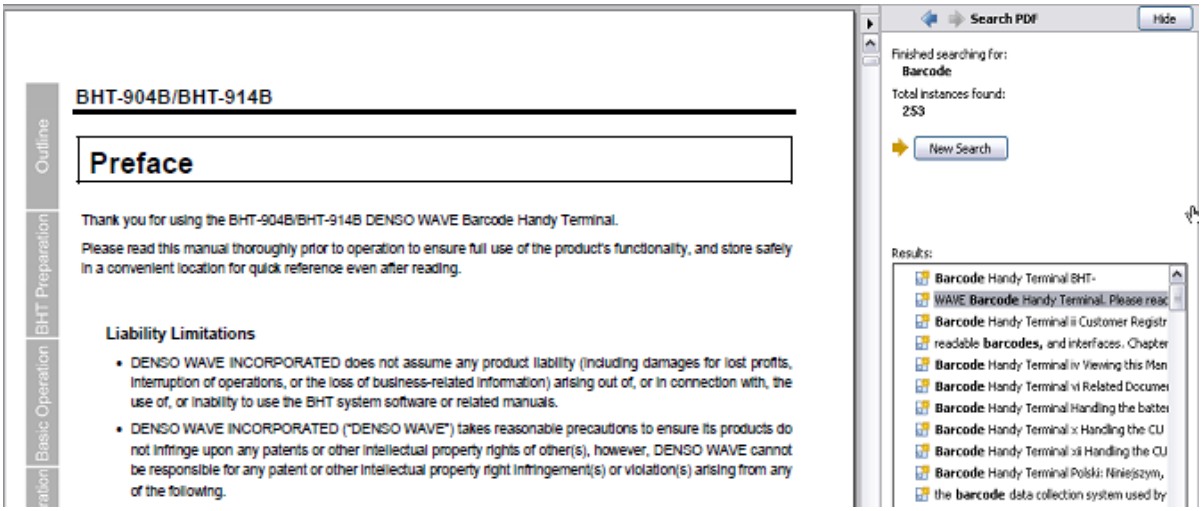
(1) Click the Search icon. (Or select “Edit” – “Search”.)

(2) Enter the word(s) or character(s) to be searched for.

(3) Click [Search].



<Search Results Example>



Related Documentation

- BHT-BASIC Programmer's Manual (BHT-900 Series)
  This is an instruction manual used to create handy terminal programs with BHT-BASIC.

- BHT-BASIC 4.0 Transfer Utility User's Guide
  This is an instruction manual for software relating to data transfer between the computer and BHT-900 and comes bundled with the BHT-BASIC 4.0 Transfer Utility.

- Easy Pack Ad for BHT-900 User's Manual
  This is an instruction manual for the easy operation application software installed before shipping of the BHT-900.

SAFETY PRECAUTIONS

■ Be sure to observe all these safety precautions.

Please READ through this manual carefully. It will enable you to use the BHT and CU correctly.
Always keep this manual nearby for speedy reference.

Strict observance of these warnings and cautions is a MUST for preventing accidents that could result in bodily injury and substantial property damage. Make sure you fully understand all definitions of these terms and symbols given below before you proceed to the text itself.

⚠ **WARNING**	Alerts you to those conditions that could cause serious bodily injury or death if the instructions are not followed correctly.
⚠ **CAUTION**	Alerts you to those conditions that could cause minor bodily injury or substantial property damage if the instructions are not followed correctly.

Meaning of Symbols

	A triangle (△) with a picture inside alerts you to a warning of danger. Here you see the warning for electrical shock.
	A diagonal line through a circle (⃠) warns you of something you should not do; it may or may not have a picture inside. Here you see a screwdriver inside the circle, meaning that you should not disassemble.
	A black circle (●) with a picture inside alerts you to something you MUST do. This example shows that you MUST unplug the power cord.

⚠ WARNING

Handling the battery

Mishandling of the battery may result in electrical shock, overheating, smoke generation, combustion, or blowout. Please read the following items prior to use.

	● Never disassemble or modify the battery.
	● Never connect the battery (+) and (-) terminals with a metal object such as a piece of wire. ● Do not carry or store the battery together with metallic ball-point pens, necklaces, coins, hairpins, etc. ● Do not use or store the battery in places exceeding the service or storage temperature. ● Never put the battery into a microwave oven or high-pressure container. ● Never burn or heat the battery. ● Never use, leave, or charge the battery in the vicinity of high-temperature locations (50°C or higher) such as a fire, stove, or under a scorching sun. ● Never place the battery into or soak it in water or seawater. ● Never charge the battery near a fire or in strong sunlight. Raised battery temperature may result in leakage of battery fluid, blowout, or combustion. ● Never charge or use the battery where any inflammable gases may be emitted. ● Do not stick a needle into the battery, hammer at it, or tread on it. ● Avoid dropping the battery or letting it undergo any shock or impact. ● Do not use significantly damaged or deformed batteries. ● Never apply solder directly to the battery. ● Never charge alkaline batteries. Doing so may result in blowout or leakage of battery fluid.
	● During use, charging, or storage of the battery, if odors come from the battery, the battery is overheated, discolored, deformed, or anything unusual is found, unload the battery from the BHT or charger. Do not use the battery. ● Do not use different types of batteries and used batteries at a time. ● After the battery is charged or immediately after use, the battery may be warm. ● If the battery fluid leaked from the battery gets into the eyes, wash thoroughly with clean water such as tap water without rubbing and obtain medical treatment immediately. Failure to do so will result in eye injuries. ● If the battery does not finish recharging within the specified time, stop recharging.

⚠ WARNING

Handling the BHT

Mishandling of the BHT-904B/BHT-914B may result in electrical shock, overheating, or smoke generation.
Please read the following items prior to use.

	● Never disassemble or modify the BHT.
	● Do not insert foreign materials in the BHT. ● Never place the BHT into or soak it in water or seawater. ● Never put the BHT into a microwave oven or high-pressure container. ● Never put the BHT in places where there are excessively high temperatures, such as inside closed-up automobiles or in places exposed to direct sunlight. ● Avoid using the BHT in extremely humid or dusty areas or where there are drastic temperature changes. ● Do not use the BHT with the damaged case. ● Do not use the power supply other than the battery specified by DENSO WAVE. ● When loading the battery in the BHT unit, set the battery selector switch on the BHT unit correctly in accordance with the type of the battery. ● If the LCD is damaged and the liquid crystal leaks, do not drink, inhale, or apply the liquid crystal on the skin. ● Never stare into the laser light. Failure to do so will result in eye injuries. ● Never point the code reading window at someone's eyes.
	● If smoke, abnormal odors, or noises come out from the BHT, immediately turn OFF the power and pull out the batteries. ● If the LCD is damaged and the liquid crystal gets into the eyes or mouth, wash thoroughly with clean water such as tap water, and obtain medical treatment immediately. Also, if leaked liquid crystal gets on the skin or clothes, wipe it off immediately and wash with soap and water. It can cause loss of sight and skin problems. ● If the LCD is damaged, be careful of broken glass. Failure to do so could result in injury.

⚠ WARNING

Handling the CU

	● If smoke, abnormal odors or noises come from the CU, immediately unplug the AC adapter from the wall socket or CU and contact your nearest dealer. Failure to do so could cause fire or electrical shock. ● If foreign material or water gets into the CU, immediately unplug the AC adapter from the wall socket or CU and contact your nearest dealer. Failure to do so could cause fire or electrical shock. ● If you drop the CU so as to damage its housing, immediately unplug the AC adapter from the wall socket or CU and contact your nearest dealer. Failure to do so could cause fire or electrical shock.
	● Never use the CU for charging anything other than the specified batteries. Doing so could cause heat, battery-rupture, or fire. ● Never bring any metals into contact with the output terminals. Doing so could produce a large current through the CU, resulting in heat or fire, as well as damage to the CU. ● Never use the CU on the line voltage other than the specified level. Doing so could cause the CU to break or burn.
	● Use the dedicated AC adapter only. Failure to do so could result in fire. ● If the power cord of the AC adapter is damaged (e.g., exposed or broken lead wires), stop using it and contact your nearest dealer. Failure to do so could result in a fire or electrical shock.

⚠ CAUTION

To System Designers

	● When introducing BHTs in those systems that could affect human lives (e.g., medicines management system), develop applications carefully through redundancy and safety design which avoids the feasibility of affecting human lives even if a data error occurs.

Handling the BHT

Incorrect handling of the BHT could cause not only incorrect operation, but also generation of heat and smoke from the BHT, and malfunction.
Please read the following items prior to use.

	● When using the hand strap or neck strap, exercise due care to avoid getting them caught in other objects or entangled in rotating machinery. Failure to do so could result in accident or injury.
	● Do not use the BHT in the vicinity of wireless devices such as personal radios and ham radios. This could cause malfunction of the BHT. ● Do not place magnetic cards such as cash cards, credit cards, etc., near the BHT speaker. Doing so may result in the loss of magnetic data. ● Do not place your ear near the speaker when tones are being emitted. Doing so may result in hearing loss. ● Do not apply excessive force when loading or unloading the battery. Doing so will result in damage to the device. ● In environments where static electricity can build into significant charges (e.g., if you wipe off the plastic plate with a dry cloth), do not operate the BHT. Doing so will result in malfunction or machine failure. ● Do not drop the BHT on the floor or apply strong shock to it. Doing so could cause malfunction of the BHT. ● Do not use batteries other than that specified by DENSO WAVE.

⚠ CAUTION

Handling the CU

	● Never disassemble or modify the CU; doing so could result in an accident such as fire or malfunction.
	● Never put the CU in places where there are excessively high temperatures, such as inside closed-up automobiles, or in places exposed to direct sunlight. Doing so could affect the housing or parts, resulting in a fire. ● Avoid using the CU in extremely humid or dusty areas, or where there are drastic temperature changes. Moisture or dust will get into the CU, resulting in malfunction, fire or electrical shock. ● Never cover or wrap up the CU or AC adapter in a cloth or blanket. Doing so could cause the unit to heat up inside, deforming its housing, resulting in a fire. Always use the CU and AC adapter in a well-ventilated area. ● Do not place the CU anyplace where it may be subjected to oily smoke or steam, e.g., near a cooking range or humidifier. Doing so could result in a fire or electrical shock. ● Keep the power cord away from any heating equipment. Failure to do so could melt the sheathing, resulting in a fire or electrical shock. ● Do not insert or drop foreign materials such as metals or anything inflammable through the openings or vents into the CU. Doing so could result in a fire or electrical shock.
	● If you are not using the CU for a long time, be sure to unplug the AC adapter from the wall socket for safety. Failure to do so could result in a fire. ● When caring for the CU, unplug the AC adapter from the wall socket for safety. Failure to do so could result in an electrical shock.

Chapter 1
Outline

This chapter describes the BHT system and provides an overall outline of the BHT.

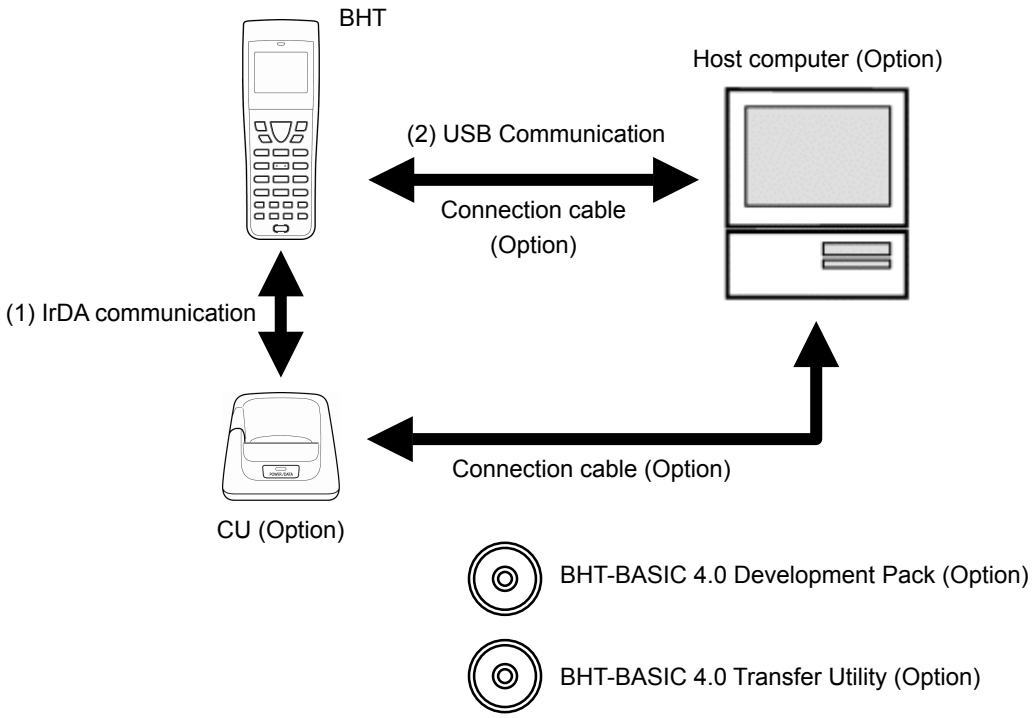
1.1 System Configuration

This section describes the hardware required for the barcode data collection system used by the BHT and the BHT software.

1.1.1 Hardware Configuration

In addition to the BHT, the following hardware and software are required for the barcode data collection system used by the BHT.
Please note that certain components of the required hardware will differ depending on the type of communication used.

- Host computer(Option)
- CU-900 Series (Option): Communication unit
- Connection cable (Option): Used to connect the BHT or CU-900 Series and host computer.
- Software: BHT-BASIC 4.0 Development Pack (Option) and BHT-BASIC 4.0 Transfer Utility (Option)



●: Required for system configuration

	Host computer	BHT	CU	Software	Ref. Page
(1) IrDA communication	●	●	●	●	Page 30
(2) USB Communication	●	—	—	●	Page 31

◆ Host Computer

Allows you to edit, manage and download user programs and data, as well as downloading system programs.

Models: PC/AT Compatible

Operating Systems and Optional Application Programs

OS	Windows XP (32bit edition)	Windows Vista (32bit edition)	Windows 7 (32bit edition)
BHT-BASIC4.0 Development Pack	√	√	—
BHT-BASIC4.0 Transfer Utility*	√	√	√

For the latest information on the operating system supported by the host computer, please access our website.

* This application does not activate any built-in IrDA interface port.

◆ CU-900 Series (Option)

Used for communication between the BHT and host computer.

Communication with the BHT is performed by IrDA communication and communication with the host computer is performed with an RS-232C, Ethernet (10BASE-T), or USB interface.

The following three types of CU are available depending on the interface used to communicate with the host computer.

- CU-901: RS-232C interface
- CU-911: Ethernet (10BASE-T) interface
- CU-921: USB interface

◆ Connection Cable (Option or Commercially Available Product)

Used to connect the host computer and BHT or CU-900 Series.

Select a cable suited to the interface being used.

- BHT: USB cable (Option)
- CU-901: RS-232C cable (Option)
- CU-911: Ethernet (10BASE-T) cable (commercially available product)
- CU-921: USB cable (Option)

* Use a USB2.0 compatible mini-B type cable.

◆ BHT-BASIC 4.0 Development Pack (Option) and BHT-BASIC 4.0 Transfer Utility (Option)

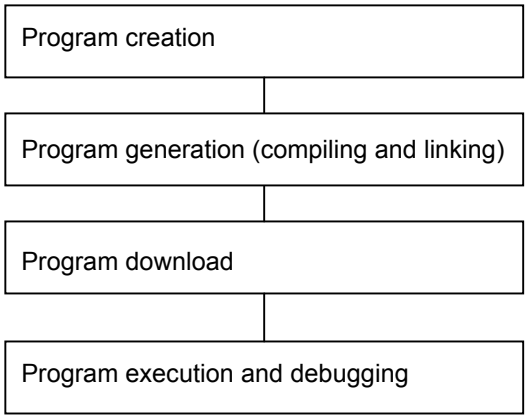
Refer to “Software Configuration” on the following page.

1.1.2 Software Configuration

This section describes the software used for BHT Series application development and application in addition to the software used at the BHT unit.
Please note that the above-mentioned software can be downloaded (Certain versions may be for trial use.) from the QBNet service discussed at “Customer Registration” on page ii.

[1] Application Development Procedure

The procedure for BHT Series program development is as follows.



[2] Software Used for Application

◆ BHT-BASIC Programmer’s Manual for BHT-900 Series

This is an instruction manual used to create handy terminal programs with BHT-BASIC.

◆ BHT-BASIC 4.0 Development Pack (option)

This is a package containing two software products required for BHT-900 Series application development and accessories.
The BHT-BASIC 4.0 Development Pack contains the following products.

- BHT-BASIC 4.0 Compiler
  Compiles and links a source program written in BHT-BASIC 4.0 to create a user program executable on the BHT (*.PD4).

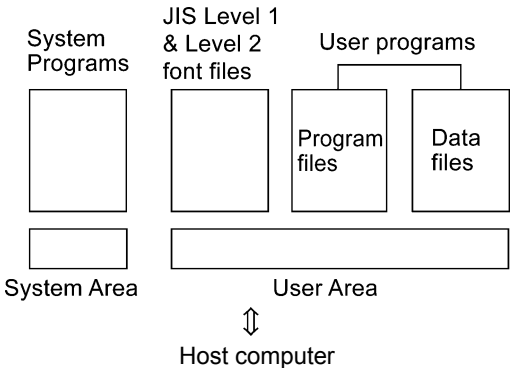
- BHT-BASIC4.0 Transfer Utility
  BHT-BASIC 4.0 specification files such as application programs and data files are transferred using YMODEM protocol.

◆ BHT-BASIC4.0 Transfer Utility (Option)

This is the same BHT-BASIC 4.0 Transfer Utility that comes bundled with the BHT-BASIC 4.0 Development Pack.

[3] Software Used at the BHT Unit

The BHT unit FLASH memory has a system area and user area, with the system program stored in the system area and font files and user programs stored in the user area.
The BHT unit is shipped with the system program and font files stored in their respective areas.



Application programs (*.PD4) stored in the user area are run by the system program in order to use the BHT.
It is necessary to download application programs (*.PD4) and data files (product master files etc.) required to run application programs (*.PD4) to the BHT user area prior to use.

◆ System Program

- Driver

  Drivers is a set of programs that directly controls the BHT hardware. It can be called up by the BHT-BASIC Interpreter or System Mode.

- BHT-BASIC Interpreter

  This program interprets application program (*.PD4) command language and controls the BHT unit hardware via drivers.

- System Mode

  This program is used to operate files, make system environment settings, and perform various types of tests.

  Refer to “Chapter 4 System Operation” .“4.4 System Mode” for further details.

◆ Font File

These files are required to display JIS 1 and 2 standard Kanji characters at the BHT unit LCD display.
By using font files, the BHT unit is able to display 12 or 16 dot Kanji in application programs (*.PD4).

– Point – If you do not need to display Kanji characters, you may delete these JIS font files. After deletion, the memory area which was occupied by these files can be used as a user area.

For the deleting procedure, refer to "Chapter 4 System Operation" - "4.1.4 Performing System Initialization" or "4.5.11 Deleting Font Files (DELETE FILE Menu)."

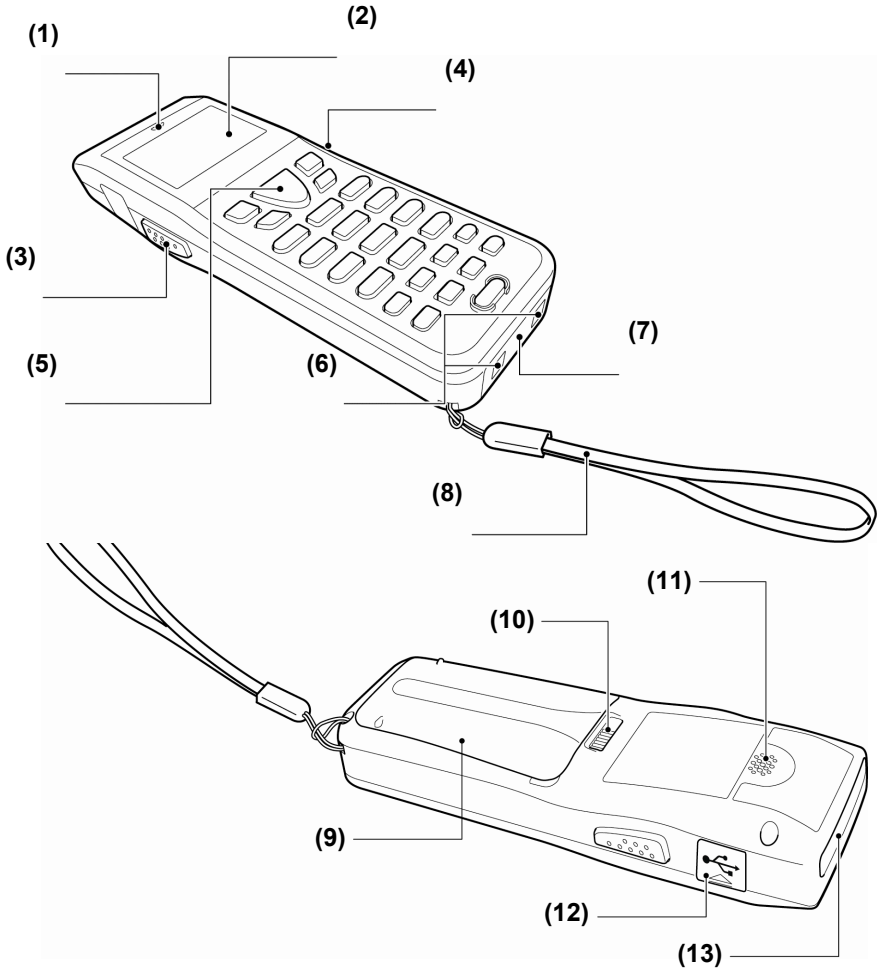
The names of the font file: FNT16J1.FN4 (JIS Level 1 font, 16-dot)
: FNT16J2.FN4 (JIS Level 2 font, 16-dot)
: FNT12J1.FN4 (JIS Level 1 font, 12-dot)
: FNT12J2.FN4 (JIS Level 2 font, 12-dot)
: FNTFSGB.FN4 (Simplified Chinese font)
: FNT16BG5.FN4 (Traditional Chinese font, 16-dot)
: FNT12BG5.FN4 (Traditional Chinese font, 12-dot)
: FNT16HG.FN4 (Hangul font, 16-dot)
: FNT12HG.FN4 (Hangul font, 12-dot)
: FNT16TH.FN4 (Thai font, 16-dot)
: FNT12TH.FN4 (Thai font, 12-dot)

◆ User Programs

Application programs and data files are downloaded to the BHT user area and are collectively known as user programs.
To download a BHT-BASIC 4.0 specification user program to the BHT unit, the BHT-BASIC 4.0 Transfer Utility is required.
By using “drag & drop” function in windows explorer after connecting the BHT unit to a PC, a user program can also be downloaded without using the BHT-BASIC 4.0 Transfer Utility.
Refer to “5.2 USB Communication” for further details.

1.2 Component Names and Functions

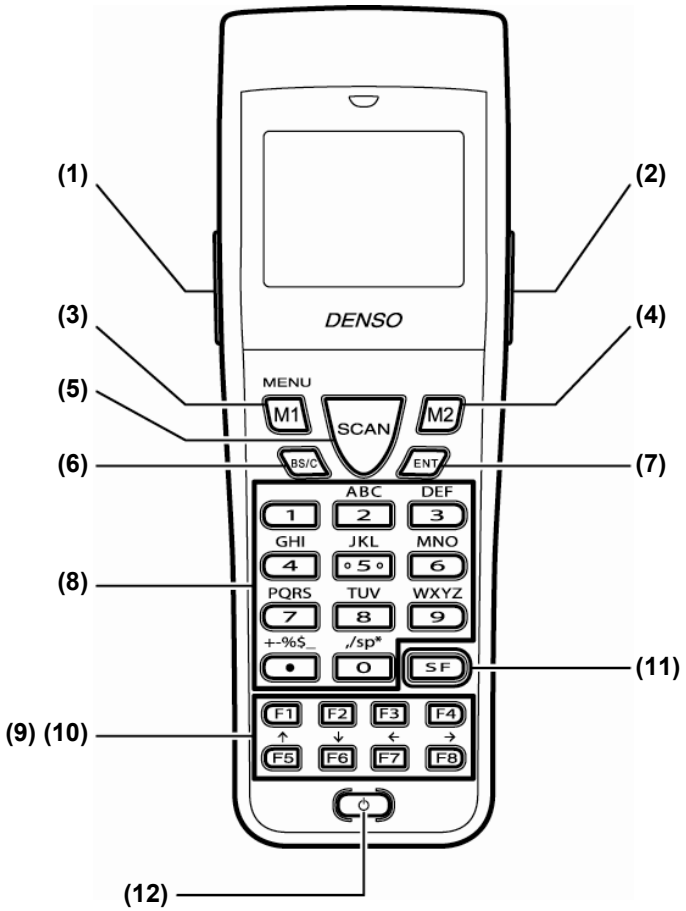
1.2.1 BHT Front/Rear



NO.	Name	Function and Description
(1)	Indicator LED	Indicates the barcode read status. Illuminates in blue when the BHT has successfully read a barcode.
(2)	LCD (Liquid crystal display)	Displays the characters and graphic patterns.
(3) (4) (5)	Trigger switch (magic keys **M3** and **M4**) ※ only BHT-904 **Scan** key (magic key **M5**)	Press when reading a barcode. The **SF** and **ENT** key functions can be assigned to these magic keys by making settings at the SYSTEM MENU. Character strings can be assigned at user programs. * Refer to “Chapter 4 System Operation” for details on how to operate the SYSTEM MENU.
(6)	Charge terminal ※ only BHT-904	Place on the CU to charge the BHT.
(7)	IrDA interface port	Used to exchange data/programs with the communication unit CU-900 or other BHTs.
(8)	Hand strap	Wear this strap around your wrist to prevent you from dropping the BHT accidentally.
(9)	Battery cover	Remove this cover to replace the battery.
(10)	Battery cover lock	Use this to lock or unlock the battery cover.
(11)	Speaker	Emits sound when a barcode is read or when a warning occurs.
(12)	Connector cover	Open this cover to connect the USB cable.
(13)	Barcode reading window	Align the reading window with barcodes to perform barcode reading.

1.2.2 Keypad/BHT Screen

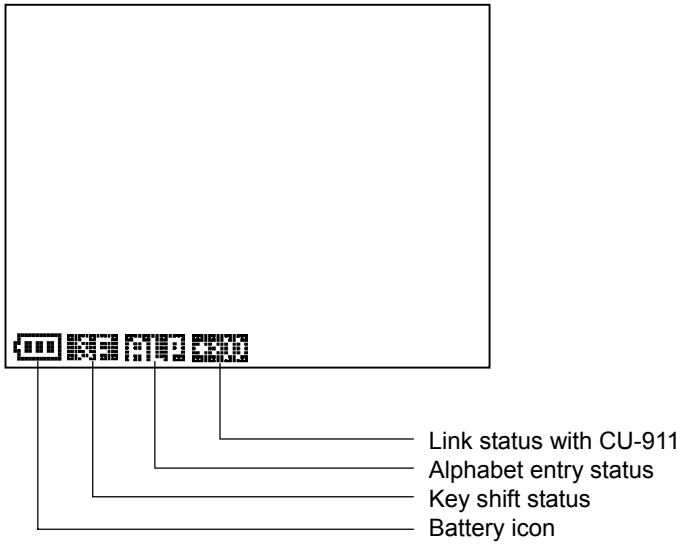
The BHT key functions can be set at user programs.
The diagram below shows an example of settings for each key function.



NO.	Key	Name	Function and Description
(1)		Trigger switch (magic key **M3**) ※ only BHT-904	Each of the **M3**, **M4**, and **M5** keys is assigned to a trigger switch by default. The **M1** to **M5** keys can also be assigned to the trigger switch, **SF**, Enter, Backlight, **MENU**, and **C** keys. Characters strings can be assigned at user programs. When the **M1** key is pressed for at least one second, it functions as the **MENU** key; the following setting screens are then displayed. • Beeper volume • Vibrator • LCD brightness • Power save
(2)		Trigger switch (magic key **M4**) ※ only BHT-904	
(3)	M1	Magic key **M1**	
(4)	M2	Magic key **M2**	
(5)	SCAN	**Scan** key (magic key **M5**)	
(6)	BS/C	Backspace/clear key	Deletes the last character entered (backspace). Pressing this key for at least one second cancels entry and returns to the previous screen (clear).
(7)	ENT	Enter key	Press to finalize entered data or execute operations.
(8)		Numeric keys	Used to enter data.

NO.	Key	Name	Function and Description
(9)	F1 ～ F8	Function keys	Used to select functions. * The functions of the function keys are assigned at user programs. For details, refer to the Programmer's Manual.
(10)	F5 ～ F8	Cursor keys	Used to move the cursor and select menus.
(11)	SF	Shift key	Used in combination with other keys such as the numeric keys and ⏻ key for special input procedures.
(12)	⏻	Power key	Turns ON or OFF. * After data backup, hold down the Power key for at least 1 seconds. For details, refer to "2.6 Turning OFF the Power".

If the system display is set to ON at the system settings or in the user program, icons display at the bottom of the screen (default) indicating the key shift status, alphabet entry status, and status of the link with the CU-911.



	This is the battery icon. Indicates the current battery power level. (Page 15)
	Displays when the SF key is pressed and the keys are in the shift status.
	When the SF key is pressed while set to alphabet entry mode at the user program, the entry mode changes from “numeric entry” to “alphabet entry” and displays. Refer to “Chapter 7.2.1 Numeric, Alphabet Entry of Programmer’s manual” for more information. Alphabet entry is used when performing FTP settings.
	displays when a link is established with the CU-911. When an attempt is made to perform communication with the CU-911 when no link has been established, the icon flashes. When there is no response from the CU-911, when waiting for the link with the CU-911 to be established, or when waiting for the link to be disengaged, the icon displays in the order → → → .

Chapter 2
BHT Preparation

This chapter presents information on how to load the battery, turn ON/OFF the BHT power, and on the use of the hand strap.

2.1 “BHT Preparation” Procedure

Follow the steps below to prepare the BHT for use.

2.2 Loading the Battery
(Page 13)

First load the battery.

↓

2.3 Wearing the Hand Strap
(Page 16)

Wear the hand strap at your wrist to prevent the BHT from being dropped.

↓

2.4 Initial Setup
(Page 17)

Set the calendar clock and the message language when the power is turned ON for the first time.

2.2 Loading the Battery

Batteries are not included in the package. Have the battery specified by DENSO WAVE ready.

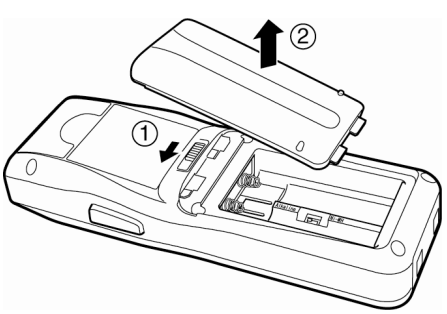
Specified battery: AA alkaline battery (LR6) or AA rechargeable battery eneloop® (HR-3UTGA)

Note 1: Use rechargeable batteries already charged.

Note 2: eneloop® is a registered trademark of SANYO Electric Co., Ltd.

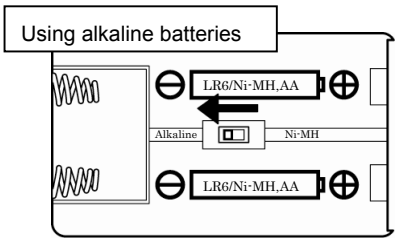
Note 3: If rechargeable batteries other than eneloop® are used, the BHT unit may not operate properly.

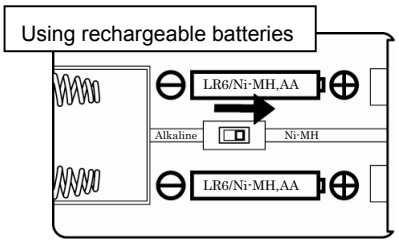
1. Slide the battery cover lock (1) in the direction indicated by the arrow and remove the battery cover (2).



2. Make sure to use the battery selector switch to select the desired battery type.

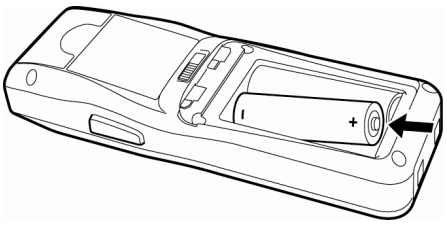
– Point – To ensure correct operation of the battery power level indicator and the charging function, make sure to select the desired battery type with the battery selector switch.



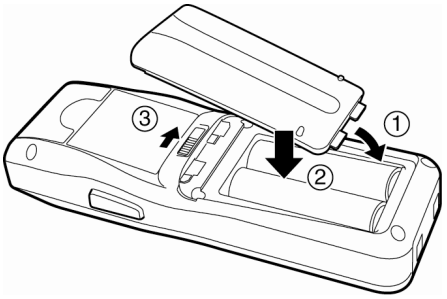


3. Make sure that the new batteries are in the correct orientation when inserting them. Insert the new batteries in the direction indicated by the arrow.

– Point – Do not use batteries other than those specified by DENSO WAVE.



4. Insert the battery cover tab (1), and then close the battery cover (2). The battery cover is now locked in position.



Mishandling of the battery may result in electrical shock, overheating, smoke generation, combustion, or blowout. Please read the following items prior to use.

⚠ **WARNING**

- Never disassemble or modify the batteries.
- Never connect the battery (+) and (-) terminals with a metal object such as a piece of wire.
- Never carry or store the batteries together with metallic necklaces, hairpins and so on.
- Never expose the batteries to fire or apply heat.
- Never use or leave the batteries in the vicinity of high-temperature locations (60° C or higher) such as a fire or stove.
- Never place the batteries into or soak them in water or seawater.
- Never charge or use the battery where any inflammable gases may be emitted.
- Never hammer nails into the batteries, hit them with a hammer, or trample on them.
- Never apply strong impact to or throw the batteries.
- Never use significantly damaged or deformed batteries.
- Never apply solder directly to the batteries.
- During use, charging, or storage of the battery, if odors come from the battery, the battery is overheated, discolored, deformed, or anything unusual is found, unload the battery from the BHT. Do not use the battery.
- If battery fluid leaked from the batteries get into the eyes or come into contact with the skin, wash thoroughly with clean water such as tap water without rubbing, and obtain medical treatment immediately. Failure to do so will result in eye or skin injuries.

– Important–

- If the BHT unit is left with the battery removed for an extended period, the memory contents will no longer be backed up and the message “Contact your administrator. Note the error number. (XXXX)” or “Set the current date and time.” may appear on the LCD.
- Refer to “Chapter 6 Maintenance” – “6.2.3 Using the BHT after Long Periods” for details of handling the BHT after long periods of time.
- Do not touch the BHT and battery terminals by hand or stain them. Doing so may result in a BHT malfunction. It is recommended that dirt on the battery terminals or BHT battery terminals be periodically wiped with a soft and dry cloth.

2.2.1 Battery Power Level Indicator

Confirming at the Power Level Icon

The battery power level can be confirmed at the battery icon () displayed in the bottom left of the LCD screen.
The battery power is indicated in four levels.
The battery power level indicator tells you when to charge the batteries.

 : Sufficient battery power remains.
 : The battery power is partially depleted.
 : The battery power is almost fully depleted. Charge immediately or replace with new batteries.
 : The battery power is totally depleted.
Charge immediately or replace with new batteries.

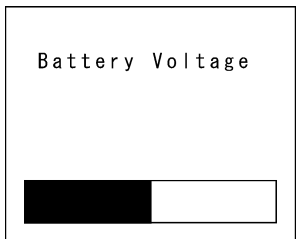
Confirming at the “Battery Voltage” Screen

The battery power level can also be confirmed at the "Battery Voltage" screen.

Display the "Battery Voltage" screen using the following procedure.

1. Hold down the **SF** key and press the Enter key.

The "Battery Voltage" screen displays while the keys are pressed.



About the Battery Level

- The battery power level indicator does not accurately reflect the battery residual power and should only be used as a guideline.
- The battery power level will fluctuate due to BHT operation, and therefore disparities may occur between the actual battery voltage and the display indicator.
- Ensure to replace the batteries or charge them as soon as possible before the battery power is depleted.

– Point – If the BHT is placed in the alphanumeric entry system in user programs, the combination of the **SF** and **ENT** keys cannot be used for displaying the battery voltage level. This is because in the alphanumeric entry system the **SF** key is used for switching between the numeric and alphabet entry modes.

– Note – In user programs, you may select the key to be used for displaying the battery voltage level (instead of the default: combination of **SF** and **ENT** keys).

The displayed battery level shows the terminal voltage of the batteries, not how much power is left.

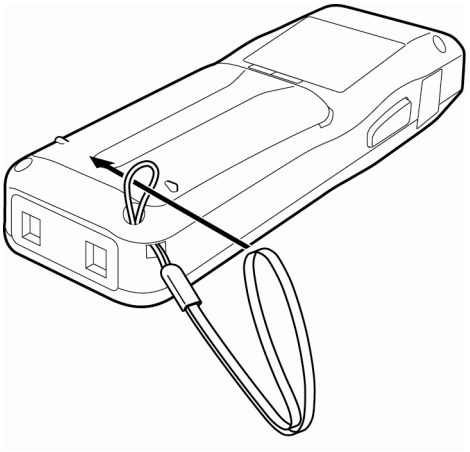
The actual voltage level varies depending upon the operation of the BHT, so the displayed level also may vary.

2.3 Wearing the Hand Strap

Wear the hand strap to prevent the BHT from being accidentally dropped during use.

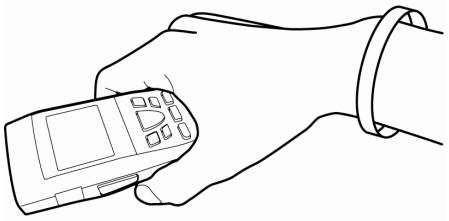
2.3.1 Attaching the Hand Strap

Attach the hand strap to the BHT as shown below.



2.3.2 Holding the BHT

Wear the hand strap to your wrist and hold the BHT as shown below.



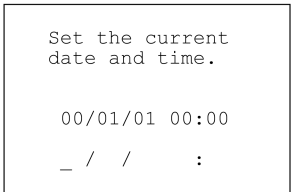
or

2.4 Initial Setup (Setting the date, time, and message language)

Turn ON the power after inserting the batteries into the BHT.
Note that the clock and message language are not set at the time of purchase. Therefore, it is necessary to make those settings when turning ON the power for the first time.
When resetting the date and time, operate the BHT according to the following procedures.

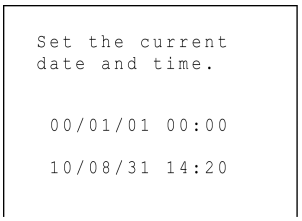
1. Press the Power key (⏻) to turn ON the BHT.

The screen right displays.



2. Enter the date and time using the numeric keys.

[Ex.] : August 31, 2010, 14:20



– **Point** – Enter the last two digits for the year, and enter the time in 24-hour clock format.

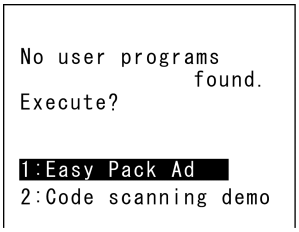
3. Press the **ENT** key to set the date and time.

When the date and time are set, the screen on the right appears. Press the numeric key corresponding to the desired message language.

“1: English”: Messages are displayed in English.
“2: Japanese”: Messages are displayed in Japanese.
“3: Chinese”: Messages are displayed in Simplified Chinese.
“4: Taiwanese”: Messages are displayed in Traditional Chinese.
“5: Korean”: Messages are displayed in Korean.
“6: Thai”: Messages are displayed in Thai.

4. Press the **ENT** key to update the message language setting.

When the message language is decided, the screen on the right appears.



– **Point** – All font files except a selected language font will be deleted.

Font files can be downloaded from the Qbdirect service (register for free membership).

5. Press numeric key [1] or [2] and **ENT** key to select either of the following items.

1: Easy Pack Ad

Activates the easy operation application software.

For details, refer to the manual accompanying with the application.

2: Code scanning demo

A scanning demo commences.

The scanning demo is a program that allows barcodes to be read without a user program. Press the trigger switch to enable barcode reading.

Refer to "Chapter 3 Basic Operation" – “3.1 Reading Barcodes” and read a barcode.

– Point – The easy operation application software “Easy Pack Ad for BHT-900” is activated by selecting [1: Easy Pack Ad].

2.5 Easy Pack Ad for BHT-900

The BHT-900 is shipped with the simple job application [Easy Pack Ad for BHT-900] that was used with the BHT.

2.5.1 Features

[Easy Pack Ad for BHT-900] has the features listed below.

・[Easy Pack Ad for BHT-900] is prepared with the following jobs.

Collect : Enter multiple part numbers (Part No.) and the corresponding quantities (Qty.), and then save a record of the data in the "JISSEKI.CSV" file.

1:1 Verify : Two sets of data are read in order, and then compared. If the two sets of data do not match, an error is reported.

1:n Verify : A set of data is read and repeatedly compared to a master data file. If the data does not match with the master data, an error is reported.

・When the BHT is directly connected to a PC using a USB cable, achievement files can be obtained in the desired folder via drag-and-drop in Windows Explore. Refer to "5.2 USB Communication" for further details.

2.5.2 Activating the Application

1. Select “1: Easy Pack Ad” in step 4 of 2.4 and then press the **ENT** key.

The screen on the right appears.

2. Press the **SCAN** key to activate the Easy Pack Ad for BHT-900.

The screen on the right appears.

– **Point** – When the **M1** key is pressed, the Easy Pack Ad for BHT-900 is activated in the same manner as for the **SCAN** key. Note, however, that the screen in step 1 is no longer displayed after this point. To turn the power OFF, press the **M2** key.

3. When information loading is complete, the screen on the right appears.

– **Note** – For information on how to use the “Easy Pack Ad for BHT-900”, first obtain the product from the QBdirect service (http://www.qbdirect.net/) and then check how to use the software.

2.6 Turning OFF the Power

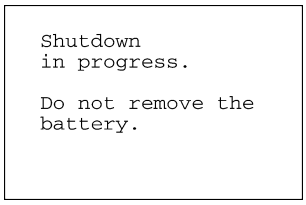
You can turn OFF the BHT in one of the following three methods.

Methods	Operation	Data back-up timing
Normal power OFF	Press the Power key (⏻).	20 minutes after the power is turned off
Turning the power OFF after data back-up	Hold down the Power key (⏻) for at least 3 seconds.	At the power OFF
Auto power OFF	The power turns OFF itself when the BHT is not used for specified period of time set at the user program.	20 minutes after the power is turned off

2.6.1 Normal Power OFF

1. Press the Power key (⏻).

The BHT turns OFF after the message on the screen given to the right displays.



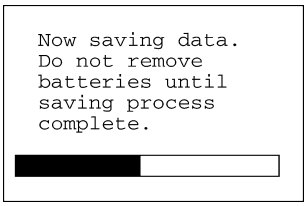
– **Point** – Do not remove the batteries while the message on the right is displayed.

When the power is next turned ON, there are times when a message “Contact your administrator. (XXXX)” displays asking the user to contact the administrator.

2.6.2 Turning the Power OFF after Data Back-up

1. Hold down the Power key (⏻) for at least 3 seconds.

The message right displays and data back-up is commenced.
The power turns OFF itself when the back-up is complete.



– Point – The back-up process may take several tens of seconds depending on the amount of data.

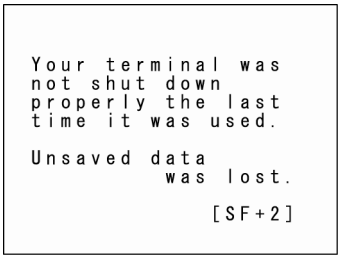
2.6.3 Auto Power OFF

The power turns OFF itself when the BHT is not used for the specified period of time set at the user program.
This is set to 3 minutes at default when the BHT is shipped from the factory.
* Refer to “BHT-900 Programmer’s Manual” for details of auto power OFF.

2.6.4 If the BHT Is Shut Down Abnormally

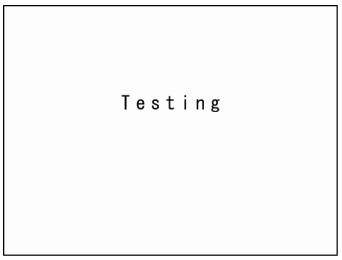
If the BHT is shut down abnormally* and is left without a batteries or with discharged batteries inserted, then unsaved data may be lost.
(* “Normally shut down” refers to “2.6 Turning OFF the Power.”)

1. The right screen will appear when you load the charged batteries and turn the BHT on.

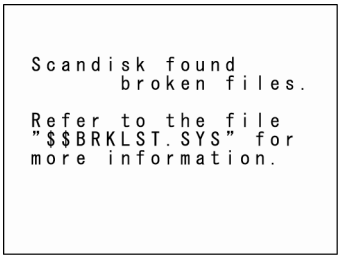


2. Then, “Testing” appears.

The screen on the right appears.
In some cases, it may take 20 to 30 seconds for the screen to appear.
When complete, the system starts.



If Scandisk finds a broken file or files, the screen on the right appears.
(If any broken files exist, the screen on the right appears each time the BHT starts.)

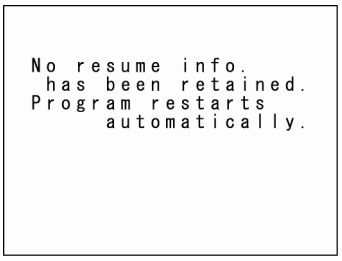


(Refer to “About “$$BRKLST.SYS” on the following page.)

After a few seconds with the screen displayed, the system starts.

Scandisk when the resume function is enabled

If Scandisk runs when the resume function is enabled, the screen given right may appear.



The BHT displays the screen for three seconds and then automatically runs the execution program from the beginning.
(The screen may also appear when the calendar clock built in the BHT stops, even without running Scandisk.)

– Note – The resume function is used to return the display to the status (screen) when the power was last turned OFF when the power is next turned ON.

Resume function settings are made at the “SET SYSTEM” menu. Refer to “Chapter 4 System Operation” – “4.5.6 System Environment Settings (SET SYSTEM Menu)” for further details.

About "$$BRKLST.SYS"

If Scandisk finds an invalid file(s), it will automatically create the "$$BRKLST.SYS" file.
To check the contents of the file, upload the file in System Mode to the host computer. (Refer to "Chapter 4 System Operation" – "4.5.4 Uploading Files (UPLOAD MENU).")

Contents of the "$$BRKLST.SYS" file

Records:	(1) File name	
	(2) Error factor	+ (Broken since the BHT has not been turned off normally) * (Broken due to any other causes)
	(3) Broken records	01000-01200 (Data in records numbered 1000 to 1200 is lost)

[Ex.]

SAMPLE1.DAT + 01000-01050
SAMPLE1.DAT + 01200-01250
SAMPLE1.DAT + 01600-01650

← If more than one sequence of records is broken in a same file, they will be written into the subsequent records in the "$$BRKLST.SYS."

SAMPLE2.DAT * 00250-00275
SAMPLE3.DAT * 00100-00150

(1) (2) (3)

2.6.5 If Broken Files Are Found

If broken files are found, carry out either of the following operations.

- Delete those broken files.
- Download valid files having the same names as broken ones.

(Refer to "Chapter 4 System Operation" – "4.5.10 Deleting Program/Data Files (DELETE FILE MENU).")
(Refer to "Chapter 4 System Operation" – "4.5.3 Downloading Files (DOWNLOAD MENU).")

Chapter 3
Basic Operation

This chapter describes basic operations such as barcode reading, numeric data entry and item selection using the BHT, basic changes to settings, and BHT data transmission.

3.1 Reading Barcodes

Follow the procedure below to read barcodes.

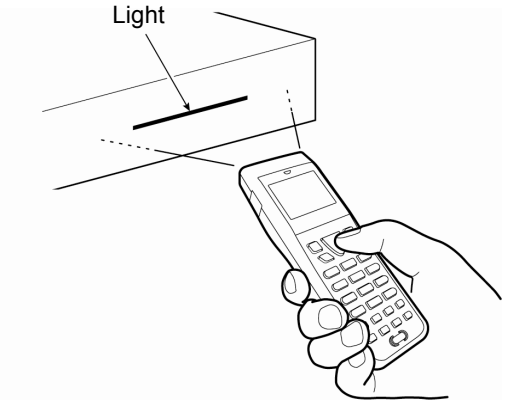
1. Turn the BHT power ON.

2. Press the trigger switch

The BHT emits light.

– Point – The trigger switch is assigned to magic keys **M3(*1)** and **M4(*1)** and **SCAN** key (**M5**) when shipped from the factory.

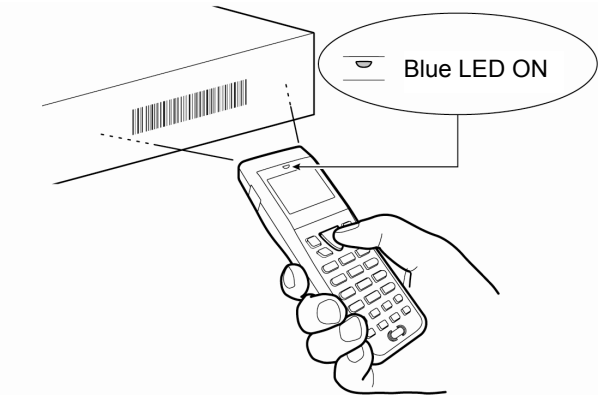
*1: only BHT-904B



3. Hold the BHT close to the barcode within the reach of light.

When the BHT has read the barcode successfully, the indicator LED will illuminate in blue.

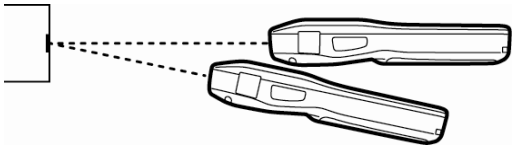
– Point – The barcode reading method may differ depending on the application. Select the most appropriate option in accordance in the User's Manual.



– Note –

- If required, clean dirty barcodes before reading.
- It may not be possible to perform reading in direct sunlight.
- If the barcode is on a curved surface, perform reading in the center of the light emission range.
- If the barcode reading window is pulled away from the barcode, the readable barcode range will become narrower than that of the light emission.

When unable to successfully read barcodes…

Cause		Countermeasure
Specular reflection	When the light is focused on the printed surface of the barcode from directly above, the BHT may not read the code due to specular reflection.	Change the BHT reading angle and try again. 
Distance from barcode	Reading may be unsuccessful if the barcode is wider than the barcode reading window.	Move the BHT slowly toward or away from the barcode and try again. Barcode reading is possible from a maximum distance* of 32 cm. * Under the following conditions: - Ambient illuminance: 500 Lx. (fluorescent lamp) - ITF conforming to the UPC Shipping Container Code - PCS value: min. 0.9 - Narrow bar width: min. 1.0 mm
Barcode surface curvature	The barcode may not be read if surface is extremely curved.	Read the barcode at the center of the barcode reading window.
Barcode surface dirt	The barcode may not be read if its surface is dirty.	Wipe the dirt from the barcode and try again.
Barcode reading window dirt	The barcode may not be read if the barcode reading window is dirty.	Blow any dust away with an airbrush, and then gently wipe the reading window with a cotton swab or similar soft object.
Direct sunlight, ambient light	Barcode reading may be adversely affected by direct sunlight or the brightness of the surrounding light.	Read the barcode away from direct sunlight. Adjust the brightness of the surrounding light when reading indoors.

3.2 Numeric Data Entry

Enter numeric data such as product volume with the numeric keys and Enter (ENT) key.
If numeric data is entered incorrectly, use the Backspace/clear key (BS/C) to delete the data and then reenter with the numeric keys.

When Entering “120”	Key Operation
Press numeric keys [1], [2], and [0] followed by the Enter key.	1 2 0 ENT

3.3 Task Selection

If a selection item "such as “1: XXX 2: XXX” with numeric values displays, enter the values with the numeric entry keys and then press the Enter key.

When Selecting Task 2: XXX	Key Operation
Press numeric key [2] followed by the Enter key.	2 ENT

If a YES/NO selection screen such as “1: YES 2: NO” displays, press numeric key [1] to select “YES”, and [2] to select “NO”.

When Selecting “1: YES”	Key Operation
Press numeric key [1] followed by the Enter key.	1 ENT

3.4 Changing the Default Settings

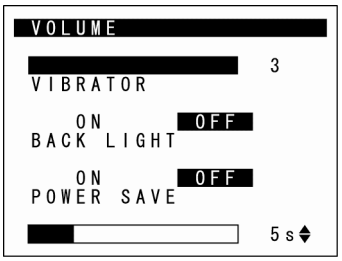
The following settings can be changed at the MENU screen.

Item	Details	Setting
VOLUME (BUZZER VOLUME)	Used to set the volume of the buzzer that notifies the user when barcode reading is complete. The volume can be adjusted in 4 levels: Hi, Lo, Mid and Mute.	Mute→Lo→Mid→Hi
VIBRATOR	Used to turn ON/OFF the vibrator that notifies the user when barcode reading is complete.	ON, OFF
BACKLIGHT	Used to turn ON/OFF the backlight.	ON, OFF
POWER SAVE	Used to set the time until the LCD screen backlight is dimmed when not in use in order to save power.	1-second units (max. 30 seconds)
BRIGHTNESS (BACKLIGHT ON)	Used to set the backlight brightness of the LCD screen. The brightness can be adjusted in 6 levels.	Levels 0 to 5

3.4.1 Procedure

1. Hold down magic key **M1** for at least 1 second.

The MENU screen displays.



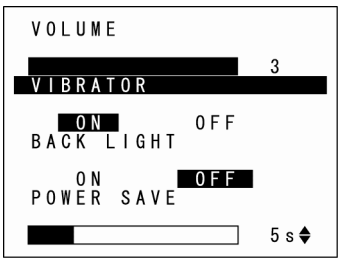
2. Use the [▲] and [▼] cursor keys to select the item to be changed.

The selected item is highlighted.

When the [▲] cursor key is pressed with the “VOLUME” selected or when the [▼] cursor key is pressed with the “POWER SAVE” selected, the next screen appears.

3. Use the [◄] and [►] cursor keys to select the setting.

F5 ~ F8



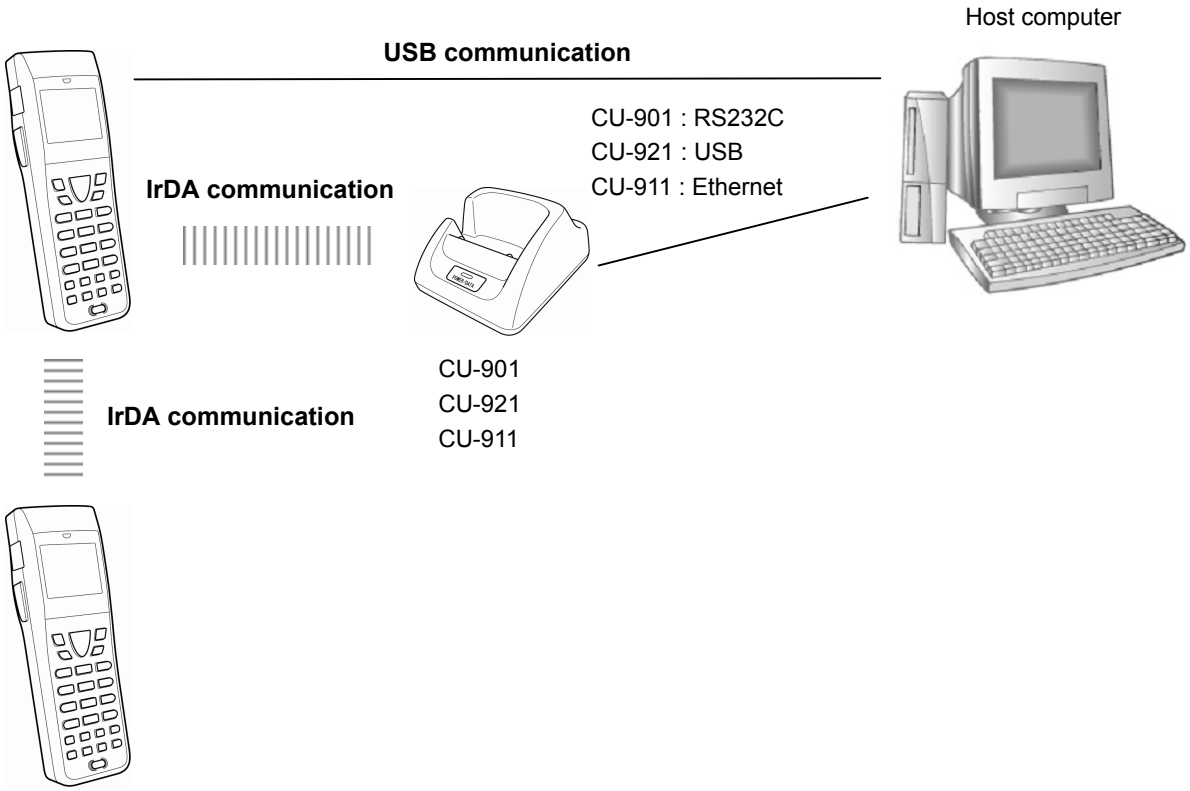
4. Press any of the following keys to exit the settings screen.

- **M1** key long press
- Backspace/clear key long press
- Enter key

3.5 Transmitting Data

Three methods for transmitting data which the BHT collects to the host computer are possible; via IrDA, or USB.
When performing data communication between BHT units, use the IrDA communication.
The data transmission method and BHT setting method will differ depending on the system used, and therefore the system administrator should be contacted for details of operation.

Request
Data gathered by the BHT should be promptly uploaded to the host computer.



3.5.1 IrDA communication

◆ When performing data communication between BHT units

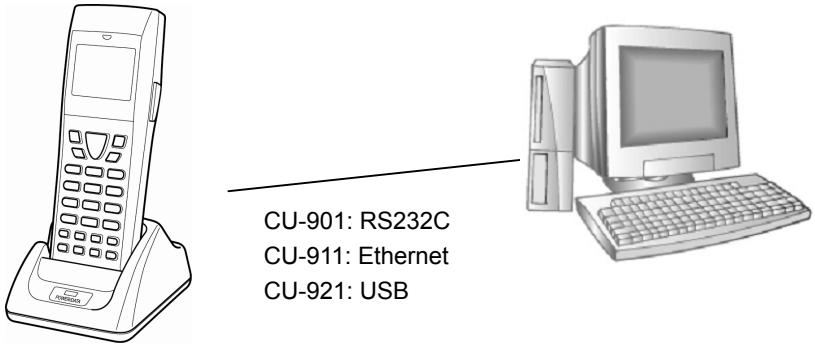
Point the BHT IrDA communication ports toward each other and perform communication.

Request

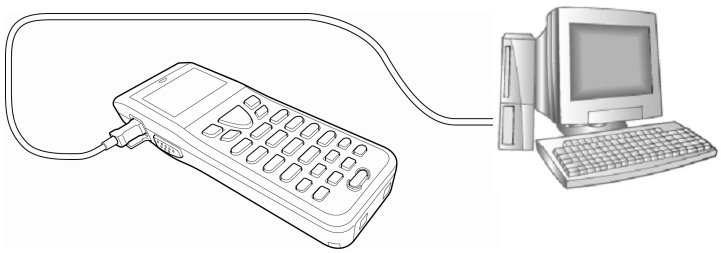
- Make sure that the light path between the BHT and any target stations is not obstructed.
- Perform communication within the effective IrDA emission range (15 cm).
- Do not operate remote control units for televisions and so forth in the vicinity of IrDA communication. This may result in communication failure.
- Perform communication in locations where the BHT units will not be exposed to light interference from sources such as intense ambient lighting (inverter-driven fluorescent lighting, in particular) or direct sunlight. This may result in communication failure.

◆ When performing data communication with the host computer

If the host computer is not equipped with an IrDA communication port, place the BHT on the communication unit (CU-901, CU-921 or CU-911) and transmit data.
In case of using the CU-901 or CU-921, the BHT-BASIC 4.0 Development Pack (Option) and BHT-BASIC 4.0 Transfer Utility (Option) software is required.
In case of using the CU-911, FTP communication environment is required.



3.5.2 USB Communication



Request

- Use a USB2.0 compatible mini-B cable, sold separately.
- Connect the BHT to the USB port on the main body of the host computer.
- If a connection is made via the hub, proper communication may not occur.
- Do not unplug and plug in the USB cable repeatedly in a short period of time. Doing so may result in the host computer being locked.

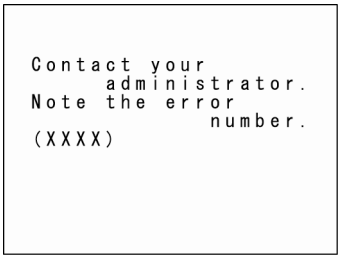
Chapter 4
System Operation

This chapter describes how to initialize and update the system, start up a user program, and operate System Mode.

4.1 Initializing the BHT System

By initializing the system, program files and data files downloaded to the BHT user area are deleted, and system settings are returned to the default status when shipped from the factory.
The system must be initialized when:

- Deleting all program files and data files downloaded to the BHT user area (Font files are also deleted by selecting the area subject to initialization.)
- The following message displays on the screen when the BHT is turned on.



– **Point –** By initializing the system, all files in the user area are deleted, and therefore all files that need to be backed up should be uploaded to the host computer and so on beforehand.
Refer to section “4.5.3 Uploading Files (UPLOAD Menu)” for details of uploading.

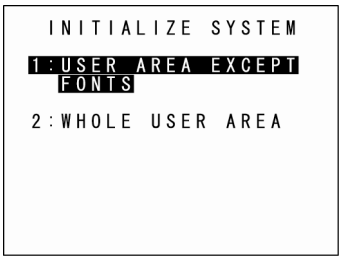
The initialization procedure is described on the following pages.
Perform operation in accordance with the procedure for each item.

■ Selecting the Memory Area to be Initialized
↓
■ Selecting the Message Version
(English/Japanese/Simplified Chinese/Traditional Chinese/Korean/Thai)
↓
■ Confirming the Memory Area to be Selected for Initialization
↓
■ Performing System Initialization

4.1.1 Selecting the Memory Area to be Initialized

1. Press the Power key (⏻) while holding down the **SF**, **M1** and [0] keys together.

2. Select the memory area to be initialized.



(1) To exempt font files from deletion

Ensure that "1: USER AREA EXCEPT FONTS" is selected and press the **ENT** key.

The screen changes to the "4.1.2 Selecting the Message Version (English /Japanese/Simplified Chinese/Traditional Chinese/Korean/Thai)".

(2) To delete font files

Press the [2] key to select "2: WHOLE USER AREA", and press the **ENT** key.

The screen changes to the "4.1.2 Selecting the Message Version (English/Japanese/Simplified Chinese/Traditional Chinese/Korean/Thai)".

"1: USER AREA EXCEPT FONTS"

The user area is initialized without deleting file fonts.

"2: WHOLE USER AREA"

The entire user area is initialized and therefore file fonts are also deleted.

– Point – If a "Contact your administrator. (XXXX)" message displays when the BHT power is ON, select "2: WHOLE USER AREA".

4.1.2 Selecting the Message Version (English/Japanese/Simplified Chinese/Traditional Chinese/Korean/Thai)

1. When the screen displays as shown on the right, select the message display language with the numeric keys.

"1: English": Messages are displayed in English.
"2: Japanese": Messages are displayed in Japanese.
"3: Chinese": Messages are displayed in Simplified Chinese.
"4: Taiwanese": Messages are displayed in Traditional Chinese.
"5: Korean": Messages are displayed in Korean.
"6: Thai": Messages are displayed in Thai.

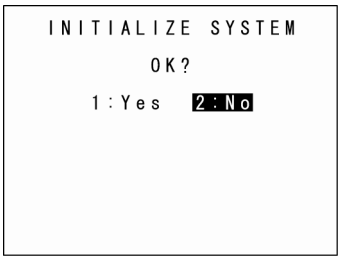
2. Press the **ENT** key.

Proceed to the operation at section "4.1.3 Confirming the Memory Area Selected for Initialization".

4.1.3 Confirming the Memory Area Selected for Initialization

(1) To exempt font files from deletion

When the screen displays as shown on the right, select the item and press the **ENT** key.

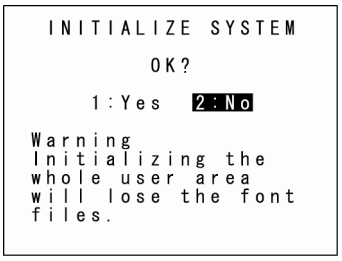


Press the Backspace/clear key to return to the screen to select the area for initialization.

"1: Yes":
The system will be initialized without deleting font files.
"2: No":
Cancels system initialization and turns the BHT power OFF.

(2) To delete font files

When the screen displays as shown on the right, select the item and press the **ENT** key.



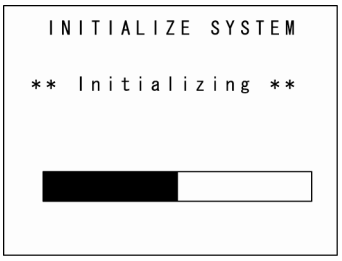
Press the Backspace/clear key to return to the screen to select the area for initialization.

"1: Yes":
The system will be initialized, and all files in the user area, including font files, will be deleted.
"2: No":
Cancels system initialization and turns the BHT power OFF.

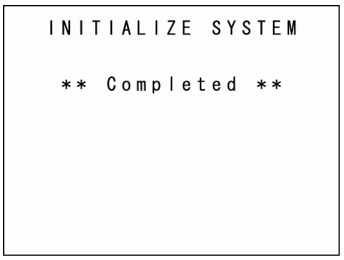
– **Note** – Font files can be downloaded from the web site (http://www.qbdirect.net/).

4.1.4 Performing System Initialization

1. The screen displays as shown on the right during system initialization.



2. Upon completion of system initialization, the BHT displays the screen on the right for a second and then turns OFF automatically.



– Point –

- Never turn OFF the BHT power during system initialization. Turning the power OFF too early will interrupt the process, requiring initialization to be performed again.
- If a "Contact your administrator. Note the error number. (XXXX)" message displays even although initialization has been completed, initialize the BHT again.
- Following initialization, all programs and data files stored in the target memory area will be lost. Download them again if necessary. (Refer to section "4.5.3 Downloading Files (DOWNLOAD Menu)" for details of downloading.)
- Always set the calendar clock and the message language following initialization. (Refer to "Chapter 2 BHT Preparation" – "2.4 Initial Setup".)
- Initialization will restore the display contrast level, communication conditions and other settings to their default values when shipped from the factory, and therefore they should be edited if necessary.

4.2 Updating the System

4.2.1 Updating the BHT System

The BHT system update procedure is as follows.

BHT System Update File Download
↓
BHT System Update

◆ BHT System Update File Download

Refer to sections “4.5.3 Downloading Files (DOWNLOAD Menu)” and “4.5.9 Downloading/Uploading Files by FTP (FTP MENU)”, and download the BHT system update file to the BHT.

– **Note** – The BHT system update file can be downloaded from the following Web site.
http://www.qbdirect.net/

◆ BHT System Update

Refer to section “4.5.15 Updating the System (MODIFY MENU)” and update the BHT system.

– **Important** – In order to prevent the battery running low during the system update process, perform the system update with the batteries sufficiently charged, with the batteries charging via a USB cable, or with the BHT placed in the CU-900 Series. During system update, the power will not turn OFF even if the Power key (⏻) is pressed. Wait until the system update process is complete before operating the BHT.

4.2.2 CU-911 System Update

The CU-911 system update procedure is as follows.

CU-911 System Update File Download
↓
CU-911 System Update

◆ CU-911 System Update File Download

Refer to sections “4.5.3 Downloading Files (DOWNLOAD Menu)” and “4.5.9 Downloading/Uploading Files by FTP (FTP MENU)”, and download the CU-911 system update file to the BHT.
Download the CU-911 system update file as a data file with field length of 64 bytes.

– **Important** – If the Transfer Utility is used to download in BHT protocol, select the “Perform binary file transfer (F)” check box at the Transfer Utility Options screen and then download.

– **Note** – The CU-911 system update file can be downloaded from the following Web site.
http://www.qbdirect.net/

◆ CU-911 System Update

Refer to section “4.5.15 Updating the System (MODIFY MENU)” and update the CU-911 system.
The CU-911 LED flashes during CU-911 system update.

– **Important** – Never remove the BHT from the CU-911 or turn the BHT power OFF during the system update process.

If the BHT is removed from the CU-911 or the BHT power is turned OFF during system update, a system update error will occur, and the CU-911 will wait for the update to be retried.

In such a case, either perform the CU-911 system update again, or reboot the CU-911.

– **Point** – If the CU-911 power is turned OFF during the system update, when the power is next turned ON, either the system prior to updating or system after updating will run.

The system running can be verified at the CU-911 System Information display.
(Refer to section “4.5.8 System Information (SYSTEM INFORMATION Menu)” for details.)

4.3 Executing User Programs

User programs (application programs) can be executed using the following methods.
Select the most appropriate method to meet the objective.

4.3.1 Executing from the SYSTEM MENU "EXECUTE PROGRAM"

Select the program to be executed at the SYSTEM MENU "EXECUTE PROGRAM" menu.
In such a case, the selected program will always be executed from the start.
Refer to section "4.5.2 Executing User Programs (EXECUTE PROGRAM Menu)" for details.

4.3.2 Automatically Executing the Program Set at the SYSTEM MENU when Turning the Power ON

Select the program to be executed at the SYSTEM MENU "EXECUTE PROGRAM" menu, and then turn the BHT power OFF. The selected program will executed automatically the next time the BHT power is turned ON.
If the resume function has been set, the BHT will resume from the position in the program that was stopped when the BHT power was last turned OFF.
Refer to section "4.5.6 [1] Setting the auto-start execution program" for details.

4.3.3 Executing the First Registered Program by Turning the Power ON (BHT System Directory Management Program Function)

If no program has been selected at the SYSTEM MENU "EXECUTE PROGRAM" menu and the BHT power turned ON, control will switch to the directory management program, and the first of the programs (.PD4) registered in the BHT will executed.
If the resume function has been set, the BHT will resume from the position in the program that was stopped when the BHT power was last turned OFF.

If downloading multiple programs after system initialization, programs are registered in the system in the order in which they are downloaded, and therefore ensure that the program to be executed is the first program downloaded.

If a program is later downloaded for purpose of upgrading the version, use the same program name. The order in which programs are registered in the system will not change, and therefore the same program will be executed even after upgrading the version. (*)

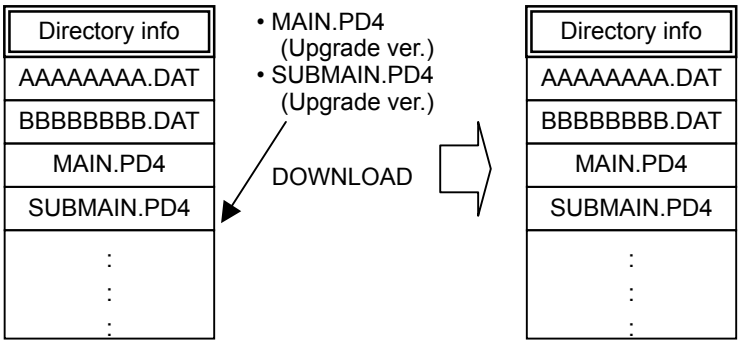
* The system directory management program also manages files with other extensions simultaneously. If the top file from the first registered program is deleted and a new program is downloaded, the new program will be registered in the position vacated by the deleted file and therefore caution is advised. It is recommended that the program to be execute after turning on the BHT power is first downloaded following system initialization.

Several directory management program examples are given below.
The names of the files used in these examples are as follows.

MAIN.PD4	:	Program to be executed by pressing the Power key (⏻) only
SUBMAIN.PD4	:	Program chained from MAIN.PD4 using the BHT-BASIC CHAIN statement
USER.PD4	:	New program
AAAAAAAA.DAT	:	Data file 1 used at the user program
BBBBBBBB.DAT	:	Data file 2 used at the user program

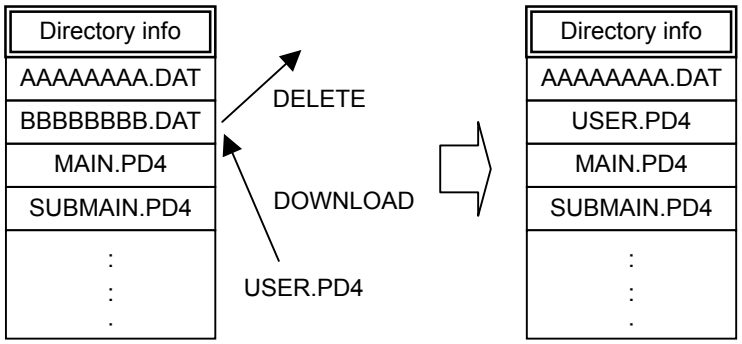
◆ (Example 1) When downloading the MAIN.PD4 and SUBMAIN.PD4 upgrade version

In the above case, the registration order does not change and therefore MAIN.PD4 starts up by pressing the Power key (⏻).



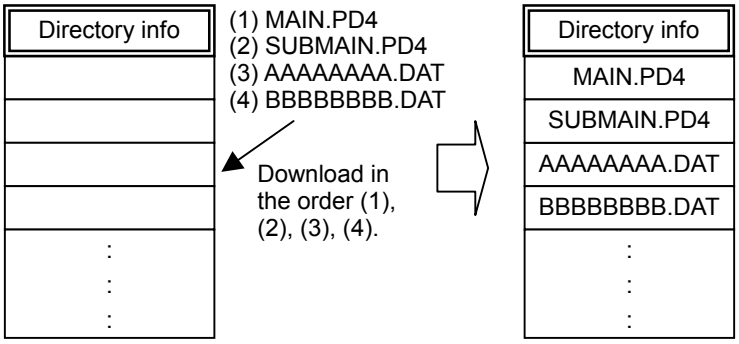
◆ (Example 2) When newly downloading USER.PD4 after deleting BBBBBBBB.DAT

In the above case, USER.PD4 is registered after BBBBBBBB.DAT, and therefore USER.PD4 will be the first registered program. Press the Power key (⏻) to start up USER.PD4.



◆ **(Example 3) Recommended download method**

After system initialization, first download the program to be executed simply by pressing the Power key (⏻). In this case, this program is always registered at the beginning of the system directory management unless the program has been deleted and another file downloaded.



<Status following system initialization>

4.3.4 Executing by Wake-up

By specifying the wake-up time at the user program, the BHT can be started up at the wake-up time and a program executed.

If an auto-start execution program has been selected at the System Mode “4.5.6 [1] Setting the auto-start execution program”, the selected program will be executed.

If no auto-start execution program has been selected, the first registered program from among the programs (.PD4) registered in the BHT will be executed.

Refer to the “BHT-BASIC Programmer’s Manual” for details.

4.3.5 Executing by Remote Wake-up

If remote wake-up is enabled, the BHT can be started up by receiving a control command from the host computer. If a fixed file called “BHTRMT.PD4” exists in the BHT at this time, BHTRMT.PD4 will be executed.

In other words, it is possible to execute the desired program by chaining from BHTRMT.PD4 using a BHT-BASIC CHAIN statement.

Refer to “4.5.13 Setting the Remote Wake-up (SET REMOTE WAKEUP Menu)” and the “BHT-BASIC Programmer’s Manual” for details.

4.3.6 Executing the Auto-start Execution Program from the Point of Start-up

When the Enter key is pressed to turn ON the power, the auto-start execution program can run from the point of start-up. It is useful, for instance, to restart the operation program from the point of start-up if communication (e.g., wireless communication) does not occur as expected.

4.4 System Mode

By starting up the BHT in System Mode and selecting each menu, the following operations can be performed individually.

- Executing setup
- Executing user programs
- File download/upload
- System environment settings
- BHT operation test
- System information display
- Downloading/uploading files by FTP
- USB communication settings
- File deletion
- Font file deletion
- System settings parameter file download/upload
- Remote wake-up settings
- System message file download/upload
- System update

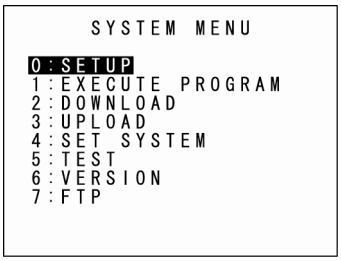
Refer to each item at the “4.5 SYSTEM MENU” for details of the above operations.

4.4.1 Starting Up System Mode

Use the following procedure to start up System Mode.

1. Press the Power key (⏻) while holding down the **SF** and [1] keys.

System Mode starts up and the SYSTEM MENU (screen on right) displays.



Select and display each menu from the SYSTEM MENU and perform each operation.

Hold down the **SF** key and press the appropriate numeric key to display items not displayed at the SYSTEM MENU.
Refer to “4.4.3 SYSTEM MENU Configuration” for details.

4.4.2 System Mode Basic Operation

Menu Selection and Display

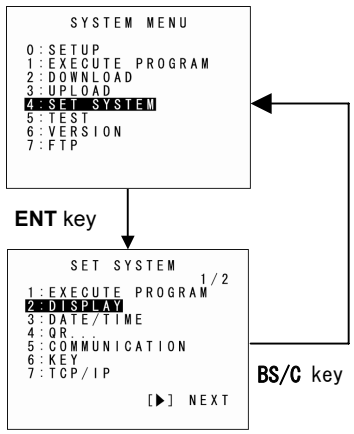
Use the following procedure to select and display each menu.

1. Press the numeric key corresponding to the menu to be selected.
Alternatively, press the cursor keys ([▲] [▼]) to select the menu.

The selected menu item will be highlighted.
"SETUP" will be highlighted when the System Mode is started.

◆ **Operation example**

Select [4: SET SYSTEM] with the [4] or [▲]/[▼] keys.



Select [2: DISPLAY] with the [2] or [▲]/[▼] keys.

2. Press the **ENT** key.

The selected item is set and the next screen displays.
Press the Backspace/clear key to return to the previous screen.
The selected item will be highlighted when returning to the previous screen.

3. Repeat the above operation to display the target menu.

Setting Value Selection

Use the following procedure to select setting values.

1. Press the numeric key corresponding to the item to be selected.
Alternatively, press the cursor keys ([▲] [▼]) to select the item.

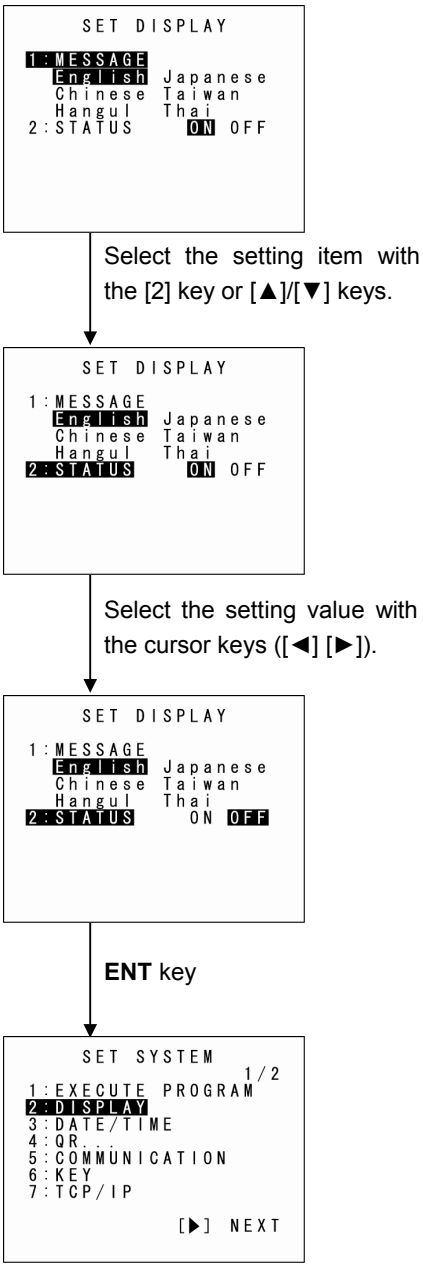
The selected item will be highlighted.

2. Select the setting value with the cursor keys ([◄] [►]).

3. Press the **ENT** key.

The selected setting value will be set.

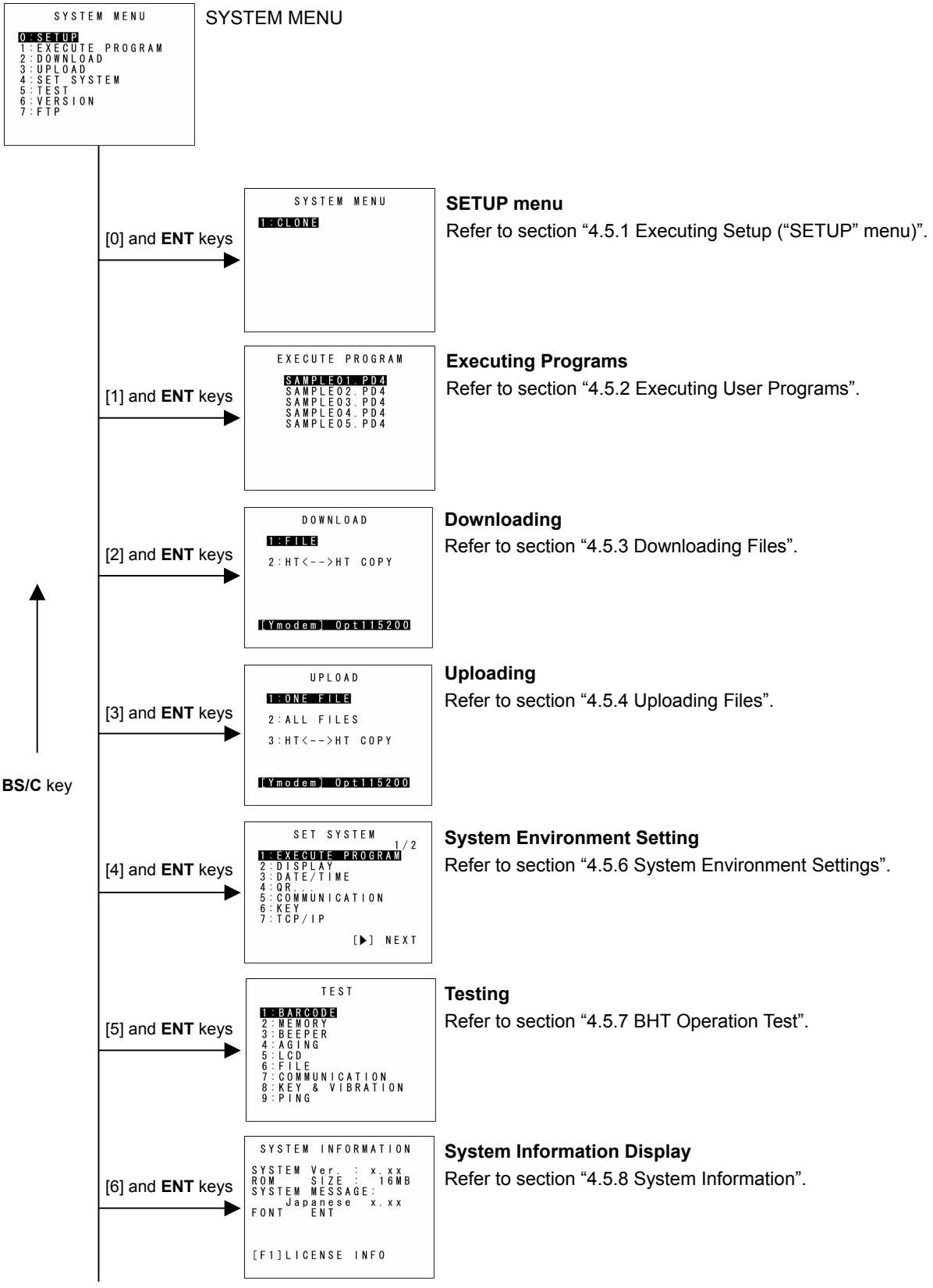
◆ **Operation example**

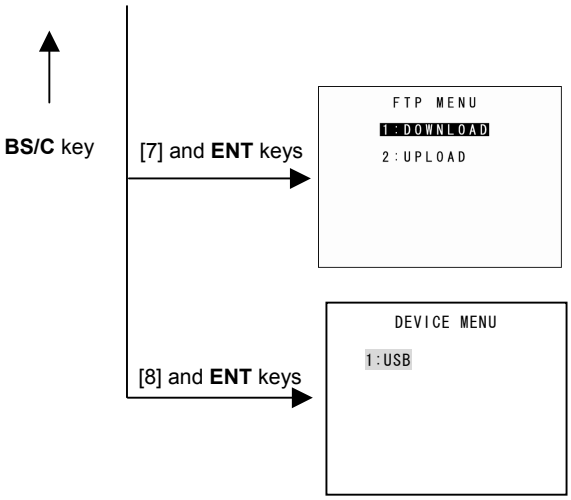


4.4.3 SYSTEM MENU Configuration

Menu Configuration for Items Displayed at the SYSTEM MENU Screen

Select the item with the numeric keys or cursor keys ([▲] [▼]) and press the **ENT** key.





Downloading/Uploading by FTP

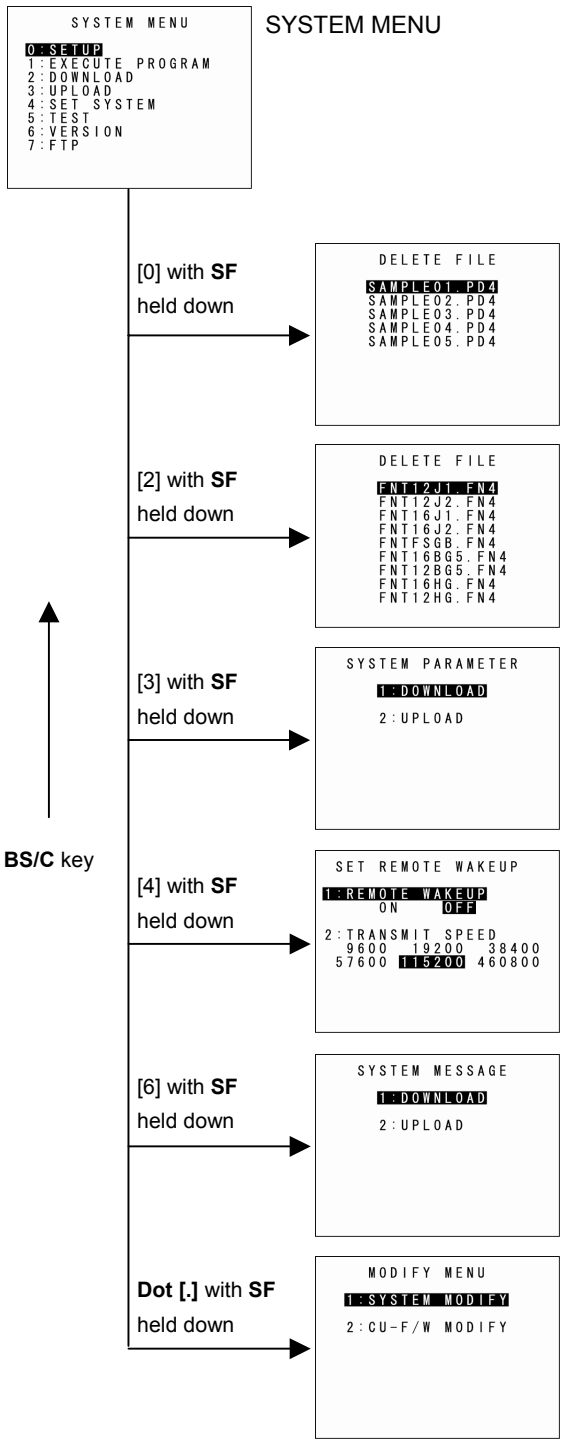
Refer to section “4.5.9 Downloading/Uploading Files by FTP”.

DEVICE menu

Refer to section “4.5.10 USB Communication”.

Menu Configuration for Items Not Displayed at the SYSTEM MENU Screen

Press the corresponding numeric key while holding down the **SF** key.



Deleting Font Files
Refer to section “4.5.11 Deleting Font Files”.

Downloading/Uploading the BHT System Parameter File
Refer to section “4.5.12 Downloading/Uploading the BHT System Parameter File”.

Setting Remote Wake-up
Refer to section “4.5.13 Setting Remote Wake-up”.

Downloading/Uploading the System Message File
Refer to section “4.5.14 Downloading/Uploading System the Message File”.

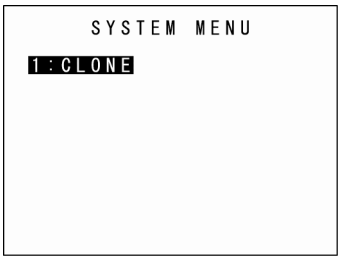
Updating the System
Refer to section “4.5.15 Updating the System”.

4.5 SYSTEM MENU

4.5.1 Executing Setup (“SETUP” menu)

The BHT setup can be effectively executed using the BHT Setting and clone functions.
This section explains the setup with the clone function using the two BHTs. Use the following procedure to setup the BHT.

1. Select “0: SETUP” at the SYSTEM MENU and then press the **ENT** key.



The screen on the right appears.

“1: CLONE”:

Creates a BHT clone (duplicate) using the two BHTs.

The clone function is similar to the conventional HT-HT Copy function. Differences between them are explained below.

Function		Clone	HT-HT Copy
OS Copy		Available	Not Available
File Copy	Overwrite copy (The file in the receiving device is overwritten by the file in the transmitting device.)	Available	Available
	Clone (Files in both receiving and transmitting devices are identical.) [Default]	Available	Not Available
OS Setting Values Copy	General system setting values (excluding the items below)	Available	Available
	• IP characteristic value (only when “0.0.0.0”) • Subnet mask • Default gateway • BHT-Ir protocol communication ID • Clone authentication key	Available	Not Available
Display	Progress Display	Displayed for Each Item	File Forwarding Progression Only
	History (usage history)	Available	Not Available
Setting Values	Target clone selection (OS)	Available	Not Available
	Post-function execution operations (reboot designation, etc.)	Designations Available	No Designations Available
	Copy mode (overwrite/clone)	Available	Not Available
	Clone authentication key (*1)	Available	Not Available
Operational Environment	Communication settings	Fixed (IrDA: 460800)	Optional

(*1): The setting of the clone authentication key allows the clone function to be passworded.

Press the Backspace/clear key to return to the SYSTEM MENU.

2. Execute the master-side setup.

Setup is performed with the BHT Setting and other SYSTEM MENU functions.

3. Perform the settings for the master-side clone using “2: CLONE” and “3: OPTION” from the SETUP menu.

Use the option menu to perform settings such as the clone number and authentication key.

The option menu contains the following items.

Item	Setting Content	Default	Remarks
1: CLONE NO. Clone number	1 to 6-digit numeric values	“0”	Specifies whether or not a “0” is placed at the beginning of a number so that not only sequential numbers can be used, but dates as well. e.g.,: The function differentiates between “1” and “000001”.
2: SOFTWAVE TO CLONE Software to clone	OS	YES	There are also OS settings and additional files. These are always cloned.
3: AUTH KEY Clone authentication key	0 to 16 one-byte alphanumeric characters to be used (Entry possible in ALP mode)	Not in use	
	Not in use		
4: SLAVE ACTION Post-slave completion operation	Clone menu	Clone menu	BHT reboot: Restarts the BHT and then activates the application.
	BHT reboot		
5: FILE COPY MODE Clone mode	Clone mode Makes the save-side file structure identical to the master-side structure.	Clone mode	
	HT-HT copy mode Leaves the slave-side files.		

4. Select “1: MASTER” from the master-side CLONE MENU.

5. Select “2: SLAVE” from the slave-side CLONE MENU.

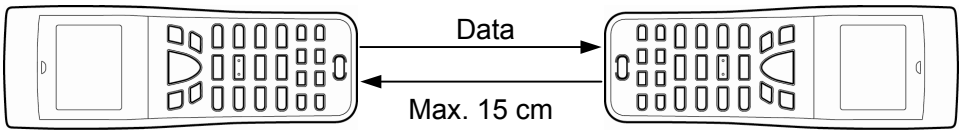
Master Side

```
      CLONE MENU

 1:MASTER
 2:SLAVE
 3:OPTION
 4:CLEAR HISTORY
      [HISTORY]
No.          : 012345
Status       : Success
Souce        : 012345
[F1]DETAIL
```

Slave Side

```
      CLONE MENU

 1:MASTER
 2:SLAVE
 3:OPTION
 4:CLEAR HISTORY
      [HISTORY]
No.          : 012345
Status       : Success
Souce        : 012345
[F1]DETAIL
```

6. Align the BHTs as shown below and then press **ENT** key on the transmitting device.



Master BHT

Slave BHT
(to be tested)

The status of the data transmission progress is displayed as shown on the screens below.

- “v”: Data transmission is complete.
- “*”: When flashing, data transmission is in progress.

Master Side

```
    CLONE MASTER
Clone No.XXXXXX
**     During     **
** Cofirmation   **
```

→

```
    CLONE MASTER
Clone No. 012345
v Delete Files
v Copy OS
v Update OS
* Copy OS Settings
  Copy Files
  Flush File
```

Slave Side

```
    CLONE SLAVE
Clone No.XXXXXX
**     During     **
** Cofirmation   **
```

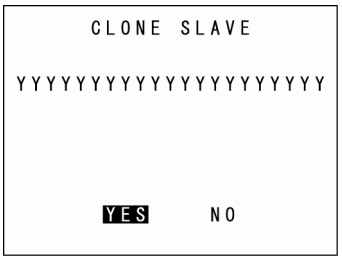
→

```
    CLONE SLAVE
Clone No. 012345
v Delete Files
v Copy OS
v Update OS
* Copy OS Settings
  Copy Files
  Flush File
```

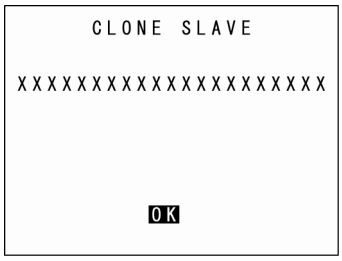
When communication is complete, the CLONE MENU (screen 1) reappears.

In the event of a communication error, screen 2 appears.

Screen 1: Error occurrence



Screen 2: Error/Correctly completed



List of possible errors when cloning

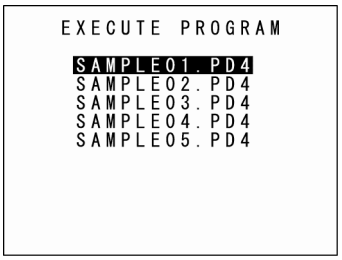
Processing Phase	Outline	Displayed Message	Detail	Operations followed by an error
Immediately After Clone Start	BHT models are different.	Different model on master side (slave side). Continue?	Different model on master side (slave side). Continue?	When screen 1 appears, select YES/NO. Y: Processing continues. (the OS and OS settings will not be copied.) N: Processing is suspended.
	OS update is not possible (when the HT-HT copy mode designation and initialization are required).	OS cannot be updated. Cloning will be stopped.	OS cannot be updated. Cloning will be stopped.	Screen 2 appears; processing is suspended.
	Number of files are exceeded.	Too many files. Cloning will be stopped.	Too many files. Cloning will be stopped.	
	Memory capacity is exceeded.	Insufficient memory on slave side. Cloning will be stopped.	Insufficient memory on slave side. Cloning will be stopped.	
When Clone is Complete	OS setting is not possible (No items/Outside value range).	Some items could not be set on slave side. (N items)	Some items could not be set on slave side. (N items)	Screen 2 appears; processing is complete.
During Communication	Communication error	Out of memory	Out of memory	
		File mismatch	File mismatch	
		Too many files	Too many files	
		File error	File error	
		Program file error	Program file error	
		Communication error	Communication error	

4.5.2 Executing User Programs (EXECUTE PROGRAM Menu)

Individually select and execute user programs downloaded to the BHT.
Use the following procedure to execute user programs.

1. Select “1: EXECUTE PROGRAM” at the SYSTEM MENU and then press the **ENT** key.

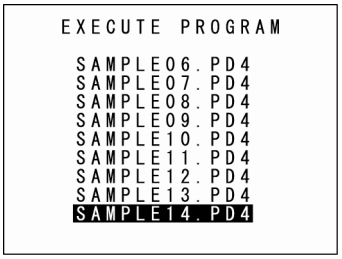
The screen displays as shown on the right.
Press the Backspace/clear key to return to the SYSTEM MENU.



2. Use the cursor keys ([▲] [▼]) to select the target program.

The selected program will be highlighted.
Use the [▼] key to scroll down when more than 9 programs have been downloaded to the user area.

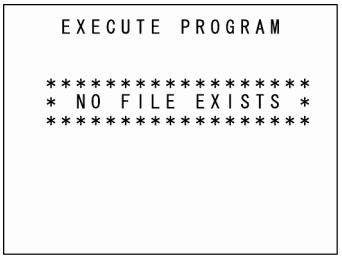
The screen on the right shows an example in which 14 programs have been downloaded.



3. When the target program is highlighted, press the **ENT** key.

The selected program will be executed.

The screen displays as shown on the right when no program files exist in the user area.
Press the Backspace/clear key to return to the SYSTEM MENU.



4.5.3 Downloading Files (DOWNLOAD Menu)

Download files to the BHT user area from other devices such as the host computer.

– Point –

- If a file with the same name as one already used in the user area of the target memory in the BHT is downloaded, the newly downloaded file replaces the old one.
- If an auto-start execution program has not been specified (See 4.5.6 [1] Setting the auto-start execution program), the directory management program will execute the first managed program from among the programs (.PD4) downloaded to the BHT when the BHT power is turned ON. (Program displayed at the top of the "EXECUTE PROGRAM" menu). Take this into account when determining the file download order.
  Refer to "4.3 Executing User Programs" for details.

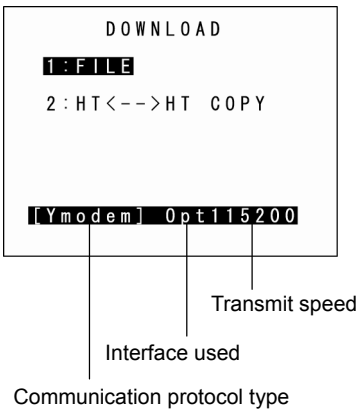
– Note – Downloading files by MTP via a USB communication port is also available.

Refer to "5.2.2 MTP Communication"

Use the following procedure to download files.

1. Select "2: DOWNLOAD" at the SYSTEM MENU and then press the **ENT** key.

The screen displays as shown on the right.



"1: FILE":
Select to download a specific file.

"2: HT<-->HT COPY":
Select to download a file from another BHT.
Refer to "4.5.5 Copying Files between 2 BHT Units" for details.

Press the Backspace/clear key to return to the SYSTEM MENU.

The current communication settings display at the bottom of the screen.

Communication protocol type	Ymodem BHT-Ir BHTp	Ymodem protocol BHT-Ir protocol BHT protocol
Interface used	Opt Con	Infrared interface USB interface
Transmit speed	9600 to 460800	Transmission speed corresponding to each protocol

Refer to "4.5.6 [5] Setting the communication environment (SET SYSTEM Menu)" for details of communication environment settings.

2. Select either “1: FILE” or “2: HT<-->HT COPY” and press the **ENT** key.

The screen displays as shown on the right indicating that the BHT is waiting for the file to be downloaded.

The screen displays as shown on the right only when “1: FILE” is selected. If “2: HT<-->HT COPY” is selected, “HT<-->HT” displays in the center of the second row of the screen.

```
DOWNLOAD FILE

** Waiting **
```

3. By executing the BHT-BASIC 4.0 Transfer Utility or similar program, the screen displays as shown on the right and file downloading is commenced.

(Refer to the “BHT-BASIC 4.0 Transfer Utility User’s Guide.”)

```
DOWNLOAD FILE

** Loading **
```

4. The screen displays as shown on the right during downloading.

The screen displays as shown on the right indicating the file name and the number of received records/the total number of records.
(When using the Ymodem protocol, the received file size/the total file size (units: KB) displays.)

Press the Backspace/clear key to abort the download process and return to the DOWNLOAD menu.

```
DOWNLOAD FILE

XXXXXXXX.XXX
** Loading **
 XXXXX/XXXXX
```

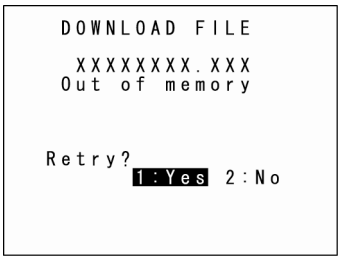
5. When downloading is complete, the beeper sounds once and the screen displays as shown on the right.

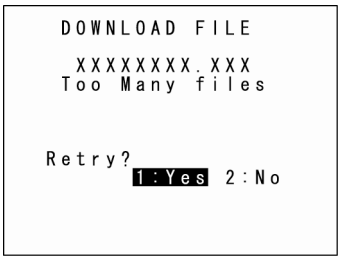
When the number of received records equals the total number of records, downloading is complete.
(When using the Ymodem protocol, the received file size equals the total file size.)

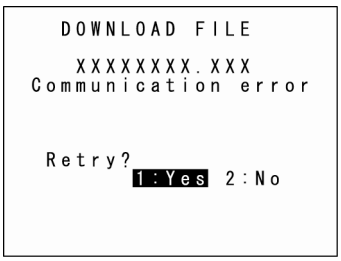
Press the Backspace/clear key to return to the DOWNLOAD menu.
With this screen displayed on the BHT, downloading another new file from the host computer allows the BHT to begin receiving.
(Refer to the “BHT-BASIC 4.0 Transfer Utility User’s Guide.”)

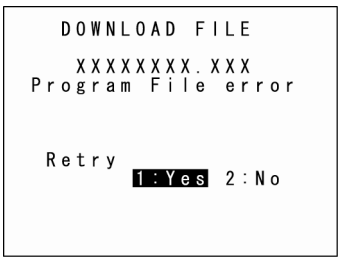
If “2: HT<-->HT COPY” is selected, repeat the above operation until all files are downloaded.

If an error message (screen below) displays during downloading, refer to “Chapter 7 Error Messages”.





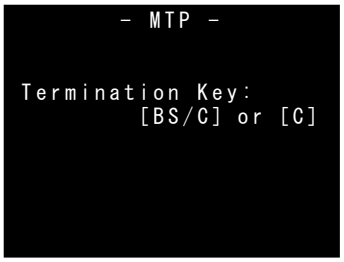




4.5.4 Uploading Files (UPLOAD Menu)

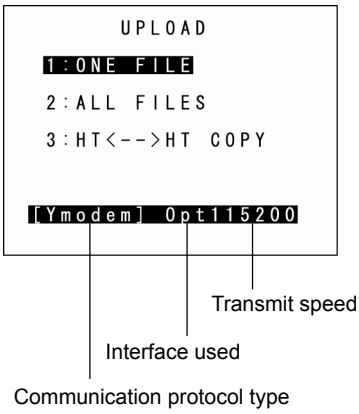
Upload files stored in the BHT user area to another device.
Use the following procedure to upload files.

– **Note** – Uploading files by MTP via a USB communication port is also available.
Refer to “5.2.2 MTP Communication”



1. Select “3: UPLOAD” at the SYSTEM MENU and then press the **ENT** key.

The screen display as shown on the right.



“1: ONE FILE”:
Select to upload a specific file.
“2: ALL FILES”:
Select to upload all files, excluding font files.
“3: HT<-->HT COPY”:
Select to upload a file to another BHT.
Refer to “4.5.5 Copying Files between 2 BHT Units” for details.

Press the **Backspace/clear** key to return to the SYSTEM MENU.

The current communication settings display at the bottom of the screen.

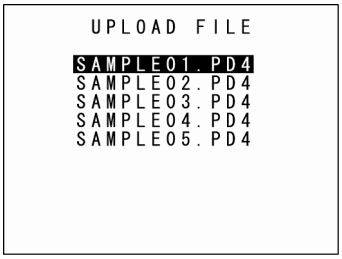
Communication protocol type	Ymodem BHT-Ir BHTp	Ymodem protocol BHT-Ir protocol BHT protocol
Interface used	Opt Con	Infrared interface USB interface
Transmit speed	9600 to 460800	Transmission speed corresponding to each protocol

Refer to “4.5.6 System Environment Settings (SET SYSTEM Menu)” for details of communication environment settings.

– **Point** – If BHT protocol or BHT-Ir protocol is selected for the communication protocol, BHT-BASIC 4.0* specification files will not display at the file selection screen, and therefore cannot be downloaded.
(*Applications with extension “.PD4”, extension libraries with extension “.FN4”, and data files that have any of the following structures: the number of fields is 17 or more, the total of the number of fields and each field length is 255 or more, and the number of records is 32768 or more)

2. Select “1: FILE”, “2: ALL FILES” or “3: HT<-->HT COPY” and press the **ENT** key.

When “1: FILE” is selected:
The screen displays as shown on the right. Select the file to be uploaded and press the **ENT** key.
Next, proceed to step 3.



When “2: ALL FILES” or “3: HT<-->HT COPY” is selected:
Proceed to step 3.

The screen displays as shown on the right if no files that can be uploaded exist in the user area.
Press the Backspace/clear key to return to the UPLOAD menu.

3. The screen displays as shown on the right indicating that the BHT is waiting for the file to be uploaded.

The screen displays as shown on the right only when “1: FILE” is selected.
If “2: ALL FILES” is selected, “ALL” displays in the center of the second row of the screen.
If “3: HT<-->HT COPY” is selected, “HT<-->HT” displays in the center of the second row of the screen.

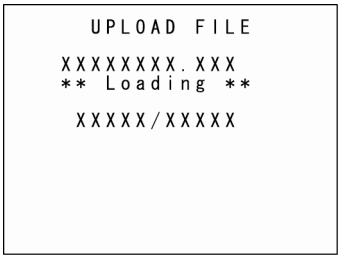
4. By executing the BHT-BASIC 4.0 Transfer Utility or similar program, the screen displays as shown on the right and file uploading is commenced.

(Refer to the “BHT-BASIC4.0 Transfer Utility User’s Guide.”)

5. The screen displays as shown on the right during uploading.

The screen displays as shown on the right indicating the file name and the number of sent records/the total number of records.
(When using the Ymodem protocol, the sent file size/the total file size (units: KB) displays.)

Press the Backspace/clear key to abort the download process and return to the UPLOAD menu.



6. When uploading is complete, the beeper sounds once and the screen displays as shown on the right.

When the number of sent records equals the total number of records, downloading is complete.
(When using the Ymodem protocol, the sent file size equals the total file size.)

Press the Backspace/clear key to return to the UPLOAD menu.

If “2: ALL FILES” or “3: HT<-->HT COPY” is selected, repeat the above operation until all files are uploaded.

If an error message displays during uploading, refer to “Chapter 7 Error Messages”.

4.5.5 Copying Files between 2 BHT Units

Copy “all files (excluding font files)”, “setting data”, and the “date and time” stored in the BHT user area to another BHT.
Use the following procedure to copy files between 2 BHT units.

1. Set the same interface at both BHT units.

An IrDA communication (Optical) interface is used.
The default interface is set to infrared communication (Optical).

2. Set “COMMUNICATION PROTOCOL OPTION” → “FIELD SPACE” (space at the end of the field) to “Ignore” at both BHT units.

The default setting is “Ignore”.
Refer to “4.5.6 [5] System Environment Settings (SET SYSTEM Menu)” when changing the interface.

3. Place the IrDA communication ports of the BHTs face-to-face.

4. Select “2: DOWNLOAD” → “2: HT<-->HT COPY” at the SYSTEM MENU of the BHT that is downloading to await downloading.

Refer to “4.5.3 Downloading Files (DOWNLOAD Menu)” for details.
When copying only the system parameter file, use the SYSTEM PARAMETER transfer menu. Refer to “4.5.12 Downloading/Uploading the BHT System Parameter File (SYSTEM PARAMETER Menu)” for details.

5. Select “3: UPLOAD” → “3: HT<-->HT COPY” at the SYSTEM MENU of the BHT that is uploading to await uploading.

Refer to the “4.5.4 Uploading Files (UPLOAD Menu)” for details.
When copying only the system parameter file, use the SYSTEM PARAMETER transfer menu. Refer to “4.5.12 Downloading/Uploading the BHT System Parameter File (SYSTEM PARAMETER Menu)” for details.

6. Preparation at both BHT units is now complete and file copying will be commenced.

◆ Setting data which are copied between the BHT units

The following setting data of the system mode are copied when copying between the BHT units.

- Display settings
- Buzzer and vibrator settings
- Barcode settings
- Communication parameter settings
- Infrared light interface settings
- Key settings
- Other settings
- Remote wakeup settings
- TCP/IP settings
- LAN CU settings
- Clone settings
- FTP settings
- USB settings
- Time and date settings

Note, however, that device unique information and security-related setting data are not copied.

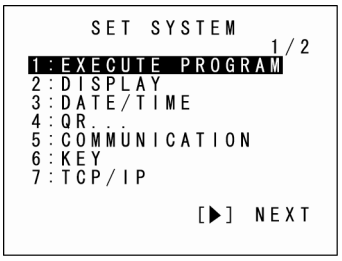
- Self IP address
- Subnet mask
- Default gateway
- BHT-Ir protocol communication ID
- License
- Clone authentication key

4.5.6 System Environment Settings (SET SYSTEM Menu)

Use the following procedure to set the system environment.

1. Select “4: SET SYSTEM” at the SYSTEM MENU and then press the **ENT** key.

The SET SYSTEM menu screen displays as shown on the right.



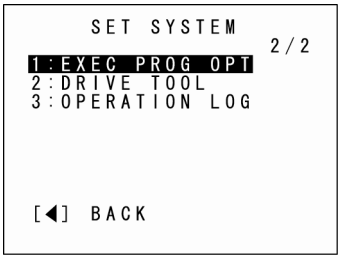
SET SYSTEM 1/2 menu

“1: EXECUTE PROGRAM”:
Sets the auto-start execution program to be executed when the power is turned ON.

“2: DISPLAY”:
Sets the message version (English/Japanese/ Simplified Chinese /Traditional Chinese/Korean/Thai).

“3: DATE/TIME”:
Sets the calendar clock (date and time).

“4: BARCODE”:
Sets the barcode reading conditions (black/white inverted barcode reading function and decode level) and minimum number of barcode digits to be read (ITF, STF, Codabar).



“5: COMMUNICATION”:
Sets the communication environment (interface port and communication parameters).

“6: KEY”:
Defines the functions of the shift key and magic keys.

“7: TCP/IP”:
Displays the setting menu for TCP/IP, FTP and DHCP.

SET SYSTEM 2/2 menu

“1: EXEC PROG OPT”:
Sets the user program execution option.

“2: DRIVE TOOL”:
Sets the drive-related operation.

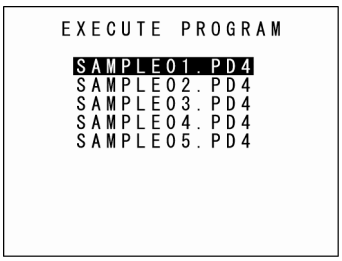
“3: OPERATION LOG”:
Sets the operation log.

Refer to the following section for details of the above items.
Press the Backspace/clear key to return to the SYSTEM MENU.

[1] Setting the auto-start execution program

Use the following procedure to set the auto-start execution program.

1. Select “1: EXECUTE PROGRAM” at the SET SYSTEM menu and then press the **ENT** key.



The SET EXECUTE PROGRAM menu screen displays as shown on the right.
The highlighted program will be the program currently set as the auto-start execution program.

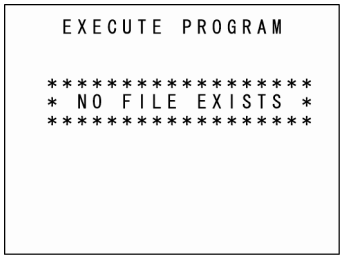
2. Use the cursor keys ([▲] [▼]) to highlight the target program.

3. Press the **ENT** key.

The selected program will be set as the auto-start execution program.

Press the Backspace/clear key to return to the SET SYSTEM menu.

The screen displays as shown on the right if no programs have been downloaded.



Press the Backspace/clear key to return to the SET SYSTEM menu.

[2] Setting the message version, system status indication and screen display compatible mode

Use the following procedure to set the display language, system status indication and screen display compatible mode.

1. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2]) to highlight "1: MESSAGE" or "2: STATUS".

2. Highlight the target setting with the cursor keys ([◄] [►]) and press the **ENT** key.

Press the Backspace/clear key to return to the SET SYSTEM menu.

"1: MESSAGE":

Sets the language of messages to be displayed on the screen.

The default is the message version selected at the system initializing process.

The following messages can be displayed according to the setting (English/Japanese/Simplified Chinese/Traditional Chinese/Korean/Thai).

System error messages

Indications relating to the LCD contrast

Beeper volume

Beeper & vibrator switching

Messages on the battery voltage level screen

"2: STATUS":

Sets whether to display or hide the system status displayed at the bottom of the screen.

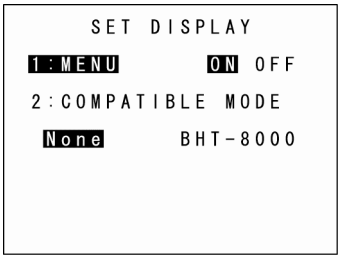
Refer to "System Status Indication" on the following page for details of the system status indication.

"ON": The system status is displayed.

"OFF": The system status is hidden.

– Note – The system status indication can be turned ON or OFF using the OUT statement in user programs. Refer to the "BHT-BASIC Programmer's Manual."

3. Simultaneously press the **SF** key and "1: MESSAGE" at the SET DISPLAY menu.



The SET DISPLAY menu displays as shown on the right.
The highlighted settings will be the current settings.

4. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2]) to highlight "1: MENU" or "2: COMPATIBLE MODE".

5. Highlight the target setting with the cursor keys ([◄] [►]) and press the **ENT** key.

Press the Backspace/clear key to return to the SET SYSTEM menu.

"1: MENU":

Sets whether to permit or prohibit menu screens (beeper volume, vibrator, screen brightness, power saving settings) being started up while applications are running.

"ON": Permits menu screen display.

"OFF": Prohibits menu screen display.

"2: COMPATIBLE MODE":

Sets compatible mode for screen display between the BHT-904B/BHT-914B and the BHT-8000.
This allows BHT-8000 Series application programs to be used at the BHT-904B/BHT-914B without changing or correcting the font size.

				BHT-8000	BHT-904B/BHT-914B	
					BHT-8000 Mode	Normal Mode
Font size	Standard font	Screen mode	ANK mode	21 x 8 char. (6 x 8 dots)	21 x 12 char. (6 x 8 dots)	21 x 12 char. (6 x 8 dots)
	Small font			21 x 10 char. (6 x 6 dots)	21 x 16 char. (6 x 6 dots)	21 x 16 char. (6 x 6 dots)
	Standard font		Kanji mode	8 x 4 char. (16 x 16 dots)	8 x 6 char. (16 x 16 dots)	8 x 6 char. (16 x 16 dots)
	Small font			10 x 5 char. (12 x 12 dots)	10 x 8 char. (12 x 12 dots)	10 x 8 char. (12 x 12 dots)

◆ System Status Indication

Turning ON the system status indication displays the following icons at the bottom of the screen.

Indication	Icon	Description
Key Shift status		Displays when the keys on the keypad are in Shift mode.
Alphabet entry mode		Displays when the BHT is set to alphabet entry mode. (If the alphanumeric entry system has been selected in user programs, pressing the **SF** key switches from the numeric entry mode to alphabet entry mode.) Each of the keys corresponds to the key data according to the table below. Key Key data [2] : 'A', 'B', 'C', 'a', 'b', 'c' [3] : 'D', 'E', 'F', 'd', 'e', 'f' [4] : 'G', 'H', 'I', 'g', 'h', 'i' [5] : 'J', 'K', 'L', 'j', 'k', 'l' [6] : 'M', 'N', 'O', 'm', 'n', 'o' [7] : 'P', 'Q', 'R', 'S', 'p', 'q', 'r', 's' [8] : 'T', 'U', 'V', 't', 'u', 'v' [9] : 'W', 'X', 'Y', 'Z', 'w', 'x', 'y', 'z' [0] : ',', '/', ' ', '*', '#', '&', '~', '?' (*1) [.] : '-', '%', '$', '_', '¥', '=', '@' (*1) *1 Each of '@', '$', '¥', '#', and '~' is displayed differently depending on country$ setting.
Communication link with the CU-911		Displays when a communication link is established with the CU-911. Flashes when the BHT tries to communicate with a CU-911 that has not been linked with the BHT.
		Displays cyclically when the BHT receives no response from the CU-911, or when it is waiting for the link to be established with or severed from the CU-911.

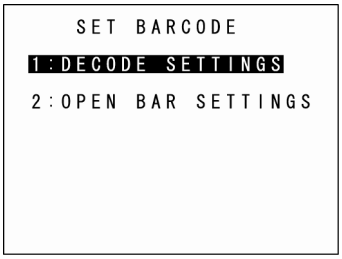
[3] Setting the calendar clock

When resetting the date and time, refer to "Chapter 2 BHT Preparation" – "2.4 Initial Setup."
Select "3: DATE/TIME" at the SET SYSTEM menu and press the **ENT** key to display the SET DATE/TIME menu screen on the right.

[4] Setting the special barcode reading parameters

Use the following procedure to set the barcode reading conditions.

1. Select "4: BARCODE" at the SET SYSTEM menu and then press the **ENT** key.



The SET BARCODE menu screen displays as shown on the right.
The highlighted display and displayed values will be the current settings.

"1: DECODE SETTINGS":
Goes to the screen on which the barcode reading parameters are set.
"2: OPEN BAR SETTINGS":
Goes to the screen on which the "function in which the reading setting is specified from the system setting" is set.

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2]) to highlight the desired item and then press the **ENT** key.

Press the Backspace/clear key to return to the SET SYSTEM menu.

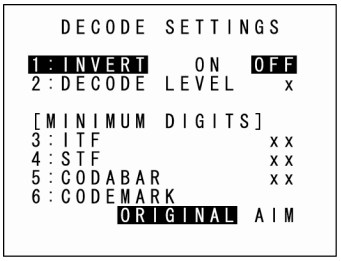
◆ "1: DECODE SETTINGS": Setting for barcode reading conditions and minimum number of barcode digits to be read

Use the following procedure to set the barcode reading conditions.

1. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4] [5] [6]) to highlight the desired item.

2. Change the settings with the cursor keys ([◄] [►]) and then press the **ENT** key.

Press the Backspace/clear key to return to the SET SYSTEM menu.



◆ "1: INVERT": Black/white inverted barcode reading function

Enables or disables black/white inverted barcode reading.

"ON": Enables black/white inverted barcode reading.
"OFF": Disables black/white inverted barcode reading.

– Point – When the black/white inverted barcode reading function is set to ON, it is possible to scan black/white inverted barcodes. However, there is a higher chance of barcodes being incorrectly scanned.
This should normally be set to "OFF" (black/white inverted barcode reading disabled).

◆ "2: DECODE LEVEL": Decode level

Set the decode level (barcode reading tolerance level).
Press [◄] to decrease the setting value and [►] to increase the setting value.

Decode level entry range: 1 to 9 Default: 4

Decreasing the level increases the barcode reading efficiency, however, the BHT may incorrectly read low-quality (split or stained) barcodes.
On the other hand, increasing the level decreases the barcode reading efficiency, but will decrease the possibility of incorrect reading.

◆ "3: ITF": Minimum number of barcode digits to be read for ITF

◆ "4: STF": Minimum number of barcode digits to be read for STF

◆ "5: CODABAR": Minimum number of barcode digits to be read for Codabar

Sets the minimum number of barcode digits to be read.
Press [◄] to decrease the setting value and [►] to increase the setting value.

ITF entry range:	2 to 20	Default: 4
STF entry range:	1 to 20	Default: 3
Codabar entry range:	3 to 20	Default: 4

Setting a small number of digits increases the frequency of missing digits when reading or incorrectly reading depending on how barcodes are read or the quality of barcodes.
On the other hand, setting a large number will decrease the possibility of such errors.

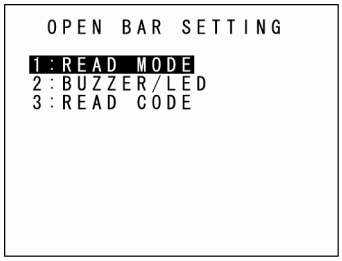
◆ "6: CODEMARK": Setting for the codemark type

Sets the type of the codemark.

ORIGINAL
Codemark system specified for DENSO
AIM
Codemark system complies with the AIM US "Guidelines on Symbology Identifiers"

◆ **"2: OPEN BAR SETTINGS": Setting for the "function in which the reading setting is specified from the system setting"**

1. Select "2: OPEN BAR SETTINGS" at the SET BARCODE menu and then press the **ENT** key.



The OPEN BAR SETTING menu screen appears.

"1: READ MODE": Read mode
Goes to the SET READ MODE screen.
"2: BUZZER/LED": Buzzer/LED control
Goes to the SET BUZZER/LED screen.
"3: READ CODE": Read barcode
Goes to the SET BARCODE screen.

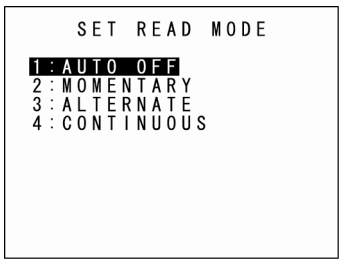
For details of the items above, refer to the following sections.

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3]) to select the desired item and then press the **ENT** key.

3. Press the Backspace/clear key to return to the SET BARCODE menu.

[1] Read mode

1. Select "1: READ MODE" at the OPEN BAR SETTING menu and then press the **ENT** key.



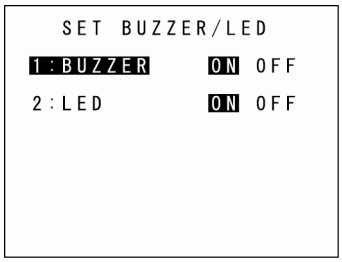
The SET READ MODE screen appears.
The highlighted setting is the current setting.

"1: AUTO OFF": Auto off mode
When the specified time elapses after the trigger operation ends, the light goes off.
"2: MOMENTARY": Momentary mode
The light is illuminated continuously when the trigger switch is pressed and held.
"3: ALTERNATE": Alternate mode
The light brinks (turns ON/OFF) when the trigger switch is pressed.
"4: CONTINUOUS": Continuous-illumination mode
The light is on continuously.

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4]) to select the desired setting.

3. Press the **ENT** or Backspace/clear key to update the setting and return to the OPEN BAR SETTING screen.

[2] Buzzer/LED control



1. Select "2: BUZZER/LED" at the OPEN BAR SETTING menu and then press the **ENT** key.

The SET BUZZER/LED screen appears.
The highlighted settings are the current settings.

"1: BUZZER":
Sets the buzzer/vibrating mechanism when the barcode is read successfully.
"ON": Enables the buzzer/vibrating mechanism when the barcode is read successfully.
"OFF": Disables the buzzer/vibrating mechanism when the barcode is read successfully.

"2: LED":
Sets the LED illumination when the barcode is read successfully.
"ON": Enables the blue LED illumination when the barcode is read successfully.
"OFF": Disables the LED illumination when the barcode is read successfully.

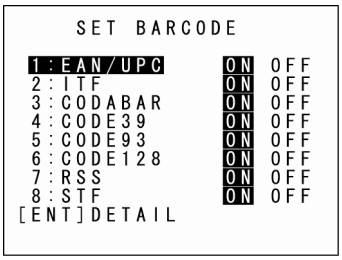
2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2]) to select the desired item.

3. Press the cursor keys ([◄] [►]) to select the desired setting.

4. Press the **ENT** or Backspace/clear key to update the setting and return to the OPEN BAR SETTING menu.

[3] Read barcode

Select [3: READ CODE] at the OPEN BAR SETTING menu and then press the Enter key. When the SET BARCODE screen appears, it is possible to set the barcode reading to ON/OFF. The highlighted settings are the current settings.



To change the setting, use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4] [5] [6] [7] [8]) to select the desired item and then use the cursor keys ([◄] [►]) to select the desired setting.

"1: EAN/UPC":
Enables or disables reading of the universal product codes.
"2: ITF":
Enables or disables reading of the interleaved 2of5 (ITF).
"3: CODABAR":
Enables or disables reading of the Codabar (NW-7).
"4: CODE39":
Enables or disables reading of the Code 39
"5: CODE93":
Enables or disables reading of the Code 93.
"6: CODE128":
Enables or disables reading of the Code 128.
"7: RSS":
Enables or disables reading of the RSS (GS1 Databar).
"8: STF":
Enables or disables reading of the standard 2of5 (STF).

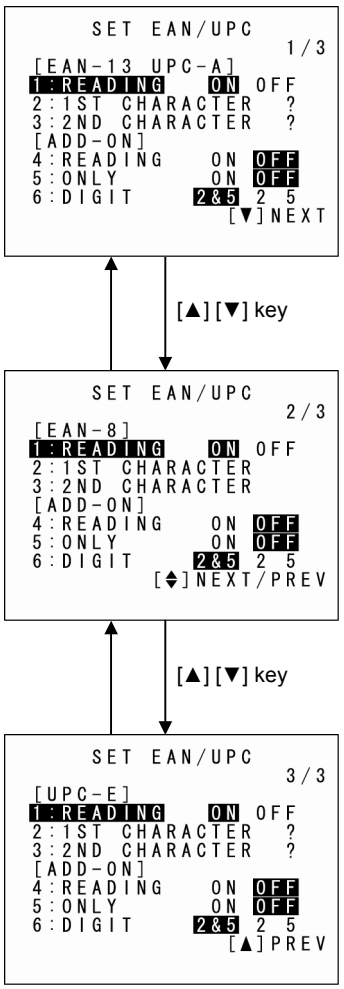
When the **ENT** key is pressed, it is possible to carry out further setting of the selected barcode. For details, refer to the information below.
Press the Backspace/clear key to update the setting and return to the SET BARCODE menu.

– **Point** – "1: EAN/UPC" and "7: RSS" include multiple barcode types. It is possible, via DETAIL (detail setting), to enable or disable barcode reading for each type. To enable reading, set both this and the detail settings to ON (enable).

"1: EAN/UPC": Detail setting of the EAN/UPC reading

1. Select "1: EAN/UPC" at the SET BARCODE menu and then press the **ENT** key.

The SET EAN/UPC setting screen appears.



EAN/UPC 1/3
(EAN-13/UPC-A setting)
"1: READING":
Enables or disables reading of the EAN-13/UPC-A.
"2: 1ST CHARACTER":
"3: 2ND CHARACTER":
Sets the first and second characters (country flag) of the EAN-13/UPC-A to "?, 0 to 9".
If "0 to 9" is specified, barcode reading is limited; the barcode for which the first and second characters are the same as the specified numbers is read. If "?" is specified, reading is carried out without any limitation. (EAN-13/UPC-A add-on setting)
"4: READING":
Enables or disables reading of the EAN-13/UPC-A with add-on.
"5: ONLY":
If "ON" is specified, barcode reading is limited; the EAN-13/UPC-A with add-on is only read. If "OFF" is specified, no limitation is carried out.
"6: DIGIT":
"2&5": Enables reading of the 2-, 5-digit add-on.
"2": Enables reading of the 2-digit add-on.
"5": Enables reading of the 5-digit add-on.

EAN/UPC 2/3
(EAN-8 setting)
"1: READING":
Enables or disables reading of the EAN-8.
"2: 1ST CHARACTER":
"3: 2ND CHARACTER":
Sets the first and second characters (country flag) of the EAN-8 to "?, 0 to 9".
If "0 to 9" is specified, barcode reading is limited for the EAN-8; the barcode for which the first and second characters are the same as the specified numbers is read. If "?" is specified, reading is carried out without any limitation. (EAN-8 add-on setting)
"4: READING":
Enables or disables reading of the EAN-8 with add-on.
"5: ONLY":
If "ON" is specified, barcode reading is limited; the EAN-8 with add-on is only read. If "OFF" is specified, no limitation is carried out.
"6: DIGIT":
"2&5": Enables reading of the 2-, 5-digit add-on.
"2": Enables reading of the 2-digit add-on.
"5": Enables reading of the 5-digit add-on.

EAN/UPC 3/3
(UPC-E setting)
"1: READING":
Enables or disables reading of the UPC-E.
"2: 1ST CHARACTER":
"3: 2ND CHARACTER":
Sets the first and second characters (country flag) of the UPC-E to "?, 0 to 9".
If "0 to 9" is specified, barcode reading is limited for the UPC-E; the barcode for which the first and second characters are the same as the specified numbers is read. If "?" is specified, reading is carried out without any limitation. (UPC-E add-on setting)
"4: READING":
Enables or disables reading of the UPC-E with add-on.
"5: ONLY":
If "ON" is specified, barcode reading is limited; the UPC-E with add-on is only read. If "OFF" is specified, no limitation is carried out.
"6: DIGIT":
"2&5": Enables reading of the 2-, 5-digit add-on.
"2": Enables reading of the 2-digit add-on.
"5": Enables reading of the 5-digit add-on.

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4] [5] [6]) to select the desired item.

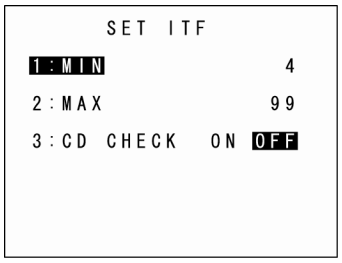
3. Press the cursor keys ([◄] [►]) to select the desired setting.

4. Press the **ENT** or Backspace/clear key to update the setting and return to the SET BARCODE menu.

"2: ITF": Detail setting of the interleaved 2of5 (ITF) reading

1. Select "2: ITF" at the SET BARCODE menu and then press the **ENT** key.

The SET ITF screen appears.



"1: MIN":
Sets the minimum number of the ITF digits.
Setting range: 2 to 99

"2: MAX":
Sets the maximum number of the ITF digits.
Setting range: 2 to 99

– **Point** – Always set the minimum number of digits to a number less than the maximum number of digits. If the minimum number exceeds the maximum number, a read error occurs.

"3: CD CHECK":
"ON": Reading is carried out only if the check digit is correct. Reading is not carried out if either the check digit is incorrect or does not exit.
"OFF": Reading is carried out regardless of the presence of the check digit.

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3]) to select the desired item.

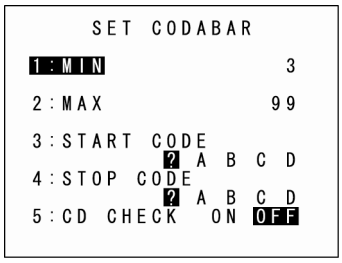
3. Press the cursor keys ([◄] [►]) to select the desired setting.

4. Press the **ENT** or Backspace/clear key to update the setting and return to the SET BARCODE menu.

"3: CODABAR": Detail setting of the Codabar (NW-7) reading

1. Select "3: CODABAR" at the SET BARCODE menu and then press the **ENT** key.

The SET CODABAR screen appears.



"1: MIN":
Sets the minimum number of the Codabar digits.
Setting range: 3 to 99

"2: MAX":
Sets the maximum number of the Codabar digits.
Setting range: 3 to 99

– **Point** – Always set the minimum number of digits to a number less than the maximum number of digits. If the minimum number exceeds the maximum number, a read error occurs

"3: START CODE":
"4: STOP CODE":
Sets the start and stop codes to "?, A, B, C, D".
If "A, B, C, D" is specified, barcode reading is limited for the Codabar; the barcode for which the start and stop codes are the same as the specified characters is only read. If "?" is specified, no limitation is carried out.

"5: CD CHECK":
"ON": Reading is carried out only if the check digit is correct. Reading is not carried out if either the check digit is incorrect or does not exit.
"OFF": Reading is carried out regardless of the presence of the check digit.

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4] [5]) to select the desired item.

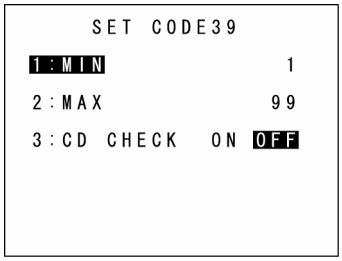
3. Press the cursor keys ([◄] [►]) to select the desired setting.

4. Press the **ENT** or Backspace/clear key to update the setting and return to the SET BARCODE menu.

"4: CODE39": Detail setting of the Code 39 reading

1. Select "4: CODE39" at the SET BARCODE menu and then press the **ENT** key.

The SET CODE39 screen appears.



"1: MIN":
Sets the minimum number of the Code 39 digits.
Setting range: 1 to 99

"2: MAX":
Sets the maximum number of the Code 39 digits.
Setting range: 1 to 99

– **Point** – Always set the minimum number of digits to a number less than the maximum number of digits. If the minimum number exceeds the maximum number, a read error occurs.

"3: CD CHECK":
"ON": Reading is carried out only if the check digit is correct. Reading is not carried out if either the check digit is incorrect or does not exit.
"OFF": Reading is carried out regardless of the presence of the check digit.

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3]) to select the desired item.

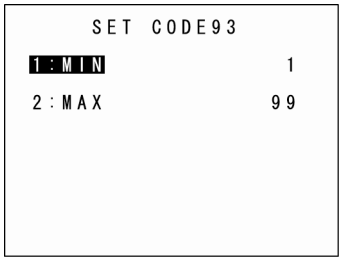
3. Press the cursor keys ([◄] [►]) to select the desired setting.

4. Press the **ENT** or Backspace/clear key to update the setting and return to the SET BARCODE menu.

"5: CODE93": Detail setting of the Code 93 reading

1. Select "5: CODE93" at the SET BARCODE menu and then press the **ENT** key.

The SET CODE93 screen appears.



"1: MIN":
Sets the minimum number of the Code 93 digits.
Setting range: 1 to 99

"2: MAX":
Sets the maximum number of the Code 93 digits.
Setting range: 1 to 99

– **Point** – Always set the minimum number of digits to a number less than the maximum number of digits. If the minimum number exceeds the maximum number, a read error occurs.

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2]) to select the desired item.

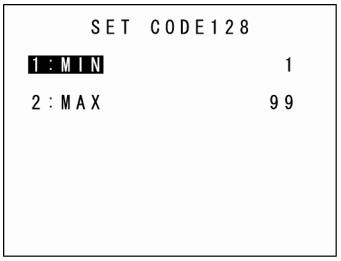
3. Press the cursor keys ([◄] [►]) to select the desired setting.

4. Press the **ENT** or Backspace/clear key to update the setting and return to the SET BARCODE menu.

"6: CODE128": Detail setting of the Code 128 reading

1. Select "6: CODE128" at the SET BARCODE menu and then press the **ENT** key.

The SET CODE128 screen appears.



"1: MIN":
Sets the minimum number of the Code 128 digits.
Setting range: 1 to 99
"2: MAX":
Sets the maximum number of the Code 128 digits.
Setting range: 1 to 99

– **Point** – Always set the minimum number of digits to a number less than the maximum number of digits. If the minimum number exceeds the maximum number, a read error occurs.

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2]) to select the desired item.

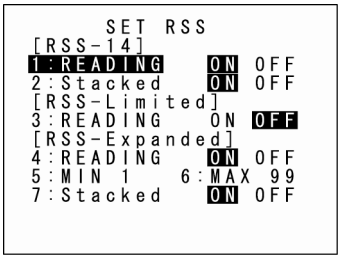
3. Press the cursor keys ([◄] [►]) to select the desired setting.

4. Press the **ENT** or Backspace/clear key to update the setting and return to the SET BARCODE menu.

"7: RSS": Detail setting of the RSS (GS1 Databar) reading

1. Select "7: RSS" at the SET BARCODE menu and then press the **ENT** key.

The SET RSS screen appears.
(RSS-14, RSS-14 Truncated setting)



"1: READING":
Enables or disables reading of the RSS-14 (GS1 Databar Omnidirectional) or RSS-14 Truncated (GS1 Databar Truncated).
"2: Stacked":
Enables or disables reading of the RSS-14 Stacked (GS1 Databar Stacked) or RSS-14 Stacked Omnidirectional (GS1 Databar Stacked Omnidirectional).

– **Point** – To enable reading of the Stacked type barcode, it is necessary to set both "1: READING" and "2: Stacked" to ON.

(RSS-Limited setting)

"3: READING":

Enables or disables reading of the RSS-Limited (GS1 Databar Limited). (RSS-Expanded setting)

"4: READING":

Enables or disables reading of the RSS-Expanded (GS1 Databar Expanded).

"5: MIN":

Sets the minimum number of the RSS-Expanded (GS1 Databar Expanded) or RSS-Expanded Stacked (GS1 Databar Expanded Stacked) digits.

Setting range: 1 to 99

"6: MAX":

Sets the maximum number of the RSS-Expanded (GS1 Databar Expanded) or RSS-Expanded Stacked (GS1 Databar Expanded Stacked) digits.

Setting range: 1 to 99

– **Point** – Always set the minimum number of digits to a number less than the maximum number of digits. If the minimum number exceeds the maximum number, a read error occurs.

"7: Stacked":

Enables or disables reading of the RSS-Expanded Stacked (GS1 Databar Expanded Stacked).

– **Point** – To enable reading of the Stacked type barcode, it is necessary to set both "4: READING" and "7: Stacked" to ON.

---

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4] [5] [6] [7]) to select the desired item.

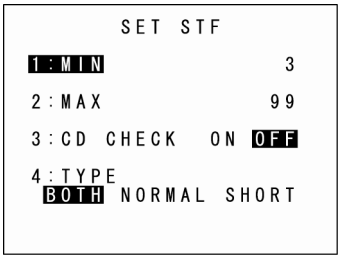
3. Press the cursor keys ([◄] [►]) to select the desired setting.

4. Press the **ENT** or Backspace/clear key to update the setting and return to the SET BARCODE menu.

"8: STF": Detail setting of the standard 2of5 (STF) reading

1. Select "2: STF" at the SET BARCODE menu and then press the **ENT** key.

The SET STF screen appears.



"1: MIN":
Sets the minimum number of the STF digits.
Setting range: 1 to 99

"2: MAX":
Sets the maximum number of the STF digits.
Setting range: 1 to 99

– **Point** – Always set the minimum number of digits to a number less than the maximum number of digits. If the minimum number exceeds the maximum number, a read error occurs.

"3: CD CHECK":
"ON": Reading is carried out only if the check digit is correct. Reading is not carried out if either the check digit is incorrect or does not exit.
"OFF": Reading is carried out regardless of the presence of the check digit.

"4: TYPE":
"BOTH": Enables reading of both normal and short types.
"NORMAL": Enables reading of the normal type.
"SHORT" : Enables reading of the short type.

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4]) to select the desired item.

3. Press the cursor keys ([◄] [►]) to select the desired setting.

4. Press the **ENT** or Backspace/clear key to update the setting and return to the SET BARCODE menu.

[5] Setting the communication environment

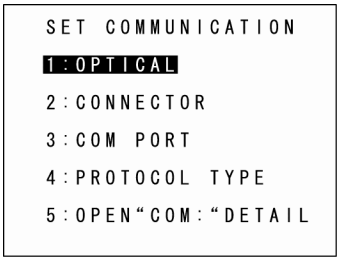
The communication environment settings following system initialization are follows.
Do not change these settings unless necessary.

Item		Default	
Interface port		Optical (infrared interface port)	
Communication protocol		Ymodem protocol	
Infrared interface port			
TRANSMIT SPEED		115200 bps	
PROTOCOL	Protocol options	SERIAL No.:	ON (Adds serial numbers to data blocks.)
		H. PARITY:	ON (Adds horizontal parity.)
		LINKUP TIME:	30 seconds
		FIELD SPACE:	Ignore (Trim)
USB interface port			
PROTOCOL	Protocol options	SERIAL No.:	ON (Adds serial numbers to data blocks.)
		H. PARITY:	ON (Adds horizontal parity.)
		LINKUP TIME:	30 seconds
		FIELD SPACE:	Ignore (Trim)

Use the following procedure if necessary to change the communication environment settings

1. Select “5: COMMUNICATION” at the SET SYSTEM menu and then press the **ENT** key.

The SET COMMUNICATION menu screen displays as shown on the right.



2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4]) to highlight the item to be set and press the **ENT** key.

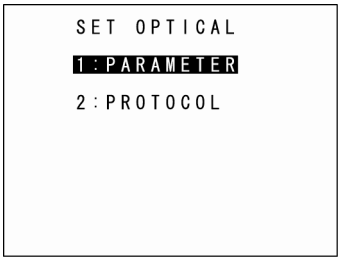
“1: OPTICAL”:
Changes the infrared communication parameters.
“2: CONNECTOR”:
Changes the setting of the USB communication parameters.
“3: COM PORT”:
Changes the communication port setting.
“4: PROTOCOL TYPE”:
Changes the communication protocol setting.
“5: OPEN “COM:” DETAIL”:
Changes the communication condition setting for the user program (OPEN “COM:”) created via the BHT-BASIC.

Refer to the following section for details of the above items.
Press the Backspace/clear key to return to the SYSTEM MENU.

◆ “1: OPTICAL”: Infrared communication parameters

1. Select “1: OPTICAL” at the SET COMMUNICATION menu and then press the **ENT** key.

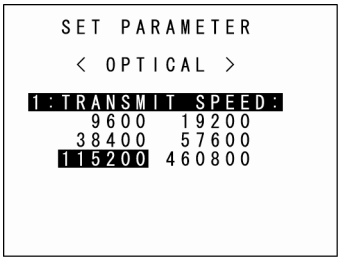
The SET OPTICAL menu screen displays as shown on the right.



2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2]) to highlight “1: PARAMETER” or “2: PROTOCOL”, and then press the **ENT** key.

Press the Backspace/clear key to return to the SET SYSTEM menu.

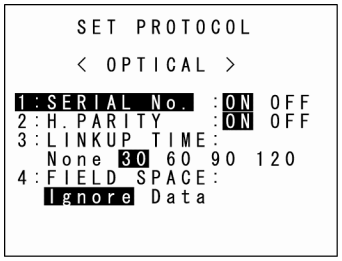
“1: PARAMETER”: Setting the communication parameters
Select “1: PARAMETER” to display the screen shown on the right.
The highlighted setting will be the current setting.



“1: TRANSMIT SPEED”: Setting the transmission speed
To change the setting, use the highlight the transmission speed with the cursor keys ([◄] [►]) and press the **ENT** key.
Press the Backspace/clear key to return to the SET OPTICAL menu.

“2: PROTOCOL”: Communication protocol options setting screen

Select “2: PROTOCOL” to display the screen shown on the right.
The highlighted settings will be the current settings.



“1: SERIAL No.”:

Selects whether or not to add serial numbers to data blocks

“2:H.PARITY”:

Selects whether or not to add horizontal parity.

”3: LINKUP TIME:

Selects the timeout length (in seconds) to be applied when a link is to be established.

”4: FIELD SPACE:

To trim trailing spaces in fields, select “Ignore”, and to retain them as data, select “Data”.

To make changes, use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]), and then press the **ENT** key.
Press the Backspace/clear key to return to the SET OPTICAL menu.

– Point – Selecting the BHT-Ir or Ymodem protocol ignores the serial number and horizontal parity settings.

◆ "2: CONNECTOR": Setting the USB communication environment

1. Select "2: CONNECTOR" at the SET COMMUNICATION menu and then press the **ENT** key.

The SET CONNECTOR screen appears.

```
SET CONNECTOR

1:COM PROTOCOL
```

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1]) to select the desired item.

Press the Backspace/clear key to return to the SET COMMUNICATION menu.

"1: COM PROTOCOL" COM communication protocol option setting

When ""1:COM PROTOCOL" is selected, the screen on the right appears.
The highlighted settings are the current settings.

```
SET COM PROTOCOL
< CONNECTOR >
1:SERIAL No.  :ON OFF
2:H.PARITY    :ON OFF
3:LINKUP TIME:
  None 30 60 90 120
4:FIELD SPACE:
  Ignore Data
```

"1: SERIAL No.":
Selects whether or not to add serial numbers to data blocks.

"2: H.PARITY":
Selects whether or not to add horizontal parity.

"3: LINKUP TIME":
Selects the timeout length (in seconds) to be applied when a link is to be established.

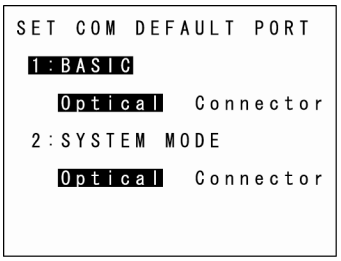
"4: FIELD SPACE":
To trim trailing spaces in fields, select "Ignore", and to retain them as data, select "Data".

To make changes, use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]) , and then press the **ENT** key.
When the **C** key is pressed, the SET CONNECTOR screen reappears.

– **Point** – Selecting the BHT-Ir or Ymodem protocol ignores the serial number and horizontal parity settings.

◆ "3: COM PORT": Setting the interface port

1. Select "3: COM PORT" at the SET COMMUNICATION menu and then press the **ENT** key.



The SET COM DEFAULT PORT menu screen displays as shown on the right.
The highlighted settings will be the current settings.

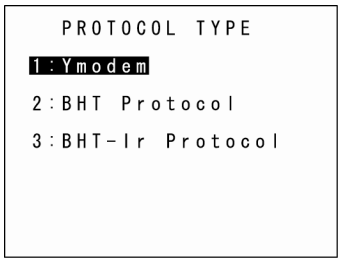
"1: BASIC"
Selects the infrared communication (Optical) or connector communication (Connector) interface port to be used for user programs written in BHT-BASIC (OPEN "COM:").
"Optical": Uses infrared communication.
"Connector": Uses USB communication.

"2: SYSTEM MODE"
Selects the infrared communication (Optical) or connector communication (Connector) interface port to be used for downloading or uploading files in System Mode.
"Optical": Uses infrared communication.
"Connector": Uses USB communication.

To make changes, use the cursor keys ([▲] [▼]) or numeric keys ([1] [2]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]), and then press the **ENT** key.
Press the Backspace/clear key to return to the SET COMMUNICATION menu.

◆ "4: PROTOCOL TYPE": Setting the communication protocol type

1. Select "4: PROTOCOL TYPE" at the SET COMMUNICATION menu and then press the **ENT** key.



The PROTOCOL TYPE menu screen displays as shown on the right.
The highlighted setting will be the current setting.

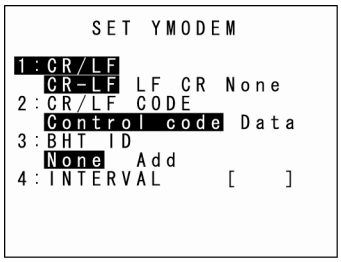
"1: Ymodem":
Selects Ymodem when uploading/downloading in System Mode or for the execution of the XFILE statement in BHT-BASIC.

"2: BHT Protocol":
Selects the BHT-protocol when uploading/downloading in System Mode or for the execution of the XFILE statement in BHT-BASIC.

"3: BHT-Ir Protocol":
Selects the BHT-Ir protocol when uploading/downloading in System Mode or for the execution of the XFILE statement in BHT-BASIC.

To make changes, use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3]) to highlight the setting item, and then press the **ENT** key.
To use the BHT-BASIC 4.0 Transfer Utility, select Ymodem or BHT-Ir protocol.
Press the Backspace/clear key to return to the SET COMMUNICATION menu.

Select “1: Ymodem” at the PROTOCOL TYPE menu to display the screen on the right.
The highlighted settings will be the current settings.



“1: CR/LF”:
Specifies line delimiters.

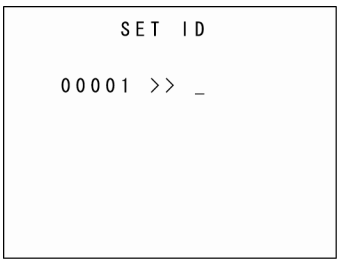
“2: CR/LF CODE”:
Specifies handling for line delimiters in records when data files are downloaded.
“Control code”:
Does not handle line-break codes as data. (Handles as record delimiters.)
“Data”:
Handles line-break codes as data.

“3: BHT ID”:
Specifies whether or not to add the BHT ID number to packets when performing Ymodem transfer.
“None” should normally be selected.
To add the BHT ID number to the transfer tool, select “Add”. (This setting is not supported. Changing this setting has no result.)

“4: INTERVAL”:
Specifies the retry interval within a range of 1 to 255 in units of 100 ms.

To make changes, use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]), and then press the **ENT** key.
For “4: INTERVAL”, press the **ENT** key to change to entry mode.
The cursor displays, allowing the previous setting to be deleted by pressing the Backspace/clear key.
Enter a new setting values with the numeric keys and press the **ENT** key.
Press the Backspace/clear key to return to the SET COMMUNICATION menu.

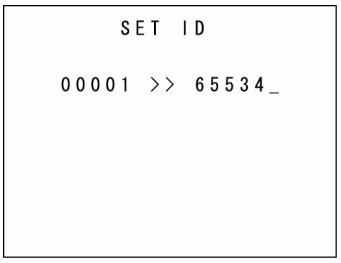
Select “3: BHT-Ir Protocol” at the PROTOCOL TYPE menu to display the screen on the right.



Enter the ID number of the BHT using the numeric keys and then press the **ENT** key.
If there is no need to edit the current setting, press the **ENT** key only.

– **Point** – ID numbers should consist of a five-digit decimal character string. The entry range is from 00001 to 65534. If the entry value is less than five digits, the **ENT** key will be invalid.

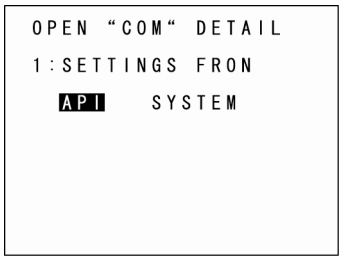
If an incorrect entry is made, press the Backspace/clear key to delete it and then enter the correct data.
Press the Backspace/clear key to return to the SET COMMUNICATION menu.



◆ "5: OPEN "COM:" DETAIL": OPEN "COM:" communication condition setting

For the communication condition setting for the user program (OPEN "COM:") created via BHT-BASIC, the system mode setting can be used. Therefore, it is not necessary to specify the communication condition setting. Even if the transmission speed must be changed, the user program does not need to be changed.

1. Select "5: OPEN "COM:" DETAIL" at the SET COMMUNICATION menu and then press the **ENT** key.



The OPEN "COM" DETAIL screen appears.
The highlighted setting is the current setting.

"1: SETTINGS FROM"
Sets the communication condition setting for the user program (OPEN "COM:") created via BHT-BASIC to either the setting specified in the user program or via the system mode setting.

"API":
Uses the setting specified in the user program (default).
"SYSTEM":
Uses the system mode setting (setting specified in the user program is not used).

Communication condition	System mode setting screen ("SET COMMUNICATION" menu)	Target API
Interface in use *1	"3:COM PORT" ↓ "1:BASIC"	OPEN "COM:"
Transmission speed	"1:OPTICAL" ↓ "1:PARAMETER" ↓ "1:TRANSMIT SPEED"	
Serial communication protocol	"2:PROTOCOL TYPE"	Out .pnCmPrtcl (6060)

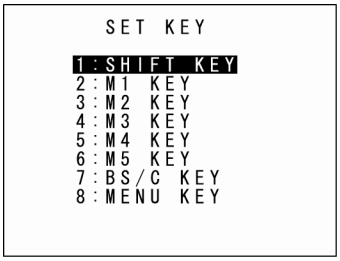
*1: Regardless of the interface specified in the user program, the operation is carried out using the interface specified in the system mode. e.g., even if OPEN "COM:2" is specified; if COM1 is specified in the system mode, the operation is carried out using COM1. Note, however, if COM3 or COM4 is specified, the operation is carried out according to the setting specified in the user program.

[6] Defining the functions of the Shift key and Magic keys

Use the following procedure to change the key settings.

1. Select "6: KEY" at the SET SYSTEM menu and then press the **ENT** key.

The SET KEY menu screen displays as shown on the right.



2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4] [5] [6] [7] [8]) to highlight the item to be set, and then press the **ENT** key.

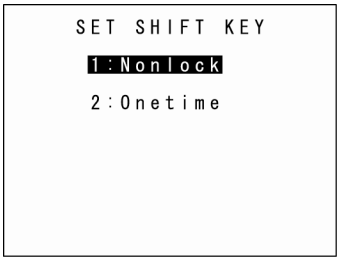
"1: SHIFT KEY": Displays the **SF** key definition screen.
"2: M1 KEY": Displays the **M1** key definition screen.
"3: M2 KEY": Displays the **M2** key definition screen.
"4: M3 KEY": Displays the **M3** (left-hand trigger switch) key definition screen.
"5: M4 KEY": Displays the **M4** (right-hand trigger switch) key definition screen.
"6: M5 KEY": Displays the **M5** key (**SCAN** key) definition screen.
"7: BS/C KEY": Displays the Backspace/clear key definition screen.
"8: MENU KEY": Displays the **M1** - **M5** key menu definition screen.

Refer to the following section for details of the above items.
Press the Backspace/clear key to return to the SET COMMUNICATION menu.

◆ "1: SHIFT KEY": Defining the Shift key function

1. Select "1: SHIFT KEY" at the SET KEY menu and then press the **ENT** key.

The SET SHIFT KEY menu screen displays as shown on the right.
The highlighted setting will be the current setting.



"1: Nonlock":
Shifts the keypad only when the **SF** key is held down.

"2: Onetime":
Shifts only the key pressed immediately after the **SF** key is pressed.
(The following keys will not be shifted.)

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2]) to highlight the item to be set, and then press the **ENT** key.

The selected item will be set and the screen will return to the SET KEY menu.

◆ "2: M1 KEY" - "6: M5 KEY": Defining the Mx key functions

1. Select "2: **M1** KEY" to "6: **M5** KEY" at the SET KEY menu and then press the **ENT** key.

The SET Mx KEY menu screen displays as shown on the right.
(In the example on the right, "2: **M1** KEY" has been selected.)
The highlighted setting will be the current setting.

"1: None":
Key entry will be ignored.
"2: Trigger Switch":
Sets the magic key as the trigger switch.
"3: Shift Key":
Sets the magic key as the **SF** key.
"4: Enter Key":
Sets the magic key as the **ENT** key.
"5: Backlight Key":
Sets the magic key as the backlight function ON/OFF key.
"6: MENU Key":
Sets the magic key as a key used to start up the "Beeper/Vibrator/Backlight Adjustment Screen".
"7: Clear Key":
Sets the magic key as the **C** key.

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4] [5] [6] [7]) to highlight the item to be set, and then press the **ENT** key.

The selected item will be set and the screen will return to the SET KEY menu.

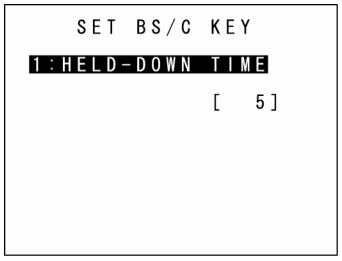
◆ Magic keys (M1 to M5)

Magic keys (**M1** to **M5**) can be set to function as the trigger switch, **SF** key, **ENT** key, backlight function ON/OFF key, **MENU** key or **C** key.
If the **M1** key is defined as the backlight function ON/OFF key, pressing the **M1** key enables or disables the backlight function.
In user programs, data strings can be also assigned to these magic keys.
Magic keys **M3**, **M4** and **M5** are set as the trigger switch by default.

– **Point** – The backlight function ON/OFF key can be assigned only to one of the magic keys from **M1** to **M5**. The key defined more recently will act as the backlight function ON/OFF key and the previously defined key will be ignored.
If, for example, the **M1** and **M2** keys are defined as the backlight function ON/OFF key in this order, the **M2** key will function as the backlight function ON/OFF key and the **M1** key entry will be ignored.
On the other hand, if the **M2** and **M1** keys are defined as the backlight function ON/OFF key in this order, the **M1** key will function as the backlight function ON/OFF key and the **M2** key entry will be ignored.

◆ Defining the Backspace/clear key function

The Backspace/clear key deletes the last character entered (backspace). When this key is pressed and held for at least 0.5 seconds, the entry is canceled and the previous screen reappears (clear).
The key press-and-hold time can be specified arbitrarily.



1. Select “7: BS/C KEY” at the SET KEY menu and then press the **ENT** key.

The highlighted setting is the current setting.

2. Press the **ENT** key to display the cursor.

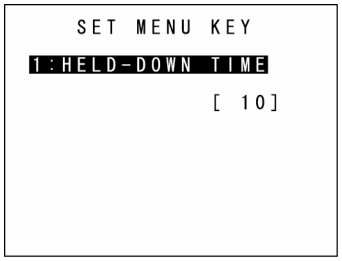
3. Press and hold the Backspace/clear key to clear the current setting.

4. Enter the desired numeric value.

Setting range: 1 to 255 (x 100 ms)

◆ Defining the MENU key setting

The **M1** to **M4** keys can be set as menu keys. For information on the menu function, refer to the operation guide.
The key press-and-hold time can be specified arbitrarily.



1. Select “8: MENU KEY” at the SET KEY menu and then press the **ENT** key.

The highlighted setting is the current setting.

2. Press the **ENT** key to display the cursor.

3. Press and hold the Backspace/clear key to clear the current setting.

4. Enter the desired numeric value.

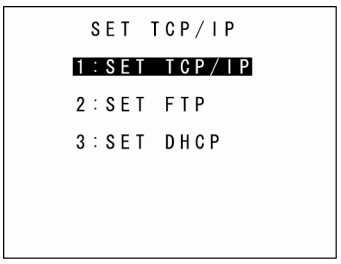
Setting range: 1 to 255 (x 100 ms)

[7] Setting the TCP/IP, FTP and DHCP

Use the following procedure to change the TCP/IP, FTP and DHCP settings.

1. Select "7: TCP/IP" at the SET SYSTEM menu and then press the **ENT** key.

The SET TCP/IP menu screen displays as shown on the right.



2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3]) to highlight the item to be set, and then press the **ENT** key.

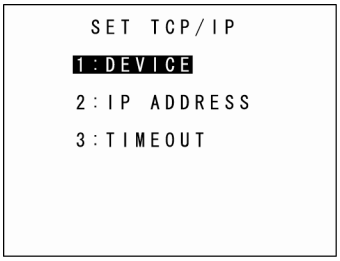
"1: SET TCP/IP": Changes the TCP/IP setting.
"2: SET FTP": Changes the FTP setting.
"3: SET DHCP": Changes the DHCP setting.

Refer to the following section for details of the above items.
Press the Backspace/clear key to return to the SET SYSTEM menu.

◆ "1: SET TCP/IP": Setting the TCP/IP

1. Select "1: SET TCP/IP" at the SET TCP/IP menu and then press the **ENT** key.

The SET TCP/IP menu screen displays as shown on the right.

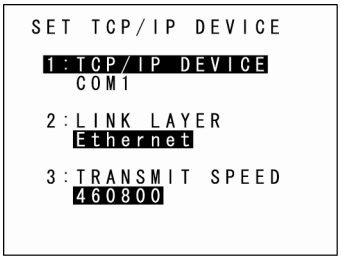


2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2]) to highlight the item to be set, and then press the **ENT** key.

Press the Backspace/clear key to return to the SET TCP/IP menu.

"1: DEVICE": Setting the TCP/IP device

Select "1: DEVICE" at the SET TCP/IP menu to display the screen on the right where the current settings are displayed.



"1: TCP/IP DEVICE": TCP/IP communication device
"2: LINK LAYER": Link layer
"3: TRANSMIT SPEED": Communication speed with the CU

Press the Backspace/clear key to return to the SET TCP/IP menu.

"2: IP ADDRESS": Setting the IP address

Select "2: IP ADDRESS" at the SET TCP/IP menu to display the screen on the right where the current settings are displayed.

To change the setting:

(1) Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3]) to highlight the item to be set and press the **ENT** key.

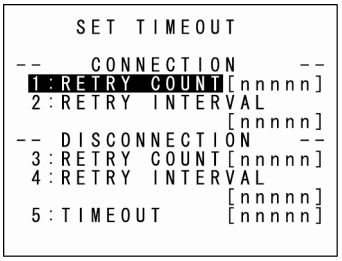
(2) The mode changes to entry mode and the cursor displays, allowing the setting to be entered with the numeric keys and dot key.
To delete a single character, press the Backspace/clear key. To delete the entire entry, press and hold the Backspace/clear key or press the **SF** and Backspace/clear keys simultaneously.

(3) Enter the desired value and then press the **ENT** key.

If the IP address, subnet mask and default gateway are all set to [0.0.0.0], DHCP is enabled.
Press the Backspace/clear key to return to the SET TCP/IP menu.

Setting the timeout (only when COM1 selected)

Select "3: TIMEOUT" at the SET TCP/IP menu to display the screen on the right where the current settings are displayed.



To change the setting:

(1) Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4] [5]) to highlight the item to be set and press the **ENT** key.

(2) The mode changes to entry mode and the cursor displays, allowing the setting to be entered with the numeric keys and dot key.
To delete a single character, press the Backspace/clear key. To delete the entire entry, press and hold the Backspace/clear key or press the **SF** and Backspace/clear keys simultaneously.

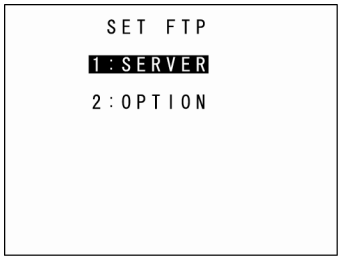
(3) Enter the desired value, and then press the **ENT** key.

Press the Backspace/clear key to return to the SET TCP/IP menu.

◆ Setting the FTP

1. Select “2: SET FTP” at the SET TCP/IP menu and then press the **ENT** key.

The SET FTP menu screen displays as shown on the right.

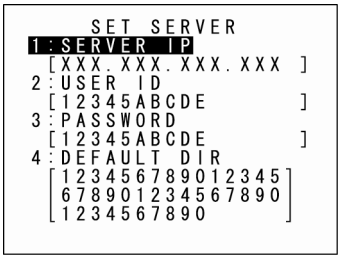


2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2]) to highlight the item to be set, and then press the **ENT** key.

Press the Backspace/clear key to return to the SET TCP/IP menu.

“1: SERVER”: Setting the FTP server connection environment

Select “1: SERVER” at the SET FTP menu to display the screen on the right where the current settings are displayed.



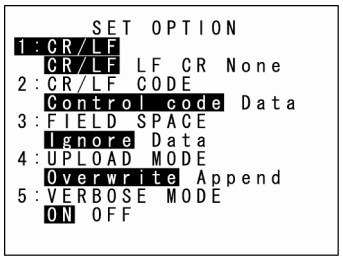
“1: SERVER IP”:
Sets the IP address for the FTP server.
“2: USER ID”:
Sets the user name.
“3: PASSWORD”:
Sets the password.
“4: DEFAULT DIR”:
Specifies an initial directory through which the FTP server will search for files for transfer first when the FTP client establishes a connection to the server.

To change the setting:
(1) Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4]) to highlight the item to be set and press the **ENT** key.
(2) The mode changes to entry mode and the cursor displays, allowing the setting to be entered with the numeric keys and dot key.
Press the **SF** key to change the entry mode (numeric entry (with no guidance display) and alphabet entry).
To delete a single character, press the Backspace/clear key. To delete the entire entry, press and hold the Backspace/clear key or press the **SF** and Backspace/clear keys simultaneously.
(3) Enter the desired value, and then press the **ENT** key.

Press the Backspace/clear key to return to the SET FTP menu.

"2: OPTION": Setting the FTP options

Select "2: OPTION" at the SET FTP menu to display the screen on the right where the current settings are displayed.



"1: CR/LF":
Specifies line delimiters that should match ones used in the server OS.

"2: CR/LF CODE":
Specifies the treatment of line delimiters in records when data files are downloaded.
"Control code": Does not handle line-break codes as data. (Handles as record delimiters.)
"Data": Handles line-break codes as data.

"3: FIELD SPACE":
Specifies the treatment of trailing spaces in fields.
"Ignore": Trims trailing spaces in fields.
"Data": Retains trailing spaces as data.

"4: UPLOAD MODE":
Specifies handling for trailing spaces in fields.
"Overwrite": Uploaded files will be written over the existing files.
"Append": Uploaded files will be appended to the existing files.

"5: VERBOSE MODE":
Specifies the command response display when using FTP.
"ON": Displays a message to the response (number) from the FTP server when the BHT (FTP client) outputs a message.
"OFF": Displays only messages output by the BHT (FTP client).

Refer to "FTP Download/Upload Messages" at section "4.5.9 Downloading/Uploading Files by FTP (FTP MENU)" for messages output by the BHT (FTP client).
Refer to "Response Messages from the FTP Server" at section "4.5.9 Downloading/Uploading Files by FTP (FTP MENU)" for messages to responses (numbers) from the FTP server.

To change the setting:
(1) Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4] [5]) to highlight the item to be set and press the **ENT** key.
(2) Use the cursor keys ([◄] [►]) to highlight each setting value.
(3) Press the **ENT** key.

Press the Backspace/clear key to return to the SET FTP menu.

◆ Setting the DHCP

1. Select “3: DHCP” at the SET TCP/IP menu and then press the **ENT** key.

The SET DHCP screen displays as shown on the right. The highlighted setting will be the current setting.
Press the Backspace/clear key to return to the SET TCP/IP menu.

```
SET DHCP

1:TIMEOUT  [XXXXX]
```

Press the dot key while holding down the **SF** key at the SET DHCP menu to display the NETWORK (DHCP) screen (acquisition check screen for IP address at DHCP).
Press the Backspace/clear key at the NETWORK (DHCP) screen to return to the SET DHCP screen.

BS/C key ⇑⇓ **SF** + [.] key

```
NETWORK(DHCP)
IP ADDRESS
   XXX.XXX.XXX.XXX
SUBNET MASK
   YYY.YYY.YYY.YYY
DEFAULT GATEWAY
   ZZZ.ZZZ.ZZZ.ZZZ
```

– Point – If the acquired IP configuration is displayed when the IP address, subnet mask or default gateway is set to a value other than “0.0.0.0”, the DHCP does not display on the screen shown on the right.

“1: TIMEOUT”:
Sets the timeout for acquiring the IP configuration from the DHCP server.
The entry range is from 00001 to 32767 seconds.

– Point – Up to 32767 seconds can be entered, but in actual operation, a maximum of 190 seconds is available since the number of retries and retry intervals are determined by the system.

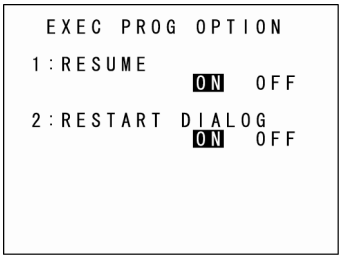
To set the DHCP:
(1) Press the **ENT** key.
(2) The mode changes to entry mode and the cursor displays, allowing the setting to be entered with the numeric keys.
To delete a single character, press the Backspace/clear key. To delete the entire entry, press and hold the Backspace/clear key or press the **SF** and Backspace/clear keys simultaneously.
(3) Enter the desired value, and then press the **ENT** key.

Press the Backspace/clear key to return to the SET FTP menu.

[8] Setting the user program execution option

Use the following procedure to set the user program execution option.

1. Select "1: EXEC PROG OPTION" at the SET SYSTEM 2/2 menu and then press the **ENT** key.



The EXEC PROG OPTION screen appears.
The highlighted settings are the current settings.

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2]) to change the setting and then press the **ENT** key.

Press the Backspace/clear key to return to the SET SYSTEM menu.

"1: RESUME":
- "ON": Enables the resume function.
- "OFF": Disables the resume function.

"2: RESTART DIALOG":

Sets the presence of the confirmation screen when the auto-start execution program is re-launched. For the function where the auto-start execution program is re-launched, refer to "4.3.6 Executing the Auto-start Execution Program from the Point of Start-up".
- "ON": The confirmation screen is displayed.
- "OFF": The confirmation screen is not displayed.

– Note – The resume function is used to return the BHT to the status (screen) when the BHT power was turned OFF previously.

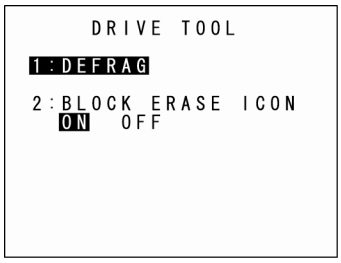
---

[9] Operation related to the drive

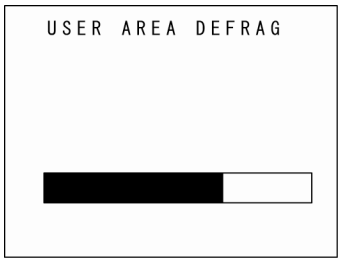
Use the following procedure to carry out the operation related to the drive.

[DEFRAG]

1. Select “2: DRIVE TOOL” at the SET SYSTEM 2/2 menu and then press the **ENT** key. When the screen on the right appears, select “1: DEFRAG” and then press the **ENT** key.



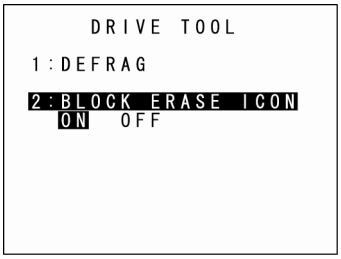
The screen on the right appears. Defragmentation is carried out for the entire user area.
When defragmentation is complete, the SET SYSTEM menu reappears.



Defragmentation reorganizes the user area, thereby increasing the amount of available space.
After defragmentation, the BHT may download files more efficiently than was the case before defragmentation.

[BLOCK ERASE ICON]

1. Select “2: DRIVE TOOL” at the SET SYSTEM 2/2 menu and then press the **ENT** key. When the screen on the right appears, select “2: BLOCK ERASE ICON” and then use the cursor keys ([◄] [►]) to toggle the setting between ON and OFF.



During defragmentation of the drive or during file writing via the application, the user area may be organized entirely or partially. During that time (for approximately one second), the application may temporarily stop and the hourglass icon appears on the bottom right. The icon can be set to be displayed (ON) or not (OFF).

[10] Setting the operation log

Use the following procedure to set the operation log.

1. Select “3: OPERATION LOG” at the SET SYSTEM 2/2 menu and then press the **ENT** key.

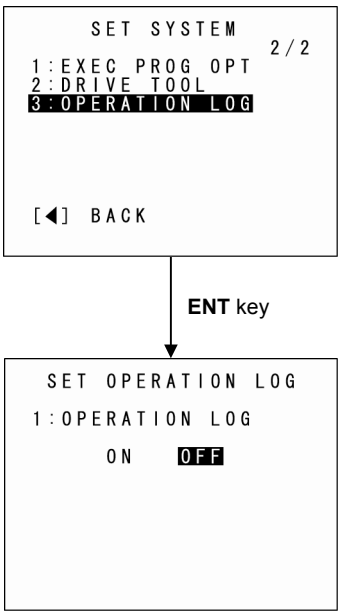
The SET OPERATION LOG menu appears.
The highlighted setting is the current setting.

2. Use the cursor keys ([◄] [►]) to change the setting and then press the **ENT** key.

“ON”: An operation log file is created.
“OFF”: An operation log file is not created.

3. Press the **ENT** key.

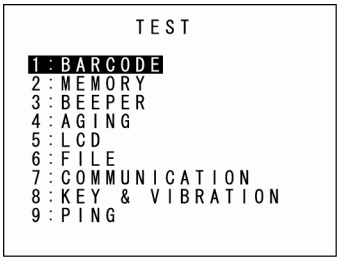
The setting is then updated.



4.5.7 BHT Operation Test (TEST Menu)

Use the following procedure to perform a BHT operation test.

1. Select “5: TEST” at the SYSTEM MENU and then press the **ENT** key.



The TEST menu screen displays as shown on the right.

“1: BARCODE”:
Selects the barcode reading test.
“2: MEMORY”:
Selects the RAM read/write test.
“3: BEEPER”:
Selects the beeper scale test.
“4: AGING”:
Selects the aging test.
“5: LCD”:
Selects the LCD and indicator LED tests.
“6: FILE”:
Checks the file information.
“7: COMMUNICATION”:
Selects the communication test.
“8: KEY & VIBRATION”:
Selects the key entry, beeper and vibrator tests.
“9: PING”:
Selects the PING test.

Refer to the following section for details of the above items.
Press the Backspace/clear key to return to the SYSTEM MENU.

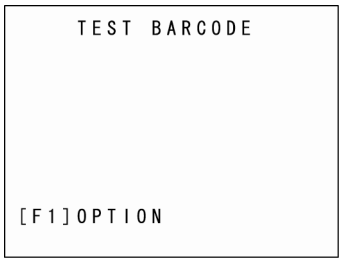
– **Point** – Contact your nearest dealer if an error occurs during any of the above tests.

[1] Barcode reading test

Use the following procedure to perform a barcode reading test.

1. Select “1: BARCODE” at the TEST menu and then press the **ENT** key.

The screen displays as shown on the right.

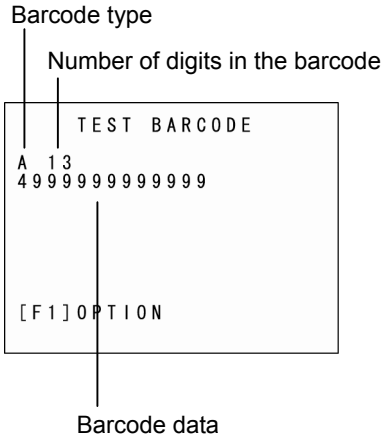


2. Read a barcode with the BHT.

Upon completion of barcode reading, the BHT beeps once, and the indicator LED turns blue.

3. The read barcode type, number of digits, and data display at the screen. Ensure that the barcode data and screen display match.

Press the Backspace/clear key to return to the TEST menu.



Barcode Type and Corresponding Characters Displayed on the Screen

Barcode Type		ID Characters	
		Codemark Type1	Codemark Type2 *3
EAN-13（JAN-13）	Without add-on	A	]E0
	With 2-digit add-on	A	]E3
	With 5-digit add-on	A	]E3
UPC-A	Without add-on	A	]X0
	With 2-digit add-on	A	]X3
	With 5-digit add-on	A	]X3
EAN-8（JAN-8）	Without add-on	B	]E4
	With 2-digit add-on	B	]E5
	With 5-digit add-on	B	]E6
UPC-E	Without add-on	C	]X0
	With 2-digit add-on	C	]X3
	With 5-digit add-on	C	]X3
Interleaved 2of5 (ITF) *1		I	]Im
Codabar（NW-7）		N	]Am
Code 39		M	]Fm
Code 93		L	]G0
Code 128		K	]Cm
GS1-128（EAN-128）		W	]C1
GS1 DataBar（RSS）		R	]em
Standard 2of5 (STF) *2	Short	H	]R0
	Normal	H	]S0

*1 With ITF, a barcode with 4 or more digits is read.

*2 With STF, a barcode with 3 or more digits is read.

*3 Codemark Type2 is a code mark system which complies with “Guidelines on Symbology Identifiers” of AIM USA; “m” in the last digit position varies, as shown in the table below, depending on the data format of the barcode system.

Example)]I1]: Flag Character (ASCII 93)
I: Code Character (ITF)
1: Modifer Character (see the table below)

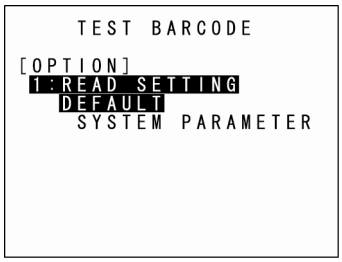
e.g., in the case of the setting in which the ITF with C/D is read, the codemark is “]I1”.

Barcode type	Modifer Character	Description
Interleaved 2of5 (ITF)	0	Reading without C/D
	1	Reading with C/D
Code 39	0	Reading without C/D
	1	Reading with C/D
Codabar（NW-7）	0	Reading without C/D
	1	Reading with C/D
Code 128	0	The first and second characters after start codes do not include FNC1.
	2	The second character after start codes is FNC1.

C/D: Check digits

◆ Setting the Barcode reading Test Options

Press **F1** key at the TEST BARCODE screen to set the barcode reading test options. The screen displays as shown on the right.
The highlighted settings will be the current settings.



To change the setting, use the cursor keys ([◄] [►]) to highlight the desired setting.

Press the **F1**, **ENT**, or Backspace/clear key to return to the TEST BARCODE screen.

"1: READ SETTING":
Sets the read conditions of the barcode reading test.

"DEFAULT": Reads barcodes according to the default read condition.

"SYSTEM PARAMETER": Sets the read condition via the system setting. It allows the read condition to be set more precisely.
When carrying out the system setting, refer to the setting for the "function in which the read setting is specified from the system settings" in "4.5.6 [4] Setting the special barcode reading parameters".

Barcodes allowed to be read in the "DEFAULT" setting
EAN-13 (JAN-13), UPC-A [*1]
EAN-8 (JAN-8) [*1]
UPC-E [*1]
Interleaved 2of5 (ITF) [*2]
Codabar (NW-7)
Code 39
Code 93
Code 128, GS1-128 (EAN-128)
RSS (GS1 DataBar)
Standard 2of5 (STF) [*3]

[*1] Excludes those with add-on.
[*2] With ITF, a barcode with 4 or more digits is read.
[*3] With STF, a barcode with 3 or more digits is read.

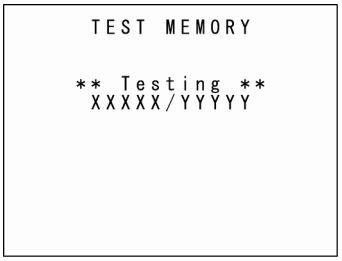
– **Point** – To read the EAN/UPC barcode with add-on in the barcode reading test, it is necessary to set the system setting and then set to "SYSTEM PARAMETER".

[2] Memory test

Use the following procedure to perform a memory test.

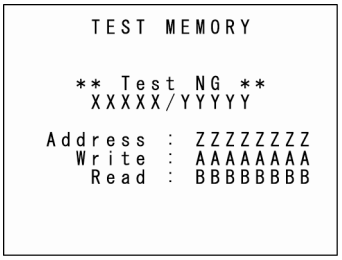
1. Select “2: MEMORY” at the TEST menu and then press the **ENT** key.

The screen displays as shown on the right, and the BHT reads and writes data to and from all areas of the RAM and performs an address check.



“XXXXX”: Tested RAM capacity (unit: kilobytes)
“YYYYY”: Total RAM capacity (unit: kilobytes)

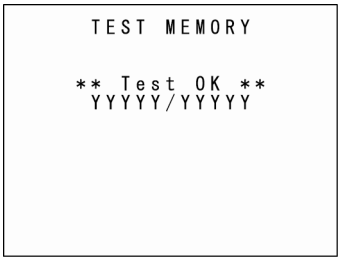
If any error is detected, the BHT beeps three times, displays a message similar to that shown on the right, and aborts the test.



“ZZZZZZZZ”: Address where the error occurred
“AAAAAAAA”: Data to write
“BBBBBBBB”: Data read out the RAM

Press the Backspace/clear key to return to the TEST menu.

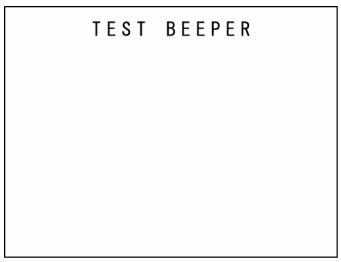
Upon normal completion of the RAM test, the BHT beeps once, displays a message similar to that shown on the right, and returns to the TEST menu.



[3] Beeper scale test

Use the following procedure to perform a beeper scale test.

1. Select "3: BEEPER" at the TEST menu and then press the **ENT** key.



The screen displays as shown on the right, and the beeper sounds at the three octaves listed below.
Upon completion of this test, the BHT automatically returns to the TEST menu.

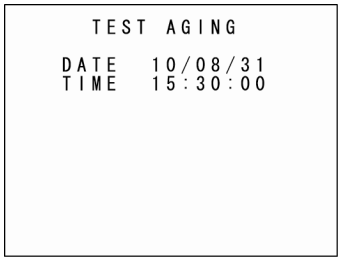
To stop the beeper scale test while in progress, turn the BHT OFF.

Scale	Frequency (Hz)			
do	523	1046	2093	4186
re	587	1174	2349	–
mi	659	1318	2637	–
fa	698	1396	2793	–
sol	783	1567	3135	–
la	880	1760	3520	–
ti	987	1975	3951	–

[4] Aging test

Use the following procedure to perform an aging test.

1. Select "4: AGING" at the TEST menu and then press the **ENT** key.



The aging test begins and the current date and time display on the screen.
(This test is intended for personnel responsible for checking the BHT at the factory.)

– Point – The Auto OFF function is disabled during the aging test. To abort the test, press the Backspace/clear key to return to the TEST menu, or turn the BHT power OFF.

[5] LCD and indicator LED tests

Use the following procedure to perform an LCD and indicator LED test.

1. Select “5: LCD” at the TEST menu and then press the **ENT** key.

The TEST BEEPER screen displays as shown on the right.
The indicator LED is OFF at this time.

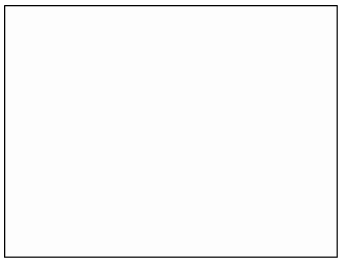
Press the Backspace/clear key to return to the TEST menu.

2. Press the **ENT** key.

The entire screen turns black and the indicator LED illuminates in green.

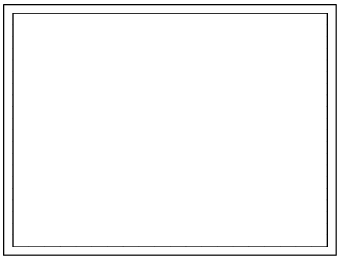
Press the Backspace/clear key to return to the previous screen.
Press and hold the Backspace/clear key or press the **SF** and Backspace/clear keys simultaneously to return to the testing.

3. Press the **ENT** key. The entire screen is displayed in white and the LED is illuminated in red simultaneously.



Press the Backspace/clear key to return to the previous screen.
Press and hold the Backspace/clear key or press the **SF** and Backspace/clear keys simultaneously to return to the TEST menu.

4. Press the **ENT** key.



A 1-dot frame is displayed around the screen and the LED is illuminated in blue simultaneously.

Press the Backspace/clear key to return to the previous screen.
Press and hold the Backspace/clear key or press the **SF** and Backspace/clear keys simultaneously to return to the TEST menu.

5. Press the **ENT** key.

The beeper sounds once, and the display returns to the TEST menu.

[6] File test

The file test allows detailed information on program files, and data files to be checked. Additionally, pressing the **M1** key sorts the display sequence of files.

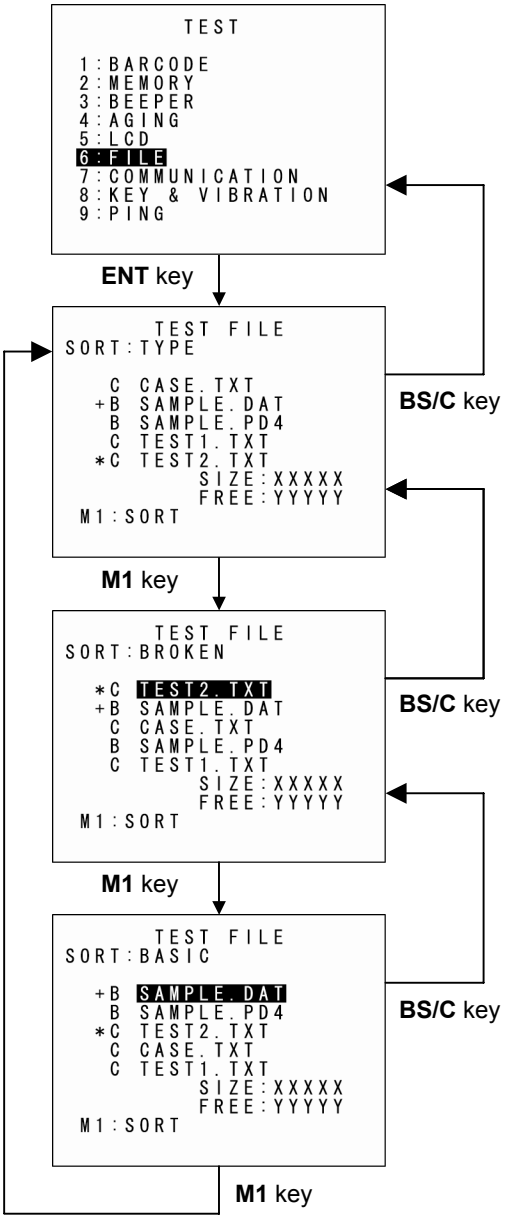
1. Select "6: FILE" at the TEST menu and then press the **ENT** key.

The screen displays as shown on the right, and if any of the files stored in the memory is defective, an asterisk (*) or plus sign (+) is prefixed to the name of the defective file (s).
Refer to "Chapter 2 BHT Preparation" – "2.5.4 If the BHT Is Shut Down Abnormally" for details about the (*) and (+).

"SIZE: bbbbb": Used memory size
"FREE: yyyyy": Available memory size

Files can be sorted each time the **M1** key is pressed.

"TYPE": Sorts files by type.
"BROKEN": Displays broken files in descending order.
"BASIC": Displays files in the order of "B: BASIC files", "C: C data files", and "None: Shared files and program files".



– Point –

- If a defective file is found, delete it or overwrite it with a file with the same name.
- Even defective files can be uploaded at the UPLOAD menu. It is therefore recommended that important files be uploaded before being deleted.

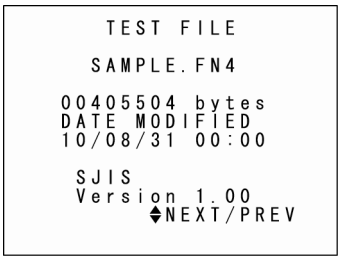
2. Select the desired file and then press the **ENT** key.

The selected item is set and the next screen then appears.
Press the Backspace/clear key to return to the previous screen.
In the previous screen, the selected item is highlighted.

◆ **Font files (*.FN3/FN4)**

1. Use the cursor keys ([▲] [▼]) to select a "*.FNT" file and then press the **ENT** key.

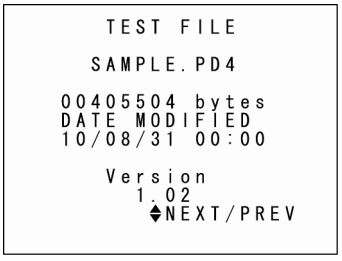
Press the Backspace/clear key to return to the previous screen.



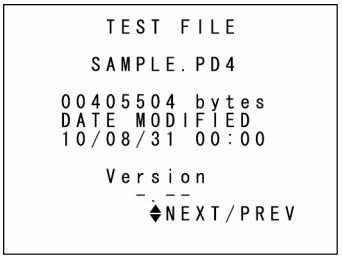
◆ **BASIC User Program (*.PD3/PD4)**

1. Use the cursor keys ([▲] [▼]) to select a "*.PD3/PD4" file and then press the **ENT** key.

Press the Backspace/clear key to return to the previous screen.



If the version cannot be acquired, the screen on the right appears.

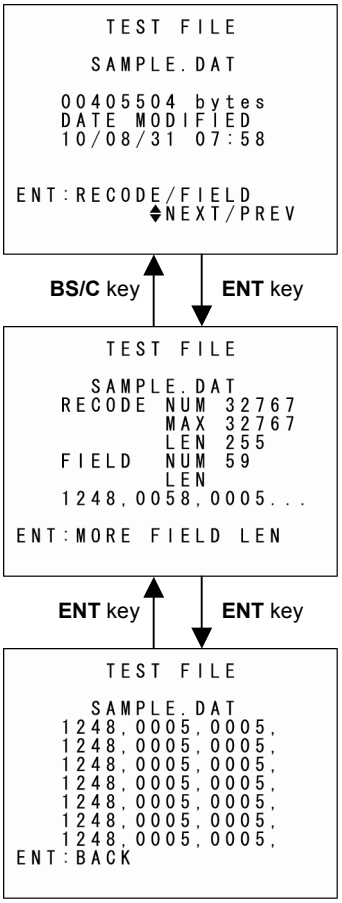


◆ **Other files (*.DAT, *.TXT)**

1. Use the cursor keys ([▲] [▼]) to select the desired file and then press the **ENT** key.

If field information is available, the next screen appears.
Press the Backspace/clear key to return to the previous screen.

If four or more fields exist, “MORE FIELD LEN” and a guide appear.
Press the **ENT** key to proceed to the next screen.
Press the **ENT** key again to return to the previous screen.



If field information is not available, the screen on the right appears.

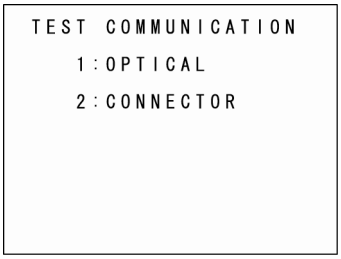
Press the Backspace/clear key to return to the previous screen.

[7] Communication test

Use the following procedure to perform a communication test.

1. Select “7: COMMUNICATION” at the TEST menu and then press the **ENT** key.

The TEST COMMUNICATION screen displays as shown on the right.



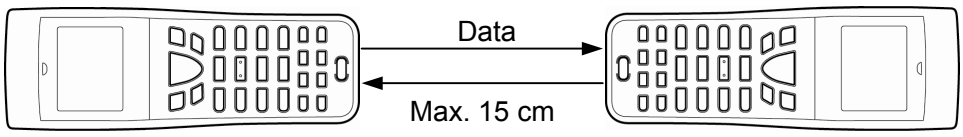
“1: OPTICAL”: Performs an infrared communication test.
“2: CONNECTOR”: Performs the USB connection test.

Refer to the following section for details of the above items.
Press the Backspace/clear key to return to the TEST menu.

◆ Infrared Communication Test

1. Arrange two BHTs, one as a master station and the other as a slave station (to be tested) with their IrDA interface ports facing each other as illustrated below.

This test involves transmitting data from the test BHT and the master BHT returning the data to the test BHT.

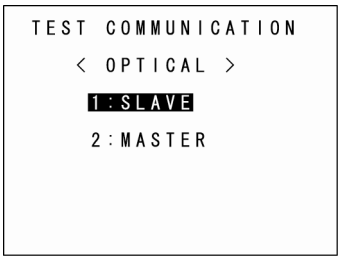


Master BHT

Slave BHT
(to be tested)

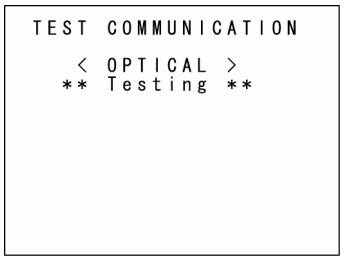
2. Select “1: OPTICAL” at the TEST COMMUNICATION menu and then press the **ENT** key.

The TEST COMMUNICATION screen displays as shown on the right.

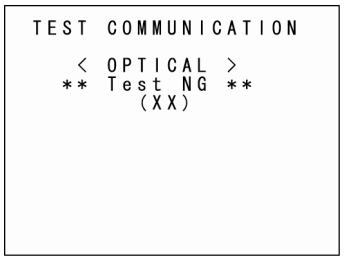


3. At the slave BHT to be tested, select “1: SLAVE”, and at the master BHT, select “2: MASTER”. Then press the **ENT** key.

The screen displays as shown on the right during the test, and an infrared communication test is performed.



If an error occurs, the tested slave BHT beeps three times and displays the screen on the right.



The meanings of the error codes in parentheses are as follows.

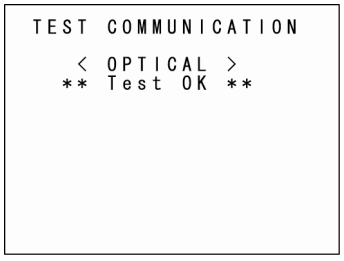
(XX)

- 1: The received data is different from the sent data.
- 2: A timeout has occurred during standby for data reception.

1: 9600 bps
2: 115200 bps
3: 460800 bps

Press the Backspace/clear key to return to the TEST COMMUNICATION menu.
The master BHT automatically returns to the TEST COMMUNICATION menu 10 seconds after the occurrence of an error.

Upon normal completion of the test, the tested slave BHT beeps once and displays the screen on the right.
Press the Backspace/clear key to return to the TEST COMMUNICATION menu.
The master BHT automatically returns to the TEST COMMUNICATION menu.



◆ USB connection test

1. Have a USB cable ready and then connect the BHT to the host.

2. Select “2: CONNECTOR” at the TEST COMMUNICATION screen and then press the **ENT** key.

During test, the screen on the right is displayed and the USB connection test is carried out.
Press the Backspace/clear key to abort the test and return to the TEST COMMUNICATION menu.

```
TEST COMMUNICATION
   < CONNECTOR >
 ** Connecting **
```

If no connection is made within 15 seconds, a buzzer sounds three times and the screen on the right then appears.
Press the Backspace/clear key to return to the TEST COMMUNICATION menu.

```
TEST COMMUNICATION
   < CONNECTOR >
 ** Connect NG **
```

If the connection is made, a buzzer sounds once and the screen on the right then appears.
Press the Backspace/clear key to return to the TEST COMMUNICATION menu.

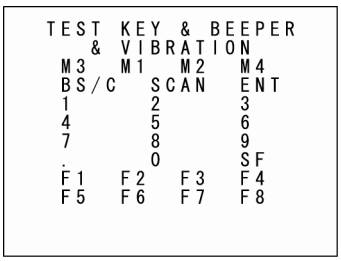
```
TEST COMMUNICATION
   < CONNECTOR >
 ** Connect OK **
```

[8] Key-entry, beeper and vibrator test

Use the following procedure to perform a key entry, beeper and vibrator test.

1. Select “8: KEY & VIBRATION” at the TEST menu and then press the **ENT** key.

The screen displays as shown on the right, and the BHT waits for key entry.



2. Press a key.

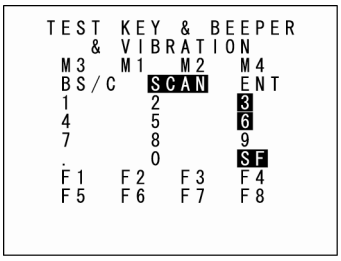
Pressing individual keys displays the identifier letters in the positions pre-assigned to those keys on the LCD as well as sounding the beeper or activating the vibrator. (As long as the individual key is held down, the BHT continues to beep or vibrate.)

3. Press the same key again.

The displayed characters disappear.

4. Repeat the above operation to display all keys on the screen.

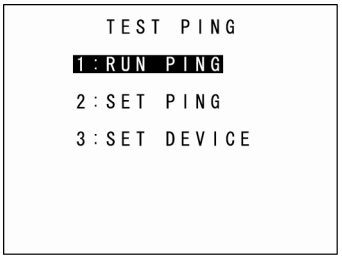
Upon completion of the test, the BHT automatically returns to the TEST menu.
Turn OFF the power to abort the test during testing.



[9] PING test

Use the following procedure to run the PING test.

1. Select “9: PING” at the TEST menu and then press the **ENT** key.



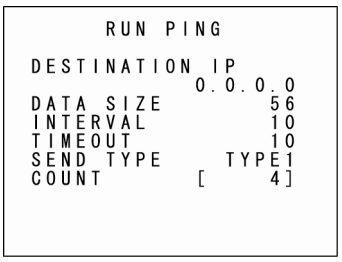
The TEST PING screen displays as shown on the right.

“1: RUN PING”: Runs the PING test.
“2: SET PING”: Displays the PING parameter setting screen.
“3: SET DEVICE”: Displays the PING device setting screen.

Refer to the following section for details of the above items.
Press the Backspace/clear key to return to the TEST menu.

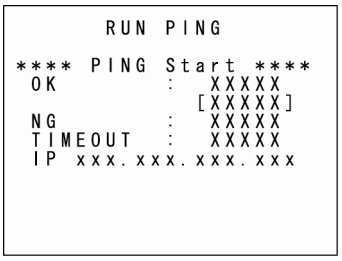
◆ “1: RUN PING” (PING Test Screen)

1. Select “1: RUN PING” at the TEST PING menu and then press the **ENT** key.



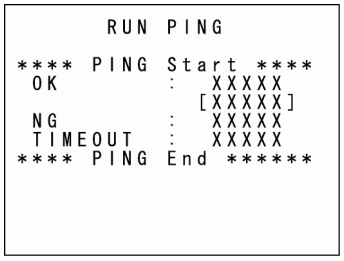
The current setting values display, and the BHT waits for the transmission count to be entered.
To change the number of echo requests displayed, enter the desired value using the numeric keys.
To delete a single character, press the Backspace/clear key. To delete the entire entry, press and hold the Backspace/clear key or press the **SF** and Backspace/clear keys simultaneously.

2. Press the **ENT** key.



When the PING test starts running, the message shown displays as shown on the right.
Press the Backspace/clear key to abort the PING test.

Upon completion of the PING test, the screen displays as shown on the right.



The PING result may include the following:

OK: Displays the number of echo replies.

[XXXXX]: Echo reply time in milliseconds.

NG: Displays the number of errors found during the PING test.

TIMEOUT: Displays the number of timeouts (for echo replies) that took place during the PING test.

IP: Displays the BHT IP address during the PING test only.

Messages displayed during PING test (displayed in center of screen)

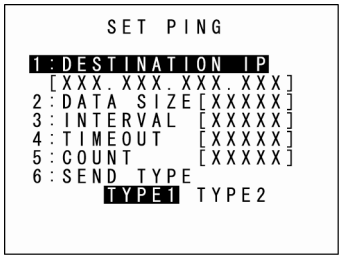
Waiting:	Setting up the PING test.
Opening device:	Opening devices.
Routing TCP/IP:	Connecting to the TCP/IP communication pathway.
PING start:	Starting the PING test.
Device error:	Failed to open a device.
TCP/IP error:	Failed to connect to the TCP/IP communication pathway.

PING termination messages (displayed at bottom of screen)

PING end:	The PING test has ended normally.
PING aborted:	The PING test has been aborted.
PING error:	An error has occurred during the PING test.

◆ "2: SET PING" (PING Options Setting Screen)

1. Select "2: SET PING" at the TEST PING menu and then press the **ENT** key.



The current settings are displayed.

[1: DESTINATION IP]:
Specifies the IP address of the host computer to be pinged.
[2: DATA SIZE]:
Specifies the data size of the echo request.
[3: INTERVAL]:
Specifies the echo request interval (in units of 100 ms).
[4: TIMEOUT]:
Specifies the timeout period (in units of 100 ms) for the echo request.
[5: COUNT]:
Specifies the number of echo requests to be sent.
[6: SEND TYPE]:
Selects the echo request send timing (TYPE 1 or TYPE 2).
(Refer to "PING Echo Request Transmission Timing (SEND TYPE)" on the following page for details.)

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4] [5] [6]) to highlight the item to be set, and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.
Use the cursor keys ([◄] [►]) to highlight the "6: SEND TYPE" setting.

3. Enter the setting values with the numeric keys and dot key.

"Use the cursor keys ([◄] [►]) to select the "6: SEND TYPE" setting.
To delete a single character, press the Backspace/clear key. To delete the entire entry, press and hold the Backspace/clear key or press the **SF** and Backspace/clear keys simultaneously

4. Enter the setting values and then press the **ENT** key.

Press the Backspace/clear key to return to the TEST PING menu.

Entry Range for DATA SIZE, INTERVAL, TIMEOUT, and COUNT

Item	Allowable Entry range	Default
DATA SIZE	4 to 1472	56
INTERVAL	0 to 65535	10
TIMEOUT	0 to 65535	10
COUNT	0* to 65535	4

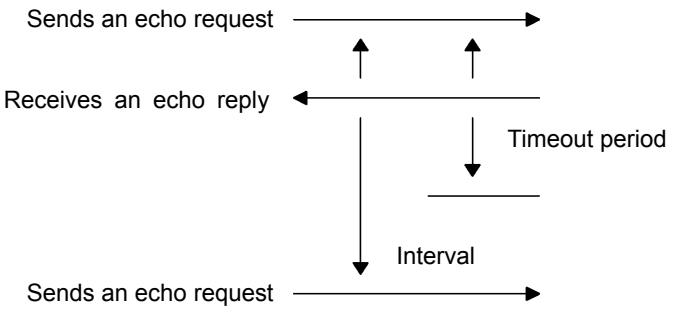
* Specifying zero (0) will set the number of echo requests to "infinite," meaning that echo requests will be sent continuously until the PING test is aborted.
If a value outside the allowable entry range listed above is specified, the nearest value within the range will automatically be applied.

PING Echo Request Transmission Timing (SEND TYPE)

Two types of echo request send timings are available: TYPE 1 and TYPE 2.

■TYPE1

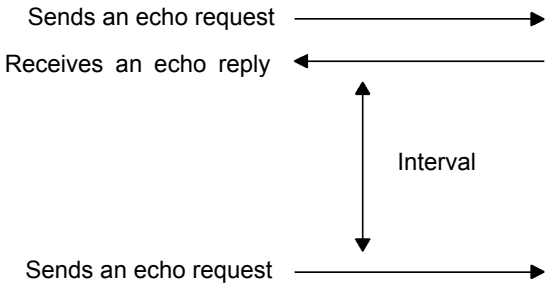
After sending an echo request, PING waits for the period specified at INTERVAL and then sends an echo request again. For TYPE 1, the relationship between the INTERVAL and TIMEOUT should be "INTERVAL ≥ TIMEOUT."



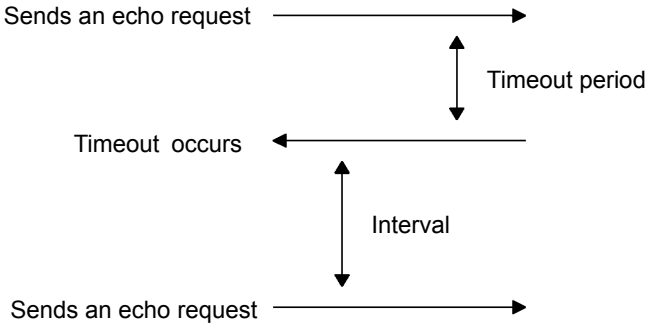
■TYPE2

After sending an echo request, PING waits for an echo reply to be received or for a timeout to occur. Following that, PING waits for the period specified at INTERVAL and then sends the next PING echo request. For TYPE 2, no relationship between the INTERVAL and TIMEOUT is required.

If PING receives an echo reply:



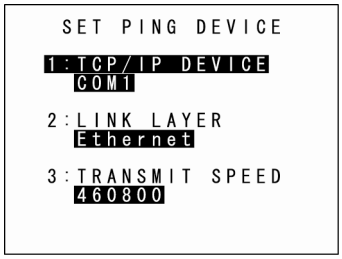
If a timeout occurs:



◆ "3: SET DEVICE" (PING Device Setting Screen)

1. Select "3: SET DEVICE" at the TEST PING menu and then press the **ENT** key.

The TCP/IP communication device, link layer, and transmission speed display.
Press the Backspace/clear key to return to the TEST PING menu.

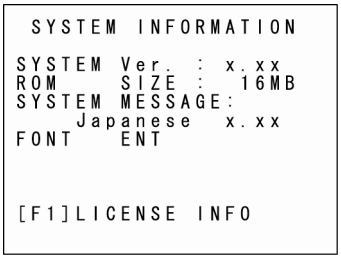


4.5.8 System Information (SYSTEM INFORMATION Menu)

[1] Displaying the BHT system information

Use the following procedure to display the BHT system information.

1. Select “6: VERSION” at the SYSTEM MENU and then press the **ENT** key.



The SYSTEM INFORMATION screen displays as shown on the right.

[SYSTEM Ver.]:	System program version
[ROM SIZE]:	ROM size
[SYSTEM MESSAGE]:	System message version
[FONT]:	Loaded font type and version

Press the Backspace/clear key to return to the SYSTEM MENU.

◆ License List

Press the **F1** key at the SYSTEM INFORMATION screen to display a license list as shown on the right.
The license list displays the names of functions for which licenses are required.

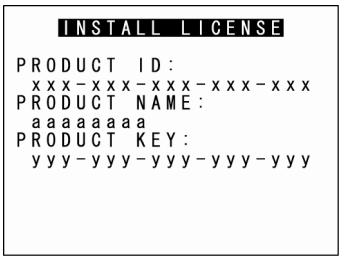
[1] ”∗” symbol: Indicates that a license has been registered.
[2] ”–” symbol: Indicates that no license has been registered.

* Even if functions for which licenses are required are loaded in the system, these functions do not display in the list if they have never been run.

Press the **F1** key or press the Backspace/clear key to return to the SYSTEM INFORMATION screen.

[1] Functions for which licenses have been registered (∗)

1. Use the cursor keys ([▲] [▼]) to highlight the name of a function that has been registered, and then press the **ENT** key to display a screen similar to that shown on the right containing the license registration details.

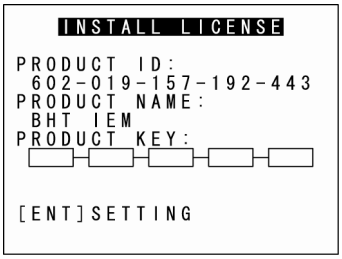


[PRODUCT ID]: Product ID
[PRODUCT NAME]: Product name
[PRODUCT KEY]: Product name

2. Press the Backspace/clear key to return to the LICENSE INFORMATION screen.

[2] Functions for which licenses have not been registered (−)

1. Use the cursor keys ([▲] [▼]) to highlight the name of a function that has not been registered, and then press the **ENT** key to display the license registration screen shown on the right.



[PRODUCT ID]: Product ID
[PRODUCT NAME]: Product name
[PRODUCT KEY]: Product name

2. Press the **ENT** key to display the cursor, allowing the product key to be entered.

Enter the product key for the product ID, and then press the **ENT** key.
If "** Authorized **" displays, license registration is complete.
If "*** Key NG ***" displays, the entered product key is incorrect.
Reenter the correct product key.
* The product key can be acquired when purchasing the product.

3. Press the Backspace/clear key to return to the LICENSE INFORMATION screen.

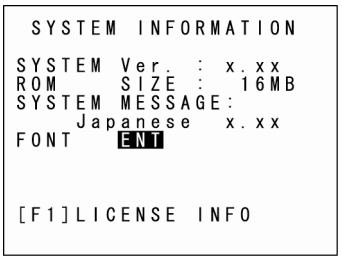
[2] CU-911 System Information Display

Use the following procedure to display CU-911 system information.

1. Place the BHT on the CU-911.

2. Select “6: VERSION” at the SYSTEM MENU and then press the **ENT** key.

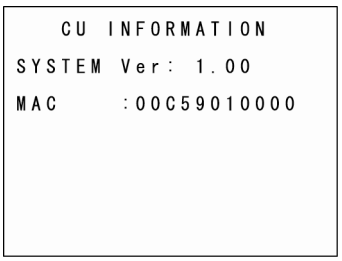
The SYSTEM INFORMATION screen displays as shown on the right.



3. Press the **M2** key.

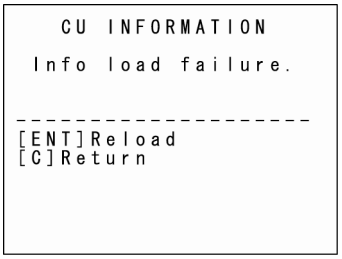
The CU-911 INFORMATION screen displays as shown on the right.

[SYSTEM Ver.]: System program information
[MAC ADDRESS]: MAC address



Press the **M1** key to return to the SYSTEM INFORMATION screen.

If the **M2** key is pressed when the BHT is not on the CU-911, the screen displays as shown on the right.



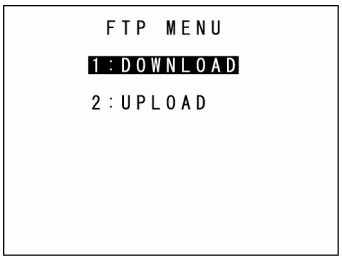
Press the Backspace/clear key to return to the SYSTEM INFORMATION screen.

4.5.9 Downloading/Uploading Files by FTP (FTP MENU)

Use the following procedure to download and upload files by FTP.

1. Select "7: FTP" at the SYSTEM MENU and then press the **ENT** key.

The FTP MENU screen displays as shown on the right.



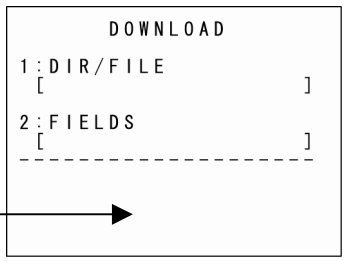
"1: DOWNLOAD": Downloads a file by FTP.
"2: UPLOAD": Uploads a file(s) by FTP.

Refer to the following section for details of the above items.
Press the Backspace/clear key to return to the SYSTEM MENU.

[1] Downloading by FTP

1. Select "1: DOWNLOAD" at the FTP MENU and then press the **ENT** key.

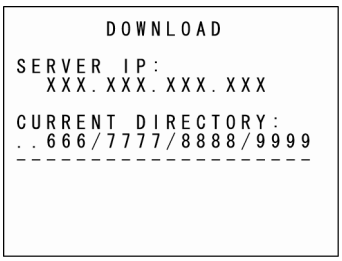
The screen displays as shown on the right.



[1: DIR/FILE]: Specifies the directory and/or file name.
[2: FIELDS]: Specifies field information for data files.

A message indicating the status displays at the bottom of the screen.

Press the **M2** key to display the screen on the right.



[SERVER IP]: Set IP address
[CURRENT DIRECTORY]: Acquired current directory

Press the **M1** key to return to the previous screen.

2. Use the cursor keys ([▲] [▼]) to highlight the item to be set, and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

3. Enter a setting value with the numeric keys and dot key.

Press the **SF** key to change the entry mode (numeric entry (no guidance display) and alphabet entry).
To delete a single character, press the Backspace/clear key. To delete the entire entry, press and hold the Backspace/clear key or press the **SF** and Backspace/clear keys simultaneously

4. Enter a setting value and press the **ENT** key.

Press the Backspace/clear key to return to the FTP MENU screen.

DIR/FILE entry box: The FTP client will interpret a character string entered into this box as a directory name at first, and will therefore send a Change Directory request to the FTP server. If the specified directory exists in the FTP server, the server will change a directory from the default to the specified one; if not, the FTP client will interpret the entered character string as a file name and send a Download request to the server.

FIELDS entry box: It is only necessary to enter field information in this box when downloading a data file. Before starting downloading, enter field information using the numeric keys and dot key. Pressing the dot key will enter a comma (,). No entry is required to download program files.

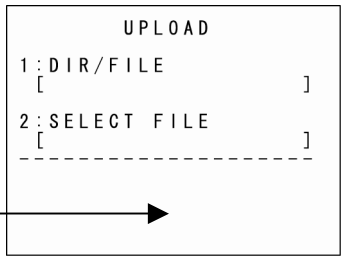
[2] Uploading by FTP

1. Select “2: UPLOAD” at the FTP MENU and then press the **ENT** key.

The screen displays as shown on the right if uploadable files exist.

[1: DIR/FILE]:
Entry box for the directory and/or file name
[2: SELECT FILE]:
File name currently selected (Nothing is displayed at the FTP client initial status.)

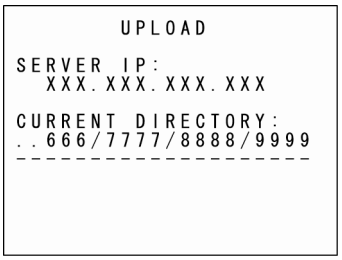
A message indicating the status displays at the bottom of the screen.



Press the **M2** key to display the screen on the right.

[SERVER IP]: Set IP address
[CURRENT DIRECTORY]: Acquired current directory

Press the **M1** key to return to the previous screen.



2. Use the cursor keys ([▲] [▼]) to highlight the item to be set, and then press the **ENT** key.

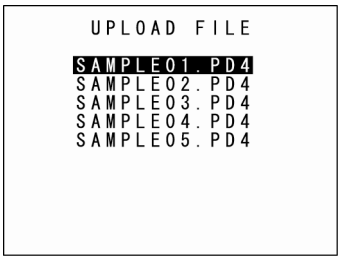
◆ When “1: DIR/FILE” is Selected

The mode changes to entry mode and the cursor displays, allowing directory and file names to be entered using the numeric keys and dot key.

Press the **SF** key to change the entry mode (numeric entry (no guidance display) and alphabet entry).
To delete a single character, press the Backspace/clear key. To delete the entire entry, press and hold the Backspace/clear key or press the **SF** and Backspace/clear keys simultaneously

◆ When “2: SELECT FILE” is Selected

The screen displays as shown on the right.
Use the cursor keys ([▲] [▼]) to highlight the upload file and then press the **ENT** key.
Return to the previous screen to display the selected file name in [2: FIELDS].



3. Enter the directory and file name, or select a file, and then press the **ENT** key.

Press the Backspace/clear key to return to the FTP MENU screen.

DIR/FILE entry box: The FTP client will interpret a character string entered into this box as a directory name at first, and will therefore send a Change Directory request to the FTP server. If the specified directory exists in the FTP server, the server will change a directory from the default to the specified one; if not, the FTP client will interpret the entered character string as a file name and send a Download request to the server.
If the SELECT FILE entry box file name differs from the file name specified in the DIR/FILE entry box, the FTP client will upload with the file name specified in the DIR/FILE entry box.

If the **ENT** key is pressed without entering a character string in the DIR/FILE entry box, the FTP client will upload to the server with the SELECT FILE entry box file name.

SELECT FILE entry box: For uploading, it is necessary to select a file to be uploaded to display the name in this entry box beforehand. Without a file name in this entry box, uploading will result in an error.
If the attributes (e.g., PD4, FN4, EX4, PD3, FN3, EX3, and data file extensions) of the selected file are different from those specified in the DIR/FILE entry box, an error will result.

If No Uploadable Files Exist

If no file exists in the BHT when uploading by FTP is selected, the message shown on the right displays.

Press the Backspace/clear key to return to the FTP MENU screen.

FTP Download/Upload Messages

When the BHT is uploading or downloading files by FTP, the following messages will appear at the bottom of the screen:

Aborted.	:	Uploading or downloading has been interrupted.
Connection error	:	The communication pathway is disconnected.
Device error	:	Failed to open a device.
Downloading	:	Downloading starts.
Download failed	:	Downloading has ended abnormally.
Download finished	:	Downloading has ended normally.
File broken!	:	The file being uploaded is corrupt.
File not found!	:	No file is found when downloading.
File not selected	:	No file has been selected.
File type mismatch!	:	When uploading, the attributes of the file selected in the SELECT FILE entry box are different from those in the DIR/FILE entry box.
FTP error	:	An error has occurred during execution of an FTP command.
FTP opened	:	Connection has been established by FTP.
Illegal text format!	:	The format of the received text is illegal.
Opening device	:	Opening a device.
Out of memory!	:	The memory is insufficient for storing files to be downloaded.
Out of range!	:	The specified parameter(s) is out of the allowable range.
Parameter error!	:	When downloading, the record length and/or field length specified in the FIELDS entry box exceed 255.
Program file error!	:	The received program file is illegal.
Routing TCP/IP	:	Connecting to the TCP/IP communications pathway.
Syntax error!	:	A syntax error has occurred.
TCP/IP error	:	Failed to connect to the TCP/IP communication pathway.
TCP socket error	:	An error occurred in the TCP layer during execution of an FTP command.
Too many files!	:	The current download will exceed the allowable number of files in the memory.
Uploading	:	Uploading starts.
Upload failed	:	Uploading has ended abnormally.
Upload finished	:	Uploading has ended normally.

Response Messages from the FTP server

The messages that FTP servers send during and after FTP operations vary, but servers all use the same reply codes as listed below.

110 : Restart marker reply.
120 : Service ready in approx. nnn minutes.
125 : Data connection has been established. Start transferring.
150 : File status okay: establishing data connection.
200 : Command okay.
202 : No response to this command. Not required at this site.
211 : System status, or system help reply
212 : Directory status.
213 : File status.
214 : Help message.
215 : NAME system type.
220 : Service ready for new users.
221 : Service closing control connection.
225 : Data connection established: no transfer in progress.
226 : Closing data connection.
227 : Entering Passive Mode.
230 : User logged in. Proceed.
250 : Requested file process completed normally.
257 : “PATHNAME” created.
331 : User name okay. Password required.
332 : Login account required.
350 : Requested file process awaiting further information.
421 : Service not available. Closing control connection.
425 : Unable to establish data connection.
426 : Connection closed: transfer aborted.
450 : Requested file action not taken.
451 : Requested action aborted: processing local error.
452 : Requested action not taken.
500 : Syntax error; command not recognized.
501 : Syntax error in parameters or arguments.
502 : Command not supported.
503 : Incorrect command sequence.
504 : Command parameter not supported.
530 : Not logged in.
532 : File storage account required.
550 : Requested action not taken.
551 : Requested action aborted: page type unknown.
552 : Requested file processing aborted.
553 : Requested action not taken.

4.5.10 USB Communication settings (“DEVICE” MENU)

The USB communication settings following system initialization are as follows.
Do not change these settings unless necessary.

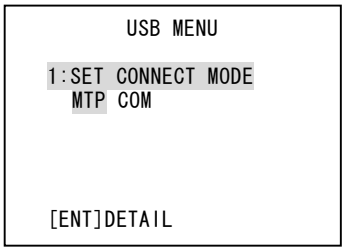
Item		Default
USB MENU		
SET CONNECT MODE	USB connection mode	MTP
MTP RESTRICTIONS		
RECEIVE	Recieve files	OFF (Enable recieving)
DELETE	Delete files	OFF (Enable deleting)
RENAME	Change file names	OFF (Enable changing)
MTP FILE SETTING		
CRLF	Carriage return code type	CR/LF
CR/LF CODE	Carriage return code function	Control code (function as a carriage return code)
FIELD SPACE	Field space function	Ignore
MTP DISP FILTER - FILE ATTRIBUTE		
ATTR DAT	Data file	YES (Displays in the file list)
ATTR APL	Application	YES (Displays in the file list)
ATTR FNT	Font file	YES (Displays in the file list)
ATTR ANO	Others	YES (Displays in the file list)
MTP DISP FILTER - FILE EXTENSION		
DISP	display /display none	YES (Displays files with specified extension in the file list)
SET	Specifies extension	NONE

Use the following procedure to set the USB communication settings.

[1] USB MENU

1. Select "1: USB" in the DEVICE menu and then press the **ENT** key.

The USB menu is displayed as shown on the right.



2. Use the cursor keys ([◄] [►]) to select the connect mode.

Press the Backspace/clear key to return to the DEVICE MENU.

"1: USB CONNECT MODE":
Setting the USB connection mode.
The highlighted settings are the current settings.
Use the cursor keys ([◄] [►]) to change the settings.

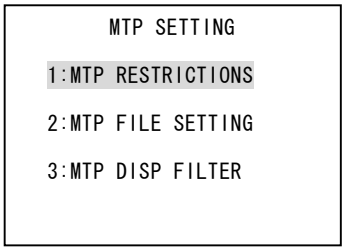
[MTP]:	Connects in the MTP mode.
[COM]:	Connects in the COM mode.

– **Point** – Continue in the following section for the MTP mode settings.
For the COM mode settings, refer to "4.5.6 [5] System Environment Settings".

[2] MTP SETTING menu

1. Select "MTP" in the USB MENU and then press the **ENT** key.

The MTP SETTING menu is displayed as shown on the right.



2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3]) to select the menu.

Press the Backspace/clear key to return to the USB MENU.

[1:MTP RESTRICTIONS]:	Displays the MTP RESTRICTIONS screen
[2:MTP FILE SETTING]:	Displays the MTP FILE SETTING screen
[3:MTP DISP FILTER]:	Displays the MTP DISP FILTER screen

Refer to the following sections for each of the above menus.

[3] MTP RESTRICTIONS menu

1. Select “1: MTP RESTRICTIONS” in the MTP SETTING menu and then press the **ENT** key.

The MTP RESTRICTIONS menu is displayed as shown on the right.

```
MTP RESTRICTIONS

1:RECEIVE    ON  OFF
2:DELETE     ON  OFF
3:RENAME     ON  OFF
```

2. Use the cursor keys ([▲] [▼])) or numeric keys ([1] [2] [3]) to select the menu.

[1:RECEIVE]	Select “ON” to restrict (disable) receiving files, select “OFF” to unrestrict (enable) receiving files.
[2:DELETE]:	Select “ON” to restrict (disable) deleting files, select “OFF” to unrestrict (enable) deleting files.
[3:RENAME]:	Select “ON” to restrict (disable) changing file names, select “OFF” to unrestrict (enable) changing file names.

Use the cursor keys ([◄] [►]) to highlight and set “ON” or “OFF”.
Press the Backspace/clear key to return to the MTP SETTING.

– Point – Function will be disabled when setting to “ON”.

[4] MTP FILE SETTING menu

1. Select “2: MTP FILE SETTING” in the MTP SETTING menu and then press the **ENT** key.

The MTP FILE SETTING menu is displayed as shown on the right.

```
MTP FILE SETTING

1:CR/LF
  CR/LF LF CR None
2:CR/LF CODE
  Control code Data
3:FIELD SPACE
  Ignore Data
```

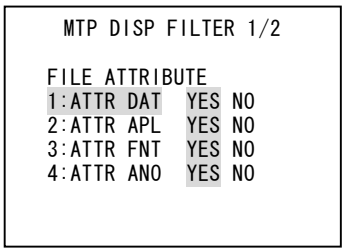
2. Use the cursor keys ([▲] [▼])) or numeric keys ([1] [2] [3]) to select the menu.

[1:CR/LF]:	Select the carriage return code.
[2:CR/LF MODE]:	Select “Control code” to use the carriage retrun code as the delimiter, select “Data” to use the carriage retrun code as data.
[3:FIELD SPACE]:	Select “Ignore” to ignore the space in the end of the field, select “Data” to use the space in the end of the field as data.

Use the cursor keys ([◄] [►]) to highlight and set the parameters.
Press the Backspace/clear key to return to the MTP SETTING.

– Point – The “CR/LF CODE” and “FIELD SPACE” settings are valid only when receiving files with field information.

[5] MTP DISP FILTER menu



1. Select “3: MTP FILE SETTING” in the MTP SETTING menu and then press the **ENT** key.

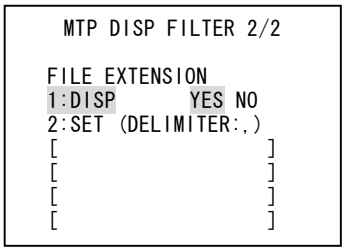
The MTP DISP FILTER menu (FILE ATTRBUTE) is displayed as shown on the right.

2. Use the cursor keys ([▲] [▼])) or numeric keys ([1] [2] [3] [4]) to select the menu.

[1:ATTR DAT]: Select “YES” to display the data files in the file list, select “NO” not to display.
[2:ATTR APL]: Select “YES” to display the application files in the file list, select “NO” not to display.
[3:ATTR FNT]: Select “YES” to display the font files in the file list, select “NO” not to display.
[4:ATTR ANO]: Select “YES” to display the other files in the file list, select “NO” not to display.

Use the cursor keys ([◄] [►]) to highlight and set ”YES” or “NO”.
Press the Backspace/clear key to return to the MTP SETTING.

3. Press the **ENT** key.



The MTP DISP FILTER menu (FILE EXTENSION) is displayed as shown on the right.

4. Use the cursor keys ([▲] [▼])) or numeric keys ([1] [2]) to select the menu.

[1:DISP]: Select “YES” to display the files with the specified extension in the file list, select “NO” not to display.
[2:SET]: Set the file extension to filter.
Use “,” as a delimiter when setting more than one extension.
Set “.” for the files without extensions.

Use the cursor keys ([◄] [►]) to highlight and set the parameters.
Press the Backspace/clear key to return to the MTP SETTING.

– Point – Control of the specified file can be disabled by not displaying the file in the explorer (i.e. file list) on a PC with the MTP connection.

The file will be displayed in the file list when receiving the filtered file (drag-and-drop a file into the file list),

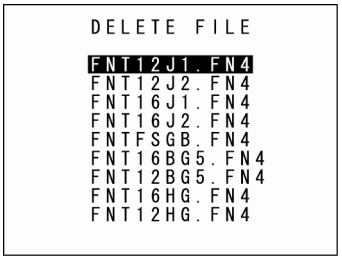
The file extension settings precedes the file attribute settings.

4.5.11 Deleting Program/Data Files ("DELETE FILE" Menu)

Delete program files or data files stored in the FLASH ROM.
Use the following procedure to delete files.

1. Press the [0] key while holding down the **SF** key at the SYSTEM MENU.

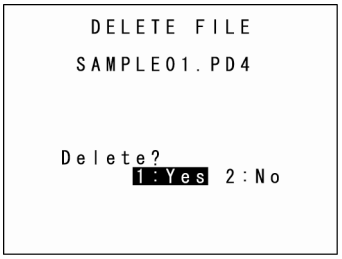
The DELETE FILE menu screen displays as shown on the right.
Press the Backspace/clear key to return to the SYSTEM MENU.



2. Use the cursor keys ([▲] [▼]) to highlight the program to be deleted.

3. Press the **ENT** key.

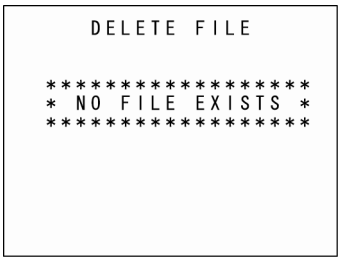
The screen displays as shown on the right.



To delete files:
Use the cursor keys ([▲] [▼]) or numeric key ([1]) to highlight [1: Yes] and then press the **ENT** key.
The selected file is deleted and the screen displays as shown on the right.
Press the Backspace/clear key to return to the DELETE FILE menu.

To cancel:
Use the cursor keys ([▲] [▼]) or numeric key ([2]) to highlight [2: No] and then press the **ENT** key.
The screen returns to the DELETE FILE menu.

The screen displays as shown on the right if no files exist.
Press the Backspace/clear key to return to the SYSTEM MENU.



4.5.12 Deleting Font Files (DELETE FILE Menu)

Delete font files stored in the FLASH ROM.
If there is insufficient user area, by deleting font files, a user area equal to the size of the deleted font files can be secured.

Not displaying Japanese fonts at the user program:
All font files can be deleted.

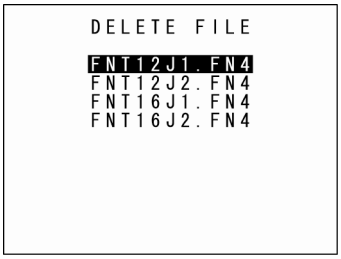
Using only 16 dots or 12 dots at the user program:
Font files that are not used can be deleted.

When deleting font files, upload the font files to the host computer and so on to ensure that they are backed up.
Refer to section “4.5.4 Uploading Files (UPLOAD Menu)” for details of uploading.

Use the following procedure to delete font files.

1. Press the [2] key while holding down the **SF** key at the SYSTEM MENU.

The DELETE FILE menu screen displays as shown on the right.
Press the Backspace/clear key to return to the SYSTEM MENU.



2. Use the cursor keys ([▲] [▼]) to highlight the font file to be deleted.

3. Press the **ENT** key.

The screen displays as shown on the right.

To delete font files:

Use the cursor keys ([▲] [▼]) or numeric key ([1]) to highlight [1: Yes] and then press the **ENT** key.

The selected file is deleted and the screen displays as shown on the right.

Press the Backspace/clear key to return to the DELETE FILE menu

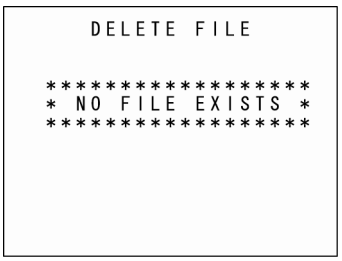
To cancel:

Use the cursor keys ([▲] [▼]) or numeric key ([2]) to highlight [2: No] and then press the **ENT** key.

The screen returns to the DELETE FILE menu

The screen displays as shown on the right if no files exist.

Press the Backspace/clear key to return to the SYSTEM MENU.



4.5.13 Downloading/Uploading the BHT System Parameter File (SYSTEM PARAMETER Menu)

The system parameter file (file name: "_BHT.SYS") is a file containing settings such as values, LCD contrast and beeper volume set at section "4.5.6 System Environment Settings".
The same settings can be set at another BHT by copying the system parameter file to that BHT.

Copying the System Parameter File

(1) Upload the system parameter file to the host computer and so on.
(2) Download the uploaded system parameter file at another BHT.

– **Supplement**– The system parameter file can also be copied directly between two BHT units by opening their respective UPLOAD and DOWNLOAD menus.
Refer to section "4.5.5 Copying Files between 2 BHT Units" for details of the copy method.

◆ Uploading the System Parameter File

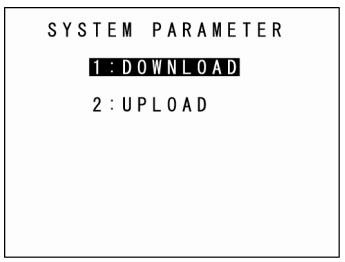
Create a system parameter file based on the current setting values and upload it to the host computer and so on. After uploading, delete the created system parameter file.

◆ Downloading the System Parameter File

Receive the system parameter file from the host computer and so on to which it was backed up, and after setting the stored values, delete the received system parameter file.

The communication parameters, communication protocol, and interface set at "[5] Setting the communication environment" in section "4.5.6 System Environment Settings" are used when uploading and downloading.
Use the following procedure to download and upload the system parameter file.

1. Press the [3] key while holding down the **SF** key at the SYSTEM MENU.



The SYSTEM PARAMETER menu screen displays as shown on the right.

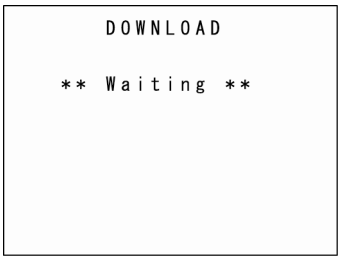
[1: DOWNLOAD]:
Downloads the BHT system parameter file to the BHT user area.
[2: UPLOAD]:
Uploads the BHT system parameter file stored in the BHT.

Refer to the following section for details of the above items.
Press the Backspace/clear key to return to the SYSTEM MENU.

[1] Downloading the BHT system parameter file

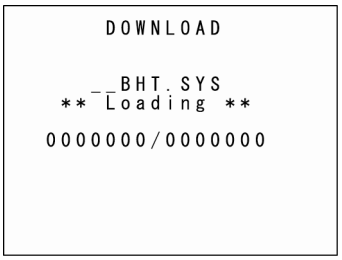
1. Use the cursor keys ([▲] [▼]) or numeric key ([1]) to highlight [1: DOWNLOAD] and then press the **ENT** key.

The screen displays as shown on the right indicating that the BHT is waiting for the system parameter file to be downloaded.



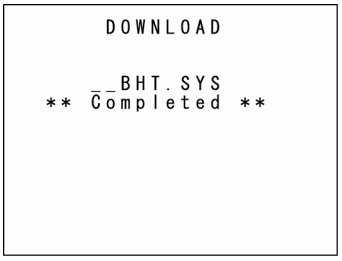
2. While the download is in progress, the screen displays as shown on the right indicating the file name and the number of received records/the total number of records.

Press the Backspace/clear key to abort the download and return to the SYSTEM PARAMETER menu.



3. Upon completion of downloading, the BHT displays the screen shown on the right and beeps once.

Press the Backspace/clear key to return to the SYSTEM PARAMETER menu.

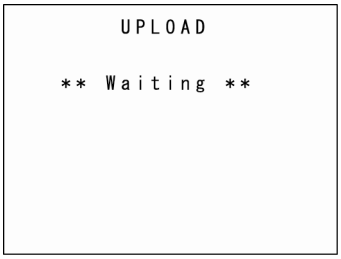


The beeper sounds three times if an error occurs during downloading, and an error screen displays
Refer to “Chapter 7 Error Messages” – “7.2 System Mode Errors” and remedy the error.

[2] Uploading the BHT system parameter file

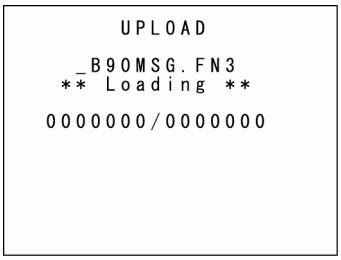
1. Use the cursor keys ([▲] [▼]) or numeric key ([2]) to highlight [2: UPLOAD] and then press the **ENT** key.

The screen displays as shown on the right indicating that the BHT is waiting for the system parameter file to be uploaded



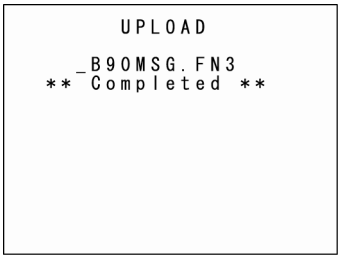
2. While the upload is in progress, the screen displays as shown on the right indicating the file name and the number of sent records/the total number of records.

Press the Backspace/clear key to abort the upload and return to the SYSTEM PARAMETER menu.



3. Upon completion of uploading, the BHT displays the screen shown on the right and beeps once.

Press the Backspace/clear key to return to the SYSTEM PARAMETER menu.

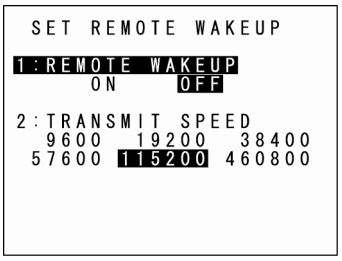


The beeper sounds three times if an error occurs during uploading, and an error screen displays.
Refer to “Chapter 7 Error Messages” – “7.2 System Mode Errors” and remedy the error.

4.5.14 Setting the Remote Wake-up (SET REMOTE WAKEUP Menu)

Use the following procedure to perform remote wake-up settings.

1. Press the [4] key while holding down the **SF** key at the SYSTEM MENU.



The SET REMOTE WAKEUP menu displays as shown on the right.

[1: REMOTE WAKEUP]:
Enables or disables remote wake-up.

[2: TRANSMIT SPEED]:
Sets the transmission speed for remote wake-up.

Press the Backspace/clear key to return to the SYSTEM MENU.

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2]) to highlight the item to be set.

3. Highlight the settings with the cursor keys ([◄] [►]) and press the **ENT** key.

Press the Backspace/clear key to return to the SYSTEM MENU.

4.5.15 Downloading/Uploading the System Message File (SYSTEM MESSAGE Menu)

The system message file is a file (file name: "_B90MSG.FN3") used by the system to display messages such as "Shutdown in progress. Do not remove the battery." or "Charge the battery!".

Downloading/Uploading the System Message File

(1) Upload the system message file to the host computer and so on.

(2) Download the uploaded system message file at another BHT.

◆ Uploading the System Message File

Create a system message file based on the current system message settings and upload it to the host computer and so on. After uploading, delete the created system message file.

◆ Downloading the system message file

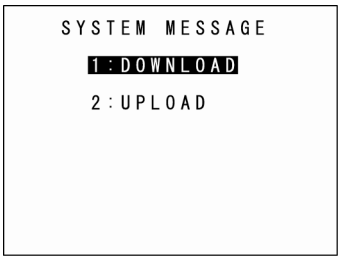
Receive the system message file from the host computer and so on to which it was backed up, and after setting the stored system messages, delete the received system message file.

The communication parameters, communication protocol, and interface set at "[5] Setting the communication environment" in section "4.5.6 System Environment Settings" are used when uploading and downloading.

– **Supplement** – System messages are normally set when the BHT is shipped from the factory, and therefore operation at this menu is unnecessary.

Use the following procedure to download and upload the system message file.

1. Press the [6] key while holding down the **SF** key at the SYSTEM MENU.



The SYSTEM MESSAGE menu displays as shown on the right.

[1: DOWNLOAD]:
Downloads the system message file.

[2: UPLOAD]:
Uploads the system message file.

Refer to the following section for details of the above items

Press the Backspace/clear key to return to the SYSTEM MENU.

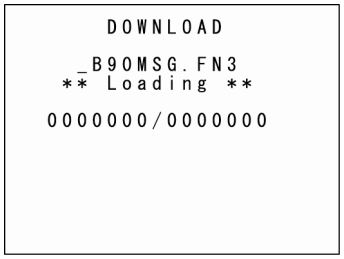
[1] Downloading the system message file

1. Use the cursor keys ([▲] [▼]) or numeric key ([1]) to highlight [1: DOWNLOAD] and then press the **ENT** key.

The screen displays as shown on the right indicating that the BHT is waiting for the system message file to be downloaded.

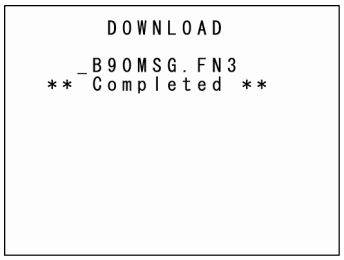
2. While the download is in progress, the screen displays as shown on the right indicating the file name and the number of received records/the total number of records.

Press the Backspace/clear key to abort the download and return to the SYSTEM MESSAGE menu.



3. Upon completion of downloading, the BHT displays the screen shown on the right and beeps once.

Press the Backspace/clear key to return to the SYSTEM PARAMETER menu.



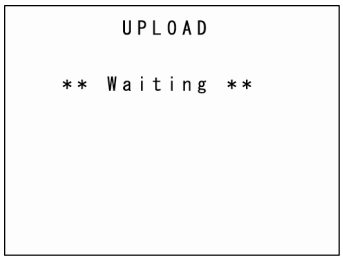
The beeper sounds three times if an error occurs during downloading, and an error screen displays.
Refer to “Chapter 7 Error Messages” – “7.2 System Mode Errors” and remedy the error.

– Point – When downloading the system message file, the BHT creates a temporary file named “_B90MSG.FN3” in the user area. An error will therefore occur if there is insufficient space in the user area to create the temporary file.
The created temporary file will automatically be deleted after downloading is complete.

[2] Uploading the system message file

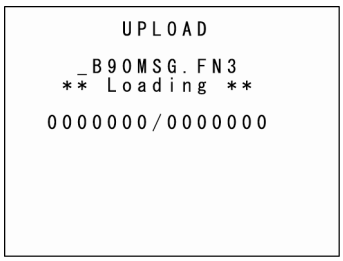
1. Use the cursor keys ([▲] [▼]) or numeric key ([2]) to highlight [2: UPLOAD] and then press the **ENT** key.

The screen displays as shown on the right indicating that the BHT is waiting for the system message file to be uploaded.



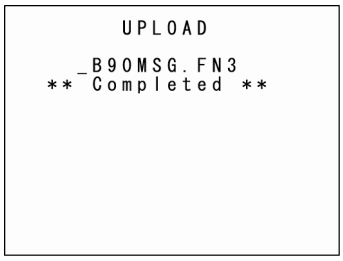
2. While the upload is in progress, the screen screen displays as shown on the right indicating the file name and the number of sent records/the total number of records.

Press the Backspace/clear key to abort the upload and return to the SYSTEM MESSAGE menu.



3. Upon completion of uploading, the BHT displays the screen shown on the right and beeps once.

Press the Backspace/clear key to return to the SYSTEM PARAMETER menu.



The beeper sounds three times if an error occurs during uploading, and an error screen displays.
Refer to “Chapter 7 Error Messages” – “7.2 System Mode Errors” and remedy the error.

– Point – When uploading the system message file, the BHT creates a temporary file named “_B90MSG.FN3” in the user area.

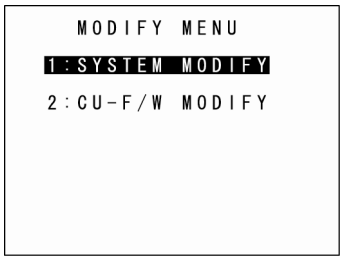
An error will therefore occur if there is insufficient space in the user area to create the temporary file.

The created temporary file will automatically be deleted after uploading is complete.

4.5.16 Updating the System (MODIFY MENU)

Use the following procedure to update the system.

1. Press the dot key while holding down the **SF** key at the SYSTEM MENU.



The MODIFY MENU screen displays as shown on the right.

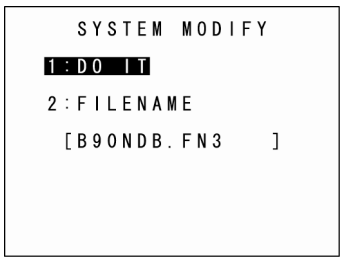
[1: SYSTEM MODIFY]: Updates the BHT system.
[2: CU-F/W MODIFY]: Updates the CU-911 system.

Refer to the following section for details of the above items.
Press the Backspace/clear key to return to the SYSTEM MENU.

[1] Updating the BHT system

Update the BHT system after downloading the BHT system update file.
(Refer to section "4.2.1 Updating the BHT System" for details.)

1. Use the cursor keys ([▲] [▼]) or numeric key ([1]) to highlight [1: SYSTEM MODIFY] and then press the **ENT** key.

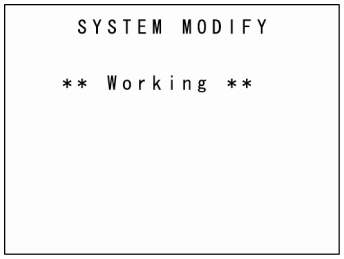


The screen displays as shown on the right.
If the downloaded BHT update file name differs from this file name, specify the correct file name using the procedure on the following page.

[1: DO IT]:
Updates the BHT system.
[2: FILENAME]:
Displays the filename to be used for updating the BHT system.

Press the Backspace/clear key to return to the SYSTEM PARAMETER menu.

2. Use the cursor keys ([▲] [▼]) or numeric key ([1]) to highlight [1: DO IT] and then press the **ENT** key.



The screen shown on the right displays and the BHT system is updated.
Upon completion of the update, the BHT power turns OFF automatically.

– **Important** – In order to prevent the battery running low during the system update process, perform the system update with the batteries sufficiently charged, with the batteries charging via a USB cable, or with the BHT placed in the CU-900 Series. During system update, the power will not turn OFF even if the Power key (⏻) is pressed. Wait until the system update process is complete before operating the BHT.

◆ When the Displayed File Name Differs from the BHT System Update File

If the name of the file displayed at [2: FILENAME] differs from the name of the BHT system update file to be used for updating the system, enter the correct file name.

1. Use the cursor keys ([▲] [▼]) or numeric key ([2]) to highlight [2: FILENAME] and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

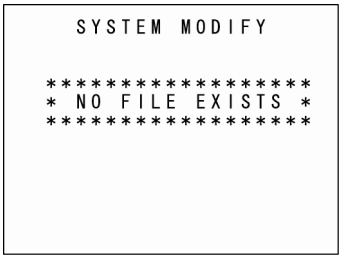
2. Use the numeric keys and dot key to enter the correct file name.

Press the **SF** key to change the entry mode (numeric entry (no guidance display) and alphabet entry).
To delete a single character, press the Backspace/clear key. To delete the entire entry, press and hold the Backspace/clear key or press the **SF** and Backspace/clear keys simultaneously.

3. Press the **ENT** key to set the entered file name.

◆ If the System Update File Does not Exist when Updating the BHT System

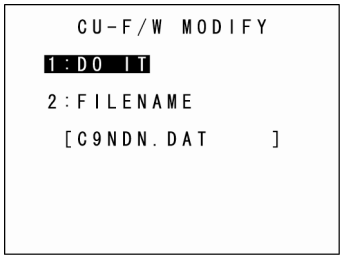
The screen displays as shown on the right if the system update file does not exist when updating the BHT system.
Download the BHT system update file and update the BHT system again.
Press the Backspace/clear key to return to the MODIFY MENU.



[2] Updating the CU-911 system

Update the CU-911 system after downloading the CU-911 system update file.
(Refer to section "4.2.2 CU-911 System Update" for details.)

1. Use the cursor keys ([▲] [▼]) or numeric key ([2]) to highlight [2: CU-F/W MODIFY] and then press the **ENT** key.

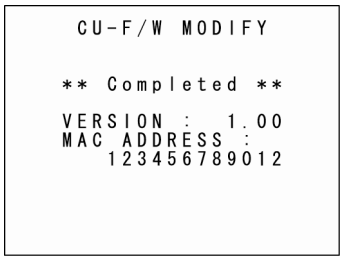


The CU-F/W MODIFY menu screen displays as shown on the right.

[1: DO IT]:
Updates the CU-911 system.
[2: FILENAME]:
Displays the filename to be used for updating the CU-911 system.

Press the Backspace/clear key to return to the SYSTEM PARAMETER menu.

2. Use the cursor keys ([▲] [▼]) or numeric key ([1]) to highlight [1: DO IT] and then press the **ENT** key.



The screen shown on the right displays and the CU-911 system is updated.
The screen displays as shown on the right upon completion of the update.

Press the Backspace/clear key to return to the CU-F/W MODIFY menu.

◆ When the Displayed File Name Differs from the CU-911 System Update File

If the name of the file displayed at [2: FILENAME] differs from the name of the CU-911 system update file to be used for updating the system, enter the correct file name.

1. Use the cursor keys ([▲] [▼]) or numeric key ([2]) to highlight [2: FILENAME] and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

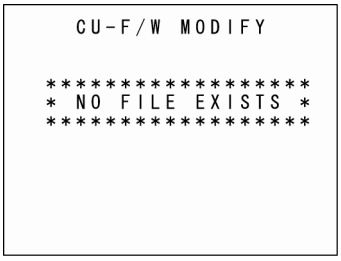
2. Use the numeric keys and dot key to enter the correct file name.

Press the **SF** key to change the entry mode (numeric entry (no guidance display) and alphabet entry).
To delete a single character, press the Backspace/clear key. To delete the entire entry, press and hold the Backspace/clear key or press the **SF** and Backspace/clear keys simultaneously.

3. Press the **ENT** key to set the entered file name.

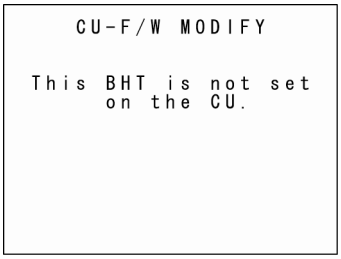
◆ If the System Update File Does not Exist when Updating the CU-911 System

The screen displays as shown on the right if the system update file does not exist when updating the CU-911 system.
Download the CU-911 system update file and update the CU-911 system again.
Press the Backspace/clear key to return to the CU-F/W MODIFY menu.



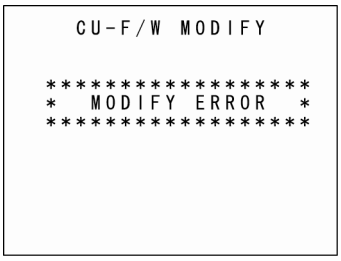
◆ If the BHT Has not been Set on the CU-911 when Updating the CU-911 System

The screen displays as shown on the right if the BHT has not been set on the CU-911 when updating the CU-911 system.
Set the BHT on the CU-911 and try again.
Press the Backspace/clear key to return to the CU-F/W MODIFY menu.



◆ If the CU-911 System Update Fails

The screen displays as shown on the right if the CU-911 system update fails.
Ensure that the BHT has been set properly on the CU-911 and then try again.
Press the Backspace/clear key to return to the CU-F/W MODIFY menu.



Chapter 5
Communication

This chapter describes technical information relating to the IrDA communication functions with which the BHT is equipped.

5.1 IrDA Communication

The BHT has a built-in IrDA communication device that enables wireless transfer of programs and data both between the BHT and the host computer and between BHTs without the need for a cable.
IrDA communication offers the following benefits over other forms of communication.

- Communication without the need for a cable
- High communication speed
- Freedom from regulations and licenses that differ from country to country when using wireless devices

Communication is performed by arranging the BHT and other IrDA-compliant devices with their IrDA (infrared) interface ports facing one another. The communication distance and angle and so on will differ depending on the devices used. Refer to the instructions given in the manuals provided with such equipment.

– Point –
- When communication is not possible, move the respective devices closer together or change the angle of the IrDA interface ports and try again.

5.1.1 IrDA Communication Port Transmission Speed

Communicating Device	Transmission Speed
BHT-900 Series	9600, 19200, 38400, 57600, 115200, 460800 bps
CU-901	9600, 19200, 38400, 57600, 115200 bps
CU-921	115200, 460800 bps
CU-911	460800 bps

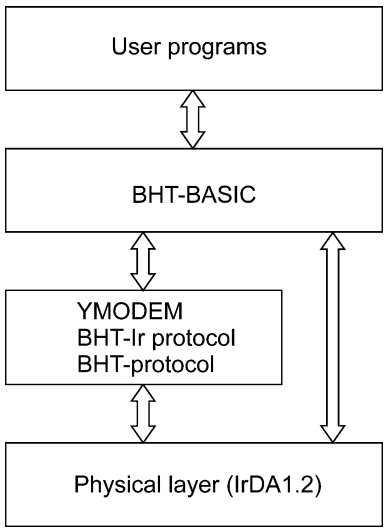
5.1.2 BHT Hardware (Physical Layer) and Communication Protocols

◆ BHT Hardware (Physical Layer) (Except Transmission Speed : 460800 bps)

The BHT complies with IrDA Ver1.3 Low Power physical layer compliant by IrDA (Infrared Data Association). The maximum transmission distance is 0.15 m.

◆ BHT Communication Protocols (Max. Transmission Speed :460800 bps)

The BHT supports Ymodem, BHT-Ir protocol, and BHT protocol.



5.2 USB Communication

The BHT can communicate with the host computer via the USB communication port.
The Connection method “COM” and “MTP” are available for the BHT USB communication.
“COM” is for the serial communication, and “MTP” is for the file transfer to the host computer without the device driver.

5.2.1 USB communication by COM

1. Install the Active USB-COM port driver in the host computer.

* The Active USB-COM port driver can be downloaded from the QBdirect service (http://www.qbdirect.net/).

* Even though our USB device (e.g., CU, scanner) has been used, the Active USB-COM port driver has been installed, and the USB port has been allocated as a COM port, the USB port is not recognized as a COM port even by connecting the BHT-900 to the port.

To use the BHT-900 for COM connection, carry out the following steps in the order:
(1) Remove all of our USB devices from the host computer.
(2) Execute the Setup file of the Active USB-COM port driver.
(3) Connect the BHT-900 to an arbitrary USB port.
(4) Install the USB driver.

The COM port is now allocated to the USB port.
For the procedures for installing the Active USB-COM port driver, refer to the driver’s installation guide.

2. Set the BHT USB connection mode to COM. For details, refer to “4.5.10 USB Communication settings.

3. Set the BHT USB communication protocol options. For details, refer to “4.5.6.[5] Setting the communication environment”.

4. Connect the host computer to the BHT using a USB cable.

* Use a USB2.0 compatible mini-B cable, sold separately.

5. The device is detected and the installation of the Active USB-COM port driver is now complete.

– Point –

- Check the COM number using the device manager, etc. Even though our products have been used and the BHT is connected to the same port, the COM port number may be different.
- It may happen that communication is impossible, depending on the destination or cable.
- Connect the BHT to the USB port on the main body of the host computer.
- If a connection is made via the hub, proper communication may not occur.
- Do not unplug and plug in the USB cable repeatedly in a short period of time. Doing so may result in the host computer being locked.

5.2.2 USB communication by MTP

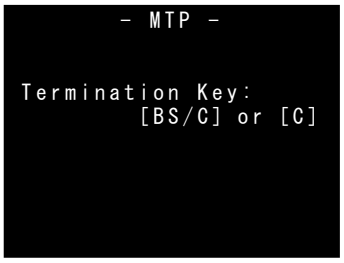
1. Set the BHT USB connection mode to MTP. For details, refer to “4.5.10 USB Communication settings.

2. Set the BHT MPT communication protocol options. For details, refer to “4.5.10 USB communication settings”.

3. Connect the host computer to the BHT using a USB cable.

4. The BHT is recognized as a portable device (device name “Handy Terminal”).
The BHT is now available to control files using the windows explorer function.

MTP can be used while running applications.
MTP can also be used with “SYSTEM MENU”, “DOWNLOAD MENU”, and “UPLOAD MENU” in SYSTEM MODE.
MTP starts when advancing to “DOWNLOAD MENU”, and “UPLOAD MENU” with USB connected it.



– Attention –
- The host computer must be installed **“Windows XP SP2 or later”** and **“Windows Media Player version 11 or later”**.
- If the BHT is recognized as an imaging device, delete the “Handy Terminal” from the windows device manager, and then unplug and plug the USB cable.

– Point –
- Check the COM number using the device manager, etc. Even though our products have been used and the BHT is connected to the same port, the COM port number may be different.
- It may happen that communication is impossible, depending on the destination or cable.
- Connect the BHT to the USB port on the main body of the host computer.
- If a connection is made via the hub, proper communication may not occur.
- Do not unplug and plug in the USB cable repeatedly in a short period of time. Doing so may result in the host computer being locked.

– **Important** – Receiving the BHT-BASIC data files (Method of specifying the field information)

The data files received via the MTP connection do not contain the field information; therefore those data files can not be used in the BHT-BASIC applications.

Use the following procedure to receive a data file as a data file that contains the field information.

1. Create the “MTPFLD.INI” (MTP field information file) which is stated data file name and field information.
2. Save the “MTPFLD.INI” in the BHT. (Downloading by MTP is possible.)
3. Download the data file by MTP. (Convert the data file to the data file containing the field information according to the statement of the “MTPFLD.INI”.)

   (The data file is converted to the data file containing the field information according to the statement of the “MTPFLD.INI”.)

File format of the “MTPFLD.INI”

- The “MTPFLD.INI” is a data file with one filed (field length 256).
- State the field as “field name : field information”.

```
MASTER.DAT:10,14,20,4,8,128
TENPO.TXT:8,8,8
URIAGE.DAT:64
```

5.3 Basic Communication Specifications and Parameters

5.3.1 Basic Communication Specifications

The table below lists the basic IrDA communication specification.

	IrDA Interface
Synchronization	Start-stop
Transmission speed	9600, 19200, 38400, 57600, 115200, 460800(Note1) bps
Transmission code	ASCII 8-bit code
Transmission bit order	LSB (Least significant bit) first
Vertical parity	None

Note1: 460800 bps is only possible when communicating from one BHT-900 unit to another or with the CU-921, CU-911.

◆ Synchronization

For accurate data transaction, it is necessary to synchronize transmission between the sender and receiver. To achieve this, the bit order and position, character length, and beginning and end of the character to be transmitted must be defined beforehand.

Start-stop synchronization is an asynchronous system that synchronizes each character as a unit; that is, it externally adds start and stop bits to the leading and trailing bit positions of the character to be transmitted, respectively. Data sampling is commenced upon receiving the start bit, and when the stop bit is received, sampling is completed and communication ceased. The number of stop bits can be selected (1 or 2 bits).

◆ Transmission Speed

This is the maximum number of bits that can be transmitted per second, and is expressed in bps (bits per second).

◆ IrDA Interface Communication Range

The maximum effective range of the IrDA interface is 15 cm, with the IR beam within a 10° angle of divergence. To communicate via the CU-900, put the BHT on the CU-900.

◆ IrDA Interface Transmission/Receipt Switching Time

The IrDA interface must satisfy the following conditions for transmission and receipt switching.

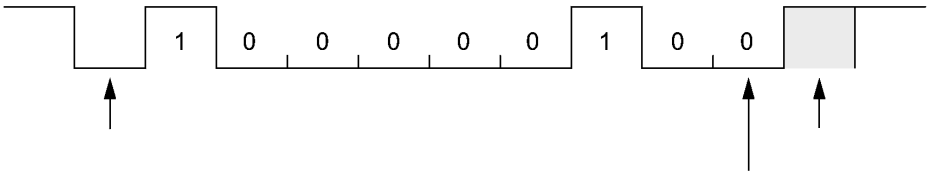
(1) The IrDA interface must be ready to receive within 10 ms following the completion of transmission.

(2) The IrDA interface must commence transmission after waiting at least 10 ms following the completion of receipt.

◆ Transmission Code and Bit Order

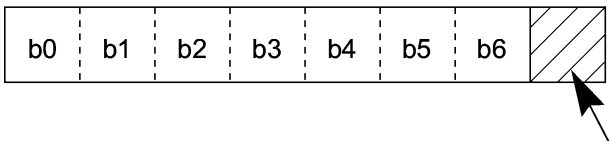
- All characters should be coded to 7 or 8-bit code for data transmission.
- The standard code at the BHT is ASCII 7-bit or 8-bit code.
- The transmission bit order is LSB (Least significant bit) first.

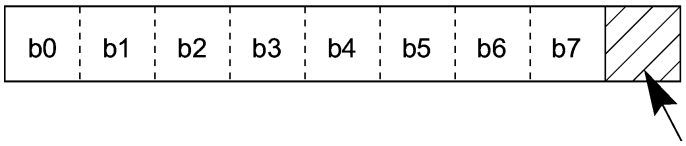
The example below is for the transmission of an ASCII 8-bit code A (41h or 01000001b, b: binary) with even vertical parity and a single bit each for the start and stop bits.



◆ Vertical Parity

A vertical parity bit is a redundant bit that is added to every character transmitted in order to check that data has been transmitted accurately. The parity bit should be set to either “1” or “0” depending upon the parity parameter setting to make the number of set bits in the character even or odd. The receiver counts the number of set bits in the transmitted character code to make sure that it has the specified number (even or odd) of set bits.
The vertical parity bit is positioned immediately after the MSB (Most significant bit) as shown below.





5.3.2 Communications Parameters

In System Mode and user programs written in BHT-BASIC, you can set the communications parameters listed below.

Port	IrDA Interface
Transmission speed	9600, 19200, 38400, 57600, 115200, 460800(Note1) bps
Character length	8 bits
Vertical parity	None
Stop bit length	1 bit

Note1: 460800 bps is only possible when communicating from one BHT-900 unit to another or with the CU-921, CU-911.

◆ System Mode

Refer to “Chapter 4 System Operation” – “4.5.6 System Environment Settings (SET SYSTEM Menu)” for further details.

◆ BHT-BASIC

To set the transmission speed, character length, vertical parity, and stop bit length (For the IrDA interface, set the transmission speed only), use the OPEN “COM:” statement in BHT-BASIC.

OPEN "COM: ..."
OPEN "COM1: ..."
Through the interface port opened by the OPEN “COM:” statement, the XFILE statement transmits a designated file.

The communication condition can be set using the settings of the system mode. For details, refer to “4.5.6 System Environment Settings – [5] Setting the communication environment” – “5: OPEN “COM:” DETAIL”.

Chapter 6
Maintenance

This chapter describes battery replacement and daily procedures for taking care of the BHT.

6.1 Replacing the Battery

Batteries are not included in the package. Have the battery specified by DENSO WAVE ready.

Specified battery: AA alkaline battery (LR6) or AA rechargeable battery eneloop® (HR-3UTGA)

Note 1: Use rechargeable batteries already charged.

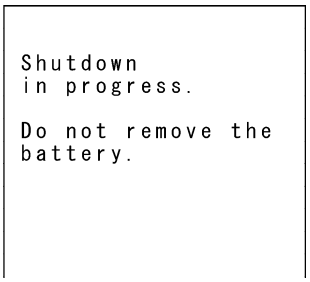
Note 2: eneloop® is a registered trademark of SANYO Electric Co., Ltd.

Note 3: If rechargeable batteries other than eneloop® are used, the BHT unit may not operate properly.

6.1.1 Replacing the Battery

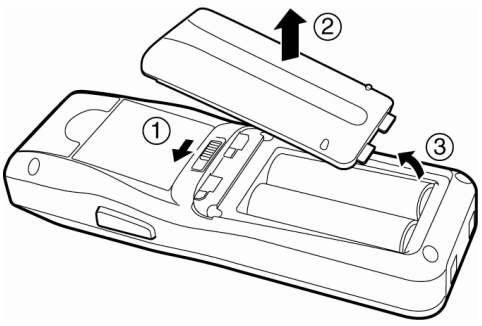
1. Press the power key (⏻) to turn OFF the BHT power.

The screen displays as shown on the right.



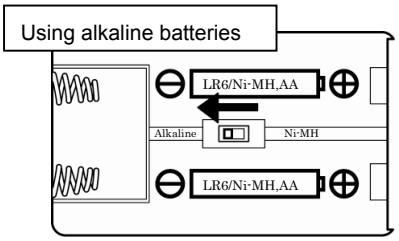
– Point – Do not remove the battery until the power turns OFF and the screen display disappears.

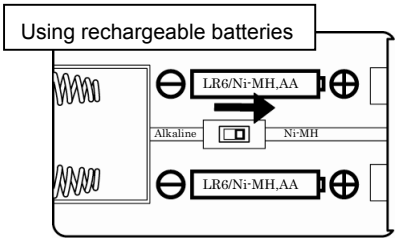
2. Slide the battery cover lock in the direction indicated by the arrow (1), remove the battery cover (2), and then remove the battery (3).



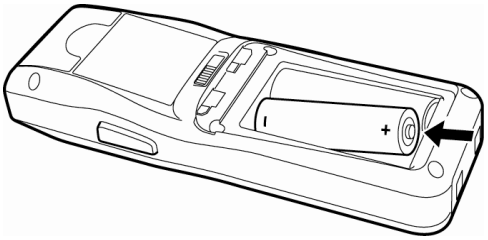
3. Make sure to use the battery selector switch to select the desired battery type.

– Point – To ensure correct operation of the battery power level indicator and the charging function, make sure to select the desired battery type with the battery selector switch.



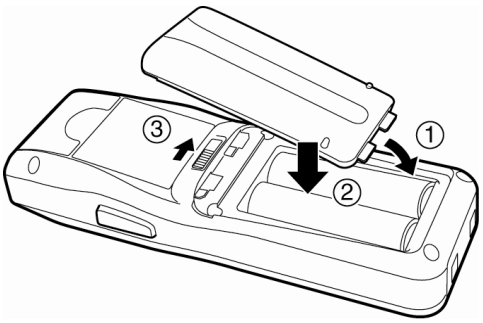


4. Check the battery terminals on a new battery and indications on the BHT unit and then insert the battery in the direction indicated by the arrow.
(Refer to “Chapter 2 BHT Preparation” – “2.2 Loading the Battery”.)



– **Point** – Do not use batteries other than those specified by DENSO WAVE.

5. Insert the battery cover tab (1), and then close the battery cover (2). The battery cover is now locked in position (3).



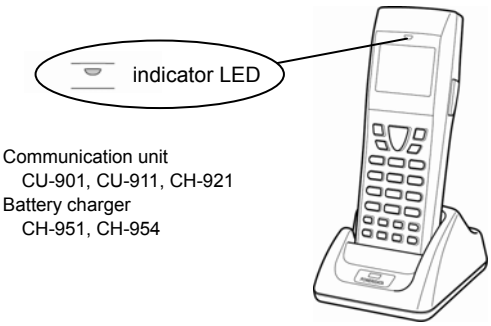
6.1.2 Charging rechargeable batteries

When using rechargeable batteries, it is possible to charge with the BHT main body as follows.

■ Charging via the communication unit or the charger

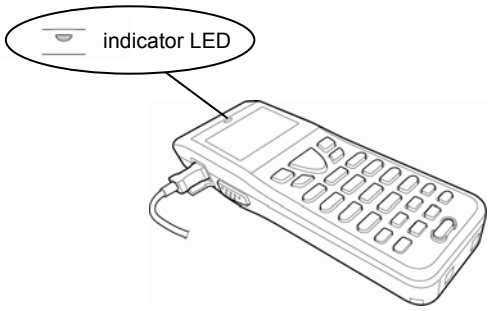
※ only BHT-904B

Place the BHT on the communication unit or the charger. The LED on the BHT illuminates in red to indicate that charging has begun. The LED on the BHT will change to green when charging is complete.



■ Charging via a USB cable

Connect a master device such as a personal computer to the BHT using a USB cable. The LED on the BHT illuminates in red to indicate that charging has begun. The LED on the BHT will change to green when charging is complete.



* For a destination to which the USB is connected, if a USB power supply without a communication function or equivalent is used, it is necessary to carry out the setting on the main unit.

The charging time is approximately 11 hours.

To ensure optimum charging of all rechargeable batteries, charge them using the genuine battery charger for the battery brand.

When using alkaline dry cell batteries, ensure that the battery selector switch is set correctly. Do not recharge alkaline dry cell batteries.

– **Note** – ● If the LED does not illuminate, it is impossible to charge the battery. Check the following items.

- Check that the battery selector switch has been set properly.
- Check that the BHT has been placed in the communication unit or charger properly. If the LED does not illuminate in red, remove the BHT and check the charger terminals. Then, position the BHT again.
- If the battery is charged with the USB cable connected, it may be impossible to charge the battery depending on the point at which the cable is connected. Check, therefore, the port to which the cable is connected.

● If the LED flashes in red, it is impossible to charge the battery. Check the following items. (The red LED starts to flash one minute after charging starts.)

- Check that the rechargeable batteries specified by DENSO WAVE have been loaded in the BHT properly.
- Check that the rechargeable battery and BHT unit are not contaminated. If any contamination is found to be on either of these items, wipe it off before.
- Place the powered-off BHT in the communication unit while holding down the [SCAN] key for at least 3 seconds, to force the BHT into the charge mode. The LED indicator illuminates in ORANGE when the BHT starts charging.
- If an old rechargeable battery which has been charged repeatedly is in use, replace it with a new one.
- Check that the battery charging temperature is not exceeded. Normally, the battery charging temperature range is narrower than that of the service temperature. If the battery is excessively cold or hot, the battery performance will be adversely affected resulting in an inability to be recharged.

– Note –
- If the LED flashes in green, it is impossible to charge the battery.
  When the LED flashes in green, stop charging and turn OFF the power and then charge the batteries again.
  If the LED does not stop flashing in green even after going through above measure, there is a possibility that the equipment is broken. Contact your system administrator.

6.1.3 Rechargeable Battery Service Life

Rechargeable batteries are consumable products. The longevity of the battery varies depending on the use condition of the individual battery.
The performance of the rechargeable battery will deteriorate gradually with repeated charging and discharging, even during normal use. When the battery operation time becomes shorter even after charging for the specified length of time, replace the battery with a new one.

Rechargeable battery recycling request

- Rechargeable batteries use sparse resources which can be recycled. We kindly ask for your cooperation in recycling to ensure reuse of these resources.
- Used batteries must not be disposed of as combustibles.
- Contact your nearest rechargeable battery recycling centre or local sales office for information on disposal procedures.
- Never disassemble batteries.

– Note –
- Replace the battery promptly.
- Always turn the BHT power OFF before replacing the rechargeable battery. Replace the rechargeable battery with a new one within three minutes to avoid data loss. Then, turn the BHT power ON and check the operation.

⚠ **WARNING**

Mishandling may result in rechargeable battery overheating, smoke generation, blowout, or combustion. Please read the following items prior to use.
- Never charge the battery in the vicinity of fire or under a scorching sun.
- Always use a dedicated charger to charge the battery.

⚠ **CAUTION**

Mishandling may result in rechargeable battery overheating, smoke generation, blowout, or combustion. Please read the following items prior to use.
- Terminate charging if not completed even after the specified time has elapsed.

6.2 Daily Maintenance

6.2.1 Proper Care of the BHT

Wipe any dirt from the BHT housing, charge terminals, and BHT or battery cartridge terminals with a dry, soft cloth. Make sure to turn OFF the BHT before cleaning.

– **Note** –
- Never use substances such as benzene or alcohol, as this may cause the housing to be marred or paint to peel off.
- Never rub or strike the LCD screen with anything hard, as this may result in scratches on the screen or breakage.
- When cleaning the keypad, do not scrub the surface too hard or pull on the keys, as this may break the keys.
- If excessively dirty, wipe with a soft cloth that has been soaked in soapy water (always use neutral detergent) and wrung out thoroughly.

Any dirt or dust adhering to the red clear plate of the barcode reading window will adversely affect reading performance.
When using in dusty areas, perform periodic inspections to check whether any dust has accumulated on the clear plate of the barcode reading window, and if so, clean the plate as described below.

- First blow the dust away with an airbrush, and then gently wipe the plate with a cotton swab or similar soft object.
- If sand or hard particles have accumulated, rubbing the plate will result in scratches. Blow the particles away with an airbrush or wipe with a soft brush.

6.2.2 Proper Care of the CU/CH

Wipe any dirt from the housing or charge terminals with a dry, soft cloth.
In the interests of safety, unplug the AC adapter from the socket when cleaning the CU or CH.

6.2.3 Using the BHT after Long Periods

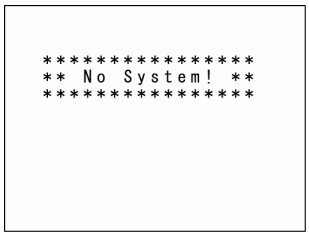
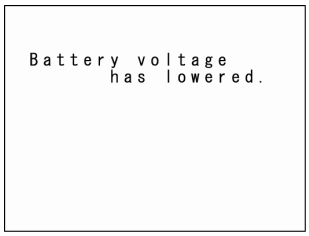
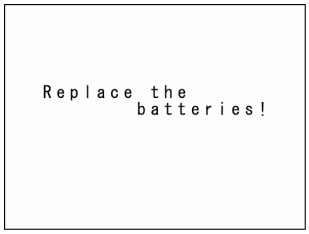
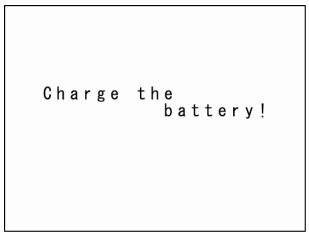
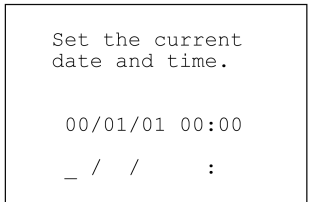
When not using the BHT for an extended period of time, remove the batteries from the BHT main body and store them in a cool, dry place, avoiding high-temperature and high-humidity environment.
If the BHT is left unused for an extended period, the BHT calendar clock may stop. Reset the clock.

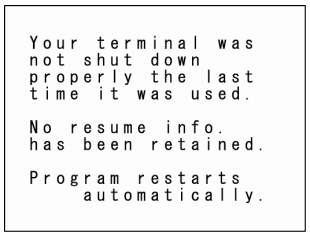
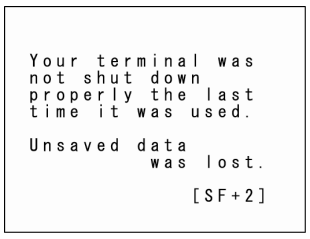
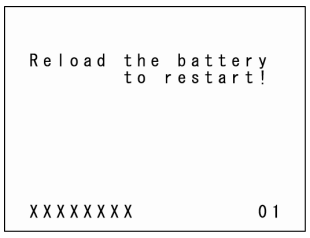
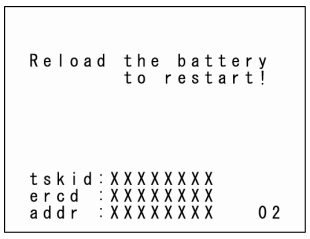
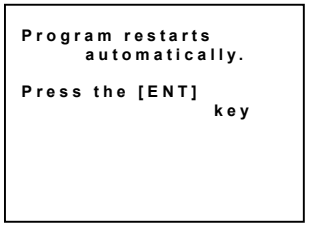
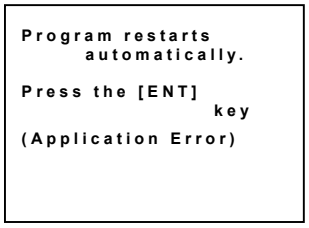
Chapter 7
Error Messages

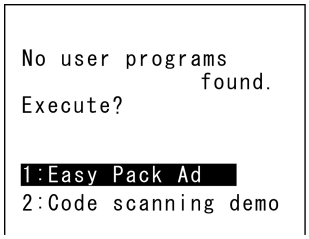
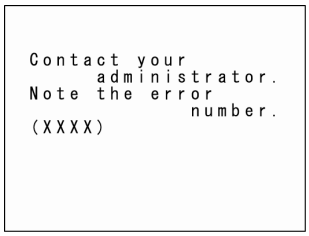
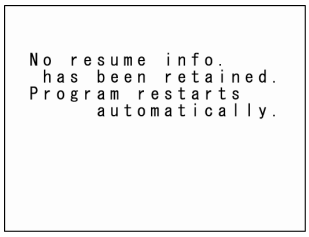
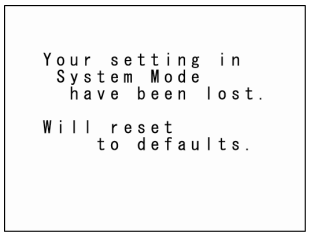
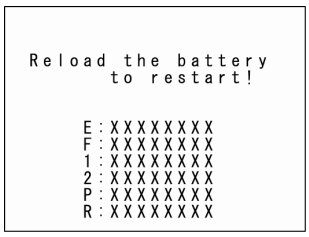
This chapter describes causes and countermeasures for error messages that display during BHT use.
About error messages during executing application program, refer to “Appendix A Error Codes and Error Messages of Programmer’s manual”.

7.1 System Errors

The error messages that display on the screen and the causes and countermeasures to be taken if an error occurs when the power is turned ON or while running a program are shown below.

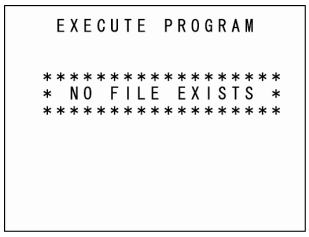
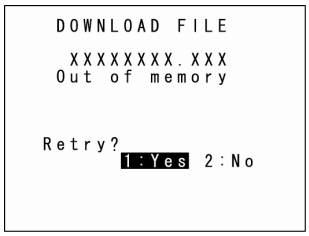
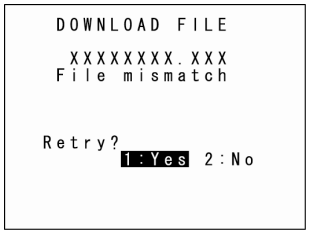
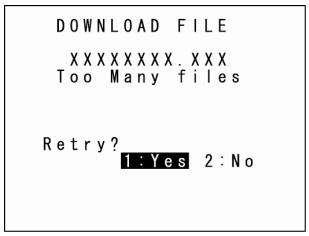
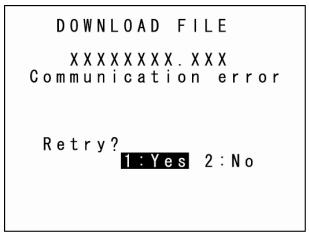
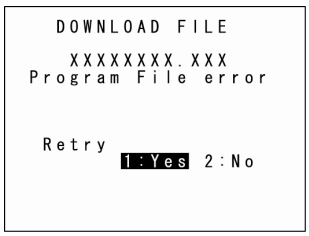
Message	BHT Response	Cause	Countermeasure
	If this error occurs, the BHT beeps five times and then turns itself off.	A System Program error has occurred.	Contact your system administrator.
	If low battery is detected, the BHT beeps three times. After that, it will resume previous regular operation.	The battery output level has dropped below a specified lower limit.	Replace or charge the battery.
Using alkaline batteries  Using rechargeable batteries 	If lower battery is detected, the BHT beeps five times and then turns itself off. Depending upon the battery level, the beeper may not sound five times.	The battery output level has lowered so that the BHT no longer operates.	Replace or charge the battery.
	The date and time settings screen displays, awaiting entry.	The calendar clock integrated in the BHT has stopped because: - the battery was removed for an extended time. - the rechargeable battery had not been charged over a long period of time.	Set the current date and time.(Refer to “Chapter 2 BHT Preparation” – “2.4 Initial Setup”)

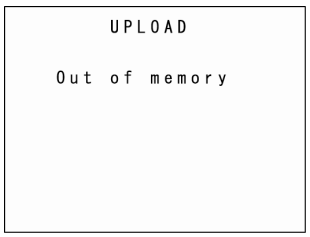
Message	BHT Response	Cause	Countermeasure
	The BHT displays this error message and automatically runs the execution program from the point of start-up.	Operation was terminated without turning OFF the power normally and therefore the application resume information has been lost. The application is relaunched.	If this error occurs frequently, contact your system administrator.
	The message continues to display.	After shut down abnormally, so unsaved data was lost.	Contact your system administrator.
	If this error occurs, the BHT beeps five times.	During execution of System Program, the System Program has attempted to write onto the write-protected area of the memory. (xxxxxxxx: Error address)	Unload and reload the battery and then turn the BHT ON. If this error occurs frequently, make a note of the displayed message and codes and contact your system administrator.
	If this error occurs, the BHT beeps five times.	During execution of System Program, the System Program has received an invalid command code. (xxxxxxxx: Error address)	Unload and reload the battery and then turn the BHT ON. If this error occurs frequently, make a note of the displayed message and codes and contact your system administrator.
	The message continues to display.	System Program error has occurred. The application restarts from the beginning.	If this error occurs frequently, contact your system administrator.
	The message continues to display.	System Program error which is caused by the application has occurred. The application restarts from the beginning.	Check the application.

Message	BHT Response	Cause	Countermeasure
	The message continues to display.	When the BHT is turned on, no user programs are found.	Contact your system administrator. To carry out scanning demo, select [2: Code scanning demo]. To carry out barcode scanning demo, press the trigger switch. To activate the easy operation application software “Easy Pack Ad for BHT-900”, select [1: Easy Pack Ad]. For details, refer to the manual accompanying with the application.
	If this error occurs, the BHT beeps five times and then turns itself off.	Any of the hardware error, memory error and execution program error has occurred. (XXXX: Error code)	Turn the BHT on again. If this error occurs frequently, make a note of the displayed code and contact your system administrator.
	The BHT displays this error message and automatically runs the execution program from the point of start-up.	Operation was terminated without turning OFF the power normally with the resume function set, and therefore resume info has been lost.	If this error occurs frequently, make a note of the displayed code and contact your system administrator.
	After displaying this error message, the BHT may start a user program other than the preset auto-start execution program or display the message “No execution program loaded.”	Your settings made in System Mode contain an error.	Contact your system administrator. (If this error occurs, the System Mode settings revert to the factory defaults.)
	If this error occurs, the BHT beeps five times.	An error has occurred during execution of System Program.	Unload and reload the battery and then turn the BHT ON. If this error occurs frequently, contact your system administrator.

7.2 System Mode Errors

When error messages display while running System Mode, refer to the following table and take appropriate measures.

Message	Cause	Countermeasure
	You attempted to execute a user program in the EXECUTE PROGRAM menu, but no user program files had been stored in the memory.	Press the Backspace/clear key to return to the SYSTEM MENU, then download user programs.
	The memory is insufficient for storing files to be downloaded.	Press the [2] key to return to the SYSTEM MENU, then delete unnecessary files in the memory or decrease the size of the file to be downloaded.
	In the SYSTEM PARAMETER transfer menu, you attempted to download a file other than the BHT system parameter file. Or in the SYSTEM MESSAGE transfer menu, you attempted to download a file other than the system message file.	Check the file you attempted to download and then download the file in the appropriate menu (DOWNLOAD menu, SYSTEM PARAMETER transfer menu, or SYSTEM MESSAGE transfer menu).
	The current download will exceed the maximum allowable number of files (420 files) in the memory.	Press the [2] key to return to the SYSTEM MENU, then delete unnecessary files in the memory (or decrease the number of files to be downloaded if you attempted to download more than one file in the DOWNLOAD menu.)
	• Downloading has failed. • Uploading has failed.	• To retry downloading/uploading, press the [1] key. • To return to the SYSTEM MENU, press the [2] key. Check the interface port, communications parameters, and communications protocol in the SET SYSTEM menu or perform the communications test in the TEST menu.
	You attempted to download an invalid program file.	Check whether the program file you attempted to download is available to the BHT-900 model. If it is not available, download the appropriate program.

Message	Cause	Countermeasure
	The file you attempted to upload is damaged.	To upload the damaged file as is, press the [1] key.
	The memory is insufficient for setting up the BHT system parameter file or system message file to be uploaded.	Press the Backspace/clear key to return to the SYSTEM MENU and delete unnecessary files.
	The memory has already contained 420 files, so the BHT system parameter file or system message file cannot be set up.	Press the Backspace/clear key to return to the SYSTEM MENU and delete unnecessary files.

Chapter 8
Specifications

This chapter describes the BHT-904B/BHT-914B specifications.

8.1 BHT-904B/BHT-914B Specification

8.1.1 Hardware Specifications

Power supply (main power):	AA alkaline battery (LR6) (x 2) or AA rechargeable battery eneloop® (HR-3UTGA) (x 2)	
Dimensions (W) x (L) x (H):	51×49×29 mm	
Weight:	Approx. 121 g (excluding the batteries)	
Ambient operating temperature:	-5 to 50° C (excluding the batteries)	
Ambient operating humidity:	20 to 80% (with no dew condensation)	
Ambient operating brightness:	500 to 3000 Lx (Depth of field: 45 mm, PCS value: 0.9 min., Reflection intensity: 85% min. for white and 5% max. for black, Narrow bar width: min. 0.125 mm) 20 to 10000 Lx (Depth of field: 100 mm, PCS value: 0.9 min., Reflection intensity: 85% min. for white and 5% max. for black, ITF: 0.625 magnification)	
Controller:	CPU:	32-bit RISC
	Flash memory:	16MB
Keypad:	Magic keys:	5(BHT-904B), 3(BHT-914B)
	Function keys:	8
	Numeric keys etc.:	15
Display:	Type:	Dot-matrix, liquid crystal display (LCD) with white backlight (monochrome)
	Formation: 128 dots wide by 96 dots high	
Calendar clock:	Year, month, day, hour, minute, and second	
	Year:	2 digits Auto leap year correction up until 2099
Indicator LED	Colors:	Red, green and blue

(Note) Due to the characteristic of the white LED used for the LCD backlight, there may be individual differences in screen color and brightness.

8.1.2 Barcode Specifications

Supported Barcode Types

Barcode Type	Bar Dimensions	Scan Magnification
Universal product codes JAN-13 (EAN-13) JAN-8 (EAN-8) UPC-A UPC-E JAN-13 (EAN-13) with add-on JAN-8 (EAN-8) with add-on UPC-A with add-on UPC-E with add-on 2-dgit add-on 5-dgit add-on	Min. 0.26 mm	Min. 0.8
Interleaved 2of5 (ITF) Standard 2of5 (STF) Codabar (NW-7)	Min. 0.125 mm PCS value ≥ 0.9 Black/white bar reflection intensity difference ≥ 0.8	
Code 39	Min. 0.15 mm PCS value ≥ 0.45	
Code 93 Code 128、GS1-128 (EAN-128)	Min. 0.15 mm PCS value ≥ 0.9 Black/white bar reflection intensity difference ≥ 0.8	
	Min. 0.19 mm PCS value ≥ 0.45	
RSS (GS1DataBar) RSS-14 (GS1 DataBar Omnidirectional) RSS-14 Truncated (GS1 DataBar Truncated) RSS-14 Stacked (GS1 DataBar Stacked) RSS-14 Stacked Omnidirectional (GS1 DataBar Stacked Omnidirectional) RSS Limited (GS1 DataBar Limited) RSS Expanded (GS1 DataBar Expanded) RSS Expanded Stacked (GS1 DataBar Expanded Stacked)	Min. 0.15 mm PCS value ≥ 0.9 Black/white bar reflection intensity difference ≥ 0.8	

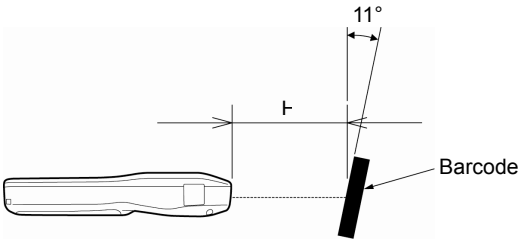
Required Optical Properties

White bars: Reflection intensity of 45% or higher
Black bars: Reflection intensity of 25% or lower
PCS value of 0.45 or higher

The reflection intensity is regulated with a light source with spectral peak of 633 nm and spectrum range of 610 to 650 nm.

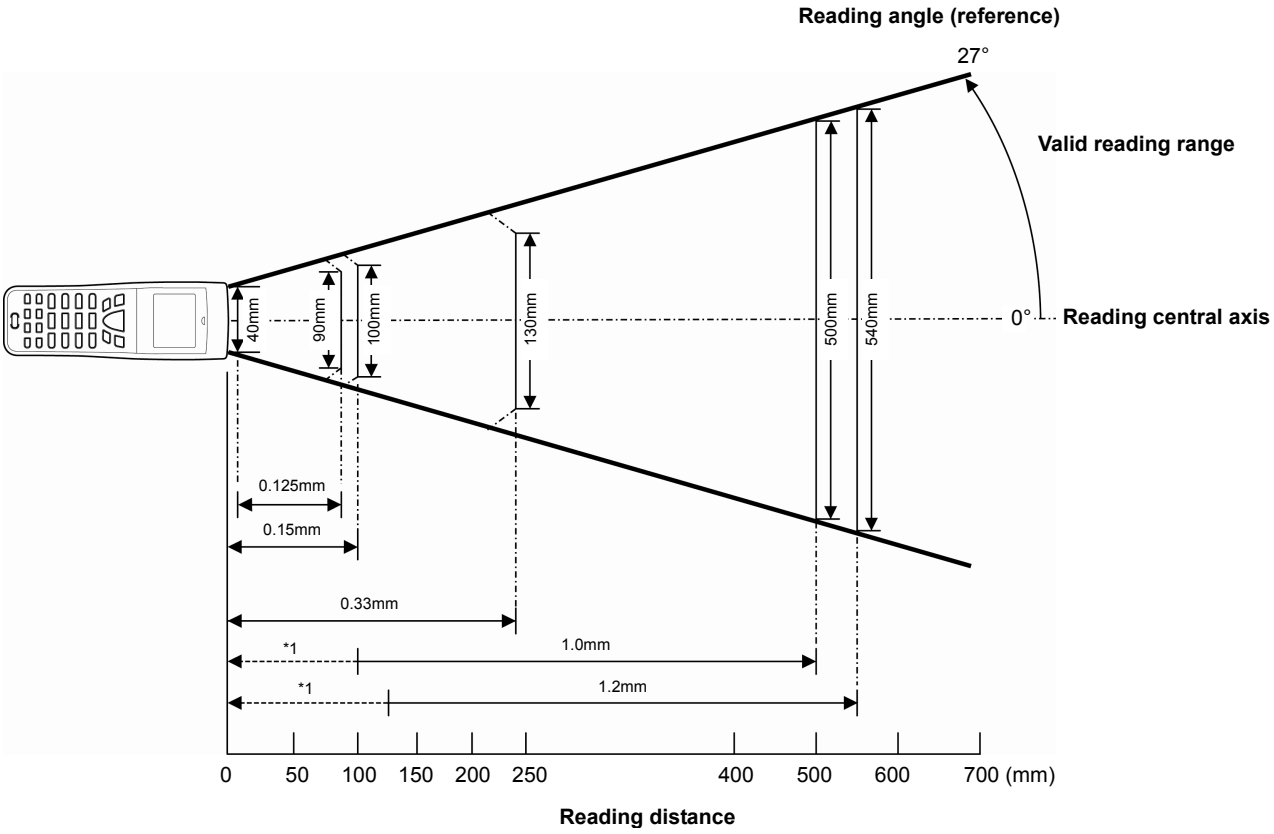
8.1.3 Reading Performance

Reading Reference Position



As illustrated on the left, align the barcode reading window with the center of the barcode.

Reading Distance and Area



Minimum Narrow Bar Width	Depth of Field
0.125 mm	15 ≤ H ≤ 80 mm *2
0.15 mm	0 ≤ H ≤ 100 mm *3
0.33 mm	0 ≤ H ≤ 240 mm *4
1.0 mm	H ≤ 500 mm *5
1.2 mm	H ≤ 550 mm *6

The label position is on the BHT-904B/BHT-914B central axis.
The BHT-904B/BHT-914B may fail to read codes due to specular reflection depending upon the position of the light source, reading angle of the reading window, and other conditions.

*1 The dotted line (◄-----) indicates that the width of the barcode label (*5, *6) exceeds the readable width of the BHT-904B/BHT-914B.

*2 Under the following conditions:
- Ambient illuminance: 500 Lx. (Xenon arc lamp)
- Code 39, 4 digits
  Narrow bar: Wide bar = 1 : 2.5
- Reflection intensity of white bars: 85% min.
  Reflection intensity of black bars: 5% max.
  PCS value: 0.9 min.

*3 Under the following conditions:
- Ambient illuminance: 500 Lx. (Xenon arc lamp)
- EAN-13
- Reflection intensity of white bars: 85% min.
  Reflection intensity of black bars: 5% max.
- 1.0 magnification, PCS value: 0.9 min.

*4 Under the following conditions:
- Ambient illuminance: 500 Lx. (Xenon arc lamp)
- ITF conforming to the UPC Shipping Container Code
- Reflection intensity of white bars: 85% min.
  Reflection intensity of black bars: 5% max.
- 1.0 magnifications, PCS value: 0.9 min.

*5 Under the following conditions:
- Ambient illuminance: 500 Lx. (Xenon arc lamp)
- ITF conforming to the UPC Shipping Container Code
- Reflection intensity of white bars: 85% min.
  Reflection intensity of black bars: 5% max.
- 1.0 magnifications, PCS value: 0.9 min.

*6 Under the following conditions:
- Ambient illuminance: 500 Lx. (fluorescent lamp)
- ITF conforming to the UPC Shipping Container Code
- Reflection intensity of white bars: 85% min.
  Reflection intensity of black bars: 5% max.
- 1.2 magnifications.

8.1.4 Interface Specifications

IrDA Interface

Specification:	IrDA Ver1.3 Low Power physical layer compliant (Except transmission speed: 460800 bps)
Input signals:	RD
Output signals:	SD
Transmission speed:	Between BHT units: 9600 to 460800 bps CU-901: 9600 to 115200 bps CU-921: 115200, 460800 bps CU-911: 460800 bps

USB interface

Specification:	USB2.0
Device consumption current:	500 mA

Chapter 9
Appendices

This chapter describes the principal specifications of the CU-900 and CH-900 Series (option). It also provides information on causes and countermeasures when file transfer is not possible using the transfer utility.

9.1 CU-900, CH-900 Specifications

9.1.1 Hardware Specifications

	CU-901	CU-911	CU-921
Power supply:	100/230 V AC (Using dedicated AC adapter)	100/230 V AC (Using dedicated AC adapter)	Powered from the USB interface*
Max. power consumption:	7 VA	8 VA	5V 500mA
Dimensions (W) x (L) x (H):	75×96.5×49 mm	75×93.5×49 mm	75×93.5×49 mm
Weight:	72 g	75 g	65 g
Ambient operating temperature:	0 to 40° C		
Ambient operating humidity:	20 to 80% (with no dew condensation)		

* The CU-921 can be powered also from the AC adapter.

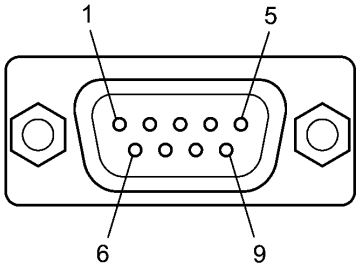
	CH-951	CH-954
Power supply:	100/230 V AC (Using dedicated AC adapter)	100/230 V AC (Using dedicated AC adapter)
Max. power consumption:	7 VA	18 VA
Dimensions (W) x (L) x (H):	75×93.5×49 mm	300.9×96×49 mm
Weight:	65 g	230 g
Ambient operating temperature:	0 to 40° C	
Ambient operating humidity:	20 to 80% (with no dew condensation)	

9.1.2 Charging Requirements

Charge current: Approx. 180 mA
Charging time: Approx. 11 hours

9.1.3 Interface Specifications

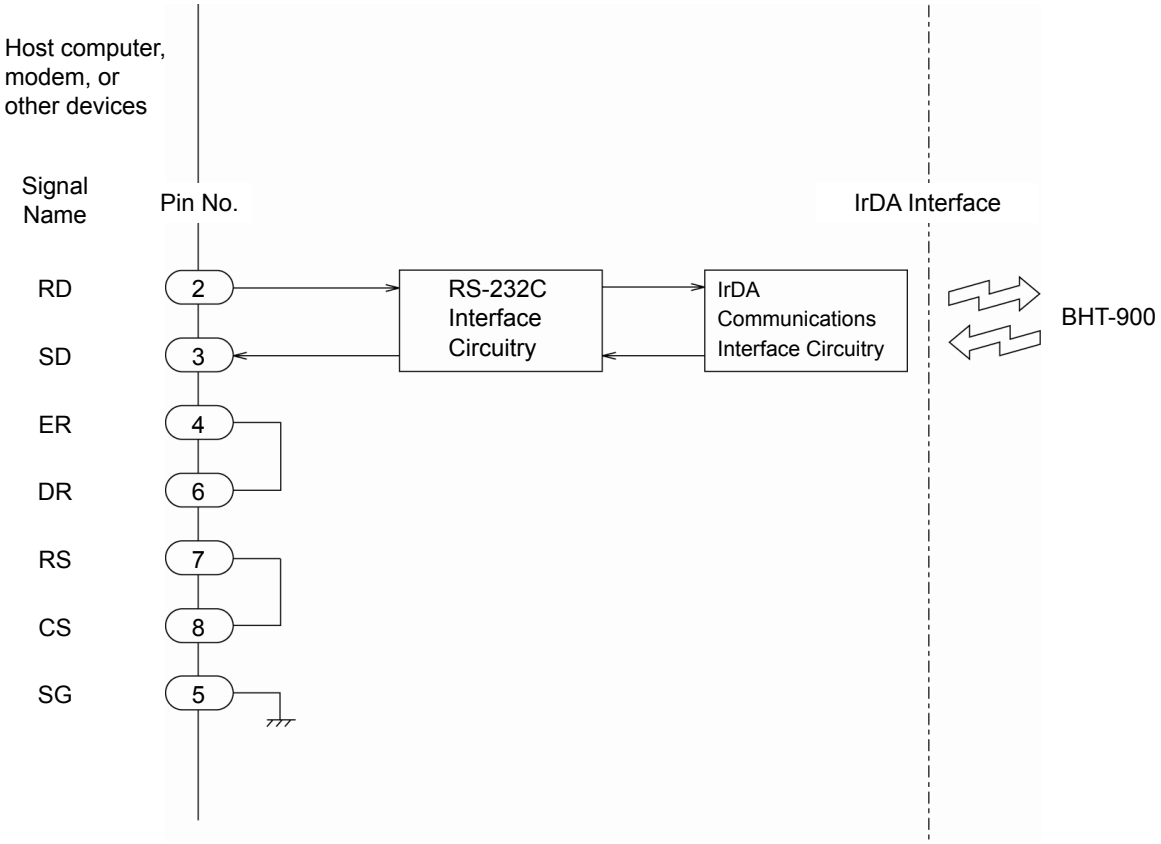
CU-901



The CU-901 RS-232C interface connector uses Dsub-9P.

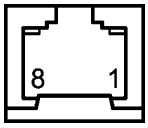
Pin. No.	Signal Name	Function	Signal Direction CU-901 ↔ External Device
2	RD	Receipt data	←
3	SD	Transmission data	→
4	ER	Data terminal ready	→
5	SG	Signal ground	—
6	DR	Data set ready	—
7	RS	Transmission request	—
8	CS	Transmission ready	—

– **TIP** – The CU-901 internal wiring is shown below.



CU-911

The CU-911 has an IEEE802.3-compliant Ethernet interface port (100Base-TX).



Ethernet Interface Port (RJ45 jack) on the CU-911

Pin No.	Signal	Functions
1	TD_+	Send data
2	TD_-	Send data
3	RD_+	Receive data
4	N.C.	No connection
5	N.C.	No connection
6	RD_-	Receive data
7	N.C.	No connection
8	N.C.	No connection

CU-921

The USB interface on the CU-921 is a Type Mini-B receptacle which is compliant with the USB1.1 (Full-speed).

9.2 When File Transfer is Not Possible

This section describes the causes and remedies when file transfer is not possible using the Transfer Utility.

Error No.	Cause Details	Remedy
2	Illegal field information specification option when transmitting data file.	Set a correct value for the field information option.
	The name of the file being downloaded is a long file name.	Long file names are not supported. Change to an 8.3 format file name.
	Illegal characters have been used in the file name.	Change the file name. Refer to QBdirect (page 175, Note 1) for details of characters that can be used in file names.
3 6 8	BHT-Ir/BHT protocol was used for transfer for a BHT-BASIC 4.0 format data file.	Use Ymodem protocol or restrict data files to BHT-BASIC 3.6 format.
51 52	Power is not being supplied to the CU.	Supply power with an AC adapter or via a USB bus when using a CU with USB connection.
	Defect or abnormality with the cable between the PC and CU.	Use a properly functioning RS-232C cross-cable.
	The DIP switch on the reverse side of the CU have been set incorrectly.	Set the correct transmission speed with the DIP switch on the reverse side of the CU.
	Defect or abnormality with the USB cable between the PC and CU.	Use a properly functioning USB cable.
	Unstable signal wire due to such reasons as a USB cable extension.	Connect directly to a PC USB port or self-powered hub. Depending on the type of hub, it may be impossible to connect to it. If operation is unstable, connect directly to a PC USB port.
	The CU can be removed. (The device remains stopped.)	Disconnect the device and then reconnect.
	The CU is not recognized by the PC. There is a ! mark at the Device Manager or the device is unknown.	Disconnect the device and then reconnect. If the problem is still not resolved, uninstall the driver and then reinstall.
	The power supply is insufficient.	The USB power supply performance may be insufficient depending on the PC model. Furthermore, if another USB device connected to an adjacent port consumes power, thereby exceeding the maximum standard (500 mA or more), insufficient current may be supplied. Use an AC adapter to supply power directly.
	Defect or abnormality with the cable between the PC and BHT.	Use a properly functioning RS-232C cross-cable.

Error No.	Cause Details	Remedy
51 52	The BHT communication interface specification is illegal.	Specify IrDA (Optical) if connected to the PC via the CU, and Connector if connected via the interface connector. Refer to QBdirect (page 175, Note 1) for details of the setting method
	The Transfer Utility “Communication port” option specification is illegal.	Specify the communication port to which the BHT is connected for the “Communication port” option.
	The transmission speed at the BHT and PC does not match.	Ensure that the transmission speed at the BHT and PC matches. Please be aware that the default transmission speed differs depending on the BHT used.
	The communication condition of the uncorrespondence is set to CU.	CU-921 corresponds only to the transmission rate 115200bps and 460800bps. Please set it to these transmission rates.
	The protocol specified at the BHT and PC does not match.	Ensure that the protocol matches. Please be aware that the default protocol differs depending on the BHT used.
	The PC communication port setting is illegal.	Enable “Use FIFO buffer. (16550 interchangeable UART required.) (U)” setting for the communication port used.
	Hardware malfunction.	Please contact your dealer.
53	The protocol specified at the BHT and PC does not match.	Ensure that the protocol matches. Please be aware that the default protocol differs depending on the BHT used.
55	The protocol specified at the BHT and PC does not match.	Ensure that the protocol matches. Please be aware that the default protocol differs depending on the BHT used.
	An attempt was made to download a file with field width differing from that of the data file already existing in the BHT.	It is not possible to download a file with the same name but different field width from the file already existing in the BHT. Either delete the existing data file in the BHT, or specify the same field format as the existing data file.
55 71	Illegal characters have been used in the file name.	Change the file name. Refer to QBdirect (page 175, Note 1) for details of characters that can be used in file names.
75	The COM port number used has already been used.	Please use another COM port number, or use it after shutting the COM port under use.
	The COM port number used doesn't exist.	Please use the existing COM port number.
	The communication condition of the uncorrespondence is set to CU.	CU-921 corresponds only to the transmission rate 115200bps and 460800bps. Please set it to these transmission rates.
91	Illegal field information specification option when transmitting data file.	Set a correct value for the field information option.

	An attempt was made to download a file with field width differing from that of the data file already existing in the BHT.	It is not possible to download a file with the same name but different field width from the file already existing in the BHT. Either delete the existing data file in the BHT, or specify the same field format as the existing data file.
	The size of the file being downloaded exceeds the size of the available space in the BHT user area.	Reduce the file size or delete any unwanted files in the BHT.
	Illegal characters have been used in the file name.	Change the file name. Refer to QBdirect (page 175, Note 1) for details of characters that can be used in file names.

Error No.	Cause Details	Remedy
Other	BHT-Ir/BHT protocol was used for transfer for a BHT-BASIC 4.0 format program file (*.PD4).	Use Ymodem protocol or convert program files to "*.PD3".
	An attempt was made to download a BHT-BASIC 3.6 format program file (*.PD3).	Use BHT-BASIC 4.0 format program files (*.PD4).

Note 1: "Customer Registration" is required to use QBdirect (free of charge).
When using for the first time, complete "Customer Registration" and then refer to the following procedure to use QBdirect.
Refer to "Customer Registration" on page ii.

(1) Click the QBdirect URL below.
(2) Enter your user ID and password to log in.
(3) Search what you need to enter keyword to the textbox.

http://www.qbdirect.net/

Barcode Handy Terminal

BHT-904B/BHT-914B

User's Manual

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DENSO WAVE INCORPORATED

The purpose of this manual is to provide accurate information in the handling and operating of the BHT-904B/BHT-914B. Please feel free to send your comments regarding any errors or omissions you may have found, or any suggestions you may have for generally improving the manual.

In no event will DENSO WAVE be liable for any direct or indirect damages resulting from the application of the information in this manual.