MITSUBISHI

D-20HC-E Handy Controller

Operating Manual(For D-2N20HC-RW)

Mitsubishi ID System

• SAFETY PRECAUTIONS •

(Always read these instructions before using this equipment.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.

The instructions given in this manual are concerned with this product. For the safety instructions of the programmable controller system, please read the manual of the host controller used.

In this manual, the safety instructions are ranked as "DANGER" and "CAUTION".

◇ DANGER	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

Note that the ⚠CAUTION level may lead to a serious consequence according to the circumstances.
Always follow the instructions of both levels because they are important to personal safety.

Please save this manual to make it accessible when required and always forward it to the end user.

[INSTALLATION PRECAUTIONS]

◇ DANGER

- Always power off the module before installing the reader/writer.
  Not doing so can cause an electric shock or damage the product.

⚠ CAUTION

- Use the module in the environment defined in the general specifications given in this manual.
  Not doing so can cause an electric shock, fire, malfunction or product damage or deterioration.

- Do not directly touch the conductive area or electronic components of the module.
  Doing so may cause malfunction or failure in the module.

- After plugging the reader/writer to the module connector securely, tighten the module mounting screw within the specified torque range.
  Undertightening can cause a short circuit or malfunction.
  Overtightening can cause a short circuit due to damage to the screw.

[INSTALLATION PRECAUTIONS]

> ⚠ **CAUTION**
>
> - Securely load the battery by pressing it against the battery connector.
>   After loading, check secure connection of the battery.
>   Insecure connection can cause a malfunction.

[WIRING PRECAUTIONS]

> ◇ **DANGER**
>
> - Always switch power off before starting installation, wiring or other work.
>   Not doing so can cause an electric shock, product damage or malfunction.

> ⚠ **CAUTION**
>
> - Tighten the screws within the range of specified torque.
>   If the screws are loose, it may result in short circuits or malfunction.
>   If the screws are tightened too much, it may cause damage to the screw and/or the module,
>   resulting in short circuits or malfunction.
>
> - Be careful not to let foreign matter such as sawdust or wire chips get inside the module.
>   They may cause fires, failure or malfunction.
>
> - The communication and power supply cables connected to the module must be placed in a duct
>   or fixed by clamps.
>   Not doing so can cause the module and/or cables to be damaged due to dangling, motion or
>   careless pulling of the cables or cause a malfunction due to poor cable contact.
>
> - Do not hold the cable part when unplugging the communication or power supply cable
>   connected to the module.
>   Unplug the cable after loosening the screw in the part connected to the module.
>   Pulling the cable connected to the module can cause the module and/or cable to be damaged or
>   cause a malfunction due to poor cable contact.

[STARTING AND MAINTENANCE PRECAUTIONS]

◇ DANGER

- Do not touch the connector while the power is on.
  Doing so may cause malfunction.

- Connect the battery correctly.
  The battery should not be charged, disassembled, heated, thrown into fire, shorted or soldered, for example.
  Incorrect handling of the battery may cause it to produce heat, burst or catch fire, for example, resulting in injury or fire.

- Switch all phases of the external power supply off when cleaning or retightening the terminal screws and module installation screws.
  Not doing so may cause failure or malfunction of the module.
  If the screws are loose, it may cause the module to fallout, short circuits, or malfunction.
  If the screws are tightened too much, it may cause damages to the screws and/or the module, resulting in the module falling out, short circuits or malfunction.

- Always switch power off before mounting or dismounting the reader/writer.
  Not doing so can cause the module to fail or malfunction.

⚠ CAUTION

- Do not disassemble or modify the modules.
  Doing so could cause failure, malfunction injury or fire.

- When the module is not loaded with the battery, do not use the power supply adapter to switch power on.
  Doing so can cause the module to fail or malfunction.

[DISPOSAL PRECAUTIONS]

⚠ CAUTION

- When disposing of this product, treat it as industrial waste.

REVISIONS

Print Date	* Manual Number	Revision
Jun., 2001	SH (NA)-080189-A	First printing

INTRODUCTION

Thank you for buying the Mitsubishi ID System D-2N Series.
Before using this unit, please read this manual to be sure that you sufficiently understand the ID System D-2N Series functions and performance to allow you to correctly operate the unit.
Please make this manual available to end users.

CONTENTS

About Manuals

The following manuals are also related to this product.
In necessary, order them by quoting the details in the tables below.

Related Manuals

Manual Name	Manual Number (Model Code)
Type AD35ID1/2, A1SD35ID1/2 ID Interface Module User's Manual 　Describes the system configuration, module specifications, part names and settings, programming method and others for use of the module.　　　　　　　　　　　　　　　　　　(Option)	SH-080147 (13JR35)
Type AJ65BT-D35ID2 CC-Link System ID Interface Module User's Manual 　Describes the system configuration, module and settings, and others of the AJ65BT-D35ID2.　(Option)	SH-080148 (13JR36)
Type D-2N232IF2 ID Interface Module User's Manual 　Describes the system configuration, module specifications, part names and settings, and others of the D-2N232IF2.　　　　　　　　　　　　　　　　　　　　　　　　　　　(Option)	SH-080149 (13JR37)

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1. OVERVIEW

This manual explains the specifications, method of use, and operation of model D-20HC-E.
The D-20HC-E is a peripheral unit for the ID system that has functions for reading and writing to and from a data carrier and for commuicating with a general purpose personal computer.

1.1 Features

(1) Reading from and writing to a data carrier is possible

Data communication with a data carrier can be performed when combined with the model D-2N20HC-RW Handy Controller Reader/Writer.

(2) Battery operated use is possible

The unit can be operated in places without an electrical supply by using the rechargeable Ni/MH batteries.

(3) Large display area

The display area was expanded by using three lines times 16 characters LCD, which makes it easy to read from and write to a data carrier.

(4) Large keys for ease of soft-touch operation

A long key stroke ensures ease of key operation.

(5) Write protectable

The user-specified memory of the data carrier can be write-inhibited.

(6) Management of data carrier life

The count write or write count batch update instruction, which can control the number of write times, easily achieves the write life management of the data carrier.

(7) Life extended up to 3.6 million write times (this requires settings to be made in the whole system)

Extended-life bank switching can increase the data carrier write life (300,000 times) up to 3,600,000 times.

1.2 Components Included in Box

When you purchase the D-20HC-E, please check that the following products are included in the box.

Product Name	Quantity
Model D-20HC-E Handy Controller	1
Model D-20HC-PS Power Supply Adapter	1
Model D-20HC-BAT Battery	1

2. SPECIFICATIONS

2.1 General Specifications

The following are the general specifications of the D-20HC-E.

Items		Specifications
Ambient Temperature	During Use	0 to 40°C
	During Storage	-10 to 50°C
Ambient Humidity	During Use	35 to 85% RH or less (no condensation)
	During Storage	35 to 90% RH or less (no condensation)
Shock Resistance		Complies with JIS-C0912 (98 m/s^2, in the three directions of the x, y, z axis)
Usage Atmosphere		Areas where there is little corrosive gas or dust is not acceptable
Cooling Method		Self cooled

2.2 Performance Specifications

The following are the performance specifications of the D-20HC-E.

Items		Specifications
Power Supply		Power supplied from the D-20HC-BAT built-in rechargeable Ni/MH battery (accessory)
Current Consumed	Unit only	4.8VDC 300mA
	When D-2N20HC-RW is connected	4.8VDC 500mA
Battery	Rating	D-20HC-BAT built-in rechargeable Ni/MH battery (accessory) 4.8VDC 1200mAh
	Charging method	Charged by the D-20HC-PC power supply adapter (accessory) (charging time: 8 hours)
	Operating time / When connected with D-2N20HC-RW	About 1.5 hours after full charging (for operation at normal temperature)
Pixels	Pixels	56 × 128 Dot graphic display liquid crystal (with back light LED)
	Character Types and Number of Characters	Alphanumeric:16 characters × 3 lines
Operation Method		36 Individual operation keys
Key Operation Confirmation		Buzzer sound
User Memory Capacity		RAM 8k bytes (4k Word)
External Interface	Extended interface (unit top)	Dedicated connector, asynchronous mode, TTL, 9600bps dedicated protocol (for connection of handy controller reader/writer)
	RS-232C interface (unit bottom)	RS-232C conformance, D-sub 25 pin female (for connection of personal computer)
External Dimensions (mm(in.))	Unit only	170(6.70)(H) × 90(3.55)(W) × 35(1.38)(D)
	When D-2N20HC-RW is connected	236(9.12)(H) × 90(3.55)(W) × 37(1.46)(D)
Weight (kg)	Unit only (including battery)	0.50
	When D-2N20HC-RW is connected	0.63

2.3 System Configuration

The following are the general configuration and system components.

2.3.1 General configuration

The following is the general configuration for use of the D-20HC-E.

Data Carrier
D-2N03PS / D-2N03PM

Data communication

Reader / Writer
D-2N20HC-RW

Power Supply Adapter	Handy Controller	Battery
Provided for handy controller		Provided for handy controller
D-20HC-PS	D-20HC-E	D-20HC-BAT
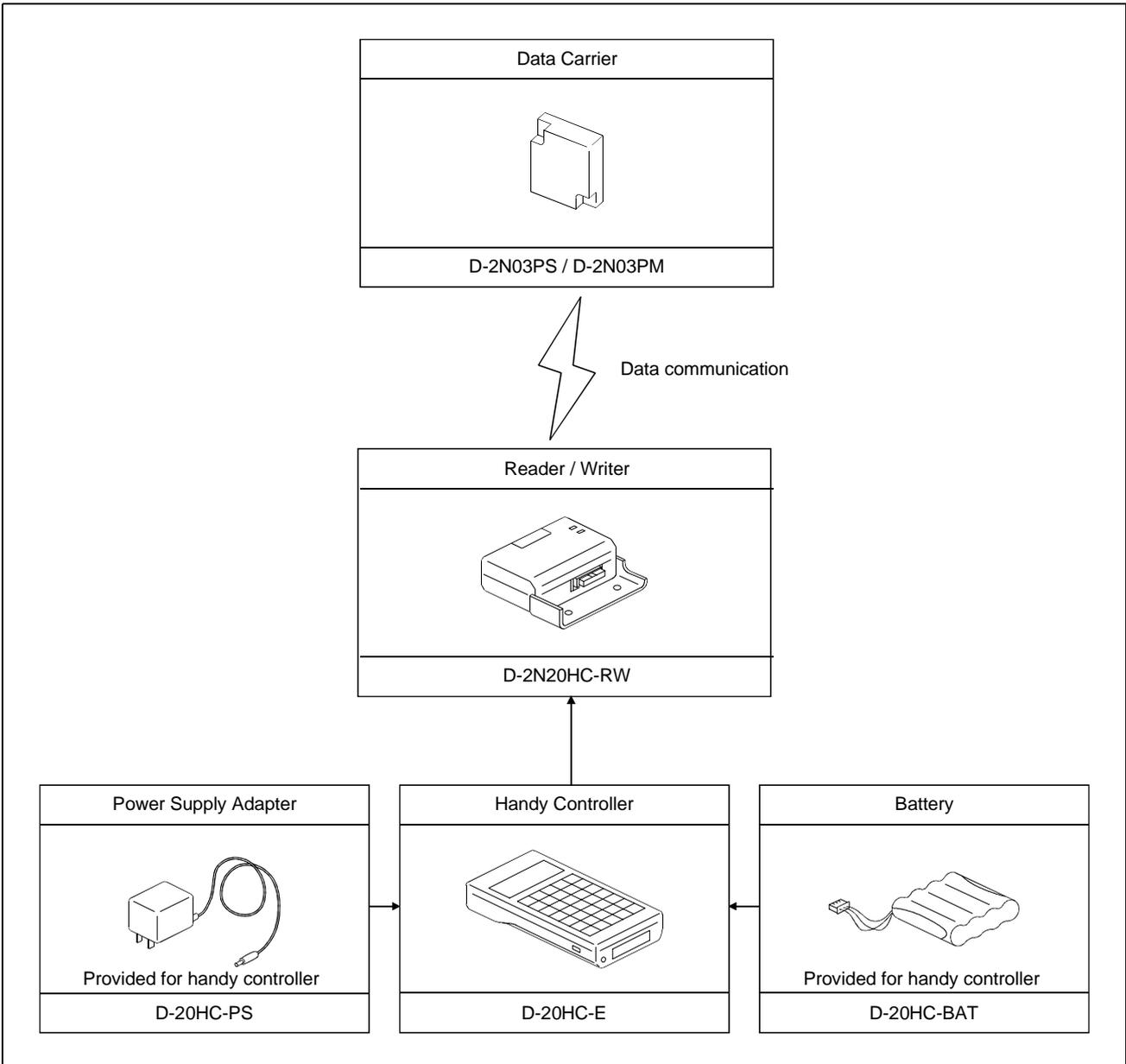
2.3.2 List of configuration equipment

(1) Necessary equipment

The following are equipment needed for use of the D-20HC-E.

A handy controller reader/writer is needed too make communication with the data carrier.

Product		Model	Remarks
Handy Controller		D-20HC-E	Portable Handy Controller
Handy Controller Reader/Writer	D-2N Series	D-2N20HC-RW	D-2N series reader/writer dedicated to handy controller
Power Supply Adapter		D-20HC-PS	Power supply adapter for charging handy controller (Provided for handy controller)
Battery		D-20HC-BAT	Battery for handy controller (Provided for handy controller)
Data Carrier	D-2N Series	D-2N03PS	ID plate, memory capacity 320 bytes (160 words), small type
		D-2N03PM	ID plate, memory capacity 320 bytes (160 words), direct metal-mounted type

2.4 List of Functions

Mode	Function		Operation Purpose	Reference section
Read	Read Entire Area	160 words	Reads all data (160 words) of the data carrier.	Section 5.2.1
		4k words	Must not be used.	—
	Setting Read	Address Specification Read	Reads the Data Carrier's Specified Address Data.	Section 5.2.2
		Item and Specification Read	Must not be used.	—
	Write-protect Information Read		Reads write-protect information set in the data carrier.	Section 5.6.2
	Communication Information Read		Reads information of communication with the last communicated data carrier.	Section 5.10
Write	Specification Write	Address Specification Write	Writes the Data to the Data Carrier's Specified Address.	Section 5.3.1
		Item Specification Write	Must not be used.	—
	Changing Data	Address Specification Change	Changes the Handy Controller's specified Address Data.	Section 5.3.3
		Item Specification Change	Must not be used.	—
	Moving Data		Moves data between the Handy Controller blocks.	Section 5.3.5
	Write-protect Information Write		Writes write-protect information to within the data carrier.	Section 5.6.1
	Count Write		Makes setting to update the total write count value once at the time of Specification Write.	Section 5.7
	Write Count Batch Update		Adds any write count addend value to the total write count value of the data carrier.	Section 5.8
	Extended-life Bank Switching ＊2		Sets the number of data carrier banks and used bank No.	Section 5.9
Other	All Clear Command		Zero clears the data carrier's data.	Section 5.4.1
	Comparison Command	Address Specification Comparison	Compares the specified address data of the Handy Controller and the data carrier.	Section 5.4.2
		Item Specification Comparison	Must not be used.	—
	Usage Start		Must not be used. (If executed, the instruction is completed properly but does nothing to the data carrier.)	—
	Usage Stop		Must not be used. (If executed, the instruction is completed properly but does nothing to the data carrier.)	—
	Total Number of Communications ＊1		Reads the data carrier's total number of communications.	Section 5.4.6
	Memory Clear	Clear Entire Area	Zero clears all the Handy Controller's data.	Section 5.4.7
		Block Clear	Zero clears the Handy Controller's data in block units.	Section 5.4.8
	Item Name Display	Creator's Name Display	Must not be used.	—
		Data Display	Must not be used.	—
		Display Switch	Must not be used.	—
Display	Data Transmission		Must not be used.	—
	Communication Change		Must not be used.	—
	Display Switch		Switches the data display between decimal, hexadecimal, and the character.	Section 5.5

＊1 Unless Count Write or Write Count Batch Update is performed, the total number of communications displayed is 0.

＊2 Settings must be made in the whole system.

    For details, refer to: AD35ID ☐ /A1SD35ID ☐ User's Manual

               AJ65BT-D35ID2 User's Manual

               D-2N232IF2 User's Manual

    Note that if you change the number of banks accidentally, the data of the data carrier may be lost.

3. NAME AND USE OF EACH COMPONENT

This section explains the name and use of each D-20HC-E component.

3.1 Usage Precautions

Following is an explanation of the usage precautions for the D-20HC-E.

(1) The case is made of plastic. Do not drop it or strike it forcefully.

(2) Do not disassemble the case. (Doing so could cause problems.)

(3) When the D-2N20HC-RW is removed, place a cover over the connector area.

(4) Do not touch the RS-232C connector pins. (Doing so could cause problems.)

(5) Do not remove the main unit's cover or loosen the cover's fastening screws.
(Doing so could cause problems.)

(6) If the keyboard becomes dirty, do not clean it with thinner, alcohol, or freon.

(7) Only conduct keyboard entry using your fingers. Using a pointed object for data
entry could cause problems. Wearing gloves when doing key entry could cause the
characters on the keys to be worn off. (When a key is pushed, a buzzer will sound
to confirm the key entry.)

(8) When the battery (D-20HC-BAT) is not connected, do not use the power supply
adapter (D-20HC-PS) to switch power on.
Doing so can cause the module to fail or malfunction.

3.2 Names of D-20HC-E Components

Following is shown the names of the D-20HC-E main unit components.

(Front)

Extension Interface Connector *1   Liquid Crystal Display

Operation Keyboard

High Speed Charge
Display Light

RS-232C Interface
(Not used)

Power Supply
Adapter Jack

＊1 The Extension Interface Connector Is for Connecting the Model D-2N20HC-RW
Handy Controller Reader/Writer.

(Back)

D-2N20HC-RW Attachment
Screw Holes

Hanger

Contrast Adjustment
Volume

Name Plate

Power Supply Switch

3.3 Key Layout and List of Key Functions

Following is shown the key layout and functions for the D-20HC-E operation keyboard.

1) Mode Key (This key selects the mode)

2) Controller Key

3) Character Key
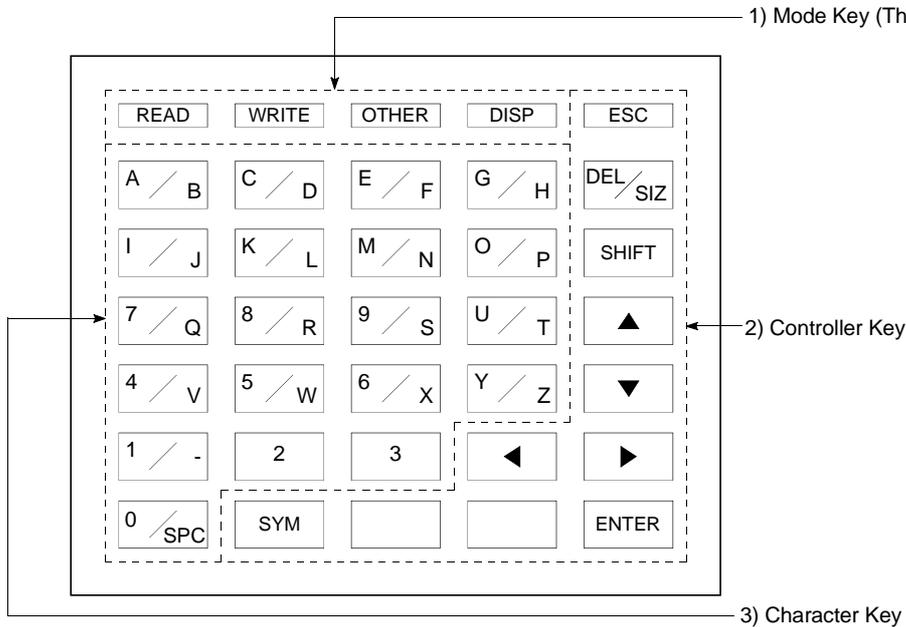
No.	Name	Key	Function Summary
1)	Mode Key	READ to DISP	This key selects the D-20HC-E modes.
2)	Controller Key	ESC	This key is used to undo an operation when a mistaken key operation was done.
			Returns to the previous display.
			Clears the input data and characters, etc.
		DEL⁄SIZ	DEL Deletes one data or character entry. SIZ When entering characters, this changes the alpha characters that are capitals to small letters or that are small letters to capital letters.
		SHIFT	This key is used to switch between the upper register and lower register of keys that have two functions. To see whether the upper register or lower register is currently valid, check the display.

(Continued on the next page.)

No.	Name	Key	Function Summary
2)	Controller Key (continued)	▲ ▼ ◀ ▶	These keys are used to specify the scroll direction of the scroll display. These keys are used to change the address and number of words.
		SYM	This key makes it possible to enter codes when the display mode is in character display.
		ENTER	When pushed after a series of key operations, this key executes the key operations pushed up until now.
3)	Character Keys	A／B to 0／SPC	This key is used to input addresses, number of words, and data. Only push the SHIFT key when it is necessary to switch between the upper register and lower register keys.

3.4 Battery Installation and Charging

Batteries are not installed in newly purchased products. Conduct charging after installing batteries.

1) Remove the D-20HC-E's back lid.
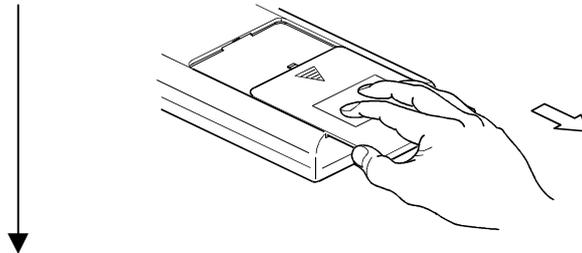
2) Connect the D-20HC-BAT's connector to the D-20HC-E's connector.
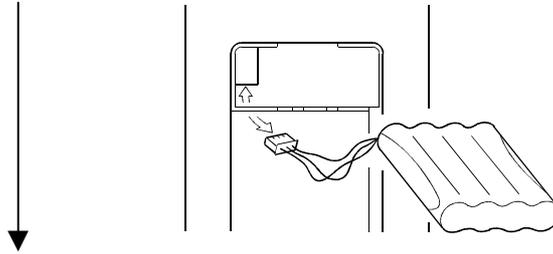
3) Load the D-20HC-BAT into the unit.
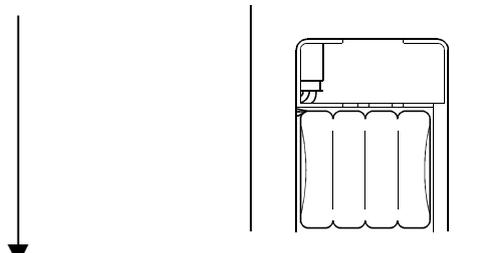
4) Replace the back lid of the D-20HC-E.
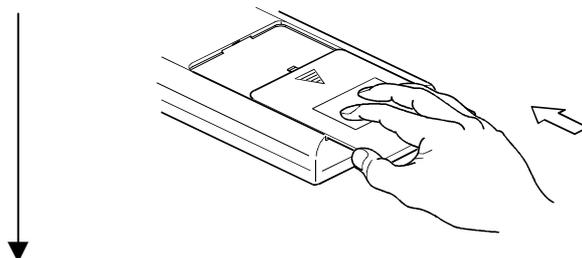
5) Connect the D-20HC-PS and begin charging.

3.5 Communication with Data Carrier

The following are the handling instructions for communication with the data carrier.

(1) Before starting communication, align the data send/receive portion center (outline center) of the reader/writer with that of the data carrier and face them to each other. Make communication within the following communication distance.

Reader/Write Used	Data Carrier Used	Communication Distance
D-2N20HC-RW	D-2N03PS	Within 5mm (0.20 inch)
	D-2N03PM	Within 3mm (0.12 inch)

(2) Leave the following intervals between data carriers. Normal communication cannot be made if the data carriers are in close contact with each other.

Reader/Write Used	Data Carrier Used	Interval L1	Interval L2
D-2N20HC-RW	D-2N03PS	More than 100mm	More than 150mm
	D-2N03PM	(3.94 inch)	(5.91 inch)
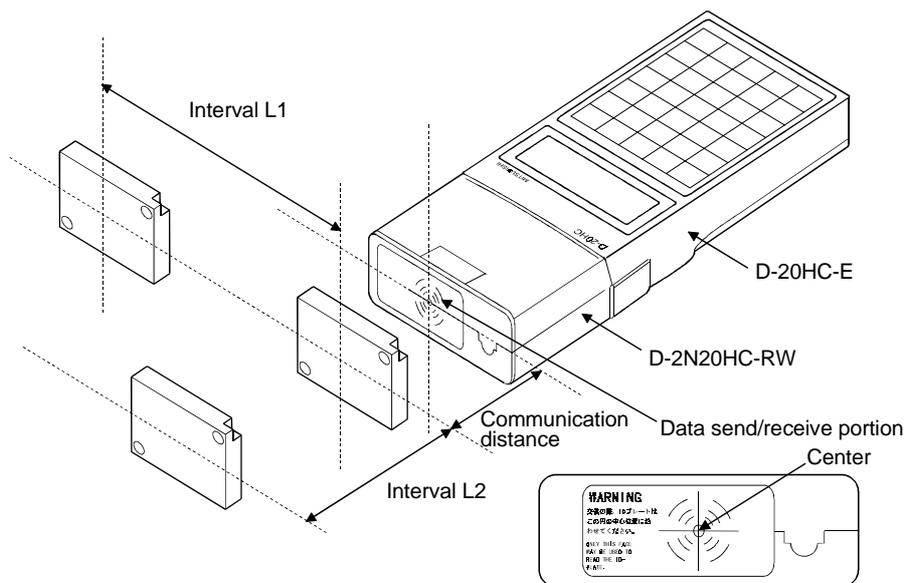
POINT

Make communication with the data carrier with the data carrier at rest. Not doing so can cause a communication error.

If an error occurs during communication with the data carrier, data (data in the handy controller during read operation or data in the data carrier during write operation) will be rewritten to some point. Therefore, restart operation until it is completed normally.

4. OPERATION PROCEDURE

This section explains the operating procedure from connection to disconnection, the screen displays, and the basic operation when using the D-20HC-E.

4.1 Procedure from Boot Up to Operation End

```
                        ┌─────────────────────┐
                        │        Start        │
                        └─────────────────────┘
                                  │
                        ┌─────────────────────┐
                        │ Connect the reader/write to the │
                        │ Handy Controller.   │
                        └─────────────────────┘
                                  │
                        ┌─────────────────────┐
                        │ Turn ON the power switch. │
                        └─────────────────────┘
                                  │
                        ┌─────────────────────┐
                        │ Handy Controller's version display. │
                        └─────────────────────┘
                                  │        (Automatically switches after approximately 1 second.)
                        ┌─────────────────────┐
                        │ Mode selection      │
                        │   Read   /   Write  │
                        │   Other  /   Display│
                        └─────────────────────┘
```

| Read | Write | others | display |

Read Mode	Write Mode	Other Mode	Display Mode
Operate according to Section 5.2, Section 5.6, Section 5.10.	Operate according to Section 5.3, Section 5.6 to Section 5.9.	Operate according to Item 5.4	Operate according to Item 5.5

```
                        ┌─────────────────────┐
                        │ Turn the power supply switch OFF. │
                        └─────────────────────┘
                                  │
                        ┌─────────────────────┐
                        │         End         │
                        └─────────────────────┘
```

┌──┐
│ POINT   │
├──┤
│ When the D-2N20HC-RW is used, the following menus are unavailable. │
│ Refer to Section 2.4 for details.   │
│ • Item Specification Change • Item Specification Write • Item Specification Comparison │
│ • Usage Start • Usage Stop • Creator's Name Display • Data Display • Display Switch │
│ • Data Transmission • Communication Change   │
└──┘

4.1.1 Connecting to the D-2N20HC-RW

Communication with the data carrier can be done by connecting the D-20HC-E to the D-2N20HC-RW.
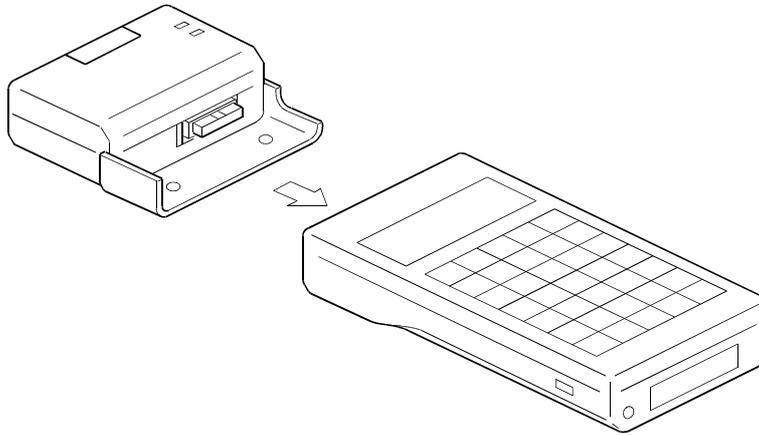
The connection procedure is as follows.
1) Turn the D-20HC-E's power OFF.
2) Remove the extension interface protection cover from the top of the D-20HC-E. Store the removed cover in a safe place.
3) Connect the D-2N20HC-RW to the top of the D-20HC-E, and tighten the D-2N20HC-RW fastening screws. The fastening torque is 32 to 49 N·cm.
4) Turn the D-20HC-E power ON.

POINT
When connecting the D-2N20HC-RW, turn the D-20HC-E's power OFF. If the power is left ON, connecting could cause problems.

4.2 Adjusting the Display

This section explains how to adjust the display of the D-20HC-E.

4.2.1 Adjusting the display contrast

After starting up the D-20HC-E, the display's contrast can be adjusted by turning the contrast adjustment volume knob on the back of the main unit.

4.2.2 Display turn off function (This function turns OFF the D-20HC-E power.)

If five minutes elapse and no key entries have been made, the D-20HC-E's power automatically turns OFF. To turn the power ON again, first turn the power switch OFF once, and then turn it ON. (This will start the unit from initialization.)

4.3 Key Operation Fundamentals

This section explains the key entry fundamental operation after the D-20HC-E is started up.

4.3.1 Shift key switching (Upper and lower registers)

The D-20HC-E's keys have two functions, one for the upper register and one for the lower register.

Normally, the upper register is valid, but by pressing the │ SHIFT │ key, low register keys can become valid.

When the │ SHIFT │ key is pushed, the following will be displayed.

Example

```
Address:          0


◄             SHIFT
```

```
Data mod. :  Hex.
Address:          0
S   Data:      000AH
```

┌───┐
│ POINT   │
│   │
│ Entering one character will cancel the │ SHIFT │ key. To again validate the lower │
│   │
│ register keys, you must again push the │ SHIFT │ key.   │
└───┘

4.3.2 Correction method for mistaken key operation

(1) Before entering the │ ENTER │ key, enter the │ ESC │ key to undo the operation.

Entering the │ ESC │ key, returns to the previously entered data.

(2) When the │ ENTER │ key has been accidentally entered, undo the correct operation.

4.3.3 Numerical entry

The following shows the method for entering data numerically.

(1) Entering decimal numbers

[Example]
When entering "365."

1)		Mode selection
		  Read / Write
		  Other / Display	

2)	WRITE	Func Setting Wrt menu **Data modif.** Data copy	Select the write mode.
3)	ENTER	Selct modif mthd **Modif adrs spec** Modif item spec	Select data change.
4)	ENTER	Address? Address: 0	Select address specification change.
5)	ENTER When the display mode is any other than decimal, push the DISP key to change the mode to the decimal mode.	Data mod. : Dec. Address: 0 Data: 0	Specify the address.
6)	3 → 6 / X → 5 / W	Data mod. : Dec. Address: 0 Data: **365**	Enter the data.
7)	ENTER	Data mod. : Dec. Address: 1 Data: 0	The change is completed.

POINT

A decimal number may be entered within the range -32768 to 32767.

(2) Entering hexadecimal numbers

[Example]
When entering "&H4F."

1)		Mode selection
		  Read / Write
		  Other / Display	

2)	WRITE	Func Setting Wrt menu **Data modif.** Data copy	Select the write mode.

3)	ENTER	Selct modif mthd
		  Modif adrs spec
		  Modif item spec
			Select change data.

4)	ENTER	Address? Address: 0	Select address specification change.
5)	ENTER	When the display mode is any other than the hexadecimal display, press the DISP key to change the hexadecimal mode.	Data mod. : Hex. Address: 0 Data: 0000H	Specify the address.
6)	4 / V → SHIFT → E / F		Data mod. : Hex. Address: 0 Data: **004FH**	Enter the data.
7)	ENTER		Data mod. : Hex. Address: 1 Data: 0000H	Change is now completed.

POINT

A hexadecimal number may be entered within the range 0H to FFFFH.

4.3.4 Character input

Following is the method for entering character data.

(1) Half-width alphanumeric input

[Example]
When entering "ABCabc01" from address 0.

	Key operation	Display	Description
1)		Mode selection Read / Write Other / Display	
2)	WRITE	Func Setting Wrt menu **Data modif.** Data copy	Select the read mode.
3)	ENTER	Selct modif mthd **Modif adrs spec** Modif item spec	Select data change.
4)	ENTER	Address? Address: 0	Select address specification change.
5)	ENTER — When the display mode is any other than the character mode, press the DISP key to change the mode to character.	Address: 0 ◀	Specify the address.
6)	A／B → SHIFT → A／B → C／D	Address: 0 ABC◀	Enter the data.
7)	SHIFT → DEL／SIZ	Address: 0 abc ◀	
8)	A／B → SHIFT → A／B → C／D	Address: 0 abcABC◀	
9)	SHIFT → DEL／SIZ	Address: 0 ABCabc◀	
10)	0／SPC → 1／-	Address: 0 ABCabc01◀	
11)	ENTER	Address: 4 ◀	
12)	▲	Address: 0 ABCabc01 ◀	

(2) Half-width symbol input
[Example]
When entering "！＊" from address 0.

1)		Mode selection Read / Write Other / Display	
2)	WRITE	Func Setting Wrt menu **Data modif.** Data copy	Select the write mode.
3)	ENTER	Selct modif mthd **Modif adrs spec** Modif item spec	Select data change.
4)	ENTER	Address? Address: 0	Select address specification change.
5)	ENTER *When the display mode is any other than the character mode, press the DISP key to change it to the character mode.*	Address: 0 ◄	Specify the address.
6)	SHIFT	Address: 0 ◄ **SHIFT**	Enter the data.
7)	SYM	Address: 0 ◄ ■!"#$%&	
8)	▶	Address: 0 ◄ ！"#$%&	
9)	ENTER	Address: 0 ！◄ ！"#$%&	
10)	▼ → ▶ → ▶	Address: 0 ！◄ '() ＊+,-	
11)	ENTER	Address: 0 ！＊◄ '() ＊+,-	
12)	ESC	Address: 0 ！＊◄	
13)	ENTER	Address: 1 ◄	
14)	▲	Address: 0 ！＊ ◄	

5. FUNCTION OPERATION METHODS

5 - 1

This section gives explanations for each of the modes.

5.1 Explanation of Operation

The explanations of the modes and functions is done using the configuration shown on the following page.

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5 FUNCTION OPERATION METHODS

Mode	Read	Write	Other	Display
— Current mode

| Function | Entire Area Specification Read | Setting Read (Address Specification Read) | ——— |
— Current functions

5.2 Read Mode Operations

Procedure for reading data from the data carrier.

5.2.1 Entire area specification read

Reads the data from all areas of the data carrier.

[Fundamental Operation]

READ → [Entire Area Read] → [Number of Words Selection] → ◄ or ► → ENTER

160 words → [Block Space No. Read] → ENTER → [Read Execution] → [Data Display]
[Block Space No. Selection] → ENTER

4k words → Error will occur in about 20 seconds.

Basic key operation

[Example Operation]   When reading D-2N03PS data 160 words to block No.2.

1)		Mode selection Read / Write Other / Display	Mode selection screen display
2)	READ	Select read mthd All areas 160 Select area	Select the read mode.
3)	ENTER	Data read to block No.: 0 ENTER / ESC	Select the block No.

Key in procedure following operation example and display contents

[Explanation]

(1) Reads the data for all areas of the data carrier.

(2) The data storage destination varies with the specified block No.
Data of 160 words are stored into the specified block No.
There are 25 blocks, from where data can be read independently.
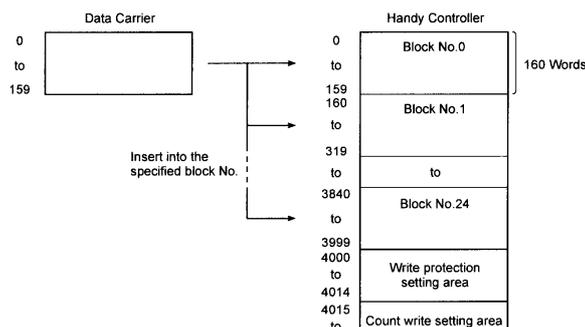
Detailed explanation of each key operation

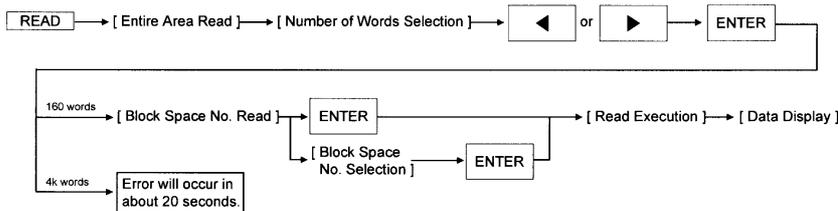| Mode	Read	Write	Other	Display
Function	Entire Area Specification Read	Setting Read (Address Specification Read)	———	

5.2 Read Mode Operations

Procedure for reading data from the data carrier.

5.2.1 Entire area specification read

Reads the data from all areas of the data carrier.

[Fundamental Operation]

READ ⟶ [Entire Area Read] ⟶ [Number of Words Selection] ⟶ ◀ or ▶ ⟶ ENTER

160 words ⟶ [Block Space No. Read] ⟶ ENTER ⟶ [Read Execution] ⟶ [Data Display]

[Block Space No. Selection] ⟶ ENTER

4k words ⟶ Error will occur in about 20 seconds.
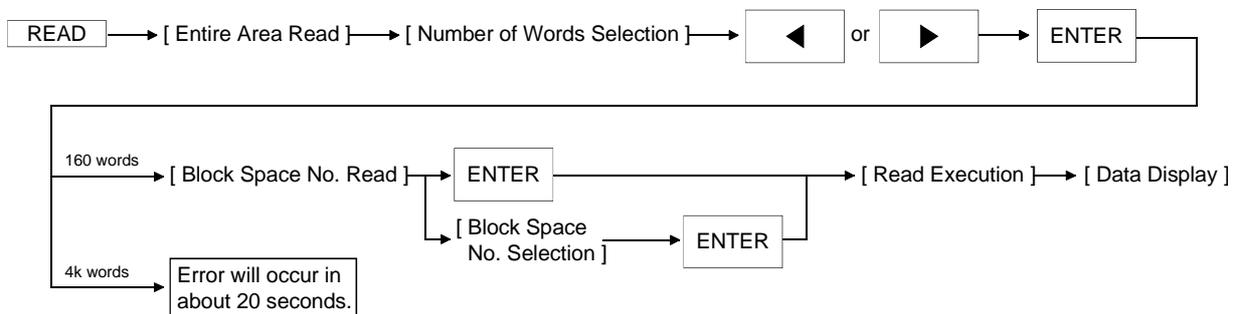
[Example Operation]   When reading D-2N03PS data 160 words to block No.2.

1)		Mode selection Read / Write Other / Display	Mode selection screen display
2)	READ	Select read mthd All areas 160 Select area	Select the read mode. (160 only) (4k not use)
3)	ENTER	Data read to block No.: 0 ENTER / ESC	Select the block No.
4)	ESC → 2	Read data to which block? (0-24): 2	Enter the block No.
5)	ENTER	Reading AD all areas 160wrd ESC	Execute the read.
6)		Reading complated all areas 160wrd ESC	The read is complete.
7)		Data disp : Hex. Address: 320 Data: 001AH	Data display

5

[Explanation]

    (1) Reads the data for all areas of the data carrier.

    (2) The data storage destination varies with the specified block No.
         Data of 160 words are stored into the specified block No.
         There are 25 blocks, from where data can be read independently.

Data Carrier		Handy Controller	
0 to 159	→	0 to 159	Block No.0 ⎫ 160 Words
	→	160 to 319	Block No.1
Insert into the specified block No.		to	to
	→	3840 to 3999	Block No.24
		4000 to 4014	Write protection setting area
		4015 to 4019	Count write setting area
		4020 to 4029	Write count batch update setting area
		4030 to 4039	Memory type setting area
		4040 to 4069	Reserved
		4070 to 4094	Communication information read area
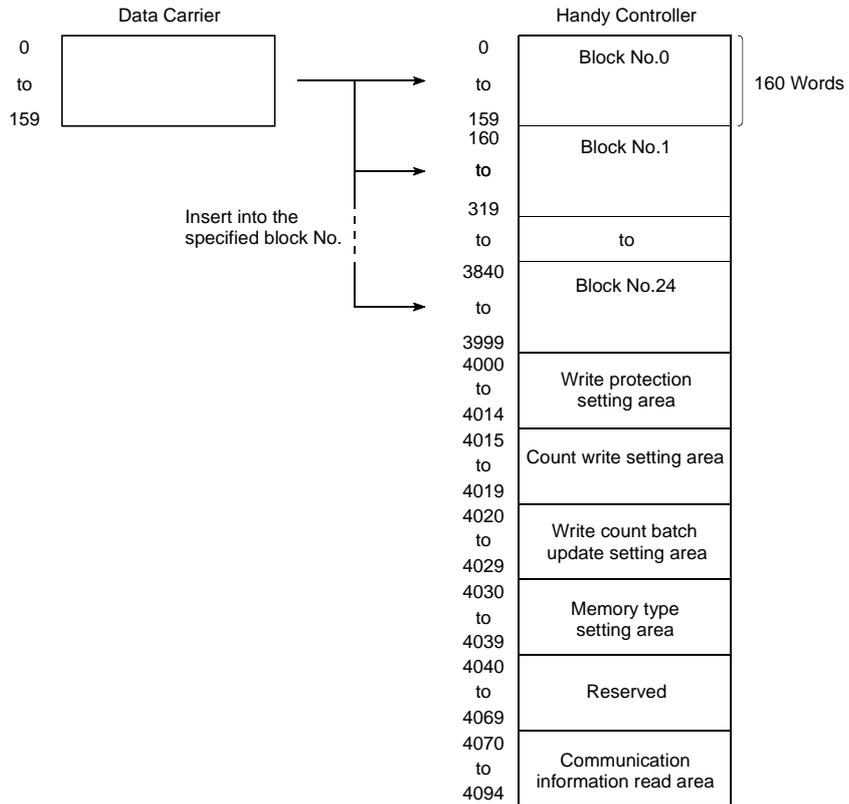
    (3) When an error occurs after the command is executed, press the ⌜ ESC ⌝ key to
        cancel the command, or, when the data carrier does not exist, the following is
        displayed.

```
Read  error !
   ENTER / ESC
```

        To re-execute, press the ⌜ ENTER ⌝ key, and to terminate, press the ⌜ ESC ⌝ key.

(4) To move the address after the data is displayed, directly enter the address with the character keys, or specify it with the following keys.

◄   ....Specifies the address as −1 from the current address.

►   ....Specifies the address as +1 from the current address.

▲   ....Specifies the address as −10 from the current address.

▼   ....Specifies the address as +10 from the current address.

(5) To change the data display units, press the DISP key. Each time the DISP key is pressed, the display will change from decimal, to hexadecimal, to character.

(6) To end the entire area specification read, press the mode keys (READ , WRITE , OTHER), or press the ESC key.

Mode	Read	Write	Other	Display

Function	Entire Area Specification Read	Setting Read (Address Specification Read)	———

5.2.2 Settings read (address specification read)

Reads the specified word number groups data from the data carrier's specified address.

[Fundamental Operation]
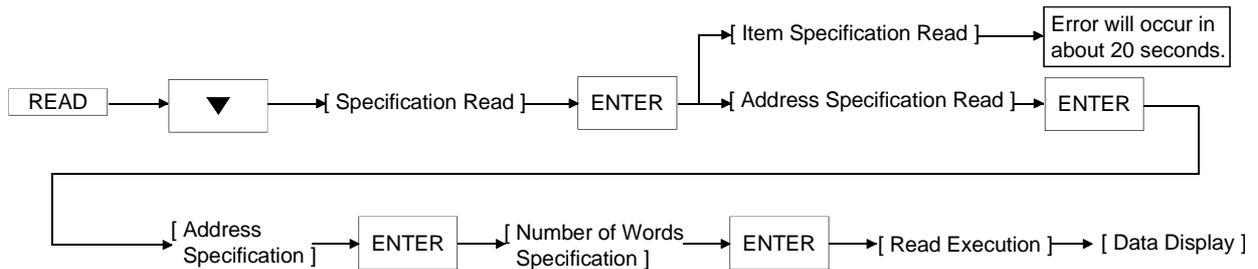
[Example Operation]   When the data for ten words is read from the data carrier's address 80.

Step	Keys	Screen	Description
1)		Mode selection Read / Write Other / Display	Mode selection screen display
2)	READ	Select read mthd **All areas** 160 Select area	Select the read mode.
3)	▼	Select read mthd All areas 160 **Select area**	Select the settings read.
4)	ENTER	Select read mthd **Read addrs spec** Read item spec.	Select the address specification read.
5)	ENTER → 8/R → 0/SPC	Read address? Address: 80	Specify the read address.
6)	ENTER → 1/- → 0/SPC	Read word cnt? Word cnt.: 10 Address: 80	Specify the read number of words.
7)	ENTER	Reading **AD** Word cnt.: 10 Address: 80	Execute the read.
8)		Reading complated Word cnt.: 10 Address: 80	The read is completed.
9)		Data mod. : Hex. Address: 80 Data: 0000H	Data display

[Explanation]

(1) The data is inserted from the specified address in the specified word number blocks.

(2) The specified address and number of words are as follows.

Address   : 0 to 159

Number of Words   : 1 to 160

POINT

If the setting for the address or the address plus number of words exceeds the data carrier's address range, an error for the command will occur approximately 20 seconds after execution.

---

(3) When an error occurs after command execution, press the ESC key to cancel the command, or, if a data carrier does not exist, the following will be displayed.

```
Read  error !
   ENTER / ESC
```

To re-execute, press the ENTER key, and to terminate, press the ESC key.

(4) To change the data display units, press the DISP key. Each time the DISP key is pressed, the display is changed from decimal, to hexadecimal, to character.

(5) Pressing the ESC key after the data is displayed makes it possible to set for re-read. When the key is pushed, the following is displayed.

```
Read  again ?
   ENTER / ESC
```

To re-execute, press the ENTER key, or, to terminate, press the ESC key.

(6) To end the address specification read, press the mode keys (READ , WRITE , OTHER), or press the ESC key twice.

(7) The address for read address, number of word specification, or address move after data display can be directly entered using the character keys or using the keys specified below.

  ◀   ....Display the −1 address from the current address.

  ▶   ....Display the +1 address from the current address.

  ▲   ....Display the −10 address from the current address.

  ▼   ....Display the +10 address from the current address.

Mode	Read	Write	Other	Display

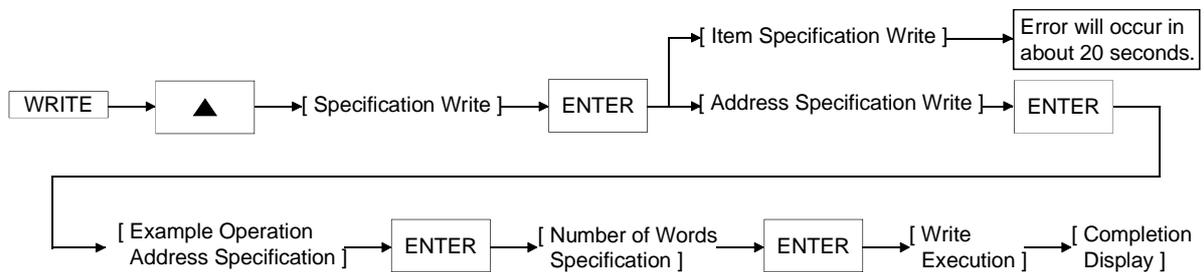| Function	Setting Write (Address Specification Write)	Change Data (Address Specification Change)	Moving Data

5.3 Write Mode Operations

Procedure for writing data to the data carrier.

5.3.1 Setting write (address specification write)

Write the data to the data carrier's specified area.

[Fundamental Operation]

WRITE → ▲ → [Specification Write] → ENTER →
- [Item Specification Write] → Error will occur in about 20 seconds.
- [Address Specification Write] → ENTER →

→ [Example Operation Address Specification] → ENTER → [Number of Words Specification] → ENTER → [Write Execution] → [Completion Display]

[Example Operation]   When writing ten words of data to the data carrier address 100.

1)		Mode selection Read / Write Other / Display	Mode selection screen display
2)	WRITE	Func Setting Wrt menu **Data modif.** Data copy	Select the write mode.
3)	▲	Func **Setting Wrt** menu Data modif. Data copy	Select the specification write.
4)	ENTER	Selct Write mthd **Write adrs spec** Write item spec	Select the address specification write.
5)	ENTER → 1 / - → 0 /SPC → 0 /SPC	Write address? Address: 100	Select the write address.
6)	ENTER → 1 / - → 0 /SPC	Write word cnt? Word cnt.: 10 Address: 100	Specify the right number of words.
7)	ENTER	Writing **AD** Word cnt.: 10 Address: 100	Execute the write.
8)		Writing complated Word cnt.: 10 Address: 100	The write is completed.

[Explanation]

    (1) The data for the specified number of words block is inserted into the data carrier's specified address.

    (2) The specified address and number of words are as follows.

        Address   : 0 to 159

        Number of Words : 1 to 160

POINT
When the address or the address plus number of word setting exceeds the data carrier's address range an error will occur after the write is executed. At this time, data in the data carrier's address range may have been written.

    (3) The following message appears if an error occurred after execution of the instruction, you pressed the ESC key to cancel the instruction, the data carrier did not exist, or the write target area includes a write-protected area.

```
Write  error !
   ENTER / ESC
```

        To re-execute, press the ENTER key, or, to terminate, press the ESC key.

    (4) After the data write has been completed, press the ENTER key to make it possible to reconduct the write.

    (5) To end the specification write, press the ESC key.

    (6) The address for the write address or the number of word specification can be directly entered using the character keys, or can be specified using the following keys.

        ◀ .... Displays the -1 address from the current address.

        ▶ .... Displays the +1 address from the current address.

        ▲ .... Displays the -10 address from the current address.

        ▼ .... Displays the +10 address from the current address.
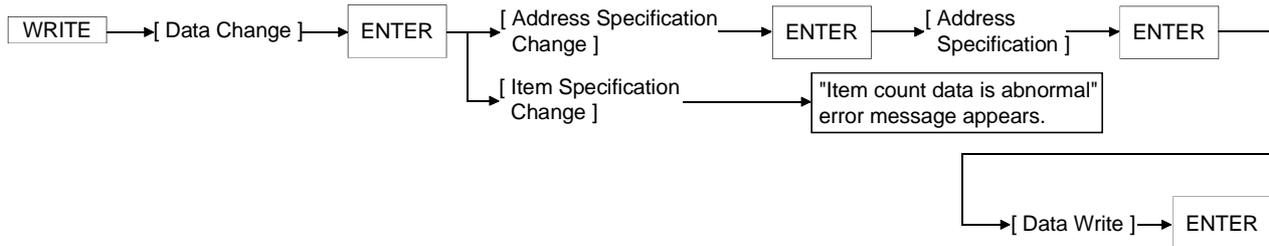
Mode	Read	Write	Other	Display
Function	Setting Write (Address Specification Write)	Change Data (Address Specification Change)	Moving Data	

5.3.2 Changing data (address specification change)

Changes the data address specified in the handy controller's memory.

[Fundamental Operation]

WRITE → [Data Change] → ENTER → [Address Specification Change] → ENTER → [Address Specification] → ENTER

[Item Specification Change] → "Item count data is abnormal" error message appears.

→ [Data Write] → ENTER

[Example Operation]

When changing the data controller's address 100's data from 50 to 2000.

		Screen	Description
1)		Mode selection Read / Write Other / Display	Mode selection screen display.
2)	WRITE	Func Setting Wrt menu Data modif. Data copy	Select the write function.
3)	▲	Selct modif mthd Modif adrs spec Modif item spec	Select the data change and address specification change.
4)	ENTER → 1 / - → 0 /SPC → 0 /SPC	Address? Address: 100	Specify the change address.
5)	ENTER	Data mod. : Dec. Address: 100 Data: 50	Check changed address.
6)	2 → 0 /SPC → 0 /SPC → 0 /SPC	Data mod. : Dec. Address: 100 Data: 2000	Set the change data.
7)	ENTER	Data mod. : Dec. Address: 101 Data:	The data change is complete.

[Explanation]

(1) Changes the handy controller specified address data.

(2) When the input made during data input is incorrect push the ESC key.

(3) To end press the ESC key.

(4) To change the data display unit press the DISP key.
Each time the DISP key is pressed the display will change from decimal, to hexadecimal, to character.

(5) The address for the data change address can be directly entered using the character keys or can be specified using the following keys.

◄ .... Displays the -1 address from the current address.

► .... Displays the +1 address from the current address.

▲ .... Displays the -10 address from the current address.

▼ .... Displays the -10 address from the current address.

(6) The addresses that can be specified are as follows.
Address: 0 to 4094

Mode	Read	Write	Other	Display

Function	Setting Write (Address Specification Write)	Change Data (Address Specification Change)	Moving Data

5.3.3 Moving data

Moves the data in the handy controller's memory between blocks.

[Fundamental Operation]

WRITE → ▼ → [Data Move] → ENTER → [Block No. Before Move] → ENTER

→ [Block No. Before Remove] → ENTER → ENTER
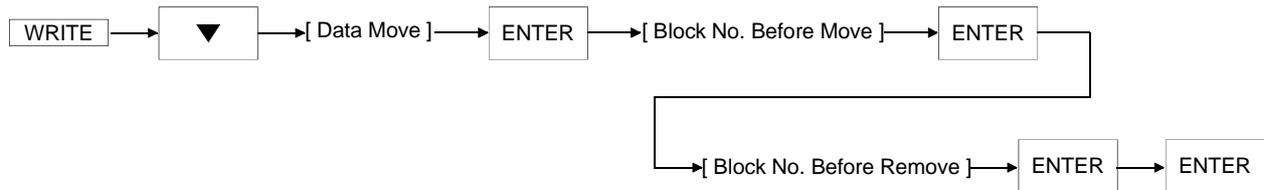
[Example Operation]   Moves the handy controller's block No. 1 data to block No. 10.

|		
1)	Mode selection 　Read　/　Write 　Other　/　Display	Mode selections screen display.
2) `WRITE`	Func　　Setting　Wrt menu　　**Data　modif.** 　　　　Data copy	Select the write function.
3) `▼`	Func　　Setting　Wrt menu　　Data　modif. 　　　　**Data copy**	Select the data move.
4) `ENTER` → `1 / -`	160-wrd　blck　cpy Copy　src　blckNo. (0-24):　　　　　　1	Select the block No. before the move.
5) `ENTER` → `1 / -` → `0 SPC`	160-wrd　blck　cpy SrcBlckNo.:　　　　1 DstBlckNo.:　　　10	Select the move desti-nation block No.
6) `ENTER`	Copy　block 　No.　　1　　to 　No.　10　OK?	Check the data move.
7) `ENTER`	Block　copied 　No.　　1　　to 　No.　10　OK?	The data move is complete.
8)	Func　　Setting　Wrt menu　　**Data　modif.** 　　　　Data copy	

[Explanation]

(1) Moves the data in 160 word units from one block to another block.

(2) The values that can be specified for the block No. are as follows.
Block No. before move   : 0 to 24
Move destination block No.   : 0 to 24
Example when moving from block No. 0 to block No. 24.

| Block No.0 |
| Block No.1 |
| |
| Block No.24 |

(160 word portion) move between blocks.
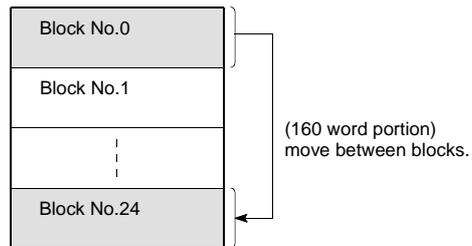
(3) Use the character keys to enter the block number. If an entry error is made press the ⌐ ESC ⌐ key.

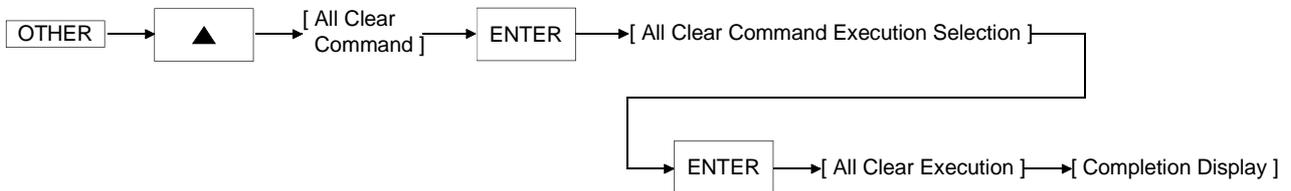| Mode	Read	Write	Other	Display
Function	All Clear Command	Comparion Command		Total Number of Communication
	Memory clear (All Memory Clear)	Memory Clear (Block Clear)		_____

5.4 Operations for Other Modes

Commands for handy controller operation such as clear and comparison.

5.4.1 All clear command

Clears all the data carrier data.

[Fundamental Operation]

OTHER → ▲ → [All Clear Command] → ENTER → [All Clear Command Execution Selection] —

→ ENTER → [All Clear Execution] → [Completion Display]

[Example Operation]   Clears the data carrier data.

1)		Mode selection Read / Write Other / Display	Mode selection screen display.
2)	OTHER	Func All clr com menu **Compare com** Activate	Select other mode.
3)	▲	Func **All clr com** menu Compare com Activate	Select all clear command.
4)	ENTER	All clear com **AD** ENTER / ESC	Check the all clear command execution.
5)	ENTER	All clear com **AD** ENTER / ESC Executing	All clear being executed.
6)		All clear com **AD** ENTER / ESC Clear completed	All clear is complete.

[Explanation]

(1) Zero clears all of the data carrier data.

(2) If an error occurs after a command execution press the ESC key to cancel the command, or if the data carrier does not exist the following will be displayed.

```
All  clear  com   AD
   ENTER  /  ESC
Clear  error !
```

To re-execute press the ENTER key, or to terminate press the ESC key.

(3) To end the all clear command press the ESC key.

(4) The area set for write protection is not cleared.
An all clear error will not take place in that area, either.
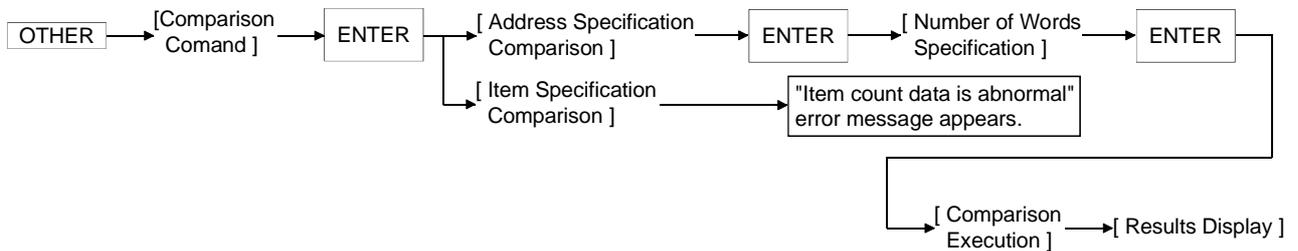Refer to Section 5.6 for the write-protect function.

Mode	Read	Write	Other	Display

Function	All Clear Command	Comparion Command	Total Number of Communication
	Memory clear (All Memory Clear)	Memory Clear (Block Clear)	———

5.4.2 Comparison command

Compares the handy controller data with the data carrier data for the specified addresses.

[Fundamental Operation]

[Example Operation]   Compares the handy controller's memory data with the data carrier data.

1)		Mode selection Read / Write Other / Display	Mode selection screen display
2)	OTHER	Func All clr com menu Compare com Activate	Select other mode.
3)	ENTER	Select comp mthd Comp addrs spec Comp item spec.	Select a comparison command.
4)	ENTER → 1 / - → 0 SPC → 0 SPC	Comp address? Address: 100	Select the address specification comparison and set the comparison address.
5)	ENTER → 1 / - → 0 SPC	Comp word cnt? Word cnt.: 10 Address: 100	Specify the comparison number of words.
6)	ENTER (Display when data matches)	Compare O.K. Word cnt.: 10 Address: 100	The comparison is completed.
	(Display when data does not match)	Compare failed! Word cnt.: 10 Address: 100	

[Explanation]

(1) Compares the handy controller data with the data carrier data for the specified address.

POINT

If the setting of the address or the address plus word count exceeds the data carrier address range, an error will occur after the instruction has been executed for about 20 seconds.

(2) When an error occurs after command execution press the ESC key to cancel the command, or when the data carrier does not exist the following will be displayed.

```
Compare   error !
   ENTER  /  ESC
```

To re-execute press the ENTER key, or to terminate press the ESC key.

(3) To end the comparison command press the ESC key.

(4) The address for the address to be compared and the specified number of words can be directly entered using the character keys or can be specified using the following keys.

◄ .... Displays the -1 address from the current address.

► .... Displays the +1 address from the current address.

▲ .... Displays the -10 address from the current address.
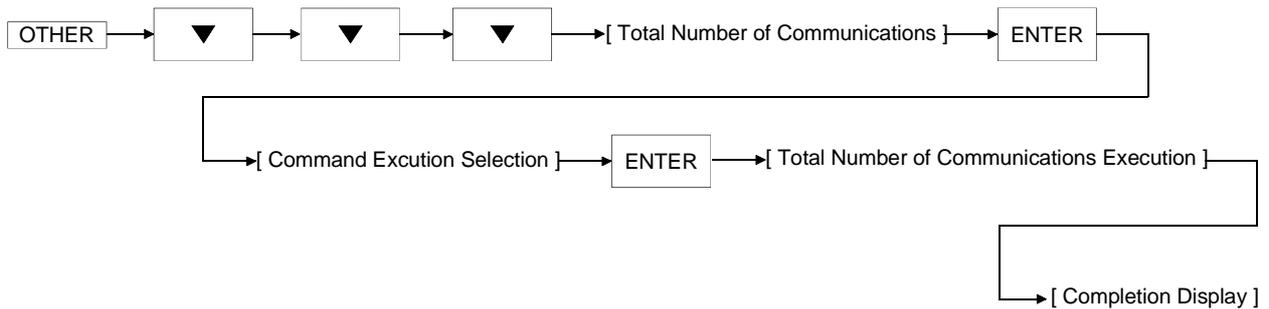
▼ .... Displays the +10 address from the current address.

Mode	Read	Write	Other	Display
Function	All Clear Command	Comparion Command	Total Number of Communication	
	Memory clear (All Memory Clear)	Memory Clear (Block Clear)	_____	

5.4.3 Total number of communications

Reads the total number of communications to the data carrier.

[Fundamental Operation]

OTHER → ▼ → ▼ → ▼ → [Total Number of Communications] → ENTER

→ [Command Excution Selection] → ENTER → [Total Number of Communications Execution]

→ [Completion Display]

[Example Operation]

Reads the total number of communications made to the data carrier.

1)		Mode selection
		  Read / Write
		  Other / Display
			Mode selection screen display

2) OTHER		Func All clr com menu Compare com Activate	Select other mode.
3) ▼ → ▼ → ▼		Func Activate menu Deactivate Trnfr count	
4) ENTER		Read trnsfrCnt AD ENTER / ESC	Select total number of communications read.
5) ENTER		Read trnsfrCnt AD ENTER / ESC Executing	
6)		Read completed Transfer count 3369	The total number of communications read is completed.

[Explanation]

(1) Reads the write count value of the data carrier increased by "Count Write" or "Write Count Batch Update".

(2) When an error occur after a command is executed press the ESC key to cancel the command, or when the data carrier does not exist the following will be displayed.

```
Read   trnsfrCnt   AD
   ENTER / ESC
Read   error !
```

To re-execute press the ENTER key, or to terminate press the ESC key.

(3) To end after the total number or communications read is completed press the ESC key.

(4) After the total number of communications has completed press the ENTER key to re-execute the total number of communications read.

(5) Unless Count Write or Write Count Batch Update is performed, the total number of communications displayed is 0.
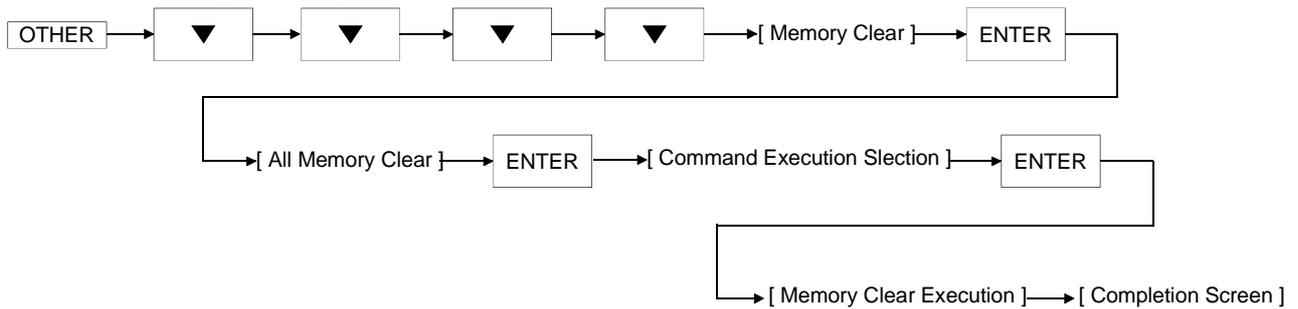
Mode	Read	Write	Other	Display
Function	All Clear Command	Comparion Command		Total Number of Communication
	Memory clear (All Memory Clear)	Memory Clear (Block Clear)		─────

5.4.4 Memory clear (all memory clear)

Zero clears all of the data in the handy controller.

[Fundamental Operation]

OTHER → ▼ → ▼ → ▼ → ▼ → [Memory Clear] → ENTER

→ [All Memory Clear] → ENTER → [Command Execution Slection] → ENTER

→ [Memory Clear Execution] → [Completion Screen]

[Example Operation]   Clears all the data in the handy controllers memory.

1)	Mode selection Read / Write Other / Display	Mode selection screen display
2) OTHER	Func All clr com menu Compare com Activate	Other mode
3) ▼ → ▼ → ▼ → ▼	Func Deactivate menu Trnfr count Memory clr	
4) ENTER	Memory clear All memry clear Block clear	Select memory clear.
5) ENTER	All memories will be cleared ENTER / ESC	Check the all memory clear selection and execution.
6) ENTER	All memories Cleared	All memory clear has been completed.
	Func Deactivate menu Trnfr count Memory clr	

[Explanation]

(1) Zero clears all the data in the handy controller.
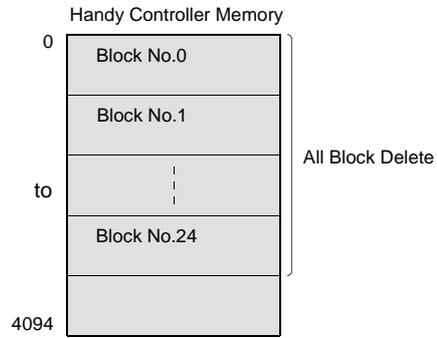
Handy Controller Memory

0	Block No.0
	Block No.1
to	
	Block No.24
4094	

All Block Delete

Mode	Read	Write	Other	Display
Function	All Clear Command	Comparion Command	Total Number of Communication	
	Memory clear (All Memory Clear)	Memory Clear (Block Clear)	_____	

5.4.5 Memory clear (block clear)

Zero clears the handy controller data in block units.

[Fundamental Operation]

OTHER → ▼ → ▼ → ▼ → ▼ → [Memory Clear] → ENTER → ▼

→ [Block Clear] → ENTER → [Block Number Selection] → ENTER → [Command Execution Selection]

→ ENTER → [Memory Clear Execution] → [Completion Screen]
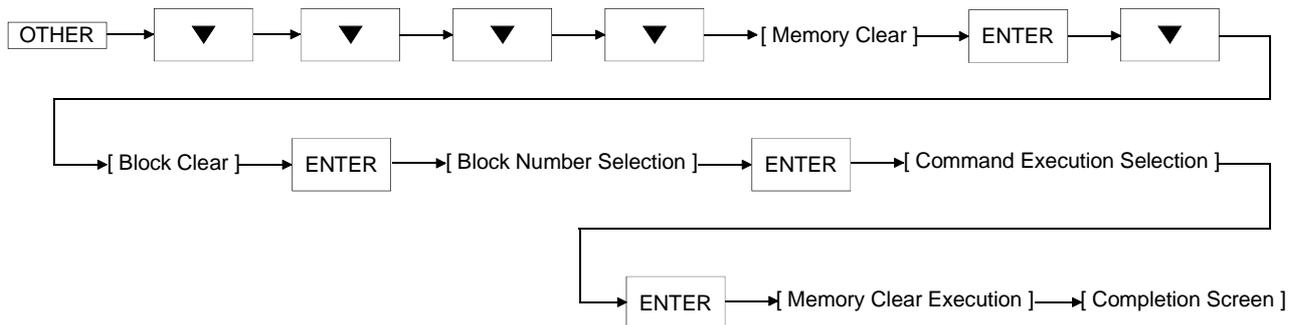
[Example Operation]   Clears the data in block No. 2 in the handy controller.

1)		Mode selection Read / Write Other / Display	Mode selection screen display
2) OTHER		Func All clr com menu Compare com Activate	Select other mode.
3) ▼ → ▼ → ▼ → ▼		Func Deactivate menu Trnfr count Memory clr	
4) ENTER		Memory clear All memry clear Block clear	Select memory clear.
5) ▼		Memory clear All memry clear Block clear	Select block clear.
6) ENTER → 2		Block clear Block No.? (0-24): 2	Select block number.
7) ENTER		Block No.: 2 will be cleared ENTER / ESC	Check the block clear execution.
8) ENTER		Block No.: 2 Cleared	Block clear is completed.
9)		Func Deactivate menu Trnfr count Memory clr	

[Explanation]

(1) Zero clears the data in the specified block No. for the handy controller.

Handy Controller Memory

| Block No.0 |
| Block No.1 |
| ⋮ |
| Block No.24 |

Block specified to be deleted.
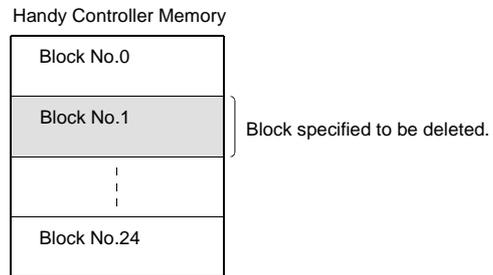
(2) The block numbers that can be specified are as follows.
Block Nos.: 0 to 24.

(3) Use character keys to enter the block No.

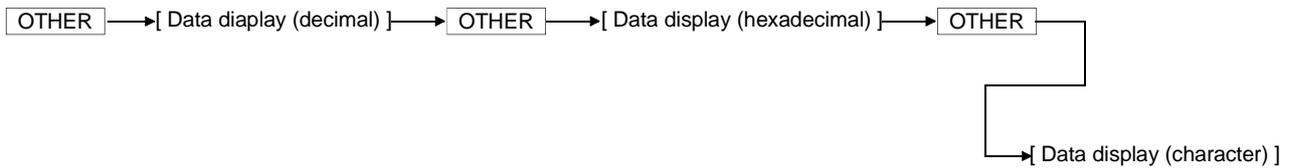| Mode	Read	Write	Other	Display

5.5 Display

The data display can be changed between decimal, hexadecimal, and character.

[Fundamental Operation]

OTHER ⟶ [Data diaplay (decimal)] ⟶ OTHER ⟶ [Data display (hexadecimal)] ⟶ OTHER

⟶ [Data display (character)]

[Example Operation]

The data display can be changed between decimal, hexadecimal, and character.

1)		Mode selection Read / Write Other / Display	Mode Selection Screen Display
2) DISP		Data disp : Dec. Address: 0 Data:	Decimal Display
3) DISP		Data disp : Hex. Address: 0 Data:	Hexadecimal Display
4) DISP		Data disp : Text Address: 0	Character Display

[Explanation]

(1) Switches the data display, hexadecimal, and character.

(2) The address can be directly entered using character keys or specified using the
following keys when specifying the display address.

| ◀ | .... Displays the -1 address from the current address. |

| ▶ | .... Displays the +1 address from the current address. |

| ▲ | .... Displays the -10 address from the current address. |

| ▼ | .... Displays the +10 address from the current address. |

5.6 Write-Protect Function

Write-protect is a function designed to inhibit write to the user-specified memory of the data carrier.
Specify the write inhibited range on a page basis (7 words = 1 page).
The write-protect function is made usable by writing the write-protect information set on the handy controller to the specified address of the data carrier.

(1) Write-protect information types

There are the following write-protect information types.

Write Target Address	Item	Description	Input Display		
			Decimal	Hexadecimal	Character
4000	Keyword 1	W (upper-case (fixed))	8279	2057H	W
4001	Keyword 2	P (upper-case (fixed))	8272	2050H	P
4002	Write protection setting/cancel	Setting: 1, cancel: 0 (upper-case (fixed))	8240, 8241	2030H, 2031H	0,1
4003	Write protection starting page address	Specify the starting page address for setting write protection. Specifying range: 0 to 22 (decimal) (upper-case (fixed)) (Set the address that is equal to or less than the write protection end page address.)	8240 to 12850	2030H to 3232H	0 to 22
4004	Write protection end page address	Specify the end page address for setting write protection. Specifying range: 0 to 22 (decimal) (upper-case (fixed)) (Set the address that is equal to or more than the write protection starting page address.)	8240 to 12850	2030H to 3232H	0 to 22

(2) Relationships between page addresses and user-defined addresses

The following are the relationships between page addresses and user-defined addresses.

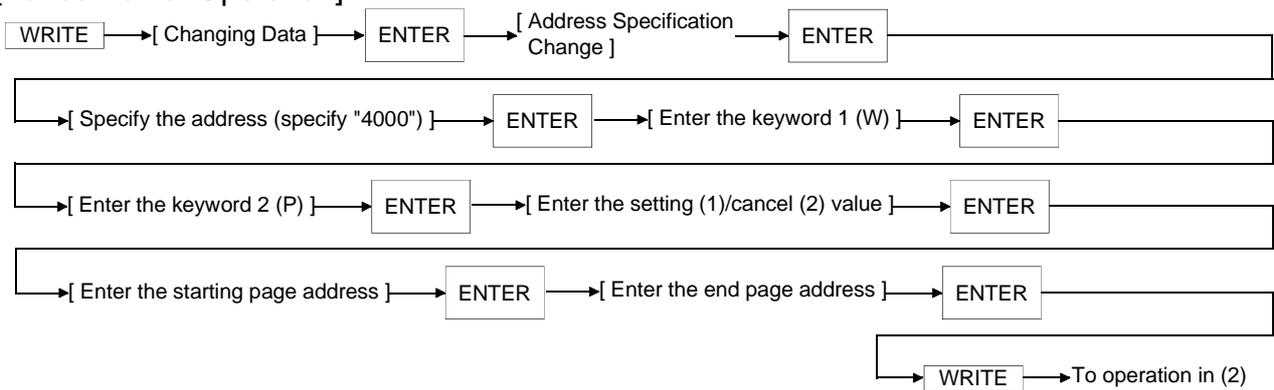| Page Address	User-defined Address	
	Decimal	Hexadecimal
0	0 to 6	0H to 6H
1	7 to 13	7H to DH
2	14 to 20	EH to 14H
3	21 to 27	15H to 1BH
4	28 to 34	1CH to 22H
5	35 to 41	23H to 29H
6	42 to 48	2AH to 30H
7	49 to 55	31H to 37H
8	56 to 62	38H to 3EH
9	63 to 69	3FH to 45H
10	70 to 76	46H to 4CH
11	77 to 83	4DH to 53H
12	84 to 90	54H to 5AH
13	91 to 97	5BH to 61H
14	98 to 104	62H to 68H
15	105 to 111	69H to 6FH
16	112 to 118	70H to 76H
17	119 to 125	77H to 7DH
18	126 to 132	7EH to 84H
19	133 to 139	85H to 8BH
20	140 to 146	8CH to 92H
21	147 to 153	93H to 99H
22	154 to 159	9AH to 9FH

5.6.1 Operation for writing write-protect information

This section explains the operation for writing the following write-protect information to the specified address of the data carrier.

(1) Changing the write-protect information
Using Changing Data (Address Specification Change), change the write-protect information on the memory of the handy controller.

[Fundamental Operation]

WRITE ⟶ [Changing Data] ⟶ ENTER ⟶ [Address Specification Change] ⟶ ENTER

⟶ [Specify the address (specify "4000")] ⟶ ENTER ⟶ [Enter the keyword 1 (W)] ⟶ ENTER

⟶ [Enter the keyword 2 (P)] ⟶ ENTER ⟶ [Enter the setting (1)/cancel (2) value] ⟶ ENTER

⟶ [Enter the starting page address] ⟶ ENTER ⟶ [Enter the end page address] ⟶ ENTER

⟶ WRITE ⟶ To operation in (2)

[Example Operation]   Set the write-protect information in the range of addresses 7 to 90 (decimal).

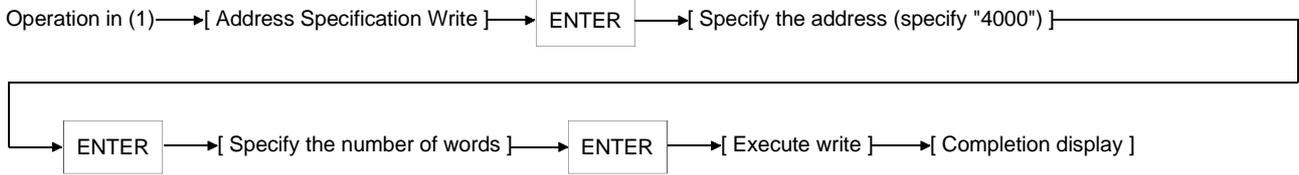|	Screen	Description
1)	Mode selection Read / Write Other / Display	Mode Selection Screen Display
2) WRITE	Func Setting Wrt menu **Data modif.** Data copy	Select the write function.
3) ENTER	Selct modif mthd **Modif adrs spec** Modif item spec	Select Changing Data and Address Specification Change. Specify a new address. (Specify "4000".)
4) ENTER → 4 / V → 0 / SPC → 0 / SPC → 0 / SPC	Address? Address: 4000	
5) ENTER	Data mod. : Dec. Address: 4000 Data: 0	Set the new address.
6) ENTER → ENTER	Address: 4000 ◀	Change the display mode to "Character".
7) SHIFT → 5 / W	Address: 4000 W◀	After entering the keyword 1 (W)

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8) | ENTER |

Address: 4001

◀

Set the keyword 1 (W).

9) | SHIFT | → | O / P |

Address: 4001

P◀

After entering the keyword 2 (P)

10) | ENTER |

Address: 4002

◀

Set the keyword 2 (P).

11) | 1 / - |

Address: 4002

1◀

Enter the setting/cancel value "1".

12) | ENTER |

Address: 4003

◀

Set the setting/cancel value "1".

13) | 1 / - |

Address: 4003

1◀

Enter the starting page address "1".

14) | ENTER |

Address: 4004

◀

Set the starting page address "1".

15) | 1 / - | → | 2 |

Address: 4004

12◀

Enter the end page address "12".

16) | ENTER |

Address: 4005

◀

Set the end page address "12".

17) | WRITE |

Selct   write   mthd
Write   adrs   spec
Write   item   spec

End the write-protect information change of the handy controller (to operation in (2)).

(2) Writing the write-protect information

Using Specification Write (Address Specification Change), write the write-protect information to the data carrier.

[Fundamental Operation]

Operation in (1) ⟶ [Address Specification Write] ⟶ | ENTER | ⟶ [Specify the address (specify "4000")]

⟶ | ENTER | ⟶ [Specify the number of words] ⟶ | ENTER | ⟶ [Execute write] ⟶ [Completion display]

[Example Operation]   Write the set write-protect information.

1)		Selct write mthd **Write adrs spec** Write item spec	Display the write method selection screen.
2)	ENTER → 4/V → 0/SPC → 0/SPC → 0/SPC	Write address? Address: 4000	Specify the write address. (Specify "4000".)
3)	SHIFT → 5/W	Write word cnt? Word cnt. : 5 Address: 4000	Specify the number of word to be written.
4)	ENTER	Writing **AD** Word cnt.: 5 Address: 4000	Write is in progress.
5)		Writing complated Word cnt.: 5 Address: 4000	Write-protect information write is completed.

[Explanation]

(1) Writes the write-protect information to the data carrier.

(2) The specified address and number of words are as follows.
    Address   : 4000
    Number of Words : 5

> **POINT**
>
> If the address or number of words specified is other than the above, the write-protect information is not written and an error will occur after execution of the instruction for about 20 seconds.

(3) After a command execution error has occurred, press the `ESC` key to cancel the command, or, when the data carrier does not exist, the following will be displayed.

```
Write  error !
   ENTER  /  ESC
```

To re-execute, press the `ENTER` key, or, to terminate, press the `ESC` key.

(4) After the data write has been completed, press the `ENTER` key to make it possible to reconduct the write.

(5) To end the specification write, press the `ESC` key.

(6) The address for the write address or the number of word specification can be directly entered using the character keys, or can be specified using the following keys.

   `◀` .... Displays the -1 address from the current address.

   `▶` .... Displays the +1 address from the current address.

   `▲` .... Displays the -10 address from the current address.

   `▼` .... Displays the +10 address from the current address.

(7) The write count batch update instruction can be used even during write protection setting.

(8) If you entered wrong data, press the `ESC` key.

(9) Press the `ESC` key to change the data display unit.
   Every time the `DISP` key is pressed, the display mode changes between decimal, hexadecimal and character.

(10) Executing the all clear command for the data carrier set for write protection does not clear the pages set for write protection. An all clear error does not occur, either.

(11) If you perform Specification Write across the pages set for write protection, a write error occurs but the data of the pages preceding those set for write protection may sometimes be written.
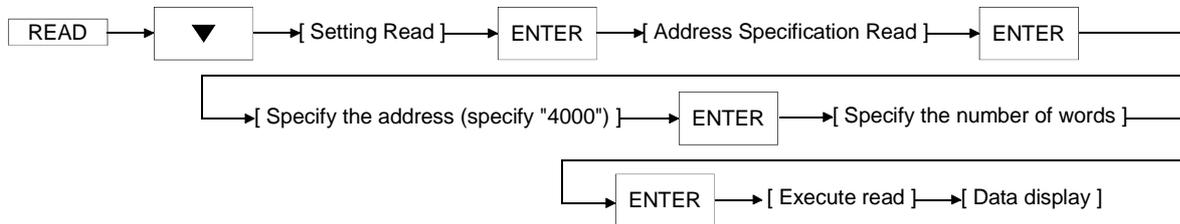
5.6.2 Operation for reading write-protect information

This section explains the operation for reading the write-protect information set to the data carrier.
The write-protect information is read to the following areas of the handy controller.

Address	Item	Description	Input Display		
			Decimal	Hexadecimal	Character
4010	Write protection setting/cancel value	Setting: 1, cancel: 0 (character)	8240, 8241	2030H to 2301H	0,1
4011	Write protection starting page address	0 to 22 (character)	8240 to 12850	2030H to 3232H	0 to 22
4012	Write protection end page address	0 to 22 (character)	8240 to 12850	2030H to 3232H	0 to 22

[Fundamental Operation]

READ → ▼ → [Setting Read] → ENTER → [Address Specification Read] → ENTER →

→ [Specify the address (specify "4000")] → ENTER → [Specify the number of words] →

→ ENTER → [Execute read] → [Data display]

[Example Operation]   Read the write-protect information.

1)		Mode selection Read / Write Other / Display	Mode Selection Screen Display
2)	READ	Select read mthd **All areas** 160 Select area	Select the read mode
3)	▼	Select read mthd All areas 160 **Select area**	Select Setting Read
4)	ENTER	Select read mthd **Read addrs spec** Read item spec.	Select Address Specification Read
5)	ENTER → 4 / V → 0 /SPC → 1 / - → 0 /SPC	Read address? Address: 4010	Specify the address to be read (Specify "4010".)
6)	ENTER → 3	Read word cnt? Word cnt. : 3 Address: 4010	Specify the number of words to be read
7)	ENTER	Reading **AD** Word cnt.: 3 Address: 4010	Read is in progress

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8)

| Reading completed |
| Word cnt.: 3 |
| Address: 4010 |

Write-protect information read is completed

9)

| Data disp : Text |
| Address: 4010 |
| 1 1 12 |

Write-protect information is read. (Choose the character display mode.) The display on the left assumes that pages 1 to 12 are set for write protection.

[Explanation]

(1) Reads the write-protect information set to the data carrier.

(2) The specified address and number of words are as follows.
   Address   : 4010
   Number of Words   : 3

POINT

If the address or number of words specified is other than the above, the write-protect information is not read and an error will occur after execution of the instruction for about 20 seconds.

---

(3) When an error occurs after command execution, press the [ESC] key to cancel the com-mand, or, if a data carrier does not exist, the following will be displayed.

| Read error ! |
| ENTER / ESC |

To re-execute, press the [ENTER] key, and to terminate, press the [ESC] key.

(4) To change the data display units, press the [DISP] key. Each time the [DISP] key is pressed, the display is changed from decimal, to hexadecimal, to character. When the write-protect information has been read, check it in the character display mode.

(5) Pressing the [ENTER] key after the data is displayed makes it possible to set for re-read. When the key is pushed, the following is displayed.

| Read again ? |
| ENTER / ESC |

To re-execute, press the [ENTER] key, or, to terminate, press the [ESC] key.

(6) To end the address specification read, press the mode keys (READ , WRITE , OTHER), or press the ESC key twice.

(7) When specifying the write address and number of words, enter the address directly with the character keys or use the following keys.

      ◄ .... Displays the -1 address from the current address.

      ► .... Displays the +1 address from the current address.

      ▲ .... Displays the -10 address from the current address.

      ▼ .... Displays the +10 address from the current address.

5.7 Count Write Setting

Count write setting is made to set the handy controller to update the total write count value of the data carrier once after completion of write. (The value is always updated once regardless of the address and number of words.)

The write count is updated once when you set the handy controller to Count Write with this instruction and then perform normal Specification Write.

Since the write count of the data carrier is not updated automatically, update the value with this instruction or the write count batch update instruction.

If this instruction has been canceled, performing write to the data carrier will not update the total write count value.

(1) Count write information types

There are the following count write information types.

Write Target Address	Item	Description	Input Display		
			Decimal	Hexadecimal	Character
4015	Keyword 1	M or L (upper-case (fixed))	8268, 8267	204C$_H$, 204B$_H$	M, L
4016	Keyword 2	W (upper-case (fixed))	8279	2057$_H$	W
4017	Count write setting/cancel	Setting: 1, cancel: 0	8240, 8241	2030$_H$, 2031$_H$	0,1

(2) Changing the count write information

Using Changing Data (Address Specification Change), change the count write information on the memory of the handy controller.

After performing this operation, perform the operation in "(3) Writing the count write information" to set Count Write.

[Fundamental Operation]

WRITE ⟶ [Changing Data] ⟶ ENTER ⟶ [Address Specification Change] ⟶ ENTER

⟶ [Specify the address (specify "4015")] ⟶ ENTER ⟶ [Enter the keyword 1 (M or L)] ⟶ ENTER

⟶ [Enter the keyword 2 (W)] ⟶ ENTER ⟶ [Enter the setting (1)/cancel (2) value] ⟶ ENTER

⟶ WRITE ⟶ To operation in (3)
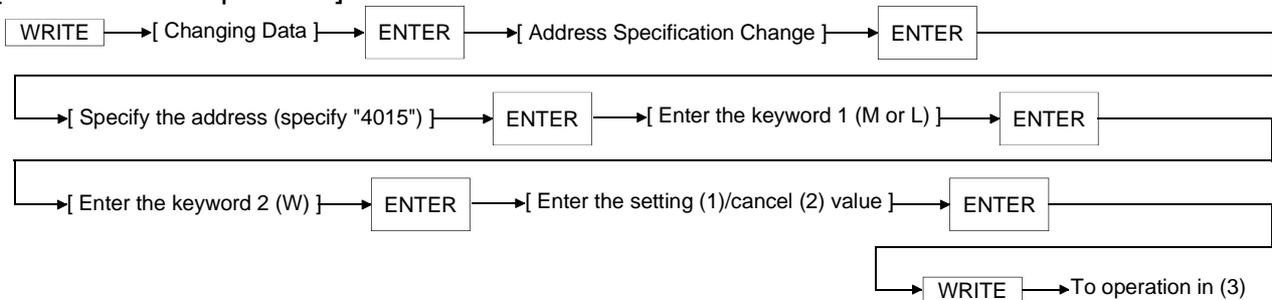
[Example Operation]   Set the count write information to "Setting (1)".

1)		Mode selection Read / Write Other / Display	Mode Selection Screen Display
2) WRITE		Func Setting Wrt menu **Data modif.** Data copy	Select the write function.
3) ENTER		Selct modif mthd **Modif adrs spec** Modif item spec	Select Changing Data and Address Specification Change.

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4) | ENTER | → | 4 / V | → | 0 /SPC | → | 1 / - | →

| 5 / W |

```
Address?
Address:        4015
```

Specify a new address
(Specify "4015".)

5) | ENTER |

```
Data  mod. :   Dec.
Address:        4015
    Data:          0
```

Set the new address

6) | DISP | → | DISP |

```
Address:        4015

◄
```

Change the display
mode to "Character"

7) | SHIFT | → | M / N |

```
Address:        4015

M◄
```

After entering the
keyword 1 (M or L)

8) | ENTER |

```
Address:        4016

◄
```

Set the keyword 1

9) | SHIFT | → | 5 / W |

```
Address:        4016

W◄
```

After entering the
keyword 2 (W)

10) | ENTER |

```
Address:        4017

◄
```

Set the keyword 2

11) | 1 / - |

```
Address:        4017

1 ◄
```

After entering the
setting/cancel value "1"

12) | ENTER |

```
Address:        4018

◄
```

Set the setting/cancel
value "1"

13) | WRITE |

```
Selct   write   mthd
Write  adrs   spec
Write  item   spec
```

End the count write
information change of
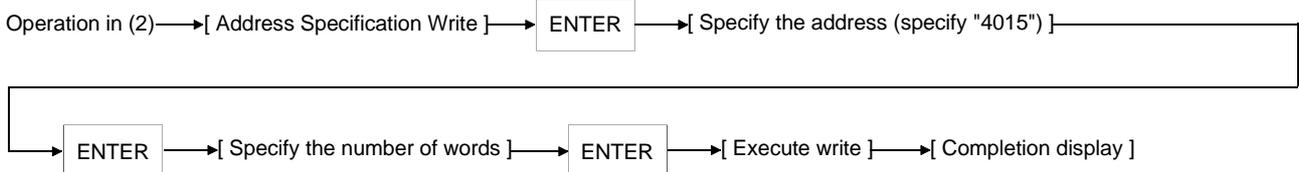the handy controller (to
operation in (3))

(3) Writing the count write information

Using Specification Write (Address Specification Change), write the count write information to the handy controller.

After making "(2) Changing the count write information", perform this operation to set Count Write.

[Fundamental Operation]

Operation in (2) ──►[Address Specification Write] ──► ENTER ──►[Specify the address (specify "4015")]──┐

└──► ENTER ──►[Specify the number of words] ──► ENTER ──►[Execute write] ──►[Completion display]

[Example Operation]   Write the set count write information.

1)	Selct write mthd **Write adrs spec** Write item spec	Display the write method selection screen
2) ENTER → 4／V → 0／SPC → 1／- → 5／W	Write address? Address: 4015	Specify the write address. (Specify "4015")
3) ENTER → 3	Write word cnt? Word cnt. : 3 Address: 4015	Specify the number of word to be written
4) ENTER	Writing **AD** Word cnt.: 3 Address: 4015	Write is in progress
5)	Writing complated Word cnt.: 3 Address: 4015	Count write information write is completed

POINT

• This instruction may be executed without communication being made with the data carrier.
• Powering off the handy controller or zeroing the count write setting cancels the setting of Count Write to the handy controller.

[Explanation]

(1) Writes the count write information to the handy controller.

(2) The specified address and number of words are as follows.
   Address   : 4015
   Number of Words : 3

```
    POINT
If the address or number of words specified is other than the above, the count write
information is not written and an error will occur after execution of the instruction for
about 20 seconds.
```

(3) After a command execution error has occurred, press the ESC key to cancel
   the command, or, when the data carrier does not exist, the following will be
   displayed.

```
Write   error !
  ENTER  /  ESC
```

   To re-execute, press the ENTER key, or, to terminate, press the ESC key.

(4) After the data write has been completed, press the ENTER key to make it possible
   to reconduct the write.

(5) To end the specification write, press the ESC key.

(6) The address for the write address or the number of word specification can be
   directly entered using the character keys, or can be specified using the following
   keys.

   ◄ .... Displays the -1 address from the current address.

   ► .... Displays the +1 address from the current address.

   ▲ .... Displays the -10 address from the current address.

   ▼ .... Displays the +10 address from the current address.

(7) When Count Write has been set (1 is set to address 4017), it is valid until 0 is set to
   address 4017 and the count write setting is made again or until the handy controller
   is powered off.

(8) If you entered wrong data, press the ESC key.

(9) To change the data display units, press the DISP key. Each time the DISP
   key is pressed, the display is changed from decimal, to hexadecimal, to character.

5.8 Write Count Batch Update

Add any write count addend value to the total write count value of the data carrier.
Since the write count of the data carrier is not updated automatically, update the value with this instruction or the write count batch update instruction.

(1) Write count batch update information types

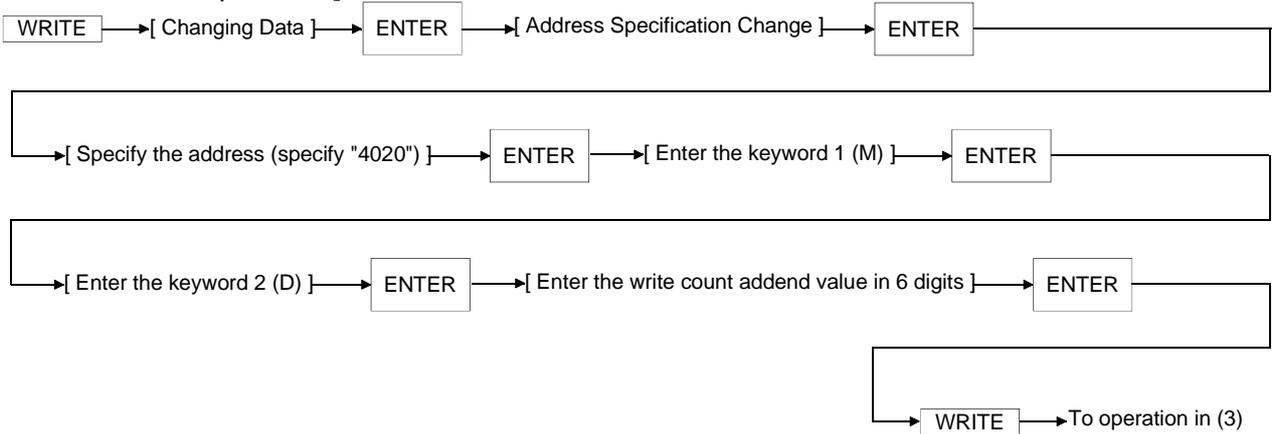There are the following write count batch update information types.

Write Target Address	Item	Description	Input Display		
			Decimal	Hexadecimal	Character
4020	Keyword 1	M (upper-case (fixed))	8268	204C$_H$	M
4021	Keyword 2	D (upper-case (fixed))	8260	2044$_H$	D
4022	Write count addend value (6th, 5th digits)	Specify the 6th and 5th digits of the write count addend value. Specifying range: 00 to 03 (fixed)	12366 to 13104	3030$_H$ to 3330$_H$	00 to 03
4023	Write count addend value (4th, 3rd digits)	Specify the 4th and 3rd digits of the write count addend value. Specifying range: 00 to 99 (fixed)	12366 to 14649	3030$_H$ to 3939$_H$	00 to 99
4024	Write count addend value (2nd, 1st digits)	Specify the 2nd and 1st digits of the write count addend value. Specifying range: 00 to 99 (fixed)	12366 to 14649	3030$_H$ to 3939$_H$	00 to 99

(2) Changing the write count batch update information

Using Changing Data (Address Specification Change), change the write count batch update information on the memory of the handy controller.
After performing this operation, perform the operation in "(3) Writing the write count batch update information" to execute Write Count Batch Update.

[Fundamental Operation]

WRITE → [Changing Data] → ENTER → [Address Specification Change] → ENTER

→ [Specify the address (specify "4020")] → ENTER → [Enter the keyword 1 (M)] → ENTER

→ [Enter the keyword 2 (D)] → ENTER → [Enter the write count addend value in 6 digits] → ENTER

→ WRITE → To operation in (3)

[Example Operation]   Set the write count addend value to "100".

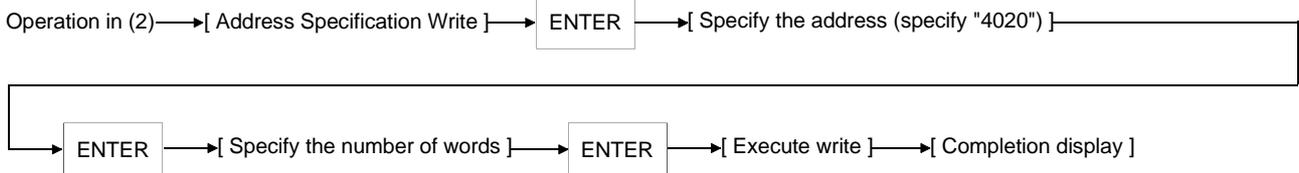| Step	Keys	Screen	Description
1)		Mode selection Read / Write Other / Display	Mode Selection Screen Display
2)	WRITE	Func Setting Wrt menu **Data modif.** Data copy	Select the write function
3)	ENTER	Selct modif mthd **Modif adrs spec** Modif item spec	Select Changing Data and Address Specification Change
4)	ENTER → 4/V → 0/SPC → 2 → 0/SPC	Address? Address: 4020	Specify a new address (Specify "4020")
5)	ENTER	Data mod. : Dec. Address: 4020 Data: 0	Set the new address
6)	DISP → DISP	Address: 4020 ◄	Change the display mode to "Character"
7)	SHIFT → M/N	Address: 4020 M◄	Enter the keyword 1 (M)
8)	ENTER	Address: 4021 ◄	Set the keyword 1
9)	SHIFT → C/D	Address: 4021 D ◄	Enter the keyword 2 (D)
10)	ENTER	Address: 4022 ◄	Set the keyword 2
11)	0/SPC → 0/SPC → 0/SPC → 1/- → 0/SPC → 0/SPC	Address: 4022 000100◄	After entering the write count addend value "000100" (Always enter it in 6 digits)
12)	ENTER	Address: 4025 ◄	Set the write count addend value
13)	WRITE	Selct write mthd **Write adrs spec** Write item spec	End the write count batch update information change of the handy controller (to operation in (3))

(3) Writing the write count batch update information

Using Specification Write (Address Specification Change), write the write count addend value to the data carrier.
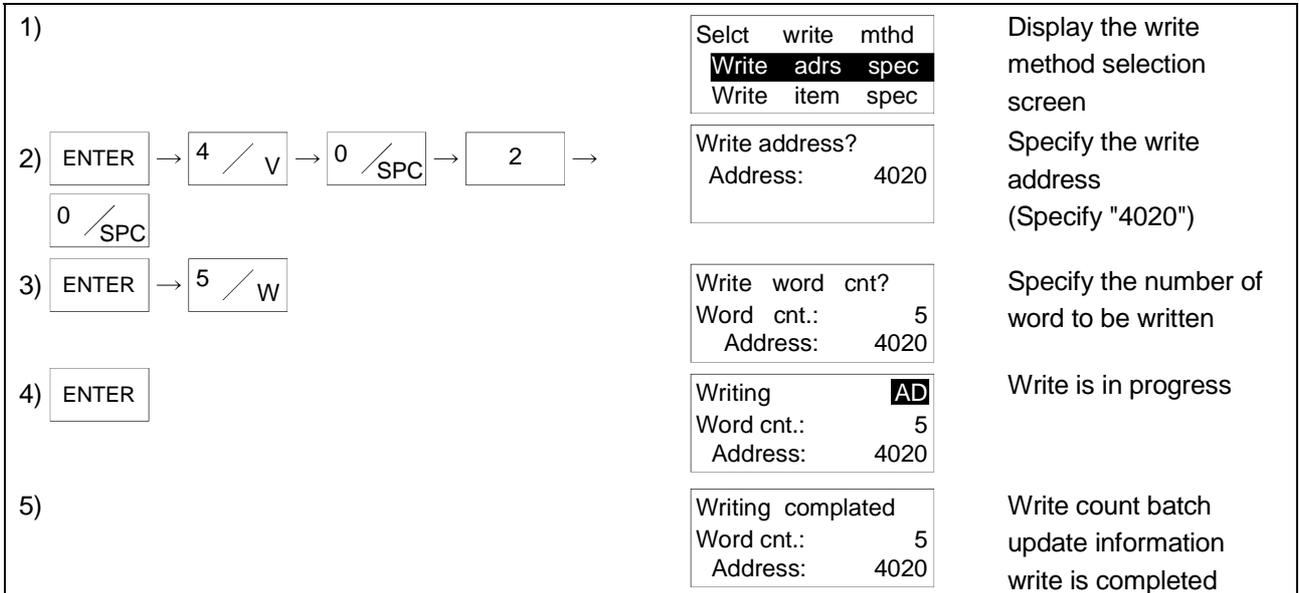
After making "changing the write count batch update information", perform this operation to execute Write Count Batch Update.

[Fundamental Operation]

Operation in (2) ——▸[Address Specification Write]——▸ ENTER ——▸[Specify the address (specify "4020")]

——▸ ENTER ——▸[Specify the number of words]——▸ ENTER ——▸[Execute write]——▸[Completion display]

[Example Operation]   Write the set write count batch update information.

1)		Selct write mthd **Write adrs spec** Write item spec	Display the write method selection screen
2)	ENTER → 4 ／V → 0 ／SPC → 2 → 0 ／SPC	Write address? Address: 4020	Specify the write address (Specify "4020")
3)	ENTER → 5 ／W	Write word cnt? Word cnt.: 5 Address: 4020	Specify the number of word to be written
4)	ENTER	Writing **AD** Word cnt.: 5 Address: 4020	Write is in progress
5)		Writing complated Word cnt.: 5 Address: 4020	Write count batch update information write is completed

[Explanation]

(1) Adds the write count addend value to the total write count value of the data carrier.

(2) The specified address and number of words are as follows.
    Address   : 4020
    Number of Words : 5

┌───┐
│ POINT   │
├───┤
│ If the address or number of words specified is other than the above, the write count │
│ batch update information is not written and an error will occur after execution of the │
│ instruction for about 20 seconds.   │
└───┘

(3) After a command execution error has occurred, press the ESC key to cancel the command, or, when the data carrier does not exist, the following will be displayed.

┌─────────────────────────┐
│ Write   error !   │
│   ENTER / ESC   │
│   │
└─────────────────────────┘

To re-execute, press the ENTER key, or, to terminate, press the ESC key.

(4) After the data write has been completed, press the ENTER key to make it possible to reconduct the write.

(5) To end the specification write, press the ESC key.

(6) The address for the write address or the number of word specification can be directly entered using the character keys, or can be specified using the following keys.

    ◄ .... Displays the -1 address from the current address.

    ► .... Displays the +1 address from the current address.

    ▲ .... Displays the -10 address from the current address.

    ▼ .... Displays the +10 address from the current address.

(7) If you entered wrong data, press the ESC key.

(8) To change the data display units, press the DISP key. Each time the DISP key is pressed, the display is changed from decimal, to hexadecimal, to character.

(9) Always set the write count addend value in 6 digits and enter 0 in the 6th digit. Also set it within the range 0 to 32767.
    (Example) To specify "50" as the write count addend value (character display)
             Address 4022 : 000050

5.9 Extended-life Bank Switching

Extended-life bank switching is designed to set the memory type of the data carrier and set the number of banks and bank No. to be used.

The guaranteed life of the data carrier is 300,000 times (-20°C to 60°C) on a bank basis.

For example, when you set "12" as the number of banks, use of the banks by switching from one to another enables read/write up to 3,600,000 times. (This requires settings to be made in the whole system.)

For details, refer to any of the AD35ID □ / A1SD35ID □ User's Manual, AJ65BT-D35ID2 User's Manual and D-2N232IF2 User's Manual.

(1) Extended-life bank switching information types

There are the following extended-life bank switching information types.

Write Target Address	Item	Description	Input Display		
			Decimal	Hexadecimal	Character
4030	Keyword 1	B (upper-case (fixed))	8258	2042H	B
4031	Keyword 2	K (upper-case (fixed))	8267	204BH	K
4032	Bank split count *1	Specify the number of banks created in the data carrier. Refer to (2) for details. Specifying range: 1, 2, 3, 4, 6, 8, C (upper-case (fixed))	8241 to 8244, 8246, 8248, 8259	2031H to 2034H, 2036H, 2038H, 2048H	1 to 4, 6, 8, C
4033	Used bank No. *1	Specify the bank No. of the data carrier to be accessed. Specifying range: 1, 2, 3, 4, 6, 8, C (upper-case (fixed))	8241 to 8244, 8246, 8248, 8259	2031H to 2034H, 2036H, 2038H, 2043H	1 to 4, 6, 8, C

*1 Make setting to satisfy the condition that bank split count used bank No.

(2) Bank counts that may be set

As the bank split count, you can set any of the following seven different bank counts.
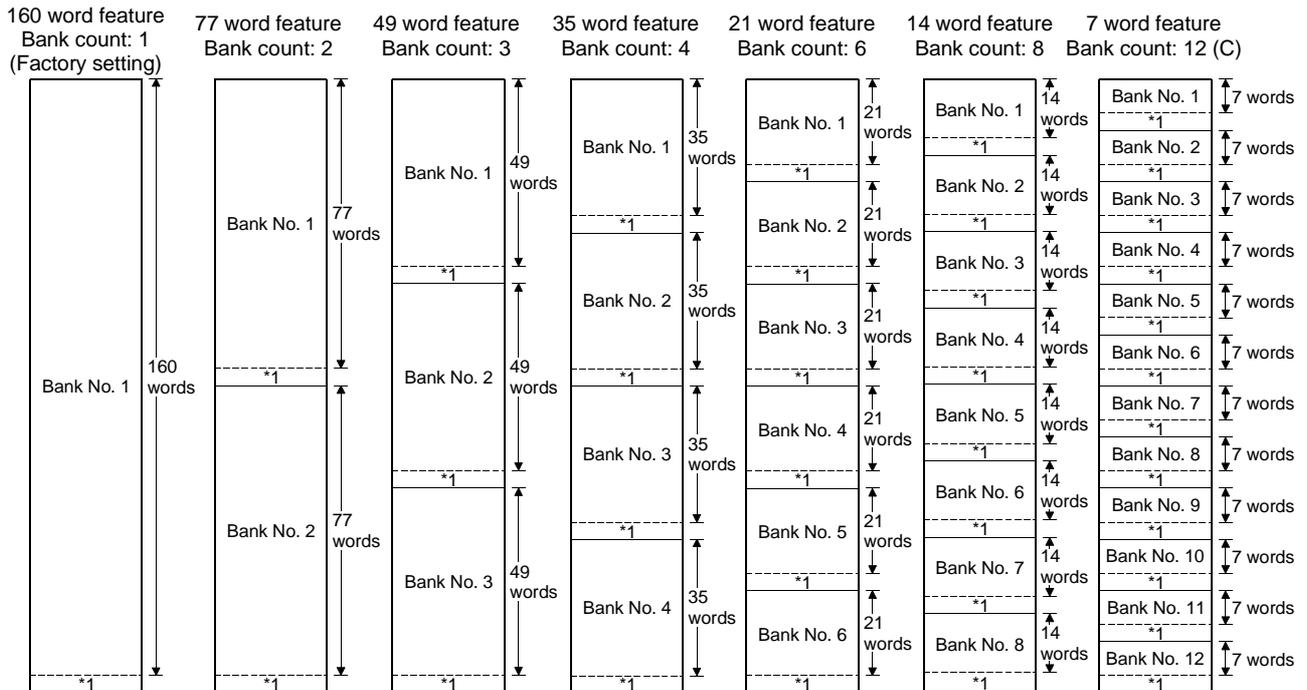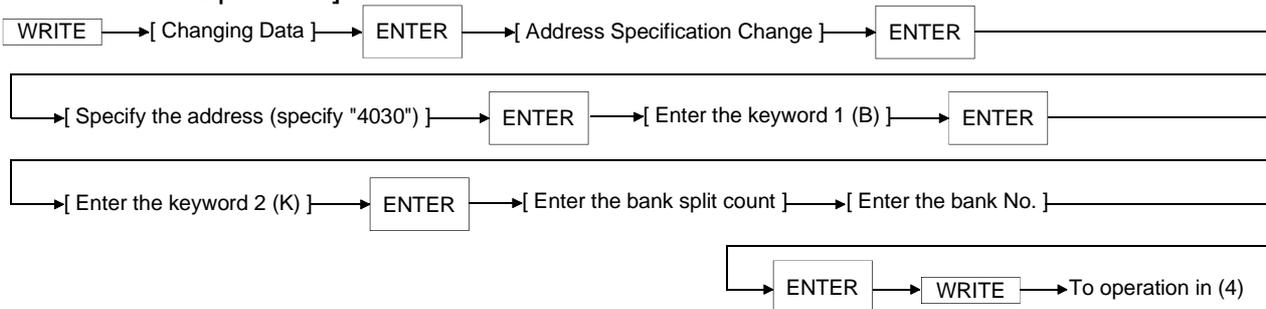

*1 Write count storage area

(3) Changing the extended-life bank switching information

Using Changing Data (Address Specification Change), change the extended-life bank switching information on the memory of the handy controller.
After performing this operation, perform the operation in "(4) Writing the extended-life bank switching information" to execute Extended-life Bank Switching.

[Fundamental Operation]

WRITE ──▶[Changing Data]──▶ ENTER ──▶[Address Specification Change]──▶ ENTER ─────

└──▶[Specify the address (specify "4030")]──▶ ENTER ──▶[Enter the keyword 1 (B)]──▶ ENTER ─────

└──▶[Enter the keyword 2 (K)]──▶ ENTER ──▶[Enter the bank split count]──▶[Enter the bank No.]─────

└──▶ ENTER ──▶ WRITE ──▶To operation in (4)

[Example Operation]   Set the bank split count to "C (12)" and the used bank No. to "1".

Step	Keys	Screen	Description
1)		Mode selection Read / Write Other / Display	Mode Selection Screen Display
2)	WRITE	Func Setting Wrt menu **Data modif.** Data copy	Select the write function
3)	ENTER	Selct modif mthd **Modif adrs spec** Modif item spec	Select Changing Data and Address Specification Change
4)	ENTER → 4/V → 0/SPC → 3 → 0/SPC	Address? Address: 4030	Specify a new address (Specify "4030")
5)	ENTER	Data mod. : Dec. Address: 4030 Data: 0	Set the new address
6)	DISP → DISP	Address: 4030 ◀	Change the display mode to "Character"
7)	SHIFT → A/B	Address: 4030 B ◀	Enter the keyword 1 (B)
8)	ENTER	Address: 4031 ◀	Set the keyword 1
9)	K/L	Address: 4031 K ◀	Enter the keyword 2 (K)

↓
To next page

From preceding page

↓

10) | ENTER |

Address: 4032

◀

Set the keyword 2

11) | C ╱ D |

Address: 4032

C◀

After entering the bank split count "C"

12) | ENTER |

Address: 4033

◀

Set the bank split count

13) | 1 ╱ - |

Address: 4033

1 ◀

After entering the used bank No. "1"

14) | ENTER |

Address: 4034

◀

Set the used bank No.

15) | WRITE |

Selct   write   mthd
Write   adrs   spec
Write   item   spec

End the extended-life bank switching information change of the handy controller (to operation in (4))

(4) Writing the extended-life bank switching information

Using Specification Write (Address Specification Change), write the extended-life bank switching information to the data carrier.

After making "changing the extended-life bank switching information", perform this operation to execute Extended-life Bank Switching.

[Fundamental Operation]

Operation in (3) ──▶[Address Specification Write] ──▶ ENTER ──▶[Specify the address (specify "4030")]

──▶ ENTER ──▶[Specify the number of words] ──▶ ENTER ──▶[Execute write] ──▶[Completion display]
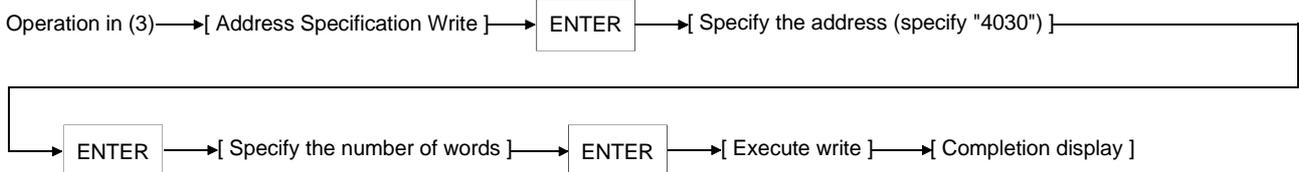
[Example Operation] Write the set extended-life bank switching information.

1)	Selct write mthd **Write adrs spec** Write item spec	Display the write method selection screen.
2)	ENTER → 4⁄V → 0⁄SPC → 3 → 0⁄SPC	Write address? Address: 4030	Specify the write address. (Specify "4030".)
3)	ENTER → 4⁄V	Write word cnt? Word cnt.: 4 Address: 4030	Specify the number of word to be written.
4)	ENTER	Writing **AD** Word cnt.: 4 Address: 4000	Write is in progress.
5)		Writing complated Word cnt.: 4 Address: 4030	Extended-life bank switching information write is completed.
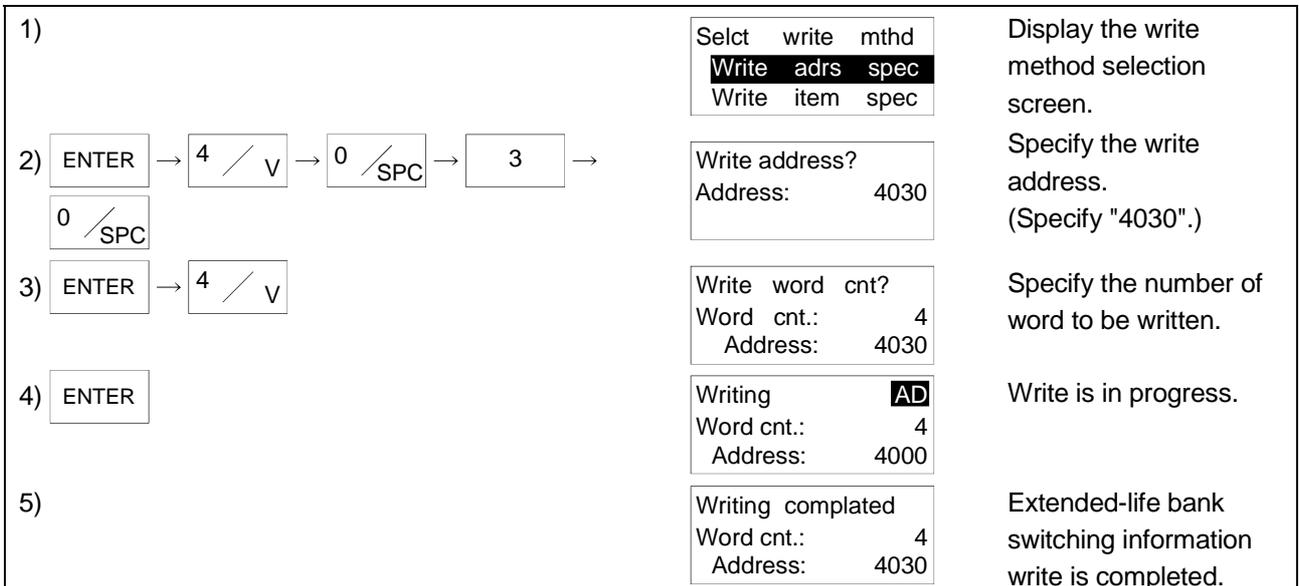
[Explanation]

(1) Writes the extended-life bank switching information to the data carrier.

(2) The specified address and number of words are as follows.
Address   : 4030
Number of Words   : 4

> **POINT**
>
> If the address or number of words specified is other than the above, the extended-life bank switching information is not written and an error will occur after execution of the instruction for about 20 seconds.

(3) After a command execution error has occurred, press the [ESC] key to cancel the command, or, when the data carrier does not exist, the following will be displayed.

```
Write  error !
  ENTER / ESC
```

To re-execute, press the [ENTER] key, or, to terminate, press the [ESC] key.

(4) After the data write has been completed, press the [ENTER] key to make it possible to reconduct the write.

(5) To end the specification write, press the [ESC] key.

(6) The address for the write address or the number of word specification can be directly entered using the character keys, or can be specified using the following keys.

　　[◀] .... Displays the -1 address from the current address.

　　[▶] .... Displays the +1 address from the current address.

　　[▲] .... Displays the -10 address from the current address.

　　[▼] .... Displays the +10 address from the current address.

(7) When the memory type that was set is the same as the one before setting, the write count is not initialized.

(8) Changing the bank No. copies the data of the old bank to the new bank.

(9) When write protection has been set, only the used bank No. can be changed and the write protection setting is also shifted.

(10) If you change the bank count during use of the data carrier, the data in the data carrier are all cleared.
Set the bank count only at the first time of memory setting.

(11) If write protection has been set when the bank count is to be changed, a write protection error occurs and the memory type cannot be set.

(12) If you entered wrong data, press the [ESC] key.

(13) To change the data display units, press the [DISP] key. Each time the [DISP] key is pressed, the display is changed from decimal, to hexadecimal, to character.

5.10 Communication Information Read

Read the information of communication with the data carrier communicated last.

(1) Communication information types

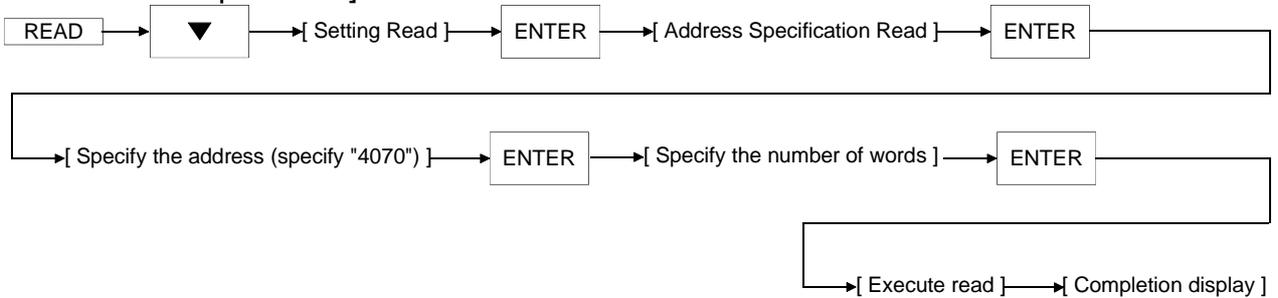There are the following communication information types.

Read Address	Item	Description	Initial Value (Decimal)
4070	Execution command code (Decimal)	The execution command code is stored. | Execution command code name	Value
---	---
Read	1
Import	2
Comparison	3
All clear	4
Communication count read	5
Write-protect information write	6
Write-protect information read	7
Count write	13
Write count batch update	14
Extended-life bank switching	15		0
4071	Starting address value (Decimal)	The read/write starting address value is stored.	0
4072	Read/write word count (Decimal)	The number of words read/written is stored.	0
4073 to 4075	Not used	———	—
4076	Write protection setting/cancel value (Decimal)	The write protection setting or cancel value is stored. Setting: 1, cancel: 0	0
4077	Write protection starting page address value (Decimal)	The write protection starting page address value is stored.	0
4078	Write protection end page address value (Decimal)	The write protection end page address value is stored.	0
4079 to 4082	Not used	———	—
4083	Memory type (Hexadecimal)	The memory type is stored as indicated below. ○○ H — Used bank — Bank count	0
4084 to 4089	Not used	———	—

(2) Reading the communication information

Using Setting Read (Address Specification Read), read the information of communication with the data carrier communicated last.

[Fundamental Operations]

READ → ▼ → [Setting Read] → ENTER → [Address Specification Read] → ENTER

→ [Specify the address (specify "4070")] → ENTER → [Specify the number of words] → ENTER

→ [Execute read] → [Completion display]

[Example Operation]   Read the communication information.

1)	Mode selection 　Read　/　Write 　Other　/　Display	Mode Selection Screen Display
2) READ	Select　read　mthd All　areas　　　160 Select　area	Select the read mode.
3) ▼	Select　read　mthd All　areas　　　160 Select　area	Select Setting Read.
4) ENTER	Select　read　mthd Read　adrs　spec Read　item　spec.	Select Address Specification Read.
5) ENTER → 4 / V → 0 / SPC → 7 / Q → 0 / SPC	Read　address? Address:　　　4070	Specify the address to be read. (Specify "4070".)
6) ENTER → 2 → 0 / SPC	Read　word　cnt? Word　cnt. :　　　20 　Address:　　　4070	Specify the number of words to be read.
7) ENTER	Reading　　　　AD Word cnt.:　　　20 　Address:　　　4070	Read is in progress.
8)	Reading　complated Word cnt.:　　　20 　Address:　　　4070	Communication information read is completed.

[Explanation]

(1) Reads the information of communication with the data carrier communicated last.

(2) The specified address and number of words are as follows.
Address   : 4070
Number of Words : 20

```
 ┌─────────┐
 │  POINT  │
 └─────────┘
If the address or number of words specified is other than the above, the
communication information is not written and an error will occur after execution of
the instruction for about 20 seconds.
```

(3) After a command execution error has occurred, press the ESC key to cancel
the command, or, when the data carrier does not exist, the following will be
displayed.

```
Read  error !
   ENTER /  ESC
```

To re-execute, press the ENTER key, or, to terminate, press the ESC key.

(4) To change the data display units, press the key. Each time the key is pressed, the
display is changed from decimal, to hexadecimal, to character.

(5) Pressing the ESC key after data display enables the setting of re-read.
Pressing the key displays the following message.

```
Read  again ?
   ENTER /  ESC
```

To re-execute, press the ENTER key, or, to terminate, press the ESC key.

(6) To end Address Specification Read, press the mode key (READ , WRITE ,
 OTHER) or the ESC key twice.

(7) When specifying the read address and number of words or moving the address
after data display, enter the address directly with the character keys or use the
following keys.

◄	.... Displays the -1 address from the current address.
►	.... Displays the +1 address from the current address.
▲	.... Displays the -10 address from the current address.
▼	.... Displays the +10 address from the current address.

(8) This instruction is designed to display the information of communication with the
last communicated data carrier on the handy controller.
Hence, when you want to read the information, e.g. memory type, of another data
carrier, execute this instruction after making communication using the read
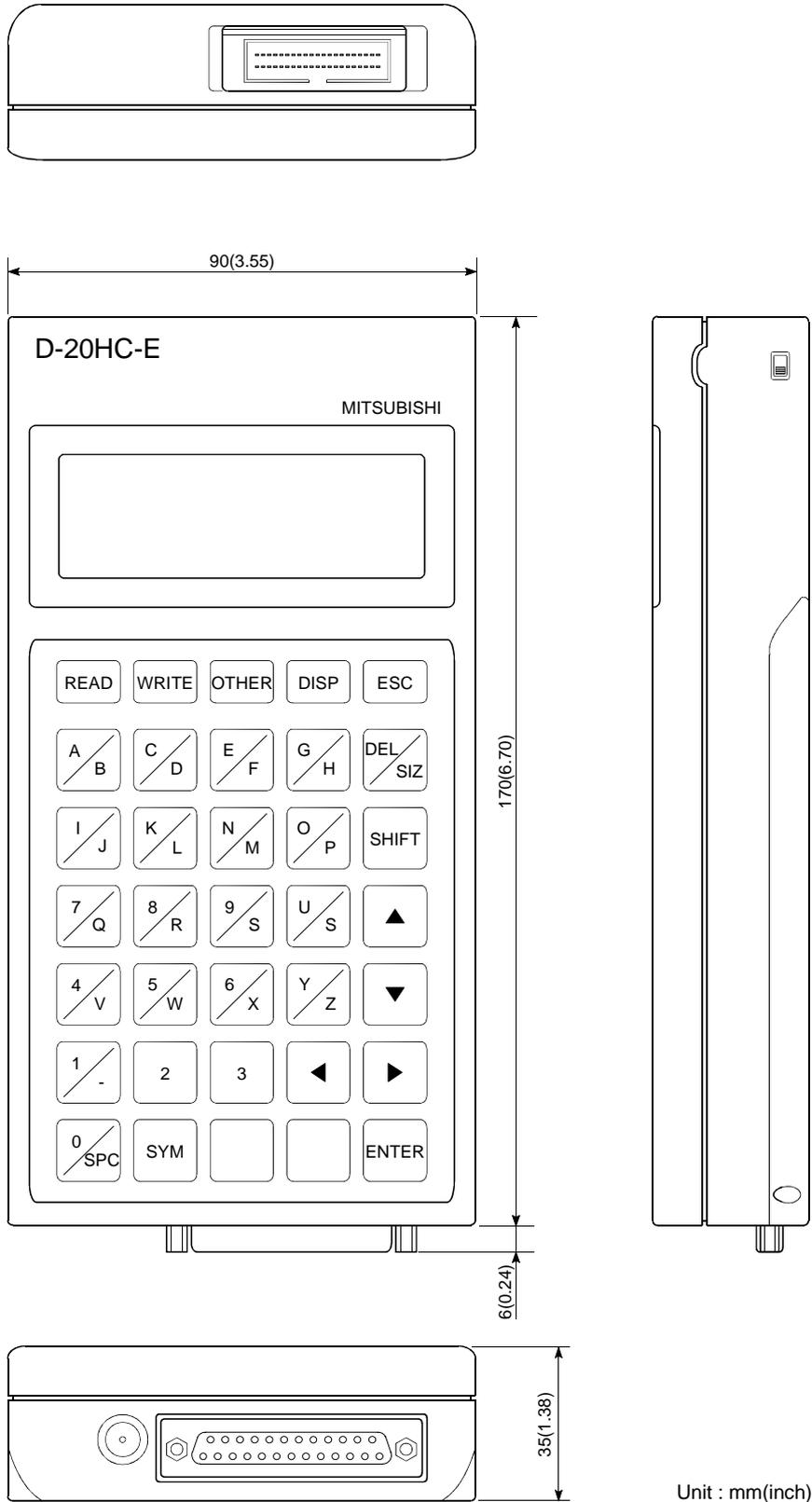instruction or like.

6 TROUBLESHOOTING

The following table lists the error indications and corrective actions at occurrence of errors.

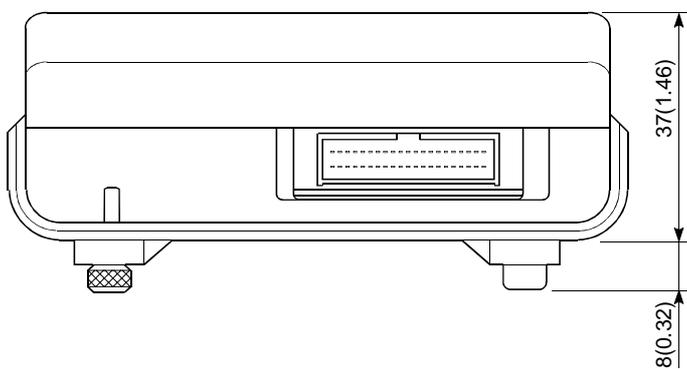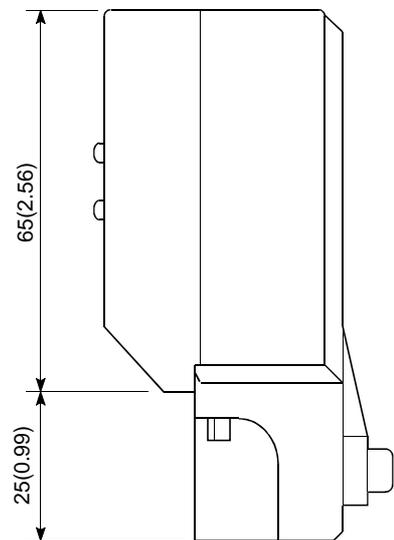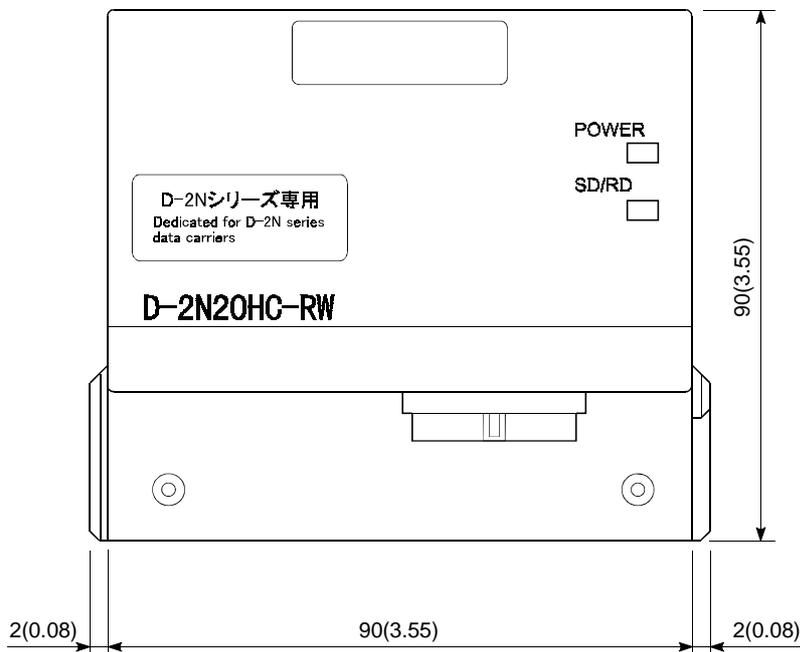| Type	Item	Description	Corrective Action
Hardware error	Displayed Warning buzzer	Internal battery voltage is low.	Recharge the battery.
Communication error	Read error Write error All clear error Comparison error	Error in communication between the reader/writer and data carrier.	Reexamine the communication distance. Reexamine the installation intervals of the data carriers. Check for noise source in the periphery.
		The reader/writer used is not compatible with the used data carrier.	Use the reader/writer that is compatible with the used data carrier. D-2N series: D-2N20HC-RW D-NS series: D-NS20HC-RW D series: D-20HC-RW
		Communication setting is RS-232C. "RS" is displayed at top right of the screen during execution of communication.	Change the setting to add-on using Communication Change. Alternatively, power off the handy controller once.
	Read error Write error Comparison error	Address or word count error	Since the D-2N series cannot read 4k words, set the address and word count to satisfy 160k or less words.
	Write error	Information write setting error (When using Write-protect Information Write, Count Write, Write Count Batch Update or Extended-life Bank Switching instruction)	Check the write address, word count and settings of the set information.
		Write protection error	Check for write performed to the area set for write protection.
	Read error	Information read setting error (When using Write-protect Information Read or Communication Information Read)	Check the read address, word count and settings of the set information.
Setting error	Item count data is in error. Total word count data is in error.	The format data is not transferred.	The D-2N series cannot use "Item Specification Read" and "Item Specification Write". Use Address Specification Read or Address Specification Write.

6

MEMO
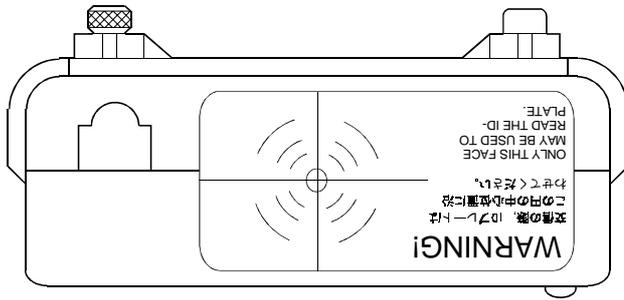
6

APPENDIX 1 External Dimensions Diagram

Appendix 1.1 D-20HC-E

Unit : mm(inch)

APP

Appendix 1.2 D-2N20HC-RW

POWER

SD/RD

D-2Nシリーズ専用
Dedicated for D-2N series
data carriers

D-2N20HC-RW

WARNING!
お使いの際は、IDプレートを
この円の中心位置に
おいてください。

ONLY THIS FACE
MAY BE USED TO
READ THE ID-
PLATE.

90(3.55)

65(2.56)

25(0.99)

2(0.08)   90(3.55)   2(0.08)

37(1.46)

8(0.32)

Unit : mm(inch)

APP

WARRANTY

Please confirm the following product warranty details before starting use.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the dealer or Mitsubishi Service Company. Note that if repairs are required at a site overseas, on a detached island or remote place, expenses to dispatch an engineer shall be charged for.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.

Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.

1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not possible after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of chance loss and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to damages caused by any cause found not to be the responsibility of Mitsubishi, chance losses, lost profits incurred to the user by Failures of Mitsubishi products, damages and secondary damages caused from special reasons regardless of Mitsubishi's expectations, compensation for accidents, and compensation for damages to products other than Mitsubishi products and other duties.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

6. Product application

(1) In using the Mitsubishi MELSEC programmable logic controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable logic controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.

(2) The Mitsubishi general-purpose programmable logic controller has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for Railway companies or National Defense purposes shall be excluded from the programmable logic controller applications.

Note that even with these applications, if the user approves that the application is to be limited and a special quality is not required, application shall be possible.

When considering use in aircraft, medical applications, railways, incineration and fuel devices, manned transport devices, equipment for recreation and amusement, and safety devices, in which human life or assets could be greatly affected and for which a particularly high reliability is required in terms of safety and control system, please consult with Mitsubishi and discuss the required specifications.

D-20HC-E Handy Controller

Operating Manual(For D-2N20HC-RW)

MODEL	D-20HC-2N-O-E
MODEL CODE	13JU21
SH(NA)-080189-A(0106)MEE	

When exported from Japan, this manual does not require application to the
Ministry of Economy, Trade and Industry for service transaction permission.

Specifications subject to change without notice.