DENSO

2D Code Handy Terminal

BHT-825QW/BHT-825QB
BHT-825Q
User's Manual

Preface

Thank you for using the BHT-825Q/BHT-825QB/BHT-825QW DENSO WAVE 2D Code 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 speaker 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 cartridge 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.

Appendices-1 CU-800 Specifications (Option)
Describes the main specifications for the CU-800 Series (option).

Appendices-2 When File Transfer is Not Possible Using the Transfer Utility
Describes causes and countermeasures when unable to transfer files.

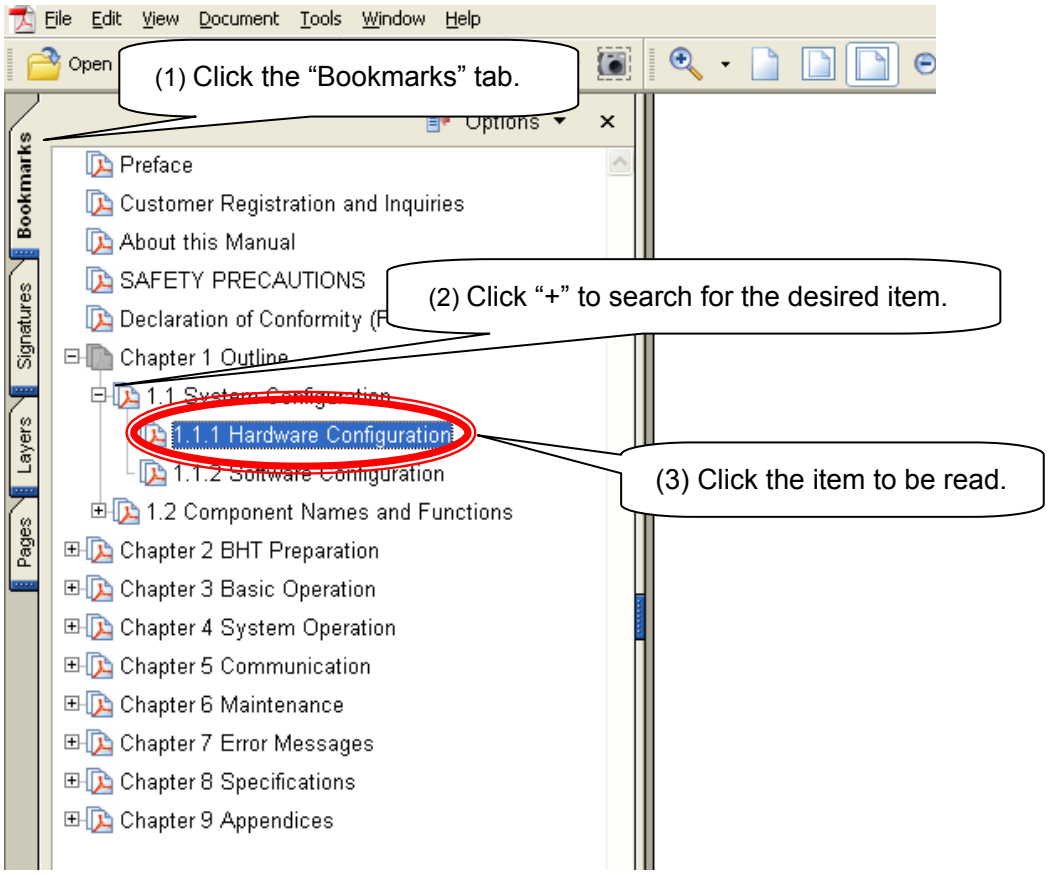
Viewing this Manual

− About the Bookmark

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

<Procedure>

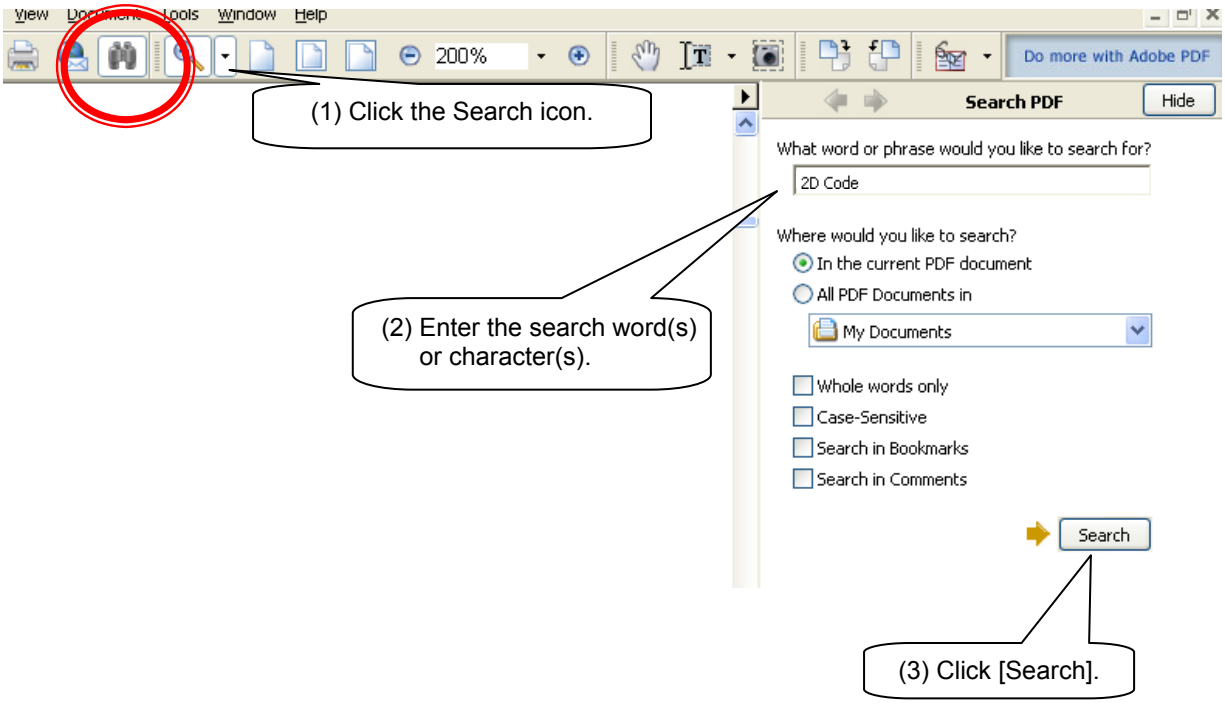
(1) Click the “Bookmark” tab.
(2) Click ⊞ to search for the desired item.
(3) Click the item to be read.



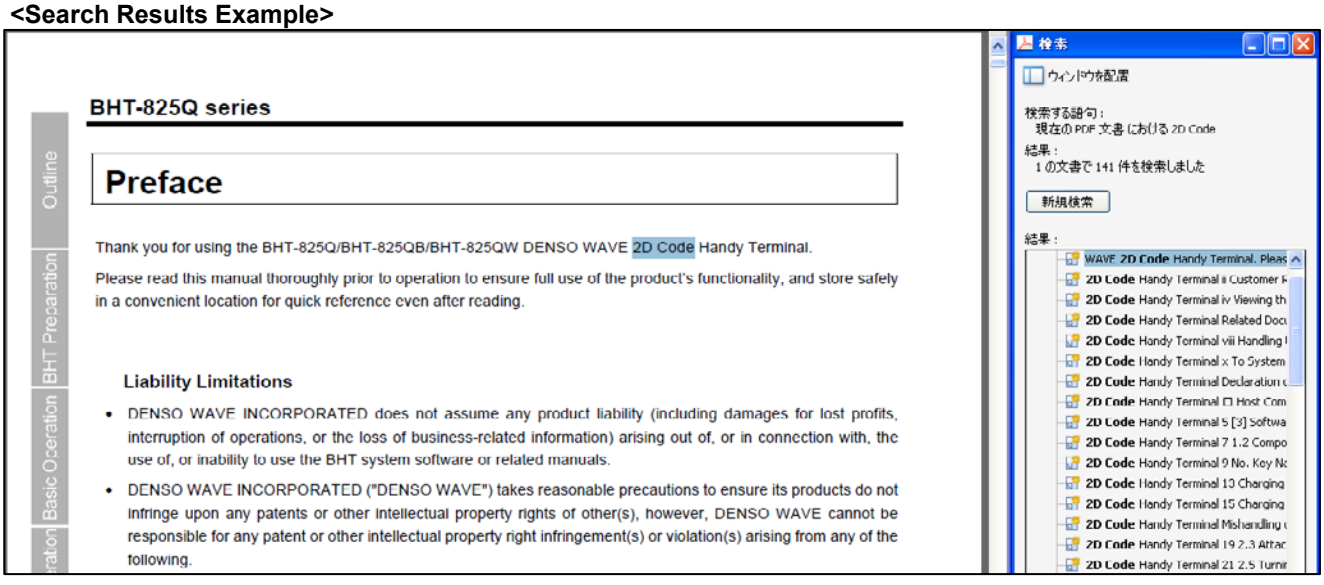
− Searching by Word

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-800 Series)
  This is an instruction manual used to create handy terminal programs with BHT-BASIC.
  This manual can be found in the BHT-BASIC Compiler CD-ROM.
  This manual can also be downloaded from the DENSO WAVE member's Web site (QBdirect).
- 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-800 and comes bundled with the BHT-BASIC 4.0 Transfer Utility.
  This manual can also be downloaded from the DENSO WAVE member's Web site (QBdirect).

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

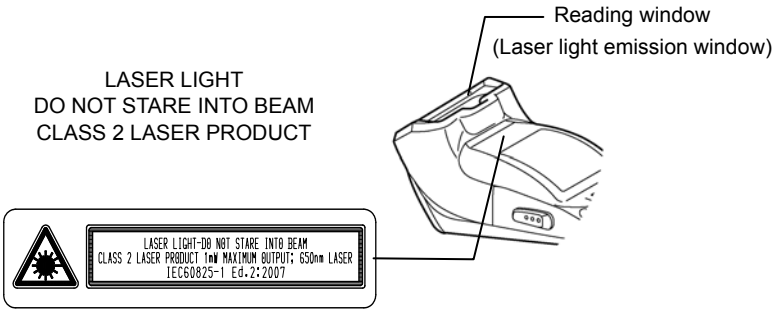
Handling the battery cartridge

- Never disassemble or heat the battery cartridge, nor put it into fire or water; doing so could cause battery-rupture or leakage of battery fluid, resulting in a fire or bodily injury.
- Do not carry or store the battery cartridge together with metallic ball-point pens, necklaces, coins, hairpins, etc.
  Doing so could short-circuit the terminal pins, causing the batteries to rupture or the battery fluid to leak, resulting in a fire or bodily injury.
- Never put the battery cartridge into a microwave oven or high-pressure container.
  Doing so could cause the batteries to break, generate heat, rupture or burn.
- Avoid dropping the battery cartridge or letting it undergo any shock or impact.
  Doing so could cause the batteries to break, generate heat, rupture or burn.
- Never charge the rechargeable battery cartridge where any inflammable gases may be emitted; doing so could cause fire.

- Only use the dedicated charger for charging the rechargeable battery cartridge.
  Using a different type of charger could cause battery-rupture or leakage of battery fluid and result in a fire, bodily injury, or serious damage to property.

Handling the BHT

- The BHT uses a laser light for indicating the scanning range. Though the intensity of the laser light is too low to inflict bodily injury.
  You must observe the following precautions when handling the BHT equipped with laser light:
  1) Never stare into the laser light.
  2) Never point the code reading window at someone's eyes.
  The BHT complies with IEC 60825-1 Ed.2:2007.
  In accordance with Clause 5 and 6, IEC 60825-1, the following information is provided to the user:



Caution - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure.

- Never put the BHT into a microwave oven or high-pressure container.
  Doing so could cause the BHT to break, generate heat, rupture or burn.

⚠ 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 battery cartridges. 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 battery cartridge

	• Never charge a wet or damp rechargeable battery cartridge. Doing so could cause the batteries to break, generate heat, rupture or burn.

Handling the BHT

	• If smoke, abnormal odors or noises come from the BHT, immediately turn off the power, pull out the battery cartridge, and contact your nearest dealer. Failure to do so could cause smoke or fire. • If foreign material or water gets into the BHT, immediately turn off the power, pull out the battery cartridge, and contact your nearest dealer. Failure to do so could cause smoke or fire. • If you drop the BHT so as to damage its housing, immediately turn off the power, pull out the battery cartridge, and contact your nearest dealer. Failure to do so could cause smoke or fire. • Do not use batteries or power sources other than the specified ones; doing so could generate heat or cause malfunction. • 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.
 Never dis-assemble	• Never disassemble or modify the BHT; doing so could result in an accident such as break or fire.
	• 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. Doing so could affect the housing or parts, resulting in a fire. • Avoid using the BHT in extremely humid or dusty areas, or where there are drastic temperature changes. Moisture or dust will get into the BHT, resulting in malfunction, fire or electrical shock. • 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 place magnetic cards or the like near the BHT speaker. Doing so may result in the loss of magnetic data from cash cards, credit cards, etc. • 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 inserting or removing the rechargeable battery cartridge. Doing so will result in damage.

- If the BHT has been stored in a hot (50°C to 60°C, 122°F to 140°F) and humid place, allow it to sit at room temperature and humidity for at least one day before use. Using the BHT with its inside being hot will fail to scan or result in a machine failure.

⚠ 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.

Declaration of Conformity

For European Union

English: Hereby, DENSO WAVE INCORPORATED, declares that this BHT-825QB/QW/QWB contains Wireless LAN Module (type: DWWL002) / Bluetooth® Board (type: DWBT011) that are in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Česky: Firma DENSO WAVE INCORPORATED tímto prohlašuje, že její radio- a telekomunikační terminál BHT-825QB/QW/QWB obsahuje bezdrátový síťový modul LAN (typ: DWWL002) / platformu Bluetooth® (typ: DWBT011), které vyplňují základní požadavky a další příslušná ustanovení směrnice 1999/5/ES.

Dansk: Undertegnede, DENSO WAVE INCORPORATED, erklærer herved, at følgende udstyr, BHT-825QB/QW/QWB indeholder en trådløs LAN modul (type: DWWL002) / Bluetooth® Board (type: DWBT011) som overholder de væsentlige krav og øvrige relevante krav i Rådets direktiv 1999/5/EF.

Deutsch: Hiermit erklärt der Hersteller, DENSO WAVE INCORPORATED, dass sich das Gerät: BHT-825QB/QW/QWB ein Wireless LAN Modul (Typ: DWWL002) / ein Bluetooth® Board (Typ: DWBT011) enthalten und sich in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befinden.

Eesti: Käesolevaga kinnitab DENSO WAVE INCORPORATED, et seade BHT-825QB/QW/QWB sisaldab traadita kohtvõrgu moodulit (tüüp: DWWL002) / Bluetooth®-süsteemi (tüüp: DWBT011), mis vastavad direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele muudele asjakohastele sätetele.

Español: Por medio de la presente, DENSO WAVE INCORPORATED, declara que el BHT-825QB/QW/QWB incluye módulo de red inalámbrica (tipo: DWWL002) / tarjetas Bluetooth® (tipo: DWBT011), las cuales cumplen con los requisitos esenciales y otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.

Ελληνική: Με το παρόν η DENSO WAVE INCORPORATED, δηλώνει ότι αυτή η συσκευή BHT-825QB/QW/QWB περιλαμβάνει μονάδα ασύρματου τοπικού δικτύου Wireless LAN (τύπος: DWWL002) / Πλακέτα Bluetooth® (τύπος: DWBT011), οι οποίες πληρούν τις βασικές απαιτήσεις και τις λοιπές σχετικές διατάξεις της Οδηγίας 1999/5/ΕΚ.

Français: Par la présente DENSO WAVE INCORPORATED déclare que le terminal BHT-825QB/QW/QWB est doté d'un module de connexion à un réseau local sans fil (type: DWWL002) / d'une carte Bluetooth® (type: DWBT011) conformes aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.

Italiano: Con la presente, DENSO WAVE INCORPORATED dichiara che questo BHT-825QB/QW/QWB contiene il modulo wireless LAN (modello: DWWL002) / la scheda Bluetooth® (modello: DWBT011), che sono conformi ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.

Latviski: Ar šo DENSO WAVE INCORPORATED deklarē, ka BHT-825QB/QW/QWB satur bezvadu LAN moduli (tips: DWWL002) / Bluetooth® karti (tips: DWBT011), kuri atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem

Lietuvių: Šiuo „DENSO WAVE INCORPORATED"deklaruoja, kad šis BHT-825QB/QW/QWB įrenginys su bevielio LAN moduliu (tipas: DWWL002) / Bluetooth® plokšte (tipas: DWBT011) atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.

Nederlands: Hierbij verklaart DENSO WAVE INCORPORATED dat het toestel BHT-825QB/QW/QWB een draadloze LAN Module (type: DWWL002) / Bluetooth® Board (type: DWBT011) bevatten, die in overeenstemming zijn met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.

Malti: Hawn hekk, DENSO WAVE INCORPORATED tiddikjara li dan il- BHT-825QB/QW/QWB fih Wireless LAN Module (tip: DWWL002) / Bluetooth® Board (tip: DWBT011), li huma konformi mar-rekwiżiti essenzjali u ma' dispożizzjonijiet relevanti oħrajn tad-Direttiva 1999/5/KE.

Magyar: Alulírott, DENSO WAVE INCORPORATED, nyilatkozom, hogy a BHT-825QB/QW/QWB típusú készülék vezeték nélküli helyi hálózati (Wireless LAN) modult (típus: DWWL002) / Bluetooth® Boardot (típus: DWBT011) tartalmaznak, amelyek megfelelnek a vonatkozó alapvető követelményeknek és az 1999/5/EK irányelv egyéb előírásainak.

Polski: Niniejszym, DENSO WAVE INCORPORATED, oświadcza, że ten BHT-825QB/QW/QWB zawiera moduł łączności bezprzewodowej dla sieci LAN (typu: DWWL002) / moduł Bluetooth® (typu: DWBT011), które są zgodne z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.

Português: DENSO WAVE INCORPORATED declara que este BHT-825QB/QW/QWB inclui um Módulo LAN sem fios (tipo: DWWL002) / uma Placa Bluetooth® (tipo: DWBT011), que estão conforme aos requisitos essenciais e a outras disposições da Directiva 1999/5/CE.

Slovensko: Podjetje DENSO WAVE INCORPORATED izjavlja, da ta BHT-825QB/QW/QWB vsebuje brezžični modul LAN (vrsta: DWWL002) / ploščo Bluetooth® (vrsta: DWBT011), ki sta skladna z bistvenimi zahtevami in drugimi zadevnimi določili direktive 1999/5/ES.

Slovensky: Firma DENSO WAVE INCORPORATED týmto vyhlasuje, že jej rádio- a telekomunikačný terminál BHT-825QB/QW/QWB obsahuje bezdrôtový sieťový (LAN) modul (typ: DWWL002) / dosku Bluetooth® (typ: DWBT011), ktoré sú v zhode so základnými požiadavkami a ostatnými príslušnými ustanoveniami Smernice 1999/5/ES.

Suomi: Täten DENSO WAVE INCORPORATED vakuuttaa, että tämän tuotteen BHT-825QB/QW/QWB sisältämä langaton WLAN-moduli (tyyppi: DWWL002) / Bluetooth®-piiri (tyyppi: DWBT011) ovat direktiivin 1999/5/EY oleellisten vaatimusten ja sen näitä tuotteita koskevien muiden ehtojen mukaisia.

Svenska: Härmed intygar DENSO WAVE INCORPORATED att denna BHT-825QB/QW/QWB innehåller en trådlös LAN-modul (type: DWWL002) / Bluetooth® Board (type: DWBT011), som står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Íslenska: Hér með lýsir DENSO WAVE hf. því yfir að þetta BHT-825QB/QW/QWB inniheldur þráðlausa staðarnetseiningu (tegund: DWWL002) / Bluetooth®-rásaspjald (tegund: DWBT011), sem eru í samræmi við grundvallarkröfur og önnur viðeigandi ákvæði tilskipunar 1999/5/EB.

Norsk: DENSO WAVE INCORPORATED erklærer med dette at denne BHT-825QB/QW/QWB inneholder trådløst LAN-nettverksmodul (type: DWWL002) / Bluetooth® Board (type: DWBT011), som er i samsvar med regelverk og øvrige bestemmelser i direktiv 1999/5/EC.

	Wireless LAN module type:DWWL002	Bluetooth® Board type:DWBT011
BHT-825QB	—	✓
BHT-825QW	✓	—
BHT-825QWB	✓	✓

CE marking:

CE

For Australia and New Zealand

This BHT-825QB/QW/QWB contains Wireless LAN Module (type : DWWL002) / Bluetooth® Board (type : DWBT011).

C-tick marking:

N661

BHT-825Q series

Chapter 1
Outline

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

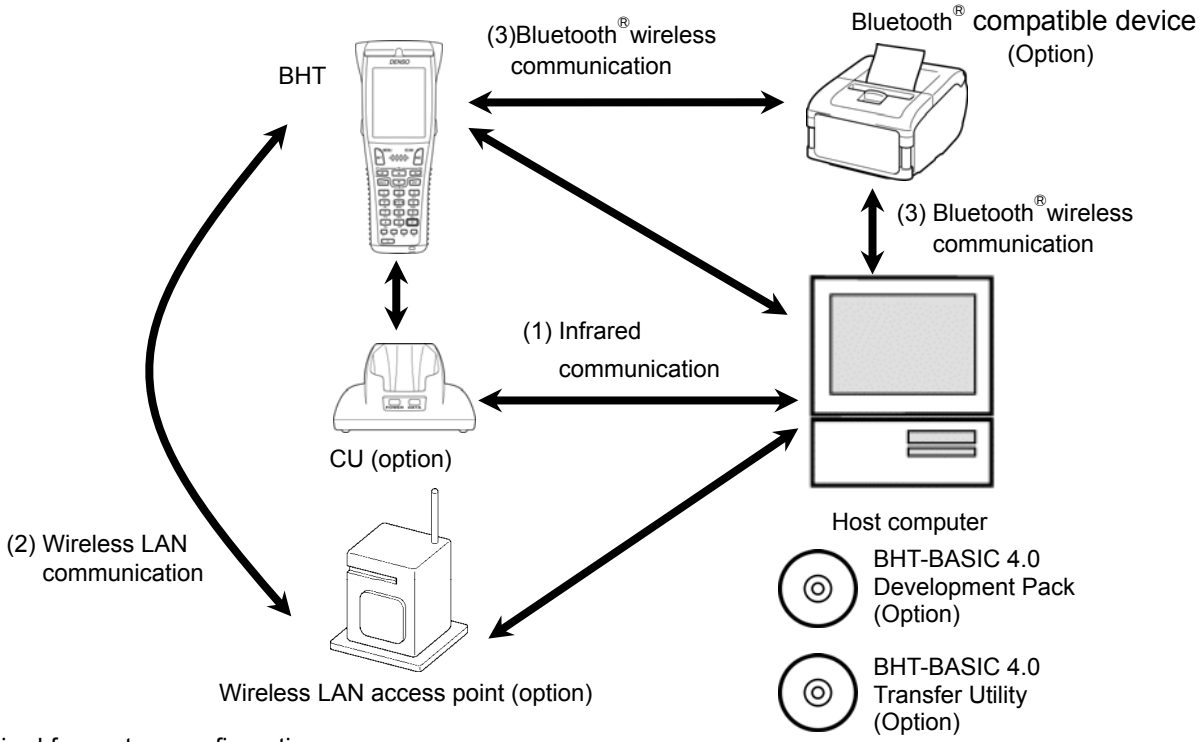
1.1 System Configuration

This section describes the hardware required for the code 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 code 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
- CU-800 Series (option): Optical communication unit
- Connection cable (option): Used to connect the CU and host computer.
- Bluetooth® compatible device (Option)
- Software: BHT-BASIC 4.0 Development Pack (Option) and BHT-BASIC 4.0 Transfer Utility (Option)



● : Required for system configuration

	Host computer	BHT	CU	Wireless LAN access point	Bluetooth® compatible device	Software	Ref. Page
(1) Infrared communication	√	√	√	–	–	√	Page 32
(2) Wireless LAN communication	√	√	–	√	–	√	Page 33
(3) Bluetooth® wireless communication	√ *1	√ *2	–	–	√	√	Page 34

*1: When the host computer is equipped with the Bluetooth® wireless communication device.
*2: The BHT supports the following profiles.
・Generic Access Profile
・Serial Port Profile
・Dialup Networking Profile

◆ 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

Operating Systems (OS)	Windows 98	Windows NT 3.51/4.0	Windows 2000 Professional	Windows XP 32bit edition	Windows Vista 32bit edition
BHT-BASIC4.0 Development Pack	–	–	√	√	√
BHT-BASIC4.0 Transfer Utility*	√	√	√	√	√

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

◆ CU-800 Series (Option)

Used for communication between the BHT and host computer.
Communication with the BHT is performed by infrared communication, and communication with the host computer is performed with an RS-232C, Ethernet or USB interface.
The following three types of CU are available depending on the interface used to communicate with the host computer.

- CU-801: RS-232C interface
- CU-811: Ethernet
- CU-821: USB interface

◆ Connection Cable (Option or Commercially Available Product)

Used to connect the host computer and CU-800 Series.
Select a cable suited to the CU-800 Series interface being used.

Supported CU-800 Series Cables

- CU801: RS-232C cable (Option)
- CU-811: Ethernet (10BASE-T) cable (commercially available product)
- CU-821: USB cable (Option)

◆ Wireless LAN Access Point (Option)

Used for wireless communication between the BHT and host computer.
The BHT is compatible with wireless LAN standard IEEE802.11g/b and can therefore be used with existing wireless LAN infrastructure. (Max. wireless communication speed: 54Mbps)
Furthermore, the BHT is WPA/WPA2 compatible to ensure maximum security.

◆ Bluetooth® compatible device (Option)

Used for Bluetooth® wireless communication between the BHT and a device such as the Bluetooth® compatible host computer, printer, mobile phone, etc.

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

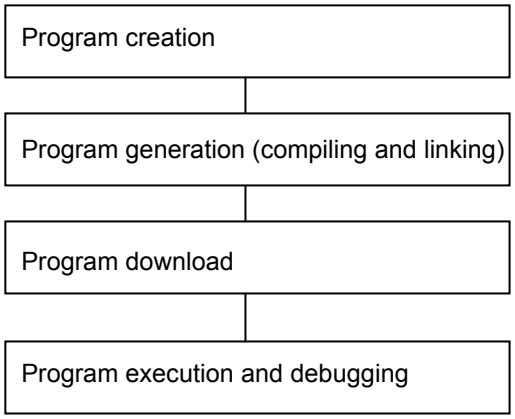
Refer to “Software Configuration” on the following page.

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 QBdirect 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-800 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 four software products required for BHT 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).

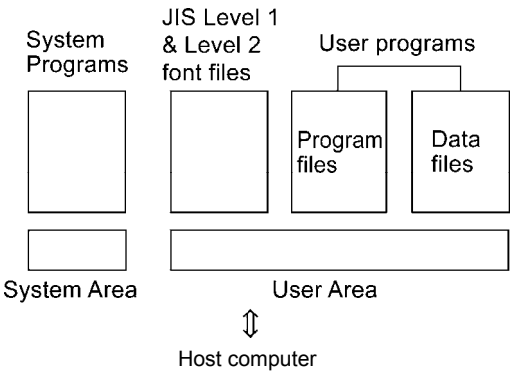
- BHT-BASIC4.0 Transfer Utility
  Transfers files between the host computer and BHT at the host computer.
  YMODEM or BHT-Ir protocol is used for file transfer.
  BHT-BASIC 4.0 specification files such as application programs and data files are transferred using YMODEM protocol.

◆ 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
  Driver 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 16 to 40 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: FNTFSHG.FN4 (JIS Level 1 and 2 font, 16-dot to 40-dot)

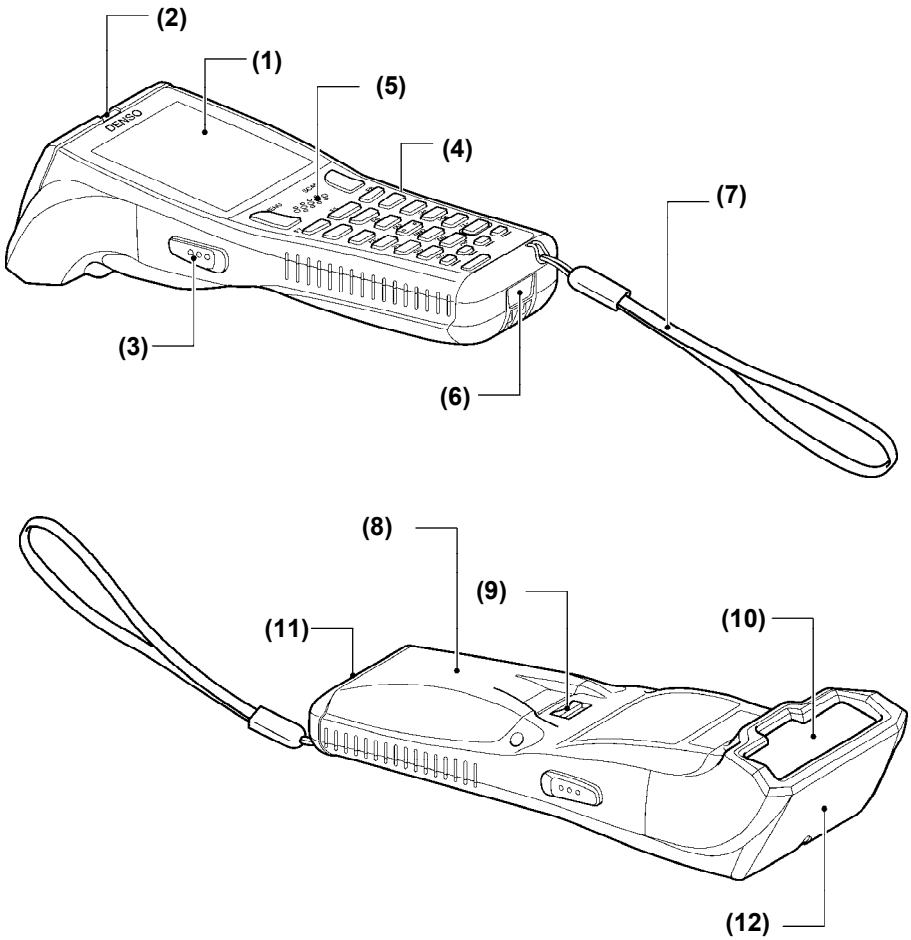
◆ User Programs

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.

1.2 Components and Functions

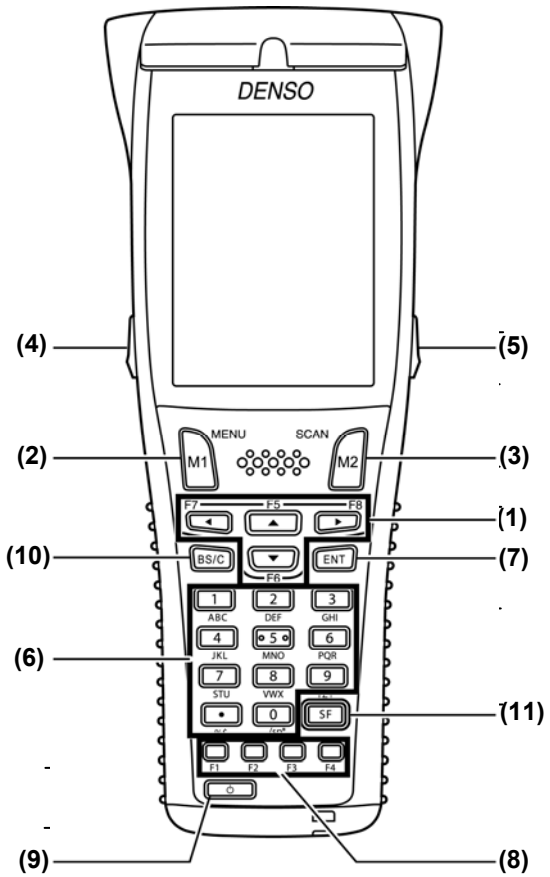
1.2.1 BHT Front/Rear

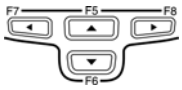


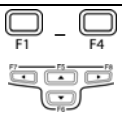
No.	Name	Function and Description
(1)	LCD (Liquid crystal display)	Displays the characters and graphic patterns.
(2)	Indicator LED	Indicates the code read status. Illuminates in blue when the BHT has successfully read a code.
(3) (4)	Trigger switch (M3 and M4 Magic keys)	Press when scanning a code. The **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.
(5)	Speaker	Emits sound.
(6)	IrDA interface port	Used to exchange data/programs with the optical communication unit CU-800 or other BHTs.
(7)	Hand strap	Be sure to put your hand through this strap to prevent you from dropping the BHT accidentally.
(8)	Battery cover	Remove this cover to replace the battery cartridge.
(9)	Battery cover lock	Use this to lock or unlock the battery cover.
(10)	Code reading window	Align the reading window with codes to perform code reading.
(11)	Charge terminal	Place on the CU to charge the BHT.
(12)	Wireless LAN / Bluetooth® communication antenna	Used to communicate with the wireless LAN access point and the Bluetooth device.

1.2.2 Keypad

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

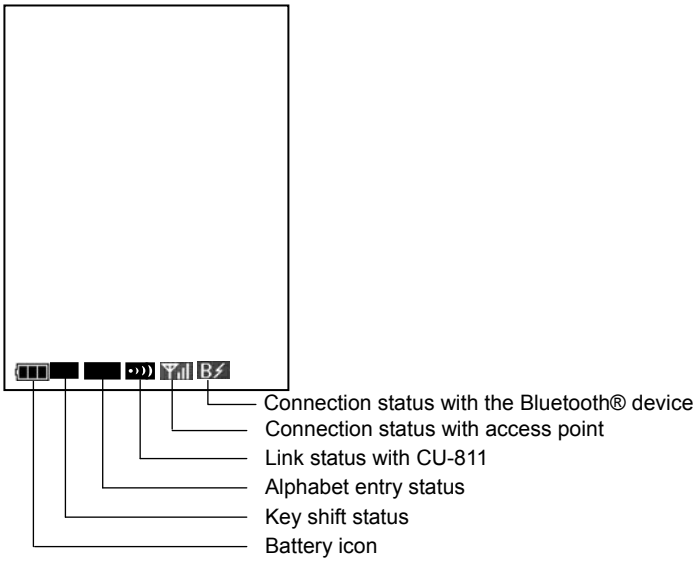


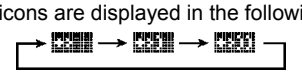
No.	Key	Name	Function and Description
(1)		Cursor keys	Used to move the cursor and select menus.
(2)		Magic key [**M1**]	• Each of the **M3** and **M4** keys is assigned a trigger switch by default. • The **SF**, **ENT**, **Backlight**, **MENU** or **C** key functions can be assigned to these magic keys by making settings at the SYSTEM MENU. • Character strings can be assigned at user programs. • Hold down the **M1** key to display the following setting screens when set to the default. - Volume - Vibrator - LCD display brightness - Power save
(3)		Magic key [**M2**]	
(4)		Magic key [**M3**]	
(5)		Magic key [**M4**]	

No.	Key	Name	Function and Description
(6)		Numerical keys	Used to enter data.
(7)		Enter key	Press to finalize entered data or execute operations.
(8)		Function keys	Used to select functions. *Function key functions are assigned at user programs. Refer to the "**BHT-BASIC Programmer's Manual (For BHT-800 Series)**" for further details
(9)		Power key	Turns the BHT power ON or OFF.
(10)		Backspace/clear key	Deletes the last entered character (backspace). When pressed and held for 1 second or more, cancels entry and returns the LCD display to the previous screen (clear.)
(11)		Shift key	Used in combination with other keys such as the numerical keys and  key for special input procedures.

1.2.3 BHT Screen

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-811.



	This is the battery icon. Shows battery level. (See page 21)
SF	Shows that the **SF** key is pressed when the keys are in the shift-mode.
ALP	Shows that the “alphabet entry” mode is set. Press the SF key to change the “numeric entry” to the “alphabet entry” when the alphabet entry mode is set by the user program. (See “Programming manual, section 7.2.1”) Alphabet entry is used for setting up the FTP.
	Shows that the CU-811 is connected. Blinks when the CU-811 which is not connected tries to connect. The icons are displayed in the following order,  when; -No response from the CU-811. -Waiting for the connection to the CU-811. -Waiting for the disconnection from the CU-811 .
	Shows the radio field strength when the BHT is connected to the access point. More bars equals the stronger connection  Strong Weak  shows that the BHT is not connected to the access point.
	Shows the Bluetooth® status.  : Shows that the Bluetooth® device is turned ON.  : Shows that the Bluetooth® device is connected.  : Shows that the Bluetooth® device is in lower power consumption mode.

Chapter 2
BHT Preparation

This chapter describes inserting and charging the battery cartridge, turning the BHT power ON and OFF, and use of the hand strap.

2.1 “BHT Preparation” Procedure

Follow the steps below to prepare the BHT for use.

2.2 Loading and Charging the Battery Cartridge(Page 14)

First load and charge the battery cartridge.

↓

2.3 Attaching the Hand Strap (Page 21)

Attach the hand strap to prevent the BHT from being dropped.

↓

2.4 Initial Setup (Page 22)

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

2.2 Loading and Charging the Battery Cartridge

The battery cartridge is not charged when purchased and should therefore be charged prior to use.
The chargers that can be use with the BHT are the communication units (CU-801, CU-811 and CU-821) and battery chargers (CH-201A, CH-851, CH-704 and CH-854).

* The CH-201A and CH-704 chargers are used for charging individual batteries, and the CH-851 and CH-854 are stand-type (same type as CU (communication unit)) chargers.

The charging time is approximately 3 hours.

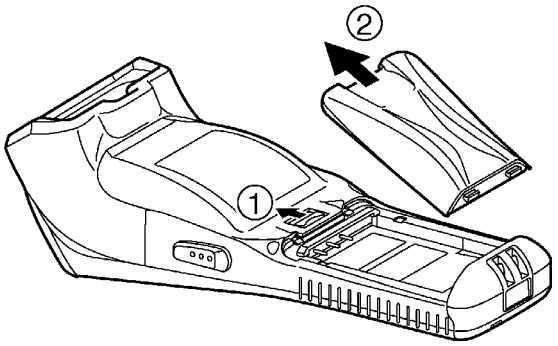
- The charging time is approximately 7 hours using the CU-821 with power supplied via the USB port.
- An only slightly discharged battery cartridge should take less time to become fully charged.

Charging Precautions

- Do not touch the BHT, battery, or charger terminals by hand or stain them. Doing so could result in a contact failure or prevent charging.
- Never charge the battery near fire or in a high-temperature environment.
  High-temperatures may activate the charger’s protective device, preventing from charging, and lead to protective device damage, overheating, blowout or combustion.
- Terminate charging if not completed even after the specified time has elapsed.
- Do not use battery cartridges other than that specified by DENSO WAVE.

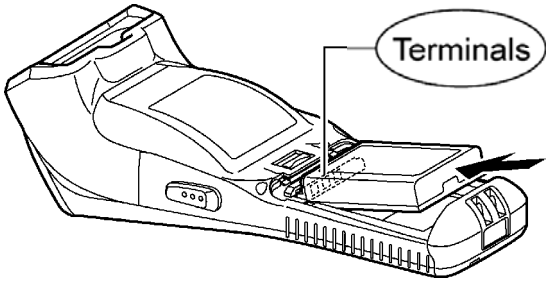
Charging with the communication unit (CU-801, CU-811 and CU-821)
or battery charger (CH-851 and CH-854)

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

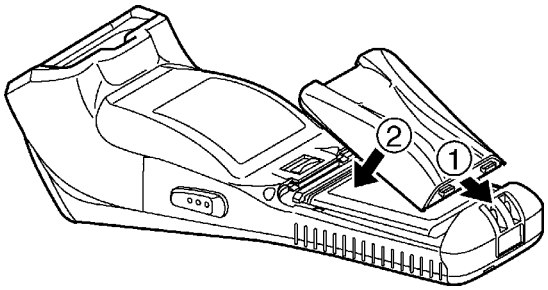


2. Check the battery cartridge terminals and indication on the BHT unit, and then insert the cartridge in the direction indicated by the arrow.

– Point – Do not use battery cartridges other than that specified by DENSO WAVE.

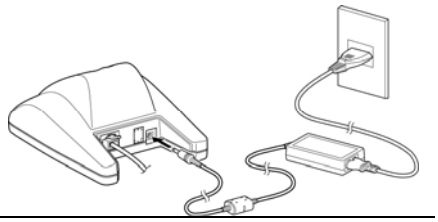


3. Insert the battery cartridge cover tab (1), and then close the battery cartridge cover (2) to lock the cover in position. Press the battery cover into place until a click is heard.



4. Connect the dedicated AC adapter to the DC input connector on the charger and plug the adapter into the wall socket.

The charger Power LED (green) turns ON.



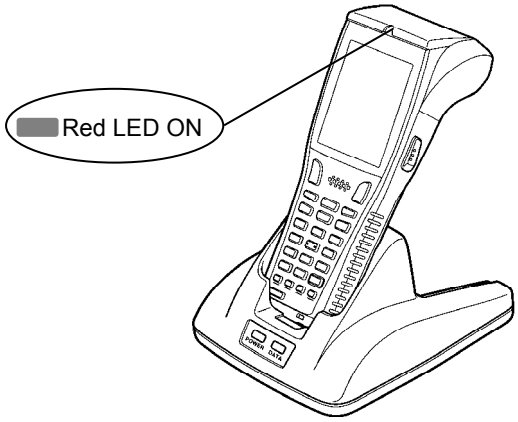
– **Note** – Power for the CU-821 can be obtained from a USB connection port (host computer or hub), however, charging is not possible while the host computer is in suspend mode. Charging is resumed when suspend mode is exited. This can be avoided using a dedicated AC adapter to supply power. Suspend mode is a power saving function used to temporarily put the computer on standby when not in use.

5. Place the BHT on the charger.

The LED illuminates in red and charging begins.

– **Point** – After placing the BHT on the charger when using the BHT for the first time or when left unused for long periods of time, do not remove from the charger for approximately 10 minutes.

*When the BHT is set on the charger, the LCD screen will momentarily turn gray.

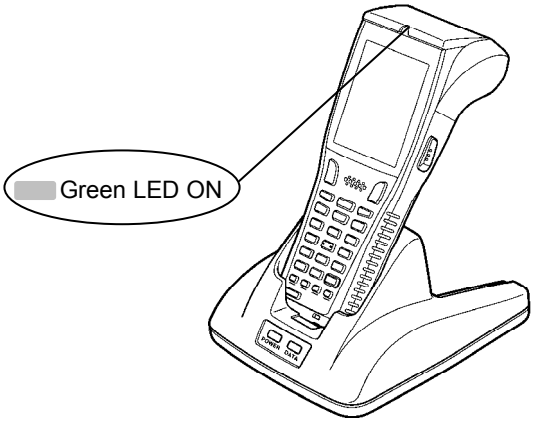


– **Note** – The BHT is equipped with a back-up battery used to back-up the internal memory and calendar clock. The internal back-up battery is charged first when charging is commenced.

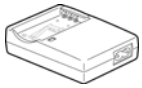
Do not remove the BHT from the charger for at least 10 minutes when using the BHT for the first time or when using after long periods of time.

6. The BHT indicator LED will change to green when charging is complete.

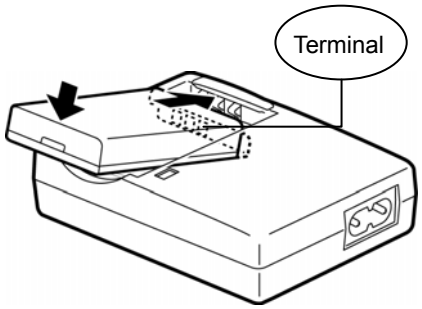
– **Point** –
- Charging takes approximately 3 hours.
- Charging takes approximately 7 hours when using the CU-821 with power supplied via the USB port.
- An only slightly discharged battery cartridge should take this time to become fully charged.



Charging with the battery charger (CH-201A and CH-704)

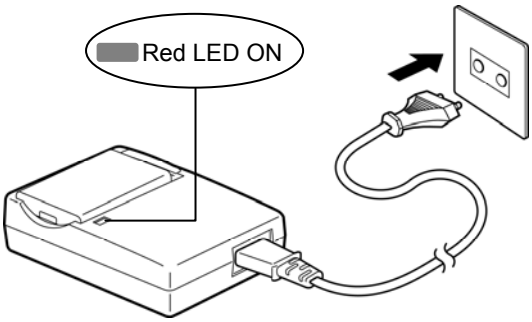


1. Check the battery cartridge terminals and insert the cartridge.

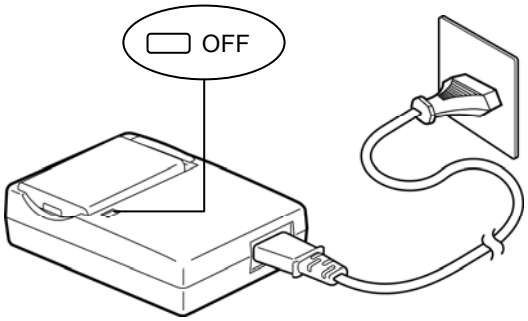


2. Connect the power cable to the CH-201A and connect the plug to a commercial AC power source (230 V AC).

   The LED will turn red when charging is commenced.

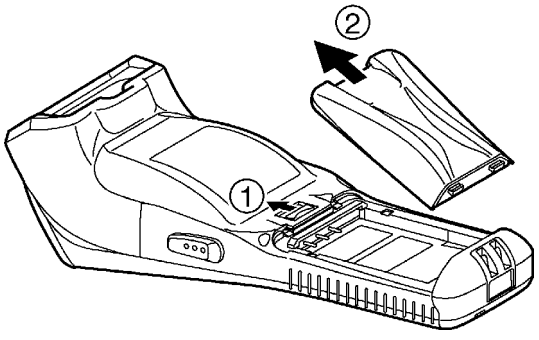


3. The LED will turn OFF when charging is complete.

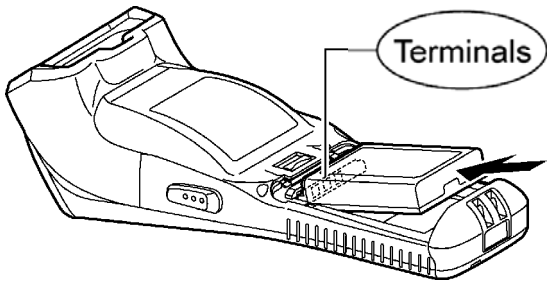


– **Point** –
- Charging takes approximately 3 hours.
- An only slightly discharged battery cartridge should take this time to become fully charged.

4. Slide the battery cartridge cover release button (1) in the direction indicated by the arrow and remove the battery cartridge cover (2).

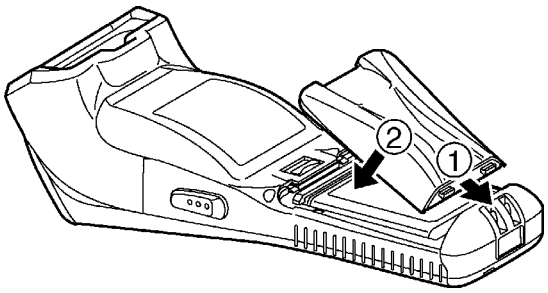


5. Check the battery cartridge terminals and indication on the BHT unit, and then insert the cartridge in the direction indicated by the arrow.



– **Point** – Do not use battery cartridges other than that specified by DENSO WAVE.

6. Insert the battery cartridge cover tab (1), and then close the battery cartridge cover (2) to lock the cover in position. Press the battery cover into place until a click is heard.



– **Note** – The BHT is equipped with a back-up battery used to back-up the internal memory and calendar clock. The internal back-up battery is charged first when charging is commenced.

Do not remove the BHT from the charger for at least 10 minutes when using the BHT for the first time or when using after long periods of time.

⚠ WARNING

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

- Never disassemble or modify the battery cartridge.
- Never connect the battery cartridge (+) and (-) terminals with a metal object such as a piece of wire.
- Never carry or store the battery cartridge together with metallic necklaces, hairpins and so on.
- Never expose the battery cartridge to fire or apply heat.
- Never use or leave the battery cartridge in the vicinity of high-temperature locations (60° C or higher) such as a fire or stove.
- Never place the battery cartridge into or soak it in water or seawater.
- Never charge the battery cartridge in the vicinity of fire or under a scorching sun.
- Never hammer nails into the battery cartridge, hit it with a hammer, or trample on it.
- Never apply strong impact to or throw the battery cartridge.
- Never use significantly damaged or deformed battery cartridges.
- Never apply solder directly to the battery cartridge.
- If battery fluid leaked from the battery cartridge gets into the eyes or comes 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.

⚠ CAUTION

Mishandling of the charger may result in charger overheating, smoke generation, blowout or combustion. Please read the following item prior to use.

- Terminate charging if not completed even after the specified time has elapsed.

– Note –

- The BHT is equipped with a back-up battery used to back-up the internal memory and calendar clock when the battery cartridge is removed or the battery voltage falls below the stipulated level.
  It is therefore necessary to charge the internal back-up battery when using the BHT for the first time or when left unused for long periods of time.
  The back-up battery is charged automatically when a fully-charged battery cartridge is loaded.
  To ensure that the back-up battery is fully charged, do not remove the battery cartridge for at least 10 minutes when using the BHT for the first time or when using after long periods of time.
- If you leave the BHT without a battery cartridge loaded for a long time, the memory contents will no longer be backed up so that 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” – “6.3 Using the BHT after Long Periods” for details of handling the BHT after long periods of time.
- Avoid storing the battery cartridge in high-temperature locations. The battery capacity may decrease.
- Do not touch the BHT, battery, or charger terminals by hand or stain them. Doing so may result in a BHT operation defect or battery cartridge charging failure. It is recommended that dirt on the battery cartridge terminals or BHT battery terminals be periodically wiped with a soft, 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 ( ) that displays in the bottom left of the LCD display.
The battery power displays in four levels.
The battery power level indicator is a guideline to notify the operator to charge the battery promptly when discharged.

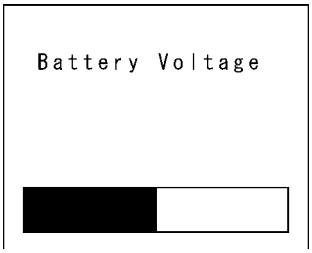
: Sufficient battery power remains.
: The battery power is partially depleted. Charge promptly.
: The battery power is almost fully depleted. Charge immediately.
: The battery power is fully depleted.
Charge immediately or replace with a fully charged battery cartridge.

Confirming at the "Battery Voltage" Screen

The battery power level can also be confirmed at the "Battery Voltage" screen.
The "Battery Voltage" screen displays the battery power level in more detail than the battery icon ( ) that displays at the LCD display.
Display the "Battery Voltage" screen using the following procedure.

1. Hold down the **SF** key and press the **ENT** 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 charge the battery 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 and **ENT** keys are used for switching between the numeric and alphabet entry modes.

– TIP –

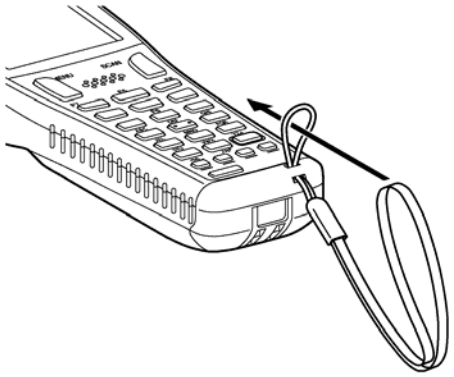
- In user programs, you may select the key to be used for displaying the battery voltage level (instead of the default: combination of **SF** and **ENT** keys).
- The displayed battery level shows the terminal voltage of the battery, not how much power is left.
- The actual voltage level varies depending upon the operation of the BHT, so the displayed level also may vary.

2.3 Attaching the Hand Strap

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

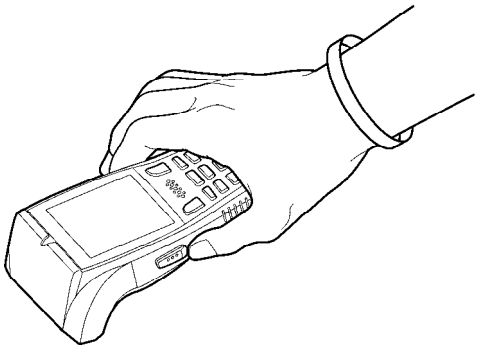
2.3.1 Attaching the Hand Strap

Attach the hand strap as shown below.

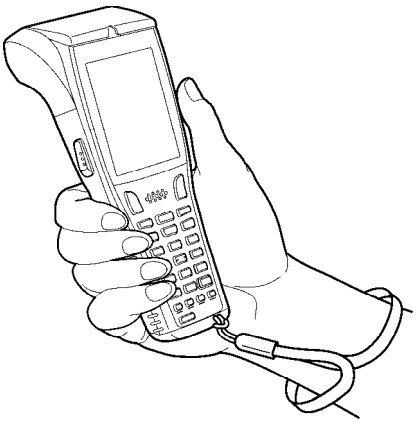


2.3.2 Holding the BHT

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



or

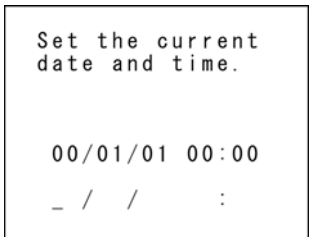


2.4 Initial Setup

Turn ON the power after inserting the fully charged battery cartridge into the BHT.
The clock will not have been set at the time of purchase, and therefore it is necessary to set the date and time when turning ON the power for the first time.

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

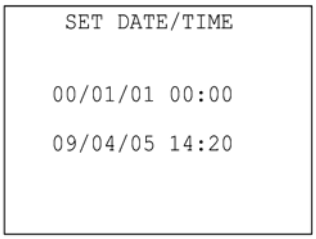
   The screen to the right displays.



> **– Point –** Press the Power key at least 1 second after data backup. Refer to “Turning OFF the Power” on data backup.

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

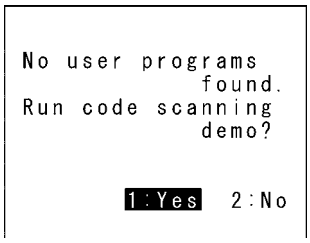
   [Ex.] : April 5, 2009, 14:20



> **– 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.

   The screen to the right displays when the date and time are set.



4. Press numeric key **1** followed by **ENT** and select [1:Yes].

   A scanning demo commences.
   The scanning demo is a program that allows codes to be scanned without a user program. Press the trigger switch to enable code scanning.
   Refer to "Chapter 3 Basic Operation" – “3.1 Reading Codes” and read a code .

> **– Point –** By selecting [2:No], the power turns OFF.

2.5 Turning OFF the Power

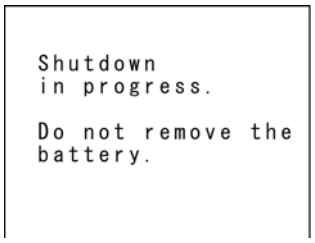
Use one of the following three methods to turn OFF the BHT power.

Methods	Operation	Data Backup Timing
1) Normal power OFF	Press the Power key.	After 20 minutes from turning off
2) Turning the power OFF after data backup	Hold down the Power key for at least 3 seconds.	When the power turns off
3) Auto power OFF	The power turns OFF itself when the BHT is not used for the specified period of time set.	After 20 minutes from turning off

2.5.1 Normal Power OFF

1. Press the **Power** key ( ).

The BHT power turns OFF after the screen on the right displays.



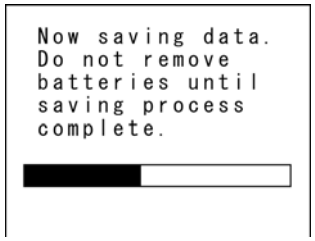
– Point – Do not remove the battery cartridge while the message on the right is displayed.

When the power is next turned ON, there are times when a message (2XXX) displays asking the user to contact the administrator.

2.5.2 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 automatically when the back-up is complete.



– Point – Do not remove the battery cartridge while the message on the right is displayed.

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

2.5.3 Auto Power OFF

The power turns OFF automatically when the BHT is not used for the length of time set at the user program.
The default time is set to 3 minutes when the BHT is shipped from the factory.
* Refer to “BHT-800 Programmer’s Manual” for details of auto power OFF.

2.5.4 If the BHT Is Shut Down Abnormally

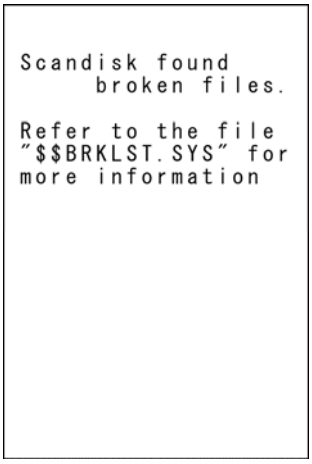
If the BHT is shut down abnormally* and is left without a battery cartridge or with a discharged battery cartridge loaded, then unsaved data may be lost.
(*"Normally shut down" refers to "2.5 Turning OFF the Power.")

1. The right message will appear when you load a charged battery cartridge and turn the BHT on.

2. Next, the testing message will appear as in the screen to the right. In some instances testing may take up to 20 to 30 seconds. When complete, the system starts.

If Scandisk finds a broken file(s), the right screen will appear.
(As long as a broken file exits, the screen displays every time the BHT System is started up.)

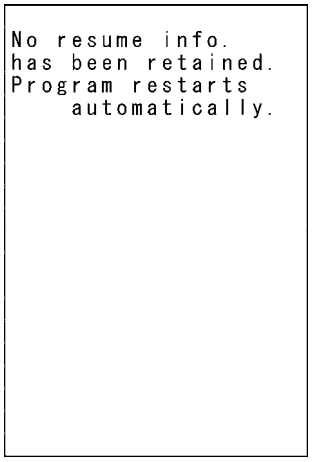
(Refer to “About “$$BRKLST.SYS” on the following page.)



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.)



– Point – The resume function is used to return the display to the status (screen) where 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 a broken 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" – "4.5.3 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	e.g. 01000-01200 (Data in records numbered 1000 to 1200 is lost)

[Ex.]

```
SAMPLE1.DAT + 01000-01050
SAMPLE1.DAT + 01200-01250
SAMPLE1.DAT + 01600-01650
SAMPLE2.DAT * 00250-00275
SAMPLE3.DAT * 00100-00150
    ↑       ↑       ↑
   (1)     (2)     (3)
```

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."

2.5.5 If Broken Files Are Found

Even broken files can be uploaded, so upload them to the host computer according to your needs.
After uploading,

- Delete those broken files.
  (Refer to "Chapter 4 System Operation" – "4.5.11 Deleting Program/Data Files (DELETE FILE MENU).")
- Download valid files having the same names as the broken ones.
  (Refer to "Chapter 4 System Operation" – "4.5.3 Downloading Files (DOWNLOAD MENU).")

BHT-825Q series

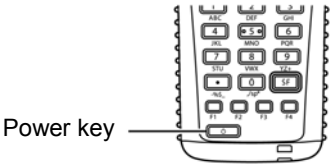
Chapter 3
Basic Operation

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

3.1 Reading Barcodes or 2D Codes

Follow the procedure below to scan barcodes.

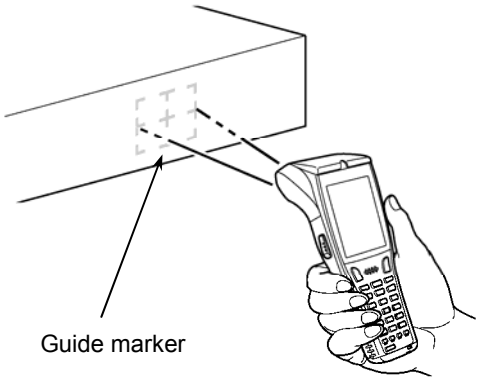
1. Turn the BHT power ON.



2. Press the trigger switch.

The BHT emits a guide marker (laser light) and the light for reading.

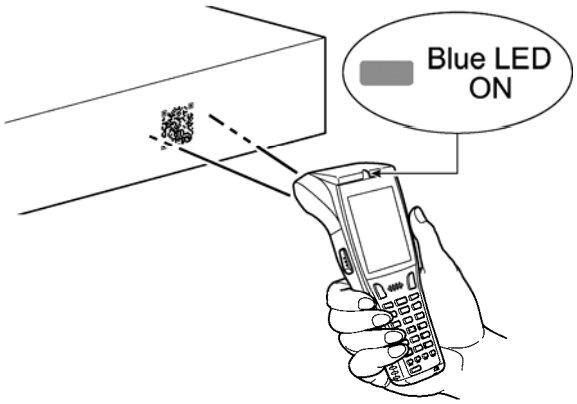
– **Point** – The trigger switch is assigned to magic keys **M3** and **M4** when shipped from the factory.



3. Hold the BHT close to the code to align the guide marker.

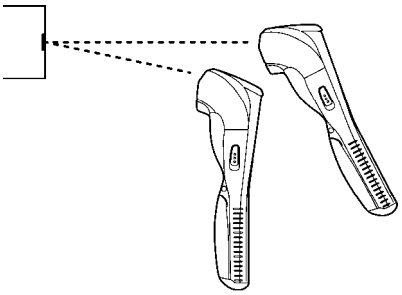
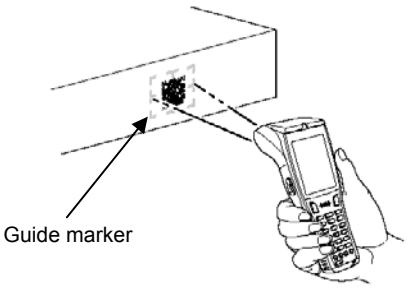
When the BHT has read the code successfully, the indicator LED will illuminate in blue.

– **Point** – The code reading method may differ depending on the application. Select the most appropriate in accordance with the instructions provided in the application User's Manual.



– **Note** –
- If required, clean dirty labels before reading.
- It may not be possible to perform reading in direct sunlight.
- If the code is on a curved surface, flatten the label surface and read it again.
- If the code reading window is pulled away from the code, the readable code range will become narrower than that of the light emission.

When unable to successfully read codes…

Cause		Countermeasure
Specular reflection	When the light is focused on the printed surface of the code from directly above, the BHT may not read the code due to specular reflection.	Change the BHT reading angle and try again. 
Distance from code	The code may not be read if it is too close to or too far from the BHT reading window.	Move the BHT slowly toward of away from the code and try again. Use the display range of the guide marker as a guide. The valid reading range is approx. 60x38 mm if the reading distance is 90 mm. 
Code surface curvature	The code may not be read if surface is extremely curved.	Flatten the label surface and read it again.
Code surface dirt	The code may not be read if its surface is dirty.	Wipe the dirt from the code and try again.
Code reading window dirt	The code may not be read if the code 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	Code reading may be adversely affected by direct sunlight or the brightness of the surrounding light.	Read the code 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 volume, vibrator, LCD display brightness and power save settings can be changed at the MENU screen.

Item	Details	Setting
VOLUME	Used to set the volume of the speaker that notifies the user when barcode scanning 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 scanning is complete.	ON, OFF
BRIGHTNESS	Used to set the backlight brightness of the LCD display. The brightness can be adjusted in 5 levels.	Levels 1 to 5
BRIGHTNESS(PS)	Used to set the backlight brightness of the LCD display during power save mode. The brightness can be adjusted in 6 levels.	Levels 0 to 5
POWER SAVE	Used to set the time until the LCD display backlight is dimmed when not in use in order to save power.	1-second units (max. 30 seconds)
ILLUMINATION CONTROL	Used to set the pattern of illumination control in reading the code. BLINKING : The illumination blinks. NO BLINKING : The illumination keeps lighting. LOW POWER : The illumination is dimmed and blinks. This may cause unreadable of code and lengthening of reading.	BLINKING NO BLINKING LOW POWER

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.

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

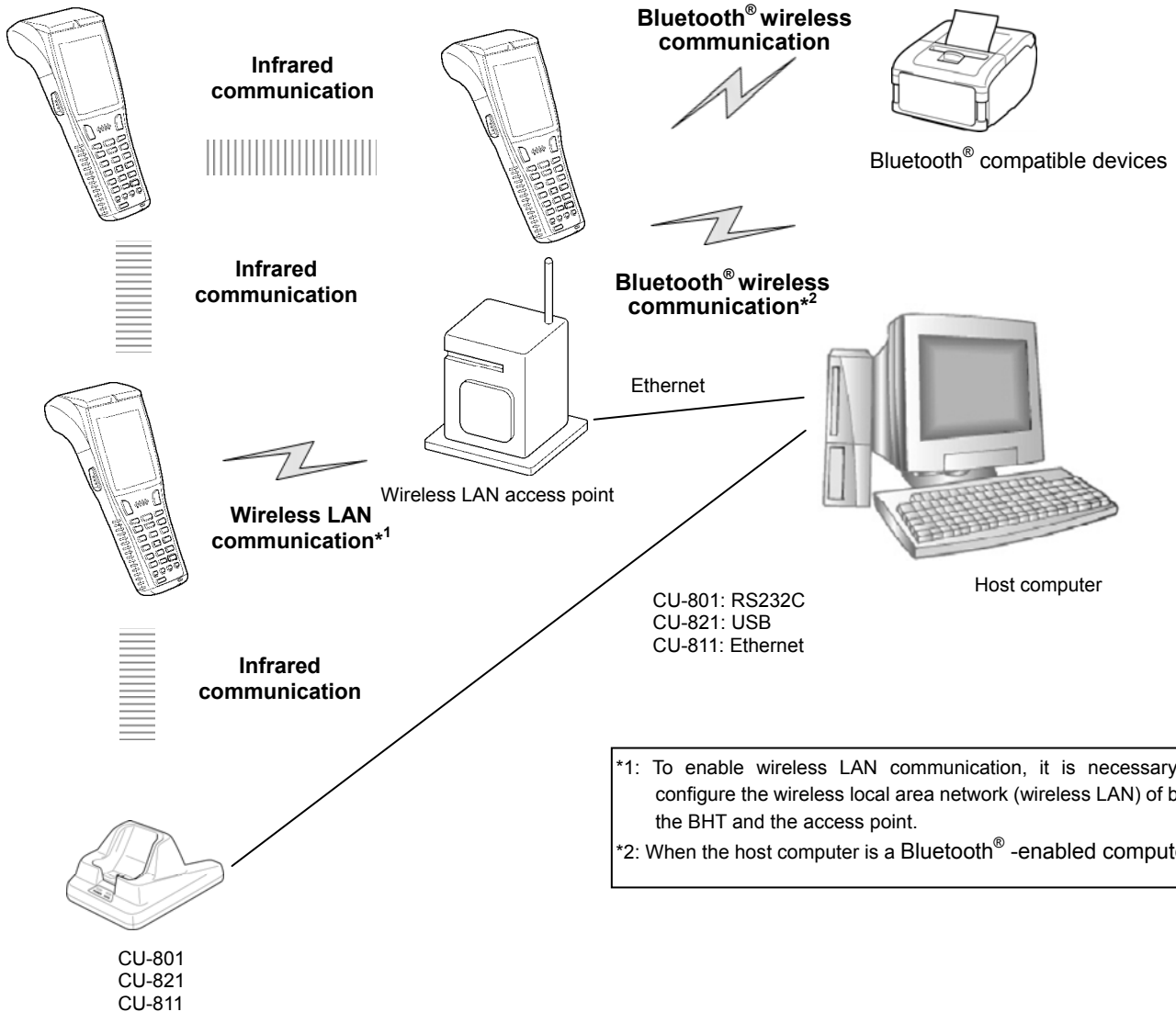
4. Press any of the following keys to exit the settings screen.
   - M1 key long press
   - Backspace/clear key
   - Enter key

The settings screen is exited.

3.5 Transmitting Data

Data gathered by the BHT can be transmitted to the host computer by infrared communication, wireless communication and Bluetooth® wireless 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.



*1: To enable wireless LAN communication, it is necessary to configure the wireless local area network (wireless LAN) of both the BHT and the access point.
*2: When the host computer is a Bluetooth® -enabled computer

3.5.1 Infrared Communication

◆ When performing data communication between BHT units

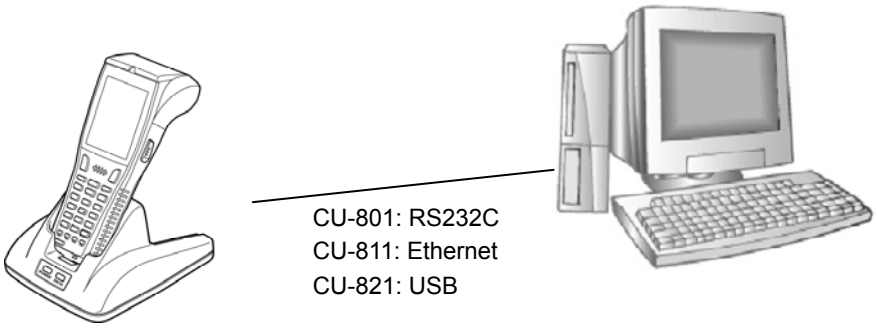
Point the BHT infrared communication ports toward each other and perform communication.

Requests

- Ensure that the light path between the BHT and any target stations is not obstructed.
- Perform communication within the effective infrared emission range (15 cm).
- Do not operate remote control units for televisions and so forth in the vicinity of infrared communication. This may result in comunication 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 comunication failure.

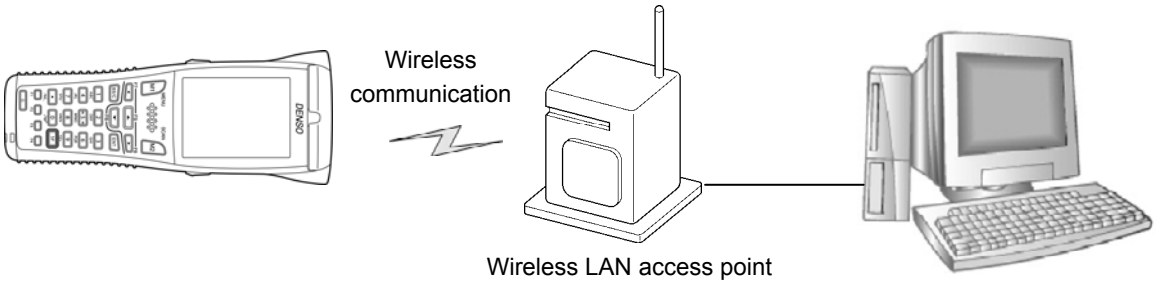
◆ When performing data communication with the host computer

Place the BHT on the communication unit (CU-801, CU-811 or CU-821) and transmit data.
The BHT-BASIC 4.0 Development Pack (Option) and BHT-BASIC 4.0 Transfer Utility (Option) software is required.



3.5.2 Wireless Communication

Transmit data to host computer via the wireless LAN access point.
To perform wireless communication, it is necessary to configure the wireless local area network (wireless LAN) at the BHT and access point.
The BHT-BASIC 4.0 Development Pack (Option) and BHT-BASIC 4.0 Transfer Utility (Option) software is required.

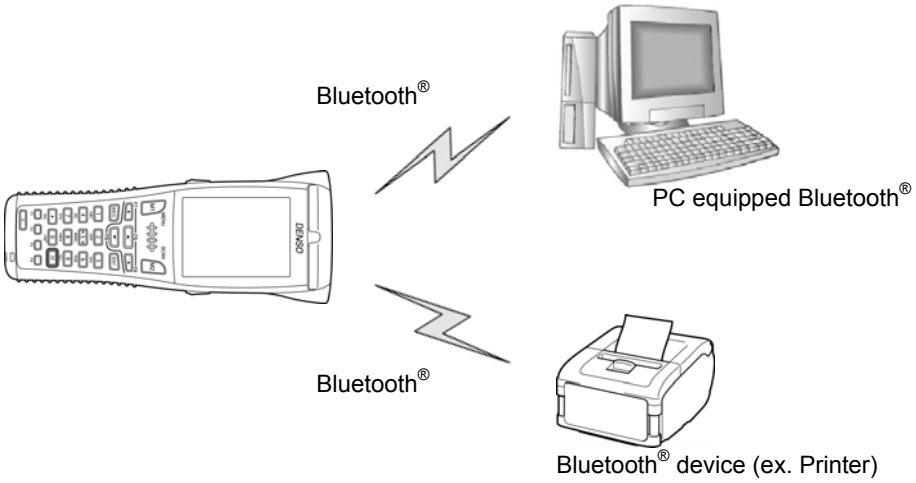


Requests

- Point the antenna on top of the BHT toward the access point to improve communication performance.
- Communication may not be possible at the following locations.
  1. In the vicinity of devices operating on the same 2.4 GHz waveband as the BHT such as microwave ovens, industrial heating equipment, or high-frequency medical equipment.
  2. In the vicinity of computers or household appliances such as refridgerators that emit electromagnetic noise.
  3. In the vicinity of metallic objects, in places with high levels of metallic dust, in rooms surrounded by metal walls (metallic influence), or places where the BHT may be subject to strong impact.

3.5.3 Bluetooth® Communication

This interface permits wireless communications with other Bluetooth® devices.



Requests

- Point the antenna on top of the BHT toward the access point to improve communication performance.
- Communication may not be possible at the following locations.
  1. In the vicinity of devices operating on the same 2.4 GHz waveband as the BHT such as microwave ovens, industrial heating equipment, or high-frequency medical equipment.
  2. In the vicinity of computers or household appliances such as refridgerators that emit electromagnetic noise.
  3. In the vicinity of metallic objects, in places with high levels of metallic dust, in rooms surrounded by metal walls (metallic influence), or places where the BHT may be subject to strong impact.

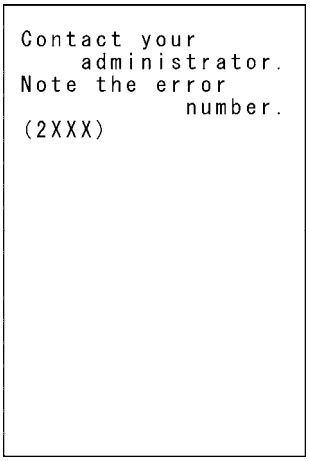
Chapter 4
System Operation

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 “4.5.4 Uploading Files (UPLOAD Menu)” for details of uploading.

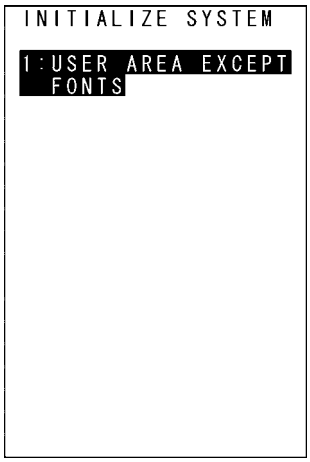
The initialization procedure is described on the following pages.
Perform operation in accordance with the procedure for each item.

ν Selecting the Memory Area to be Initialized
↓
ν Selecting the Message Version (English or Japanese)
↓
ν Confirming the Memory Area to be Selected for Initialization
↓
ν 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.

The screen on the right displays.



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 "4.1.3 Confirming the Memory Area Selected for Initialization".

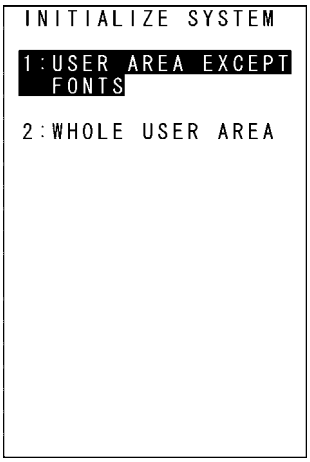
(2) To delete font files:

Press the **2** key while holding down the **SF** key.

The screen on the right displays.

Next, press the **2** key, select "2:WHOLE USER AREA", and press the **ENT** key.

The screen changes to the "4.1.2 Selecting the Message Version (English or Japanese)".



"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 the administrator. (2XXX)" message displays when the BHT power is ON, select "2: WHOLE USER AREA".

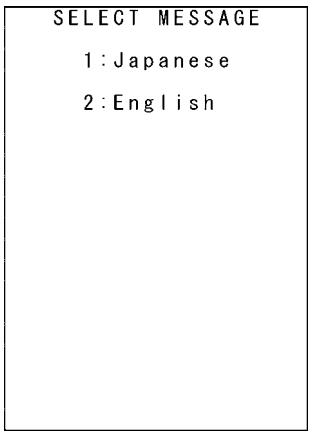
4.1.2 Selecting the Message Version (English or Japanese)

1. When the screen on the right displays, select the message display language with the numerical keys.

"1: Japanese" Changes the message language to Japanese.
"2: English" Changes the message language to English.

2. Press the **ENT** key.

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



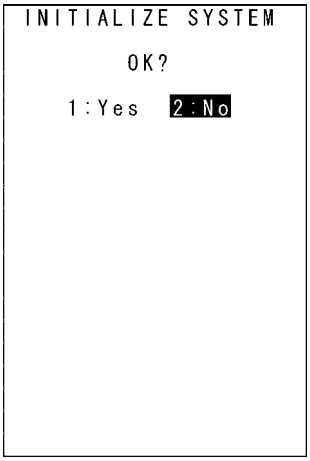
4.1.3 Confirming the Memory Area Selected for Initialization

(1) To exempt font files from deletion:

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

Press the **BS/C** 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.

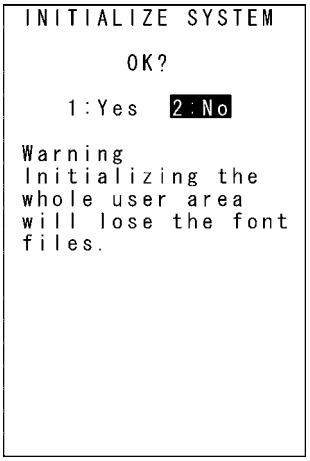


(2) To delete font files:

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

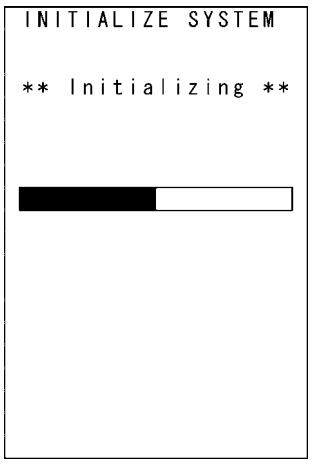
Press the **BS/C** key to return to the screen to select the area for initialization.

"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.

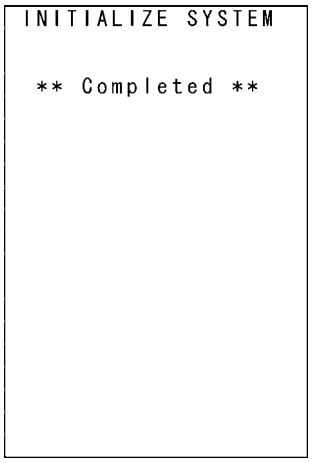


4.1.4 Performing System Initialization

1. The screen on the right displays 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 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.denso-wave.com/en/

◆ BHT System Update

Refer to section “4.5.16 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 battery sufficiently charged, or with the BHT placed in the CU-800 Series. If the BHT power turns OFF due to a low battery and so on during the system update, the system update will continue when the power is next turned ON. Furthermore, 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-811 System Update

The CU-811 system update procedure is as follows.

CU-811 System Update File Download
↓
CU-811 System Update

◆ CU-811 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-811 system update file to the BHT.
Download the CU-811 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-811 system update file can be downloaded from the following Web site.
http://www.denso-wave.com/en/

◆ CU-811 System Update

Refer to section “4.5.16 Updating the System (MODIFY MENU)” and update the CU-811 system.
The CU-811 LED flashes during CU-811 system update.

- Important - Never remove the BHT from the CU-811 or turn the BHT power OFF during the system update process.
If the BHT is removed from the CU-811 or the BHT power turned OFF during system update, a system update error will occur, and the CU-811 will wait for the update to be retried.
In such a case, either perform the CU-811 system update again, or reboot the CU-811.

- Point - If the CU-811 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-811 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 System Environment Settings (SET SYSTEM Menu)” 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 is turned ON, control will switch to the directory management program, and the first of the programs (.PD4) registered in the BHT will be 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. (∗)

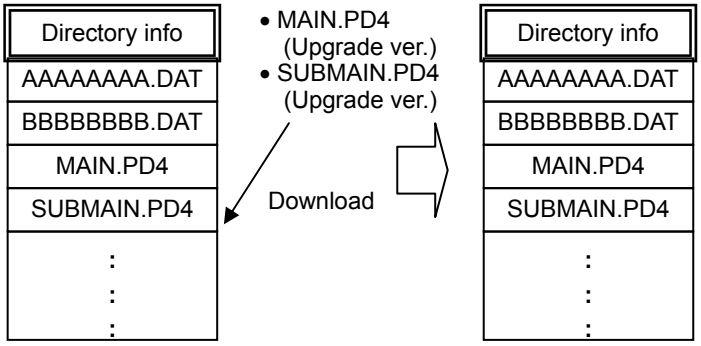
∗ The system directory management program also manages files with other extensions simultaneously. If the top file from the first registered program is deleted and a new program is downloaded, the new program will be registered in the position vacated by the deleted file and therefore caution is advised. 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

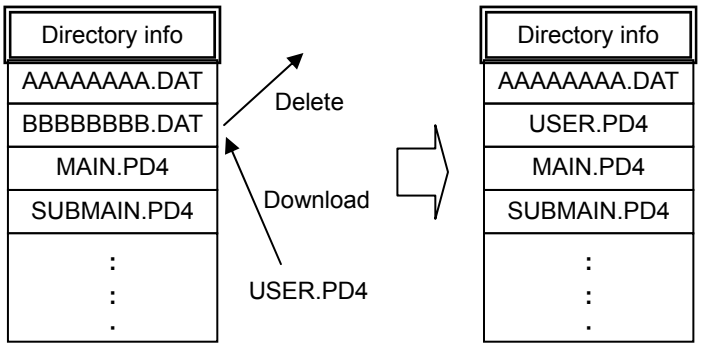
◆ (Example 1) When downloading the MAIN.PD4 and SUBMAIN.PD4 upgrade version

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

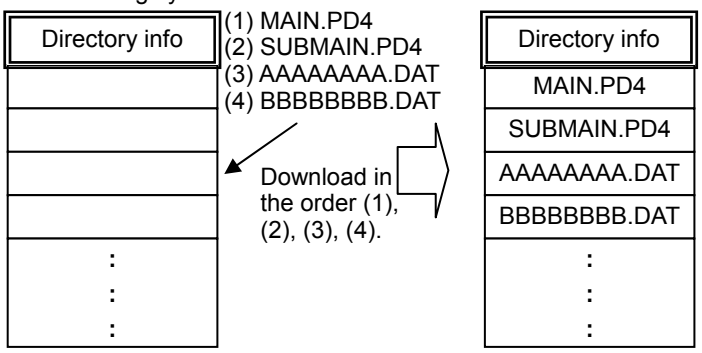
In the above case, USER.PD4 is registered after BBBBBBBB.DAT, and therefore USER.PD4 will be the first registered program. Press the **Power** key (⏻) to start up USER.PD4.



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

4.4 System Mode

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

- Setup initialization
- Executing user programs
- File download/upload
- System environment setting
- BHT operation test
- System information display
- Downloading/uploading files by FTP
- File deletion
- Font file deletion
- System settings parameter file download/upload
- Remote wake-up setting
- 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

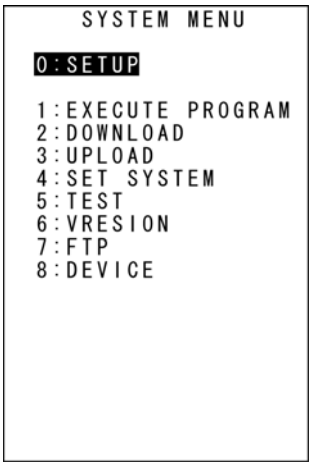
Use the following procedure to start up System Mode.

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 numerical 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 numerical 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 System Mode is started up.

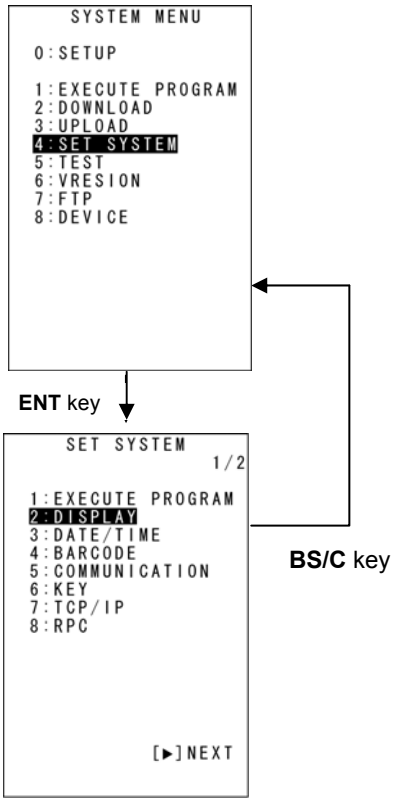
2. Press the **ENT** key.

The selected item is set and the next screen displays.
Press the **BS/C** 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.

◆ **Operation example**

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



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

Setting Value Selection

Use the following procedure to select setting values.

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

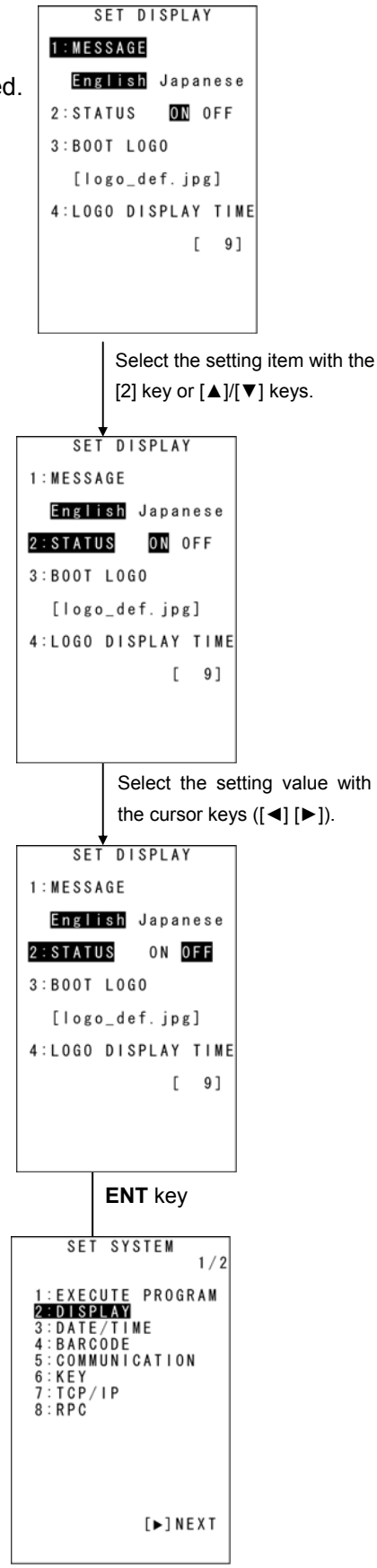
The selected item will be highlighted.

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

3. Press the **ENT** key.

The selected setting value will be set.

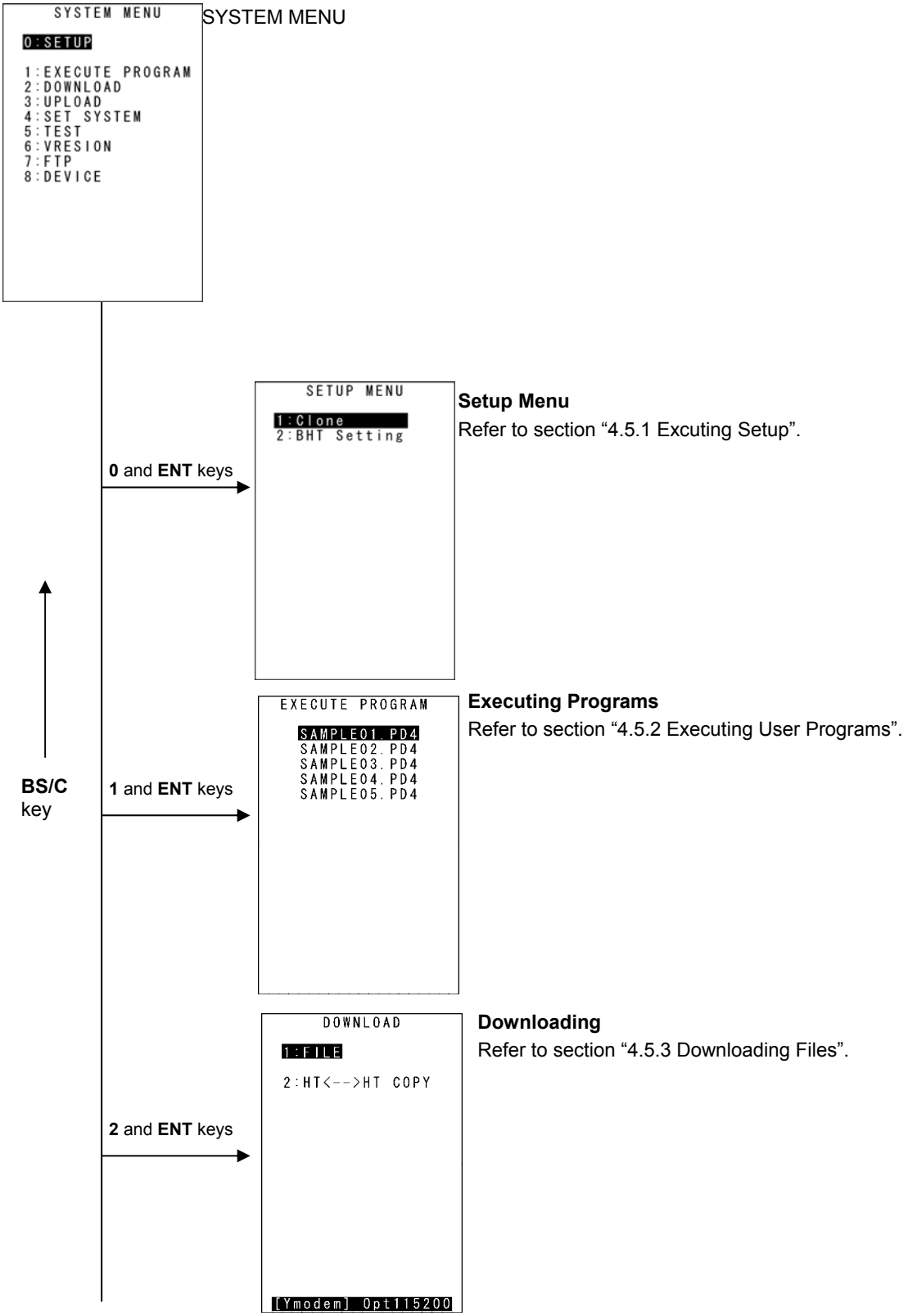
◆ **Operation example**

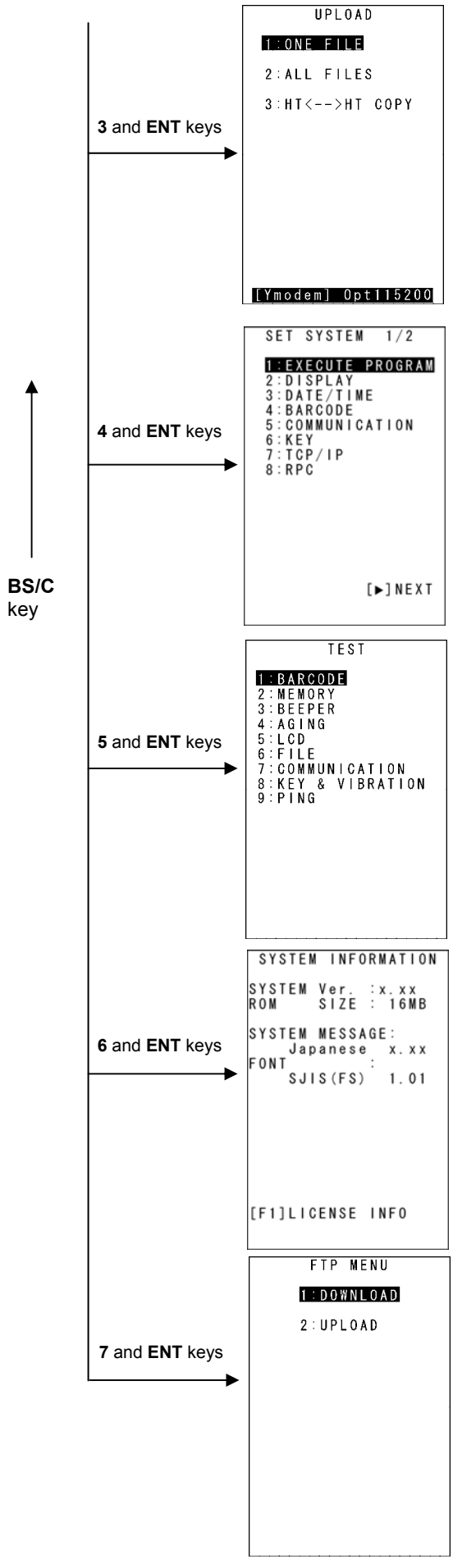


4.4.3 SYSTEM MENU Configuration

Menu Configuration for Items Displayed at the SYSTEM MENU Screen

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





Uploading

Refer to section “4.5.4 Uploading Files”.

System Environment Setting

Refer to section “4.5.6 System Environment Setting”.

Testing

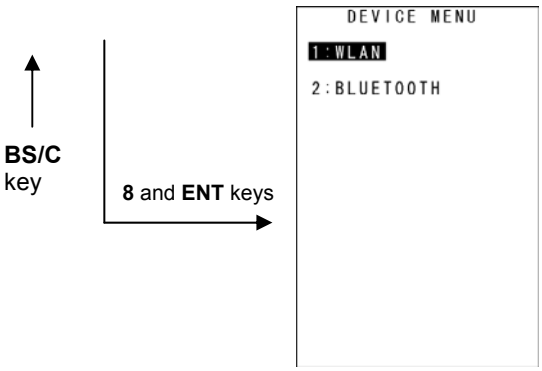
Refer to section “4.5.7 BHT Operation Test”.

System Information Display

Refer to section “4.5.8 System Information”.

Downloading/Uploading by FTP

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



DEVICE MENU

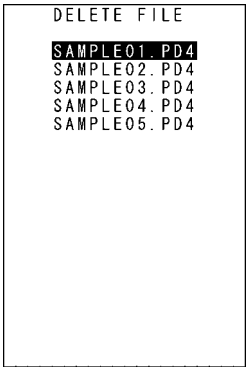
Refer to section “4.5.10 Wireless Communication Settings”.

Menu Configuration for Items Not Displayed at the SYSTEM MENU Screen

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

SYSTEM MENU

0 with **SF** held down

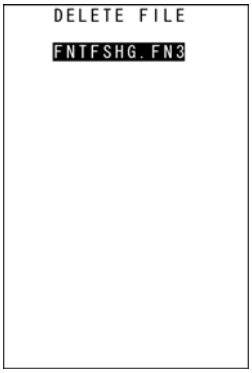


Deleting Program/Data Files

Refer to section “4.5.11 Deleting Program/Data Files”.

BS/C key

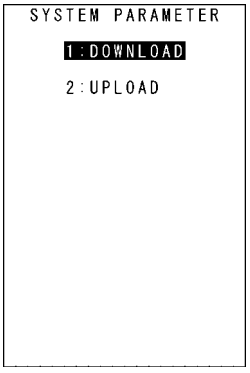
2 with **SF** held down



Deleting Font Files

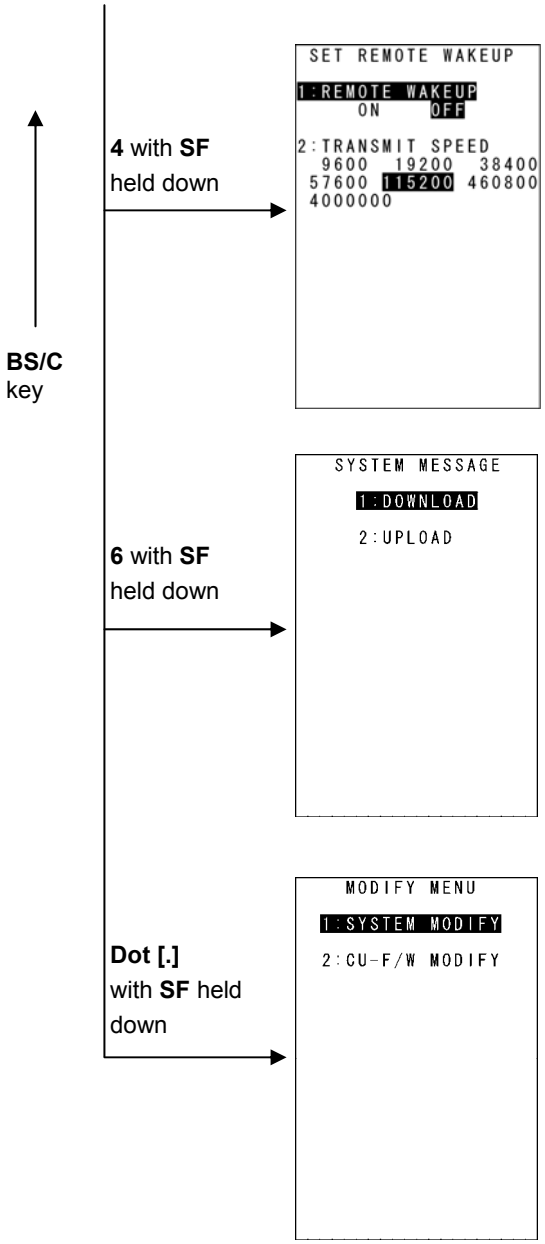
Refer to section “4.5.12 Deleting Font Files”.

3 with **SF** held down



Downloading/Uploading the BHT System Parameter File

Refer to section “4.5.13 Downloading/Uploading the BHT System Parameter File”.



Setting Remote Wake-up

Refer to section “4.5.14 Setting the Remote Wake-up”.

Downloading/Uploading the System Message File

Refer to section “4.5.15 Downloading/Uploading the System Message File”.

Updating the System

Refer to section “4.5.16 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.
The following explains setup using two BHTs with the clone function. Use the procedure below for BHT setup.

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

The screen on the right displays.
“1: CLONE”:
Select to use two BHTs to create a BHT clone (s).
The clone function resembles the conventional HT-HT copy function, but differs according to the points in the table below.
“2:BHT Setting”:
For details, refer to the “BHT Setting User’s Manual.”

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 from the transmitting device.)	Available	Available
	Clone (Files in both the receiving and transmitting devices are identical.) [Default]	Available	Not Available
OS Setting Values Copy	General system setting values (excluding the items below.)	Available	Available
	Password settings for wireless/FTP, etc.	Available	Not Available
	IP characteristic value (only when “0.0.0.0") copy	Available	Not Available
Display	Progressive 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 designations, etc.)	Designations Available	No Designations Available
	Copy mode (overwrite/clone)	Available	Not Available
	Authentication key (*1)	Available	Not Available
Operational Environment	Communication settings	Fixed (IrDA: 460800)	Optional

(*1): The authentication key is protected due to password cloning for wireless/FTP, etc.

Press the **BS/C** 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.

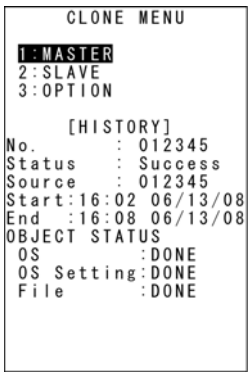
“OPTION” menu content is as per the table below.

Item	Setting Content	Default	Remarks
1: CLONE NO.	1 to 6-digit numeric values	“0”	Differentiates whether or not the beginning of the number is padded with a “0” so that the not only sequential numbers, but date settings can be performed as well. Ex.: The function differentiates between ”1” and ”000001”.
2: SOFTWAVE TO CLONE	OS	YES	There are also OS settings and additional files, but the aforementioned items are always cloned.
3: AUTH KEY	Used 0 to 16 one-byte alphanumeric characters (Entry possible in ALP mode.)	Not used	
	Not used		
4: SLAVE ACTION	Clone menu	Clone menu	BHT reboot: Restarts the BHT, then starts the applications.
	BHT reboot		
5: FILE COPY MODE	Clone mode Makes the slave-side file structure identical to the master-side structure.	Clone mode	
	HT-HT copy mode Leaves a copy of the slave-side files.		

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

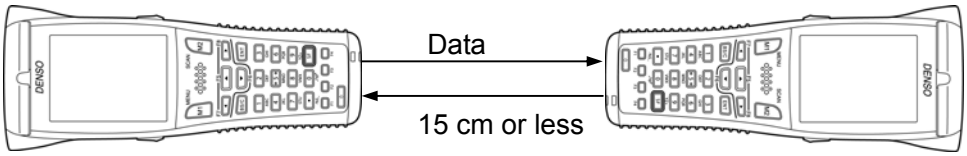
5. Select “2: SLAVE” from the slave-side CLONE MENU.

Master Side



Slave Side

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



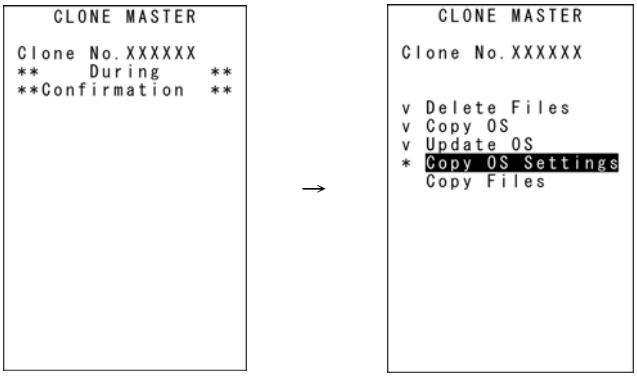
Master Side

Slave Side
(Test Use)

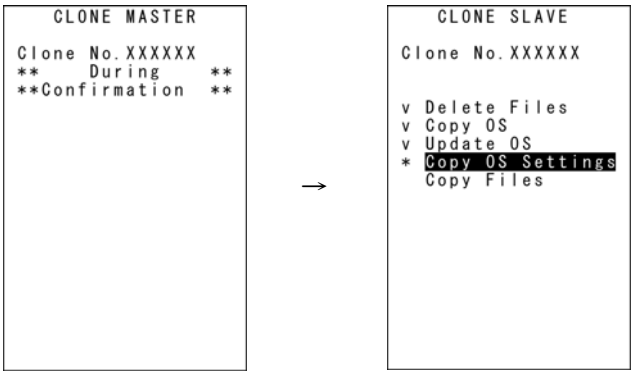
The data transmission progress status is shown as per the screens below.

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

Master Side



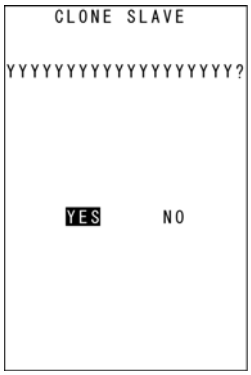
Slave Side



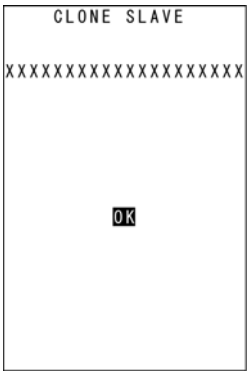
When communication is complete, the screen will return to the CLONE MENU (the previous screen.)

In the event of a communication error, “Screen 2” below will appear.

Screen 1: Error occurrence



Screen 2: Error/correctly completed



List of possible errors when cloning

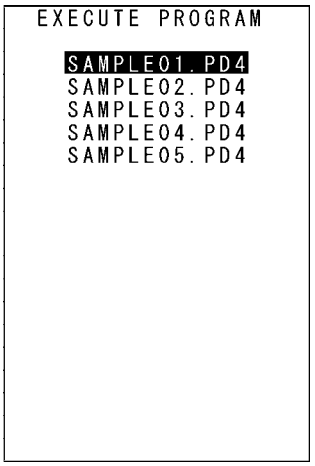
Processing Phase	Outline	Displayed Message	Operations Following Error
Directly After Clone Start	BHT models are different.	Different model on master side (slave side). Continue?	When screen 1 appears, select Yes/No. Y: Continue processing (the OS and OS settings will not be copied.) N: Suspend processing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

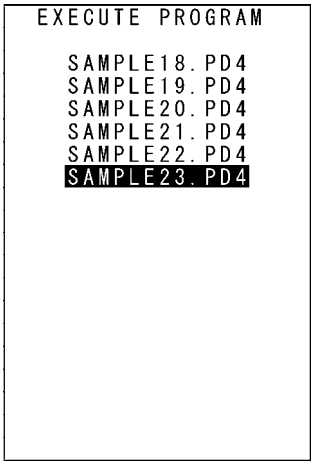
The screen on the right displays.
Press the **BS/C** key to return to the SYSTEM MENU.



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 18 programs have been downloaded to the user area.

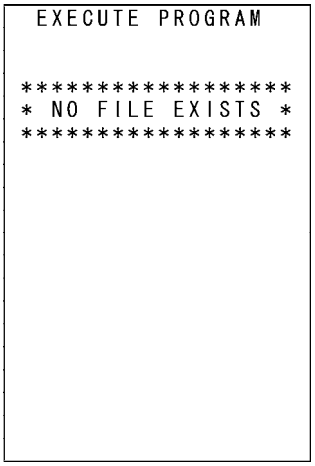
The screen on the right shows an example in which 23 programs have been downloaded.



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

The selected program will be executed.

The screen on the right displays when no program files exist in the user area.
Press the **BS/C** 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 -

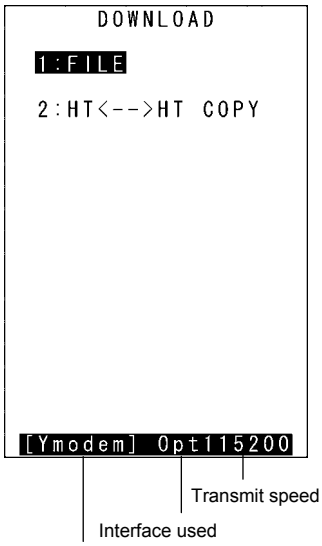
- If a file with the same name as one already used in the user area of the target memory in the BHT is downloaded, the newly downloaded file replaces the old one.
- If an auto-start execution program has not been specified (See 4.5.6 [1] Setting the auto-start Execution Program), the directory management 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.

Use the following procedure to download files.

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

The screen on the right displays.



"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 **BS/C** key to return to the SYSTEM MENU.

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

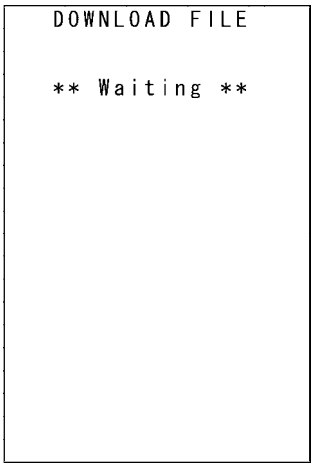
Communication protocol type	Ymodem BHT-Ir BHTp	Ymodem protocol BHT-Ir protocol BHT protocol
Interface used	Opt	Infrared interface
Transmit speed	9600 to 460800	Transmission speed corresponding to each protocol

Refer to "4.5.6 [5] Setting the communication environment" for details of communication environment settings.

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

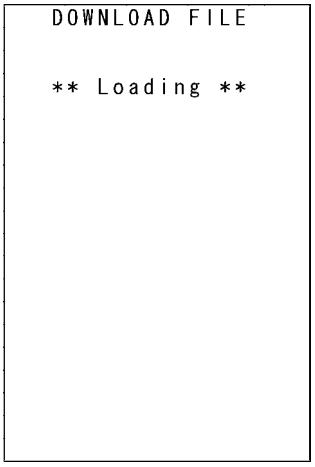
The screen on the right displays indicating that the BHT is waiting for the file to be downloaded.

The screen on the right displays 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.



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

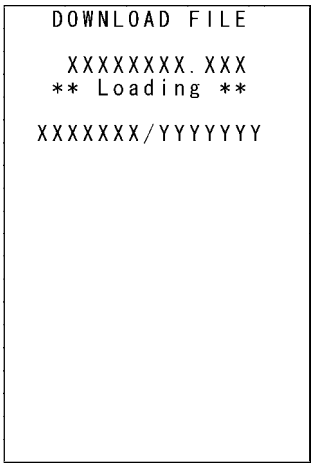
(Refer to the “BHT-BASIC 4.0 Transfer Utility User’s Guide.”)



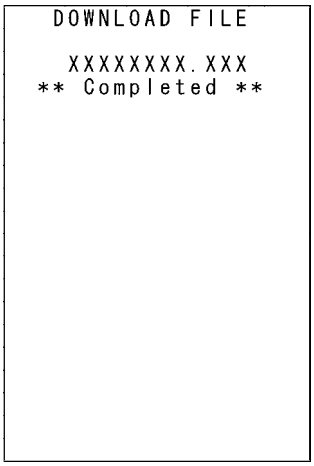
4. The screen on the right displays during downloading.

The screen on the right displays 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 **BS/C** key to abort the download process and return to the DOWNLOAD menu.



5. When downloading is complete, the speaker sounds once and the screen on the right displays.

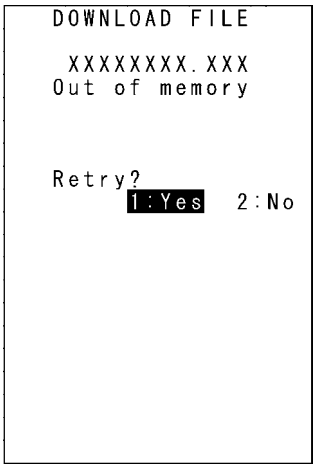


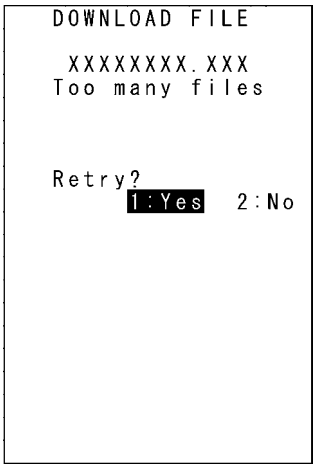
When the number of received records equals the total number of records, downloading is complete.
(When using the Ymodem protocol, the received file size equals the total file size.)

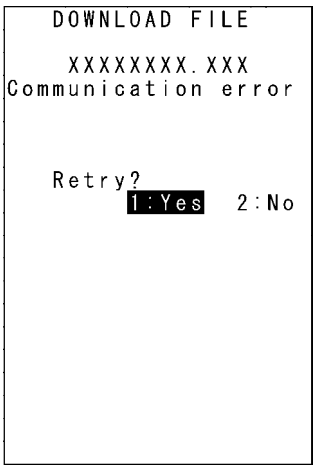
Press the **BS/C** key to return to the DOWNLOAD menu.
With this screen displayed on the BHT, downloading another new file from the host computer allows the BHT to begin receiving.
(Refer to the "BHT-BASIC 4.0 Transfer Utility User's Guide.")

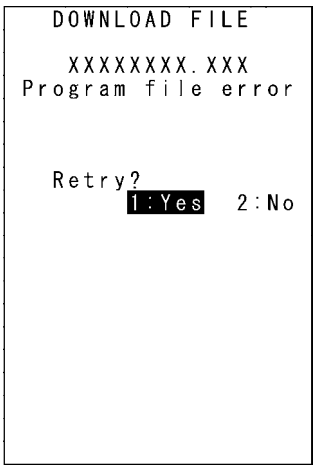
If "2: HT<-->HT COPY" is selected, repeat the above operation until all files are downloaded.

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.

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

The screen on the right displays.

“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 **BS/C** 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	Infrared interface
Transmit speed	9600 to 460800	Transmission speed corresponding to each protocol

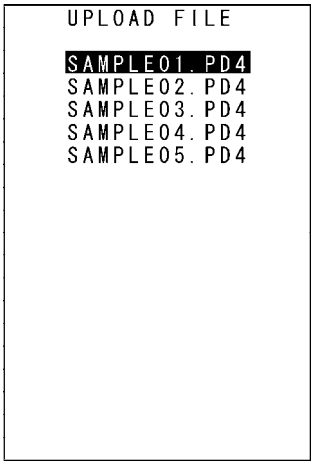
Refer to “4.5.6 System Environment Settings (SET SYSTEM Menu)” for details of communication environment settings.

- 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)

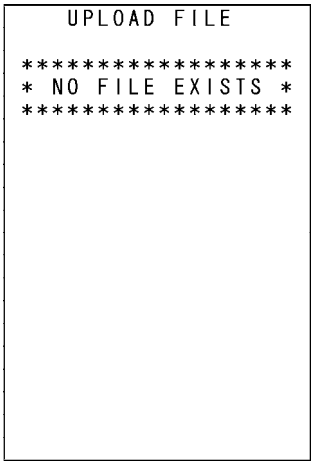
2. Select “1: FILE”, ”2: ALL FILES” or ”3: HT<-->HT COPY” and press the **ENT** key.

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

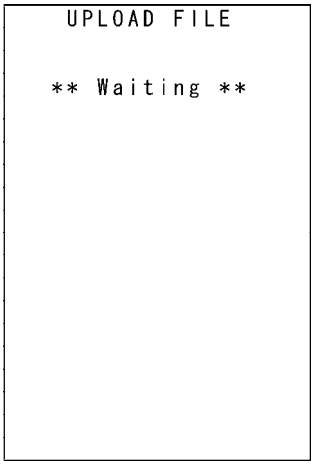


When “2: ALL FILES” or ”3:HT<-->HT COPY” is selected:
Proceed to step 3.

The screen on the right displays if no files that can be uploaded exist in the user area.
Press the **BS/C** key to return to the UPLOAD menu.



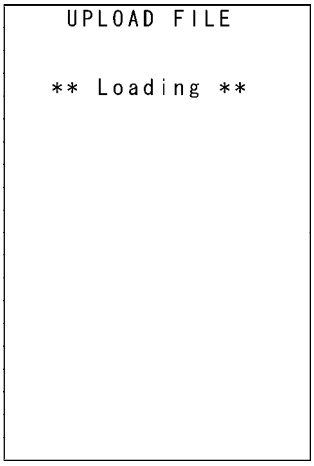
3. The screen on the right displays indicating that the BHT is waiting for the file to be uploaded.



The screen on the right displays 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 on the right displays and file uploading is commenced.

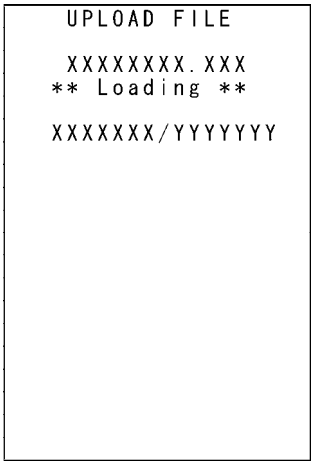
(Refer to the “BHT-BASIC4.0 Transfer Utility User’s Guide.”)



5. The screen on the right displays during uploading.

The screen on the right displays 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 **BS/C** key to abort the download process and return to the UPLOAD menu.

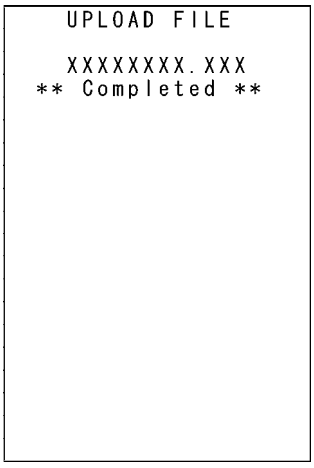


6. When uploading is complete, the speaker sounds once and the screen on the right displays.

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 **BS/C** 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 infrared communication (Optical) interface is used.
.

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] Setting the communication environment” when changing the interface.

3. Ensure that the BHT infrared communication ports are facing one another.

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 “4.5.13 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 “4.5.13 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.

- Note - The following setting data is copied when copying between BHT units.

LCD contrast level
Volume
Switching between speaker and vibrator
Program to be executed automatically when the BHT is turned ON
Message version (English or Japanese)
Backlight brightness of the LCD display
Backlight brightness of the LCD display during power save mode
Display font size
System status display
Date
Time
Setting of black-and-white inverted label reading function (enable/disable)
Decode level
Minimum number of digits to be read for ITF
Minimum number of digits to be read for STF
Minimum number of digits to be read for Codabar (NW-7)
Interface port to be used in user programs
Interface port to be used in System Mode
Communication parameters for the infrared interface
Communication protocol options for the infrared interface
Communication protocol type
Shift key function definition
M1 key function definition
M2 key function definition
M3 key function definition
M4 key function definition
Resume function
Remote wake-up setting (enable/disable)
Transmission speed for remote wake-up
Remote wake-up history
YMODEM option
IP address of FTP server
User name of FTP server
Password of FTP server
Default directory for FTP server

FTP option, Line delimiters (CR/LF)
FTP option, Handling of line delimiters
FTP option, Handling of trailing spaces in data fields
FTP option, Upload mode
FTP option, Verbose mode

IP address of host computer for ping-test
Data size of echo request
Echo request intervals
Timeout period for echo request
No. of echo requests to be sent

Echo request send timing
TCP/IP operation device
TCP/IP link layer
Transmission speed between BHT and CU
No. of retries for link establishment command to be sent

Link establishment command intervals
No. of retries for link release command to be sent
Link release command intervals
Link release period
Service Set ID (SSID) (Not possible to copy correctly if there is a space at the end.)

Power save mode for wireless module
Authentication system
WEP (Wired Equivalent Privacy) (enable/disable)
Maximum DHCP IP address acquisition wait time
Wireless method

Wireless security mode
Wireless security EAP authentication method
Wireless security encryption method
Wireless security root certificate filename
Wireless security EAP start time

Wireless security retry interval for non-response
Wireless security retry interval for authentication failure
Wireless security retry interval for authentication start failure
Wireless security retry count for authentication start failure
PPP authentication name
PPP authentication password
PPP authentication method

Bluetooth device name
Remote device address for the connection target
Device detection time
Number of detcted device
Bluetooth® passkey for the master station

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 on the right displays.

SYSTEM MENU 1/2

“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 or Japanese).

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

“4: QRCODE”:
Sets the code scanning conditions (black/white inverted label scanning function, front/back inverted label scanning function, decode label, added option data for the 2D codes), minimum number of scan digits for scan codes (ITF, STF, Codabar), marker illumination, light and senser off time, and “The function to assign scan settings with the system settings”

“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 TCP/IP, FTP, and DHCP settings menu.

“8: RPC”:
Sets the communication method with the BHT Manager.

SYSTEM MENU 2/2

“1: RESUME”:
Sets the resume function.

“2: DRIVE TOOL”:
Performs the drive related operation.

“3: OPERATION LOG”:
Sets whether or not to create a log from data collected by the BHT Manager.

Refer to the following section for details of the above items.

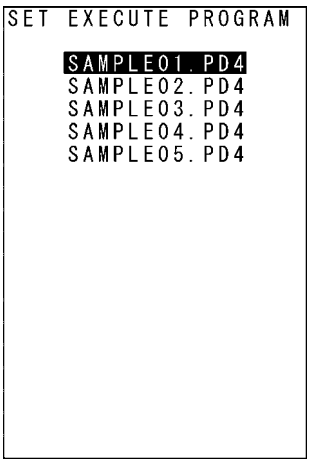
Press the **BS/C** key to return to the SYSTEM MENU.

[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 on the right displays.
The highlighted program will be the program currently set as the auto-start execution program.



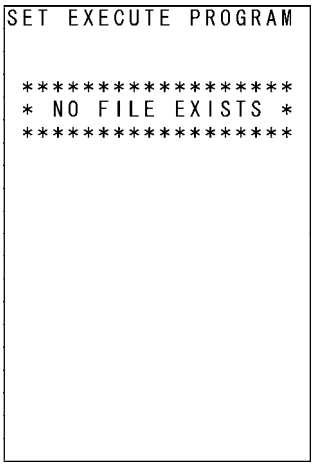
2. Use the cursor keys ([▲] [▼]) to highlight the target program.

3. Press the **ENT** key.

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

Press the **BS/C** key to return to the SET SYSTEM menu.

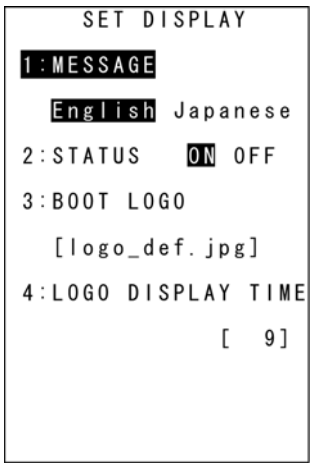
The screen on the right displays if no programs have been downloaded.



Press the **BS/C** 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 numerical keys ([1] [2] [3] [4]) to highlight ”1: MESSAGE”, ”2: STATUS”, “3: BOOT LOGO”, or “LOGO DISPLAY TIME”.

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

Press the **BS/C** key to return to the SET SYSTEM menu.

“1: MESSAGE”:

Sets whether messages displayed at the screen are displayed in English or Japanese.

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

The English and Japanese display changes at the following messages.

- System error messages
- Indications relating to the LCD contrast
- Speaker volume
- Switching between speaker and vibrator
- Battery voltage level screens

“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.

“3: BOOT LOGO”:

Selects the logo displayed at startup.

The JPG file for the logo is downloaded, and then this menu is used to display the selected JPG file upon startup.

“4: LOGO DISPLAY TIME”:

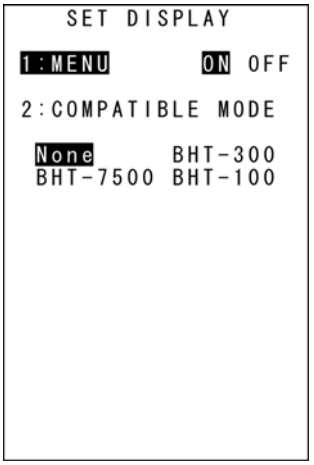
Sets the minimum time the selected logo is displayed.

- The time can be set between 9 and 100 (x 100 ms).
- When a number between 0 and 9 (x 100 ms) is set, the value is treated as a “9”.
- The display time varies according to the logo file size.

- 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 on the right displays.
The highlighted settings will be the current settings.



4. Use the cursor keys ([▲] [▼]) or numerical 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 **BS/C** key to return to the SET SYSTEM menu.

"1: MENU":

Sets whether to permit or prohibit the menu screen (speaker volume, vibrator, screen brightness, power saving and lighting control setting) starting up while application program is running.

- "ON": Permits menu screen display.
- "OFF": Prohibits menu screen display.

"2: COMPATIBLE MODE":

Sets compatible mode for screen display with the BHT-100, BHT-300, or BHT-7500.
This allows BHT-100 Series, BHT-300 Series, or BHT-7500 Series application programs to run at the BHT-825QW without changing or correcting the font size.

				BHT-300	BHT-7500	BHT-100
Font Size	Standard font	Screen mode	ANK mode	22 x 9 char. (6 x 8 dots)	26 x 20 char. (6 x 8 dots)	16 x 25 char. (12 x 12 dots)
	Small font			22 x 12 char. (6 x 6 dots)	26 x 26 char. (6 x 6 dots)	16 x 25 char. (12 x 12 dots)
	Standard font		Kanji mode	8 x 4 char. (16 x 16 dots)	10 x 10 char. (16 x 16 dots)	12 x 19 char. (16 x 16 dots)
	Small font			11 x 6 char. (12 x 12 dots)	13 x 13 char. (12 x 12 dots)	16 x 25 char. (12 x 12 dots)
			Reduced Kanji	11 x 4 char. (12 x 16 dots)	（Not supported）	(Not supported)

				BHT-825Q series			
				BHT-300 Mode	BHT-7500 Mode	BHT-100 Mode	Normal Mode
Font size	Standard font	Screen mode	ANK mode	22 x 16 char. (10 x 20 dots)	26 x 26 char. (9 x 12 dots)	20 x 26 char. (12 x 12 dots)	20 x 20 char. (12 x 16 dots)
	Small font			22 x 21 char. (10 x 15 dots)	26 x 26 char. (9 x 12 dots)	20 x 26 char. (12 x 12 dots)	20 x 20 char. (12 x 16 dots)
	Standard font		Kanji mode	8 x 8 char. (28 x 40 dots)	10 x 13 char. (24 x 24 dots)	15 x 20 char. (16 x 16 dots)	8 x 10 char. (30 x 30 dots)
	Small font			11 x 10 char. (20 x 30 dots)	13 x 17 char. (18 x 18 dots)	20 x 26 char. (12 x 12 dots)	10 x 13 char. (24 x 24 dots)
			Reduced Kanji	11 x 8 char. (20 x 40 dots)	（Not supported）	（Not supported）	（Not supported）

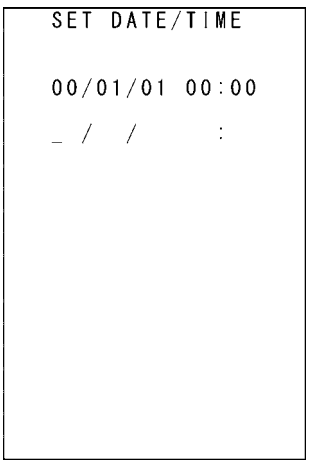
◆ System Status Indication

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.)
Communication link with the CU-811		Displays when a communication link is established with the CU-811. Flashes when the BHT tries to communicate with a CU-811 that has not been linked with the BHT.
		Displays cyclically when the BHT receives no response from the CU-811, or when it is waiting for the link to be established with or severed from the CU-811.
Radio link with access point		If synchronization with the access point is established during wireless communication, the overall quality of communication with the access point is displayed incrementally. These respective icons indicate how good the communication environment is.
		Displays when synchronization with the access point has not been established, or when authentication fails.
Bluetooth device status		Appears when the Bluetooth device power in on.
		Appears when the Bluetooth wireless link is established.
		Appears when the Bluetooth is in the power-saving mode.

[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 code scanning parameters

Use the following procedure to set the code scanning conditions.

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

The SET QRCODE screen on the right displays.
The highlighted display and displayed values will be the current settings.

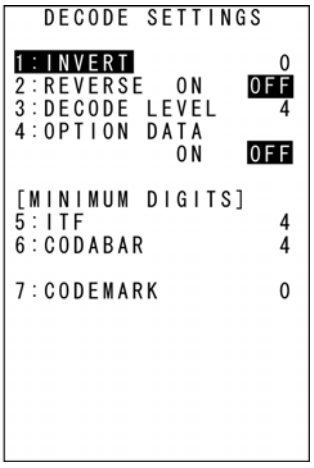
1: DECODE SETTINGS:
The DECODE SETTINGS screen displays
2: DEVICE SETTINGS:
The DEVICE SETTINGS screen displays
3: OPEN BAR SETTINGS:
The FUNCTION TO ASSIGN SCAN SETTINGS WITH THE SYSTEM SETTINGS VALUE screen displays

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

Press the **BS/C** key to return to the SET SYSTEM menu.

◆ **“1: DECODE SETTINGS”: Code reading conditions and minimum number of digits for the code to be read**

1. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4] [5] [6] [7]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]) and press the **ENT** key.



Press the **BS/C** key to return to the SET QRCODE menu.

◆ “1: INVERT”: Black/white inverted label reading function

Inverted 2D codes and barcodes can be read.

“0”:	Disables black/white inverted label reading.
“1”:	Enables black/white inverted label reading.
“2”:	Enables black/white inverted label auto-detect reading.

- Point - Auto-detect reading may take longer than ordinary reading of black/white inverted labels or non-inverted labels.

◆ “2: REVERSE”: Inverted 2D code reading function

Setting inverted 2D code reading to ON enables 2D code reading from the reverse side.
Reading times for 2D codes may be longer in such cases.

◆ "3: DECODE LEVEL"

Set the decode level (code reading tolerance level).
Press [◀] to decrease the setting value and [▶] to increase the setting value.

Decode level entry range: 1 - 9 (default: 4)

Setting a lower value improves the reading rate but increases the risk of incorrectly reading poor quality codes (split or dirty codes). Conversely, setting a higher value reduces the reading rate but decreases the risk of such errors.

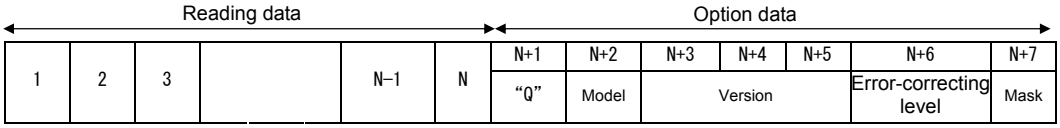
◆ "4: OPTION DATA"

If set to ON when 2D codes are read, option data for the 2D codes such as the model and the error-correcting level are added to the end of the reading data.

- Point - These settings are enabled even when system mode scanning tests are not being carried out. Do not change these settings unless necessary.

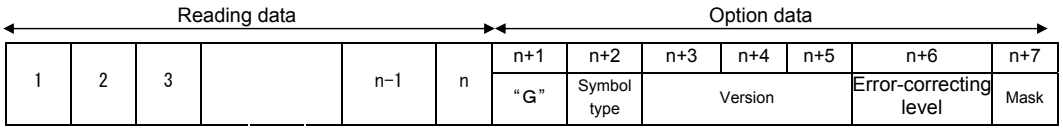
■Option data formats

・QR code



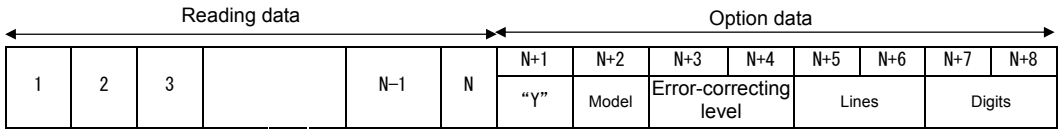
(Ex.) When scanned code is "QR code, Model 2, Version 5, Error-correcting level M, Mask number 6" (Reading data)... Q2v05M6

・iQR CODE



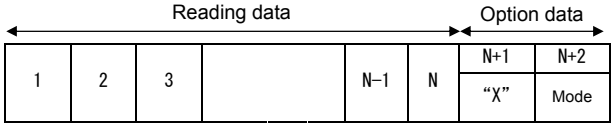
(Ex.) When scanned code is "iQR code, oblong figure, Version3, Error-correcting level M, Mask number 0" (Reading data)... G1R03M0

・PDF417



(Ex.) When scanned code is "PDF417 code, Error-correcting level 4, Lines: 12, Digits: 2" (Reading data)... Y1041202

・MaxiCode



(Ex.) When scanned code is "Maxi code, Mode 4" (Reading data)... X4

・Data Matrix

Reading data						Option data										
1	2	3		N–1	N	N+1	N+2	N+3	N+4	N+5	N+6	N+7	N+8	N+9	N+10	N+11
						"Z"	Model	Error-correcting level			Longitudinal cells			Lateral cells		

(Ex.) When scanned code is "data matrix, Error-correcting level ECC200, Longitudinal cells: 10, Lateral cells: 10"...z0200010010

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

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

Set minimum number of digits for the Code to be read.
Press [◀] to decrease the setting value and [▶] to increase the setting value.

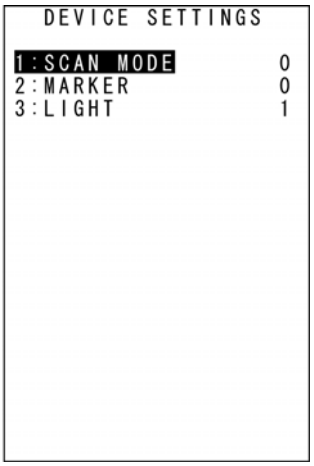
ITF entry range:	2 - 20	(default: 4)
Codabar entry range:	3 - 20	(default: 4)

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

◆ "7: CODEMARK": Setting the types of Code mark

Set the types of Code mark.
"0":CODE MARK Type1
CODE MARK system is defined by DENSO Corporation.
"1":CODE MARK Type2
CODE MARK system is compliant with "Guidelines on Symbology Identifiers" by AIM USA.

◆ "2: DEVICE SETTINGS": Device settings during reading



1. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]) and press the **ENT** key.

Press the **BS/C** key to return to the SET QRCODE menu.

"1: SCAN MODE"

Set the scan mode.

"0": Normal mode

Codes within the field of view can be read.

Refer to "Chapter 8 Specifications" regarding the size of the field of view.

"1": Point scan mode

Codes above the cross at the center of the marker can be read. Reading will be unsuccessful if there is no code above the cross or the marker cannot be detected due to external light. This kind of reading is only enabled if marker illumination is enabled.

"2: MARKER"

Set whether the guide marker illuminates or not when the trigger switch is pressed.

"0": Operated by trigger switch
"1": Locked ON (Illuminates)
"2": Locked OFF (Doesn't illuminate)

- Point - When the marker is locked on, more power is used and operating times are shorter compared to other modes. Do not change these settings unless necessary.

"3: LIGHT"

Set whether the INDICATOR LED light illuminates or not when the trigger switch is depressed.

"0": Illuminates
"1": Illuminates
"2": OFF

◆ **"3: OPEN BAR SEETTINGS": Setting "The FUNCTION TO ASSIGN SCAN SETTINGS WITH THE SYSTEM SETTINGS"**

1. Select "3:OPEN BAR SEETTINGS" at SET QRCODE and then press the **ENT** key.

OPEN BAR SETTING screen displays.

1: READ MODE: Read mode
The READ MODE screen displays
2: BUZZER/LED: Speaker/LED control
The SPEAKER/LED screen displays
3: READ CODE: Read code
The READ CODE screen displays

Refer to the following section for details of the above items.

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

3. Press the **BS/C** key to return to the SET QRCODE menu.

[1] Read mode

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

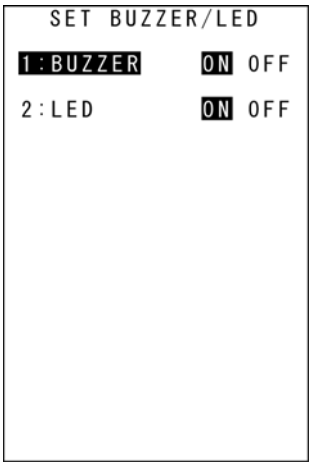
SET READ MODE screen displays.
The highlighted settings are the current settings.

"1：AUTO OFF"：Auto-off mode
If the trigger operation is not operated, it turnes off the illumination LED after the certain amount of time.
"2：MOMENTARY"：Momentary mode
Only while you hold down the trigger swich, the illumination LED lights.
"3：ALTERNATE"：Alternate mode
The illumination LED is turned ON/OFF repeatedly, every time trigger switch is pressed over.
"4：CONTINUOUS"：Continuous lighting mode
The illimination LED lights continiously.

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

3. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the OPEN BAR SETTING screen.

[2] BUZZER/LED control



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

Speaker/LED control settings screen displays.
The highlighted settings are the current settings.

"1：BUZZER"：
Enable to set Speaker/Vibrator beeping when a read of a code is successful.
"ON" ： Speaker/Vibrator beeps when a read of a code is successful.
"OFF"：Speaker/"Vibrator doesn't beep when a read of a code is successful.

"2：LED"：
Enable to set LED illuminations when a read of a code is successful.
"ON" ：LED lights in blue when a read of a code is successful.
"OFF"：LED doesn't light when a read of a code is successful.

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

3. Use the cursor keys ([◄] [►])to select settings value.

4. Press the **ENT** key or the **BS/C** key for the settings value to be valid and then return to the OPEN BAR SETTING screen.

[3] Read code

1. Select “3: READ CODE” at OPEN BAR SETTING and then press the ENT key.

SET READ CODE screen displays.

“1：BARCODE”：
The BARCODE screen displays.
“2：2D CODE”：
The 2D CODE screen displays.
“3：MULTI-LINE”：
The MULTI-LINE screen displays

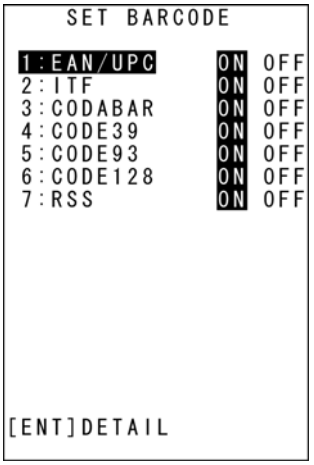
Refer to the following section for details of the above items.

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

3. Press the **BS/C** key to return to the OEPN BAR SETTING menu.

◆ “1:BARCODE”：Bar code

Select “1:BARCODE” and press **ENT** key at SET READ CODE menu to display the SET BARCODE screen, allowing code reading to be set to enable (ON) or disable (OFF). The highlighted settings are the current settings.



To change the settings, use the cursor keys （[▲][▼]）or numerical keys （[1][2][3][4][5][6][7]）to select the item to be set and select the setting value using the cursor keys （[◀][▶]）.

“1：EAN/UPC”：
Enable/disable EAN/UPC Code
“2：ITF”：
Enable/disable Interleaved 2 of 5
“3：CODABAR”：
Enable/disable Codabar（NW-7）
“4：CODE39”：
Enable/disable Code 39
“5：CODE93”：
Enable/disable Code 93
“6：CODE128”：
Enable/disable Code 128
“7：RSS”：
Enable/disable RSS（GS1 Databar）

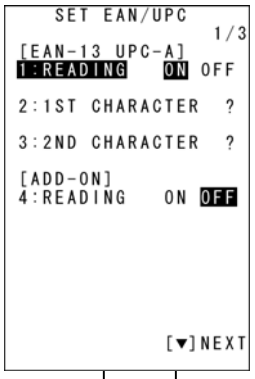
Press **ENT** key for the detailed settings of the bar code beign selected. Refer to the following section for the details.

Press the **BS/C** key for the settings value to be valid and then return to the SET READ CODE screen.

- Point - 「1：EAN/UPC」and 「7：RSS」have different types of code readings, which allows code readings to be set enable /disable at the detailed settings according to types of code readings . If enable, both this setting and the detailed settings need to be enabled.

“1:EAN/UPC”：Detailed settings for EAN/UPC

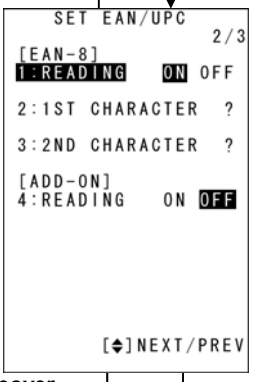
1. Select “1: EAN/UPC” at SET BARCODE menu and then press the **ENT** key.



SET EAN/UPC screen displays.

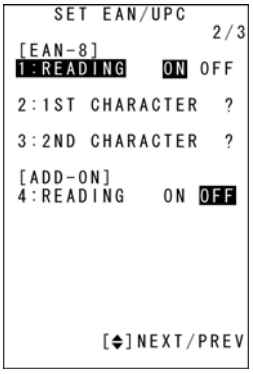
EAN/UPC 1／3
（EAN-13/UPC-A set）
“1：READING”：
Enable/Disable EAN-13/UPC-A
“2：1ST CHARACTER”：
“3：2ND CHARACTER”：
Allocate「?，0～9」to the first and second characters of EAN-13/UPC-A (country flags) .
If 「0～9」is allocated at the menu, limitation can be set to read only when allocated numeric characters matchs to the first and second numeric characters of EAN-13/UPC-A. It can read umlimitedly when「?」is allocated.
（Add-on set of EAN-13/UPC-A）
“4：READING”：
Enable/Disable EAN-13/UPC-A with Add-on.

Changeover with [▲▲][▼▼]key



EAN/UPC 2／3
（EAN-8 set）
“1：READING”：
Enable/Disable EAN-8
“2：1ST CHARACTER”：
“3：2ND CHARACTER”：
Allocate「?，0～9」to the first and second characters of EAN-8 (country flags).
If 「0～9」is allocated at the menu, limitation can be set to read only when allocated numeric characters matchs to the first and second numeric characters of EAN-8. It can read umlimitedly when「?」is allocated.
（EAN-8 Add-on set）
“4：READING”：
Enable/Disable EAN-8 with Add-on.

Changeover with[▲▲][▼▼]key



EAN/UPC 3／3
（UPC-E set）
“1：READING”：
Enable/Disable UPC-E.
“2：1ST CHARACTER”：
“3：2ND CHARACTER”：
Allocate「?，0～9」to the first and second characters of UPC-E (country flags).
If「0～9」is allocated at the menu, limitation can be set to read only when allocated numeric characters matchs to the first and second numeric characters of UPC-E. It can read umlimitedly when「?」is allocated.
（UPC-E add-on set）
“4：READING”：
Enable/Disable UPC-E with Add-on

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

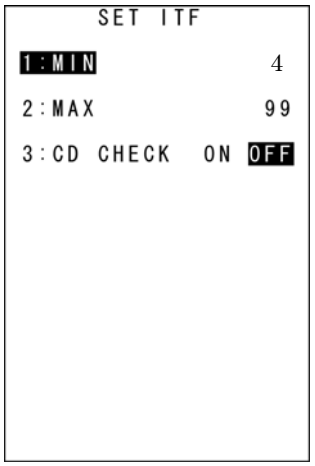
3. Use the cursor keys ([◀] [▶]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET BARCODE screen.

"2:ITF"：Detailed settings for Interleaved 2 of 5 (ITF)

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

SET ITF screen displays.



"1：MIN"：
Set minimum number of digits of ITF
ITF entry range： 2～99
"2：MAX"：
Set maximum number of digits of ITF
ITF entry range： 2～99

— **Point** — Set the value of minimum number of digits less than that of maximum number of digits. If the value of minimum munber of digits is larger than that of maximum munber of digits, error occurs when reading.

"3：CD CHECK"：
"ON" ：It reads only when check digits are correct. It doesn't read when check digits are not corrct or no check digits are found.
"OFF"：It reads whether check digits are found or not.

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

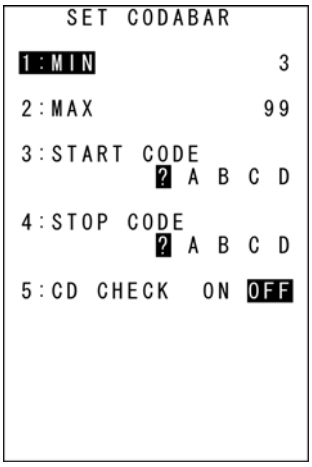
3. Use the cursor keys ([◀] [▶]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET BARCODE screen.

"3:CODABAR"：Detailed settings for Codabar (NW-7)

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

SET CODABAR screen displays.



"1：MIN"：
Set minimum number of digits of Codabar
Setting range： 3～99
"2：MAX"：
Set maximum number of digits of Codabar
Setting range： 3～99

— **Point** — Set the value of minimum number of digits less than that of maximum number of digits. If the value of minimum munber of digits is larger than that of maximum munber of digits, error occurs when reading.

"3：START CODE"：
"4：STOP CODE"：
Allocate "?, A, B, C, D" to start/stop code of Codabar.
If "A, B, C, D" is allocated at the menu, limitation can be set to read only when allocated characters matchs to the characters of CODABAR. It can read umlimitedly when "?" is allocated.
"5：CD CHECK"：
"ON" ：It reads only when check digits are correct. It doesn't read when check digits are not corrct or no check digits are found.
"OFF"：It reads whether check digits are found or not.

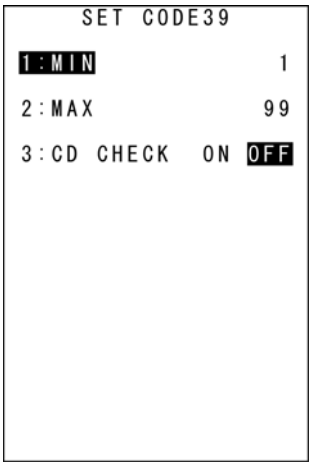
2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4] [5]) to select the item to be set.

3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET BARCODE screen.

"4:CODE39"：Detailed settings for Code 39

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



SET CODE39 screen displays.

"1：MIN"：
Set minimum number of digits of Code 39
Setting range： 1～99
"2：MAX"：
Set maximum number of digits of Code 39
Setting range： 1～99

— **Point** — Set the value of minimum number of digits less than that of maximum number of digits. If the value of minimum munber of digits is larger than that of maximum munber of digits, error occurs when reading.

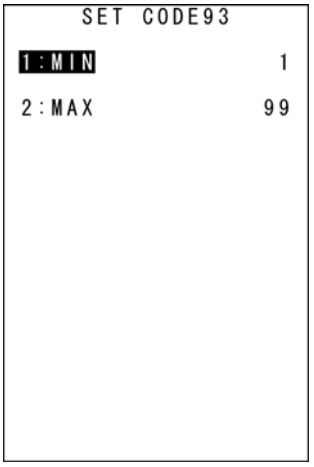
"3：CD CHECK"：
"ON" ：It reads only when check digits are correct. It doesn't read when check digits are not corrct or no check digits are found.
"OFF"：It reads whether check digits are found or not.

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3]) to select the item to be set.

3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET BARCODE screen.

"5:CODE93"：Detailed settings for Code 93



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

SET CODE93 screen displays.

"1 : MIN" :
Set minimum number of digits of Code 93
Setting range : 1～99
"2 : MAX" :
Set maximum number of digits of Code 93
Setting range : 1～99

— **Point** — Set the value of minimum number of digits to less than that of maximum number of digits. If the value of minimum munber of digits is larger than that of maximum munber of digits, error occurs when reading.

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to select the item to be set.

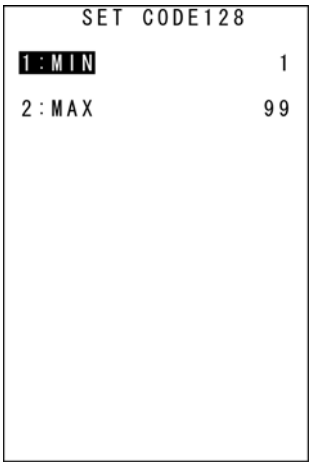
3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET BARCODE screen.

"6:CODE128" : Detailed settings for Code 128

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

SET CODE 128 screen displays.



"1 : MIN" :
Set minimum number of digits of Code 128
Setting range : 1～99
"2 : MAX" :
Set maximum number of digits of Code 128
Setting range : 1～99

— **Point** — Set the value of minimum number of digits to less than that of maximum number of digits. If the value of minimum munber of digits is larger than that of maximum munber of digits, error occurs when reading.

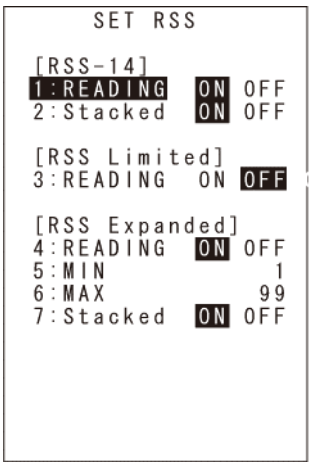
2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to select the item to be set.

3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET BARCODE screen.

"7:RSS"：Detailed settings for RSS (GS1 Databar)

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



SET RSS screen displays.

（RSS-14、RSS-14 Truncated set）
"1：READING"：
Enable/Disable RSS-14(GS1 Databar Omnidirectional）, RSS-14 Truncated（GS1 Databar Truncated）
"2：Stacked"：
Enable/disable RSS-14 Stacked（GS1 Databar Stacked）, RSS-14 Stacked Omnidirectional（GS1 Databar Stacked Omnidirectional）

— **Point** — To Enable Stacked type, both the 「1：READING」and 「2：Stacked」need to be Enable.

（RSS-Limited set）
"3：READING"：
Enable/disable RSS-Limited（GS1 Databar Limited）
（RSS-Expanded set）
"4：READING"：
Enable/disable RSS-Expanded（GS1 Databar Expanded）
"5：MIN"：
Set the minimum number of digits of RSS-Expanded（GS1 Databar Expanded）, RSS-Expanded Stacked（GS1 Databar Expanded Stacked）
Setting range： 1～99
"6：MAX"：
Set the maximum number of digits of RSS-Expanded（GS1 Databar Expanded）, RSS-Expanded Stacked（GS1 Databar Expanded Stacked）
Setting range： 1～99

- Point - Set the value of minimum number of digits to less than that of maximum number of digits. If the value of minimum number of digits is larger than that of maximum number of digits, error occurs when reading.

"7：Stacked"：
Enable/disable RSS-Expanded Stacked（GS1 Databar Expanded Stacked）

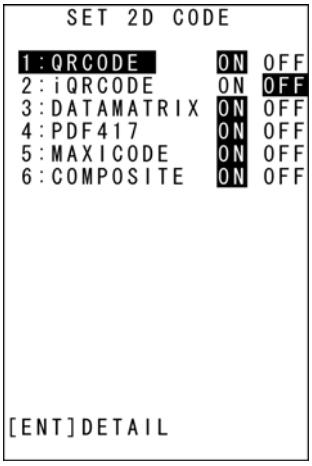
- Point - To Enable Stacked type, both the "4：READING" and "7：Stacked" need to be Enable.

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

3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET BARCODE screen.

◆ “2:2D CODE”：2D Code



Select “2:2D CODE” and press **ENT** key at SET READ CODE to display SET 2D CODE screen, allowing the code to be set to enable/disable. The highlighted settings are the current settings.

To change the settings, use the cursor keys ([▲] [▼]) or numerical keys（[1][2][3][4][5][6]）to select the item to be set and then select the setting value using the cursor keys ([◄] [►]).

“1：QRCODE”：
Enable/disable QR Code.
“2：iQRCODE”：
Enable/disable iQR Code.
“3：DATAMATRIX”：
Enable/disasble Data Matrix.
“4：PDF417”：
Enable/disable PDF417.
“5：MAXICODE”：
Enable/disable MaxiCode.
“6：COMPOSITE”：
Enable/disable COMPOSITE.

Press **ENT** key for the detailed settings of the 2D code being selected. Refer to the following section for the details. Press the **BS/C** key for the settings value to be valid and then return to the SET READ CODE screen.

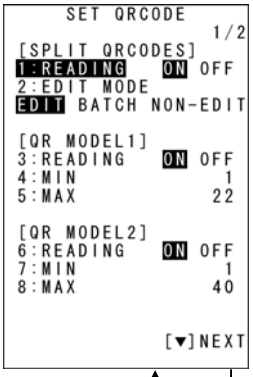
- Point - “1：QRCODE”, ”Q2：iQRCODE”, “Q3：DATAMATRIX”, “Q4：PDF417Q” have different types of code readings, which allows code readings to be set enable /disable at the detailed settings according to the type of code readings. If enable, both this setting and the detailed settings need to be Enabled.

- Point - No detailed settings for ”5:MAXICODE” and ”6:COMPOSITE”.

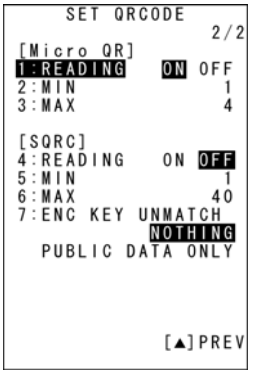
"1:QRCODE"：Detailed settings for QR Code

1. Select "1:QRCODE" at SET 2D CODE menu and then press the **ENT** key.

SET QRCODE screen displays.



Changeover with[▲ ▲][▼ ▼]keys



QR Code 1／2
（Concatenated QR code set）
"1：READING":

Enable/disable concatenated QR Code.
For QR Codes, there is a function where data is coded after being spilit into a maximum of 16 segments and original data is restored when the codes are read. These segmented codes are called concatenated codes.

"2：EDIT MODE"：

Set the scan mode of concatenated QR Code.

"EDIT": Edit mode

The data is stored in memory when all segmented codes have been read.
A reading error occurs if the volume of data exceeds 65,280 bytes. The beeper sounds at 500 ms intervals, and all read data is discarded.

"BATCH": Batch edit mode

The data is stored in memory when all segmented codes within the scanning field of view have been read.

"NON-EDIT": Unedited mode

The data is stored in memory each time a segmented code is read.

In edit mode, when the first code of the concatenated code is read the beeper sounds twice and the system enters concatenated code reading status.
When subsequent concatenated codes are read the beeper sounds once. After the final code has been read, the beeper sounds three times and reading is complete.

- Point -

- If QR codes other than concatenated codes are read during concatenated code reading then concatenated code reading ends, the read concatenated codes are discarded, and the data for the last QR codes read is saved.
- When the illuminating indicator LED is set to OFF in trigger switch operation (Auto-off mode, Momentary mode, and alternate) or when the raeding of the next concatenated code is not completed within approx. 3 seconds in modes other than Auto-off mode, the data read so far is cleared and concatenated code reading ends.
- When other concatenated codes are read before a concatenated code has been read completely, the data read so far is cleared and reading begins on the new code.

（QR Code　model1 setting）
“3：READING”：
Enable/disable QR Code model 1
“4：MIN”：
Set the minimum code version of QR Code model 1.
Setting ragne：　1～22
“5：MAX”：
Set the maximum code version of QR Code mode1.
Setting range：　1～22
（QR Code model 2 setting）
“6：READING”：
Enabel/disable QR Code model 2.
“7：MIN”：
Set the minimum code version of QR Code model 2.
Setting range：　1～40
“8：MAX”：
Set the maximum code verion of QR Code model 2.
Setting range：　1～40

QR Code　2／2
（Micro QR Code setting）
“1：READING”：
Enable/disable QR Code model 2.
“2：MIN”：
Set the minimum code version of QR Code model 2.
Setting range：　1～4
“3：MAX”：
Set the maximum code verion of QR Code model 2.
Setting range：　1～4
（SQRC Code setting）
“4：READING”：
Enable/disable SQRC Code.
“5：MIN”：
Set the minimum code version of SQRC.
Setting range：　1～40
“6：MAX”：
Set the minimum code version of SQRC.
Setting range：　1～40
“7：ENC KEY UNMATCH”：
Enable/disable public data when encryption key is unmatched.
“NOTHING”：The public data is not read when the encryption key is unmatched.
“PUBLIC DATA ONLY”：The public data is read when the encryption key is unmatched.

— **Point** —
- Set the value of minimum code version to less than that of maximum code version. If the value of minimum code version is larger than that of maximum code version, error occurs when reading.
- Set the minimum/maximum code version within the setting range listed above. If the value is out of the setting range, error occurs.

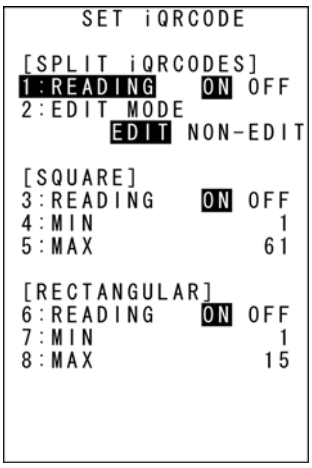
2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4] [5] [6] [7] [8]) to select the item to be set.

3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET 2D CODE screen.

"2:iQRCODE" : Detailed settings for iQR Code

1. Select "2:iQRCODE" at SET 2D CODE menu and then press the **ENT** key.



SET iQRCODE screen displays.

（Concatenated iQR code settings ）

"1：READING"：

Enable/disable concatenated iQR Code

For iQR Codes, there is a function where data is coded after being spilit into a maximum of 16 segments and original data is restored when the codes are read. These segmented codes asre called concatenated codes.

"2：EDIT MODE"：

Set the scan mode of concatenated iQR Code.

"EDIT": Edit mode

The data is stored in memory when all segmented codes have been read.

A reading error occurs if the volume of data exceeds 65,280 bytes. The beeper sounds at 500 ms intervals, and all read data is discarded.

"NON-EDIT": Unedited mode

The data is stored in memory each time a segmented code is read.

In edit mode, when the first code of the concatenated code is read the beeper sounds twice and the system enters concatenated code reading status.

When subsequent concatenated codes are read the beeper sounds once. After the final code has been read, the beeper sounds three times and reading is complete.

- Point -

- If iQR codes other than concatenated codes are read during concatenated code reading then concatenated code reading ends, the read concatenated codes are discarded, and the data for the last iQR codes read is saved.
- When the illuminating indicator LED is set to OFF in trigger switch operation (Auto-off mode, Momentary mode, and alternate) or when the raeding of the next concatenated code is not completed within approx. 3 seconds in modes other than Auto-off mode, the data read so far is cleared and concatenated code reading ends.
- When other concatenated codes are read before a concatenated code has been read completely, the data read so far is cleared and reading begins on the new code.

（Square iQR Code setting）

“3：READING”：

Enable/disable Square iQR Code

“4：MIN”：

Set the minimum code version of Square iQR Code.

Setting range： 1～61

“5：MAX”：

Set the maximum code version of Square iQR Code.

Setting range： 1～61

（Rectangular iQRCode setting）

“6：READING”：

Enable/disable rectangular iQR Code

“7：MIN”：

Set the minimum code version of recatangular iQR Code.

Setting range： 1～15

“8：MAX”：

Set the maximum code version of recatangular iQR Code.

Setting range： 1～15

— **Point** —
- Set the value of minimum code version to less than that of maximum code version. If the value of minimum code version is larger than that of maximum code version, error occurs when reading.
- Set the minimum/maximum code version within the setting range listed above. If the value is out of the setting range, error occurs.

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4] [5] [6] [7] [8]) to select the item to be set.

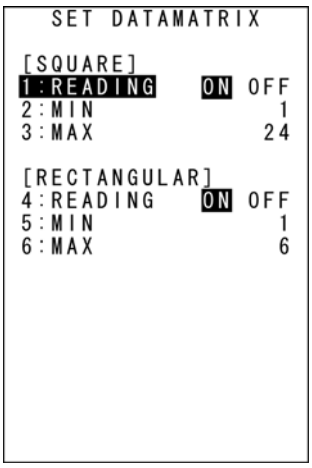
3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET 2D CODE screen.

“3:DATAMATRIX”：Detailed settings for Data Matrix

1. Select “3:DATAMATRIX” at SET 2D CODE menu and then press the **ENT** key.

SET DATAMATRIX screen displays.



（Square Data Matrix setting）

“1：READING”：

Enable/disable Squra Data Matrix.

“2：MIN”：

Set the minimum code version of square Data Matrix Code.

Setting range： 1～24

"3：MAX"：
Set the maximum code version of square Data Matrix Code.
Setting range： 1～24
（Recatangular Data Matrix setting）
"4：READING"：
Enable/disable recatangular Data Matrix
"5：MIN"：
Set the minimum code version of recatangular iQR Code.
Setting range： 1～6
"6：MAX"：
Set the maximum code version of recatangular Data Matrix.
Setting range： 1～6

— Point —
- Set the value of minimum code version to less than that of maximum code version. If the value of minimum code version is larger than that of maximum code version, error occurs when reading.
- Set the minimum/maximum code version within the setting range listed above. If the value is out of the setting range, error occurs.

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

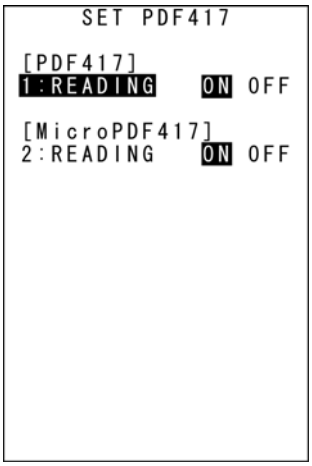
3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET 2D CODE screen.

"4:PDF417"：Detailed settings for PDF417

1. Select "4:PDF417" at SET 2D CODE menu and then press the **ENT** key.

SET PDF417 screen displays.



（PDF417 setting）
"1：READING"：
Enable/disable PDF417.
（Micro PDF417 setting）
"2：READING"：
Enable/disable Micro PDF417

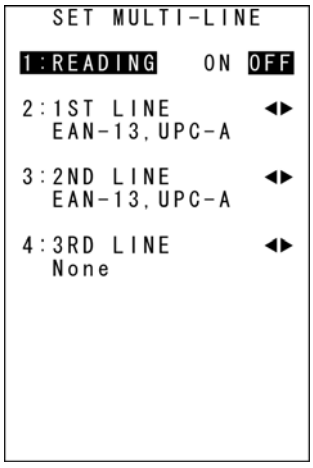
2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to select the item to be set.

3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET 2D CODE screen.

◆ "3:MULTI-LINE"：Multi-line code

1. Select "3:MULTI-LINE" at SET READ CODE menu and then press the **ENT** key.



SET MULTI-LINE screen displays, allowing the multi-line code to be set to enable/disable and the reading code can be set.

"1：READING" : Enable/disable multi-line code.
"2：1ST LINE"：Set the first line of the barcode to be set.
"3：2ND LINE"：Set the second line of the barcode to be set.
"4：3RD LINE"：Set the third line of the barcode to be set

Multiline is limited to 3 lines, and is compatible with 9 types of the reading code.
（EAN-13/UPC-A, EAN-8, UPC-E、ITF, Codabar, Code 39, Code 93, Code 128）

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4]) to select the item to be set.

3. Use the cursor keys ([◄] [►]) to select settings value.

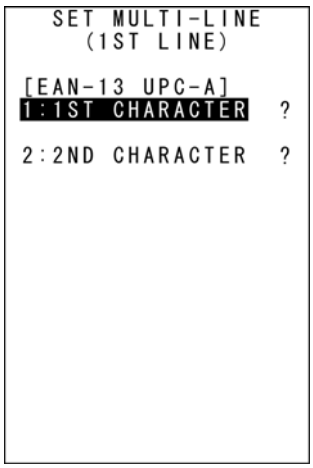
Press the cursor keys ([◄] [►]) while "2：1ST LINE", "3：2ND LINE" or "4：3RD LINE" is being selected to change the barcode at the line where the cursor is located. Press **ENT** key for the detailed settings of the barcode being selected. Press the **BS/C** key for the settings value to be valid and then return to the SET READ CODE screen.

— **Point** — The Multi-line code and bar code don't interfere each other. EAN-13/UPC-A can be read when EAN/UPC –A is selected on the 1ST and 2ND LINE of Multi-line code even though "Disable EAN-13/UPC-A" is selected at SET BARCODE.

4. Press the BS/C key for the settings value to be valid and then return to the SET READ CODE screen.

"EAN-13/UPC-A"：Detailed settings of EAN-3/UPC-A for the Multiline code

1. Select "EAN-13/UPC-A" at SET MULTI-LINE menu and then press the **ENT** key.



SET MULTI-LINE [EAN-13 UPC-A] screen displays.

"1：1ST CHARACTER"：
"2：2ND CHARACTER"：

Allocate "?，0～9" to the first and second characters of EAN-13/UPC-A (country flags).

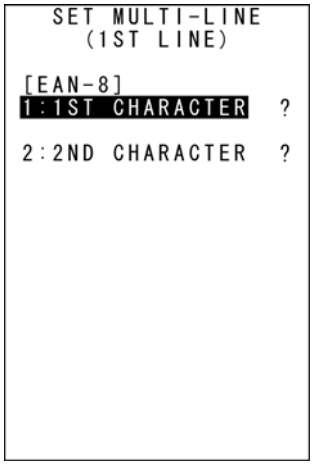
If “0～9” is allocated at the menu, limitation can be set to read only when allocated numeric characters matchs to the first and second numeric characters of EAN-13/UPC-A. It can read umlimitedly when “?” is allocated.

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to select the item to be set.

3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET MULTI-LINE screen.

“EAN-8” : Detailed settings of EAN-8 for the Multiline code



1. Select “EAN-8” at SET MULTI-LINE menu and then press the **ENT** key.

SET MULTI-LINE [EAN-8] screen displays.

“1：1ST CHARACTER”：
“2：2ND CHARACTER”：

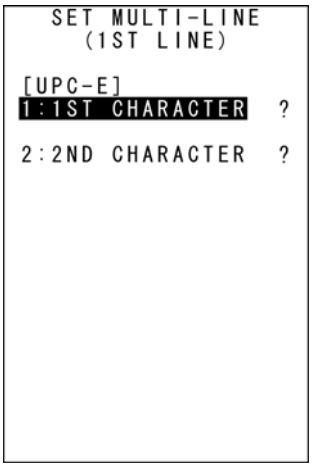
Allocate “?, 0～9” to the first and second characters of EAN-8 (country flags).
If “0～9” is allocated at the menu, limitation can be set to read only when allocated numeric characters matchs to the first and second numeric characters of EAN-8. It can read umlimitedly when “?” is allocated.

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to select the item to be set.

3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET MULTI-LINE screen.

"UPC-E" : Detailed settings of UPC-E for the Multiline code



1. Select "UPC-E" at SET MULTI-LINE menu and then press the **ENT** key.

SET MULTI-LINE [UPC-E] screen displays.

"1 : 1ST CHARACTER" :
"2 : 2ND CHARACTER" :

Allocate "?, 0～9" to the first and second characters of UPC-E (country flags).
If "0～9" is allocated at the menu, limitation can be set to read only when allocated numeric characters matchs to the first and second numeric characters of UPC-E. It can read umlimitedly when "?" is allocated.

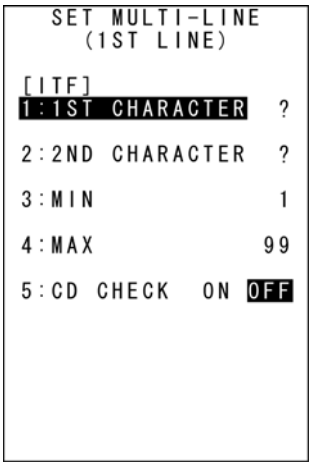
2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to select the item to be set.

3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET MULTI-LINE screen.

"ITF" : Detailed settings of ITF for the Multiline code

1. Select "ITF" at SET MULTI-LINE menu and then press the **ENT** key.



SET MULTI-LINE [IFT] screen displays.

"1 : 1ST CHARACTER" :
"2 : 2ND CHARACTER" :

Allocate "?, 0～9" to the first and second characters of ITF.
If "0～9" is allocated at the menu, limitation can be set to read only when allocated numeric characters matchs to the first and second numeric characters of ITF. It can read umlimitedly when "?" is allocated.

"3 : MIN" :
Set minimum number of digits of ITF.
Setting range : 2～99
"4 : MAX" :
Set maximum number of digits of ITF.
Setting range : 2～99

— Point — ● Set the value of minimum number of digits to less than that of maximum number of digits. If the value of minimum number of digits is larger than that of maximum number of digits, error occurs when reading.

● Set the minimum/maximum number of digits within the setting range stated above. If the value is out of the setting range, error occurs.

"5：CD CHECK"：

"ON" ：It reads only when check digits are correct. It doesn't read when check digits are not corrct or no check digits are found.

"OFF"：It reads whether check digits are found or not.

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

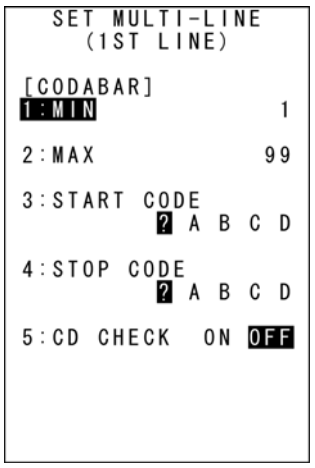
3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET MULTI-LINE screen.

"CODABAR" : Detailed settings of Codabar (NW-7) for the Multiline code

1. Select "CODABAR" at SET MULTI-LINE menu and then press the **ENT** key.

SET MULTI-LINE [CODABAR] screen displays.



"1 : MIN" :
Set minimum number of digits of Codabar
Setting range : 3～99

"2 : MAX" :
Set maximum number of digits of Codabar.
Setting range : 3～99

— Point — ● Set the value of minimum number of digits to less than that of maximum number of digits. If the value of minimum number of digits is larger than that of maximum number of digits, error occurs when reading.

● Set the minimum/maximum number of digits within the setting range stated above. If the value is out of the setting range, error occurs.

"3：START CODE"：

"4：STOP CODE"：

Allocate "?, A, B, C, D" to start/stop code of Codabar.

If "A, B, C, D" is allocated at the menu, limitation can be set to read only when allocated characters matchs to the characters of CODABAR. It can read umlimitedly when "?" is allocated.

"5：CD CHECK"：
"ON" ：It reads only when check digits are correct. It doesn't read when check digits are not corrct or no check digits are found.
"OFF"：It reads whether check digits are found or not.

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

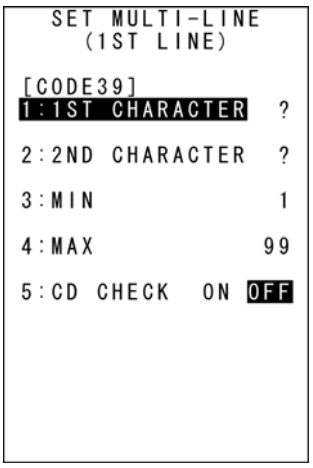
3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET MULTI-LINE screen.

"CODE39"：Detailed settings of Code 39 for the Multiline code

1. Select "CODE39" at SET MULTI-LINE menu and then press the **ENT** key.

SET MULTI-LINE [CODE39] screen displays.



"1：1ST CHARACTER"：
"2：2ND CHARACTER"：
Allocate "?, 0～9" to the first and second characters of Code 39.
If "0～9" is allocated at the menu, limitation can be set to read only when allocated characters matchs to the characters of Code39. It can read umlimitedly when "?" is allocated.
"3：MIN"：
Set minimum number of digits of Code 39.
Setting range： 1～99
"4：MAX"：
Set maximum number of digits of Code 39.
Setting range： 1～99

— **Point** — ● Set the value of minimum number of digits to less than that of maximum number of digits. If the value of minimum number of digits is larger than that of maximum number of digits, error occurs when reading.

"5：CD CHECK"：
"ON" ：It reads only when check digits are correct. It doesn't read when check digits are not corrct or no check digits are found.
"OFF"：It reads whether check digits are found or not.

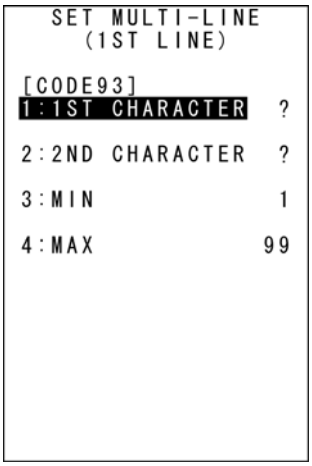
2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4] [5]) to select the item to be set.

3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET MULTI-LINE screen.

"CODE93" : Detailed settings of Code 93 for the Multiline code

1. Select "CODE93" at SET MULTI-LINE menu and then press the ENT key.



SET MULTI-LINE [CODE93] screen displays.

"1：1ST CHARACTER"：
"2：2ND CHARACTER"：
Allocate "?, 0～9" to the first and second characters of Code 93.
If "0～9" is allocated at the menu, limitation can be set to read only when allocated characters matchs to the characters of Code93. It can read umlimitedly when "?" is allocated.
"3：MIN"：
Set minimum number of digits of Code 93.
Setting range： 1～99
"4：MAX"：
Set maximum number of digits of Code 93.
Setting range： 1～99

— **Point** — Set the value of minimum number of digits to less than that of maximum number of digits. If the value of minimum number of digits is larger than that of maximum number of digits, error occurs when reading.

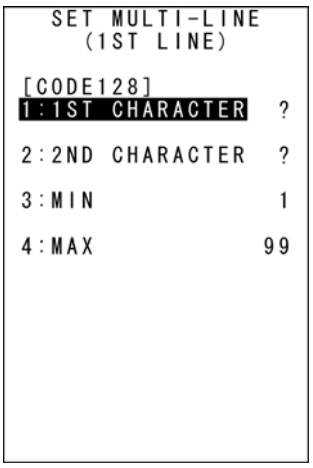
2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4]) to select the item to be set.

3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the ENT key or BS/C key for the settings value to be valid and then return to the SET MULTI-LINE screen.

"CODE128" : Detailed settings of Code 128 for the Multiline code

1. Select "CODE128" at SET MULTI-LINE menu and then press the **ENT** key.



SET MULTI-LINE [CODE128] screen displays.

"1 : 1ST CHARACTER" :
"2 : 2ND CHARACTER" :
Allocate "?, 0～9" to the first and second characters of Code 128.
If "0～9" is allocated at the menu, limitation can be set to read only when allocated characters matchs to the characters of Code128. It can read umlimitedly when "?" is allocated.
"3 : MIN" :
Set minimum number of digits of Code 128.
Setting range : 1～99
"4 : MAX" :
Set maximum number of digits of Code 93.
Setting range : 1～99

— **Point** — Set the value of minimum number of digits to less than that of maximum number of digits. If the value of minimum number of digits is larger than that of maximum number of digits, error occurs when reading.

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4]) to select the item to be set.

3. Use the cursor keys ([◄] [►]) to select settings value.

4. Press the **ENT** key or **BS/C** key for the settings value to be valid and then return to the SET MULTI-LINE screen.

[5] Setting the communication environment

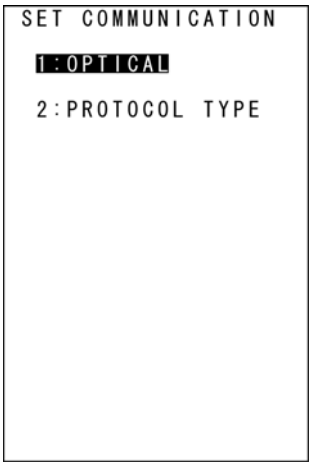
The communication environment settings following system initialization are follows.
Do not change these settings unless necessary.

Item		Default	
Interface port		Optical (infrared interface port)	
Communication protocol		Ymodem protocol	
Infrared interface port			
TRANSMIT SPEED	Baud rate	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)

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 on the right displays.



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

“1: OPTICAL”:
Changes the infrared communication parameters.

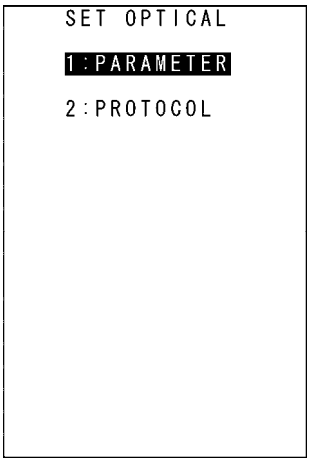
“2: PROTOCOL TYPE”:
Changes the communication protocol setting.

Refer to the following section for details of the above items.
Press the **BS/C** 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 on the right displays.

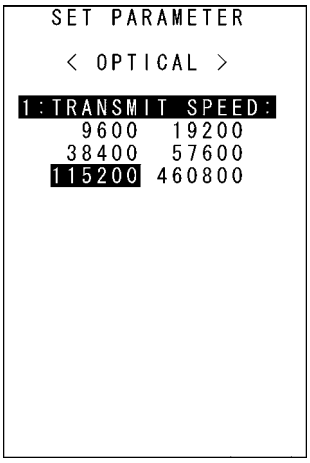


2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to highlight ”1: PARAMETER” or ”2: PROTOCOL”, and then press the **ENT** key.

Press the **BS/C** 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.

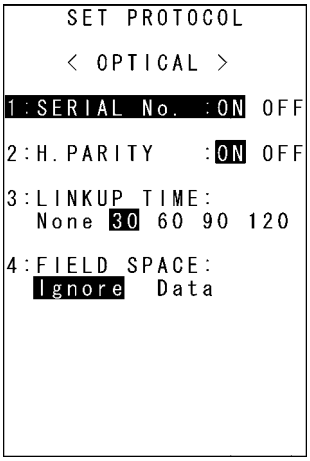


The highlighted setting will be the current setting.

"1: TRANSMIT SPEED": Setting the transmission speed
To change the setting, highlight the transmission speed with the cursor keys ([◄] [►]) and press the **ENT** key.
Press the **BS/C** 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.

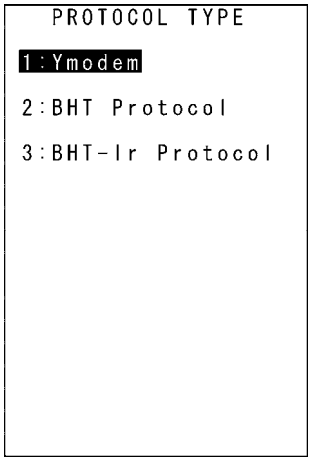
"4: FIELD SPACE":
Specifies handling for trailing spaces in fields.
To trim trailing spaces in fields, select "Ignore", and to retain them as data, select "Data".

To make changes, use the cursor keys ([▲] [▼]) or numerical 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 **BS/C** 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: PROTOCAL TYPE": Setting the communication protocol type

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



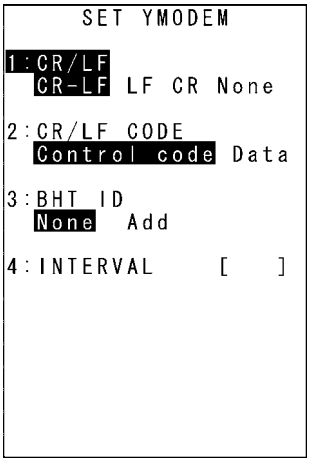
The PROTOCOL TYPE menu screen on the right displays.
The highlighted setting will be the current setting.

"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 numerical 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 **BS/C** 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.

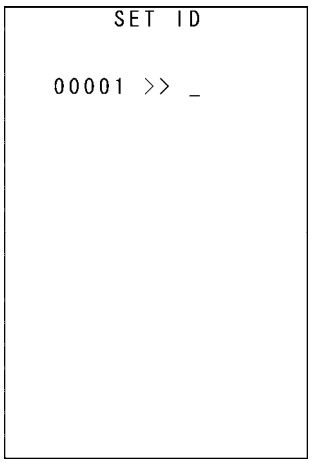
“3: BHT ID”:
Specifies whether or not to add the BHT ID number to packets when performing YMODEM transfer. “None” should normally be selected. To add the BHT ID number to the transfer tool, select “Add”. (This setting is not supported. Changing this setting has no result.)

“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 numerical 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 **BS/C** key.
Enter a new setting value with the numerical keys and press the **ENT** key.

Press the **BS/C** key to return to the SET COMMUNICATION menu.

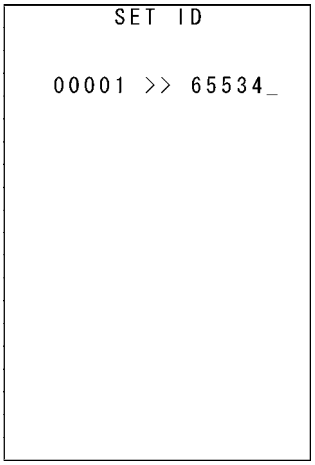
Select “3: BHT-Ir Protocol” at the PROTOCOL TYPE menu to display the screen on the right.



Enter the ID number of the BHT using the numerical 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 **BS/C** key to delete it and then enter the correct data.
Press the **BS/C** key to return to the SET COMMUNICATION menu.

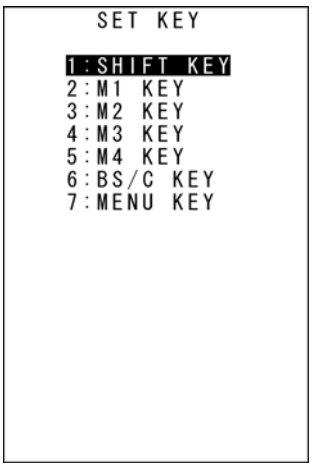


[6] Defining the functions of the Shift key and Magic keys

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 on the right displays.



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

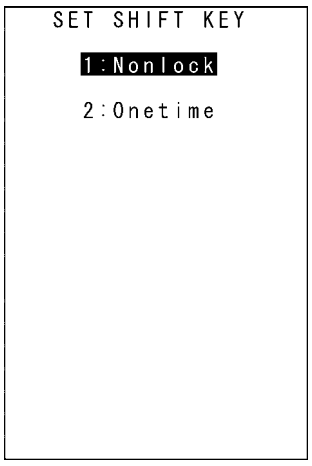
"1: SHIFT KEY":	Displays the **SF** key definition screen.
"2: M1 KEY":	Displays the **M1** key definition screen.
"3: M2 KEY":	Displays the **M2** key definition screen.
"4: M3 KEY":	Displays the **M3** (left-hand trigger switch) key definition screen.
"5: M4 KEY":	Displays the **M4** (right-hand trigger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

Refer to the following section for details of the above items.
Press the **BS/C** key to return to the SET SYSTEM 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 on the right displays.
The highlighted setting will be the current setting.



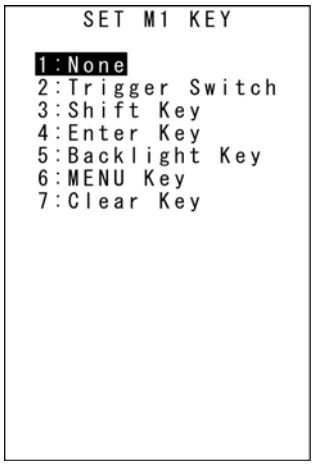
"1: Nonlock": Shifts the keypad only when the **SF** key is held down.
"2: Onetime": Shifts only the key pressed immediately after the **SF** key is pressed. (The following keys will not be shifted.)

2. Use the cursor keys ([▲] [▼]) or numerical 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" - "5: M4 KEY": Defining the Mx key functions

1. Select "2: M1 KEY" to "5: M4 KEY" at the SET KEY menu and then press the **ENT** key.



The SET Mx KEY menu screen on the right displays.
(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":
Sets the magic key as a key used to start up the "Speaker/Vibrator/Backlight Adjustment Screen".
"7: Clear Key":
Sets the magic key as the **C** key.

2. Use the cursor keys ([▲] [▼]) or numerical 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 M4)

Magic keys (**M1** to **M4**) can be set to function as the trigger switch, **SF** key, **ENT** key, backlight function ON/OFF key, **MENU** key or **BS/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** and **M4** are set as the trigger switch by default.

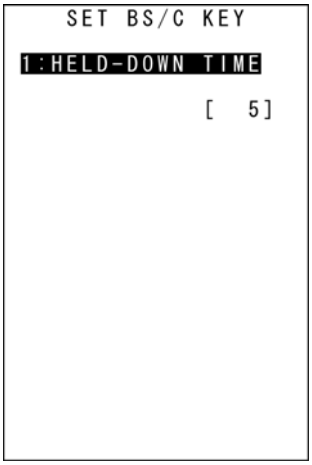
- Point - The backlight function ON/OFF key can be assigned only to one of the magic keys from **M1** to **M4**. The key defined more recently will act as the backlight function ON/OFF key and the previously defined key will be ignored.

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 (BS/C key) function

The **BS/C** key deletes the last entered character (backspace), and when pressed and held, cancels entry and returns the LCD display to the previous screen (clear). This menu sets the key hold time for “clear”.



1. Select “6: **BS/C** KEY” at the SET KEY menu, and then press the **ENT** key.

The highlighted setting will be the current setting.

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

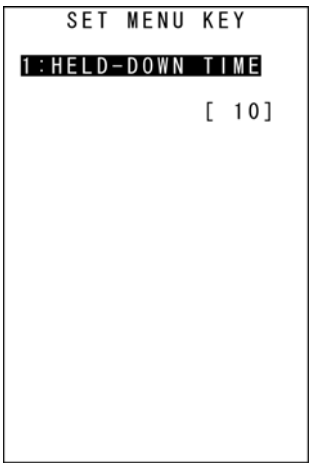
3. Press and hold the **BS/C** key to clear all of the current settings.

4. Enter the desired numeric values.

Numeric values can be entered between 1 and 255 (x 100 ms.)

◆ Defining the MENU key setting

The M1 to M4 keys can be set as menu keys. When M1 to M2 set as menu keys are pressed and held, the menu screen is displayed. This menu sets the key hold time.



1. Select “7: MENU KEY” at the SET SYSTEM menu and then press the **ENT** key.

The highlighted setting will be the current setting.

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

3. Press and hold the **BS/C** key to clear all of the current settings.

4. Enter the desired numeric values.

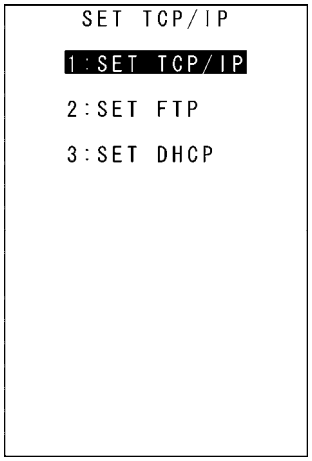
Numeric values can be entered between 1 and 255 (x 100 ms.)

[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 on the right displays.



2. Use the cursor keys ([▲] [▼]) or numerical 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 **BS/C** 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.

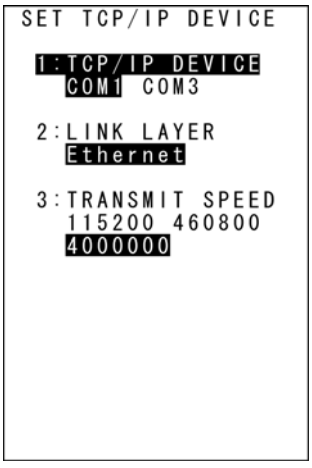
The SET TCP/IP menu screen on the right displays.

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

Press the **BS/C** key to return to the SET TCP/IP menu.

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

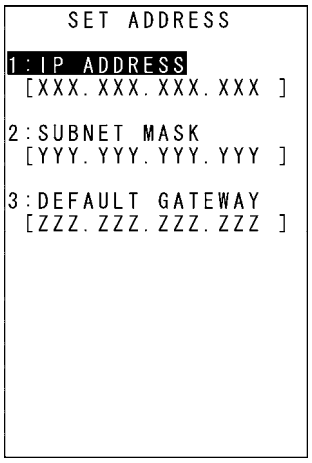
Select "1: DEVICE" at the SET TCP/IP menu to display the screen on the right where the current settings are displayed.



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

Press the **BS/C** key to return to the SET TCP/IP menu.

"2: IP ADDRESS": Setting the IP address



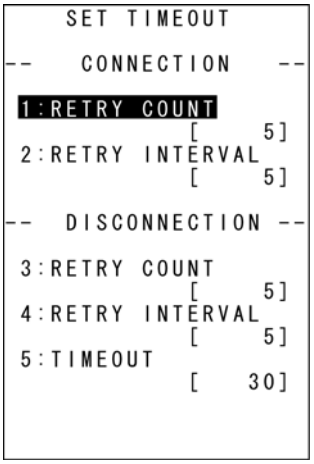
Select "2: IP ADDRESS" at the SET TCP/IP menu to display the screen on the right where the current settings are displayed.

To change the setting:

(1) Use the cursor keys ([▲] [▼]) or numerical 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 numerical keys and dot key.
To delete a single character, press the BS/C key. To delete the entire entry, press and hold the BS/C key, or press the SF key and BS/C key 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 **BS/C** key to return to the SET TCP/IP menu.

"3: TIMEOUT": Setting the timeout (only when COM1 selected)



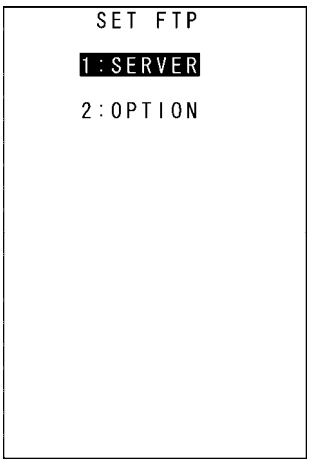
Select "3: TIMEOUT" at the SET TCP/IP menu to display the screen on the right where the current settings are displayed.

To change the setting:

(1) Use the cursor keys ([▲] [▼]) or numerical 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 numerical keys and dot key.
To delete a single character, press the BS/C key. To delete the entire entry, press and hold the BS/C key, or press the SF key and BS/C key simultaneously.
(3) Enter the desired value, and then press the ENT key.

Press the **BS/C** 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 on the right displays.

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

Press the **BS/C** 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.

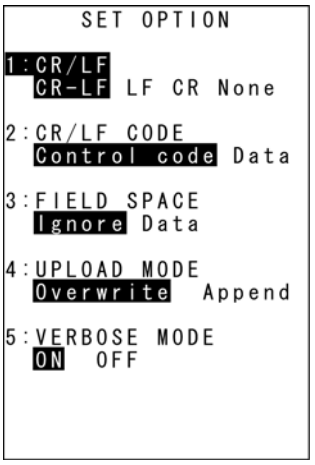
“1: SERVER IP”:
Sets the IP address for the FTP server.
“2: USER ID”:
Sets the user name.
“3: PASSWORD”:
Sets the password.
“4: DEFAULT DIR”:
Specifies an initial directory through which the FTP server will search for files for transfer first when the FTP client establishes a connection to the server.

To change the setting:

(1) Use the cursor keys ([▲] [▼]) or numerical 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 numerical 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 BS/C key. To delete the entire entry, press and hold the BS/C key, or press the SF key and BS/C key simultaneously.
(3) Enter the desired value, and then press the ENT key.

Press the **BS/C** 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:

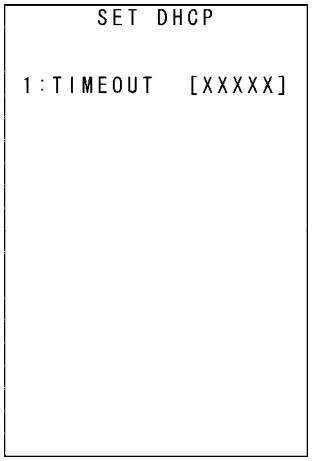
(1) Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4] [5]) to highlight the item to be set and press the ENT key.
(2) Use the cursor keys ([◄] [►]) to highlight each setting value.
(3) Press the ENT key.

Press the **BS/C** key to return to the SET FTP menu.

◆ Setting the DHCP

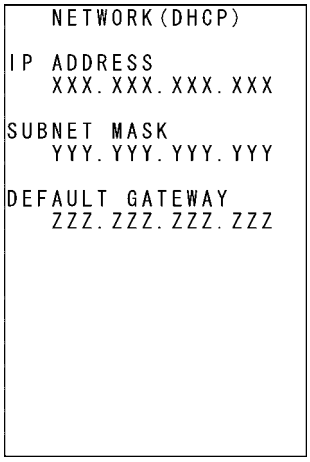
1. Select “3: DHCP” at the SET TCP/IP menu and then press the **ENT** key.

The SET DHCP screen on the right displays.
The highlighted setting will be the current setting.
Press the **BS/C** key to return to the SET TCP/IP menu.



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 **BS/C** key at the NETWORK (DHCP) screen to return to the SET DHCP screen.

BS/C key / **SF** key + [.] key



- 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:

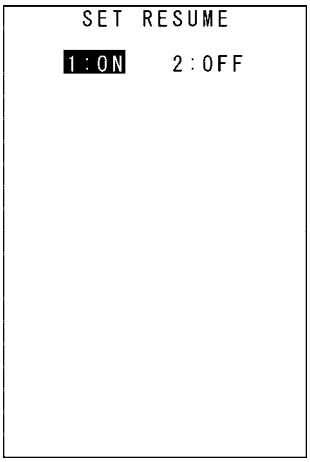
(1) Press the **ENT** key.
(2) The mode changes to entry mode and the cursor displays, allowing the setting to be entered with the numerical keys.
To delete a single character, press the **BS/C** key. To delete the entire entry, press and hold the **BS/C** key, or press the **SF** key and **BS/C** key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

Press the **BS/C** key to return to the SET FTP menu.

[8] Setting the resume function

Use the following procedure to set the resume function.

1. Select “1: RESUME” from the SET SYSTEM Menu 2/2 and then press the **ENT** key.



The SET RESUME screen on the right displays.
The highlighted setting will be the current setting.

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

Press the **BS/C** key to return to the SET SYSTEM Menu.

1:ON: Enables the resume function.
2:OFF: Disables the resume function.

-Point- When the power is turned ON, the resume function starts the BHT from the position in the program (screen) where the BHT power was last turned OFF.

If you want to execute the program from the start, refer to section”4.3.6 Execute the auto-start execution program from the start”.

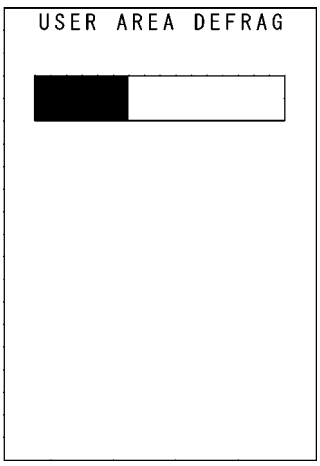
---

[9] Drive related operation

Use the following procedure to perform drive related operations.

[Defragging the drive**]**

1. Select “2: DRIVE TOOL” from the SET SYSTEM Menu 2/2 and then press the **ENT** key to display the screen on the right. Select “1: DEFRAG” from the DRIVE TOOL screen and then press the **ENT** key.



The screen on the right displays and the defragmentation process is performed for the entire user area.
The screen returns to the SYSTEM MENU when defragmentation is complete.
Defragmentation reorganizes the user area in order to increase the amount of available space.
If defragmented, the BHT may download files more efficiently than before performing defragmentation

[BLOCK ERASE ICON]

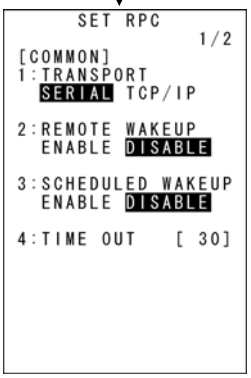
1. Select “2: DRIVE TOOL” from the SET SYSTEM Menu 2/2 and then press the **ENT** key to display the screen on the right. Select the “2: BLOCK ERASE ICON” from the DRIVE TOOL screen and use the the cursor keys ([◄] [►]) to select ON/OFF.

Whole/partial user area sometimes needs to be reorganized during file writing on the application or drive degragmentation and so on. During these times (approx. 1 second) the application is suspended to display the hourglass icon on the bottom-right corner. Whether to display the icon (ON) or not (OFF) can be specifed.

[10] Setting the RPC

The BHT-800 series is compliant with the BHT Manager software (host-side tool). The RPC screen displays the settings used to communicate with the BHT Manager software.
For details, refer to the “BHT Manager User’s Manual”. The following explains only the operation of this menu and an outline of the settings.

ENT key



Select items with the [▲] and [▼] keys.

1. Select “8: RPC” from the SET SYSTEM Menu 1/2 and then press the **ENT** key.

The SET RPC screen on the right will display.
The highlighted setting will be the current setting.

“1: TRANSPORT”:
Selects the communication path for communicating with the BHT Manager.
“2: REMOTE WAKEUP”:
Sets the PRC remote wakeup.
“3: SCHEDULED WAKEUP”:
Sets the scheduled wakeup.
“4: TIMEOUT”:
Sets the communication time out interval.
“5: DEVICE COM1”:
Sets the COM port when a serial communication path is used.
“6: PORT”:
Sets the port number for RPC.
“7: HOST ADDRESS”:
Sets the BHT Manager HOST-IP.
“8: HOST PORT”:
Sets the port number for the BHT Manager line connection notification.

2. Use the cursor keys ([◄] [►]) to select each setting value.

3. Press the **ENT** key.

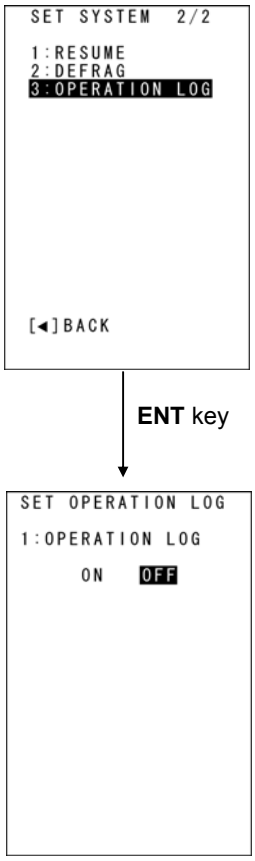
The selected value will then be set.

[11] Setting the operation log

The BHT-800 series is compliant with the BHT Manager software (host-side tool). The OPERATION LOG sets wheter of not create log data that the BHT Manager collects.
For details, refer to the “BHT Manager User’s Manual”. The following explains only the operation of this menu and an outline of the settings.

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

The OPERATION LOG settings menu will display.
The highlighted setting will be the current setting.



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

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

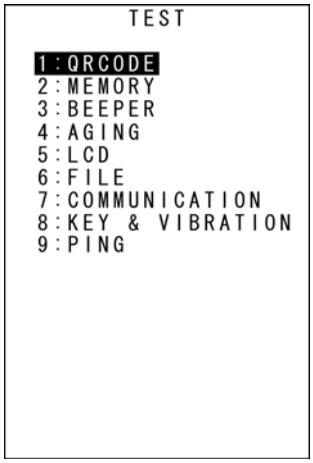
3. Press the **ENT** key.

The selected value will then be set.

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 on the right displays.

“1: QRCODE”:
Selects the code scanning test.
“2: MEMORY”:
Selects the RAM read/write test.
“3: BEEPER”:
Selects the speaker 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, speaker and vibrator tests.
“9: PING”:
Selects the PING test.

Refer to the following section for details of the above items.
Press the **BS/C** key to return to the SYSTEM MENU.

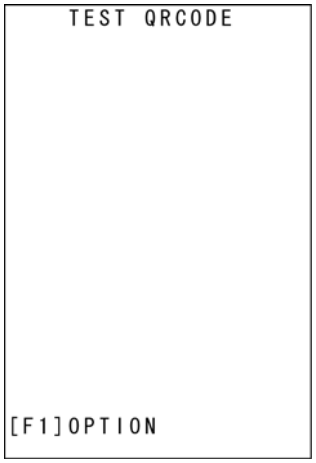
- Point - Contact your nearest dealer if an error occurs during any of the above tests.

[1] Code scanning test

Use the following procedure to perform a barcode scanning test.

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

The screen on the right displays.

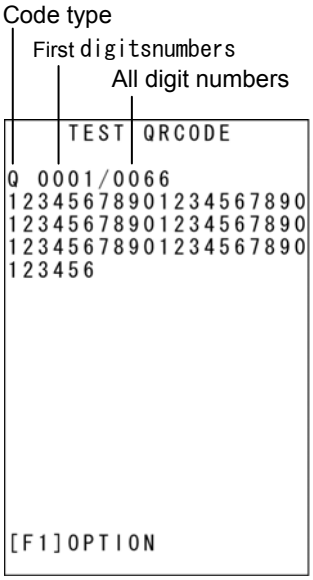


2. Scan a barcode or 2D with the BHT

Upon completion of barcode or 2D scanning, the speaker beeps once, and the indicator LED turns blue.

3. The scanned 2D code or barcode type, lead digits, total number of digits, and code data display on the screen. Ensure that the code data and screen display match.

Press the **BS/C** key to return to the TEST menu.



- Point - QR Code has a function where data is coded after being split into a maximum of 16 segments and the segmented codes are read. Codes segmented using this function are called concatenated codes.

When reading concatenated codes, the beeper works differently than with normal reading.

The beeper sounds twice when the first code of the concatenated code is rad, and the system enters the concatenated code reading mode. When subsequent concatenated codes are read, the beeper sounds once. After the final code has been read, the beeper sounds three times and reading is complete.

The reading data screen display will not be shown until after concatenated code reading is complete.

If QR codes other than concatenated codes are read during concatenated code reading those codes are displayed, the concatenated code reading mode is cancelled and the read concatenated codes are discarded. This also happens if the trigger switch is released or the interval between reading of concatenated codes is over 5 seconds.

The order for reading concatenated codes is arbitrary. The same concatenated codes will not be read it again.

- Point - Option data is displayed at the end of the QR Code data when OPTION DATA is set to ON at the set code reading conditions screen of the SET SYSTEM menu. (Refer to “4.5.5 [4] Setting the code reading conditions”)

Code Type and Corresponding Characters Didplayed on the Screen

Code type		Displayed characters	
		Code mark Type1	Code mark Type2 *2
QR Code		Q	]Qm
QR Code（Codes concatenated with unedited modes）		S	S *3
Micro QR Code		Q	Q *3
SQRC		Q	Q *3
i QR Code		G	]Qm
I QR Code（Codes concatenated with unedited modes）		S	Q *3
PDF417		Y	]L0
MaxiCode		X	]Um
Data Matrix		Z	]dm
EAN-13	Without add-on	A	]E0
	With 2 digits add-on	A	]E3
	With 5 digits add -on	A	]E3
UPC-A	Without add-on	A	]X0
	With 2 digits add-on2	A	]X3
	With 5 digits add -on	A	]X3
EAN-13（JAN-13）COMPOSITE	Without add-on	A	]E0
	With 2 digits add-on	A	]E3
	With 5 digits add -on	A	]E3
UPC-A COMPOSITE	Without add-on	A	]X0
	With 2 digits add-on	A	]X3
	With 5 digits add -on	A	]X3
EAN-8	Without add-on	B	]E4
	With 2 digits add-on	B	]E5
	With 5 digits add -on	B	]E6
EAN-8 COMPOSITE	Without add-on	B	]E4
	With 2 digits add-on	B	]E5
	With 5 digits add -on	B	]E6
UPC-E	Without add-on	C	]X0
	With 2 digits add-on	C	]X3
	With 5 digits add -on	C	]X3
UPC-E COMPOSITE	Without add-on	C	]X0
	With 2 digits add-on	C	]X3
	With 5 digits add -on	C	]X3
Interleaved 2 of 5（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
GS1-128 COMPOSITE（EAN-128 COMPOSITE）		W	]em
GS1 DataBar（RSS）		R	]em
GS1 DataBar COMPOSITE（RSS COMPOSITE）		R	]em

*1: The codes with more than 4 digits are read for ITF.

*2: CODE MARK Type 2 is the Code Mark system that is compliant with “Guidelines on Symbology Identifiers” by AIM USA . Suffix “m” differs from the data format of bar code system, as shown in the table below.

e.g.）]I1]：Flag Character (ASCII 93)
I：Code Character (ITF)
1：Modifer Character (tabel below)

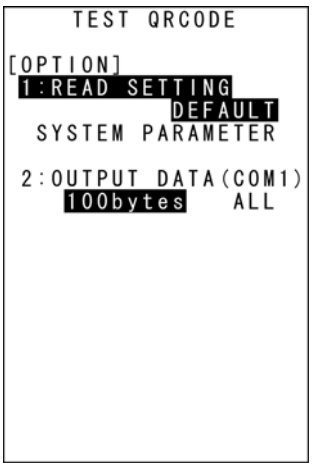
For example, ITF is set to read “with C/D, code mark is “]I1”

Code type		Modifer Character	Comment
2D Code			
	QR Code	**0**	**model1**
		1	**Model 2**
		3	**model2（The first character from the start code is FNC1）**
	iQR Code	**A**	**The first character fromt the start code doesnt include FNC1.**
		C	**The first character from the start code is FNC1.**
	MaxiCode	**0**	**mode4、mode5**
		1	**mode2、mode3**
	Data Matrix	**1**	**ECC-200**
		2	**ECC-200（The 5th character from the start code is FNC1）**
		3	**ECC-200（The 2nd or 6th characters from the start codeis FNC1）**
Bar code			
	Interleaved 2of5（ITF）	**0**	**Read without C/D**
		1	**Read without C/D C/D**
	Code 39	**0**	**Read without C/D**
		1	**Read without C/D**
	Codabar（NW-7）	**0**	**Read without C/D**
		1	**Read without C/D**
	Code 128	**0**	**The 1st and 2nd characters from the start code doesnt include FNC1.**
		2	**The 2nd character from the start code is FNC1**

C/D：check digits

*3: The code types that are not compliant with with “Guidelines on Symbology Identifiers” by AIM USA use the Code mark Type 1.

◆ Setting the Code Scanning Test Options



When performing the code scanning test, press the **F1** key to display the screen on the right, allowing code scanning test options to be set.
The highlighted setting will be the current settting.

To make changes, use the cursor keys （[▲][▼]） or numerical keys （[1][2]） to highlight the setting item, and then highlight the setting values using the cursor keys ([◄] [►]).

Press the **ENT** key or **BS/C** key to return to the Code scanning test menu.

“1：READ SETTING”：

Set the scanning conditions for code scanning test.

「DEFAULT」：Read under default scanning conditions.

「SYSTEM PARAMETER」：Specify scanning conditions with system setting values. Specifying with the system setting value enables to set the detailed scanning conditions. Refer to the “The function to assign scan settings with the system settings” in “4.5.6. [4] Setting the code scanning parameters” for setting of the system setting value.

Codes that permit to read with “DEFAULT”settings
QR Code（model 1, model 2, Micro QR Code）
PDF417, Micro PDF417
MaxiCode
Data Matrix
Composite
EAN-13, UPC-A *1
EAN-8 * 2
UPC-E *1
Interleaved 2 of 5 （ITF） * 2
Codabar（NW-7）
Code 39
Code 93
Code 128、GS1-128（EAN-128）
RSS（GS1 DataBar）

*1: Exclude “with add-on”。

*2: The codes with more than 4 digits are read for ITF.

— **Point** — When EAN/UPC Code with add-on or multiline code is read under the code scanning test, set the system setting value prior to setting of the “SYSTEM PARAMETER”

“2：OUTPUT DATA(COM1)”：

Under the code scanning test, code marks, digit numbers and the data, which are read from infared communication ports when reading codes, are output. Use the values set at section 4.5.6 [5] “Setting the communication environment” for the communication speed. The setting enables to limit the size of the output data.

“100bytes”：Output data is limited to 100 bytes.

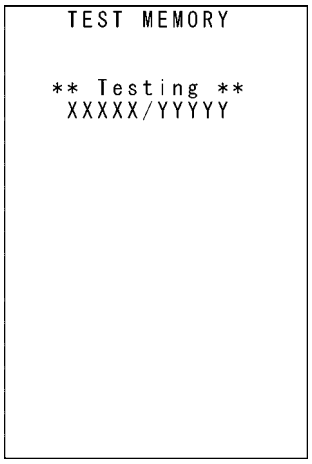
“ALL”： The data read are output entirely

[2] Memory test

Use the following procedure to perform a memory test.

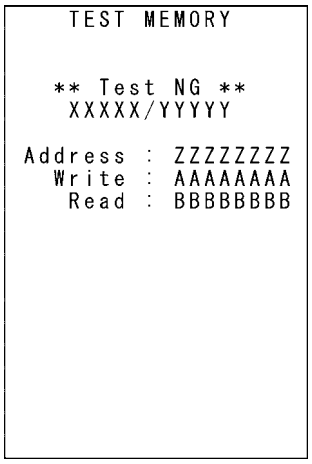
1. Select “2: MEMORY” at the TEST menu and then press the **ENT** key.

The screen on the right displays, 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)

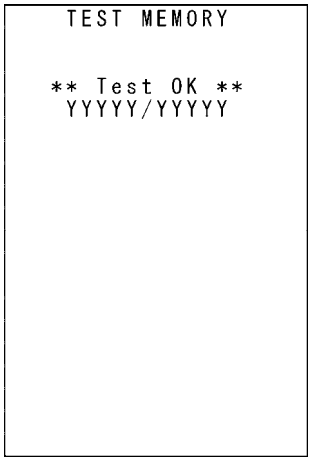
If any error is detected, the BHT speaker beeps three times, displays a message similar to that shown on the right, and aborts the memory test.



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

Press the **BS/C** key to return to the TEST menu.

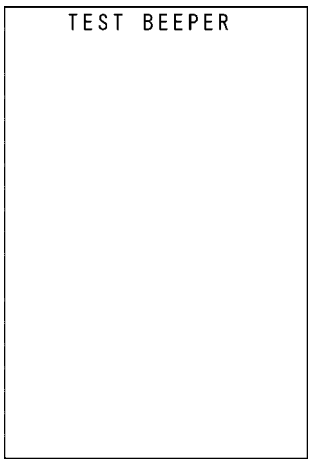
Upon normal completion of the RAM test, the BHT speaker beeps once, displays a message similar to that shown on the right, and returns to the TEST menu.



[3] Scale test

Use the following procedure to perform a scale test.

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



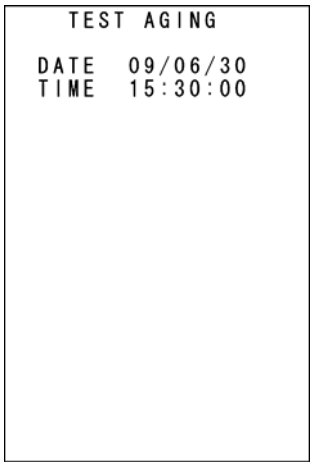
The screen on the right displays, and the beeper sounds at the three octaves listed below.
Upon completion of this test, the BHT automatically returns to the TEST menu.

To stop the speaker 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 **BS/C** 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.

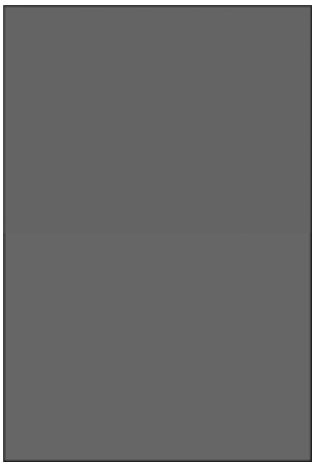
1. Select “5: LCD” at the TEST menu and then press the **ENT** key.

The TEST BEEPER screen on the right displays.
The indicator LED is OFF at this time.
Press the **BS/C** 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 **BS/C** key to return to the previous screen.
Press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously to return to the TEST menu.



3. Press the **ENT** key.

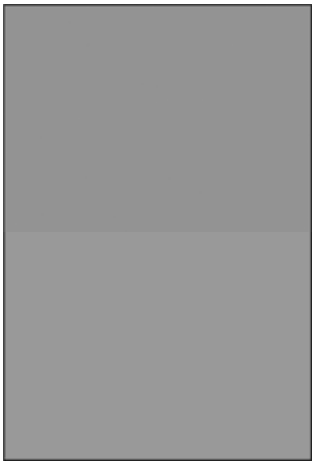
The entire screen turns gray.

Press the **BS/C** key to return to the previous screen.
Press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously to return to the TEST menu.

4. Press the **ENT** key.

The entire screen turns a lighter shade of gray.

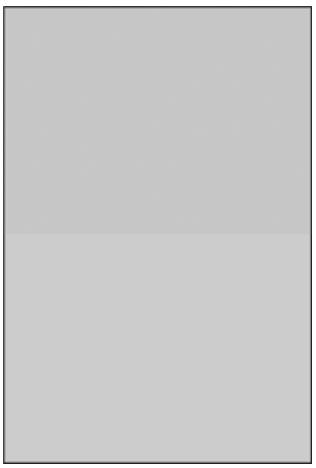
Press the **BS/C** key to return to the previous screen.
Press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously to return to the TEST menu.



5. Press the **ENT** key.

The entire screen turns an even lighter shade of gray.

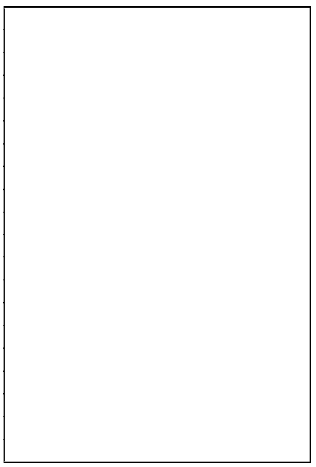
Press the **BS/C** key to return to the previous screen.
Press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously to return to the TEST menu.



6. Press the **ENT** key.

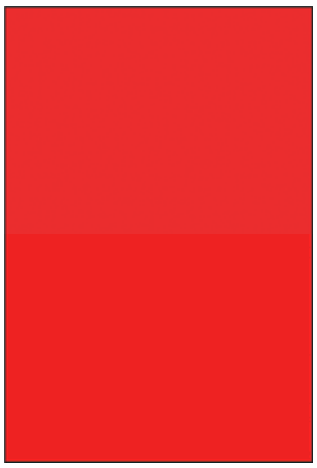
The entire screen turns white.

Press the **BS/C** key to return to the previous screen.
Press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously to return to the TEST menu.



7. Press the **ENT** key.

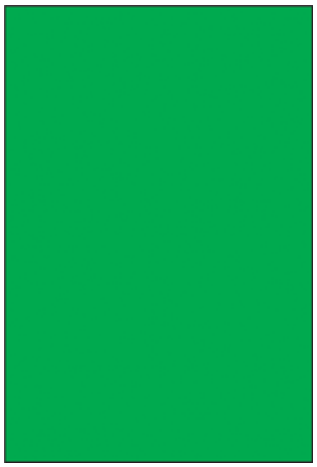
The entire screen turns red, and at the same time, the indicator LED turns red.



Press the **BS/C** key to return to the previous screen.
Press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously to return to the TEST menu.

8. Press the **ENT** key.

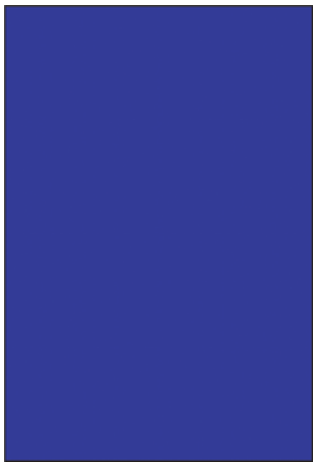
The entire screen turns green, and at the same time, the indicator LED turns green.



Press the **BS/C** key to return to the previous screen.
Press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously to return to the TEST menu.

9. Press the **ENT** key.

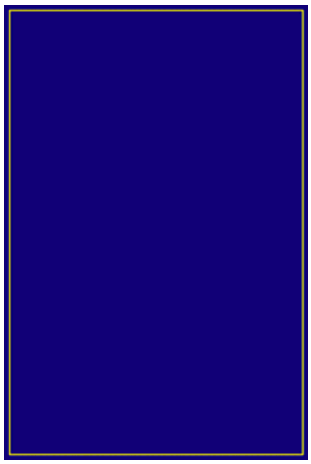
The entire screen turns blue, and at the same time, the indicator LED turns blue.



Press the **BS/C** key to return to the previous screen.
Press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously to return to the TEST menu.

10. Press the **ENT** key.

A 1-dot thick frame displays around the screen.



Press the **BS/C** key to return to the previous screen.
Press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously to return to the TEST menu.

11. Press the **ENT** key.

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

[6] File test

The file test allows detailed information on program files, data files, audio files (*.WAV), and image files(*.JPG) to be checked. In addition, pressing the M1 key sorts the files.

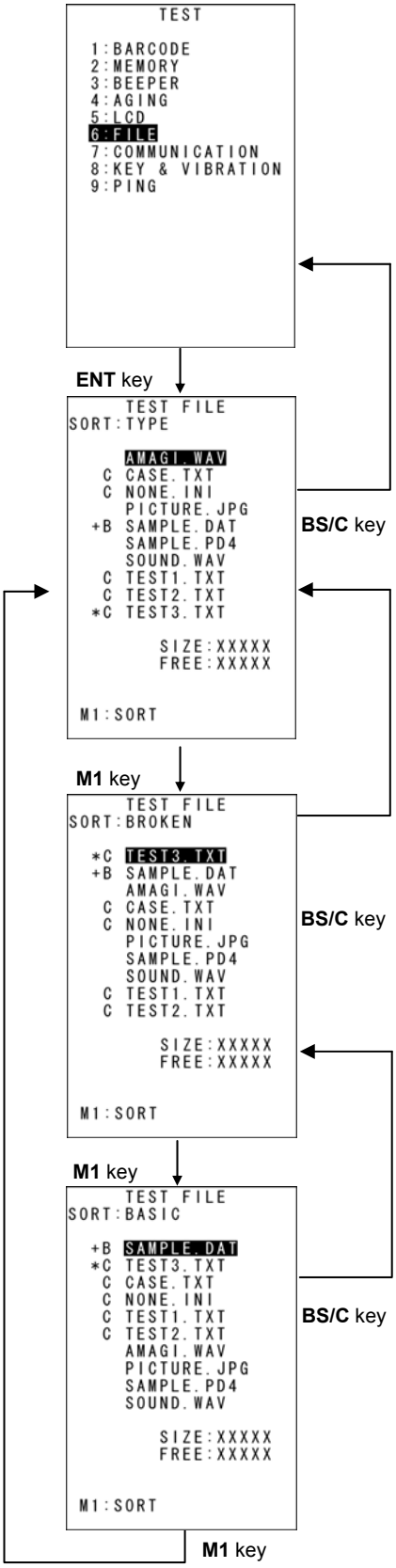
1. Select “6: FILE” at the TEST menu and then press the **ENT** key.

The right screen is displayed. If any of the stored files are broken, an asterisk (*) or plus sign (+) is prefixed to the name of the defective file (s).
Refer to [About “$$BRKLST.SYS”] of “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 following order: “B：BASIC files”, “C: C data files”, 「None: Shared files and program files.”



— **Point** —
- When a file contains an abnormality, the file must be deleted, or overwritten with a file of the same name.
- Even files containing abnormalities can be uploaded with the upload menu. It is recommended to delete important files after uploading.

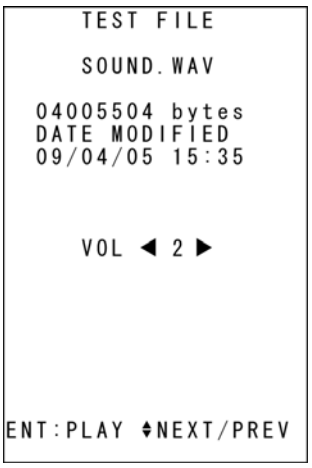
2. Select a file, and then press the **ENT** key.

The selected file will be set, and then the menu will return to the previous screen.
Press the **BS/C** key to return to the previous screen.
When returning to the previous screen, the selected item will be highlighted.

◆ Media files (*.WAV)

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

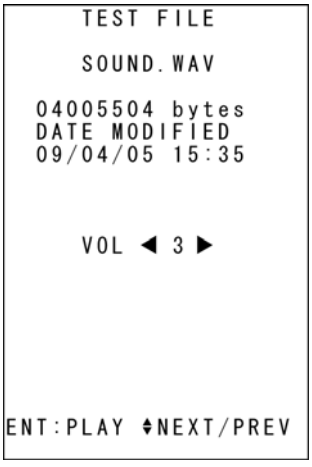
The screen to the right will appear, displaying the file size and creation date.



2. Press the **F1** key to play the file.

Press the **F1** key while the file is playing to stop the file, and return to the previous screen.

Use the cursor keys ([◄] [►]) to adjust the volume. The volume can be adjusted in four levels from 0 (minimum) to 3 (maximum.)



◆ Media files (*.JPG)

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

The screen to the right will appear, displaying the file size, creation date, and a preview image.

2. Press the **F1** key to display the image in full screen.

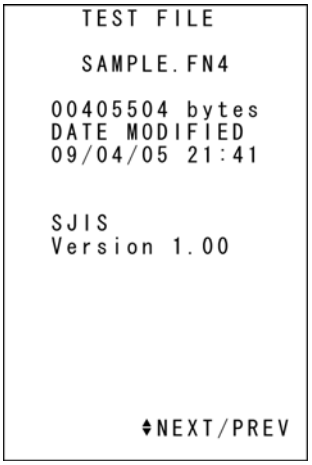
If the actual image is larger than the screen, the image will be displayed at the actual size centered on the top left of the screen.
Press any key to return to the previous screen.

If the actual image size is smaller than the preview size, the image will be displayed at the original size.

◆ Font files (*.FN3/FN4)

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

Press the **BS/C** 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 **BS/C** key to return to the previous screen.

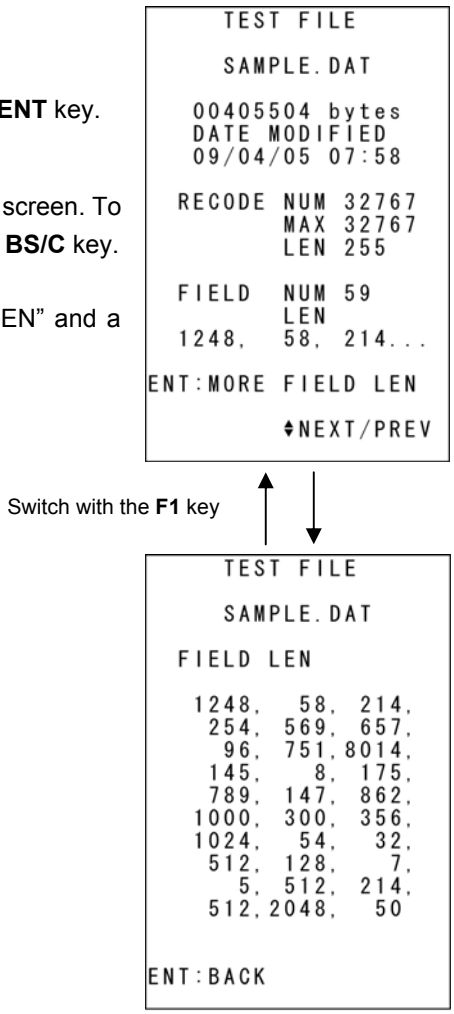
If the version cannot be acquired, the screen to the right will display.

◆ Other files (*.DAT, *.TXT, etc.)

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

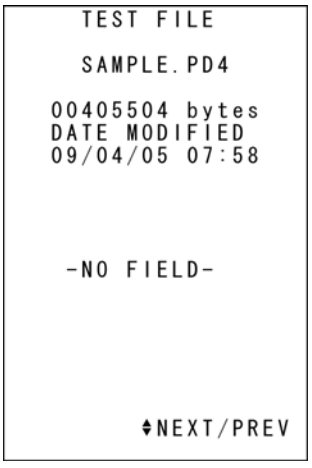
If field information is available, press the **F1** key to display the next screen. To return to the previous screen, press the **F1** key again, or press the **BS/C** key.

In addition, when there are four or more fields, “MORE FIELD LEN” and a guide will display.



If field information is not available, the screen to the right will display.

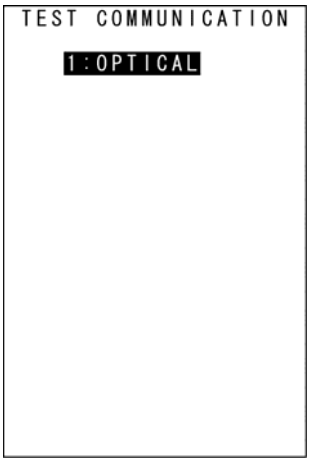
Press the **BS/C** key to return to the previous screen.



[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 shown on the right displays.

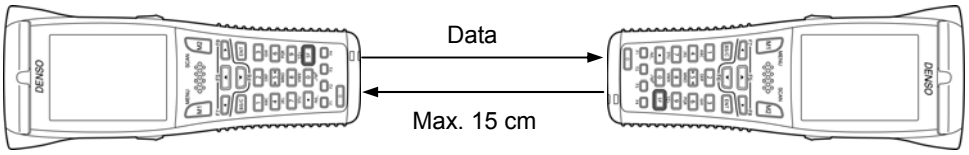
“1: OPTICAL”: Performs an infrared communication test.

Refer to the following section for details of the above items.
Press the **BS/C** 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.

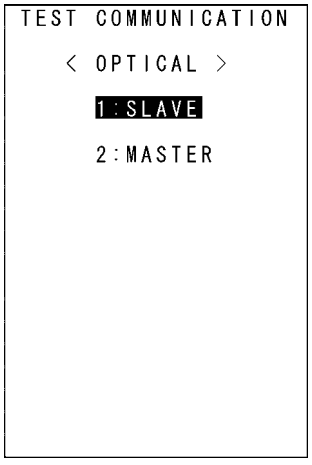
This test involves transmitting data from the test BHT and the master BHT returning the data to the test BHT.



Master BHT

Slave BHT
(to be tested)

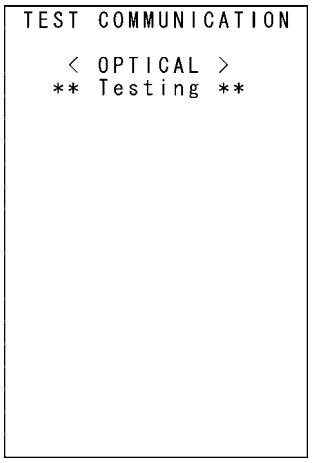
2. Select “1: OPTICAL” at the TEST COMMUNICATION menu and then press the **ENT** key.



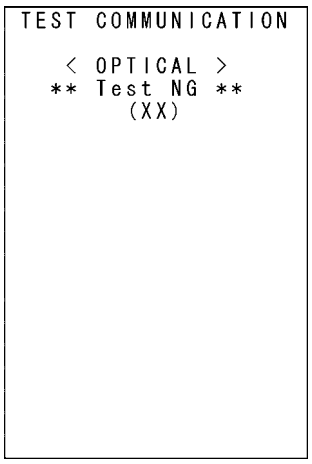
The TEST COMMUNICATION screen displays as shown on the right.

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 on the right displays during the test, and an infrared communication test is performed.



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



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

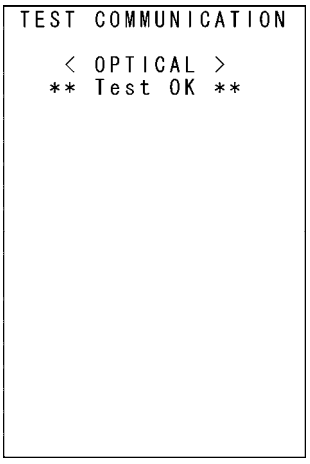
(XX)

- 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

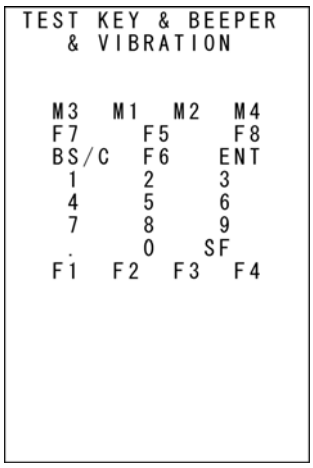
Press the **BS/C** key to return to the TEST COMMUNICATION menu.
The master BHT automatically returns to the TEST COMMUNICATION menu 10 seconds after the occurrence of an error.

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



[8] Key-entry, speaker and vibrator test

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

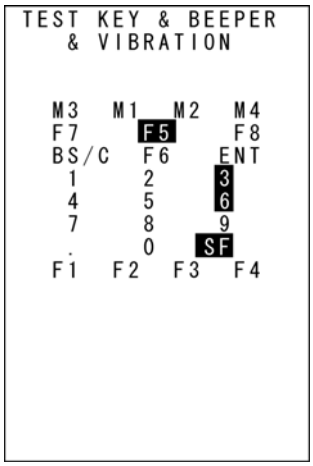


1. Select “8: KEY & VIBRATION” at the TEST menu and then press the **ENT** key.

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

2. Press the **ENT** key.

Pressing individual keys displays the identifier letters in the positions pre-assigned to those keys on the LCD, as well as sounding the speaker 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.

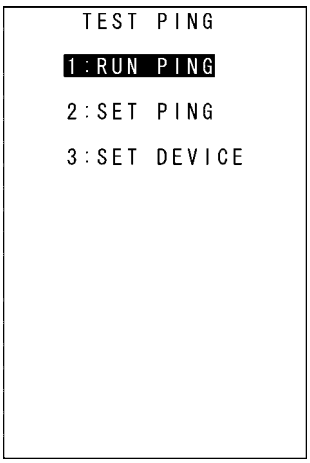
4. Repeat the above operation to display all keys on the screen.

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 perform a PING test.

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



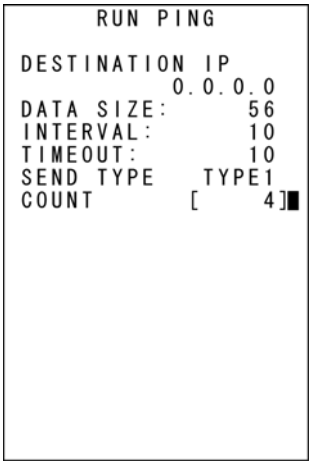
The TEST PING screen displays as shown on the right.

“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 **BS/C** key to return to the TEST menu.

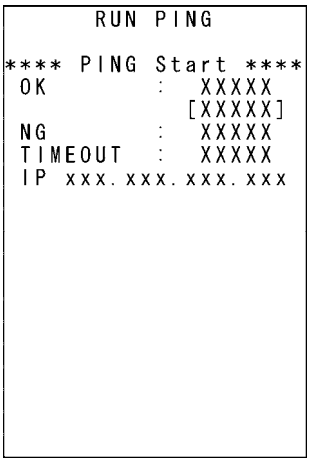
◆ “1: RUN PING” (PING Test Screen)

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



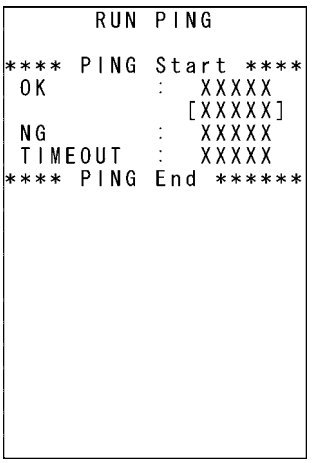
The current setting values display, and the BHT waits for the transmission count to be entered.
To change the number of echo requests displayed, enter the desired value using the numerical keys.
To delete a single character, press the **BS/C** key. To delete the entire entry, press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

2. Press the **ENT** key.



When the PING test starts running, the message shown on the right displays.
Press the **BS/C** key to abort the PING test.

Upon completion of the PING test, the screen on the right displays.



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)

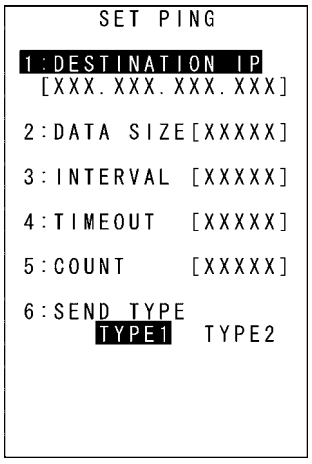
Waiting:	Setting up the PING test.
Opening device:	Opening devices.
Routing TCP/IP:	Connecting to the TCP/IP communication pathway.
PING start:	Starting the PING test.
Device error:	Failed to open a device.
TCP/IP error:	Failed to connect to the TCP/IP communication pathway.

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 numerical 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 numerical keys and dot key.

To delete a single character, press the **BS/C** key. To delete the entire entry, press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

4. Enter the setting values and then press the **ENT** key.

Press the **BS/C** 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

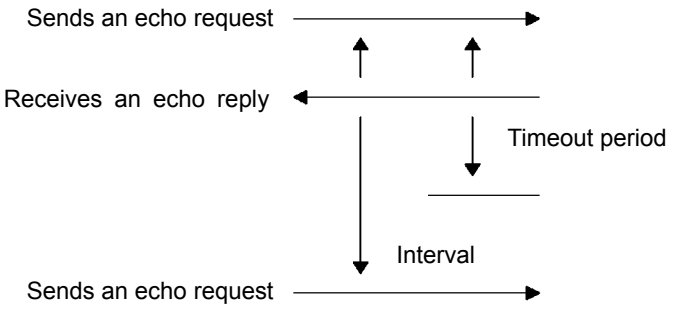
* Specifying zero (0) will set the number of echo requests to "infinite," meaning that echo requests will be sent continuously until the PING test is aborted.
If a value outside the allowable entry range listed above is specified, the nearest value within the range will automatically be applied.

PING Echo Request Transmission Timing (SEND TYPE)

Two types of echo request send timings are available: TYPE 1 and TYPE 2.

ν TYPE1

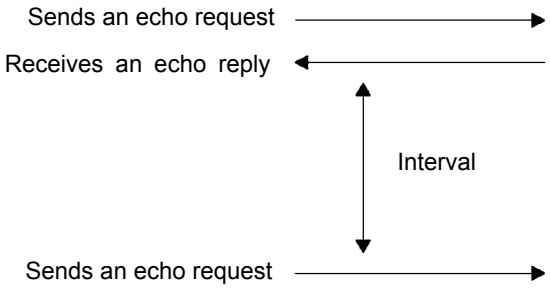
After sending an echo request, PING waits for the period specified at INTERVAL and then sends an echo request again. For TYPE 1, the relationship between the INTERVAL and TIMEOUT should be "INTERVAL ≥ TIMEOUT."



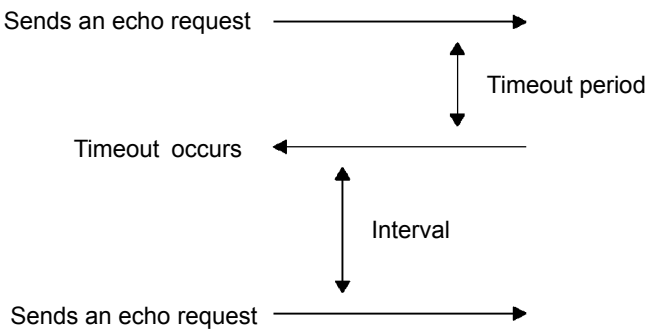
ν TYPE2

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:



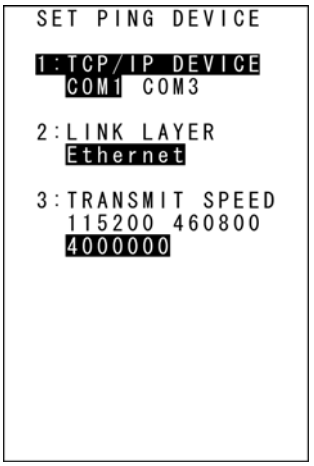
If a timeout occurs:



◆ "3: SET DEVICE" (PING Device Setting Screen)

3. 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 **BS/C** 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.

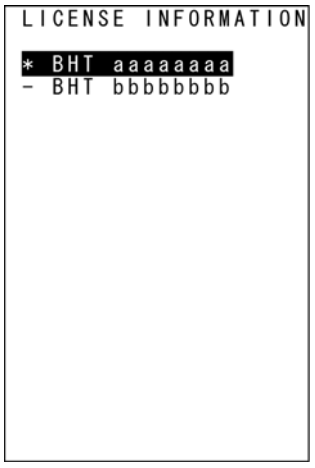
The SYSTEM INFORMATION screen on the right displays.

[SYSTEM Ver.]:	System program version
[ROM SIZE]:	ROM size
[SYSTEM MESSAGE]:	System message version
[FONT]:	Loaded font type and version

Press the **BS/C** key to return to the SYSTEM MENU.

◆ License List

Press the **F1** key at the LICENCE 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 **BS/C** 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 key

2. Press the **BS/C** 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 key

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 **BS/C** key to return to the LICENSE INFORMATION screen.

[2] CU-811 System Information Display

Use the following procedure to display CU-811 system information.

1. Place the BHT on the CU-811.

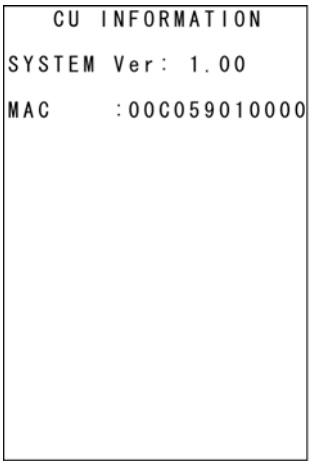
2. Select “6: VERSION” at the SYSTEM MENU and then press the **ENT** key.

The SYSTEM INFORMATION screen on the right displays.

3. Press the **M2** key.

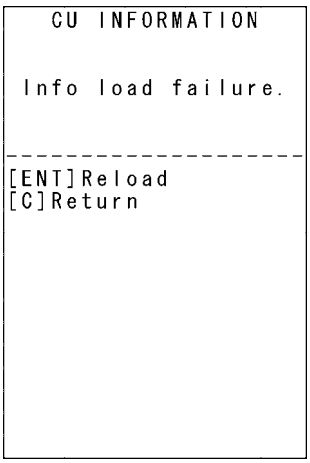
The CU-811 INFORMATION screen displays.

[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-811, the screen on the right displays.

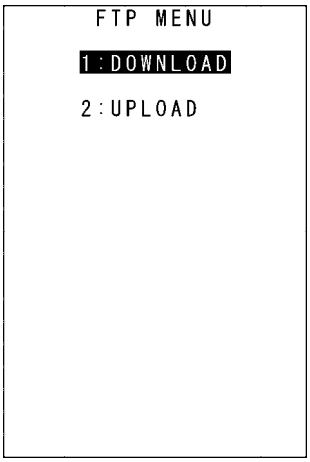


Press the **BS/C** key to return to the SYSTEM INFORMATION screen.

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.



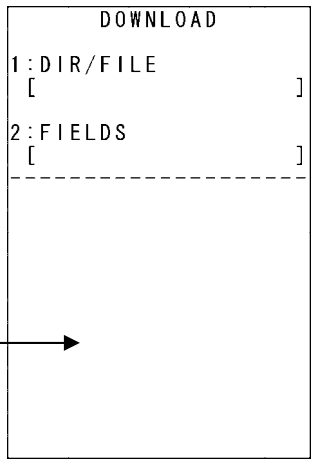
The FTP MENU screen on the right displays.

“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 **BS/C** 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.

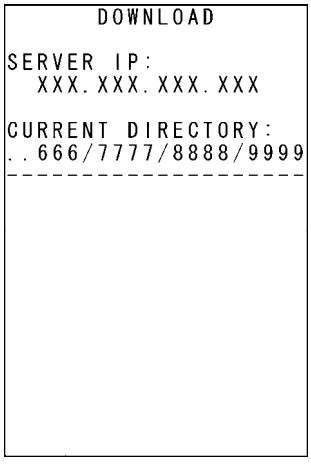


The screen on the right displays.

[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 numerical keys and dot key.

Press the **SF** and the **BS/C** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry,
press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

4. Enter a setting value and press the **ENT** key.

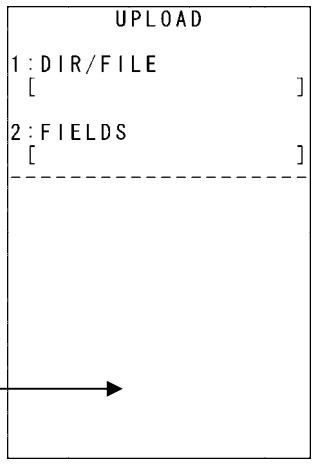
Press the **BS/C** key to return to the FTP MENU screen.

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 numerical 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.

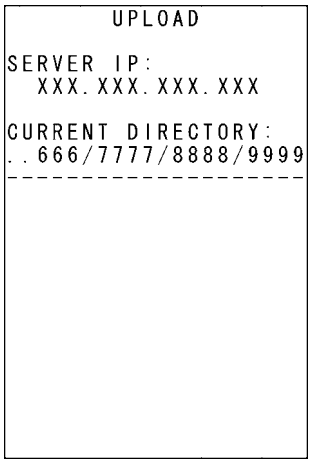


The screen on the right displays if uploadable files exist.

[1: DIR/FILE]:
Entry box for the directory and/or file name
[2: FIELDS]:
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.

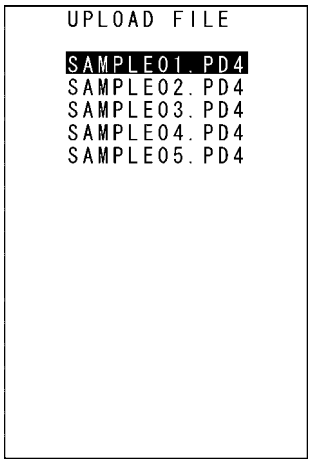
2. Use the cursor keys ([▲] [▼]) to highlight the item to be set, and then press the **ENT** key.

◆ 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 numerical keys and dot key.

Press the **SF** and the **BS/C** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry, press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

◆ When “2: SELECT FILE” is Selected



The screen on the right displays.
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 **BS/C** key to return to the FTP MENU screen.

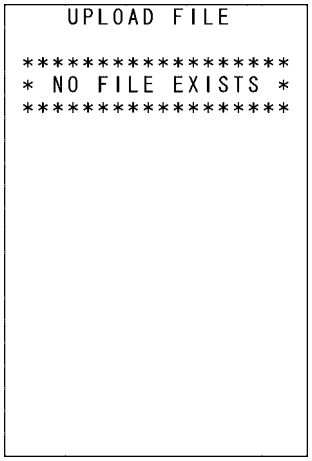
DIR/FILE entry box: The FTP client will interpret a character string entered into this box as a directory name at first, and will therefore send a Change Directory request to the FTP server. If the specified directory exists in the FTP server, the server will change a directory from the default to the 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 **BS/C** 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 Wireless Communcation Settings (DEVICE MENU)

Use the following procedure to set up wireless communication.

1. Select “8: DEVICE” in the SYSTEM MENU and then press the **ENT** key.

The DEVICE MENU screen on the right is displayed.

2. Select “WLAN” in the DEVICE MENU and then press the **ENT** key.

The RF MENU screen on the right is displayed.

[1: PARAMETER]: Sets up the wireless parameter.
[2: SITE SURVEY]: Sets up the site survey.
[3: VERSION]: Displays the wireless version.

Refer to the following section for details of the above menus.
Press the **BS/C** key to return to the SYSTEM MENU.

[1] Wireless parameter menu (RF MENU)

1. Select “1: PARAMETER” in the RF MENU and then press the **ENT** key.

The SET RF PARAMETER screen on the right is displayed.

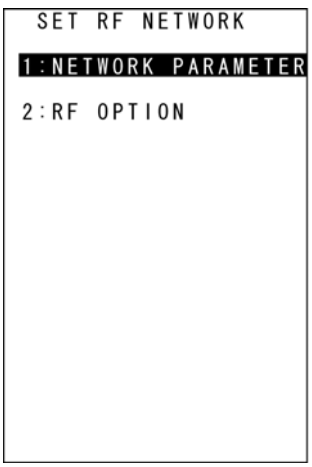
[1: RF NETWORK]: Sets up the wireless network.
[2: SECURITY]: Sets up the wireless security.
[3: INITIALIZE]: Ilitializes the wireless parameter.

Refer to the following section for details of the above menus.
Press the **BS/C** key to return to the RF MENU screen.

◆ Wireless Network Settings Menu

1. Select “1: RF NETWORK” in the SET RF PARAMETER menu and then press the **ENT** key.

The SET RF NETWORK screen on the right is displayed.

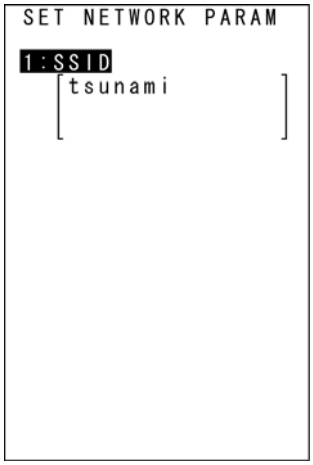


[1: NETWORK PARAMETER]: Sets up wireless network parameter.
[2: RF OPTION]: Sets up wireless network option.

Refer to the following section for details of the above items.
Press the **BS/C** key to return to the SET RF PARAMETER screen.

◆ Wireless Network Parameter Settings

1. Select "1: NETWORK PARAMETER" in the SET RF NETWORK menu and then press the **ENT** key.



The screen on the right is displayed.

[1: SSID]: Displays the current Service Set ID.

Refer to "Chapter 5 Communication" – "5.2 Wireless Communication" for details on the Service Set ID.

2. Ensure that [1: SSID] is highlighted and press the **ENT** key.

The mode changes to entry mode and the cursor is displayed.

3. Use the numerical keys and dot key to enter the Service Set ID.

Press the **SF** and the **BS/C** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry, press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

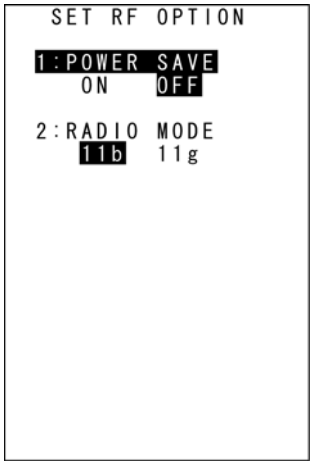
4. Enter the Service Set ID and press the **ENT** key.

The entered Service Set ID is set.

5. Press the **BS/C** key to return to the SET RF NETWORK screen.

◆ Wireless Network Option Settings

1. Select "2: RF OPTION" in the SET RF NETWORK menu and then press the **ENT** key.



The screen on the right is displayed.
The highlighted settings are the current settings.

[1: POWER SAVE]: Sets us power saving mode.
[2: RADIO MODE]: Sets us the wireless mode.

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to highlight the item to be set.

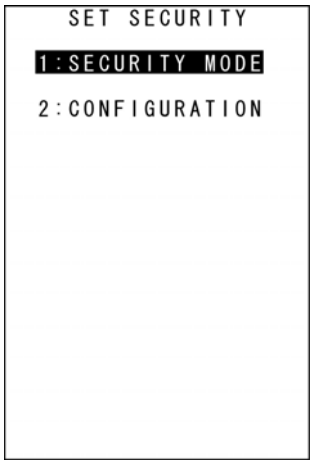
3. Use the cursor keys ([◄] [►]) to highlight each setting value.

4. Press the **ENT** key or **BS/C** key to return to the SET RF NETWORK menu.

Refer to "Chapter 5 Communication" – "5.3 Bluetooth Wireless Communication" for details of the above setting items.

◆ Wireless Security Settings

1. Select “2: SECURITY” in the SET RF PARAMETER menu and then press the **ENT** key.



The screen on the right is displayed.

[1:SECURITY MODE]: Sets up the wireless security mode.
[2:CONFIGURATION]: Sets up the wireless security parameters.

Refer to the following section for details of the above items.
Press the **BS/C** key to return to the SET RF PARAMETER screen.

◆ Wireless Security Mode Settings

1. Select “1: SECURITY MODE” in the SET SECURITY menu and then press the **ENT** key.

The screen on the right is displayed.
The highlighted setting is the current setting.

[1: None]: None mode
[2: 1x Supplicant]: 1x Supplicant mode
[3: WPA-1x]: WPA 1x mode
[4: WPA-PSK]: WPA-PSK mode
[5: WPA2-1x]: WPA2-1x mode
[6: WPA2-PSK]: WPA2-PSK mode

2. To change the settings, use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4] [5] [6]) to highlight each setting value.

3. Press the **ENT** key or **BS/C** key to return to the SET SECURITY menu.

◆ Wireless Security None Mode

WEP can be used with the Wireless security None mode.
To enable WEP, WEP and WEP KEY settings are required.
The first WEP KEY setting is the encryption key, which can be set from WEP KEY 1 to 4.
After setting the encryption key, the encryption key used is specified by setting the TRANSMIT KEY.
Refer to “Chapter 5 Communication” – “5.2 Wireless Communication” for details of the WEP KEY and TRANSMIT KEY.

1. Select “2: CONFIGURATION” in the SET SECURITY menu and then press the **ENT** key.

The screen on the right is displayed.

[1: WEP OPTION]: WEP option settings
[2: WEP KEY1]: WEP KEY 1 settings
[3: WEP KEY2]: WEP KEY 2 settings
[4: WEP KEY3]: WEP KEY 3 settings
[5: WEP KEY4]: WEP KEY 4 settings
[6: TRANSMIT KEY]: TRANSMIT KEY settings

Press the **BS/C** key to return to the SET SECURTIY menu

2. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: WEP OPTION], and then press the **ENT** key.

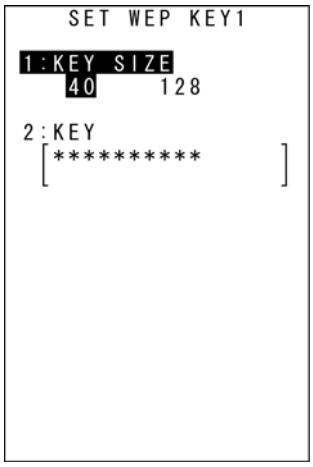
The screen on the right is displayed.

[1: WEP]: Selects whether to enable or disable WEP.
The highlighted setting is the current setting.

[2: AUTHENTICATE]: Selects open system settings or shared key authentication.
Select shared key authentication.
The highlighted setting is the current setting.

3. Press the **ENT** key or **BS/C** key to return to the SECURITY CONFIG menu.

4. Use the cursor keys ([▲] [▼]) or numerical keys ([2] [3] [4] [5]) to highlight a WEP KEY from 1 to 4, and then press the **ENT** key.



The screen on the right displays.

[1: KEY SIZE]:
Select 40 (40 bits) or 128 (128 bit).
The highlighted setting is the current setting.
When no encryption key has been set, 40 will be highlighted.

[2: KEY]:
The key size "*" displays.

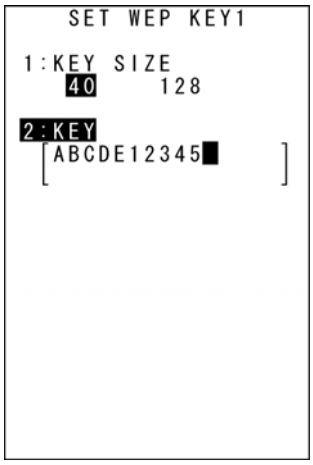
5. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: KEY SIZE], and then use the cursor keys ([◄] [►]) to select either 40 (40 bit) or 128 (128 bit).

Select 40 bit for a 10-digit encryption key.
Select 128 bit for a 26-digit encryption key.

6. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: KEY], and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

7. Use the numerical keys to enter an encryption key and then press the **ENT** key.



Hexadecimal notation (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F) is used for the encryption key.

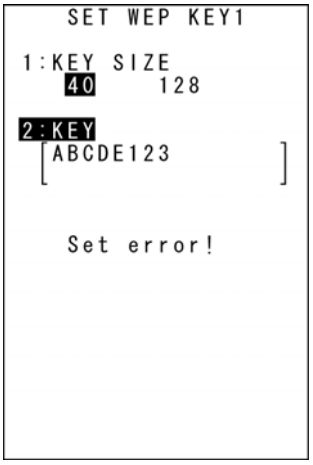
Press the **SF** and the **BS/C** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry, press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

The existing key can be overwritten, however, cannot be edited or deleted.
The screen on the right shows an example in which "40 bit" has been set for "WEP KEY1" and the key setting is "ABCDE12345".

8. Press the **BS/C** key to return to the SECURITY CONFIG menu.

- Point - It is not possible to read a written WEP key, and therefore the WEP key setting must always be stored in a safe location. When not setting a WEP key, the WEP key will be the same as the previous setting.

If an attempt is made to save an incorrect encryption key, and error will occur, and the screen on the right displays.
Reset with a correct encryption key.



Incorrect Encryption Key Examples

- The encryption key length is incorrect.
- Characters other than hexadecimal notation (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F) are used.

Repeat the above procedure to set the required number of encryption keys for WEP KEY 1 to 4.
Following that, set the transmit key.

9. Use the cursor keys ([▲] [▼]) or numerical key ([6]) to highlight [6: TRANSMIT KEY], and then press the **ENT** key.

The screen on the right displays.

10. Use the cursor keys ([◄] [►]) to highlight the key number to be used.

- Point - Select a key number for which an encryption key has been set.

11. Press the **ENT** key or **BS/C** key to return to the SECURITY CONFIG menu.

◆ Wireless Security 1x Supplicant Mode

EAP authentication can be used with wireless security 1x Supplicant mode.

1. Select “2: CONFIGURATION” at the SET SECURITY menu and then press the **ENT** key.

The screen on the right displays.

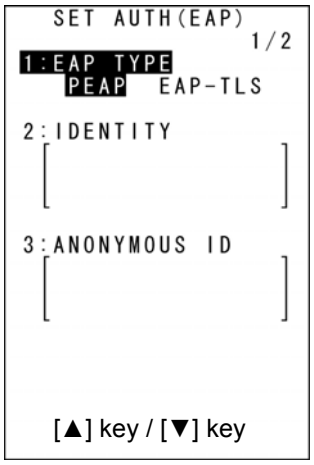
[1: AUTH PARAM (EAP)]: EAP authentication parameter setting

Press the **BS/C** key to return to the SET SECURITY menu.

2. Ensure that [1: AUTH PARAM (EAP)] is hightlighted and then press the **ENT** key.

The screen on the right displays.

[1: EAP TYPE]: Selects PEAP or EAP-TLS.
[2: IDENTITY]: ID
[3: ANONYMOUS ID]: Anonymous ID
[4: PASSWORD]: Password
[5: ROOT CERT]: Root certificate
[6: CLIENT CERT]: Client certificate

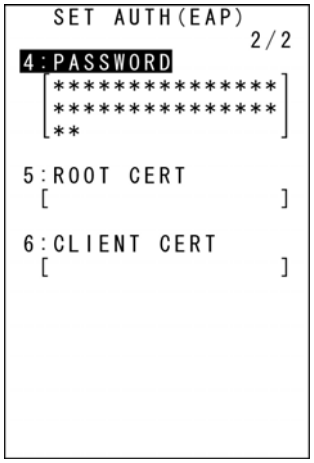


3. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: EAP TYPE], and then use the cursor keys ([◄] [►]) to select PEAP or EAP-TLS.

If PEAP is selected, a root certificate is used.
If EAP-TLS is selected, a root certificate and client certificate are used.

4. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: IDENTITY] and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.



5. Use the numerical keys to enter an ID and press the **ENT** key.

Press the **SF** and the **BS/C** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry,
press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

6. Use the cursor keys ([▲] [▼]) or numerical key ([3]) to highlight [3: ANONYMOUS ID] and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

7. Use the numerical keys to enter an ID and press the **ENT** key.

Press the **SF** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry,
press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

8. Use the cursor keys ([▲] [▼]) or numerical key ([4]) to highlight [4: PASSWORD] and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

9. Use the numerical keys to enter a password and press the **ENT** key.

Press the **SF** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry,
press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

10. Use the cursor keys ([▲] [▼]) or numerical key ([5]) to highlight [5: ROOT CERT] and then press the **ENT** key.

The screen on the right displays.

Use the cursor keys ([▲] [▼]) to select a file name.
A “NO FILE EXISTS” message displays if no files exist.

11. Use the cursor keys ([▲] [▼]) or numerical key ([6]) to highlight [6: CLIENT CERT] and then press the **ENT** key.

The same screen as that for [5: ROOT CERT] displays.
Use the cursor keys ([▲] [▼]) to select a file name.
A “NO FILE EXISTS” message displays if no files exist.

12. Press the **BS/C** key to return to the SECURITY CONFIG menu.

◆ Wireless Security WPA-1x Mode

EAP authentication and an encryption system can be used with wireless security WPA-1x mode.

1. Select “2: CONFIGURATION” at the SET SECURITY menu and then press the **ENT** key.

The screen on the right displays.

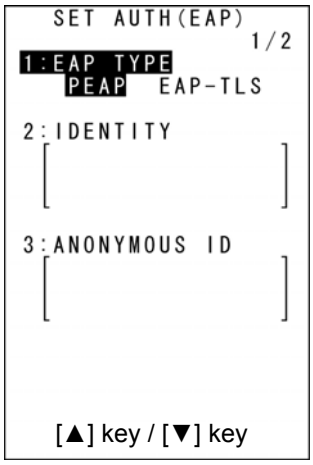
[1: AUTH PARAM (EAP)]: EAP authentication parameter setting
[2: WPA CIPHER]: Encryption system setting

Press the **BS/C** key to return to the SET SECURITY menu.

2. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: AUTH PARAM (EAP)] and then press the **ENT** key.

The screen on the right displays.

[1: EAP TYPE]: Selects PEAP or EAP-TLS.
[2: IDENTITY]: ID
[3: ANONYMOUS ID]: Anonymous ID
[4: PASSWORD]: Password
[5: ROOT CERT]: Root certificate
[6: CLIENT CERT]: Client certificate

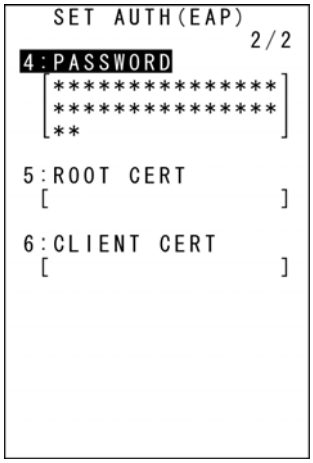


3. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: EAP TYPE], and then use the cursor keys ([◄] [►]) to select PEAP or EAP-TLS.

If PEAP is selected, a root certificate is used.
If EAP-TLS is selected, a root certificate and client certificate are used.

4. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: IDENTITY] and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.



5. Use the numerical keys to enter an ID and press the **ENT** key.

Press the **SF** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry,
press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

6. Use the cursor keys ([▲] [▼]) or numerical key ([3]) to highlight [3: ANONYMOUS ID] and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

7. Use the numerical keys to enter an ID and press the **ENT** key.

Press the **SF** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry,
press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

8. Use the cursor keys ([▲] [▼]) or numerical key ([4]) to highlight [4: PASSWORD] and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

9. Use the numerical keys to enter a password and press the **ENT** key.

Press the **SF** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry,
press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

10. Use the cursor keys ([▲] [▼]) or numerical key ([5]) to highlight [5: ROOT CERT] and then press the **ENT** key.

The screen on the right displays.

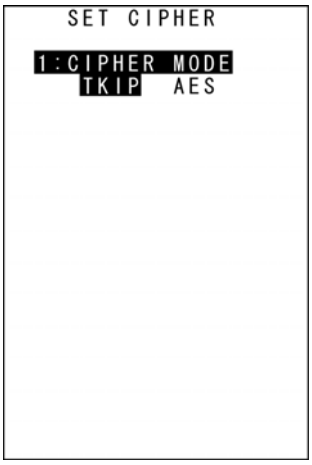
Use the cursor keys ([▲] [▼]) to select a file name.
A “NO FILE EXISTS” message displays if no files exist.

11. Use the cursor keys ([▲] [▼]) or numerical key ([6]) to highlight [6: CLIENT CERT] and then press the ENT key.

The same screen as that for [5: ROOT CERT] displays.
Use the cursor keys ([▲] [▼]) to select a file name.
A “NO FILE EXISTS” message displays if no files exist.

12. Press the **BS/C** key to return to the SECURITY CONFIG menu.

13. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: WPA CIPHER] and then press the **ENT** key.



The screen on the right displays.

[1: CIPHER MODE]: Selects TKIP or AES.

14. Ensure that [1: CIPHER MODE] is highlighted and then select TKIP or AES.

Select TKIP to use TKIP.
Select AES to use AES.

15. Press the **ENT** key or **BS/C** key to return to the SECURITY CONFIG menu.

◆ Wireless Security WPA-PSK Mode

PSK authentication and an encryption system can be used with wireless security WPA-PSK mode.

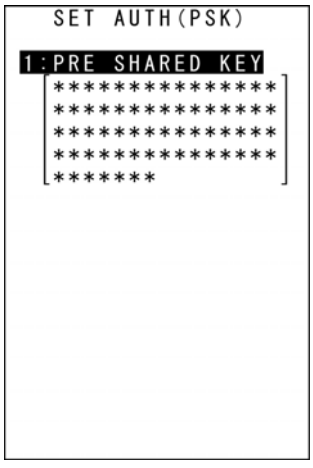
1. Select “2: CONFIGURATION” at the SET SECURITY menu and then press the **ENT** key.

The screen on the right displays.

[1: AUTH PARAM (PSK)]: PSK authentication parameter setting
[2: WPA CIPHER]: Encryption system setting

Press the **BS/C** key to return to the SET SECURITY menu.

2. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: AUTH PARAM (PSK)] and then press the **ENT** key.



The screen on the right displays.

[1:PRE SHARED KEY]: Sets the shared key.

3. Ensure that [1: PRE SHARED KEY] is highlighted and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

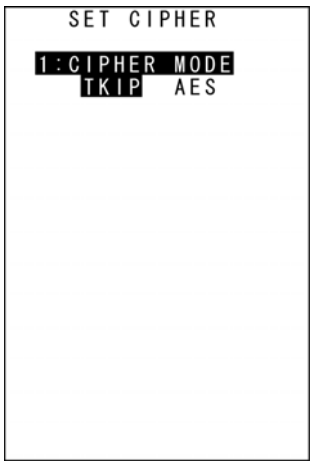
4. Use the numerical keys to enter a shared key and press the **ENT** key.

Press the **SF** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry,
press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

5. Press the **BS/C** key to return to the SET RF PARAMETER menu.

6. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: WPA CIPHER] and then press the **ENT** key.

The screen on the right displays.



[1: CIPHER MODE]: Selects TKIP or AES.

7. Ensure that [1: CIPHER MODE] is highlighted and then select TKIP or AES.

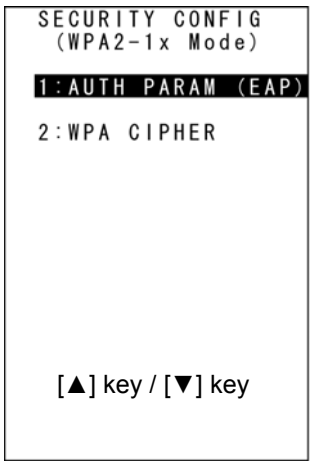
Select TKIP to use TKIP.
Select AES to use AES.

8. Press the **ENT** key or **BS/C** key to return to the SECURITY CONFIG menu.

◆ Wireless Security WPA2-1x Mode

EAP authentication and an encryption system can be used with wireless security WPA2-1x mode.

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

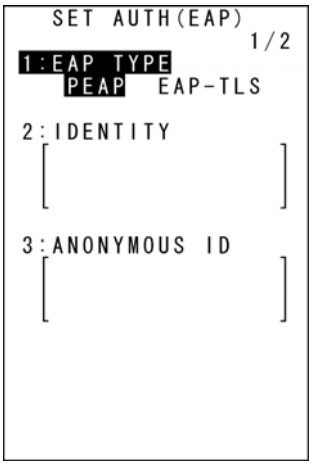


The screen on the right displays.

[1: AUTH PARAM (EAP)]: EAP authentication parameter setting
[2: WPA CIPHER]: Encryption system setting

Press the **BS/C** key to return to the SET SECURITY menu.

2. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: AUTH PARAM (EAP)] and then press the **ENT** key.

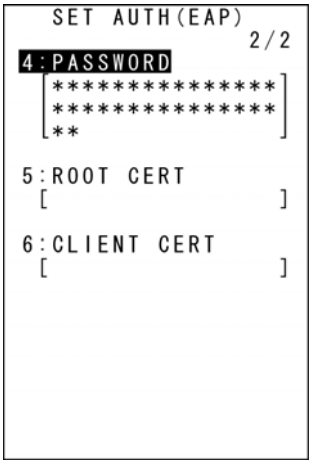


The screen on the right displays.

[1: EAP TYPE]: Selects PEAP or EAP-TLS.
[2: IDENTITY]: ID
[3: ANONYMOUS ID]: Anonymous ID
[4: PASSWORD]: Password
[5: ROOT CERT]: Root certificate
[6: CLIENT CERT]: Client certificate

3. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: EAP TYPE], and then use the cursor keys ([◄] [►]) to select PEAP or EAP-TLS.

If PEAP is selected, a root certificate is used.
If EAP-TLS is selected, a root certificate and client certificate are used.



4. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: IDENTITY] and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

5. Use the numerical keys to enter an ID and press the **ENT** key.

Press the **SF** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry, press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

6. Use the cursor keys ([▲] [▼]) or numerical key ([3]) to highlight [3: ANONYMOUS ID] and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

7. Use the numerical keys to enter an ID and press the **ENT** key.

Press the **SF** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry,
press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

8. Use the cursor keys ([▲] [▼]) or numerical key ([4]) to highlight [4: PASSWORD] and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

9. Use the numerical keys to enter a password and press the **ENT** key.

Press the **SF** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry,
press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

10. Use the cursor keys ([▲] [▼]) or numerical key ([5]) to highlight [5: ROOT CERT] and then press the **ENT** key.

The screen on the right displays.

Use the cursor keys ([▲] [▼]) to select a file name.
A “NO FILE EXISTS” message displays if no files exist.

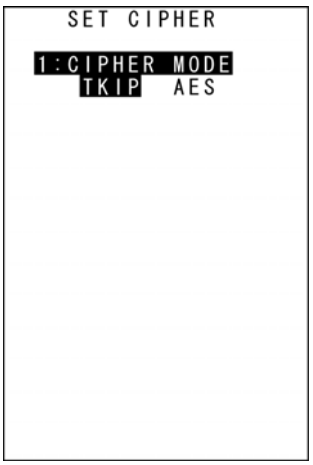
11. Use the cursor keys ([▲] [▼]) or numerical key ([6]) to highlight [6: CLIENT CERT] and then press the **ENT** key.

The same screen as that for [5: ROOT CERT] displays.
Use the cursor keys ([▲] [▼]) to select a file name.
A “NO FILE EXISTS” message displays if no files exist.

12. Press the **BS/C** key to return to the SECURITY CONFIG menu.

13. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: WPA CIPHER] and then press the **ENT** key.

The screen on the right displays.



[1:CIPHER MODE]: Selects TKIP or AES.

14. Ensure that [1: CIPHER MODE] is highlighted and then select TKIP or AES.

Select TKIP to use TKIP.
Select AES to use AES.

15. Press the **ENT** key or **BS/C** key to return to the SECURITY CONFIG menu.

◆ Wireless Security WPA2-PSK Mode

PSK authentication and an encryption system can be used with wireless security WPA2-PSK mode.

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

The screen on the right displays.

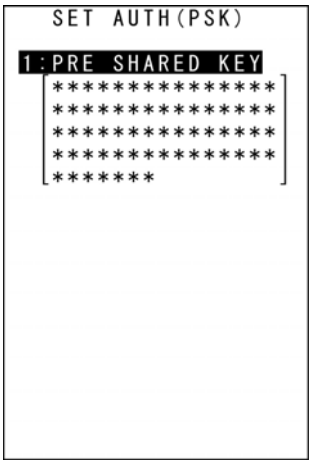
[1: AUTH PARAM (PSK)]: PSK authentication parameter setting
[2: WPA CIPHER]: Encryption system setting

Press the **BS/C** key to return to the SET SECURITY menu.

2. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: AUTH PARAM (PSK)] and then press the **ENT** key.

The screen on the right displays.

[1:PRE SHARED KEY]: Sets the shared key.



3. Ensure that [1: PRE SHARED KEY] is highlighted and then press the **ENT** key.

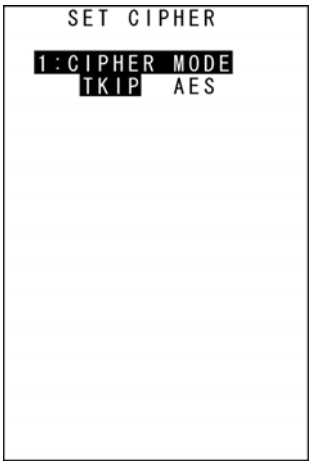
The mode changes to entry mode and the cursor displays.

4. Use the numerical keys to enter a shared key and press the **ENT** key.

Press the **SF** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry, press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

5. Press the **BS/C** key to return to the SECURITY CONFIG menu.

6. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: WPA CIPHER] and then press the **ENT** key.



The screen on the right displays.

[1:CIPHER MODE]: Selects TKIP or AES.

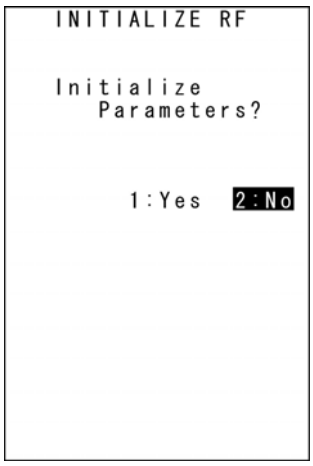
7. Ensure that [1: CIPHER MODE] is highlighted and then select TKIP or AES.

Select TKIP to use TKIP.
Select AES to use AES.

8. Press the **ENT** key or **BS/C** key to return to the SECURITY CONFIG menu.

◆ Wireless Parameter Initialization

1. Select “3: INITIALIZE” at the SET RF PARAMETER menu and then press the **ENT** key.



The screen on the right displays.

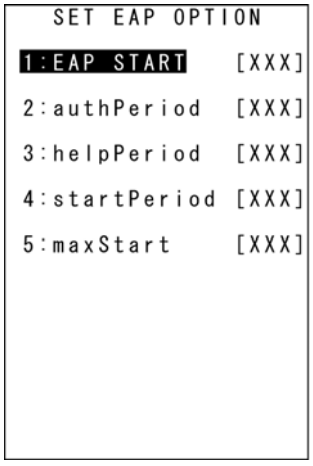
To initialize wireless parameters:
Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: Yes] and then press the **ENT** key.
Wireless parameters are initialized and the screen returns to the SET RF PARAMETER menu.

To cancel:
Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: No] and then press the **ENT** key.
The screen returns to the SET RF PARAMETER menu.

◆ EAP Authentication Option Setting

This setting can be used when the mode is set to other than “1: None” at the SET SECURITY MODE menu.

1. Press the **SF** key and dot key at the SECURITY CONFIG menu.



The screen on the right displays.

[1: EAP START]: EAP authentication start time
[2: authPeriod]: Retry interval when there is no response
[3: helpPeriod]: Retry interval when authentication fails
[4: startPeriod]: Start retry interval
[5: maxStart]: Start retry count

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

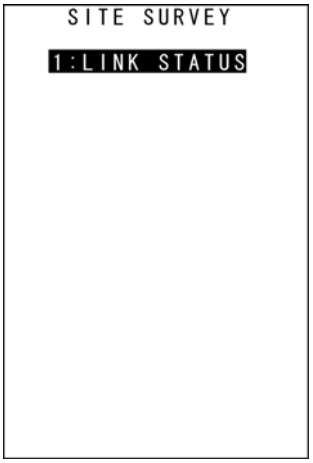
The mode changes to entry mode and the cursor displays.

3. Enter each item with the numerical keys and press the **ENT** key.

To delete a single character, press the **BS/C** key. To delete the entire entry, press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

4. Press the BS/C key to return to the the SECURITY CONFIG menu

[2] Site Survey Menu



1. Select “2: SITE SURVEY” at the RF MENU and then press the **ENT** key.

The SITE SURVEY screen on the right displays.

Press the **BS/C** key to return to the RF MENU screen.

2. Press the **ENT** key.

The current communication status displays in real time.

[ASSOCIATED AP]:
Displays the MAC address of the wireless interface for the associated access point.
[SIGNAL STRENGTH]:
Displays the signal strength of received packets.
[LINK QUALITY]:
Displays the overall communication quality with the access point.

Display	Communication Status
EXCELLENT	Excellent communication link
GOOD	↕
FAIR	
POOR	Poor communication link
NOT ASSOCIATED	Not associated with an access point

[CHANNEL]:
Displays the current communication channel.

Press the **BS/C** key to return to the SITE SURVEY menu.

[3] RF Version

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

The screen on the right displays after information is acquired.

[V X.XX]: Wireless module firmware version
[MACID]: Wireless module MACID

Press the **BS/C** key to return to the RF MENU.

Use the following procedure to set Bluetooth wireless communications.

1. Select “BLUETOOTH” in the **DEVICE MENU** and then press the **ENT** key.

The **BLUETOOTH MENU** screen on the right is displayed.

[1: INFORMATION]:
Displays the Bluetooth® interface information.
[2: SET BLUETOOTH]:
Sets up the Bluetooth® parameter.
[3: BROWSE DEVICE]:
Detects accessible Bluetooth® devices available in the vicinity.
[4: SERIAL PORT]:
Transfers files via the serial port profile.

Refer to the following sections for each of the above menus.
Press the **BS/C** key to return to the DEVICE MENU.

[1] Viewing Bluetooth® information

1. Select “1: INFORMATION” in the BLUETOOTH MENU and then press the ENT key.

Bluetooth® system version, firmware version, address, and Bluetooth® device name are displayed.

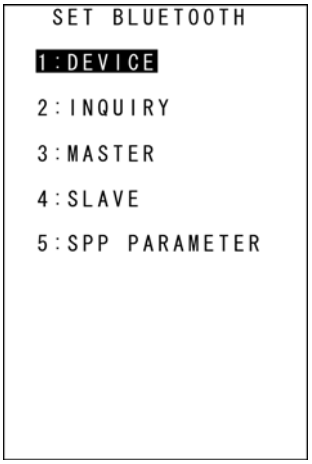
Press the **BS/C** key to return to the **BLUETOOTH MENU**.

When the Bluetooth® information is read from the device, the screen on the right is displayed.

– Point – Pressing the Backspace/clear key while this message is on the screen will not return to the BLUETOOTH MENU.

[2] Setting up the Bluetooth® parameter

1. Select "**2: SET BLUETOOTH**" in the **BLUETOOTH MENU** and then press the **ENT** key.



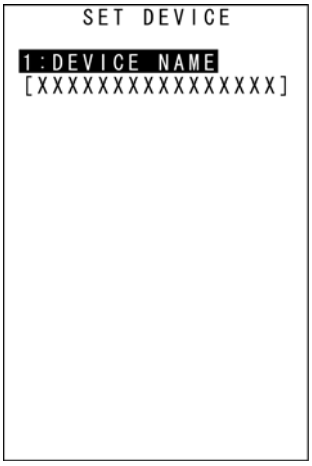
The **SET BLUETOOTH** menu is displayed.

[1: DEVICE]:	Sets up the device.
[2: INQUIRY]:	Sets up the device detection.
[3: MASTER]:	Sets up the master station.
[4: SLAVE]:	Sets up the slave station.
[5: SPP PARAMETER]:	Sets up the protocol options for transferring files via the serial port profile.

Refer to the following sections for each of the above menus.
Press the **Backspace/clear** key to return to the **BLUETOOTH MENU**.

◆ Setting up the device name

1. Select "**1: DEVICE**" in the **SET BLUETOOTH** menu and then press the **ENT** key.



The current setting is displayed.

[1: DEVICE NAME]: Sets up the Bluetooth® device name.

Press the **Backspace/clear** key to return to the **SET BLUETOOTH** menu.

2. Press the **ENT** key.

Entry mode is activated and the cursor is displayed.

3. Use the numeric keys and the dot key to enter the Bluetooth® device name.

The Bluetooth® device name can be up to 16 characters long. The default setting is DENSO-BHT.
To swicth the entry mode (between numeric and alphabet entries), press the **SF** key.
Refer to "Chapter 5 Communication" – "5.3 Bluetooth® wireless communications" for the Bluetooth® device name.
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. Press the **ENT** key.

5. Press the **Backspace/clear** key to return to the **SET BLUETOOTH** menu.

◆ Setting up the device detection parameters

1. Select "**2: INQUIRY**" in the **SET BLUETOOTH** menu and then press the **ENT** key.

The current settings are displayed.

[1: INQUIRY TIME]:
Sets up the duration of device detection in seconds.
[2: NUM RESPONSES]:
Sets up the number of devices to detect.

Press the **Backspace/clear** key to return to the **SET BLUETOOTH** menu.

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

Entry mode is activated and the cursor is displayed.

3. Use the numeric keys to enter the desired value.

"INQUIRY TIME" ;	Valid Range: 0–255, Default: 10 seconds
"NUM RESPONSES" ;	Valid Range: 0–8, Default: 0 Detects a maximum of 8 devices when "0" is set.

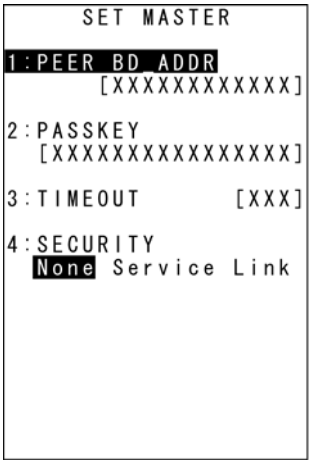
To delete a single character, press the Backspace/clear key. To delete the entire entry, press and hold the Backspace/clear key or press the **SF** and Backspace/clear keys simultaneously.

4. Press the **ENT** key.

5. Press the **Backspace/clear** key to return to **SET BLUETOOTH** menu.

◆ Setting up the master station

1. Select "**3: MASTER**" in the **SET BLUETOOTH** menu and then press the **ENT** key.



The current settings are displayed.

[1: PEER BD_ADDR]: Sets up the remote device address of the connection target.
[2: PASSKEY]: Sets up the Bluetooth® passkey for the master station
[3: TIMEOUT]: Sets up the timeout period in seconds.
[4: SECURITY]: Sets up the security mode for the master station.

Press the **Backspace/clear** key to return to the **SET BLUETOOTH** menu.

2. Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4]) to select the menu and then press the **ENT** key.

Entry mode is activated and the cursor is displayed.
To set up the "**4: SECURITY**", use the cursor keys ([◄] [►]) to highlight and set the desired setting.

3. Use the numeric and period (.) keys to enter the desired value.

"PEER BD ADDR"; 12-digit hexadecimal numbers only
The **ENT** key is not available until the twelfth digit is entered.
"PASSKEY": Up to 16 characters
"TIMEOUT"; Valid Range: 1–255, Default: 30 seconds

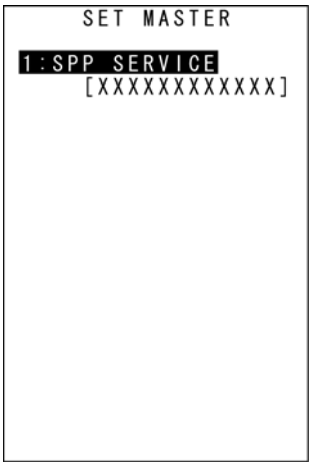
For the Bluetooth® passkey and the security mode details, refer to "Chapter 5 Communication" – "5.3 Bluetooth® wireless communications".

To switch the entry mode (between numeric and alphabet entries), press the **SF** 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.

4. Press the **ENT** key.

5. Press the **Backspace/clear** key to return the **SET BLUETOOTH** menu.

Setting up the serial port profile (SPP) service for the connection target



1. Press numeric key [**7**] and the **SF** key simultaneously in the **SET MASTER** menu to display the screen on the right.

[1: SPP SERVICE]: Sets up the serial port service name for the connection target.

Press the **Backspace/clear** key to return to the **SET MASTER** menu.

2. Press the **ENT** key.

Entry mode is activated and the cursor is displayed.

3. Use the numeric and period (.) keys to enter the serial port service name to connect.

Up to 12-characters can be entered. There is no default setting.
To switch the entry mode (between numeric and alphabet entries), press the **SF** 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.

4. Press the **ENT** key.

5. Press the Backspace/clear key to return the SET MASTER menu.

– Point – If the target remote device has two or more serial port services, the link is established with any of them. Specifying the serial port service name on the above screen selects the specified one. For the service name of the destination remote device, refer to "[3] BROWSE DEVICE menu" – "Searching for services".

◆ Setting up the slave station

1. Select "**4: SLAVE**" in the **SET BLUETOOTH** menu and then press the **ENT** key.

The current settings are displayed.

[1: PASSKEY]: Sets up the Bluetooth® passkey for the slave station.
[2: TIMEOUT]: Sets up the timeout limit in seconds.
[3: SECURITY]: Sets up the security mode for the slave station.

Press the **Backspace/clear** key to return to the **SET BLUETOOTH** menu.

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

Entry mode is activated and the cursor is displayed.
To set up the "**3: SECURITY**", use the cursor keys ([◄] [►]) to highlight and set the desired setting.

3. Use the numeric and period (.) keys to enter the desired value.

"PASSKEY"; Up to 16 characters
"TIMEOUT" Valid Range: 1-255, Default : 255 seconds

For the Bluetooth® passkey and the security mode details, refer to "Chapter 5 Communication" – "5.3 Bluetooth® wireless communications".

To switch the entry mode (between numeric and alphabet entries), press the **SF** 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.

4. Press the **ENT** key.

5. Press the **BS/C** key to return to the SET BLUETOOTH menu.

◆ Setting up the file transfer protocol options

1. Select "**5: SPP PARAMETER**" in the **SET BLUETOOTH** menu and then press the **ENT** key.

The current settings are displayed.

"1: SERIAL No.":
- "ON": Adds serial numbers to data blocks.
- "OFF": Does not add serial numbers to data blocks

"2: H.PARITY":
- "ON": Adds a horizontal parity.
- "OFF": Does not add a horizontal parity.

"3: LINKUP TIME":
Sets up the timeout period (in seconds) for the data link establishment.

"4: FIELD SPACE":
- "Ignore": Ignores the trailing spaces in data fields.
- "Data": Treats the trailing spaces as data.

When changing the setting
(1) Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2] [3] [4]) to select the desired menu.
(2) Press the cursor keys ([◄] [►]) to highlight and set the desired setting.
(3) Press the **ENT** key.

Press the **Backspace/clear** key to return to the **SET BLUETOOTH** menu.

– Point – The "SERIAL No" and the "H.PARITY" settings are ignored when the BHT-Ir protocol or the Ymodem protocol is selected as the communication protocol.

[3] Detecting remote devices

1. Select "**3: BROWSE DEVICE**" in the **BLUETOOTH MENU** and then press the **ENT** key.

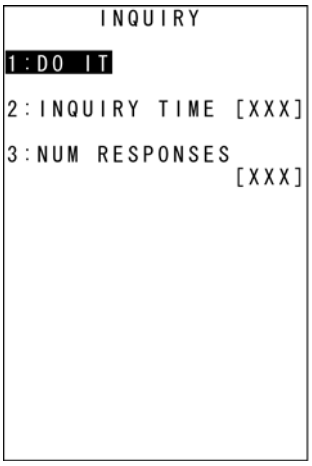
The screen on the right is displayed.

[1: INQUIRY]:	Sets up the device detection.
[2: BROWSE SERVICE]:	Searches the bluetooth services.
[3: AUTH BD_ADDR]:	Displays a list of authenticated remote device addresses.

Refer to the following sections for each of the above menus.
Press the **Backspace/clear** key to return to the **BLUETOOTH MENU**.

◆ Detecting devices

1. Select "**1: INQUIRY**" in the **BROWSE DEVICE** menu and then press the **ENT** key.



The screen on the right is displayed.

[1: DO IT]:	Starts device detection.
[2: INQUIRY TIME]:	Sets up the device inquiry time.
[3: NUM RESPONSES]:	Sets up the number of devices to detect.

Press the Backspace/clear key to return to the **BROWSE DEVICE** menu.

2. Use the cursor keys ([▲] [▼]) or numeric key ([2]) to highlight the [**2: INQUIRY TIME**] and then press the **ENT** key.

Entry mode is activated and the cursor is displayed.

3. Use the numeric keys to enter the desired value.

Set up the device inquiry time to detect devices.
The device inquiry time is used only for the device detection ([1: DO IT] menu).

Valid Range: 0 -255, Default: 10 seconds
Note that the setting specified here will not be saved.

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. Press the **ENT** key.

5. Use the cursor keys ([▲] [▼]) or numeric key ([3]) to highlight the [**3: NUM RESPONSES**] and then press the **ENT** key.

Entry mode is activated and the cursor is displayed.

6. Use the numeric keys to enter the desired value.

Set up the number of devices to detect.
This number is used only for the device detection ([1: DO IT] menu).

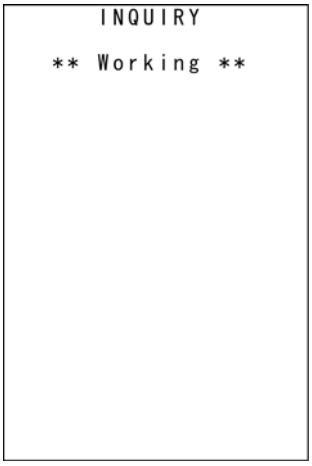
Valid Range: 0 – 8, Default: 0.
Detects a maximum of 8 devices when "0" is set.
Note that the setting specified here will not be saved.

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.

7. Press the **ENT** key.

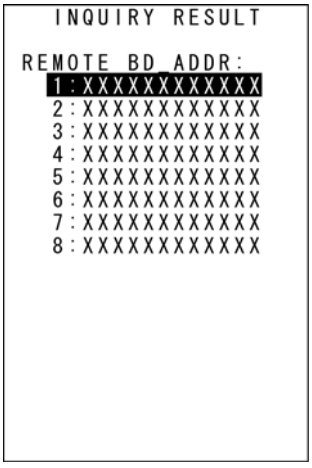
8. Use the cursor keys ([▲] [▼]) or numeric key ([1]) to highlight the [1: DO IT] and then press the **ENT** key.

The screen on the right is displayed and the device detection is started.



The device inquiry ends and the screen on the right is displayed
When;

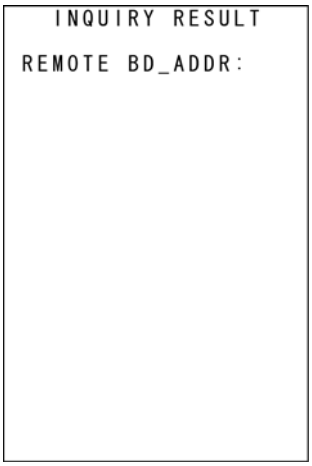
- The specified number of devices have been found.
- The specified time has elapsed.
- The Backspace/clear key has been pressed while detecting devices.



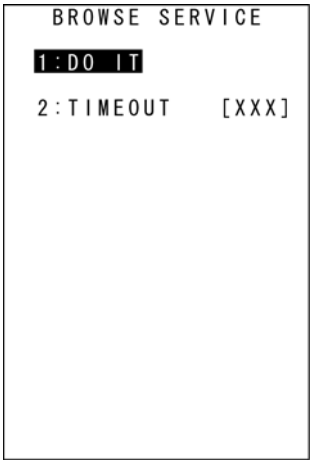
Press the **Backspace/clear** key to return to the **BROWSE DEVICE** menu.
To set the detected device address as a destination remote device address for the master station,
use the cursor keys ([▲] [▼]) or numeric keys to select the desired address and then press the **ENT** key.

The confirmation screen on the right is displayed.
To set the selected address as a remote device address, select "**1: Yes**" and press the **ENT** key.
To cancel the new setting, select the "**2: No**" and press the **ENT** key.
The screen returns to the **BROWSE DEVICE** menu.

If the detected device does not exist, the screen on the right is displayed.
Press the **Backspace/clear** key to return to the **BROWSE DEVICE** menu.



◆ Searching for services



1. Select "**2: BROWSE SERVICE"** in the **BROWSE DEVICE** menu and then press the **ENT** key.

The screen on the right is displayed.

[1: DO IT]: Starts service inquiry.
[2: TIMEOUT]: Sets up the services inquiry time.

Press the **Backspace/clear** key to return to the **BROWSE DEVICE** menu.

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

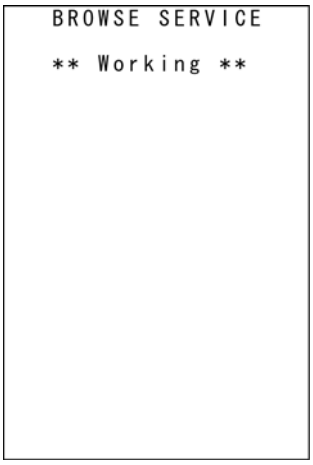
Entry mode is activated and the cursor is displayed.

3. Use the numeric keys to enter the desired value.

Set up the service inquiry time to search services.
The service inquiry time is used only for the service search ([1: DO IT] menu).

Valid Range: 1 -255, Default: 30 seconds
Note that the setting specified here will not be saved.

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.



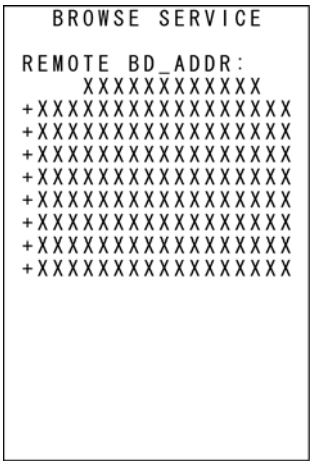
4. Press the **ENT** key.

5. Use the cursor keys ([▲] [▼]) or numeric key ([1]) to highlight the [**1: DO IT**] and then press the **ENT** key.

The screen on the right is displayed.
Connects to the specified destination remote device, and then searches for the services provided by the destination remote device.

Press the **Backspace/clear** key to return to the **BROWSE DEVICE** menu.

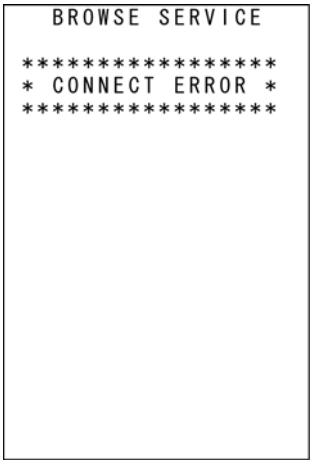
When the service inquiry is completed or the service inquiry time has elapsed, the Bluetooth® device address of the destination remote device and the provided service names are displayed as shown on the screen on the right.



Press the **Backspace/clear** key to return to the **BROWSE DEVICE** menu.

If the service inquiry fails, the screen on the right will be displayed.
Check the following and retry the service inquiry.

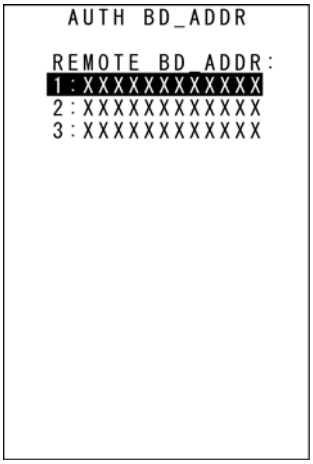
- The destination remote devices are in the vicinity.
- The destination remote devices are ready for use.
- The Bluetooth® passkey is correctly set.
- The timeout period is sufficiently set.



Press the **Backspace/clear** key to return to the **BROWSE DEVICE** menu.

◆ Displaying the authenticated remote device addresses

1. Select "**3: AUTH BD_ADDR**" in the **BROWSE DEVICE** menu and then press the **ENT** key.



A list of the authorized remote device addresses is displayed.
A maximum of three authorized remote device addresses is displayed.

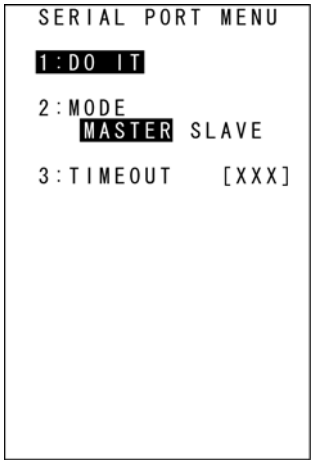
Press the **BS/C** key to return to the **BROWSE DEVICE** menu.
To delete the authorized remote device address, use the cursor keys ([▲] [▼]) or numeric keys to select the desired address and then press the **ENT** key.

The screen on the right is displayed.
To delete the selected address, select "**1: Yes"** and then press the **ENT** key.
To cancel deletion, select "**2: No**" and then press the **ENT** key.
The screen returns to the **BROWSE DEVICE** menu.

– Point – Deleting an address may cause connection problems with the link level security to the remote device which has a deleted address. In this case, reconnect to the remote device with the service level security.

[4] File transfer with serial port profile

1. Select "**4: SERIAL PORT**" in the **BLUETOOTH MENU** and then press the **ENT** key.



The screen on the right is displayed.

[1: DO IT]: Connects via the serial port profile for transferring files.
[2: MODE]: Sets up the connection mode.
[3: TIMEOUT]: Sets up the connection timeout period.

Press the **BS/C** key to return to the **BLUETOOTH MENU**.

2. Use the cursor keys ([▲] [▼]) or numeric keys ([2]) to selectt the [**2: MODE**].

3. Use the cursor keys ([◄] [►]) to highlight and set the desired setting.

Set up the connection mode.
The connection mode is used only for transferring files ([1: DO IT] menu).
Note that the setting specified here will not be saved.

4. Use the cursor keys ([▲] [▼]) or numeric key ([3]) to highlight the [**3: TIMEOUT**] and then press the **ENT** key.

Entry mode is activated and the cursor is displayed.

5. Use the numeric keys to enter the desired value.

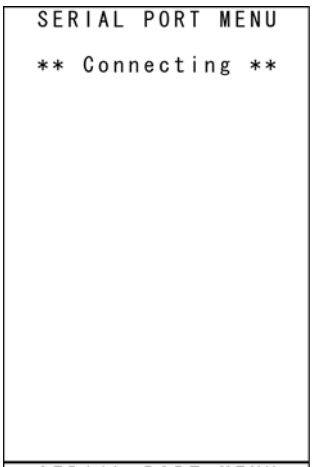
Set up the timeout period.
The timeout period is used only for transferring files ([1: DO IT] menu).

Valid Range: 1 – 255, Default: 255 seconds.
Note that the setting specified here will not be saved.

To delete a single character, press the **BS/C** key. To delete the entire entry, press and hold the **BS/C**key or press the **SF** and **BS/C** keys simultaneously.

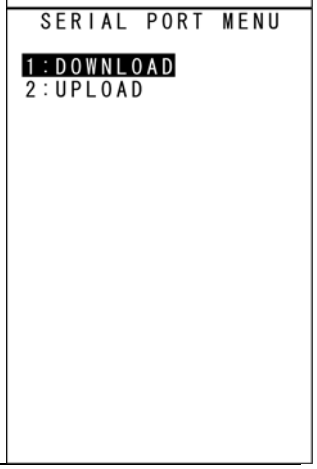
6. Press the **ENT** key.

7. Use the cursor keys ([▲] [▼]) or numeric key ([1]) to highlight the [**1: DO IT**] and then press the **ENT** key.



A serial port connection is started.
Press the **Backspace/clear** key to return to the **SERIAL PORT MENU**.

When the connection is established, the screen on the right is displayed.



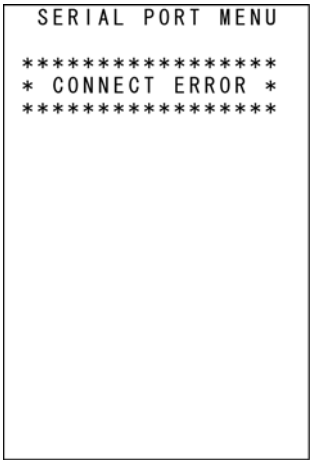
[1: DOWNLOAD]: Transfers files from the host computer to the BHT. Downloading between BHTs is also possible.
See the "4.5.3 Downloading Files (DOWNLOAD Menu)" for details.

[2: UPLOAD]: Transfers files from the BHT to the host computer. Uploading between BHTs is also possible.
See the "4.5.4 Uploading Files (UPLOAD Menu)" for details.

Use the cursor keys ([▲] [▼]) or numeric keys ([1] [2]) to select the desired menu and then press the **Enter** key.
Press the **Backspace/clear** key to return to the **SERIAL PORT MENU**.

– Point – The protocols (Ymodem protocol, BHT protocol, or BHT-Ir protocol) used for the file transfer are in accordance with the communication protocol setting specified in "4.5.6[5] Setting the communication environment". The protocol option is in accordance with the option specified in "[2] BLUETOOTH MENU (RF MENU)" – "File transfer protocol option setting".

If the serial port connection fails, the screen on the right is displayed.
Check the followings and retry the serial port connection.



- The destination remote devices are in the vicinity.
- The destination remote devices are ready for use.
- The destination remote devices support the serial port profile.
- The Bluetooth® passkey is correctly set.
- The timeout period is sufficiently set.

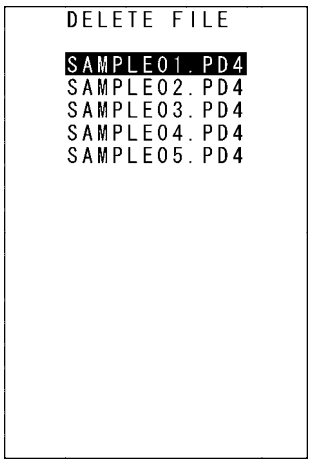
Press the **Backspace/clear** key to return to the **BROWSE DEVICE** menu.

4.5.11 Deleting Program/Data Files (DELEETE 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.

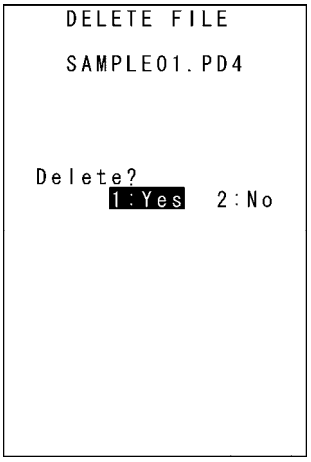


The DELETE FILE menu screen on the right displays.
Press the **BS/C** key to return to the SYSTEM MENU.

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

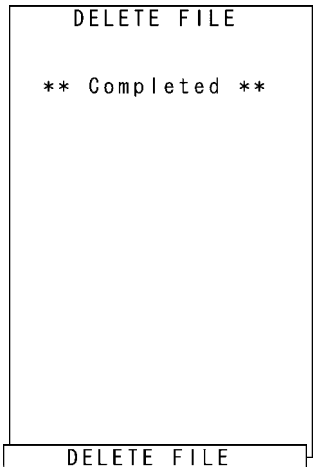
3. Press the **ENT** key.

The screen on the right displays.



To delete files:

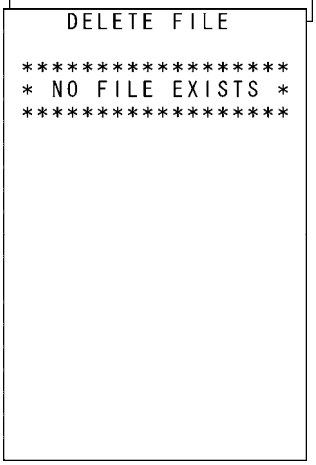
Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: Yes] and then press the **ENT** key.
The selected file is deleted and the screen on the right displays.
Press the **BS/C** key to return to the DELETE FILE menu.



To cancel:

Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: No] and then press the **ENT** key.
The screen returns to the DELETE FILE menu.

The screen on the right displays if no files exist.
Press the **BS/C** 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.

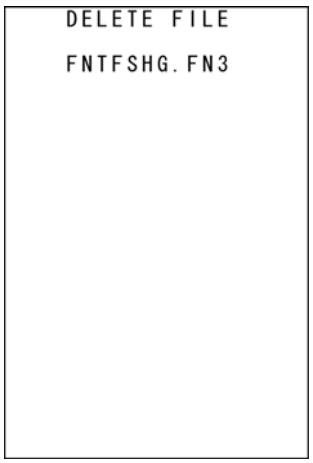
Using only 16 dots or 12 dots at the user program:
Font files that are not used can be deleted.

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 on the right displays.
Press the **BS/C** 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.

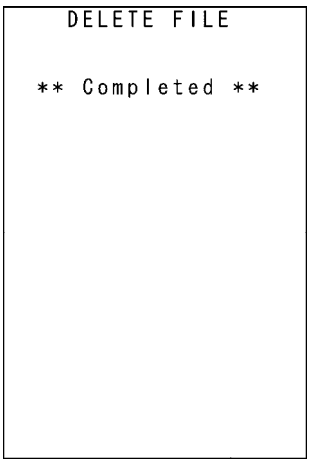
The screen on the right displays.

To delete font files:

Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: Yes] and then press the **ENT** key.

The selected file is deleted and the screen on the right displays.

Press the **BS/C** key to return to the DELETE FILE menu.



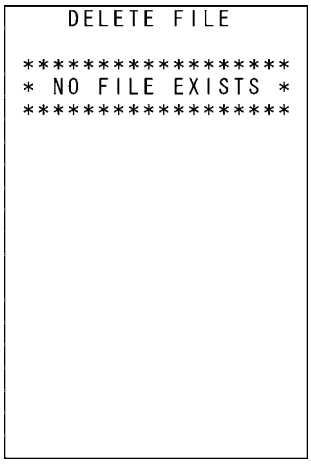
To cancel:

Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: No] and then press the **ENT** key.

The screen returns to the DELETE FILE menu.

The screen on the right displays if no files exist.

Press the **BS/C** 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 speaker volume set at section "4.5.6 Setting 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

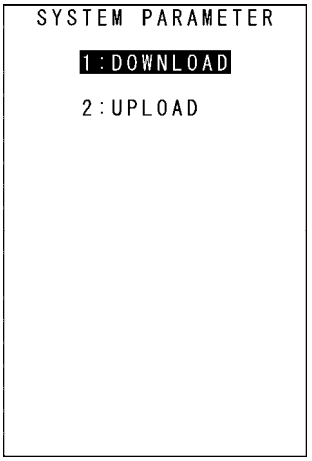
Create a system parameter file based on the current setting values and upload it to the host computer and so on. After uploading, delete the created system parameter file.

◆ 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 on the right displays.

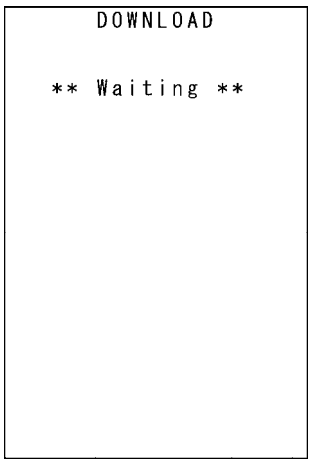
[1: DOWNLOAD]:
Downloads the BHT system parameter file to the BHT user area.
[2: UPLOAD]:
Uploads the BHT system parameter file stored in the BHT.

Refer to the following section for details of the above items.
Press the **BS/C** key to return to the SYSTEM MENU.

[1] Downloading the BHT system parameter file

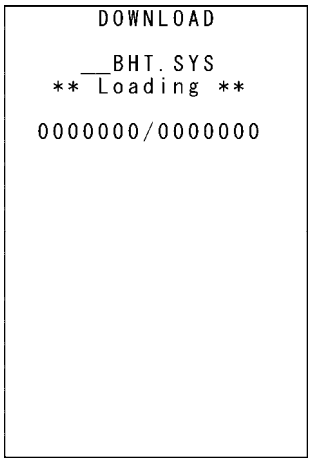
1. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: DOWNLOAD] and then press the **ENT** key.

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



2. While the download is in progress, the screen on the right displays indicating the file name and the number of received records/the total number of records.

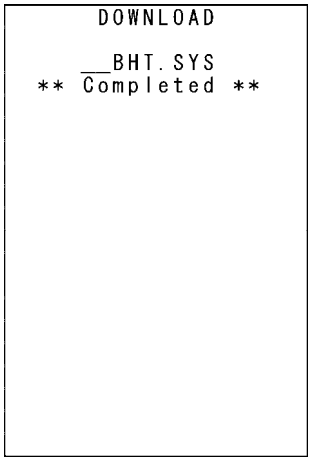
Press the **BS/C** key to abort the download and return to the SYSTEM PARAMETER menu.



3. Upon completion of downloading, the BHT displays the screen shown on the right and the speaker beeps once.

Press the **BS/C** key to return to the SYSTEM PARAMETER menu.

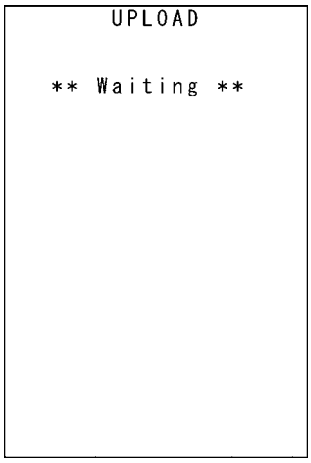
The speaker sounds three times if an error occurs during downloading, and an error screen displays.
Refer to “Chapter 7 Error Messages” - “7.2 System Mode Errors” and remedy the error.



[2] Uploading the BHT system parameter file

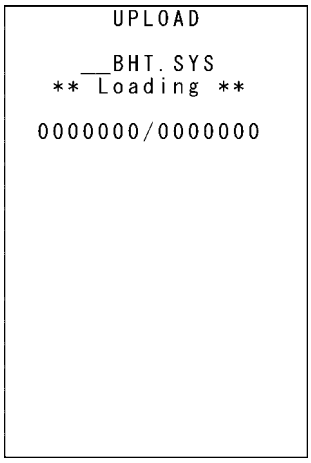
1. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: UPLOAD] and then press the **ENT** key.

The screen on the right displays indicating that the BHT is waiting for the system parameter file to be uploaded.



2. While the upload is in progress, the screen on the right displays indicating the file name and the number of sent records/the total number of records.

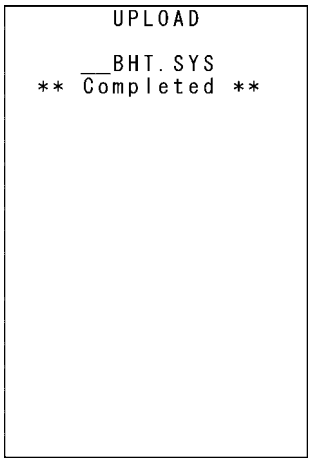
Press the **BS/C** key to abort the upload and return to the SYSTEM PARAMETER menu.



3. Upon completion of uploading, the BHT displays the screen shown on the right and the speaker beeps once.

Press the **BS/C** key to return to the SYSTEM PARAMETER menu.

The speaker 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.

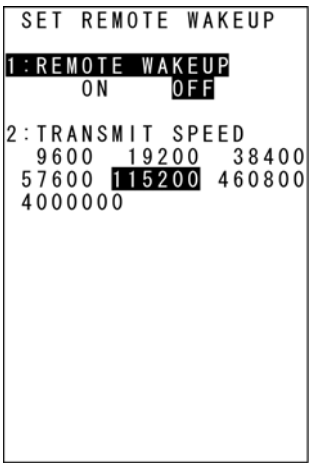


4.5.14 Setting the Remote Wake-up (SET REMOTE WAKEUP Menu)

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 **BS/C** key to return to the SYSTEM MENU.

2. Use the cursor keys ([▲] [▼]) or numerical 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 **BS/C** 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: "_B80MSG.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.

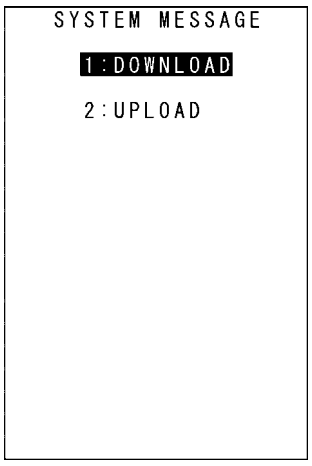
The communication parameters, communication protocol, and interface set at "[5] Setting the communication environment" in section "4.5.6 [5] System Environment Settings" are used when uploading and downloading.

- 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.



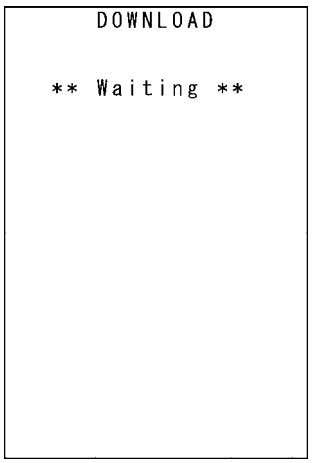
[1: DOWNLOAD]:
Downloads the system message file.
[2: UPLOAD]:
Uploads the system message file.

Refer to the following section for details of the above items.
Press the **BS/C** key to return to the SYSTEM MENU.

[1] Downloading the system message file

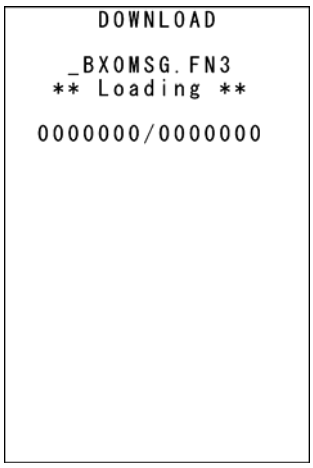
1. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: DOWNLOAD] and then press the **ENT** key.

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



2. While the download is in progress, the screen on the right displays indicating the file name and the number of received records/the total number of records.

Press the **BS/C** 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 the speaker beeps once.

Press the **BS/C** key to return to the SYSTEM PARAMETER menu.

The speaker 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 -

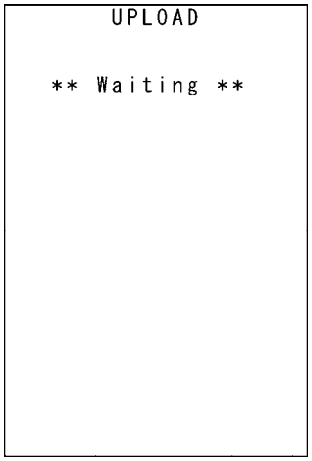
When downloading the system message file, the BHT creates a temporary file named “_B80MSG.FN3” in the user area. An error will therefore occur if there is insufficient space in the user area to create the temporary file.

The created temporary file will automatically be deleted after downloading is complete.

[2] Uploading the system message file

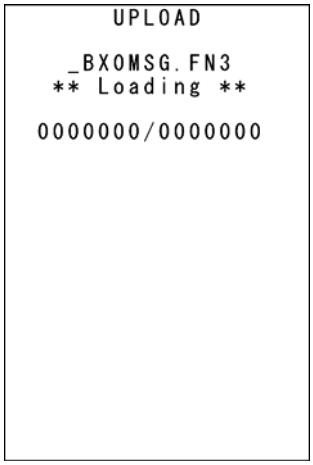
1. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: UPLOAD] and then press the **ENT** key.

The screen on the right displays indicating that the BHT is waiting for the system message file to be uploaded.



2. While the upload is in progress, the screen on the right displays indicating the file name and the number of sent records/the total number of records.

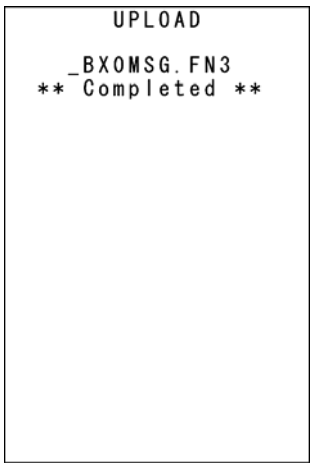
Press the **BS/C** key to abort the upload and return to the SYSTEM MESSAGE menu.



3. Upon completion of uploading, the BHT displays the screen shown on the right and the sepaker beeps once.

Press the **BS/C** key to return to the SYSTEM PARAMETER menu.

The speaker 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.



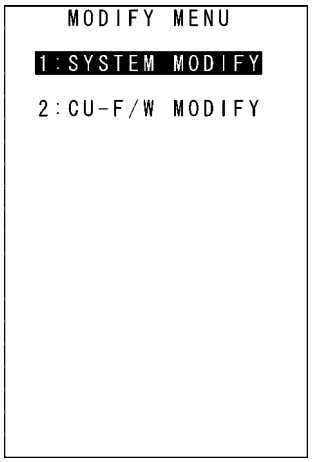
- Point - When uploading the system message file, the BHT creates a temporary file named “_B80MSG.FN3” in the user area. An error will therefore occur if there is insufficient space in the user area to create the temporary file.

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 on the right displays.

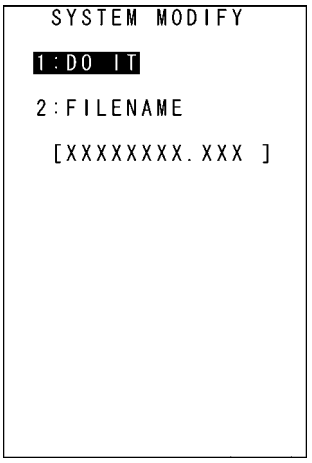
[1: SYSTEM MODIFY]: Updates the BHT system.
[2: CU-F/W MODIFY]: Updates the CU-811 system.

Refer to the following section for details of the above items.
Press the **BS/C** 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 numerical key ([1]) to highlight [1: SYSTEM MODIFY] and then press the **ENT** key.

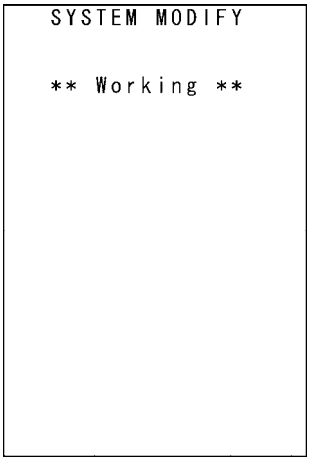


The screen on the right displays.
If the downloaded BHT update file name differs from this file name, specify the correct file name using the procedure on the following page.

[1: DO IT]:
Updates the BHT system.
[2: FILENAME]:
Displays the filename to be used for updating the BHT system.

Press the **BS/C** key to return to the SYSTEM PARAMETER menu.

2. Use the cursor keys ([▲] [▼]) or numerical 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.

◆ 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 numerical key ([2]) to highlight [2: FILENAME] and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

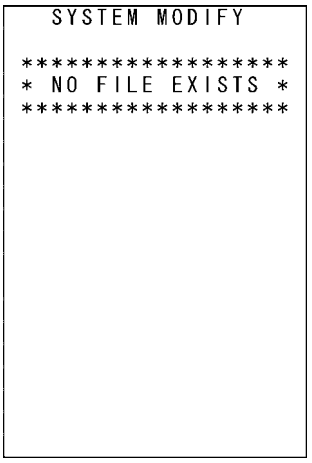
2. Use the numerical keys and dot key to enter the correct file name.

Press the **SF** key to change the entry mode (numerical entry (no guidance display) and alphabet entry). To delete a single character, press the **BS/C** key. To delete the entire entry, press and hold the **BS/C** key, or press the **SF** key and **BS/C** key 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 on the right displays 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 **BS/C** key to return to the MODIFY MENU.



[2] Updating the CU-811 system

Update the CU-811 system after downloading the CU-811 system update file.
(Refer to section ”4.2.2 CU-811 System Update” for details.)

1. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: CU-F/W MODIFY] and then press the **ENT** key.

The CU-F/W MODIFY menu screen on the right displays.

[1: DO IT]:
Updates the CU-811 system.
[2: FILENAME]:
Displays the filename to be used for updating the CU-811 system.

Press the **BS/C** key to return to the SYSTEM PARAMETER menu.

2. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: DO IT] and then press the **ENT** key.

The CU-811 system is updated.
The screen on the right displays upon completion of the update.

Press the **BS/C** key to return to the CU-F/W MODIFY menu.

♦ When the Displayed File Name Differs from the CU-811 System Update File

If the name of the file displayed at [2: FILENAME] differs from the name of the CU-811 system update file to be used for updating the system, enter the correct file name.

1. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: FILENAME] and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

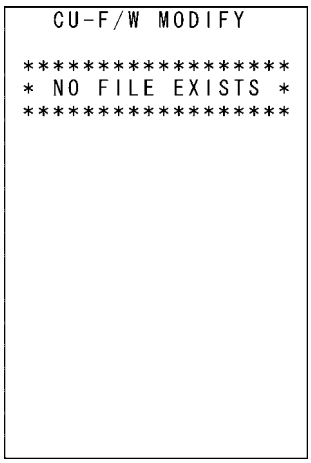
2. Use the numerical keys and dot key to enter the correct file name.

Press the **SF** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS/C** key. To delete the entire entry,
press and hold the **BS/C** key, or press the **SF** key and **BS/C** key simultaneously.

3. Press the **ENT** key to set the entered file name.

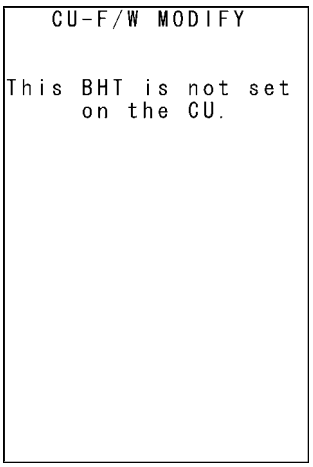
◆ If the System Update File Does not Exist when Updating the CU-811 System

The screen on the right displays if the CU-811 system update file does not exist when updating the CU-811 system.
Download the CU-811 system update file and update the CU-811 system again.
Press the **BS/C** key to return to the CU-F/W MODIFY menu.



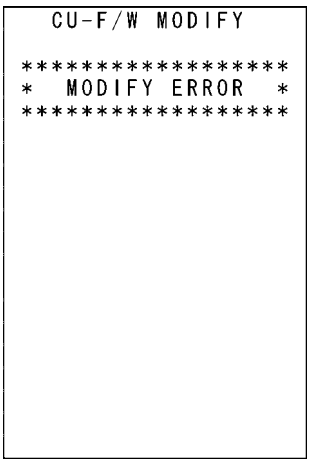
◆ If the BHT Has not been Set on the CU-811 when Updating the CU-811 System

The screen on the right displays if the BHT has not been set on the CU-811 when updating the CU-811 system.
Set the BHT on the CU-811 and try again.
Press the **BS/C** key to return to the CU-F/W MODIFY menu.



◆ If the CU-811 System Update Fails

The screen on the right displays if the CU-811 system update fails.
Ensure that the BHT has been set properly on the CU-811 and then try again.
Press the **BS/C** key to return to the CU-F/W MODIFY menu.



Chapter 5
Communication

This chapter describes technical information relating to the infrared communication, wireless communication, and Bluetooth wireless communication functions with which the BHT is equipped.

5.1 Infrared Communication

The BHT has a built-in infrared 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.
Infrared 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 Infrared Communication Port Transmission Speed

Communicating Device	Transmission Speed
BHT-800 Series	9600, 19200, 38400, 57600, 115200, 460800bps
CU-801	9600, 19200, 38400, 57600, 115200bps
CU-821	115200, 460800bps
CU-811	4 Mbps

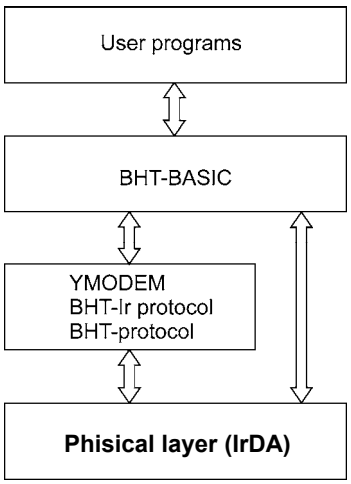
5.1.2 BHT Hardware (Physical Layer) and Communication Protocols

◆ BHT Hardware (Physical Layer) (Exclude 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 : 115200 bps)

The BHT supports Ymodem, BHT-Ir protocol, and BHT protocol.



5.2 Wireless Communication

The BHT-825Q series is equipped with a 2.4 GHz frequency band wireless module.

5.2.1 Usage Precautions

- It may be possible to avoid the easy occurrence of communication errors by pointing the right side of the BHT (equipped with built-in antenna) toward the access point. This is because the radio waves of the 2.4 GHz frequency band on which the BHT operates are emitted straight ahead and do not easily pass through the human body and so on.
- Communication may not be possible when used in the vicinity of wireless devices, microwave ovens, industrial heating equipment, or high-frequency medical equipment operating on the same 2.4 GHz frequency band as the BHT.
- Communication may not be possible due to electromagnetic noise when the BHT is used in the vicinity of household appliances such as computers or refrigerators.
- Communication may not be possible in the following locations.
  - In the vicinity of metal objects or in places with high levels of metallic dust
  - Rooms surrounded by metal walls
  - Places subject to strong impact

– Point – **Requests to System Designers**

- Communication may not be possible depending on the environment in which the device is being used. Ensure that problem-free communication is possible prior to use.
- Use a program capable of retransmitting data if communication fails.
- If the BHT is introduced into an environment in which a device using the 2.4 GHz frequency band is operating, or if another device using the 2.4 GHz frequency band is introduced following introduction of the system, run all devices and ensure that communication with the BHT is possible prior to use.
- Check communication once again prior to use if any changes are made to the usage environment (addition of household appliances, movement or addition of shelves, equipment and so on) following introduction of the system.

– Point – **Wireless LAN Interference**

In addition to industrial, scientific, and medical equipment such as microwave ovens, static wireless stations (permit required) used for mobile identification in places such as plant manufacturing lines, amateur wireless stations, and specified low-power wireless stations (no permit required) operate on the same frequency band as this device.

1. Before using this device, ensure that no static wireless stations or specified low-power wireless stations for mobile identification are being used in the vicinity.
2. In the event of electromagnetic interference from this device to a static wireless station being used for mobile identification, either promptly alter the usage frequency, or halt the electromagnetic discharge.
3. If other problems arise due to reasons such as electromagnetic interference from this device to a specified low-power wireless station being used for mobile identification, please contact DENSO WAVE through QBdirect (see page ii).

5.2.2 Setting Parameters

Programs written in BHT-BASIC control wireless communication with commands between the BHT and access points which are connected each other by a wireless LAN.
For the setting procedure of RF-related parameters, refer to “Chapter 4 System Operation” – “Wireless Communication Settings (RF MENU).”

◆ Service Set ID (SSID)

SSID is an ID to be used on the communications network. The BHT is able to communicate with devices having the same SSID.
The SSID of the BHT should be the same as that of the access point you want to use.

◆ POWER SAVE

You may place the wireless module built in the BHT in the energy saving mode.
If this mode is set to “OFF,” the service period of the BHT may be shortened.
If it is set to ON, the BHT may take more time to wake-up for link operation or send response messages.

◆ RADIO MODE

Setting the Wireless Method
Select either 11b (802.11b) or 11g (802.11g) based on the access point setting.
Please note that 11g should be selected when 11b/11g auto.

◆ WEP (Wired Equivalent Privacy)

When WEP is ON, messages to be sent/received over the wireless LAN will be encrypted.
The WEP KEY uses 40-bit (10-digit hexadecimal) or 128-bit (26-digit hexadecimal) encryption word.
The BHT is able to definitely communicate with the access points having the same WEP KEY.

◆ WEP KEY

You can set four types of encryption keys (WEP KEY1 through WEP KEY4).
If you enable WEP, choose any one of WEP KEY1 through WEP KEY4 as TRANSMIT KEY.

◆ AUTHENTICATE

This is the authentication method setting employed when using encrypted communication (WEP setting), and a selection can be made from OPEN or SHAREDKEY.
Select OPEN when the WEP setting is OFF. Communication will no longer be possible if OPEN is not selected.

◆ TRANSMIT KEY

You need to use the TRANSMIT KEY in order to choose and activate any one of the WEP KEY1 through WEP KEY4 already defined.

◆ SECURITY MODE

This is the setting for the wireless security function.
A selection can be made from no security (WEP level), 1x Supplicant, WPA-1x, WPA-PSK, WPA2-1x or WPA2-PSK.

◆ EAP TYPE

This is the EAP authentication method setting used for 802.1x authentication.
Select PEAP or EAP-TLS.
This is valid only when the Security mode is 1x Supplicant, WPA-1x or WPA2-1x.

◆ IDENTITY

This is the user ID used for 802.1x authentication.
A format that includes the domain name (<domain name>\<user name>) may be specified for the identity. An identity, including the domain name, may be specified up to 32 bytes. The domain name may be omitted.

◆ PASSWORD

This is the password used for 802.1x authentication.
This is valid only when the EAP TYPE is PEAP.

◆ ROOT CERTIFICATE

This setting is for the filename of the root certificate used for 802.1x authentication.

◆ CLIENT CERTIFICATE

This setting is for the filename of the client certificate used for EAP-TLS authentication.

◆ ANONYMOUS IDENTITY

This is the setting for the ID transmitted by EAP Request (ID) packet when performing PEAP authentication.

◆ WPA CIPHER

This is the setting for the encryption method used when specifying WPA.
Select TKIP or AES.

◆ PRE SHARED KEY

This is the setting for the key used for WPA-PSK or WPA2-PSK.
Always set when the Security mode is WPA-PSK or WPA2-PSK.

5.3 Bluetooth® Wireless Communication

5.3.1 Usage Precautions

- It may be possible to avoid the easy occurrence of communication errors by pointing the right side of the BHT (equipped with builtin antenna) toward the access point. This is because the radio waves of the 2.4 GHz waveband on which the BHT operates are emitted straight ahead and do not easily pass through the human body and so on.
- Communication may not be possible when used in the vicinity of wireless devices, microwave ovens, industrial heating equipment or high-frequency medical equipment operating on the same 2.4 GHz waveband as the BHT.
- Communication may not be possible due to electromagnetic noise when the BHT is used in the vicinity of household appliances such as computers or refrigerators.
- Communication may not be possible in the following locations.
  In the vicinity of large metal objects or in places with high levels of metallic dust
  Rooms surrounded by metal walls
  Places subject to strong impact
- The possible communication distance between the BHT and other devices used is about 5m. Even if the communication distance is within 5m, communication may not be possible depending on the other device and the environment.
  The possible communication distance may vary by individual BHTs. Although communication may be possible on a BHT when the communication distance is longer than 5m, avoid operation of the BHT on this basis.

– Point – **Requests to System Designers**

- Communication may not be possible depending on the environment in which the device is being used. Ensure that problem-free communication is possible prior to use.
- Use a program capable of retransmitting data if communication fails.
- If the BHT is introduced into an environment in which a device using 2.4 GHz waveband electromagnetic waves is operating, or if another device using 2.4 GHz waveband electromagnetic waves is introduced following introduction of the system, run all devices and ensure that communication with the BHT is possible prior to use.
- Check communication once again prior to use if any changes are made to the usage environment (addition of household appliances, movement or addition of shelves, equipment and so on) following introduction of the system.

5.3.2 Setting Parameters

◆ Bluetooth® Device Address

Remote devices return these addresses, uniquely assigned to each Bluetooth® device by the Bluetooth® SIG, during device detection.

◆ Bluetooth® Device Name

Bluetooth® devices can distinguish themselves using user-friendly names--Robert or Sandra, for example.

◆ Bluetooth® passkey (Bluetooth® PIN)

Pairs of Bluetooth® devices use these encryption keys for mutual authentication and for establishing secure links between themselves.

◆ Security Modes

This BHT supports the following three security modes.

(1) No security:
There is no security authentication.
(2) Service level security:
There is security authentication.
(3) Link level security:
There is security authentication using point-to-point encryption keys.

Specifying No security sometimes prevents connecting to remote devices using service or link level security--unless both ends use the same Bluetooth® passkey.

Service or link level security requires that both ends use the same Bluetooth® passkey.

5.4 Basic Communication Specifications and Parameters

5.4.1 Basic Communication Specifications

The table below lists the basic infrared communication specifications for the BHT-825Q series.

	IrDA Interface
Synchronization	Start-stop
Transmission speed	9600, 19200, 38400, 57600, 115200, 460800(Note1) or 4M(Note2) 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-825Q series unit to another, or to the CU-821.

Note2: 4 Mbps is only possible for communication with the dedicated CU-811 unit.

◆ 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 0.15 m, with the IR beam within a 10° angle of divergence.

To communicate via the CU-800, put the BHT on the CU-800.

◆ IrDA Interface Transmission/Receipt Switching Time

The IrDA interface must satisfy the following conditions for transmission and receipt switching.

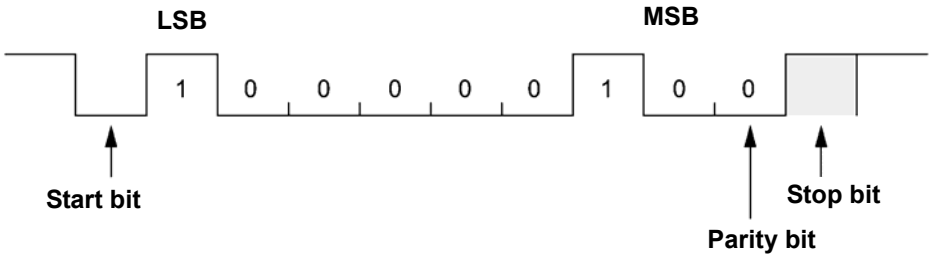
(1) The IrDA interface must be ready to receive within 10 ms following the completion of transmission.

(2) The IrDA interface must commence transmission after waiting at least 10 ms following the completion of receipt.

◆ Transmission Code and Bit Order

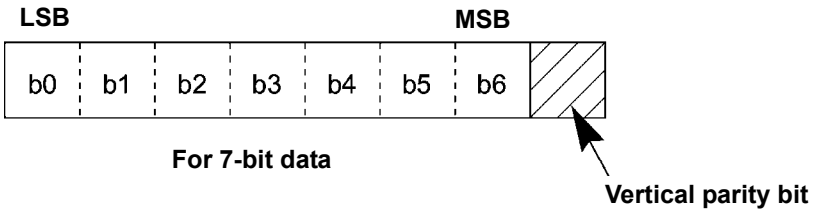
- All characters should be coded to 7 or 8-bit code for data transmission.
- The standard code at the BHT is ASCII 7-bit or 8-bit code.
- The transmission bit order is LSB (Least significant bit) first.

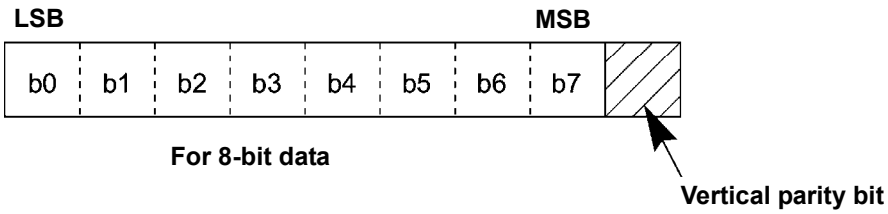
The example below is for the transmission of an ASCII 8-bit code A (41h or 01000001b, b: binary) with even vertical parity and a single bit each for the start and stop bits.



◆ 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.





5.4.2 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) or 4M(Note2) bps
Character length	8 bits
Vertical parity	None
Stop bit length	1 bit

Note1: 460800 bps is only possible when communicating from one BHT-825Q series unit to another, or with the CU-821.

Note2: 4 Mbps is only possible for communication with the dedicated CU-811 unit.

◆ System Mode

Refer to “Chapter 4 System Operation” – “4.5.6 Set System Menu.”

◆ 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.

BHT-825Q series

Chapter 6
Maintenance

This chapter describes battery cartridge and daily procedures for taking care of the BHT and CU/CH.

6.1 Replacing the Battery Cartridge

6.1.1 Battery Cartridge Service Life

The battery cartridge is a consumable part and should be replaced after being charged approximately 300 times.

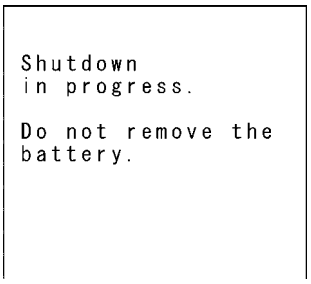
The performance of the battery cartridge's lithium-ion battery will deteriorate gradually with repeated charging, even during normal use. When the battery operation time becomes shorter even after charging for the specified length of time, replace the battery with a new one.

6.1.2 Battery Cartridge Replacement Method

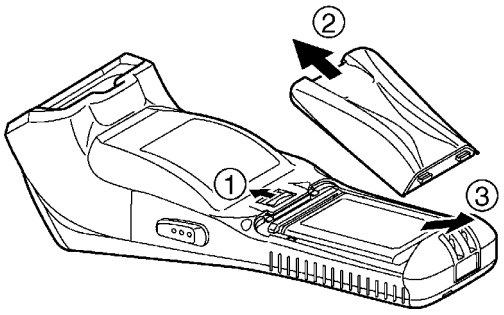
1. Press the **power** key (⏻) to turn OFF the BHT power.

   The screen on the right displays.

   – Point – Do not remove the battery cartridge until the power turns OFF and the screen display clears.



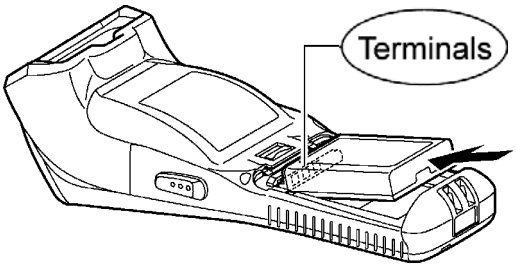
2. Slide the battery cartridge cover release button (1) in the direction indicated by the arrow and remove the battery cartridge cover (2), and then remove the battery cartridge (3).



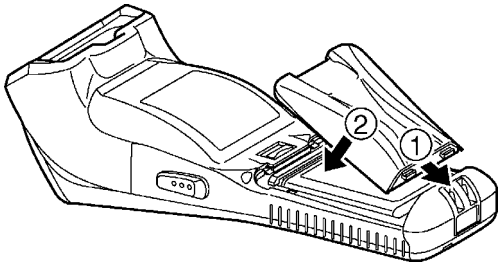
3. Check the battery cartridge terminals on the new battery cartridge and then insert in the direction shown by the arrow.

   (Refer to "Chapter 2 BHT Preparation" – "2.2 Loading and Charging the Battery Cartridge".)

   – Point – Do not use battery cartridges other than that specified by DENSO WAVE.



4. Insert the battery cartridge cover tab (1), and then close the battery cartridge cover (2) to lock the cover in position. Press the battery cover into place until a click is heard.



◆ Battery Cartridge Recycling Request

- This product uses a lithium-ion battery that contains scarce, recyclable resources. We kindly ask for your cooperation in recycling to ensure reuse of these resources.

  The crossed-out wheeled bin is applicable for EU member status only.

- Used battery cartridges must not be disposed of as combustibles.
- Contact your nearest rechargeable battery recycling center or local sales office for information on disposal procedures.
- When disposing of used battery cartridges at your nearest recycle center, cover the terminals with vinyl tape to insulate and protect from overheating or fire due to a short-circuit.
- Never disassemble battery cartridges.

⚠ WARNING Mishandling may result in battery cartridge overheating, smoke generation, blowout or combustion. Please read the following items prior to use.

- Never charge the battery cartridge in the vicinity of fire or under a scorching sun.
- Always use a dedicated charger to charge the battery cartridge.

⚠ CAUTION Mishandling may result in battery cartridge overheating, smoke generation, blowout or combustion. Please read the following item prior to use.

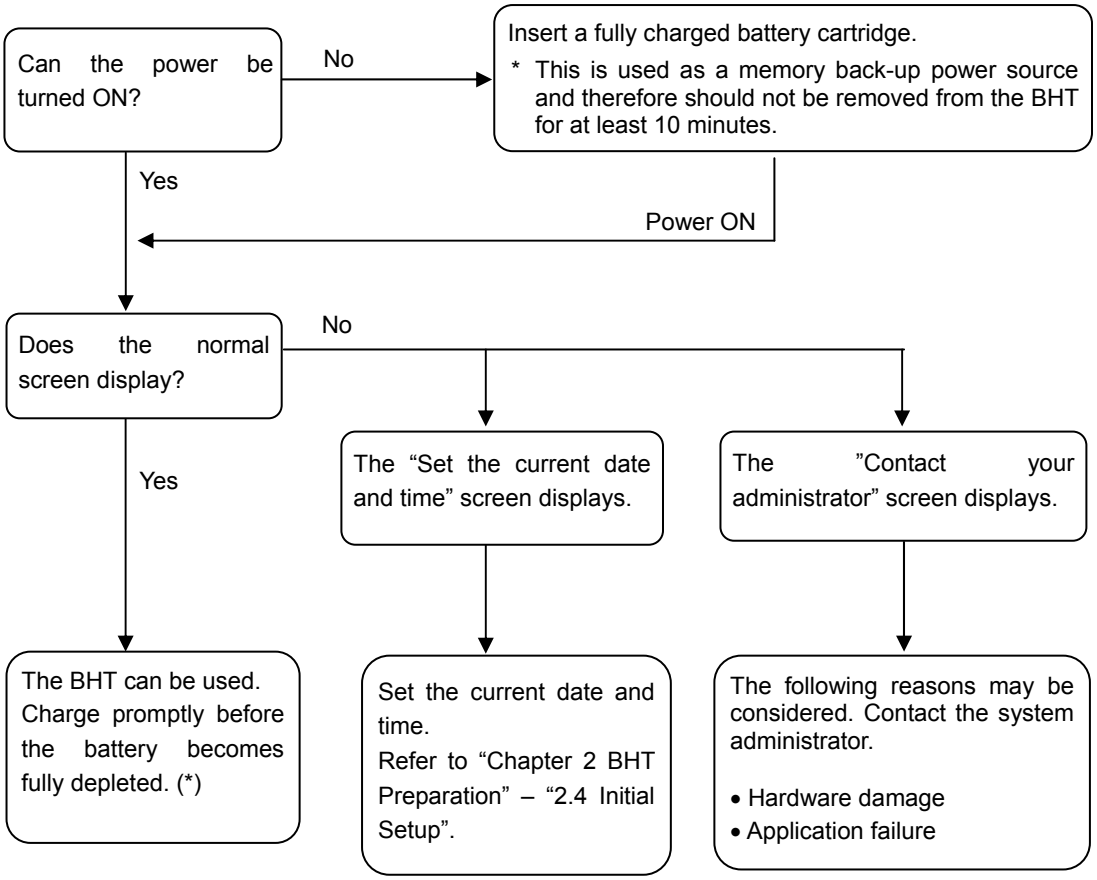
- Terminate charging if not completed even after the specified time has elapsed.

– Note –

- Replace the battery cartridge promptly.
- Always turn the BHT power OFF before replacing the battery cartridge. Replace the depleted battery cartridge with a new one within three minutes to avoid data loss. Following replacement, turn ON the BHT power and check operation.
- The battery cartridge is charged using either a CU-801/811/821 communication unit (option) or CH-851/854/201A/704 battery charger (option). Refer to the respective User's Manual provided with each device for details of the charging method for the CH-851/854/201A/704.
- If a "Battery voltage has lowered." or "Replace or recharge the battery cartridge." message displays when impact is applied to the BHT, reboot the BHT and check the battery voltage level. The battery may not actually be depleted.

6.2 Using the BHT after Long Periods

Data stored in the BHT may be lost and the calendar clock may stop if the BHT is left unused for long periods of time. Take appropriate measures in accordance with the procedure below.



– **Point** – *: Files may become corrupt if left for a long period of time without replacing the battery cartridge.

6.3 Daily Maintenance

6.3.1 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.
Ensure 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 code 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 code 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.

6.3.2 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.

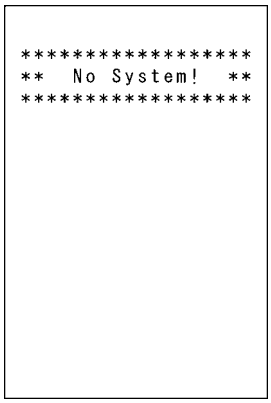
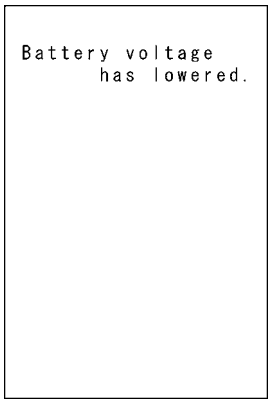
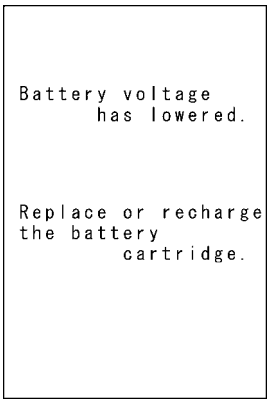
BHT-825Q series

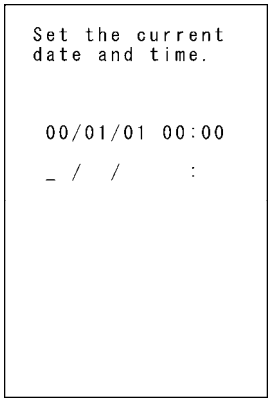
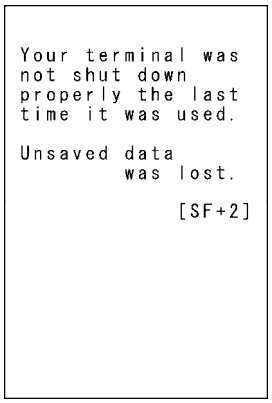
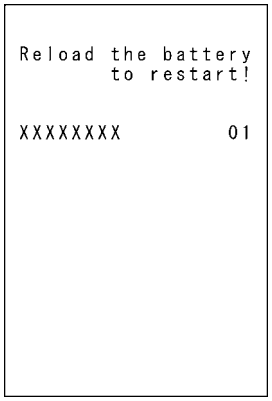
Chapter 7
Error Messages

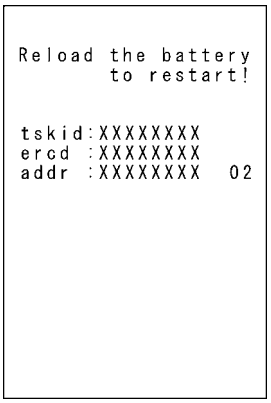
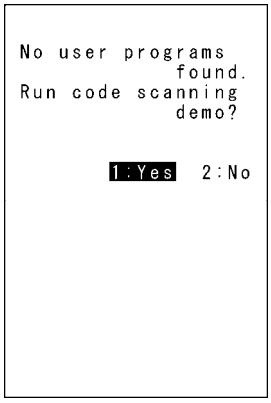
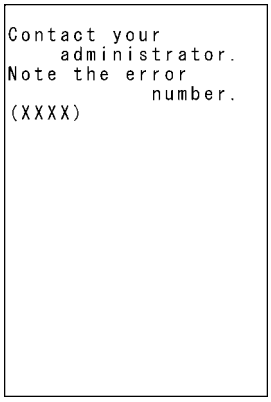
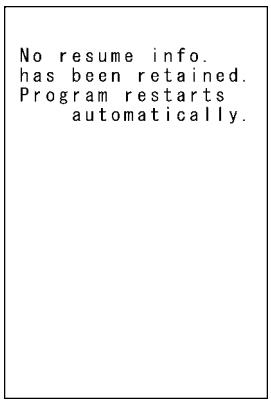
This chapter describes causes and countermeasures for error messages that display during BHT use.

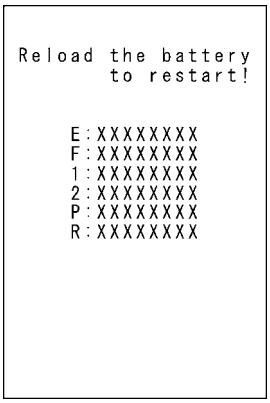
7.1 System Errors

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 warning tone beeps five times and then turns itself off.	A System Program error has occurred.	Contact your system administrator.
	If low battery is detected, the warning tone beeps three times. After that, it will resume previous regular operation.	The battery output level has dropped below a specified lower limit.	Replace or recharge the battery cartridge.
	If lower battery is detected, the warning tone beeps five times and then turns itself off. Depending upon the battery level, the warning tone may not sound five times.	The battery output level has lowered so that the BHT no longer operates.	Replace or recharge the battery cartridge.

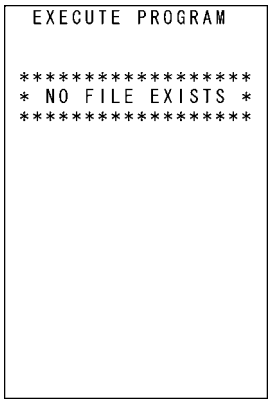
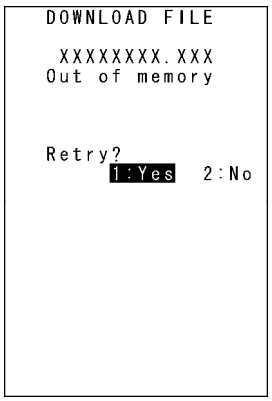
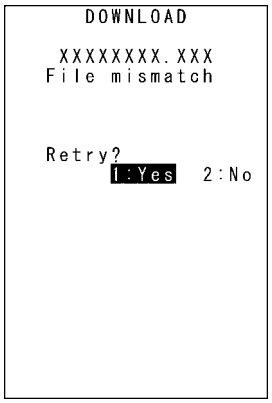
Message	BHT Response	Cause	Countermeasure
	The date and time settings screen displays, awaiting entry.	The calendar clock integrated in the BHT has stopped because: - the battery cartridge had been removed for a long time, - the battery cartridge had not been recharged for a long time.	Set the current date and time. (Refer to “Chapter 2 BHT Preparation” – “2.4 Initial Setup”)
	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. The application restarts from the beginning.	If this error occurs frequently, contact your system administrator.
	The message continues to display.	After shut down abnormally, the BHT has been left without the battery cartridge loaded, or with discharged battery cartridge loaded, so unsaved data was lost.	Contact your system administrator.
	If this error occurs, the warning tone 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 cartridge, then turn the BHT on. If this error occurs frequently, make a note of the displayed message and codes and contact your system administrator.

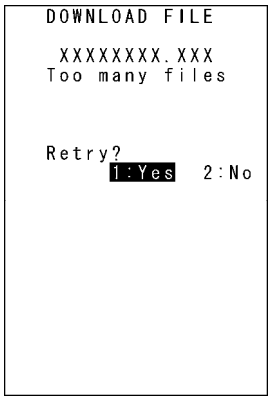
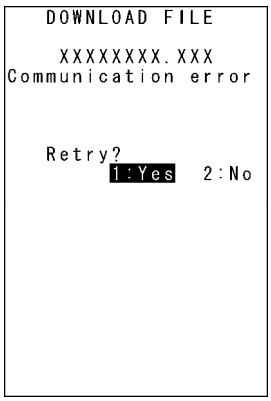
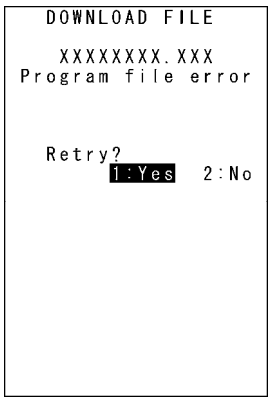
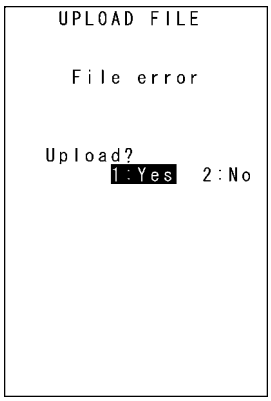
Message	BHT Response	Cause	Countermeasure
	If this error occurs, the warning tone beeps five times.	During execution of System Program, the System Program has received an invalid command code. (xxxxxxxx: Error address)	Unload and reload the battery cartridge, then turn the BHT on. If this error occurs frequently, make a note of the displayed message and codes and contact your system administrator.
	The message continues to display.	When the BHT is turned on, no user programs are found.	Contact your system administrator. You can run the code scanning demo without user programs. Pressing “1:Yes” runs the code scanning demo. Press the trigger switch to start the code scanning demo. Selecting “2:No” turns the power off.
	If this error occurs, the warning tone beeps five times and then turns itself off.	Any of the hardware error, memory error, execution program error, etc. 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.

Message	BHT Response	Cause	Countermeasure
	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 warning tone beeps five times.	An error has occurred during execution of System Program.	Unload and reload the battery cartridge, 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	BHT Response	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 **BS/C** 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).

Message	BHT Response	Countermeasure
	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 for the BHT-800 model. If it is not available, download the appropriate program.
	The file you attempted to upload is damaged.	To upload the damaged file as is, press the **1** key.

Message	BHT Response	Countermeasure
UPLOAD Out of memory	The memory is insufficient for setting up the BHT system parameter file or system message file to be uploaded.	Press the **BS/C** key to return to the SYSTEM MENU and delete unnecessary files.
UPLOAD Too many files	The memory already contains 420 files, so the BHT system parameter file or system message file cannot be set up.	Press the **BS/C** key to return to the SYSTEM MENU and delete unnecessary files.

Chapter 8
Specifications

This chapter describes the BHT-825Q series specifications.

8.1 BHT-825Q series Specifications

8.1.1 Hardware Specifications

Power supply (main power):	Rechargeable lithium-ion battery cartridge (3.7 V DC)
Dimensions (W) x (L) x (H):	67 x 182 x 55 mm
Weight:	Approx. 230 g (including battery cartridge BT-20LB)
Ambient operating temperature:	-20 to 50° C (on charging:0 to 40° C)
Ambient operating humidity:	20 to 80% (with no dew condensation)
Ambient operating brightness:	20 to 10,000 lx. (Depth of field: 90 mm, QR Code ver.5 (37cellsx37cell), Error-correcting level: M, Cell pitch: 0.5mm, PCS value: 0.9mm, White reflection intensity: 85% min. 500 to 3,000 lx Other conditions Refer to “8.1.2 Supported Code Types” for details.
Controller:	CPU: 32-bit RISC Flash memory: 32 MB
Keypad:	Magic keys: 6 Function keys: 16 Numerical keys etc.: 12
Display:	Type: Dot-matrix, TFT liquid crystal display (LCD) with backlight Formation: 240 dots wide by 320 dots high

Font size		Chars x Lines	Dots (W x H)
40-dot font	Full-width	6 x 8	40 x 40
	Half-width	12 x 8	20 x 40
30-dot font	Full-width	8 x 10	30 x 30
	Half-width	16 x 10	15 x 30
24-dot font	Full-width	10 x 13	24 x 24
	Half-width	20 x 13	12 x 24
16-dot font	Full-width	15 x 20	16 x 16
	Half-width	30 x 20	8 x 16

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) Some of the pixels on the LCD may not illuminate or stay permanently illuminated. Furthermore, there may also be inconsistencies in color and brightness. None of these aspects represent an LCD defect.

Moreover, there will also be individual differences in visual quality in screens containing the above defects.

8.1.2 Code Specifications

Supported Code Types

QR code (Model 1, Model 2), Micro QR code

Code size	Cell pitch
QR code	
Max 117 cells x 117 cells（360° Skew）	0.2 mm
Max 69 cells x 69 cells（360° Skew）	0.33 mm
Micro QR code	
Max 17 cells x 17 cells（360° Skew）	0.2 mm

iQR code

Code size	Cell pitch
Square	
Max 99 cells x 99 cells（360° Skew）	0.25 mm
Max 73 cells x 73 cells（360° Skew）	0.33 mm
rectangle	
Max 43 cells x 131 cells（360° Skew）	0.25 mm
Max 31 cells x 95 cells（360° Skew）	0.33 mm

PDF417

Digits/lines	Module dimensions
1 to 12 digits, 3 to 44 rows *1	0.2 mm min

*1 exclude start/stop codes and left/right indicator

Micro PDF417

Digits/lines	Module dimensions
1 to 4 digits, 4 to 44 rows *2	0.2 mm min

*2 exclude left, middle, and right Row address pattern

MaxiCode

Module size	Module pitch
30 (29) modules × 33 modules	0.88 mm

Data Matrix

Code size	Cell pitch
Max 96 cells × 96 cells（360° skew）	0.25 mm
Max 72 cells × 72 cells（360° skew） 104 cells × 104 cells	0.33 mm

COMPOSITE

Read digits	Module dimensions
RSS, EAN128, Universal product codes, PDF417, Micro PDF, all codes within limits	0.25 mm min

Barcodes

Supported Barcode Types	Bar Dimensions	Scan Magnification
Universal product codes		
EAN-13	0.26 to 0.53 mm	0.8 to 1.6 times
EAN-8	0.26 to 0.66 mm	0.8 to 2.0 times
UPC-A	0.26 to 0.53 mm	0.8 to 1.6 times
UPC-E	0.26 to 0.66 mm	0.8 to 2.0 times
Interleaved 2of5 (ITF)	Min. 0.15 mm	2 to 46 digits*
Codabar (NW-7)		3 to 34 digits
Code 39		1 to 24 digits
Code 93		1 to 38 digits
Code 128（EAN-128）		1 to 31 digits
RSS-14 (GS1 DataBar)		

* Even number digits only

Note: These specification values all apply to ambient illuminance of 500 to 3,000 Lx. (xenon lamp light source)

Multiline codes

Multiline reading can be performed up to a maximum of 3 lines at a time in the specified order on the following codes: Universal product codes, Interleaved 2of5 (ITF), Codabar (NW-7), Code 39, Code93, Code 128 (EAN-128).

This can only be specified with application programs. Refer to BHT-BASIC Programming Manual (BHT-800 Series).

Required Optical Properties

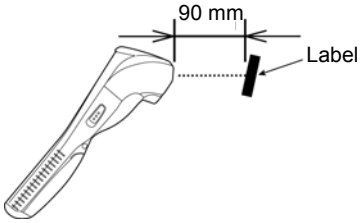
White bars: Reflection intensity of 45% or higher

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 650 nm and spectrum range of 610 to 700 nm.

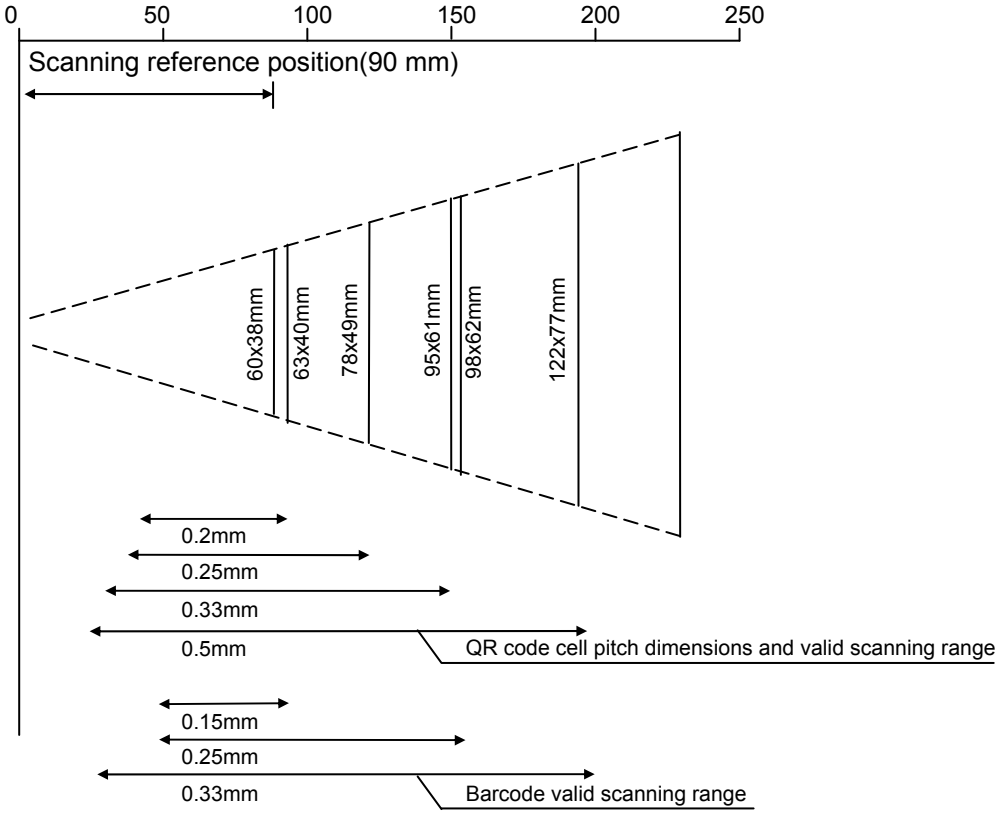
8.1.3 Scanning Performance

Scanning Reference Position



As illustrated at left, align the reading window with the center of the label (code) to be scanned.

Reading Distance and Area



QR code cell pitch dimensions	Valid reading distance
0.20 mm	45 to 95 mm *1
0.25 mm	40 to 120 mm *1
0.33 mm	35 to 150 mm *1
0.50 mm	30 to 195 mm *2

PCS value: 0.9 min., White reflection intensity: 85% min

*1 Under the following conditions:
QR code model 2 Ver.5 (37 cells × 37 cells)
Error-correcting level: M,
Black & white label

*2 Under the following conditions:
QR code model 2 Ver.3 (29 cells × 29 cells)
Error-correcting level: M, Black & white label

Barcode module dimensions	Valid reading distance
0.15 mm	50 to 95 mm *3
0.25 mm	50 to 155 mm *4
0.33 mm	30 to 195 mm *5

PCS value: 0.9 min., White reflection intensity: 85% min

*3 Under the following conditions:
Codabar 10 digits NarrowBar, NarrowSpace
0.15mm

*4 Under the following conditions:
Codabar 10 digits NarrowBar, NarrowSpace
0.25mm

*5 Under the following conditions:
EAN-8 Module dimensions 0.33mm

The BHT-825Q series 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.

8.1.4 Interface Specifications

IrDA Interface

Specification:	IrDA Ver1.3 Low Power physical layer compliant (Except transmission speed: 460,800 bps)
Input signals:	RD
Output signals:	SD
Transmission speed:	9,600 / 19,200 / 38,400 / 57,600 / 115,200 / 460,800 /4M bps

Note: 460,800 bps is only possible when communicating from one BHT-800 unit to another or with the CU-821. 4 Mbps is only possible for communication with the dedicated CU-811 unit. The maximum transmission speed in all other cases is 115,200 bps.

Wireless Interface (BHT-825QW)

IEEE802.11b

Communication method:	DS-SS
Frequency band:	2400 – 2483.5 MHz
Transmission speed:	11/5.5/2/1 Mbps
Channels:	1 to 13 ch

IEEE802.11g

Communication method:	OFDM
Frequency band:	2400 – 2483.5 MHz
Transmission speed:	54/48/36/24/18/12/9/6 Mbps
Channels:	1 to 13 ch

Bluetooth® Interface (BHT-825QB)

Compatible specification:	Bluetooth® Specification Ver. 2.1+EDR
Output class:	Class 2 (Max. 2.5 mW)
Compliant profile:	Generic Access Profile Serial Port Profile Dialup Networking Profile

Chapter 9
Appendices

This chapter describes the CU-800 Series (option) specifications, and describes causes and countermeasures when unable to transfer files.

9.1 CU-800 Specifications

9.1.1 Hardware Specifications

	CU-801	CU-811	CU-821
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:	6.5 VA	7 VA	5V 500 mA
Dimensions (W) x (L) x (H):	110 x 134 x 81.7 mm		
Weight:	105 g	110 g	100 g
Ambient operating temperature:	0 to 40° C		
Ambient operating humidity:	20 to 80% (with no dew condensation)		

*The CU-821 can be powered also from the AC adapter.

9.1.2 Charging Requirements (CU-801/811/821)

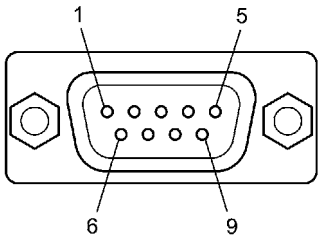
Charge current: Approx. 950 mA (approx. 400 mA *)

Charging time: Approx. 3 hours (approx. 7 hours *)

(*When the CU-821 is powered from the USB host (computer) or USB hub)

9.1.3 Interface Specifications

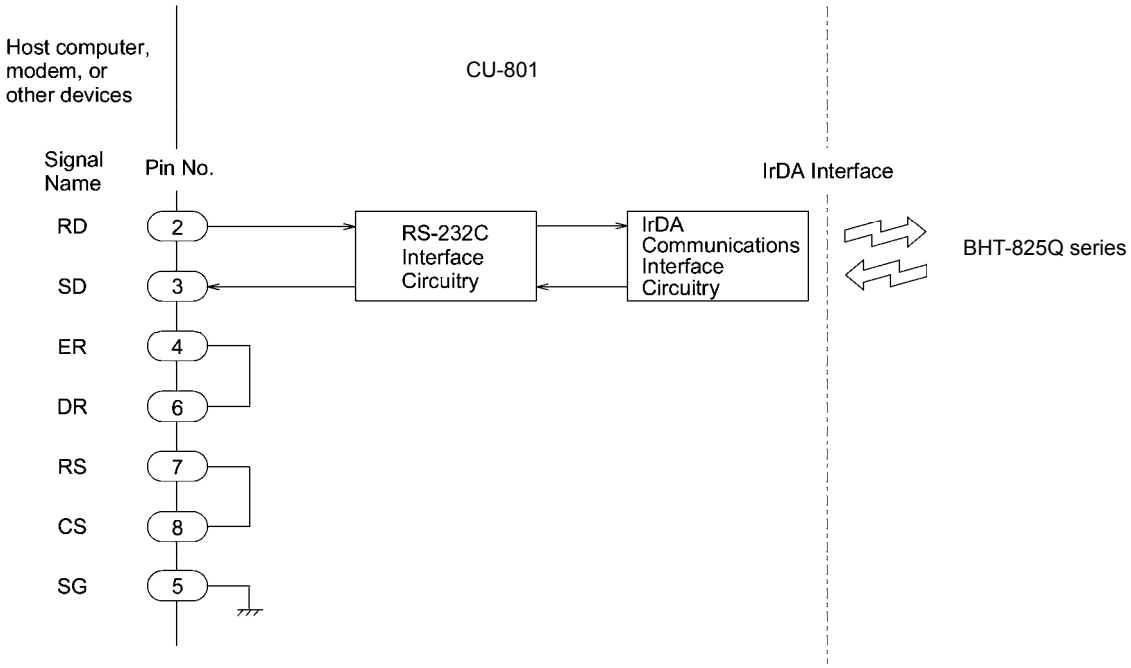
CU-801



The CU-801 RS-232C interface connector uses Dsub-9P.

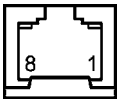
Pin. No.	Signal Name	Function	Signal Direction CU-801 ↔ External Device
2	RD	Receipt data	←
3	SD	Transmission data	→
4	ER	Data terminal ready	→
5	SG	Signal ground	—
6	DR	Data set ready	—
7	RS	Transmission request	—
8	CS	Transmission ready	—

The CU-801 internal wiring is shown below.



CU-811

The CU-811 has an IEEE802.3-compliant Ethernet interface port (100Base-TX).



Ethernet Interface Port (RJ45 jack) on the CU-811

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-821

The USB interface on the CU-821 is USB1.1 (Full-speed) compliant, with a Type Mini-B receptacle.

9.2 When File Transfer is Not Possible Using the Transfer Utility

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 237, 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 has 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. Connection may not be possible depending on the hub model, and 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 consuming power exceeding the maximum standard (500mA or more) is connected to the adjacent port, insufficient current may be supplied. Use an AC adapter to supply power directly.
	Defect or abnormality with the cable between the PC and CU.	Use a properly functioning RS-232C cross-cable.
	The BHT communication interface specification is illegal.	Specify IrDA (Optical) if connected to the PC via the CU. Refer to QBdirect (page 237, Note 1) for details of the setting method.

Error No.	Cause Details	Remedy
51 52	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 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 237, Note 1) for details of characters that can be used in file names.
75	The USB-COM port drive has been incorrectly installed.	Reinstall the USB-COM port driver.
91	Illegal field information specification option when transmitting data file.	Set a correct value for the field information option.
91	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 237, Note 1) for details of characters that can be used in file names.
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".

Error No.	Cause Details	Remedy
	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/

2D Code Handy Terminal

BHT-825Q
BHT-825QB
BHT-825QW

User's Manual

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