DENSO BHT-100QW

Operator's Guide 0 This guide has been prepared expressly for the hands-on user. Always keep it nearby for speedy reference. 000

Related Publications

BHT-100QW/100BW User's Manual

(Contained in the Manual Pack CD. Download available at our URL printed on the back cover of this operator's guide.)

Instructions for using the handy terminal (BHT-100QW/100BW) and optical communication unit (CU-7000).

BHT-BASIC Programmer's Manual (BHT-100 series)

(Contained in the BHT-BASIC Compiler CD and Manual Pack CD)

Description for developing application programs of the handy terminal in BHT-BASIC.

Transfer Utility Guide (that comes with Transfer Utility)

Description about software that transmits data and programs between the handy terminal and computer.

Ir-Transfer Utility C Guide (that comes with Ir-Transfer Utility C)

Description about software that transmits data and programs between the handy terminal and computer via the optical communication unit (CU).

Ir-Transfer Utility E Guide (that comes with Ir-Transfer Utility E)

Description about software that transmits data and programs between the handy terminal and computer via the computer's integrated IR port or any of the specified external IR transceivers.

SAFETY PRECAUTIONS

Be sure to observe all these safety precautions.

Strict observance of these warning and caution indications are a MUST for preventing accidents which could result in bodily injury and substantial property damage. Make sure you fully understand all definitions of these terms and related symbols given below, before you proceed on to the text itself.

Alerts you to those conditions which could cause serious bodily injury or death if the instructions are not followed correctly.
Alerts you to those conditions which could cause minor bodily injury or substantial property dam- age if the instructions are not followed correctly.

Meaning of Symbols



A triangle (\bigtriangleup) 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 (\bigcirc) alerts you to 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 (\bigcirc) with a picture inside alerts you to something you MUST do. This example shows that you MUST unplug the power cord.

Handling the battery cartridge

 Never disassemble or heat the rechargeable 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.





26

This

humidity is killing

me!

Refrigeration

Refrigeration

Refrigeratio

I'm burning

up!

Hot-

l'm freezing!

Handling the rechargeable 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

 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.

• Never disassemble or modify the BHT; doing so could result in an accident such as break or fire.



Never disassemble



Keep me

away from

water

Do not drop me!

• 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.
- 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.
- Touch the LCD only with the stylus that comes with the BHT. Using the tip of a pen or any pointed object will result in a damaged or broken LCD.





Components and Functions



The functions of the keys may be set by user programs. Shown below is a set of sample functions.



Reading 2D Codes and Bar Codes

Turn the BHT power on, bring the reading window to the target code, and press the trigger switch. The BHT turns three marker LEDs on to indicate the scanning range and the illumination LED to scan the code. Keep the BHT stationary in a position where the target code lies between the right and left markers and the center marker comes to the center of the target code.

Hold the reading window 4 to 14 cm (1.6 to 5.5 inches) away from codes to be scanned.

When the BHT has read the code successfully, the indicator LED will illuminate in green and the markers will go off.



- The markers show the left-to-right scanning range. When the scanning distance is 8.5 to 9.5 cm (3.3 to 3.7 inches), they indicate almost the center of the up-down scanner's view. If the distance is out of the range, those markers will deviate from the center.
- If the BHT fails to read due to specular effects or other factors, change the scanning angle of the reading window or the distance from codes as shown at right, and try it again. (Specular effects occur when the reflection of the light from the code becomes excessively strong. This can easily happen when the reflecting surface is polished or covered with vinyl.)



• The code reading procedure may differ depending upon the application used, so follow the application's manual.

- NOTE
- Before reading 2D codes or bar codes, clean those labels if stained.
- Avoid using the BHT in direct sunlight. The BHT might fail to read correctly.
- To read 2D codes or bar codes on curved surfaces, apply the BHT to the target code so that the code comes to the center of the scanning range indicated by the markers.
- Depending upon the code size or cell pitch, the proper scanning distance from 2D codes or bar codes will differ.
- TIP At the scanning time, the marker LEDs and illumination LED will come on. The illumination LED may not come on where it is bright enough for the BHT to scan. The light intensity of those LEDs will vary depending upon the scanning conditions and variation of their elements.

Using Radio Link

- If there are too many communications errors, first make sure that the BHT points directly at an access point because the 2.4-GHz band requires a more or less straight line path. Note also that the low-power radio waves have trouble passing through human bodies and other obstacles along that path.
- This link will not operate properly in the vicinity of microwave ovens, industrial heaters, high-frequency medical equipment, and other sources of radio waves in the 2.4-GHz band.
- Electromagnetic noise from personal computers, refrigerators, and other home appliances can also interfere with link operation.
- Environmental factors that can also interfere with link operation include large metallic objects, metallic dust, or metallic walls in the vicinity of the path and vibration at either end.



To System Designers:

- Before developing the application, make sure that the intended environment is free of the interference factors above and thus actually capable of supporting link operation.
- Assume that there will be communications failures requiring robust retry capabilities in the software.
- When introducing the BHT link operation into an environment where equipment using radio waves in the 2.4-GHz band operates or when introducing such equipment after the introduction of the BHT link operation, be sure to confirm that the BHT radio link operates properly with all equipment being in operation beforehand.
- If the environment of the radio communications system is changed after the introduction (e.g., newly installed household appliances and movement/addition of shelves or objects), then confirm that the radio link operates properly again before the actual use.

Using Infrared Link

■ CU-7000

Make sure that the BHT is securely in the CU-7000.



NOTE Shield the optical interface from direct sunlight, ambient intense lighting (inverter-driven fluorescent lighting, in particular), and other potential sources of infrared radiation. Sources to watch out for include remote control units for television sets and the like.

Setting the Backlight

Pressing the right-hand trigger switch (M4 key) while holding down the SF (Shift) key activates or deactivates the backlight function.



NOTE In user programs, you can select the key to be used for activating or deactivating the backlight function (instead of the initial setting: combination of **SF** and the right-hand trigger switch), as well as modifying the ON-duration of the backlight before the automatic turning-off.

Adjusting the LCD Contrast, Beeper Volume and Touch Screen, and Switching the Beeper & Vibrator

While holding down the **M1** key or right-hand trigger switch (**M4**), press the **PW** key. The main adjustment screen appears which differs depending upon the current state as shown below.

After adjustment, press the **ENT** key or no keys for five seconds. The new settings will be registered and the main adjustment screen will disappear.

[1] LCD CONTRAST		
[2] BEEPER		
[3] BEEPER VOLUME		
TOUCH SCREEN		
[4] VOLUME		
[5] CALIBRATION ENT		

When the beeper is selected (default)

[1] LCD CONTRAST	
[2] BEEPER VIBRATION	
[3] BEEPER VOLUME	
TOUCH SCREEN	
[4] VOLUME	
[5] Calibration ent	

When both the beeper and vibrator are selected

(The current selection is highlighted.)

[1] LCD CON	TRAST
[2]	VIBRATION
[3]	
TOUCH [4] VOLUME	SCREEN
[5] Calibra	TION ENT

When the vibrator is selected

Adjusting the LCD contrast

You can adjust the LCD contrast to eight levels.

- (1) Use the 1 key (or M1 or M2 key) to select the LCD CONTRAST line.
- (2) To make the contrast low, press the **M1** key with the **SF** key held down; to make it high, press the **M2** key with the **SF** key held down.

Switching the beeper & vibrator

You may choose any of three ways—beeping only, vibrating only, or beeping & vibrating as a confirmation of completion of code reading.

(1) Use the **2** key (or **M1** or **M2** key) to select the BEEPER VIBRATION line that will be highlighted in any one of the following three states:



(2) Highlight the desired way(s) by using the M1 or M2 key while holding down the SF key.

Adjusting the beeper volume

You can adjust the beeper volume to four levels from OFF to MAX.

- (1) Use the **3** key (or **M1** or **M2** key) to select the BEEPER VOLUME line.
- (2) To turn down the volume, press the **M1** key with the **SF** key held down; to turn it up, press the **M2** key with the **SF** key held down.

Adjusting the beeper volume to be sounded when you press the touch screen

You can adjust the volume of the beeper to be sounded when you press the touch screen, to three levels from OFF to MAX.

- (1) Use the 4 key (or M1 or M2 key) to select the VOLUME line.
- (2) To turn down the volume, press the **M1** key with the **SF** key held down; to turn it up, press the **M2** key with the **SF** key held down.

Adjusting the touch screen

At the first use of the touch screen or if the touch areas seem to deviate from the normal positions when in use, adjust the touch screen according to the steps given below.





Touch the center of the 4th "+."

The adjustment will complete and the display will return to the main adjustment screen.



If the adjustment is not completed normally, the screen shown at left will appear where you may choose retry or not.

If you select "1:Yes" and press the **ENT** key, the display will return to the top screen of the touch screen adjustment sequence.

If you select "2:No" and press the **ENT**, or press the **C** key, the display will return to the main adjustment screen.

About Status Indicators



Battery voltage level

Shows the current battery voltage level.

- Displays when the voltage level is high.
- Displays when the voltage level is low.

Keypad shift state

SE Displays when the keypad is shifted.

Alphabet and touch screen input states

- ALP Displays when the alphabet input function is activated.
- Displays when the touch screen is ready to accept entry.

Synchronization state

- Displays when the BHT is synchronized with an access point.
- The displayed battery level shows the terminal voltage of the battery cartridge, not how much power is left.

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

Loading the Battery Cartridge

Before the first use of the BHT, be sure to load the battery cartridge as shown below. The battery cartridge is not loaded in the BHT when shipped from the factory.

- (1) Charge the rechargeable battery cartridge.
- (2) Turn the BHT upside down.
- (3) As shown below, slide the battery cartridge into the BHT until it clicks into place. (To remove it, press the release button after making sure that the BHT power is off.)



• The BHT integrates a rechargeable backup power source which backs up the memory and calendar clock in the BHT when no battery cartridge is loaded or the voltage level of the battery cartridge drops below the specified level. The backup power source is automatically charged by the battery cartridge.

> When you first load the battery cartridge after purchase or you load it after leaving the BHT unused for a long time, do not remove the battery cartridge for 10 minutes or more after that loading. This is for charging the memory backup source integrated in the BHT.

• If you will not be using the BHT for a long time, take the specified procedure given in "Battery Replacement Notes."

BHT Turning-off Notes

When the BHT is turned off by pressing the **PW** key or by the auto power-off feature, it displays the following message and starts preparation for shut-down.

Shutdown in progress.
Do not remove
the battery.

When the above message is displayed, do not remove the battery cartridge.

If you do so and leave the BHT without a battery cartridge loaded for one hour or more, then the error message "Contact your administrator. Note the error number. (2XXX)" may appear when you reload the battery cartridge and turn the BHT on.

Battery Replacement Notes

■ When is battery replacement needed?

If the "Charge the battery!" appears on the LCD, replace the rechargeable battery cartridge with a fully charged one, respectively.

If you leave the BHT without replacing the rechargeable battery cartridge, the integrated calendar clock or data will no longer be backed up so that the calendar clock will stop or the message "Contact your administrator. Note the error number. (XXXX)" will appear on the LCD.



Be sure to turn the BHT off before battery replacement.

Replace the battery cartridge quickly. Load a charged battery cartridge within 3 minutes after the removal to avoid data loss.

After battery replacement, turn the BHT on and check the BHT operation.

■ If you will use the BHT more than one time per month:

Keep the battery cartridge loaded in the BHT.

■ If you will not be using the BHT for more than one month:

Remove the battery cartridge from the BHT and then store the BHT. To do so, be sure to follow the procedure given below.

(1) When removing the battery cartridge:

Press the PW key for more than 3 seconds to turn the BHT off.

The following message will appear on the LCD and the BHT will start backing up data. After completion of the backup operation so that the message disappears, remove the battery cartridge.

(The backup operation may take several tens of seconds depending upon the volume of data to be backed up.)



(2) When turning the BHT on after storage with no battery cartridge loaded:

Even after removal of the battery cartridge, the calendar clock will work with the backup power source for a while.

If the calendar clock backup has stopped, loading the battery cartridge and turning the BHT on will display the following message, prompting you to set the current date and time.

For details about the setting procedure, contact your system administrator.

(The indication "00/01/01 00:00" will vary depending upon the calendar clock state.)

Set the current date and time.
00/01/01 00:00
_ , , , .

- The rechargeable battery cartridge can be recharged hundreds of times, but it will eventually wear out. If the run time is noticeably shorter than normal, replace the battery cartridge with a new one.
 - Use only DENSO WAVE-authorized battery cartridges and chargers.
 - Never dispose of batteries into a fire.
 - When disposing of battery cartridges, cover their terminal pins with vinyl tape to prevent short-circuit.
 - Batteries should be recycled properly. Do not throw them in the trash.

Error Messages

If some error occurs when the power is turned on or during program execution, one of the following error messages will appear on the LCD.



System Program error

Problem

A System Program error has occurred.



If this error occurs, the BHT beeps five times (for 0.1 second per beep) and then turns itself off.

Solution

Contact your system administrator.



Low battery indication—Level 1

Problem

When the power is turned on or off or during execution of program (System Mode or application), the battery output level has dropped below a specified lower level limit.



If low battery is detected, the BHT displays this message for approx. 2 seconds and beeps three times (for 0.1 second per beep). After that, it will resume previous regular operation.

Solution

The battery recharge or replacement time will come soon.

If the BHT is loaded with the rechargeable battery cartridge, replace or charge it.



Low battery indication—Level 2

Problem

When the power is turned on or off or during execution of programs (System Mode or applications), the battery output level has lowered to the extent the BHT can no longer operate.



If lower battery is detected, the BHT beeps five times (for 0.1 second per beep) and then turns itself off. Depending upon the battery level, the beeper may not sound five times.

Solution

Replace or recharge the battery cartridge.



Calendar clock stopped

Problem

The calendar clock integrated in the BHT has stopped because:

- The battery cartridge had been removed for a long time or
- The battery cartridge had not been recharged for a long time.

NOTE The indication "00/01/01 00:00" will vary depending upon the calendar clock state.

Solution

Contact your system administrator.







Abnormally turned off last

Problem

After turned off abnormally*, the BHT had been left with no battery cartridge loaded or with a discharged battery cartridge loaded, so unsaved data was lost.

(*"Normally turned off" refers to turned-off with the PW key or by the auto power-off feature.)

Solution

Contact your system administrator.

System Program malfunction

Problem

During execution of System Program, the System Program has attempted to write onto the write-protected area of the memory.

(xxxxxxxx: Error address)



If this error occurs, the BHT beeps five times (for 0.1 second per beep).

Solution

Unload and reload the battery cartridge, then turn on the power. If this error occurs frequently, contact your system administrator.

Problem

During execution of System Program, the System Program has received an invalid command code.

(xxxxxxxx: Error address)



If this error occurs, the BHT beeps five times (for 0.1 second per beep).

Solution

Unload and reload the battery cartridge, then turn on the power. If this error occurs frequently, contact your system administrator.





Execution program not selected

Problem

No user program has been selected as an execution program to be run when the power is turned on.



If this error occurs, the BHT beeps five times (for 0.1 second per beep) and then turns itself off.

Solution

Contact your system administrator.

Resume data lost

Problem

No resume data has been retained since the BHT was not normally turned off and then left with no battery cartridge loaded or with a discharged battery cartridge loaded even if the resume function had been set to ON.



The BHT displays this error message for 3 seconds and automatically runs the execution program from the point of start-up.



Error in System Mode settings

Problem

Your settings made in System Mode contain an error.



- If this error occurs, the System Mode settings revert to the factory defaults.
- The BHT displays this error for 3 seconds and then displays the "No execution program selected..." message.

Solution

Contact your system administrator.

d the
tery
to restart!
: x x x x x x x x x x x x x x x x x x x



Problem

An error has occurred during execution of System Program.



If this error occurs, the BHT beeps five times (for 0.1 second per beep).

Solution

Unload and reload the battery cartridge, then turn on the power.

If this error occurs frequently, contact your system administrator.

System administrator to be called

Problem

Any of a hardware-related error, memory error, and execution program error has occurred.

(xxxx: Error code)



If such an error occurs, the BHT beeps five times (for 0.1 second per beep) and then turns itself off.

Solution

Turn on the power again. If this error occurs frequently, make a note of the displayed error code and contact your system administrator.



Proper Care of the BHT

Clean the housing and the rechargeable battery cartridge terminals with a dry, soft cloth. Before cleaning, be sure to turn the BHT off.

- Never use benzene, alcohol, or other organic solvents. The housing may be marred or the paint may come off.
- Never rub or strike the liquid crystal display (LCD) with anything hard. The LCD surface will be easily scratched or broken.
- When cleaning the keypad, do not scrub the surface too hard, and do not pull on the keys. Doing so may break the keys or cause the keypad to dislocate.



• If the BHT becomes smudged, moisten a soft cloth with neutral detergent and wring it out thoroughly. Wipe the BHT with the cloth and then go over it again with a dry cloth.

Dust or dirt accumulating on the clear plate of the reading window will affect reading performance. If you use the BHT in dusty areas, therefore, periodically check the clear plate of the reading window and clean it if dusty.

- To clean the plate, first blow the dust away with an air brush. Then wipe the plate with a cotton swab or the similar soft one gently.
- If sand or hard particles have accumulated, never rub the plate; doing so will scratch or damage it. Blow the particles away with an air brush or a soft brush.

Handling Notes

- An early upload of gathered data is recommended, since the data stored in the RAM might be affected by the so-called "soft error" or other environmental phenomena. In some cases, the "Contact your administrator." will appear on the LCD.
- Do not use the BHT near a personal or amateur radio device. Doing so may cause the BHT to malfunction.
- Avoid storing the rechargeable battery cartridge in a hot place. The battery capacity may be decreased.
- Do not touch the charge terminals of the battery cartridge by hand or stain those terminals. Doing so could result in a charging failure.
- When connecting or disconnecting the direct-connect interface cable to/ from the BHT, do no plug or unplug at an angle and do not pull the cable strongly. Doing so will result in a machine failure.
- For touch screen operation, use the stylus that comes with the BHT. Do not use your fingernails, any pointed or hard material. Do not press the touch screen strongly or apply a strong shock to the touch screen.
- If the stylus wears so that its point becomes sharp, then replace it with a new one.
- Do not drop the BHT to the floor or apply a strong impact to the BHT. Doing so will break the BHT or result in a machine failure.

US and Canada Regulations

This device complies with Part 15 of the FCC Rules, Canadian ICES-003 and RSS-210 Rules.

Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

NOTE: This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

FCC WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CAUTION: Radio Frequency Radiation Exposure

This device is approved for hand held use only and, to comply with applicable FCC radio frequency exposure regulations, must be used with a distance of at least 20 cm (7.9 inches) between the antenna and the body of any person at all times during use.

This transmitter and its antenna should not be placed next to other antennas or similar radiating structures.

LABELING:



Declaration of Conformity (For European Union)

The radio frequency module that comlies with the Directive 99/5/EC(R&TTE) is mounted on this device (BHT-100QW).

DECLARATION OF CONFORMITY

Directive 99/5/EC (R&TTE)

Manufacturer or Authorized representative : **DENSO WAVE INCORPORATED**

Address : 1-1 Showa-cho, Kariya-shi, Aichi-ken, 448-8661, Japan

We declare on our sole responsibility, that the following product :

- Kind of equipment : Radio frequency module
- Type-designation : *MI802B3*

CEO

is compliance with the essential requirement of §3 of the R&TTE.

- Health and safety requirements pursuant to §3(1)a : Applied Standard(s) or other means of providing conformity : *EN60950 : 2000*
- Protection requirements concerning EMC §3(1)b : Applied Standard(s) or other means of providing conformity : EN301 489-17 : 2000
- Measures for the effective use of the Radio frequency spectrum §3(2) : Applied Standard(s) or other means of providing conformity : ETS300 328/A2 : 2001

CE marking

- DENSO WAVE INCORPORATED does not assume any product liability arising out of, or in connection with, the application or use of any product, circuit, or application described herein.
- If it is judged by DENSO WAVE INCORPORATED that malfunction of the product is due to the product having been dropped or subjected to impact, repairs will be made at a reasonable charge even within the warranty period.
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