

Ethernet Based Open Network
CC-Link IE Compatible Product Development Reference Manual

CC-Link IE  **control**

CC-Link IE Controller Network
Q80BD-J71GP21-SX/Q81BD-J71GP21-SX Driver Development

Safety Precautions

(Read these precautions before using this product.)

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

The precautions given in this manual are concerned with this product only.

In this manual, the safety precautions are classified into two levels: "⚠WARNING" and "⚠CAUTION".



WARNING

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 minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠CAUTION" may lead to serious consequences. Observe the precautions of both levels because they are important for personal and system safety. Make sure that the end users read this manual and the relevant manuals and then keep the manuals in a safe place for future reference.

[Design Precautions]

⚠WARNING

- Configure safety circuits external to the board to ensure that the entire system operates safely even when a fault occurs in the personal computer. Failure to do so may result in an accident due to an incorrect output or malfunction.
 - (1) Emergency stop circuits, protection circuits, and protective interlock circuits for conflicting operations (such as forward/reverse rotations or upper/lower limit positioning) must be configured external to the board.
 - (2) If the station in which the board is installed is disconnected from data link due to a data link error, the data that is output from that station and written to other stations will remain the same as immediately before the error. This data will be held until the data link for the disconnected station is resumed (until the disconnected station returns to the system). Provide a mechanism to monitor the data link status and handle data link errors for each station that is connected to the data link system.
- For the operating status of each station after a communication failure, refer to the CC-Link IE Controller Network Reference Manual (SH-080668ENG). Incorrect output or malfunction due to a communication failure may result in an accident.
- When changing data during operation, configure an interlock circuit in the program to ensure that the entire system will always operate safely. In addition, determine corrective actions to be taken between the board and other stations in case of a communication failure.
- The optical transmitter and receiver of the CC-Link IE Controller Network board use laser diodes (class 1 in accordance with IEC 60825-1/JIS C6802). Do not look directly at a laser beam. Doing so may harm your eyes.
- Do not write any data to the "use prohibited" area of the memory areas (PCI configuration area, 2-port memory area, and hardware control memory area) in the product.
- Writing data to the "use prohibited" area may cause malfunction of the host where the board is installed. When changing data and operating status of the board, configure an interlock circuit external to the board to ensure that the entire system will always operate safely.

[Design Precautions]

⚠CAUTION

- Do not install the power cables or communication cables together with the main circuit lines or power cables. Keep a distance of 100 mm or more between them. Failure to do so may result in malfunction due to noise.

[Security Precautions]

⚠CAUTION

- To maintain the security (confidentiality, integrity, and availability) of the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from external devices via the network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.

[Installation Precautions]

⚠WARNING

- Shut off the external power supply (all phases) used in the system before installing/uninstalling the board to/from a personal computer. Failure to do so may result in electric shock or cause the board to fail or malfunction.
- Do not touch any connectors while power is on. Doing so will cause electric shock or malfunction.

[Installation Precautions]

CAUTION

- Use the board in an environment that meets General Specification in the CC-Link IE Controller Network Interface Board User's Manual (For SW1DNC-MNETG-B). Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- Do not directly touch any conductive parts and electronic components of the board. Doing so can cause malfunction or failure of the board.
- Do not disassemble or modify the board. Doing so may cause failure, malfunction, injury, or a fire.
- Securely fix the board with the fixing screws. Tighten the screws within the specified torque range. Undertightening can cause drop of the screw, short circuit, or malfunction. Overtightening can damage the screw and/or board, resulting in drop, short circuit, or malfunction. For the tightening torque range, refer to the user's manual included with the personal computer used.
- Before handling the board, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Failure to do so may cause the board to fail or malfunction.
Install the board to a personal computer which is compliant with PCI standard or PCI Express® standard. Failure to do so may cause a failure or malfunction.
- Securely attach the board to the PCI slot or the PCI Express® slot following the board installation instruction of the personal computer used. Incorrect installation of the board may lead to malfunction, failure, or drop of the board.
- When installing the board, take care not to contact with other boards.
- When installing the board, take care not to get injured by an implemented component or a surrounding member.
- Handle the board in a place where static electricity will not be generated. Failure to do so may cause a failure or malfunction.
- The board is included in an antistatic bag. When storing or transporting it, be sure to put it in the antistatic bag. Failure to do so may cause malfunction or failure.
- Do not drop or apply strong shock to the board. Doing so may cause malfunction or failure.

[Wiring Precautions]

WARNING

- Shut off the external power supply (all phases) used in the system before installing the board and wiring. Failure to do so may result in electric shock or cause the board to fail or malfunction.
- After board installation and wiring, attach the cover to the device where the board is installed before turning it on for operation. Failure to do so may result in electric shock.

[Wiring Precautions]

CAUTION

- Place the communication cables in a duct or clamp them. If not, the dangling cables may swing or inadvertently be pulled, resulting in damage to the board or cables or malfunction due to poor contact.
- When disconnecting the cable from the board, do not pull the cable by the cable part. Pulling the cable connected the board may result in malfunction or damage to the board or cable.
- Prevent foreign matter such as dust or wire chips from entering the personal computer. Such foreign matter can cause a fire, failure, or malfunction.
- Connect the communication cables to the connectors of the board. Check the connection for looseness. Poor contact may cause incorrect input or output.
- Ground the host where the board is installed with a ground resistance of 100 ohms or less. Failure to do so may result in malfunction.

[Disposal Precautions]

CAUTION

- When disposing of the board, treat it as industrial waste.

Notice for Safety Design

(Read before using this product.)

- Mitsubishi Electric Corporation (Mitsubishi) puts the maximum effort into making its products better and more reliable, but there is always the possibility that product failure or malfunction may occur. Failure or malfunction of Mitsubishi products may lead to personal injury, fire, and/or property damage. Remember to give due consideration to safety when making your designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of non-flammable material, or (iii) prevention against any malfunction or mishap.

Notes Regarding This Manual

(Read before using this product.)

- This manual is intended as a reference to assist our customers in the development of CC-Link family products best suited to the customer's application; it does not convey any license under any intellectual property rights, or any other rights, belonging to Mitsubishi in relation to the technical information described herein.
- When using any or all of the information contained in this manual, including product data, technical information in diagrams and charts, programs, and algorithms, please be sure to evaluate all information not only in terms of the technical details, programs, or algorithms, but as a total system before making a final decision on the applicability of the information and products. Mitsubishi assumes no responsibility for inapplicability.
- Mitsubishi assumes no responsibility for any damage, or infringement of any third-party's rights, originating in the use of any product data, diagrams, charts, programs, algorithms, or circuit application examples contained in this manual.
- The precautions given in this manual are concerned with this product only. For the safety precautions of the system, refer to the user's manuals for the products used.
- All information contained in this manual, including product data, diagrams, charts, programs, and algorithms, represents information on products at the time of publication of this manual; the items and specifications described herein are subject to change by Mitsubishi without notice. Please consult your local Mitsubishi Electric representative for the latest product information before purchasing a Mitsubishi product.
- The prior written approval of Mitsubishi is necessary to reprint or reproduce this manual in whole or in part.
- If you have any questions or concerns regarding the details described in this manual, consult your local Mitsubishi Electric representative.

Conditions of Use for the Product

- (1) Mitsubishi personal computer board ("the PRODUCT") shall be used in conditions;
 - i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
 - ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

- (2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries. MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.

("Prohibited Application")

Prohibited Applications include, but not limited to, the use of the PRODUCT in;

- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above restrictions, Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTS are required. For details, please contact the Mitsubishi representative in your region.

- (3) Mitsubishi shall have no responsibility or liability for any problems involving system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

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Relevant Manuals

This manual does not describe the details on terms and functions of CC-Link IE Controller Network. For the details, please refer to the following manuals.

Manual name [manual number]	Description
MELSEC-Q CC-Link IE Controller Network Reference Manual [SH(NA)-080668ENG]	System configuration, performance specifications, functions, handling, wiring, and troubleshooting of CC-Link IE Controller Network
CC-Link IE Controller Network Interface Board User's Manual (For SW1DNC-MNETG-B) [SH(NA)-080691ENG]	System configuration, specification, functions, setting and procedure before operation, parameter setting, programming, and troubleshooting of the CC-Link IE Controller Network interface board

Terms

Unless otherwise specified, this manual uses the following terms.

Term	Description
Baton pass	A token to send data over a network
Buffer memory	Memory in a user application, where data (such as setting values and monitoring values) are stored
Control station	A station that controls a network. Only one station can be used in the network.
Cyclic transmission	A function by which data are periodically exchanged among stations on the same network using link devices (LB, LW, LX, and LY) <ul style="list-style-type: none">• LB and LW: Data of one station is sent to all stations. (1:N communications)• LX and LY: Data of one station is sent to another station. (1:1 communications)
Device	A device (X, Y, M, D, or others) in a programmable controller CPU, or memory in a host, where data communicated with the board are stored
Disconnection	A process of stopping data link if a data link error occurs
Group number	A number that is assigned to perform transient transmission. By specifying this number, data can be sent to the stations having the same number.
Host	A device where a PCI board or a PCI Express board is installed
Link device	A device (LB, LW, LX, or LY) in a module and a board on CC-Link IE Controller Network
Link scan time	Time required for all the stations on the network to transmit data. The link scan time depends on data volume and the number of transient transmission requests. Link scan is performed asynchronously with the sequence scan of the controller.
Link special register (SW)	Word data that indicates the operating status and data link status of a module and a board on CC-Link IE Controller Network
Link special relay (SB)	Bit data that indicates the operating status and data link status of a module and a board on CC-Link IE Controller Network
Loopback	A function that disconnects the station in which an error has occurred, and continues data link with the stations that are operating normally. Stations connected after the faulty station can also continue data link.
Normal station	A station that performs cyclic transmission according to the range assigned at the control station
Reserved station	A station reserved for future use. This station is not actually connected, but counted as a connected station.
Return	A process of restarting data link when a station recovers from an error
Transient transmission	A function of communication with another station, which is used when requested by a dedicated instruction or an engineering tool

Generic Terms and Abbreviations

Unless otherwise specified, this manual uses the following generic terms and abbreviations.

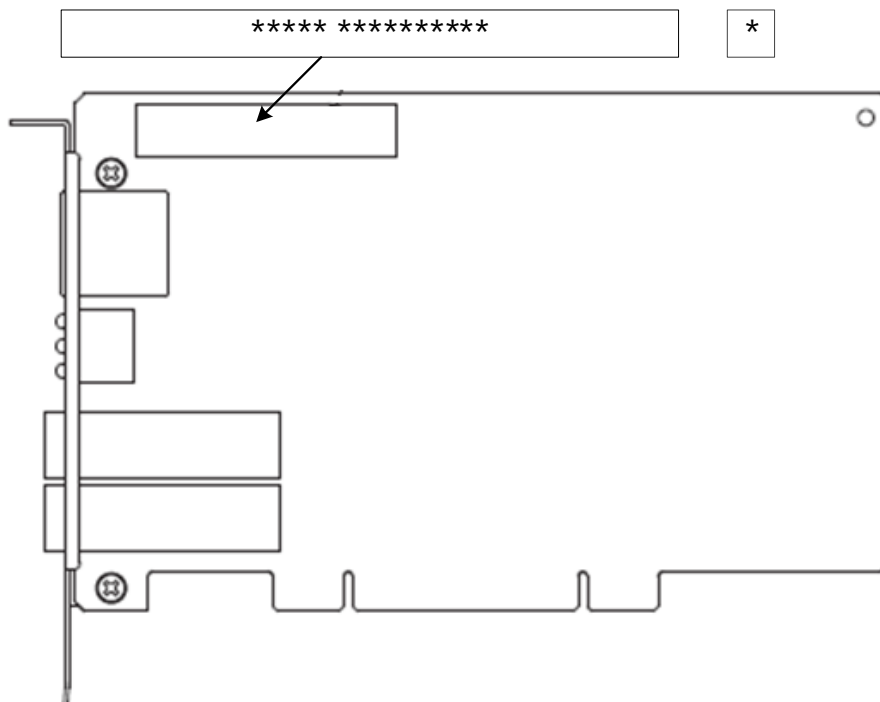
Generic term/abbreviation	Description
Board	A generic term for a PCI board and a PCI Express board
PCI Express board	An abbreviation for the Q81BD-J71GP21-SX CC-Link IE Controller Network interface board without external power supply function
PCI board	An abbreviation for the Q80BD-J71GP21-SX CC-Link IE Controller Network interface board without external power supply function
RAS	An abbreviation for Reliability, Availability, and Serviceability. This term refers to usability of automated equipment.

Usage Precautions

- (1) The sample code described in this manual is for the Q80BD-J71GP21-SX/Q81BD-J71GP21-SX CC-Link IE Controller Network interface boards developed by Mitsubishi Electric. The sample code indicates an example of use of the materials herein; its operation is not guaranteed by Mitsubishi Electric.
- (2) Before using the sample code, check the "END-USER SOFTWARE LICENSE AGREEMENT" (BCN-P5999-1690). The document can be viewed on the Mitsubishi Electric FA website.
- (3) The intellectual property rights of the information provided on the CD-ROM belong to Mitsubishi Electric. Reprinting the information without the consent of Mitsubishi Electric and reproduction of the information for any purpose other than the development of an OS-compatible driver is prohibited. Distribution of a product (object code or the like) after sample code compilation, however, is unrestricted.
- (4) To use the transient transmission function described in this manual, the CC-Link IE Controller Network interface board with a serial number (first five digits) of "10092" or later is required.

Checking the Serial Number

The serial number of the CC-Link IE Controller Network interface board can be checked on the board as shown below.



Address Notation

This manual uses byte addresses, unless otherwise specified.

Radix Notation

This manual uses the following radix notation, unless otherwise specified.

Radix	Description	Example
Binary	"b" is added at the end of the number to indicate bit.	0b
Decimal	Nothing is added at the end of the number.	0
Hexadecimal	"h" is added at the end of the number to indicate hexadecimal.	10BAh

(Note) LB/LW and SB/SW numbers are hexadecimal, but "h" is not added.

CC-Link Partner Association

(1) Specifications

The materials related to this manual include the specifications published by the CC-Link Partner Association below.
For CC-Link IE Controller Network details, download and refer to the following specifications from the CC-Link Partner Association website.

Document title	Document No.
CC-Link IE Controller Network Specification (Overview)	BAP-C2004-001(E)
CC-Link IE Controller Network Specification (Application layer service definition)	BAP-C2004-002(E)
CC-Link IE Controller Network Specification (Application layer protocol specification)	BAP-C2004-003(E)
CC-Link IE Controller Network Specification (Communication profile)	BAP-C2004-004(E)
CC-Link IE Controller Network Specification (Implementation rules)	BAP-C2004-005(E)
CC-Link IE Controller Network Specification (Device Profile)	BAP-C2004-006(E)

(2) Inquiries

To request materials published by the CC-Link Partner Association, please contact the following:

TEL: +81-52-919-1588

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Web: <http://www.cc-link.org/>

1 OVERVIEW

This manual describes how to develop an OS-compatible driver for the CC-Link IE Controller Network interface boards Q80BD-J71GP21-SX/Q81BD-J71GP21-SX manufactured by Mitsubishi Electric (hereinafter referred to as "board").

The manual includes the device information memory map of the board, driver processing procedure, and sample code specifications required for the driver development. Cyclic transmission and transient transmission can be performed by installing an OS-compatible driver together with the board to the host.

1.1 Included CD-ROM

This section describes the folder structure and files in the CD-ROM included with this manual.

(1) Folder structure in the CD-ROM

The following shows the folder structure in the CD-ROM.

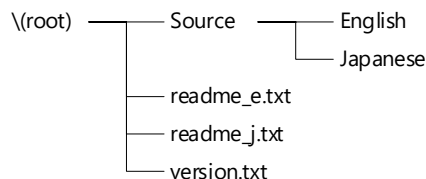


Figure 1.1-1 Folder Structure in the CD-ROM

(2) File overview in the CD-ROM

The following lists the files in the CD-ROM.

Table 1.1-1 Files in the CD-ROM

Folder	File	Description
Source	*1	Sample code (processing examples such as initial processing, parameter settings, cyclic transmission, and transient transmission) Format: C language source file, C language header file
-	readme_e.txt	Sample code modification procedure (overview) (English) Format: Text file
-	readme_j.txt	Sample code modification procedure (overview) (Japanese) Format: Text file
-	version.txt	Version information of the CD-ROM included with the manual Format: Text file

*1: For details on the file, refer to Section 6.1 "File List".

1.2 Sample Code

The CD-ROM included with the manual contains the sample code. The following are the precautions for the sample code. For details, refer to Chapter 6 "SAMPLE CODE".

- (1) Use the sample code as a reference to check the logic.
- (2) Add processing required for the target OS to use the sample code.
- (3) The sample code is created so that the host can operate as a control station or normal station.

2 FUNCTIONS

This chapter describes the functions of the board.

(1) Cyclic transmission functions

Function		Description
Communication using LB/LW		Allows each station to write data to its own send range of link devices (LB/LW) to send them to all other stations on the network.
	Send points extension (Extended mode)	Extends the maximum number of send points per station.
Communication using LX/LY		Exchanges data between the I/O master station that controls LX/LY and another station on a one-to-one (1:1) basis.
Assurance of cyclic data integrity		Assures the cyclic data in station-based units.
Cyclic transmission punctuality assurance	Cyclic transmission punctuality assurance	Keeps the link scan time constant by performing the specified number of transient transmissions at each station within one link scan.
	Constant link scan	Keeps the link scan time constant.
Reserved station specification		Reserves a station to be connected to the network in the future. (A reserved station is not actually connected, but included in the total number of stations.) A reserved station is not detected as a faulty station.

(2) Transient transmission functions

Function		Description
CC-Link compatible transient	Memory read	Reads data from the devices of the controller on another station.
	Memory write	Writes data to the devices of the controller on another station.
	Memory access information acquisition	Acquires device access information of the controller on another station.
	Remote RUN	Remotely runs the controller on another station.
	Remote STOP	Remotely stops the controller on another station.

(3) RAS functions

Function	Description
Control station switching	Continues data link by switching the control to a normal station (sub-control station) if the control station goes down.
Loopback	Continues data link among normally operating stations by disconnecting a station where a cable disconnection or an error has occurred from the network.
Automatic return	Automatically returns to the network and restarts data link after the station disconnected due to a data link error becomes normal.
Cable fault detection	Detects a communication error due to a cable fault.
Cable insertion error detection	Detects loopback or disconnection due to incorrect cable connection between OUT and IN.
Detection of duplicated control station or station No.	Detects loopback or disconnection due to duplication of control stations or station numbers.

3 HARDWARE INFORMATION OF THE BOARD

A developed driver enables the host to be operated as a control station or a normal station on CC-Link IE Controller Network by accessing board resources.

The board has three resources: PCI configuration area, 2-port memory area, and hardware control memory area.

The addresses of the 2-port memory area and hardware control memory area are set in the PCI configuration area.

The parameter data and cyclic data are sent and received in the 2-port memory area.

The firmware information of the board is set in the hardware control memory area.

The following figure shows the relationship between the driver and the board resources.

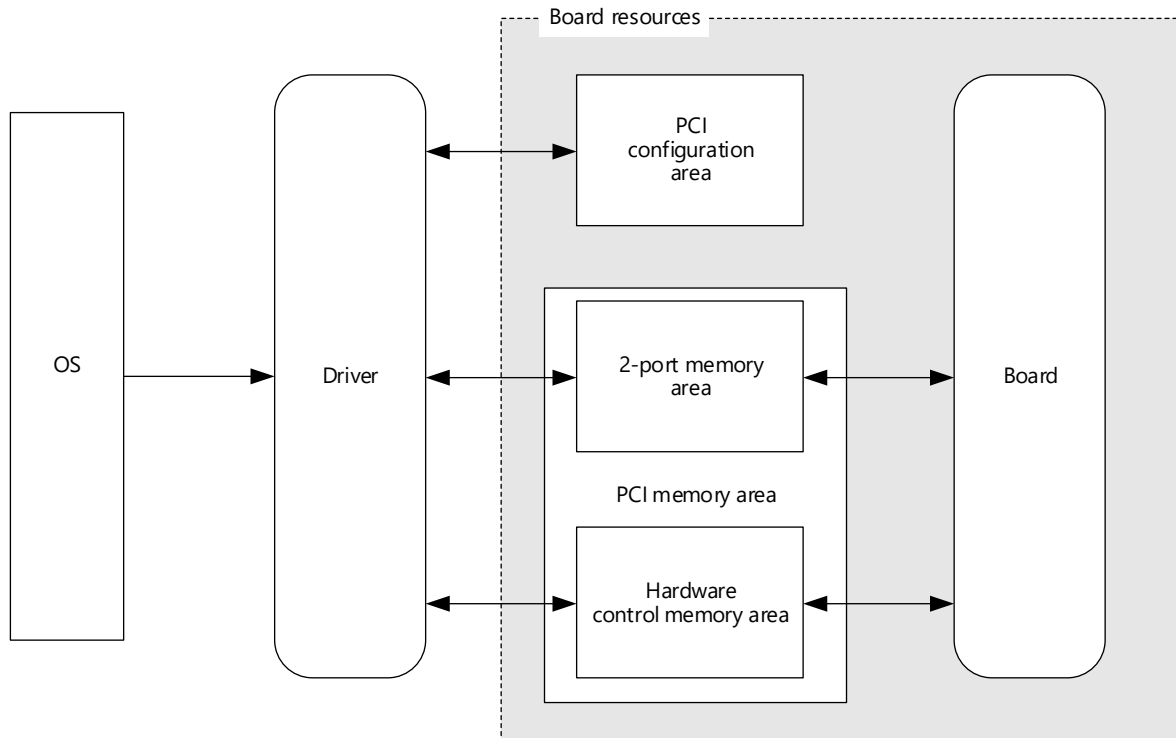


Figure 3-1 Relationship between Driver and Board Resources

3.1 PCI Configuration Area

The PCI configuration area stores information for the driver to identify the board and addresses to access the 2-port memory area and hardware control memory area.

3.1.1 Overview of the PCI configuration area

Information for the driver to identify the board, such as device IDs and vendor IDs, is stored in the PCI configuration area. After identifying the board, the driver accesses the board resources using the 2-port memory area base address and the hardware control memory area base address.

The following figure shows the image of the PCI configuration area.

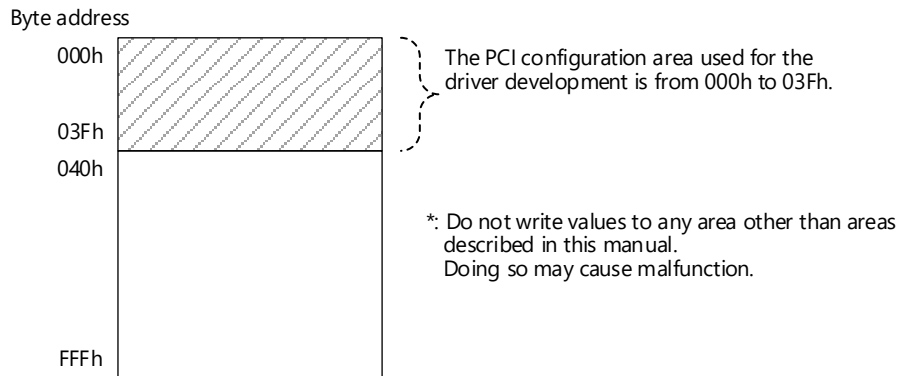


Figure 3.1.1-1 PCI Configuration Area

3.1.2 List of areas in the PCI configuration area

The following table lists the areas in the PCI configuration area used for the driver development. For details, refer to Section 3.1.3 "Details of areas in the PCI configuration area".

Table 3.1.2-1 List of Areas in the PCI Configuration Area

Byte address	b31	b16	b15	b0
000h to 003h	Device ID		Vendor ID	
004h to 013h	Use prohibited			
014h to 017h	2-port memory area base address register			
018h to 01Bh	Hardware control memory area base address register			
01Ch to 02Bh	Use prohibited			
02Ch to 02Fh	Subsystem ID		Subsystem vendor ID	
030h to 03Fh	Use prohibited			

3.1.3 Details of areas in the PCI configuration area

This section describes the details of the areas in the PCI configuration area.

Note

The following are the meanings of the symbols (R/W, R, W, -) in the "R/W" column of the tables in this section.

R/W	Values can be read and written.
R	Values can be read only. Written values are ignored.
W	Values can be written only. Read values will be undefined.
-	Use prohibited. Read values will be undefined. A value to be written must be "0".

(1) Vendor ID

Byte address	Bit	R/W	Description	Initial value
000h, 001h	15 to 0	R	ID code to identify the vendor of the board 10BAh: Mitsubishi Electric	10BAh

(2) Device ID

Byte address	Bit	R/W	Description	Initial value
002h, 003h	15 to 0	R	ID code to identify the board 061Fh: Q80BD-J71GP21-SX 0625h: Q81BD-J71GP21-SX	-

(3) 2-port memory base address register

Byte address	Bit	R/W	Description	Initial value
014h to 017h	31 to 23	R	Start address of the 2-port memory area	0 ^{*1}
	22 to 0	R	Fixed to 0	1FFh ^{*2} 0

*1: The initial value for the PCI board

*2: The initial value for the PCI Express board

(4) Hardware control memory base address register

Byte address	Bit	R/W	Description	Initial value
018h to 01Bh	31 to 11	R	Start address of the hardware control memory area	0 ^{*1}
	10 to 0	R	Fixed to 0	1FFFFFFh ^{*2} 0

*1: The initial value for the PCI board

*2: The initial value for the PCI Express board

(5) Subsystem vendor ID

Byte address	Bit	R/W	Description	Initial value
02Ch, 02Dh	15 to 0	R	ID code to identify the vendor of the subsystem 10BAh: Mitsubishi Electric	10BAh

*: The register for the PCI board. Do not use the register for the PCI Express board.

(6) Subsystem ID

Byte address	Bit	R/W	Description	Initial value
02Eh, 02Fh	15 to 0	R	ID code to identify the subsystem 0601h: Q80BD-J71GP21-SX	0601h

*: The register for the PCI board. Do not use the register for the PCI Express board.

3.2 2-Port Memory Area

The 2-port memory area consists of the board setting area 1, board setting area 2, system area, and user area.
The board setting area 1 is used for the hardware initial settings and the board setting area 2 is used for the board initial processing and a handshake.
The system area stores the board status information, start addresses of the link device (LB, LW, LX, and LY) information area and the parameter information area, host operation information, and interrupt factor information between the driver and the board.
The user area has the transient transmission processing area.

Note

When accessing the 2-port memory area, specify an even-numbered address and use word (16 bits) data or double word (32 bits) data.
Do not access the area by specifying an odd-numbered address and using byte (8 bits) data. Doing so causes an error.

3.2.1 Overview of the 2-port memory area

Information such as the model name information area start address, device information area start address, and parameter setting information area start address is stored in the system area.
The user area has the transient transmission processing area.

The following figure shows the image of the 2-port memory area.

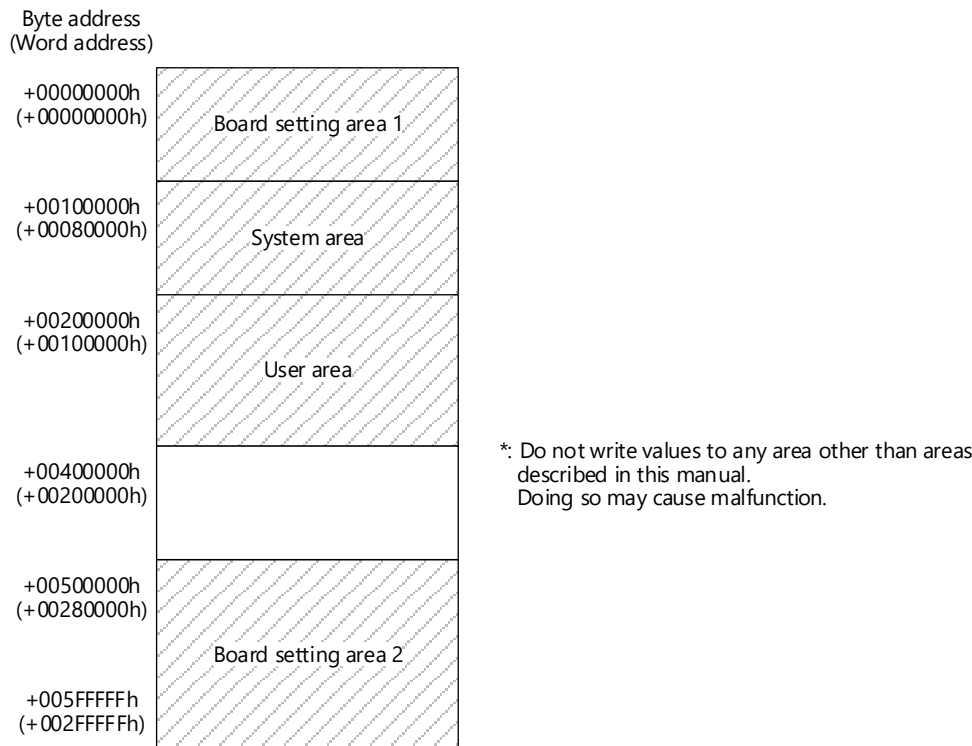


Figure 3.2.1-1 2-Port Memory Area

Point

- The 2-port memory area base address can be acquired from Section 3.1.3(3) 2-port memory base address register (byte address: 14h).
- The 2-port memory can be accessed after the 2-port memory area unlock processing described in Section 5.2.2 "Details of the firmware initial processing" has completed.

3.2.2 Lists of areas in the 2-port memory area

The following tables list the areas in the 2-port memory area used for the driver development.

Note

When accessing the 2-port memory area, specify an even-numbered address and use word (16 bits) data or double word (32 bits) data. Do not access the area by specifying an odd-numbered address and using byte (8 bits) data. Doing so causes an error.

(1) Board setting area 1

The following table lists the areas in the board setting area 1. For details, refer to the corresponding section.

Table 3.2.2-1 List of Areas in the Board Setting Area 1

Byte address	Word address	Item	Reference
00h, 01h	00h	Common information 0 (SPI/O0)	Section 3.2.3(1)
02h, 03h	01h	Common information 1 (SPI/O1)	Section 3.2.3(2)
04h, 05h	02h	Common information 2 (SPI/O2)	Section 3.2.3(3)
06h, 07h	03h	Common information 3 (SPI/O3)	Section 3.2.3(4)
08h, 09h	04h	Board → Driver interrupt area (SPI/O4)	Section 3.2.3(5)
0Ah, 0Bh	05h	Driver → Board interrupt area (SPI/O5)	Section 3.2.3(6)
0Ch to 0Fh	06h, 07h	Use prohibited	-
10h, 11h	08h	Group number and network number setting (SPI/O8)	Section 3.2.3(7)
12h, 13h	09h	Station number (SPI/O9)	Section 3.2.3(8)
14h, 15h	0Ah	Operation mode (SPI/OA)	Section 3.2.3(9)
16h, 17h	0Bh	Operation setting (SPI/OB)	Section 3.2.3(10)
18h to 1Fh	0Ch to 0Fh	Use prohibited	-

(2) Board setting area 2

The following table lists the areas in the board setting area 2. For details, refer to the corresponding section.

Table 3.2.2-2 List of Areas in the Board Setting Area 2

Byte address	Word address	Item	Reference
00h, 01h	00h	Initial processing complete flag	Section 3.2.4(1)
02h to 1Fh	01h to 0Fh	Use prohibited	-
20h, 21h	10h	Driver operation information	Section 3.2.4(2)
22h, 23h	11h	Error code	Section 3.2.4(3)

(3) System area

The following table lists the areas in the system area. For details, refer to the corresponding section.

Table 3.2.2-3 List of Areas in the System Area

Byte address	Word address	Item	Reference
00h to 17h	00h to 0Bh	Use prohibited	-
18h, 19h	0Ch	Model name information area start address ^{*1}	Section 3.2.5(1)
1Ah, 1Bh	0Dh	Device information area start address ^{*1}	Section 3.2.5(2)
1Ch, 1Dh	0Eh	Use prohibited	-
1Eh, 1Fh	0Fh	Latest error code ^{*2}	Section 4.1
20h, 21h	10h	Use prohibited	-
22h, 23h	11h	Parameter setting information area start address ^{*1}	Section 3.2.5(3)
24h to 2Dh	12h to 16h	Use prohibited	-
2Eh, 2Fh	17h	Station-based block data assurance information area start address ^{*1}	Section 3.2.5(4)
30h to 3Fh	18h to 1Fh	Use prohibited	-
40h, 41h	20h	Host operation information 1	Section 3.2.5(5)
42h to 45h	21h, 22h	Use prohibited	-
46h, 47h	23h	Host operation information 2	Section 3.2.5(6)
48h, 49h	24h	Host operation information 3	Section 3.2.5(7)
4Ah, 4Bh	25h	Host operation information 4	Section 3.2.5(8)
4Ch to 5Dh	26h to 2Eh	Use prohibited	-
5Eh, 5Fh	2Fh	Host operation information 5	Section 3.2.5(9)
60h, 61h	30h	Board → Driver interrupt request	Section 3.2.5(10)
62h to 7Fh	31h to 3Fh	Use prohibited	-
80h, 81h	40h	Driver → Board interrupt acceptance	Section 3.2.5(11)
82h to 9Fh	41h to 4Fh	Use prohibited	-
A0h, A1h	50h	Driver → Board interrupt request	Section 3.2.5(12)
A2h to BFh	51h to 5Fh	Use prohibited	-
C0h, C1h	60h	Board → Driver interrupt acceptance	Section 3.2.5(13)
C2h to DFh	61h to 6Fh	Use prohibited	-

*1: The start address of each information area is stored. Access each information area, referring to the start address read.

*2: The error code that corresponds to an error occurred in the board is stored.

(4) User area

The following table lists the areas in the user area. For details, refer to the corresponding section.

Table 3.2.2-4 List of Areas in the User Area

Byte address	Word address	Item	Reference
0000h to 5FFFh	0000h to 2FFFh	Use prohibited	-
6000h to 601Fh	3000h to 300Fh	Transient handshake area ^{*1}	Section 3.2.6(1)
6020h to 603Fh	3010h to 301Fh	Use prohibited	-
6040h to 803Fh	3020h to 401Fh	Transient data area ^{*1}	Section 3.2.6(2)
8040h to A03Fh	4020h to 501Fh	Use prohibited	-

*1: The transient handshake area and transient data area are collectively called as the transient transmission processing area.

3.2.3 Details of areas in the 2-port memory area (Board setting area 1)

Note

The following are the meanings of the symbols (R/W, R, W, -) in the "R/W" column of the tables in this section.

R/W	Values can be read and written.
R	Values can be read only. Written values are ignored.
W	Values can be written only. Read values will be undefined.
-	Use prohibited.
	Read values will be undefined. A value to be written must be "0".

(1) Common information 0 (SPI/O0)

Byte address	Word address	Bit	R/W	Description	Initial value
00h, 01h	00h	15	R	Board installation status information 0b: Not installed 1b: Installed	1b
		14	-	Use prohibited	-
		13	R	Board-side I/O information setting completion status 0b: Not completed 1b: Completed	0b
		12 to 0	-	Use prohibited	-

(2) Common information 1 (SPI/O1)

Byte address	Word address	Bit	R/W	Description	Initial value
02h, 03h	01h	15	W	Driver-side I/O information setting completion status 0b: Not completed 1b: Completed	0b
		14 to 9	-	Use prohibited	-
		8	W	Set this bit to "1b" (fixed value).	0b
		7 to 2	-	Use prohibited	-
		1	R/W	I/O HOLD specification 0b: CLEAR 1b: HOLD	0b
		0	-	Set this bit to "0b" (fixed value).	-

(3) Common information 2 (SPI/O2)

Byte address	Word address	Bit	R/W	Description	Initial value
04h, 05h	02h	15	R/W	Driver-side initial information setting completion status 0b: Not completed 1b: Completed	0b
		14 to 2	-	Use prohibited	-
		1	R	Board information READY completion status 0b: Not ready 1b: Ready	0b
		0	R	Board-side initial information setting completion status 0b: Not completed 1b: Completed	0b

(4) Common information 3 (SPI/O3)

Byte address	Word address	Bit	R/W	Description	Initial value
06h, 07h	03h	15 to 4	-	Use prohibited	-
		3 to 0	R/W	Set these bits to "Fh" (fixed value).	0000b

(5) Board → Driver interrupt area (SPI/O4)

Byte address	Word address	Bit	R/W	Description	Initial value
08h, 09h	04h	15 to 4	-	Use prohibited	-
		3	R	Board → Driver interrupt factor 2 ^{*1} 0b: No factor 1b: Factor exists	0b
			W	Board → Driver interrupt factor 2 reset 0b: No processing 1b: Interrupt factor reset	-
		2	R	Board → Driver interrupt factor 1 ^{*1} 0b: No factor 1b: Factor exists	0b
			W	Board → Driver interrupt factor 1 reset 0b: No processing 1b: Interrupt factor reset	-
		1	W	Board → Driver interrupt unmask bit ^{*2, *3} 0b: No processing 1b: Interrupt unmasked	-
		0	W	Board → Driver interrupt mask bit ^{*2, *3} 0b: No processing 1b: Interrupt masked	-

*1: An interrupt factor can be read when the interrupt is masked.

*2: After reset, the interrupts are masked.

*3: When the interrupts are masked and unmasked at the same time, they are masked.

(6) Driver → Board interrupt area (SPI/O5)

Byte address	Word address	Bit	R/W	Description	Initial value
0Ah, 0Bh	05h	15 to 3	-	Use prohibited	-
		2	R	Driver → Board interrupt factor 1 0b: No factor 1b: Factor exists	0b
			W	Driver → Board interrupt factor 1 0b: No processing 1b: Interrupt factor set	-
		1, 0	-	Use prohibited	-

(7) Group number and network number setting (SPI/O8)

Byte address	Word address	Bit	R/W	Description	Initial value
10h, 11h	08h	15 to 8	R/W	Group number 0: No group specified 1 to 32	-
		7 to 0	R/W	Network number 1 to 239	-

(8) Station number (SPI/O9)

Byte address	Word address	Bit	R/W	Description	Initial value
12h, 13h	09h	15 to 8	R/W	Set these bits to "00h" (fixed value).	-
		7 to 0	R/W	Station number: 1 to 120	-

(9) Operation mode (SPI/OA)

Byte address	Word address	Bit	R/W	Description	Initial value
14h, 15h	0Ah	15 to 0	R/W	Mode 0: Online 2: Offline 5: Station-to-station test* ¹ 6: Circuit test* ¹ 7: Self-loopback test* ¹ 9: Hardware test* ¹	-

*1: For details, refer to the CC-Link IE Controller Network Reference Manual.

For test results, refer to Appendix 1 "Link Special Relay (SB)" and Appendix 2 "Link Special Register (SW)".

(10) Operation setting (SPI/OB)

Byte address	Word address	Bit	R/W	Description	Initial value
16h, 17h	0Bh	15 to 7	R/W	Set these bits to "0" (fixed value).	-
		6	R/W	0b: When the CC-Link IE Controller Network extended mode is not used 1b: When the CC-Link IE Controller Network extended mode is used	-
		5 to 3	R/W	Set these bits to "000b" (fixed value).	-
		2	R/W	0b: Normal station, 1b: Control station	-
		1	R/W	Set this bit to "0b" (fixed value).	-
		0	R/W	Set this bit to "1b" (fixed value).	-

3.2.4 Details of areas in the 2-port memory area (Board setting area 2)

Note

The following are the meanings of the symbols (R/W, R, W, -) in the "R/W" column of the tables in this section.

R/W	Values can be read and written.
R	Values can be read only. Written values are ignored.
W	Values can be written only. Read values will be undefined.
-	Use prohibited. Read values will be undefined. A value to be written must be "0".

(1) Initial processing complete flag

Byte address	Word address	Bit	R/W	Description	Initial value
00h, 01h	00h	15 to 1	-	Use prohibited	-
		0	R/W	0b: Initial processing not completed 1b: Initial processing completed	0b

(2) Driver operation information

Byte address	Word address	Bit	R/W	Description	Initial value
20h, 21h	10h	15 to 10	-	Use prohibited	-
		9, 8	W	Set these bits to "0" (fixed value).	-
		7	W	I/O reset command 0b: Reset released 1b: Reset command issued	-
		6	W	Reset command 0b: Reset released 1b: Reset command issued	-
		5 to 0	R/W	Driver operation information 000000b: Initial state 000001b: Stopped normally 000010b: Stopped due to a moderate error or a major error 000100b: Running 001111b: Driver initial processing	000000b

(3) Error code

Byte address	Word address	Bit	R/W	Description	Initial value
22h, 23h	11h	15 to 0	R/W	Error code defined by the vendor	0000h

3.2.5 Details of areas in the 2-port memory area (System area)

Note

The following are the meanings of the symbols (R/W, R, W, -) in the "R/W" column of the tables in this section.

R/W	Values can be read and written.
R	Values can be read only. Written values are ignored.
W	Values can be written only. Read values will be undefined.
-	Use prohibited. Read values will be undefined. A value to be written must be "0".

(1) Model name information area

Access this area, referring to the address stored in 0Ch (Model name information area start address). (Refer to Section 3.2.2(3) System area.)

0Ch	Model name information area start address
-----	---

Byte offset address	Word offset address	R/W	Item	Reference	Initial value
+00h to +09h	+00h to +04h	-	Use prohibited	-	-
+0Ah to +1Bh	+05h to +0Dh	R	Model name string	Q80BD-J71GP21-SX*1	-

*1: When the PCI Express board is used, the same string, "Q80BD-J71GP21-SX", is stored.

(2) Device information area

Access this area, referring to the address stored in 0Dh (Device information area start address). (Refer to Section 3.2.2(3) System area.)

0Dh Device information area start address

Byte offset address	Word offset address	R/W	Item	Description	Initial value
+00h to +03h	+00h, +01h	-	Use prohibited	-	-
+04h to +07h	+02h, +03h	R	SB area address (driver write area)	Word offset for the SB area	-
+08h to +0Bh	+04h, +05h	R	SB area size (driver write area)	Number of words in the SB area	-
+0Ch to +0Fh	+06h, +07h	R	SB area address (driver read area)	Word offset for the SB area	-
+10h to +13h	+08h, +09h	R	SB area size (driver read area)	Number of words in the SB area	-
+14h to +17h	+0Ah, +0Bh	R	SW area address (driver write area)	Word offset for the SW area	-
+18h to +1Bh	+0Ch, +0Dh	R	SW area size (driver write area)	Number of words in the SW area	-
+1Ch to +1Fh	+0Eh, +0Fh	R	SW area address (driver read area)	Word offset for the SW area	-
+20h to +23h	+10h, +11h	R	SW area size (driver read area)	Number of words in the SW area	-
+24h to +27h	+12h, +13h	R	LX area address	Word offset for the LX area	-
+28h to +2Bh	+14h, +15h	R	LX area size	Number of words in the LX area	-
+2Ch to +2Fh	+16h, +17h	R	LY area address	Word offset for the LY area	-
+30h to +33h	+18h, +19h	R	LY area size	Number of words in the LY area	-
+34h to +37h	+1Ah, +1Bh	R	LB area address	Word offset for the LB area	-
+38h to +3Bh	+1Ch, +1Dh	R	LB area size	Number of words in the LB area	-
+3Ch to +3Fh	+1Eh, +1Fh	R	LW area address	Word offset for the LW area	-
+40h to +43h	+20h, +21h	R	LW area size	Number of words in the LW area	-
+44h, +45h	+22h	-	Use prohibited	-	-

(3) Parameter setting information area

Access this area, referring to the address stored in 11h (Parameter setting information area start address). (Refer to Section 3.2.2(3) System area.)

11h	Parameter setting information area start address
-----	--

Byte offset address	Word offset address	R/W	Item	Description
+00h to +0Fh	+00h to +07h	-	Use prohibited	-
+10h, +11h	+08h	R	Parameter information area address ^{*1}	The parameter information area address is stored (in units of words).
+12h, +13h	+09h	R	Parameter information area size	The parameter information area size is stored (in units of words).
+14h, +15h	+0Ah	R	System parameter information area address	The system parameter information area address is stored (in units of words).
+16h, +17h	+0Bh	R	System parameter information area size	The system parameter information area size is stored (in units of words).
+18h to +1Bh	+0Ch, +0Dh	-	Use prohibited	-
+1Ch, +1Dh	+0Eh	R/W	Common parameter sequence (PRSQ)	The sequence number that indicates the common parameter setting status is stored.
+1Eh, +1Fh	+0Fh	-	Use prohibited	-
+20h, +21h	+10h	R/W	Parameter block sequence (BKSQ)	The sequence number that indicates the parameter block transfer status is stored.
+22h, +23h	+11h	R/W	Total number of parameters to be transferred	The total number of parameters to be transferred is stored.
+24h, +25h	+12h	R/W	Transfer number	The parameter number that is being transferred is stored.
+26h, +27h	+13h	R/W	Transfer size	The size of parameter to be transferred is stored (in units of words).
+28h, +29h	+14h	R/W	Specific parameter sequence (SPSQ)	The sequence number that indicates the specific parameter setting status is stored.
+2Ah to +4Fh	+15h to +27h	-	Use prohibited	-
(System parameter information area)				
++00h	++00h	-	Use prohibited	-
++02h	++01h	R	Refresh table ^{*2}	The refresh table is stored.

*1: For how to use the parameter information area, refer to Section 5.3.2(1) Common parameters and Section 5.3.2(2) Specific parameters.

*2: For how to use the refresh table, refer to Section 5.3.2(3) Refresh table.

(4) Station-based data assurance information area

Access this area, referring to the address stored in 17h (Station-based data assurance information area start address). (Refer to Section 3.2.2(3) System area.)

17h Station-based data assurance information area start address

Byte offset address	Word offset address	R/W	Item	Description	Initial value
+00h, +01h	+00h	R	Area size	The firmware sets the total area size starting from "Station-based block data assurance detail setting" to "Station-based data assurance flag for receive data (station No.120)" (in units of words).	007Dh
+02h, +03h	+01h	R	Station-based block data assurance detail setting	The firmware enables or disables the station-based block data assurance function. 0000h: Function disabled 0001h: Function enabled	0001h
+04h, +05h	+02h	R	Number of areas of send data assured per station	The firmware sets the number of areas of send data assured per station.	0002h
+06h, +07h	+03h	R	Number of areas of receive data assured per station	The firmware sets the number of areas of receive data assured per station.	0078h (120)
+08h, +09h	+04h	R/W	Station-based data assurance flag for send data (own station)	0000h: Initial state 0001h: Send data exists 0002h: Send data being read	0000h
+0Ah, +0Bh	+05h	-	Use prohibited	-	0000h
+(12+0)h	+(06+0)h	R/W	Station-based data assurance flag for receive data (station No.1)	0000h: Initial state 0001h: Receive data exists 0002h: Receive data being read	0000h
...	...	-	-	-	-
+(12+2m)h	+(06+m)h	R/W	Station-based data assurance flag for receive data (station No.120)	0000h: Initial state 0001h: Receive data exists 0002h: Receive data being read	0000h

m = Station number - 1

(5) Host operation information 1

Byte address	Word address	Bit	R/W	Description	Initial value
40h, 41h	20h	15 to 0	R/W	Set these bits to "2D39h" (fixed value) during initial processing.	0000h

(6) Host operation information 2

Byte address	Word address	Bit	R/W	Description	Initial value
46h, 47h	23h	15 to 0	R/W	Set these bits to "0001h" (fixed value) during initial processing.	0000h

(7) Host operation information 3

Byte address	Word address	Bit	R/W	Description	Initial value
48h, 49h	24h	15 to 0	R/W	Set these bits to "2030h" (fixed value) during initial processing.	0000h

(8) Host operation information 4

Byte address	Word address	Bit	R/W	Description	Initial value
4Ah, 4Bh	25h	15 to 0	R/W	Set these bits to "0D08h" (fixed value) during initial processing.	0000h

(9) Host operation information 5

Byte address	Word address	Bit	R/W	Description	Initial value
5Eh, 5Fh	2Fh	15 to 0	R/W	Set these bits to "0000h" (fixed value) during initial processing.	0000h

(10) Board → Driver interrupt request

Byte address	Word address	Bit	R/W	Description	Initial value
60h, 61h	30h	15	R	Board interrupt request flag for parameter setting*1	0b
		14 to 0	-	Use prohibited	-

*1: For how to use the flag, refer to Section 5.1.3 "Handshake".

(11) Driver → Board interrupt acceptance

Byte address	Word address	Bit	R/W	Description	Initial value
80h, 81h	40h	15	R/W	Board interrupt acceptance flag for parameter setting*1	0b
		14 to 0	-	Use prohibited	-

*1: For how to use the flag, refer to Section 5.1.3 "Handshake".

(12) Driver → Board interrupt request

Byte address	Word address	Bit	R/W	Description	Initial value
A0h, A1h	50h	15	R/W	Driver interrupt request flag for parameter setting*1	0b
		14 to 0	-	Use prohibited	-

*1: For how to use the flag, refer to Section 5.1.3 "Handshake".

(13) Board → Driver interrupt acceptance

Byte address	Word address	Bit	R/W	Description	Initial value
C0h, C1h	60h	15	R	Driver interrupt acceptance flag for parameter setting*1	0b
		14 to 0	-	Use prohibited	-

*1: For how to use the flag, refer to Section 5.1.3 "Handshake".

3.2.6 Details of areas in the 2-port memory area (User area)

Note

The following are the meanings of the symbols (R/W, R, W, -) in the "R/W" column of the tables in this section.

R/W	Values can be read and written.
R	Values can be read only. Written values are ignored.
W	Values can be written only. Read values will be undefined.
-	Use prohibited. Read values will be undefined. A value to be written must be "0".

(1) Transient handshake area

For transient transmission, a handshake between the driver and the board is performed in this area to send and receive data. For details, refer to Section 5.6.1 "Overview of the transient transmission processing".

Table 3.2.6-1 Handshake Area

Byte address	Word address	R/W	Description			Initial value
6000h, 6001h	3000h	R/W	Transient area 1	Transient data send	Send signal	0000h
6002h, 6003h	3001h	R			Error code	
6004h, 6005h	3002h	R/W		Transient data receive	Receive signal	
6006h, 6007h	3003h	R		Reserved	Fixed to 0	
6008h, 6009h	3004h	R/W	Transient area 2	Transient data send	Send signal	
600Ah, 600Bh	3005h	R			Error code	
600Ch, 600Dh	3006h	R/W		Transient data receive	Receive signal	
600Eh, 600Fh	3007h	R		Reserved	Fixed to 0	
6010h, 6011h	3008h	R/W	Transient area 3	Transient data send	Send signal	
6012h, 6013h	3009h	R			Error code	
6014h, 6015h	300Ah	R/W		Transient data receive	Receive signal	
6016h, 6017h	300Bh	R		Reserved	Fixed to 0	
6018h, 6019h	300Ch	R/W	Transient area 4	Transient data send	Send signal	
601Ah, 601Bh	300Dh	R			Error code	
601Ch, 601Dh	300Eh	R/W		Transient data receive	Receive signal	
601Eh, 601Fh	300Fh	R/W		Reserved	Fixed to 0	

(2) Transient data area

For transient transmission, the request send data and response receive data are stored in this area.

For details, refer to Section 5.6.1 "Overview of the transient transmission processing".

Table 3.2.6-2 Transient Data Area

Byte address	Word address	R/W	Description			Initial value
6040h to 643Fh	3020h to 321Fh	R/W	Transient data area	Transient data area 1	Send area 1	0000h
6440h to 683Fh	3220h to 341Fh	R			Receive area 1	
6840h to 6C3Fh	3420h to 361Fh	R/W		Transient data area 2	Send area 2	
6C40h to 703Fh	3620h to 381Fh	R			Receive area 2	
7040h to 743Fh	3820h to 3A1Fh	R/W		Transient data area 3	Send area 3	
7440h to 783Fh	3A20h to 3C1Fh	R			Receive area 3	
7840h to 7C3Fh	3C20h to 3E1Fh	R/W		Transient data area 4	Send area 4	
7C40h to 803Fh	3E20h to 401Fh	R			Receive area 4	

3.3 Hardware Control Memory Area

3.3.1 Overview of the hardware control memory area

The following figure shows the image of the hardware control memory area.

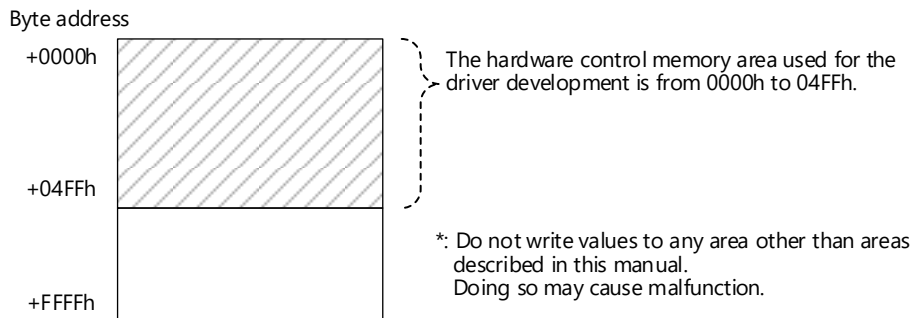


Figure 3.3.1-1 Hardware Control Memory Area

Point

The hardware control memory area base address can be acquired from Section 3.1.3(4) Hardware control memory base address register (byte address: 18h).

3.3.2 List of areas in the hardware control memory area

The following table lists the areas in the hardware control memory area used for the driver development. For details, refer to Section 3.3.3 "Details of areas in the hardware control memory area".

Table 3.3.2-1 List of Areas in the Hardware Control Memory Area

Byte address	Word address	Register name* ¹	R/W	Description	Reference
0000h to 0003h	0000h, 0001h	RSINSTL	R/W	Set this register to "0000h" (fixed value).	-
0004h to 0007h	0002h, 0003h	RSRSTOH	R/W	Internal bus system target reset signal output	Section 3.3.3(1)
000Ch to 000Fh	0006h, 0007h	RSIOROH	R/W	Internal bus system I/O reset signal output	Section 3.3.3(2)
0010h to 0013h	0008h, 0009h	RSRSTLTOH	R/W	Internal bus system target reset trigger signal output	Section 3.3.3(3)
0018h to 001Bh	000Ch, 000Dh	RSITMSK	R/W	Set this register to "0000h" (fixed value).	-
0028h to 002Bh	0014h, 0015h	RSYACCYCL	R/W	Set this register to "0005h" (fixed value).	-
002Ch to 002Fh	0016h, 0017h	RXYACCYCL	R/W	Set this register to "0005h" (fixed value).	-
0030h to 0033h	0018h, 0019h	RGLACCYCL	R/W	Set this register to "0005h" (fixed value).	-
0034h to 0037h	001Ah, 001Bh	RSFRAMHGH	R/W	Set this register to "0004h" (fixed value).	-
0038h to 003Bh	001Ch, 001Dh	RQWTRG	R/W	Set this register to "000Fh" (fixed value).	-
0400h to 0403h	0200h, 0201h	QBTLEDST	R	Internal bus target LED status register	Section 3.3.3(4)
040Ch to 040Fh	0206h, 0207h	RBDNO	R/W	LED control register	Section 3.3.3(5)
0434h to 0437h	021Ah, 021Bh	BDSTRST	W	Board status reset register	Section 3.3.3(6)
0438h to 043Bh	021Ch, 021Dh	RBDIT	R	Board status interrupt factor register	Section 3.3.3(7)
043Ch to 043Fh	021Eh, 021Fh	RBDITMSK	R/W	Board status interrupt mask register	Section 3.3.3(8)
0440h to 0443h	0220h, 0221h	BDITRST	W	Board status interrupt reset register	Section 3.3.3(9)
0448h to 044Bh	0224h, 0225h	RITMSK	R/W	Interrupt factor batch mask register	Section 3.3.3(10)
0450h to 0453h	0228h, 0229h	RWDT	R/W	Alive check setting register	Section 3.3.3(11)
0454h to 0457h	022Ah, 022Bh	RWDTLC	W	Alive check setting register lock register	Section 3.3.3(12)
0458h to 045Bh	022Ch, 022Dh	WDTRST	R	Interval timer reset register	Section 3.3.3(13)
045Ch to 045Fh	022Eh, 022Fh	RWDTRSTLC	W	Interval timer reset register lock register	Section 3.3.3(14)
0480h to 0483h	0240h, 0241h	DMA1PADL	R/W	Host-side DMA start address (lower 32 bits)* ²	Section 3.3.3(15)
0484h to 0487h	0242h, 0243h	DMA1PADU	R/W	Host-side DMA start address (upper 32 bits)* ²	Section 3.3.3(16)
0488h to 048Bh	0244h, 0245h	DMA1GAD	R/W	Board-side DMA start address* ²	Section 3.3.3(17)
048Ch to 048Fh	0246h, 0247h	DMA1DRNU	R/W	DMA transfer direction / Number of DMA transfer data sets* ²	Section 3.3.3(18)
0490h to 0493h	0248h, 0249h	DMA1CTRL	W	DMA transfer control* ²	Section 3.3.3(19)
0494h to 0497h	024Ah, 024Bh	DMA1ST	R	DMA transfer status* ²	Section 3.3.3(20)
0498h to 049Bh	024Ch, 024Dh	DMA1ERDN	R	Remaining data length at DMA transfer error occurrence* ²	Section 3.3.3(21)
04C0h to 04C3h	0260h, 0261h	FLOCK_CLR	W	2-port memory area unlock register* ²	Section 3.3.3(22)
04C4h to 04C7h	0262h, 0263h	FLOCK_STA	R	2-port memory area lock status register* ²	Section 3.3.3(23)

*1: The register names are used in Section 5.2.2 "Details of the firmware initial processing" and sample code.

*2: The registers for the PCI Express board. Do not use the registers for the PCI board.

3.3.3 Details of areas in the hardware control memory area

Note

The following are the meanings of the symbols (R/W, R, W, -) in the "R/W" column of the tables in this section.

R/W	Values can be read and written.
R	Values can be read only. Written values are ignored.
W	Values can be written only. Read values will be undefined.
-	Use prohibited. Read values will be undefined. A value to be written must be "0".

(1) Internal bus system target reset signal output

The internal bus system target reset signal output value is set.

Byte address	Word address	Bit	R/W	Description	Initial value
0004h to 0007h	0002h, 0003h	31 to 1	-	Use prohibited	-
		0	R/W	Internal bus system target reset signal 0b: Reset released 1b: Reset	1b

(2) Internal bus system I/O reset signal output

The internal bus system I/O reset signal output value is set.

Byte address	Word address	Bit	R/W	Description	Initial value
000Ch to 000Fh	0006h, 0007h	31 to 1	-	Use prohibited	-
		0	R/W	Internal bus system I/O reset signal 0b: Reset released 1b: Reset	0b

(3) Internal bus system target reset trigger signal output

The internal bus system target reset trigger signal output value is set.

Byte address	Word address	Bit	R/W	Description	Initial value
0010h to 0013h	0008h, 0009h	31 to 1	-	Use prohibited	-
		0	R/W	Internal bus system target reset trigger signal 0b: Trigger off 1b: Trigger on	0b

(4) Internal bus target LED status register

The LED status of the board is stored.

Byte address	Word address	Bit	R/W	Description	Initial value
0400h to 0403h	0200h, 0201h	31 to 8	-	Use prohibited	-
		7	R	L.ERR. LED status 0b: Off 1b: On	0b
		6	R	RD LED status 0b: Off 1b: On	0b
		5	R	D.LINK LED status 0b: Off 1b: On	0b
		4	R	PRM LED status 0b: Off 1b: On	0b
		3	R	ERR. LED status 0b: Off (normal frame received) 1b: On (receive data error, alive check error, clock loss)	0b
		2	R	SD LED status 0b: Off 1b: On	0b
		1	R	MODE LED status 0b: Off 1b: On	0b
		0	R	RUN LED status 0b: Off 1b: On	0b

*: The driver can always read the LED output status of the board even in the error mode status.

All the LEDs of the board turn off when the internal bus reset (system reset, board reset) occurs.

(5) LED control register

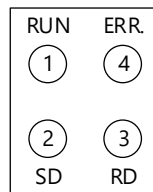
The LED control right can be switched.

Byte address	Word address	Bit	R/W	Description	Initial value
040Ch to 040Fh	0206h, 0207h	31 to 16	-	Use prohibited	-
		15	R/W	LED control right* ¹ 0b: Board (firmware) 1b: Driver	0b
		14 to 4	-	Use prohibited	-
		3	R/W	LED signal 4) control* ² 0b: Off 1b: On	0b
		2	R/W	LED signal 3) control* ² 0b: Off 1b: On	0b
		1	R/W	LED signal 2) control* ² 0b: Off 1b: On	0b
		0	R/W	LED signal 1) control* ² 0b: Off 1b: On	0b

*1: When b15 is off (0b), the board (firmware) has the LED control right. The RUN LED, ERR. LED, SD LED, and RD LED turn on/off depending on the board operating status. For details, refer to the CC-Link IE Controller Network Interface Board User's Manual.

*2: When b15 is on (1b), the driver has the LED control right. The driver can control (turn on/off) LED signals 1) to 4) with b3 to b0. These bits can be used for specific applications such as identifying board numbers and debugging the program by controlling the LEDs freely.

(The following figure shows the positions of the LEDs controlled by LED signals 1) to 4).)



LED signals and LED positions

(6) Board status reset register

The board status is reset.

Byte address	Word address	Bit	R/W	Description	Initial value
0434h to 0437h	021Ah, 021Bh	31 to 7	-	Use prohibited	-
		6	W	Reserved area. Set this bit to the following in accordance with the board type. PCI board: "1b" (fixed value) PCI Express board: "0b" (fixed value)	-
		5, 4	-	Use prohibited	-
		3	W	Alive check error reset 0b: No processing 1b: Reset	-
		2	W	Reserved area. Set this bit to "1b" (fixed value).	-
		1, 0	-	Use prohibited	-

(7) Board status interrupt factor register

Whether a factor exists or not is set for each board status interrupt.

Byte address	Word address	Bit	R/W	Description	Initial value
0438h to 043Bh	021Ch, 021Dh	31 to 11	-	Use prohibited	-
		10	R	DMA transfer completion interrupt* ¹ 0b: No factor 1b: Factor exists	0b
		9	-	Use prohibited	-
		8	R	DMA transfer error interrupt* ^{1, *2} 0b: No factor 1b: Factor exists	0b
		7	R	Host-side PCI Express bus correctable error interrupt* ¹ 0b: No factor 1b: Factor exists	0b
		6	-	Use prohibited	-
		5	R	Host-side PCI data parity error interrupt 0b: No factor 1b: Factor exists	0b
				Host-side PCI Express fatal error interrupt 0b: No factor 1b: Factor exists	
		4	-	Use prohibited	-
		3	R	Alive check error interrupt 0b: No factor 1b: Factor exists	0b
		2, 1	-	Use prohibited	-
		0	R	Clock stop error interrupt 0b: No factor 1b: Factor exists	0b

*1: The bits for the PCI Express board. Do not use the bits for the PCI board.

*2: For the error cause, refer to Section 3.3.3(20) DMA transfer status.

(8) Board status interrupt mask register

The mask status of each board status interrupt is set.

Byte address	Word address	Bit	R/W	Description	Initial value
043Ch to 043Fh	021Eh, 021Fh	31 to 15	-	Use prohibited	-
		14 to 11	R/W	Reserved area. Set these bits to the following in accordance with the board type. PCI board: "0000b" (fixed value) PCI Express board: "1101b" (fixed value)	-
					1111b ^{*1}
		10	R/W	DMA transfer completion interrupt mask ^{*2} 0b: Unmasked 1b: Masked	-
					1b ^{*1}
		9	R/W	Reserved area. Set this bit to the following in accordance with the board type. PCI board: "0b" (fixed value) PCI Express board: "1b" (fixed value)	-
					1b ^{*1}
		8	R/W	DMA transfer error interrupt mask ^{*2} 0b: Unmasked 1b: Masked	-
					1b ^{*1}
		7	R/W	Host-side PCI Express bus correctable error interrupt mask 0b: Unmasked 1b: Masked	1b ^{*1}
		6	R/W	Reserved area. Set this bit to "1b" (fixed value).	1b
		5	R/W	Host-side PCI data parity error interrupt mask 0b: Unmasked 1b: Masked	1b
				Host-side PCI Express fatal error interrupt mask 0b: Unmasked 1b: Masked	
		4	R/W	Reserved area. Set this bit to "1b" (fixed value).	1b
		3	R/W	Alive check error interrupt mask 0b: Unmasked 1b: Masked	1b
		2	R/W	Reserved area. Set this bit to "1b" (fixed value).	1b
		1	R/W	Reserved area. Set this bit to "1b" (fixed value).	1b
		0	R/W	Clock stop error interrupt mask 0b: Unmasked 1b: Masked	1b

*1: The initial values for the PCI Express board

*2: The bits for the PCI Express board. Do not use the bits for the PCI board.

(9) Board status interrupt reset register

The status of each board status interrupt is reset.

Byte address	Word address	Bit	R/W	Description	Initial value
0440h to 0443h	0220h, 0221h	31 to 15	-	Use prohibited	-
		14 to 11	W	Reserved area. Set these bits to the following in accordance with the board type. PCI board: "0000b" (fixed value) PCI Express board: "1111b" (fixed value)	-
		10	W	DMA transfer completion interrupt reset* ¹ 0b: No processing 1b: Interrupt reset	-
		9	W	Reserved area. Set this bit to the following in accordance with the board type. PCI board: "0b" (fixed value) PCI Express board: "1b" (fixed value)	-
		8	W	DMA transfer error interrupt reset* ¹ 0b: No processing 1b: Interrupt reset	-
		7	W	Host-side PCI Express bus correctable error interrupt reset* ¹ 0b: No processing 1b: Interrupt reset	-
		6	W	Reserved area. Set this bit to "1b" (fixed value).	-
		5	W	Host-side PCI data parity error interrupt reset 0b: No processing 1b: Interrupt reset	-
				Host-side PCI Express fatal error interrupt reset 0b: No processing 1b: Interrupt reset	
		4	W	Reserved area. Set this bit to "1b" (fixed value).	-
		3	W	Alive check function interrupt reset 0b: No processing 1b: Interrupt reset	-
		2	W	Reserved area. Set this bit to "1b" (fixed value).	-
		1	W	Reserved area. Set this bit to "1b" (fixed value).	-
		0	W	Clock stop error interrupt reset 0b: No processing 1b: Interrupt reset	-

*1: The bits for the PCI Express board. Do not use the bits for the PCI board.
(For the PCI board, set "0b" (fixed value).)

(10) Interrupt factor batch mask register

Whether to mask all the interrupt factors to the driver at once or not is set.

Byte address	Word address	Bit	R/W	Description	Initial value
0448h to 044Bh	0224h, 0225h	31 to 1	-	Use prohibited	-
		0	R/W	Interrupt factor batch mask 0b: Unmasked 1b: Masked	0b

(11) Alive check setting register

The interval timer and execution status of the alive check function is set.

Byte address	Word address	Bit	R/W	Description	Initial value
0450h to 0453h	0228h, 0229h	31 to 16	-	Use prohibited	-
		15	R/W	Alive check function execution status 0b: Not executed 1b: Executed	0b
		14 to 0	R/W	Alive check interval timer setting Set the value in binary (0001h to 7FFFh). Interval timer = 10 ms × (Setting value)	0000h

Point

- (1) This register is locked by Alive check setting register lock register (byte address: 0454h). While the register is locked, the written values are ignored.
- (2) Do not set b15 and b14 to b0 at the same time. Set b14 to b0 first, and then set b15.
- (3) Set b14 to b0 to a value other than "0". When the alive check function is executed with "0" being set, an error occurs immediately.
- (4) Do not change the setting value while the alive check function is being executed. Change the setting value while the alive check function is not executed.

(12) Alive check setting register lock register

The lock/unlock status of the alive check function is set.

Byte address	Word address	Bit	R/W	Description	Initial value
0454h to 0457h	022Ah, 022Bh	31 to 8	-	Use prohibited	-
		7 to 0	W	Alive check setting register lock/unlock status 55h: Unlocked AAh: Locked	AAh

*: After reset, this register will be locked.

(13) Interval timer reset register

The interval timer is reset by reading the value in this register.

Byte address	Word address	Bit	R/W	Description	Initial value
0458h to 045Bh	022Ch, 022Dh	31 to 8	-	Use prohibited	-
		7 to 0	R	The interval timer is reset by reading the value in this register. Read value: 00h	00h

Point

- (1) This register is locked by Interval timer reset lock register (byte address: 045Ch).
- (2) The interval timer is not reset by reading the value while the register is in the locked state.

(14) Interval timer reset lock register

The lock/unlock status of Interval timer reset register is set.

Byte address	Word address	Bit	R/W	Description	Initial value
045Ch to 045Fh	022Eh, 022Fh	31 to 8	-	Use prohibited	-
		7 to 0	W	Interval timer reset register lock/unlock status 55h: Unlocked AAh: Locked	AAh

*: After reset, this register will be locked.

(15) Host-side DMA start address (lower 32 bits)

The DMA transfer start address (lower 32 bits) of the host is set.

The register is for the PCI Express board. Do not use the register for the PCI board.

Byte address	Word address	Bit	R/W	Description	Initial value
0480h to 0483h	0240h, 0241h	31 to 1	R/W	Host-side DMA start address (b31 to b1)	0
		0	R	Use prohibited	0b

Point

- (1) The 64-bit DMA start address can be specified by using this register and Host-side DMA start address (upper 32 bits) (byte address: 0484h) together. When accessing the 32-bit space, set Host-side DMA start address (upper 32 bits) (byte address: 0484h) to "0".
- (2) Values can be written to this register only when DMA transfer is stopped. (DMA transfer status (byte address: 0494h, bit: b9, b8) is set to "00b" (Stopped) or "11b" (Error).)
- (3) b0 shall be set to "0b" because byte access is prohibited.

(16) Host-side DMA start address (upper 32 bits)

The DMA transfer start address (upper 32 bits) of the host is set.

The register is for the PCI Express board. Do not use the register for the PCI board.

Byte address	Word address	Bit	R/W	Description	Initial value
0484h to 0487h	0242h, 0243h	31 to 0	R/W	Host-side DMA start address (b63 to b32)	0

Point

- (1) The 64-bit DMA start address can be specified by using this register and Host-side DMA start address (lower 32 bits) (byte address: 0480h) together. When accessing the 32-bit space, set this register to "0".
- (2) Values can be written to this register only when DMA transfer is stopped. (DMA transfer status (byte address: 0494h, bit: b9, b8) is set to "00b" (Stopped) or "11b" (Error).)

(17) Board-side DMA start address

The DMA transfer start address of the board is set.

The register is for the PCI Express board. Do not use the register for the PCI board.

Byte address	Word address	Bit	R/W	Description	Initial value
0488h to 048Bh	0244h, 0245h	31	R/W	DMA 2-port memory area setting 0b: System area 1b: User area	0b
		30 to 20	-	Use prohibited	-
		19 to 0	R/W	Board-side DMA start address Set the offset address (word address) from the start of the system area or user area.	00000h

*: Values can be written to this register only when DMA transfer is stopped. (DMA transfer status (byte address: 0494h, bit: b9, b8) is set to "00b" (Stopped) or "11b" (Error).)

(18) DMA transfer direction / Number of DMA transfer data sets

The DMA transfer direction and the number of DMA transfer data sets are set.

The register is for the PCI Express board. Do not use the register for the PCI board.

Byte address	Word address	Bit	R/W	Description	Initial value
048Ch to 048Fh	0246h, 0247h	31 to 29	-	Use prohibited	-
		28	R/W	DMA transfer direction 0b: Host → Board 1b: Board → Host	0b
		27 to 16	-	Use prohibited	-
		15 to 0	R/W	Number of DMA transfer data sets*1 (in units of words) 0001h: 1 word 0002h: 2 words to FFFFh: 65535 words 0000h: 65536 words	0000h

*1: Values can be written to this register only when DMA transfer is stopped. (DMA transfer status (byte address: 0494h, bit: b9, b8) is set to "00b" (Stopped) or "11b" (Error).)

(19) DMA transfer control

The DMA transfer operating status (start, pause, stop) is set.

The register is for the PCI Express board. Do not use the register for the PCI board.

Byte address	Word address	Bit	R/W	Description	Initial value
0490h to 0493h	0248h, 0249h	31 to 2	-	Use prohibited	-
		1, 0	W	DMA transfer control 00b: Stop 01b: Start 10b: Pause 11b: Stop	-

Point

Write a value to this register when the following two conditions are satisfied.

- (a) The internal bus system reset is released. (Internal bus system target reset signal (byte address: 0004h, bit: b0) is set to "0b" (Reset released).)
- (b) The internal bus system I/O reset is released. (Internal bus system I/O reset signal (byte address: 000Ch, bit: b0) is set to "0b" (Reset released).)

(20) DMA transfer status

The DMA transfer status is set.

The register is for the PCI Express board. Do not use the register for the PCI board.

This register is reset by starting DMA (by setting DMA transfer control (byte address: 0490h, bit: b1, b0) to "01b" (Start)).

Byte address	Word address	Bit	R/W	Description	Initial value
0494h to 0497h	024Ah, 024Bh	31 to 10	-	Use prohibited	-
		9, 8	R	DMA transfer status 00b: Stopped 01b: Operating 10b: Paused 11b: Error	00b
		7	-	Use prohibited	-
		6	R	DMA PCI Express unsupported request error 0b: No error 1b: Error exists	0b
		5	R	DMA PCI Express completer abort error 0b: No error 1b: Error exists	0b
		4	R	DMA PCI Express timeout error 0b: No error 1b: Error exists	0b
		3	-	Use prohibited	-
		2	R	DMA internal bus timeout error 0b: No error 1b: Error exists	0b
		1	-	Use prohibited	-
		0	R	DMA parameter error*1 0b: No error 1b: Error exists	0b

*1: When DMA transfer is started (DMA transfer control (byte address: 0490h, bit: b1, b0) is set to "01b"(Start)) on the conditions that the total value of Board-side DMA start address (byte address: 0488h, bit: b19 to b0) and Number of DMA transfer data sets (byte address: 048Ch, bit: b15 to b0) exceeds 100000h, the following registers are set.

(1) DMA parameter error (byte address: 0494h, bit: b0) is set to "1b" (Error exists).

(2) DMA transfer error interrupt (byte address: 0438h, bit: b8) is set to "1b" (Factor exists).

(21) Remaining data length at DMA transfer error occurrence

The remaining data length at the time of a DMA transfer error is set.

The register is for the PCI Express board. Do not use the register for the PCI board.

Byte address	Word address	Bit	R/W	Description	Initial value
0498h to 049Bh	024Ch, 024Dh	31 to 16	-	Use prohibited	-
		15 to 0	R	Remaining data length at DMA error occurrence (in units of words)	0000h

This register is updated when an unsupported request error, DMA PCI Express completer abort error, DMA PCI Express timeout error, or DMA internal bus timeout error occurs. The register is not updated when a DMA parameter error occurs.

(22) 2-port memory area unlock register

A value to unlock the 2-port memory area is stored.

The register is for the PCI Express board. Do not use the register for the PCI board.

Byte address	Word address	Bit	R/W	Description	Initial value
04C0h to 04C3h	0260h, 0261h	31 to 0	W	Write a different value (a different value from the last set value) every time to unlock the 2-port memory area.	-

Point

(1) Set this register first, and then access the 2-port memory area.

(2) Write the value in units of 32 bits.

(3) The read value will always be "00000000h".

(23) 2-port memory area lock status register

The internal bus access lock status is stored.

The register is for the PCI Express board. Do not use the register for the PCI board.

Byte address	Word address	Bit	R/W	Description	Initial value
04C4h to 04C7h	0262h, 0263h	31 to 1	-	Use prohibited	-
		0	R	2-port memory area lock status*1 0b: Locked 1b: Unlocked	0b

*1: Check that the system area and the user area are unlocked before accessing the 2-port memory area or releasing the board reset.

4 TROUBLESHOOTING

4.1 Error Codes

This section describes the error codes.

Table 4.1-1 Error Codes

Error code (Hexadecimal)	Error name	Error details and cause	Action
E000h to E005h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E006h	Receive queue full	The maximum number of queues for transient receive processing has been used.	Pause the transient transmission for the target station, or reduce the frequency of the transient transmission, and then retry the operation. Or, increase the frequency of transient transmission receive processing.
E007h to E011h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E012h	Parameter check result error	The specific parameter values are out of specification range.	Write the correct parameters in accordance with the specifications.
E013h	Parameter check result error	The common parameter values are out of specification range.	Write the correct parameters in accordance with the specifications.
E014h to E018h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E101h	Parameter error	Some of the common parameters and specific parameters are invalid.	Write the correct parameters in accordance with the specifications.
E102h	Own station number reserved station error	The own station is set as a reserved station.	Cancel the reserved station setting using parameters of the control station. Or change the own station number to the one that is not specified as a reserved station.
E103h	Invalid own station No.	The own station number is out of range of total number of connected stations.	Increase the total number of connected stations using parameters of the control station. Or change the own station number to the one that is within the total number of connected stations.
E104h	Sumcheck code error (common parameter)	The common parameter data is partially corrupted.	Write the correct parameters in accordance with the specifications.
E105h	Start block code error (common parameter)	The start block code of the common parameters is broken.	Write the correct parameters in accordance with the specifications.
E106h	End block code error (common parameter)	The end block code of the common parameters is broken.	Write the correct parameters in accordance with the specifications.
E107h	Sumcheck code error (specific parameter)	The specific parameter data is partially corrupted.	Write the correct parameters in accordance with the specifications.
E108h	Start block code error (specific parameter)	The start block code of the specific parameters is broken.	Write the correct parameters in accordance with the specifications.
E109h	End block code error (specific parameter)	The end block code of the specific parameters is broken.	Write the correct parameters in accordance with the specifications.
E10Ah	Setting error	• The group number, network number, station number, and operation mode are not set correctly.	• Write the group number, network number, station number, and operation mode correctly.
E10Ch	Specific parameter setting error	The specific parameters are not set correctly.	Write the correct parameters in accordance with the specifications.
E110h	Device number error (LW)	The LW start number set in the range assignment setting is invalid.	Write the correct parameters in accordance with the specifications.
E111h	Device address error (LW)	The LW end number set in the range assignment setting is invalid.	Write the correct parameters in accordance with the specifications.

Error code (Hexadecimal)	Error name	Error details and cause	Action
E112h	Device number error (LB)	The LB start number set in the range assignment setting is invalid.	Write the correct parameters in accordance with the specifications.
E113h	Device address error (LB)	The LB end number set in the range assignment setting is invalid.	Write the correct parameters in accordance with the specifications.
E114h	Device number error (LY)	The LY start number set in the range assignment setting is invalid.	Write the correct parameters in accordance with the specifications.
E115h	Device address error (LY)	The LY end number set in the range assignment setting is invalid.	Write the correct parameters in accordance with the specifications.
E116h	Device number error (LX)	The LX start number set in the range assignment setting is invalid.	Write the correct parameters in accordance with the specifications.
E117h	Device address error (LX)	The LX end number set in the range assignment setting is invalid.	Write the correct parameters in accordance with the specifications.
E134h	Network type inconsistency	The network type set in the control station and the one set in the own station do not match. Control station: When the CC-Link IE Controller Network extended mode is used Normal station: When the CC-Link IE Controller Network extended mode is not used	Match the network type set in the normal station with the one set in the control station.
E135h	Network type inconsistency	The network type set in the control station and the one set in the own station do not match. Control station: When the CC-Link IE Controller Network extended mode is not used Normal station: When the CC-Link IE Controller Network extended mode is used	Match the network type set in the normal station with the one set in the control station.
E136h	Parameter without the send points extension function	Parameters do not support the send points extension function.	<ul style="list-style-type: none"> Change the specific parameter setting from "When the CC-Link IE Controller Network extended mode is not used" to "When the CC-Link IE Controller Network extended mode is used". (For details, refer to Section 5.3.2 "Parameter information".) Change the network type to "When the CC-Link IE Controller Network extended mode is not used" in the control station.
E152h	Cyclic transmission start condition error	A station that has not stopped cyclic transmission started cyclic transmission.	The station that stops cyclic transmission must restart cyclic transmission. Or, execute the forced start.
E160h	Invalid instruction	The value set in Link stop/startup direction (SW0000) was out of range.	Set the value in Link stop/startup direction (SW0000) correctly, and then turn on SB0002 (System link startup) or SB0003 (System link stop).
E163h	Cyclic transmission start/stop processing execution error (instructed by own station)	When the cyclic transmission start/stop instruction was executed by the own station, its processing had already been performed.	To start cyclic transmission, execute the forced start. To stop cyclic transmission, wait until the processing in progress completes, and then execute the stop instruction again.
E164h	Cyclic transmission start/stop processing execution error (instructed by entire system)	When the cyclic transmission start/stop instruction of the entire system was executed by the own station, its processing had already been performed.	To start the cyclic transmission, execute the forced start. To stop cyclic transmission, wait until the processing in progress completes, and then execute the stop instruction again.

Error code (Hexadecimal)	Error name	Error details and cause	Action
E165h	No station specification error	When cyclic transmission to the specified station was started or stopped, its station information in SW0001 to SW0008 has not been set correctly.	Set the station information in Link stop/startup direction (SW0001 to SW0008) correctly, and then start or stop cyclic transmission.
E166h	Group specification error	When cyclic transmission to the specified group was started or stopped, its group is not specified correctly in SW0012 and SW0013.	Set the group in Group specification for link stop/startup (SW0012 and SW0013) correctly, and then start or stop cyclic transmission.
E170h to E172h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E177h to E179h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E17Bh	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E200h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E201h	Duplicated transient data reception error	The same transient data has been received two times or more.	Correct the line status. Even if the error occurs, discard the second or later transient data in the board.
E202h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E206h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E207h	Target network number error	When transient data is sent/received, the network number of the own station is different from that of the target station.	Correct the target network number in the transient sending station, and perform transient transmission again.
E208h	Target station number error	When transient data is sent/received, the target station number specified is out of specification range.	Correct the target station number in the transient sending station, and perform transient transmission again.
E209h	Target station number error	When transient data is received, the target station number specified is out of specification range.	Correct the target station number in the transient sending station, and perform transient transmission again.
E20Dh	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E20Eh	Target network number error	When transient data is sent, the target network number is 0.	Correct the target network number in the transient sending station, and perform transient transmission again.
E20Fh	Target station number error	When transient data is sent, the target station number is 0.	Correct the target station number in the transient sending station, and perform transient transmission again.
E210h	Network number/station number error	When transient data is sent, the target station network number is 0, and the target station number is FFh.	Correct the network number and station number.
E214h to E217h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.

4. TROUBLESHOOTING

Error code (Hexadecimal)	Error name	Error details and cause	Action
E219h to E21Ah	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E21Ch to E220h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E222h to E223h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E226h to E227h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E246h to E24Eh	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E252h to E253h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E25Ch to E261h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E274h to E288h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E2A2h	Transmission completion wait time timed out	When transient data is sent, timeout has occurred without send completion.	Correct the line status.
E2A3h	Frame length (L) error	The invalid transient frame was received.	Correct the source transient frame.
E2A5h	Destination station number (DA) error	The invalid transient frame was received.	Correct the source transient frame.
E2A6h	Source station number (SA) error	The invalid transient frame was received.	Correct the source transient frame.
E2A7h	Destination application (DAT) error	The invalid transient frame was received.	Correct the source transient frame.
E2A8h	Source application (SAT) error	The invalid transient frame was received.	Correct the source transient frame.
E2A9h	Destination network No. (DNA) error	The invalid transient frame was received.	Correct the source transient frame.
E2AAh	Destination station number (DS) error	The invalid transient frame was received.	Correct the source transient frame.
E2ABh	Source network No. (SNA) error	The invalid transient frame was received.	Correct the source transient frame.
E2ACh	Source station number (SS) error	The invalid transient frame was received.	Correct the source transient frame.
E2ADh	Data length (L1) error	The invalid transient frame was received.	Correct the source transient frame.
E2AEh	Data not addressed to own station was received	The invalid transient frame was received.	Correct the source transient frame.
E2AFh	Data addressed to own station attempted to receive	The own station is specified as the destination station in the send data.	Correct the target station number.

Error code (Hexadecimal)	Error name	Error details and cause	Action
E2B0h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E300h to E3BAh	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E3BBh	Number of stations exceeded	The total number of network stations is out of specification range.	Assign some stations to other networks so that the total number of stations will be set within the specification range.
E3BCh	Network line error	Baton pass stopped due to a communication line error or network module error.	Correct the line status.
E504h	Transient execution error (no baton passing on the own station)	Transient transmission was performed while the own station is not performing baton pass.	To perform transient transmission, program an interlock in SB0047 (Baton pass status (own station)). When baton pass has not been performed, perform baton pass by referring to SW0048 (Cause of baton pass interruption), and perform transient transmission.
E505h	Transient execution error with own station number duplicated	Transient transmission was performed with the own station number duplicated.	Correct the duplication number of the own station, and perform transient transmission.
E508h	Duplication of station No. and control station setting of the own station	The station number is duplicated with other station number. Also, the control station setting is duplicated.	Change the own station number and control station setting to different ones from other stations. After taking the above action, reset the board of the own station from the driver.
E509h	Own station No. duplication	The station number is duplicated with other station number.	Change the own station number to a unique number. After taking the above action, reset the board of the own station from the driver.
E50Ah	Duplication of the own station's control station setting	The control station setting is duplicated with other station setting.	Change the control station setting to a different one from other stations. After taking the above action, reset the board of the own station from the driver.
E50Bh	Network No. error	The network number of the (sub-)control station is different from the one of the own station.	Set the same network number to the own station and the (sub-)control station.
E521h to E5E9h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
E5F0h	Transient execution error (no baton passing on the target station)	Transient transmission was performed while the target station is not performing baton pass.	Return the target station to the system. When SW0047 (Baton pass status (own station)) is off, check SW00A0 to SW00A7 (Baton pass status of each station), and then perform transient transmission.
E5F1h	Specified station duplication	The specified station number is duplicated.	Correct the station number of the normal station.
E5F2h to EAE4h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.
EAE7h to EAF6h	Board error	The hardware of the board has failed.	Install the board in the PCI slot of the host properly. Check if the host is operating normally. If the error occurs again, replace the board.

4.2 Troubleshooting at Driver Development

This section describes the symptoms and actions of each problem at driver development.

Table 4.2-1 List of Corrective Actions

Symptom	Description	Action	Reference
No data link (Both the D.LINK LED and the RD LED are on.)	Is the network range assignment of the control station set correctly?	Set the network range assignment of the control station correctly.	-
	Has a stop error occurred in the corresponding station in SW0100 to SW0107?	Check SW0100 to SW0107 (Controller operation status of each station (1)), and eliminate the error cause of the alive check function.	-
No data link (The D.LINK LED is flashing, and the RD LED is on.)	Is the mode of the control station set to offline?	Check that the mode of the control station is set to online.	-
	Is the own station specified as a reserved station?	Correct the network parameters. (control station)	-
	Has an error occurred?	Check SW0049 (Cause of data link stop), and eliminate the error cause.	-
	Is the station number setting of the own station correct?	Correct the station number of the own station.	-
No data link (The D.LINK LED is off, and the RD LED is on.)	Is the data link monitoring time shorter than the link scan time?	Correct the data link monitoring time (using control station parameters).	-
	Is the mode of the own station set to offline?	Check that the mode of the own station is set to online.	-
An error occurs during a data link. (Data cannot be sent nor received.)	Is the device (address) where data is read and written correct?	Set the device (address) correctly.	-
	Has an error occurred in the destination station?	Take action for "No data link" at the corresponding station. Or, perform troubleshooting for the corresponding products.	-

(Reference) Relationship between the driver operating status and the LED status (overview)

Table 4.2-2 Relationship between the Driver Operating Status and the LED Status (Overview)

LED	Timing when LEDs turn on
RUN LED	The LED turns on during the firmware initial processing for the driver.
SD	The LED starts flashing after the RD LED starts flashing during the parameter setting processing for the driver.
RD	The LED starts flashing during the parameter setting processing for the driver.
D.LINK	The LED starts flashing when the driver starts the baton pass processing. The LED remains on when the driver starts the cyclic transmission processing.

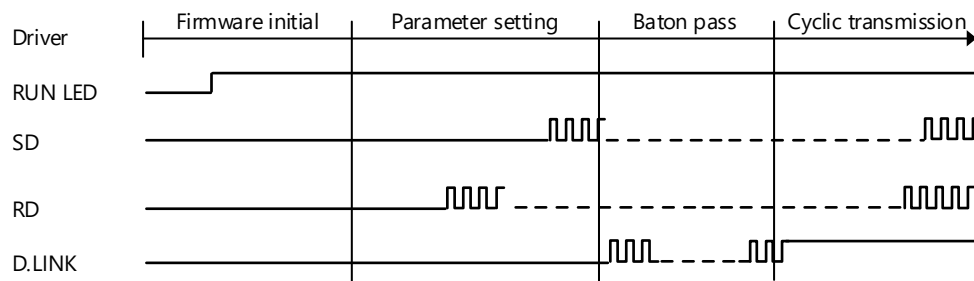


Figure 4.2-1 Relationship between the Driver and the LEDs (Overview)

5 PROCESSING TO BE IMPLEMENTED TO THE DRIVER

5.1 Processing to be Implemented to the Driver

To operate the host as a control station or a normal station, the following processing must be implemented to the driver.

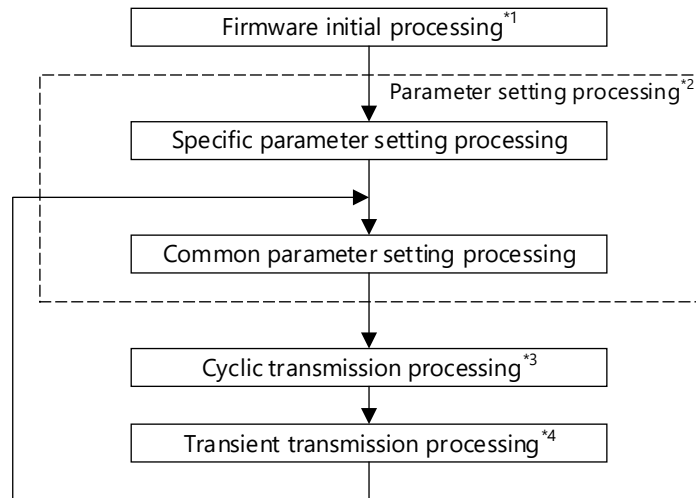


Figure 5-1 Processing to be Implemented to the Driver

*1: Refer to Section 5.2 "Firmware Initial Processing".

*2: Refer to Section 5.3 "Parameter Setting Processing".

*3: Refer to Section 5.5 "Cyclic Transmission Processing".

*4: Refer to Section 5.6 "Transient Transmission Processing".

5.1.1 Information exchange between the board and the driver

The board and the driver exchange information by performing the interrupt processing and the handshake processing. (Refer to Section 5.1.2 "Interrupt processing" and Section 5.1.3 "Handshake".) This information exchange processing is used in Section 5.3.3 "Parameter setting sequences".

5.1.2 Interrupt processing

Interrupt processing procedure

When the driver changes the parameter exchange sequence (specific parameter sequence (SPSQ) or common parameter sequence (PRSQ)), the driver sets an interrupt factor to notify the board of the change.

When the board changes the parameter exchange sequence, the board sets an interrupt factor. Therefore, the driver has to check the change of the sequence and reset the interrupt factor.

(1) Setting an interrupt (from the driver to the board)

- 1) Compare the b15 value of 50h with the b15 value of 60h in the system area, and check that an interrupt is not requested. If the values are the same, an interrupt is not requested.
- 2) Invert b15 of 50h in the system area to notify that a parameter interrupt has been requested.
- 3) Set b2 of 05h in the board setting area 1 to "1b". The interrupt factor 1 is set.
- 4) The driver notifies the change using the interrupt.

(2) Resetting an interrupt (from the board to the driver)

- 1) Check that b2 (Board → Driver interrupt factor 1) of 04h in the board setting area 1 is set to "1b" (Factor exists).
- 2) Compare the b15 value of 30h with the b15 value of 40h in the system area, and check that an interrupt is requested.
If the values are not the same, an interrupt is requested.
- 3) Invert b15 of 40h in the system area to accept the interrupt.
- 4) Set b2 of 04h in the board setting area 1 to "1b".
The interrupt factor 1 is reset.

Point

- | |
|--|
| <ul style="list-style-type: none">• In the sample code, interrupt factors are always monitored instead of steps 1) and 4) in "Procedure for resetting an interrupt".
To use interrupts by implementing steps 1) and 4), implement them in accordance with the OS used. |
|--|

5.1.3 Handshake

Handshake procedure

When an interrupt is requested, a handshake between the driver and the board is performed using 30h to 60h in the system area.

30h Board → Driver interrupt request 50h Driver → Board interrupt request
40h Driver → Board interrupt acceptance 60h Board → Driver interrupt acceptance

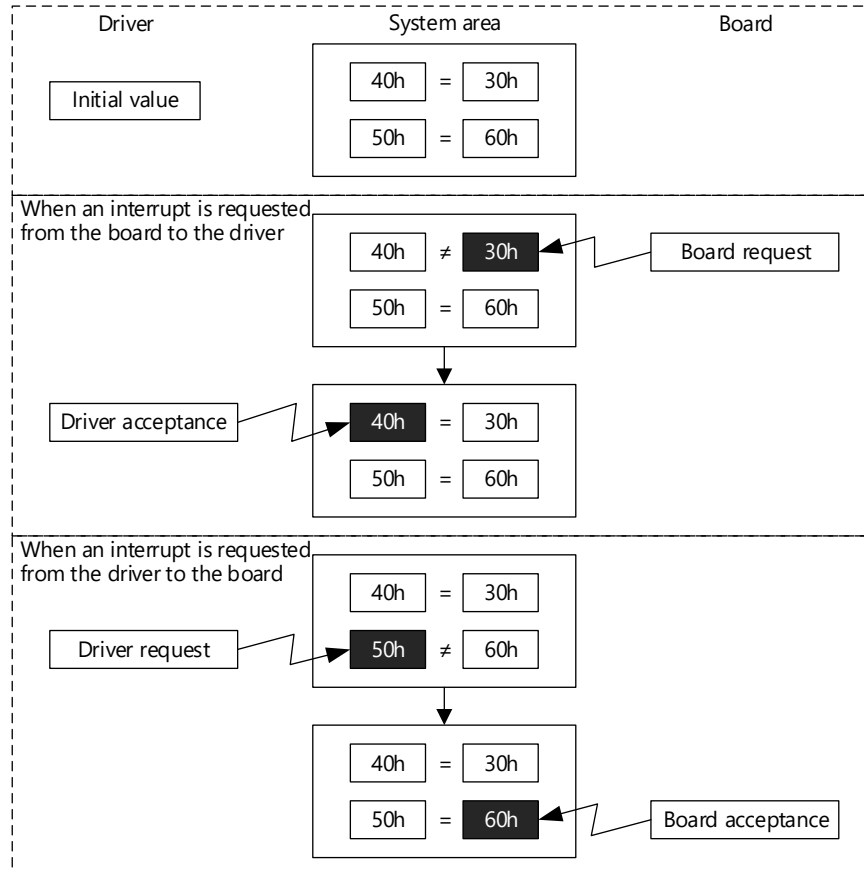


Figure 5.1.3-1 Handshake between the Driver and the Board (When an Interrupt is Requested)

*() The shaded area indicates that b15 in this area is inverted.

For address details, refer to Section 3.2.5(10) Board → Driver interrupt request to Section 3.2.5(13) Board → Driver interrupt acceptance.

- When an interrupt is requested from the board to the driver
The handshake processing is performed using 30h and 40h.
When an interrupt is requested, the b15 value of 40h differs from the b15 value of 30h. The driver has to invert b15 of 40h to accept the interrupt.
- When an interrupt is requested from the driver to the board
The handshake processing is performed using 50h and 60h. To request an interrupt, the driver has to invert b15 of 50h.

5.2 Firmware Initial Processing

When the host is powered on, the firmware of the board starts the initial processing. This processing writes the settings required for operating the host as a control station or a normal station on CC-Link IE Controller Network.

5.2.1 Overview of the firmware initial processing

The processing writes the settings in the following order: hardware control memory information, 2-port memory information (board setting area 1, board setting area 2, and system area), parameters, and 2-port memory information (board setting area 2).

The following figure shows the flowchart for the firmware initial processing.

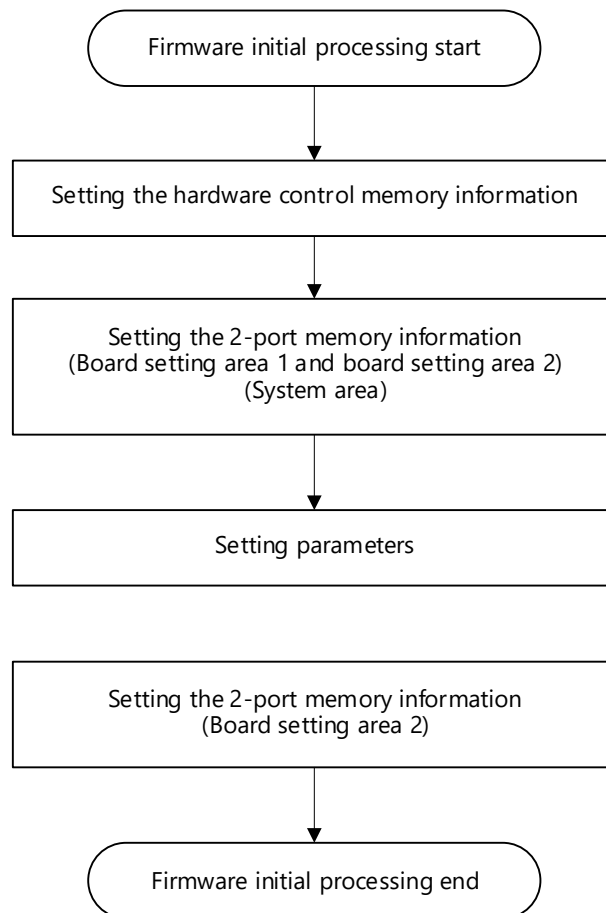


Figure 5.2.1-1 Flowchart for Firmware Initial Processing

5.2.2 Details of the firmware initial processing

This section describes the details of the firmware initial processing.

In the figure, the start address of each area in the 2-port memory area is word-addressed, and the start address of each register in the hardware control memory area is byte-addressed.

- (1) After the hardware control memory information and the 2-port memory information are set, interrupts from the board are enabled.
For details on the hardware control memory area, refer to Section 3.3.3 "Details of areas in the hardware control memory area".
For details on the 2-port memory area, refer to Section 3.2.3 "Details of areas in the 2-port memory area (Board setting area 1)".
- (2) After the interrupts from the board are enabled, parameters can be set.
For details on the parameter setting processing, refer to Section 5.3 "Parameter Setting Processing".

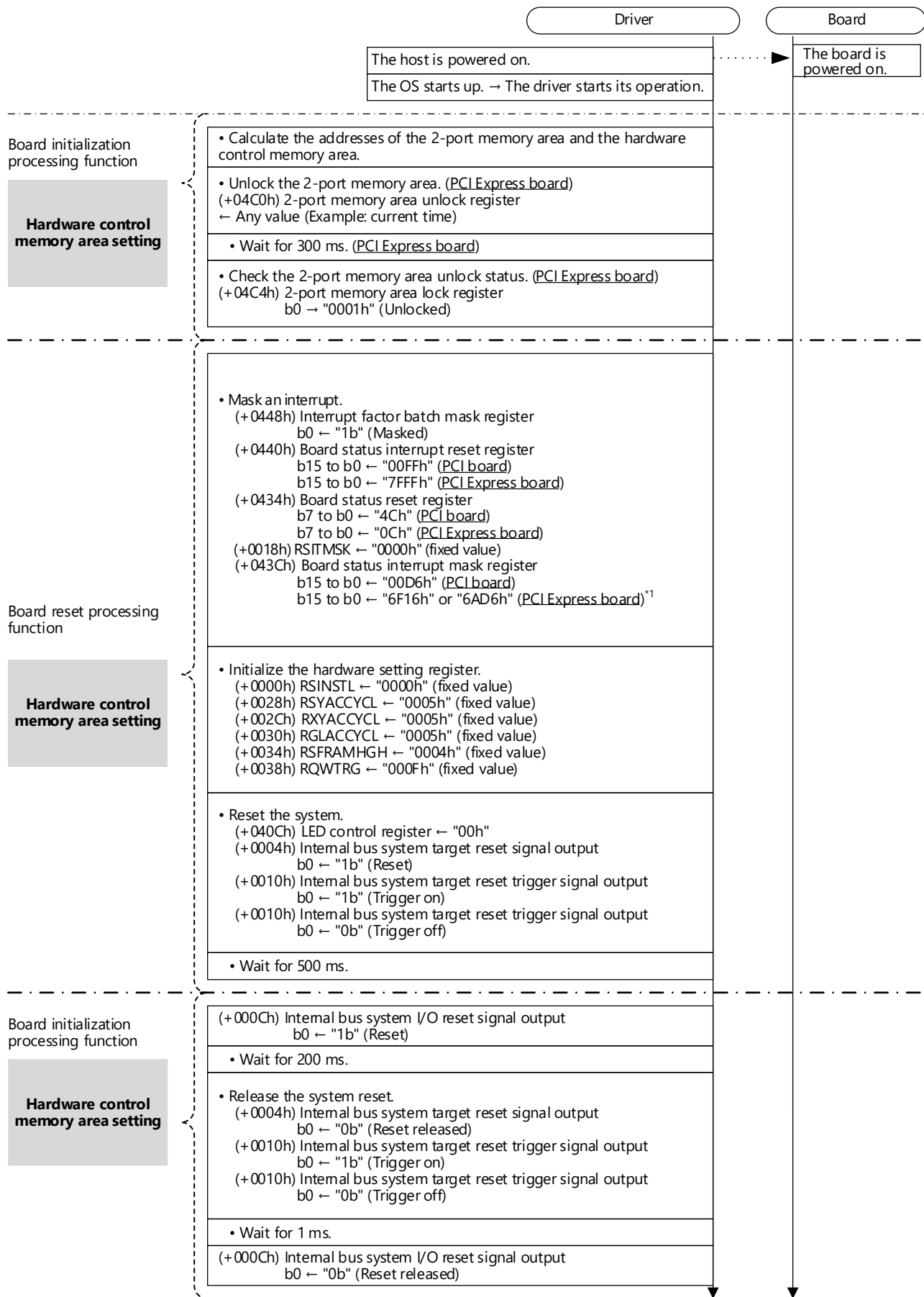


Figure 5.2.2-1 Details of Firmware Initial Processing (1/3)

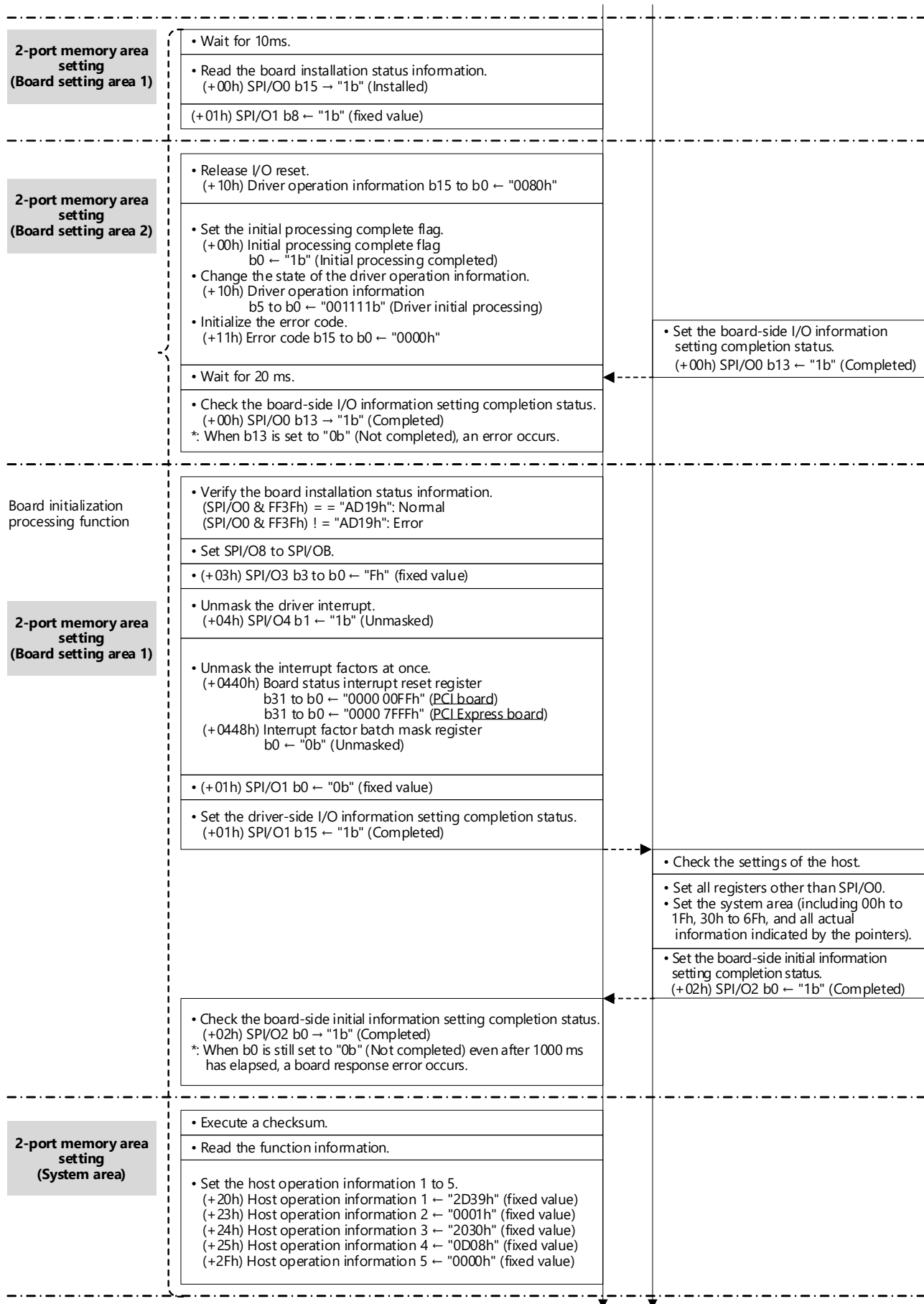


Figure 5.2.2-1 Details of Firmware Initial Processing (2/3)

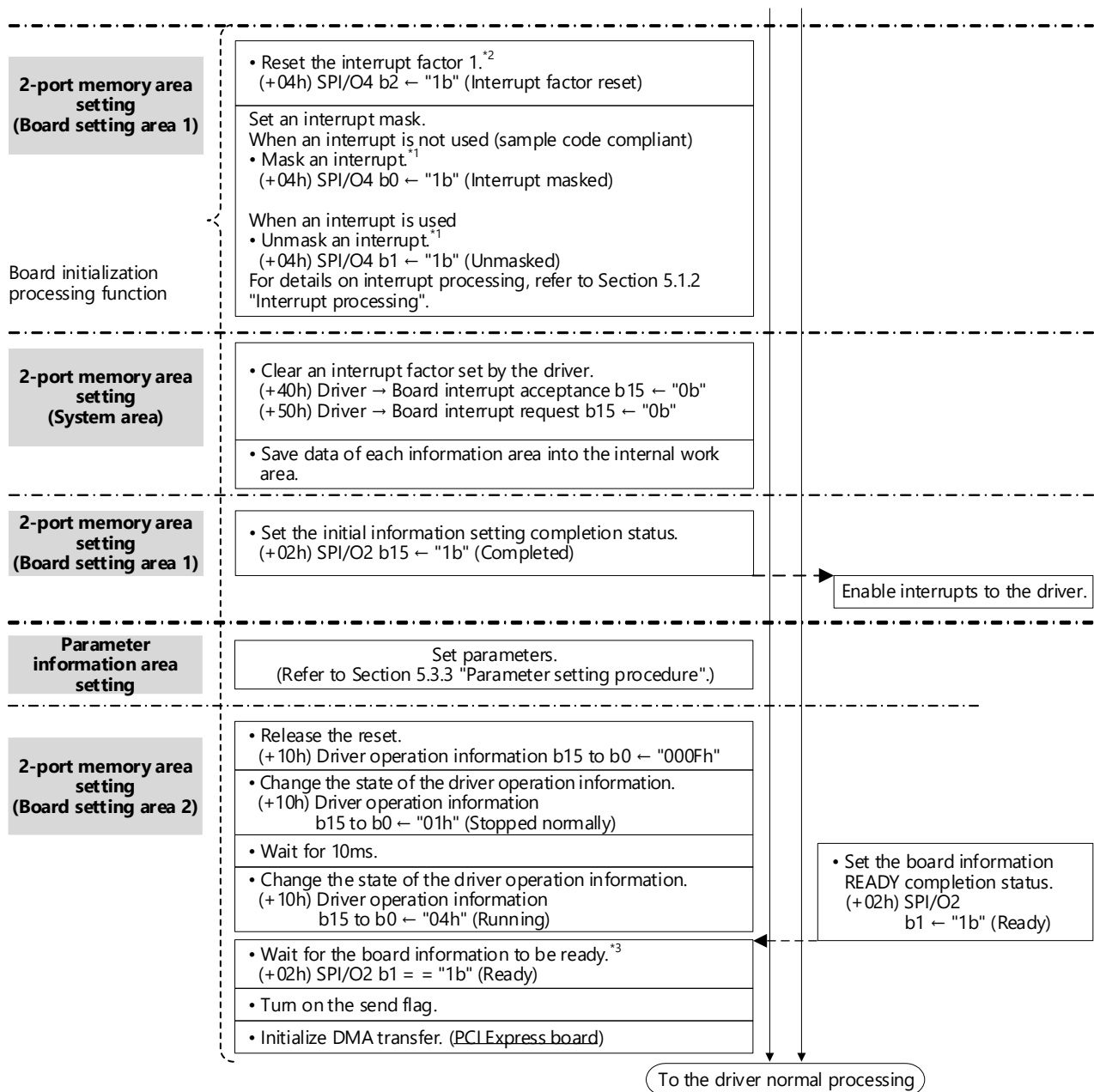


Figure 5.2.2-1 Details of Firmware Initial Processing (3/3)

*1: When the driver uses an interrupt in the DMA transfer processing, set "6AD6h". When the driver does not use an interrupt, set "6F16h".

*2: Do not reset an interrupt factor and mask an interrupt at the same time. Perform each processing individually.

*3: When b1 is still set to "0b" (Not ready) even after 5000 ms has elapsed, a timeout error occurs.

5.3 Parameter Setting Processing

This section describes how to set CC-Link IE Controller Network parameters.

5.3.1 Overview of the parameter setting processing

The following figure shows the flowchart for the parameter setting processing.

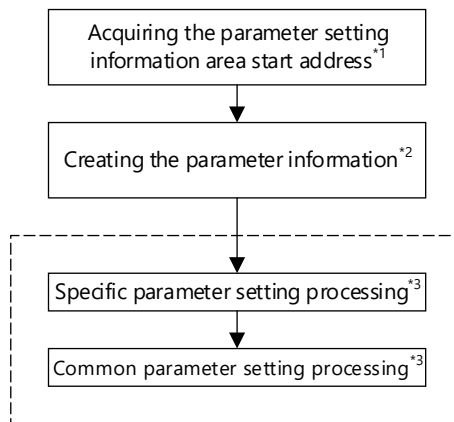


Figure 5.3.1-1 Flowchart for Parameter Setting Processing

*1: The value in the offset address +08 in Section 3.2.5(3) Parameter setting information area is acquired.

*2: Refer to Section 5.3.2(1) Common parameters and Section 5.3.2(2) Specific parameters.

*3: Refer to Section 5.3.3 "Parameter setting sequences".

5.3.2 Parameter information

There are two types of parameters: common parameters and specific parameters. Common parameters are created in the control station and they are distributed to normal stations. Specific parameters need to be created in both the control station and normal stations.

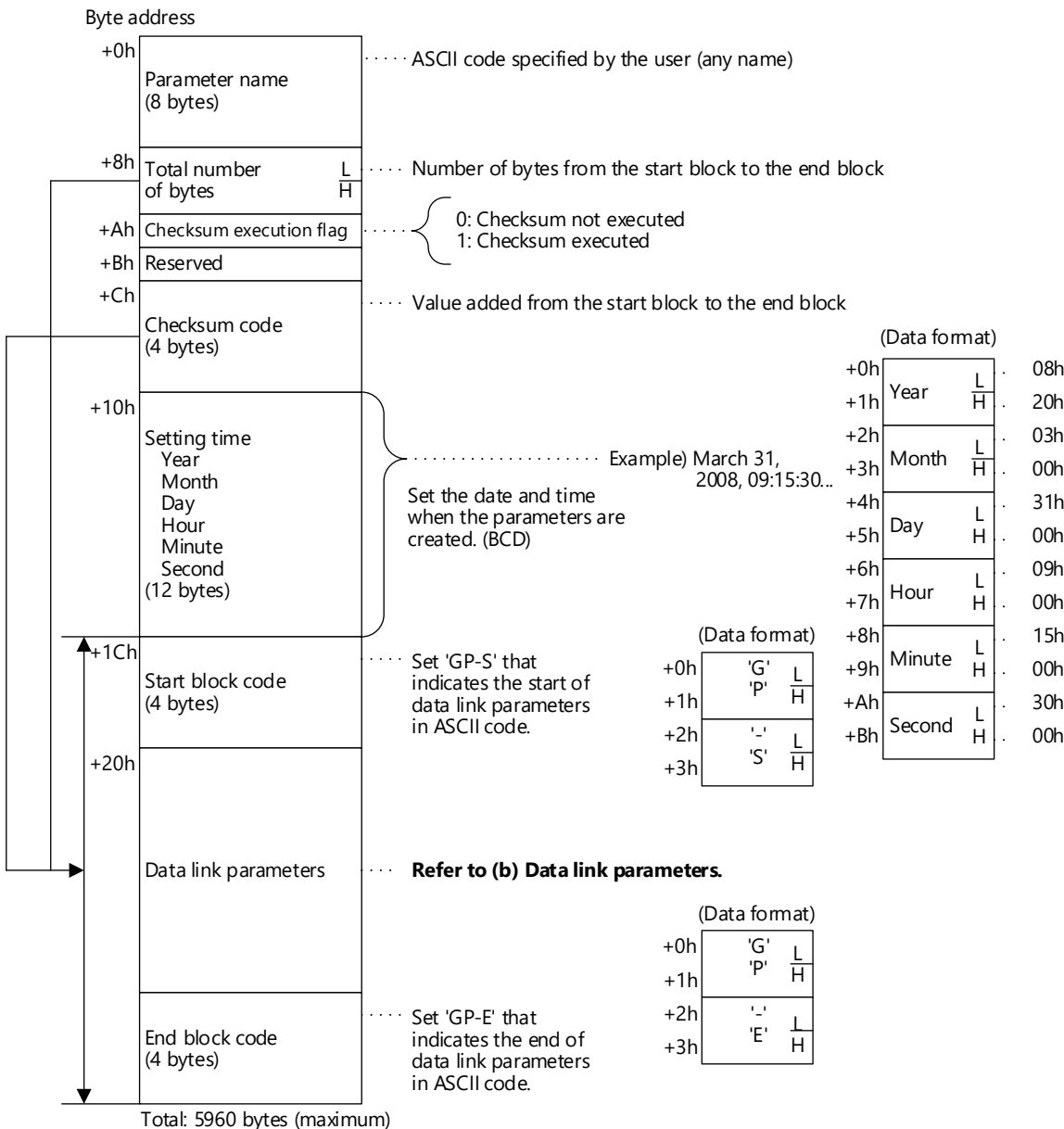
The following describes details of parameters to be created.

(1) Common parameters

In common parameters, the number of points and operation information are set for all stations that perform cyclic transmission.

(a) Common parameters (overall configuration)

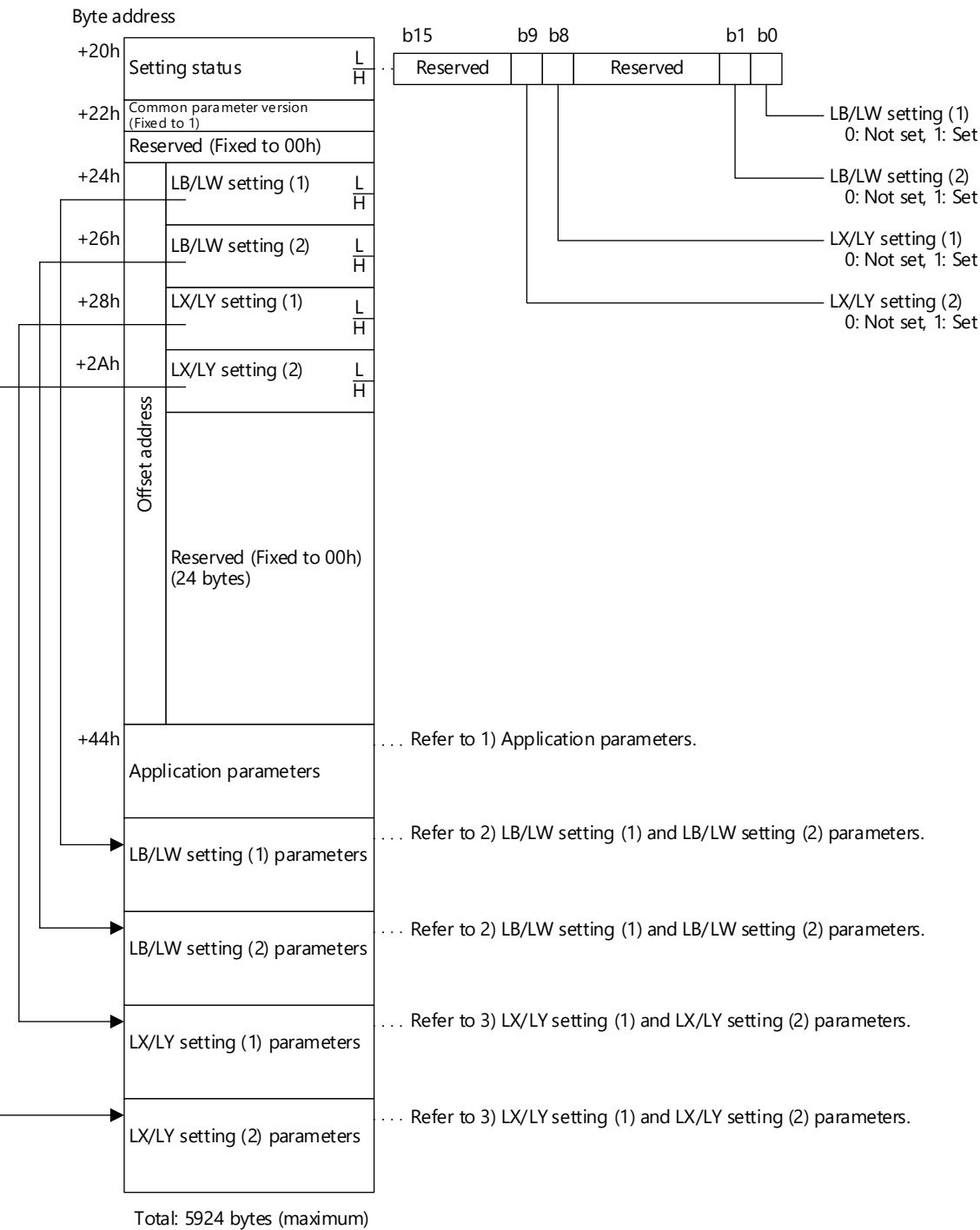
[Data structure]



Note

- (1) The board checks the following:
Checksum code
Start block code, end block code
- (2) When changing parameters, change the setting time as well.

(b) Data link parameters
[Data structure]



Note

(1) Set the reserved areas to "00h" unless a fixed value is determined.

(2) Each offset address indicates a distance (in units of bytes) from the start address of the data link parameter area.

(3) Regardless of the parameter setting status, secure areas for all items specified by the offset addresses.

(4) When no parameter needs to be set (when "Setting status" is set to "0"), do not secure the corresponding parameter area.

1) Application parameters
[Data structure]

Byte address

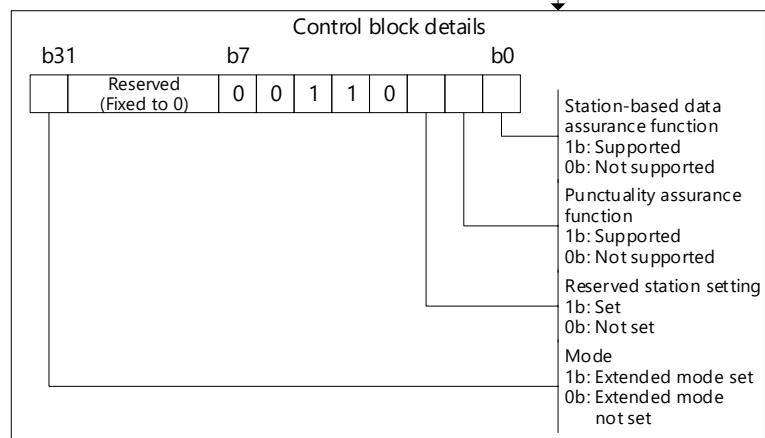
+44h	Control block (4 bytes)
+48h	Reserved (Fixed to 0)
+49h	Reserved (Fixed to 0)
+4Ah	Total number of stations
+4Bh	Reserved (Fixed to 1)
+4Ch	Reserved (Fixed to 2)
+4Eh	Link scan time monitoring time
+50h	Constant scan time
+52h	Reserved (Fixed to 0) (18 bytes)
+64h	Reserved (Fixed to 0) (16 bytes)
+74h	Reserved station specification (16 bytes)
+84h	Reserved (Fixed to 0) (16 bytes)

Total: 80 bytes

Total number of stations
Range: 1 to 120

Link scan time monitoring time (in increments of 5 ms)
Range: 5 to 2000 (Recommended time: 2000 ms)

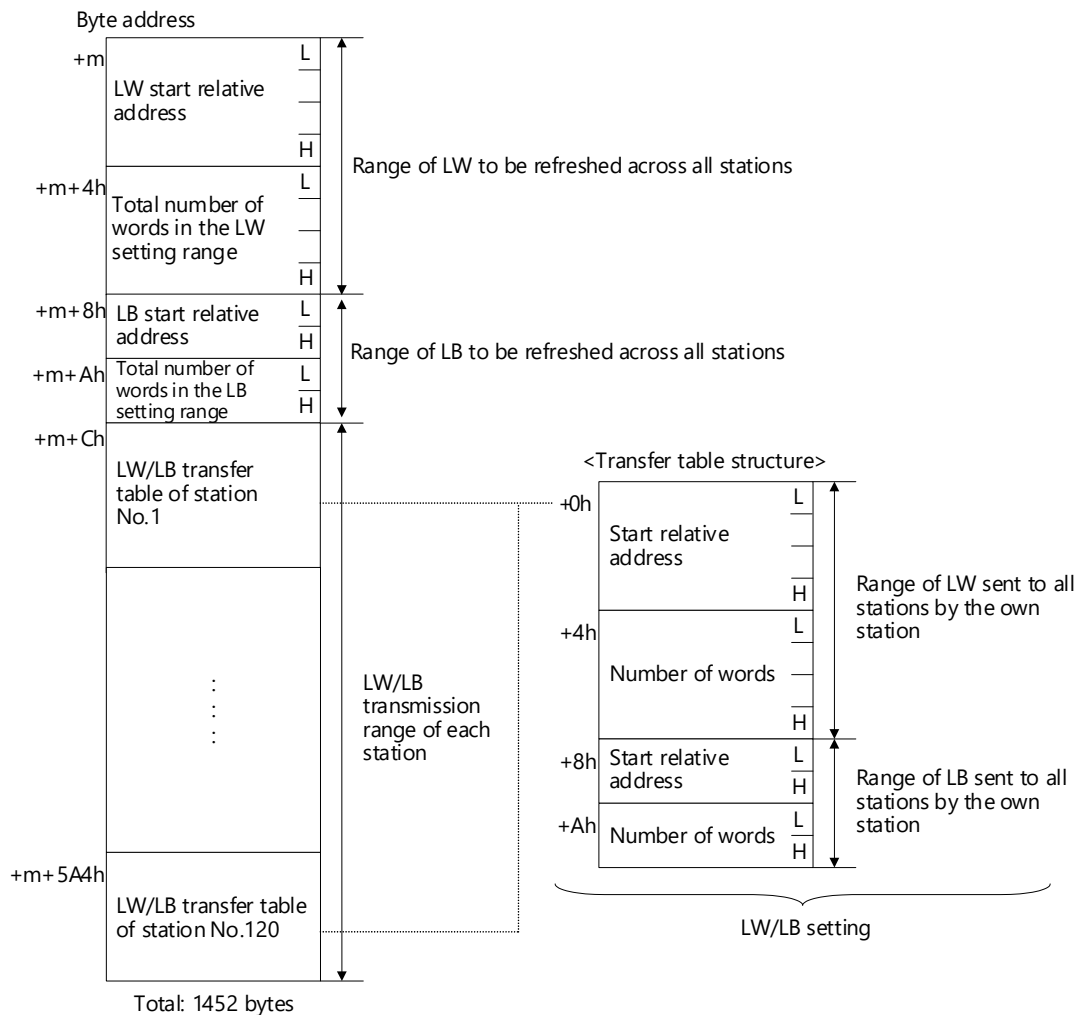
Constant scan time (in increments of 1 ms)
Range: 1 to 500
0: Constant scan not set



Reserved station specification
1 to 120 stations, specified
per bit
0b: Not specified
as a reserved station
1b: Specified
as a reserved Station

	b15																b0
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1		
32																	17
48																	33
64																	49
80																	65
96																	81
112																	97
Reserved (Fixed to 0)								120	119	118	117	116	115	114	113		

- 2) LB/LW setting (1) and LB/LW setting (2) parameters
 LB/LW setting (1) and LB/LW setting (2) parameters have the same data structure.
 [Data structure]



Note

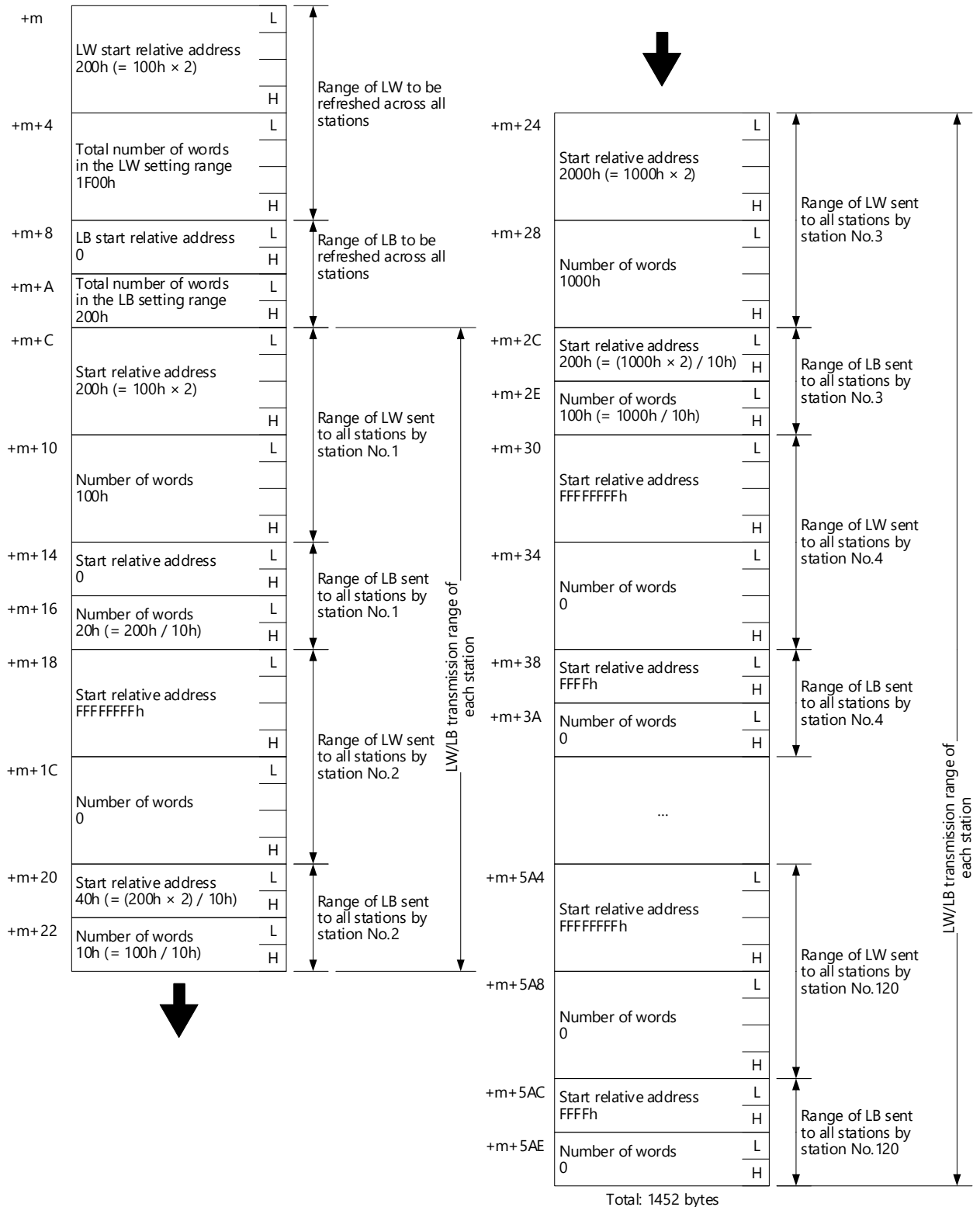
- (1) Regardless of the parameter setting status, secure the transmission range areas for 120 stations.
 For the empty areas, set the start relative address to FFFFFFFFh and the number of words to 0 (zero).
- (2) Each start relative address of LB/LW indicates a distance (in units of bytes) from the start address of each device area.
- (3) The start relative address of LB/LW has to be within the following range.
 LB: 0 to FFEh (0 to 4094) 32K points
 LW: 0 to 3FFEh (0 to 262142) 128K points
- (4) The number of words in LB/LW has to be within the following range.
 (Check the total number of words of the LB/LW setting (1) and the LB/LW setting (2) as well.)
 LB: 0 to 400h (0 to 1024) 16K words
 LW: 0 to 4000h (0 to 16384) 16K words
- (5) Set the transfer table so that the send ranges of each station do not overlap.
- (6) Set the offset addresses so that the ranges of the LB/LW setting (1) do not overlap with those of the LB/LW setting (2).

Setting examples of LB/LW setting parameters

Set values
LB/LW setting (1)

Station No.	LB			LW		
	Points	Start	End	Points	Start	End
1	512	0	01FF	256	100	01FF
2	256	200	02FF			
3	4096	1000	1FFF	4096	1000	1FFF

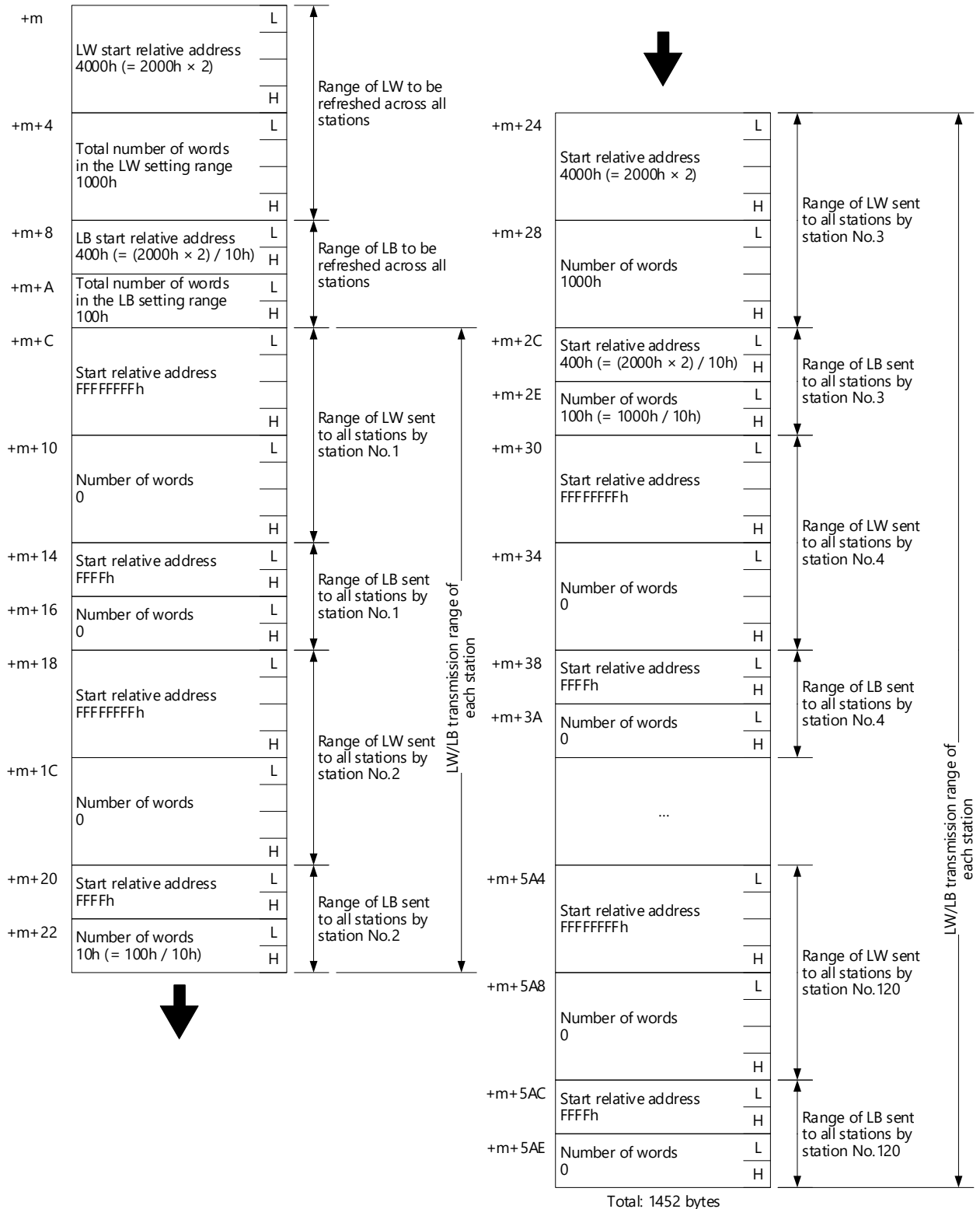
Actual parameter settings
LB/LW setting (1)



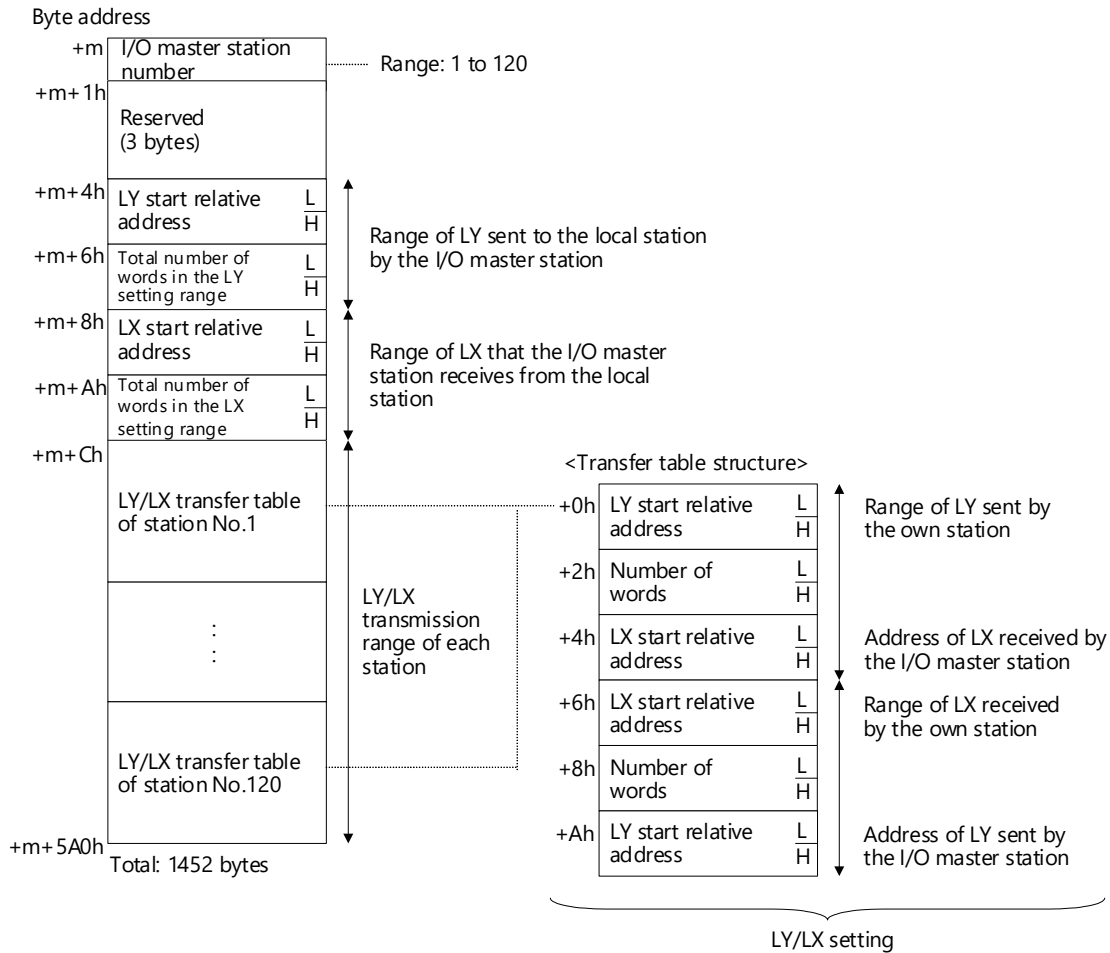
Set values
LB/LW setting (2)

Station No.	LB			LW		
	Points	Start	End	Points	Start	End
1						
2						
3	256	2000	2FFF	4096	2000	2FFF

Actual parameter settings
LB/LW setting (2)



- 3) LY/LX setting (1) and LY/LX setting (2) parameters
 LX/LY setting (1) and LX/LY setting (2) parameters have the same data structure.
 [Data structure]



Note

- (1) Regardless of the parameter setting status, secure the transmission range areas for 120 stations.
 For the empty areas, set the start relative address to FFFFh and the number of words to 0 (zero).
- (2) When the station is specified as an I/O master station, leave the corresponding area of the LY/LX transmission range as an empty area.
- (3) Each start address indicates a distance (in units of bytes) from the start address of each device area.
- (4) The start relative address of LX/LY has to be within the range between 0 to 3FEh (0 to 1022).
- (5) The number of words in LX/LY has to be within the range between 0 to 200h (0 to 512).
 (Check the total number of words of the LX/LY setting (1) and the LX/LY setting (2) as well.)
- (6) Set the transfer table so that the send ranges of the I/O master station do not overlap.
- (7) Set the transfer table so that the receive ranges of the I/O master station do not overlap.

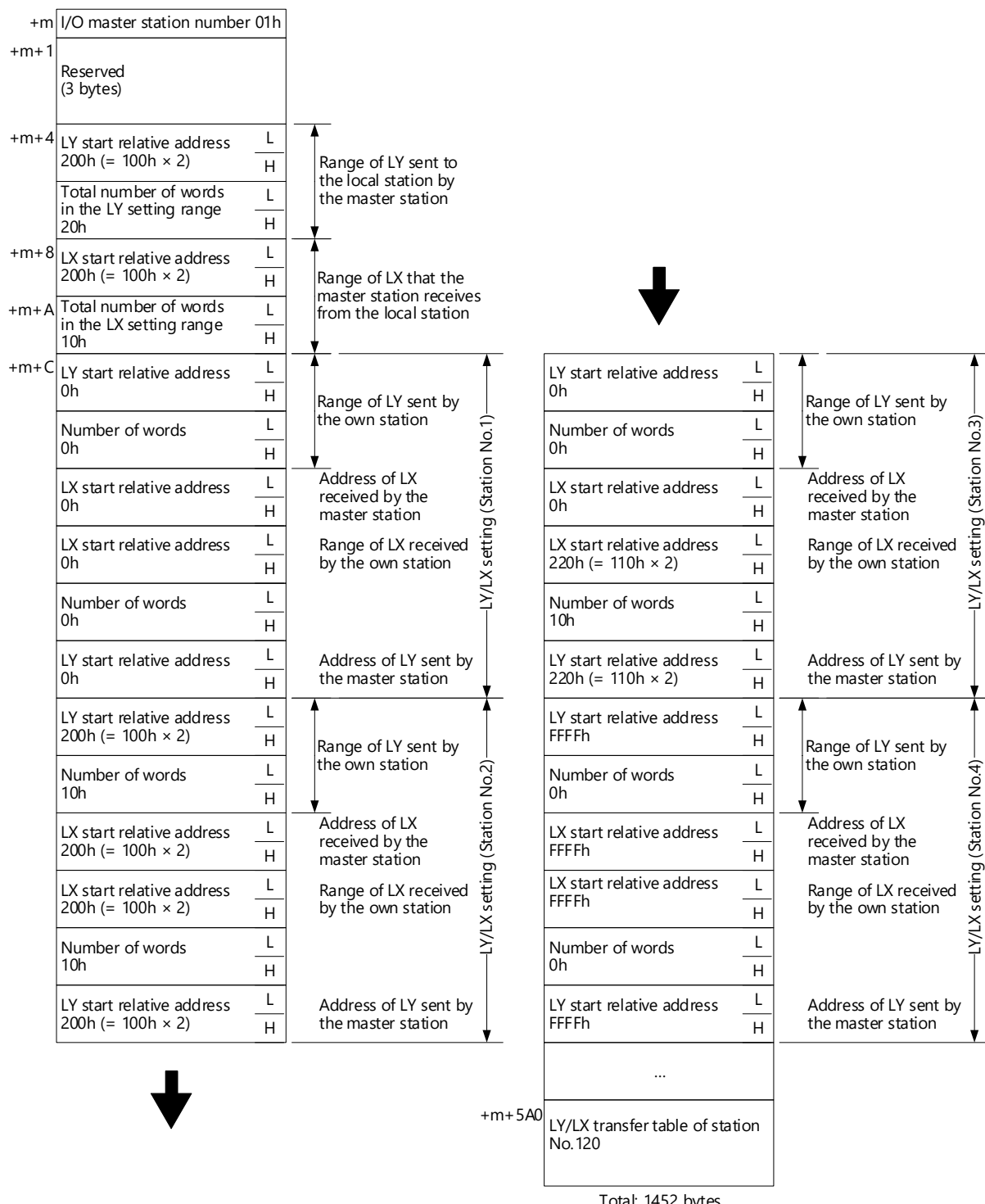
Setting example of LX/LY setting parameters

Set values

Station No.	Master station (I/O master station) → Local station (another station)						Master station (I/O master station) ← Local station (I/O master station)					
	LX			LY			LX			LY		
	Points	Start	End	Points	Start	End	Points	Start	End	Points	Start	End
1 (I/O master station)												
2	256	1000	10FF	256	1000	10FF	256	1000	10FF	256	1000	10FF
3	256	1100	11FF	256	1100	11FF						

Actual parameter settings

Byte address

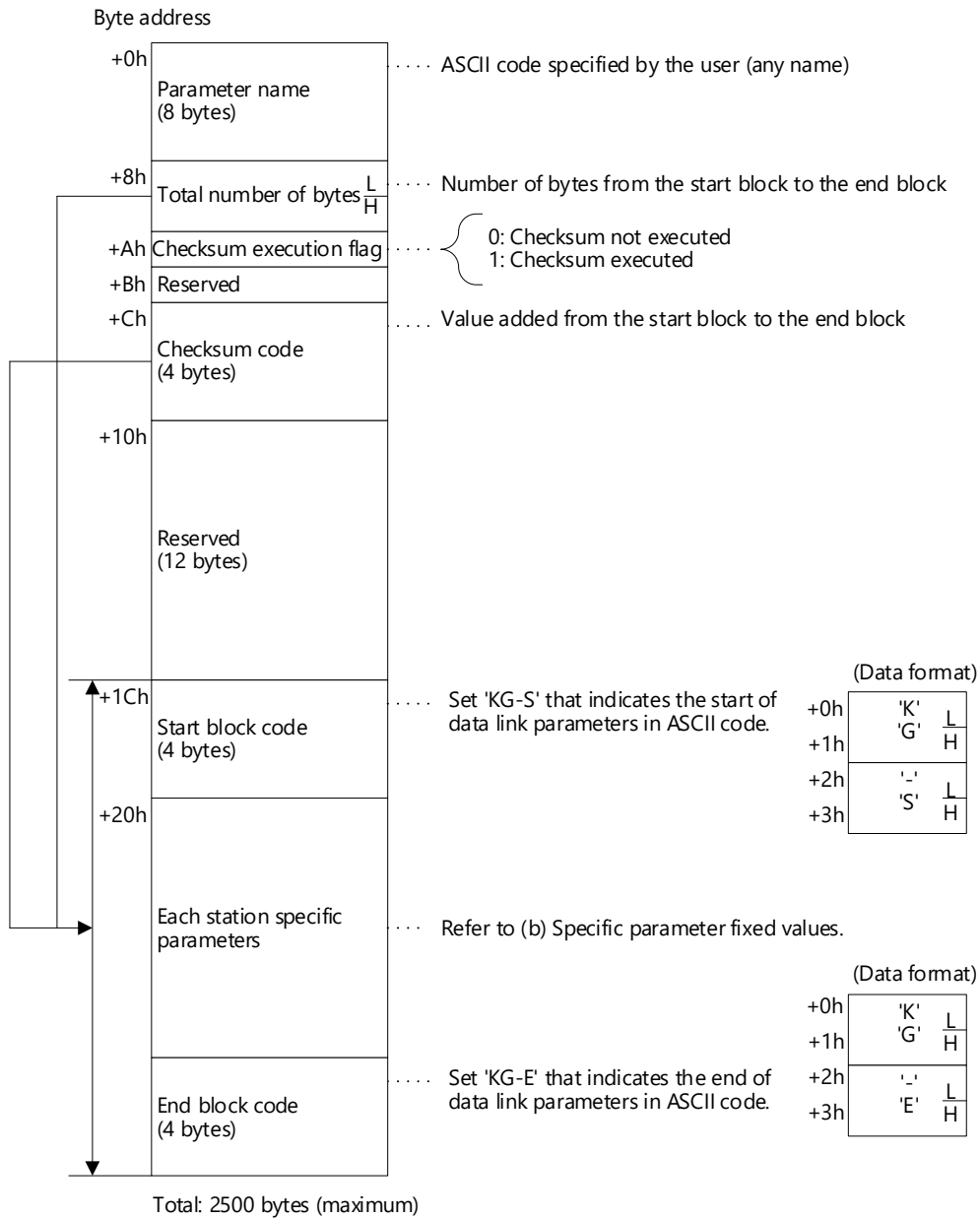


(2) Specific parameters

Specific parameters are used to set the specific settings for each station.

(a) Specific parameters (overall configuration)

[Data structure]



Note

Specific parameters must be created.

(b) Specific parameter fixed values

[Data structure]

Byte address

+20h	Fixed to 0	L H
+22h	Specific parameter version	
	Reserved (Fixed to 00h)	
+24h	Fixed to FFFFh	
+24h	Fixed to FFFFh	
+26h	Fixed to FFFFh	
+28h	Fixed to FFFFh	
+2Ah	Reserved (Fixed to 00h) (24 bytes)	
+43h		

Total: 36 bytes (fixed)

Specific parameter version

- 1: When the CC-Link IE Controller Network extended mode is not used
- 3: When the CC-Link IE Controller Network extended mode is used

Note

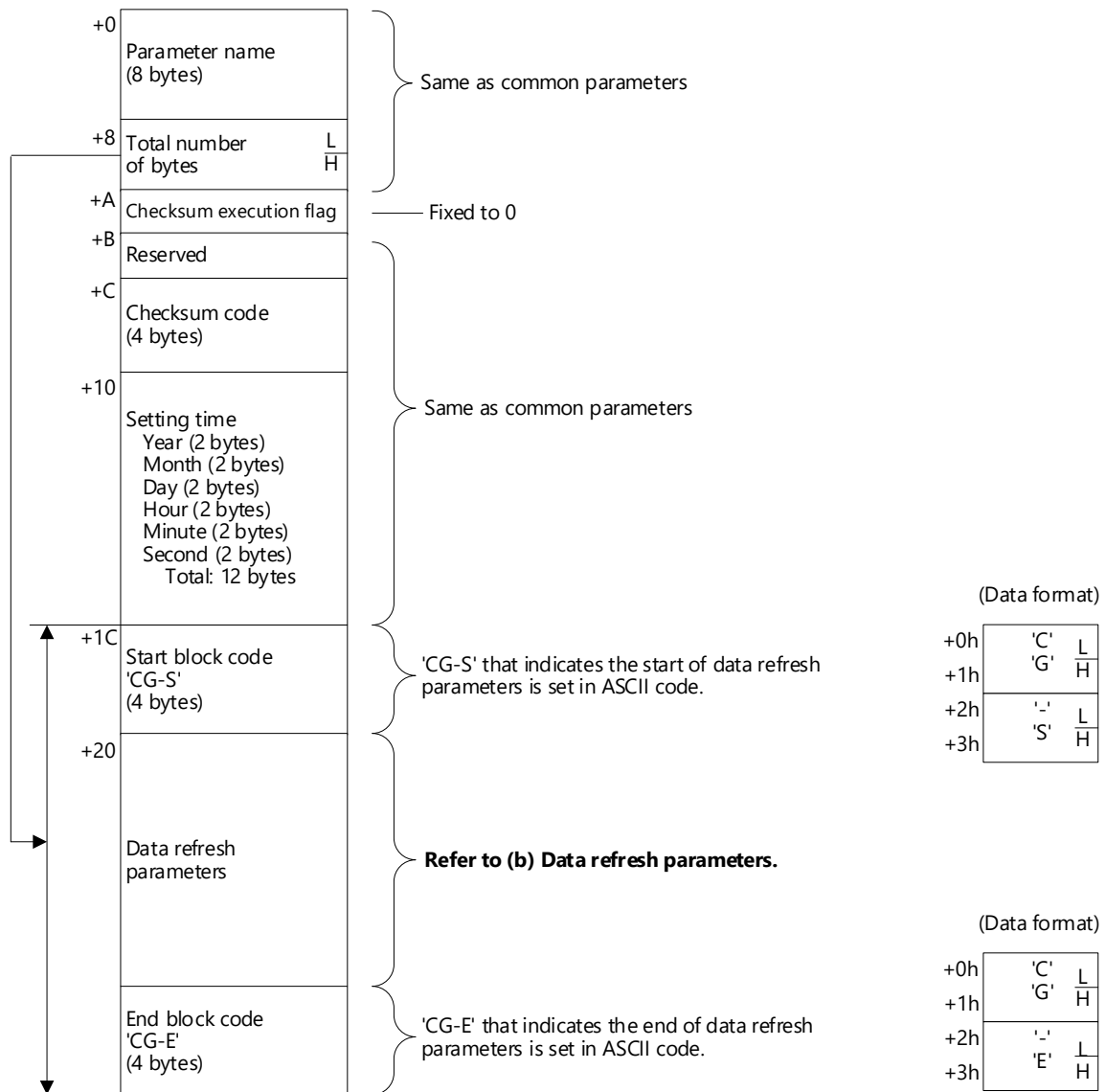
- (1) Set the reserved areas to "00h".
- (2) Each offset address indicates a distance (in units of bytes) from the start address of the specific parameters for each station.
- (3) Regardless of the parameter setting status, secure areas for all items specified by the offset addresses.

(3) Refresh table

To operate the host as a control station, a refresh table is used for the board to notify the driver of information such as a send range of the own station and receive range of each station.

(a) Refresh table (overall configuration)

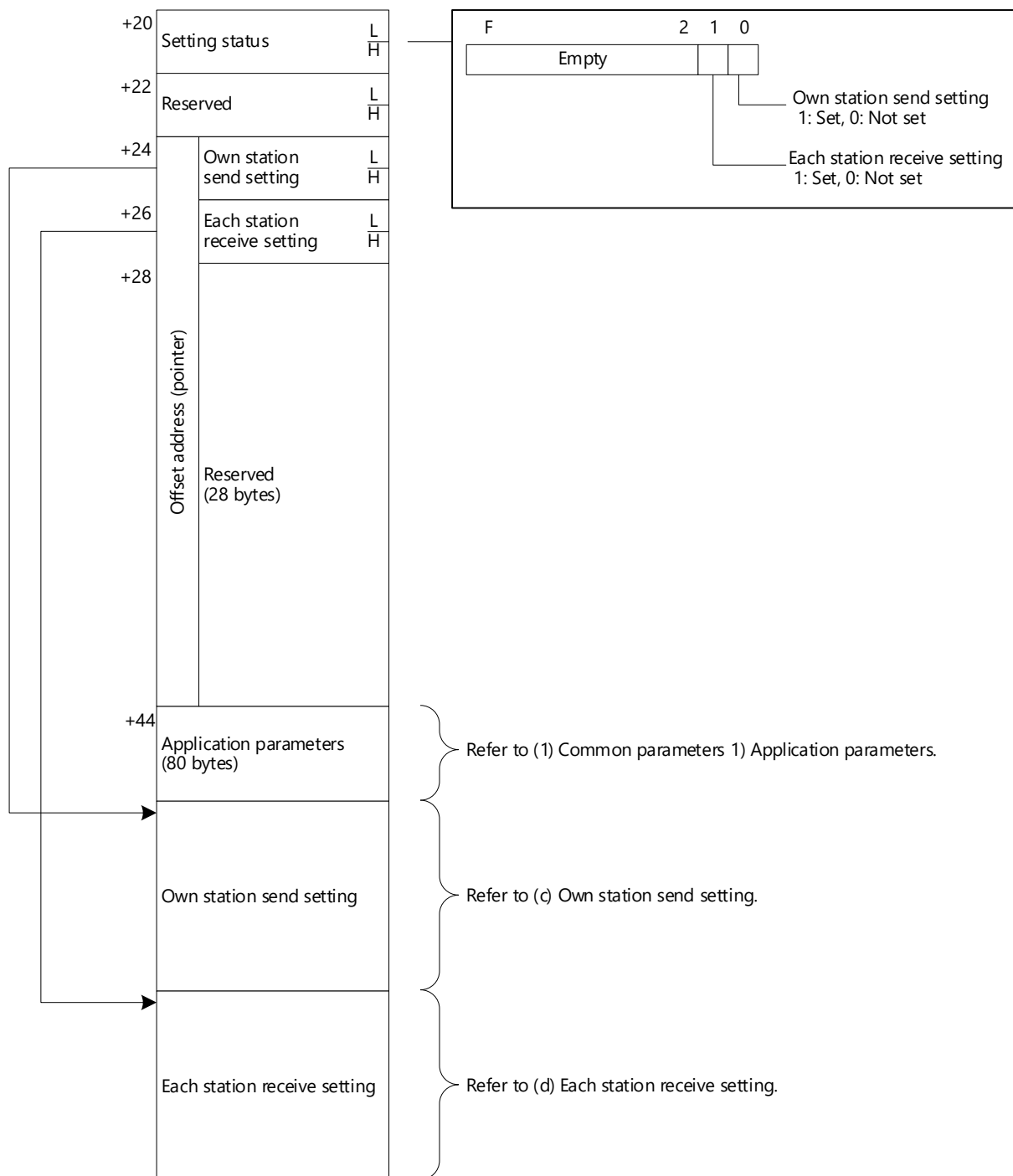
[Data structure]



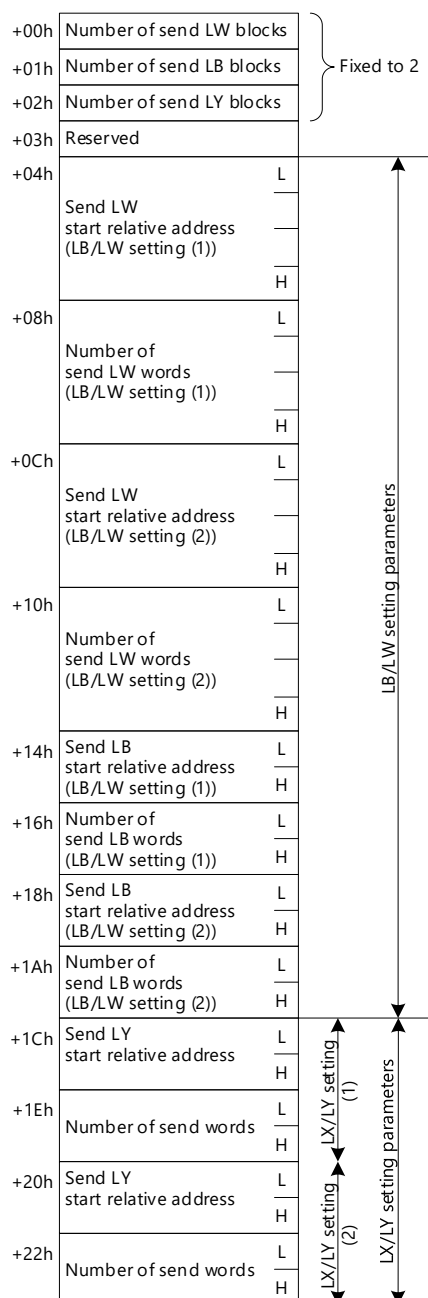
Note

Normal stations use the common parameter sequence (PRSQ) to exchange refresh tables between the board and the driver. (Refer to Section 5.4.3 "Common parameter sequence (normal station)".)
The driver reads refresh tables when the state of the PRSQ transitions to "05h".
After reading tables, the driver has to change the state of PRSQ to "06h".
When exchanging refresh tables, the parameter block sequence (BKSQ) is not used.

(b) Data refresh parameters
[Data structure]



(c) Own station send setting
[Data structure]



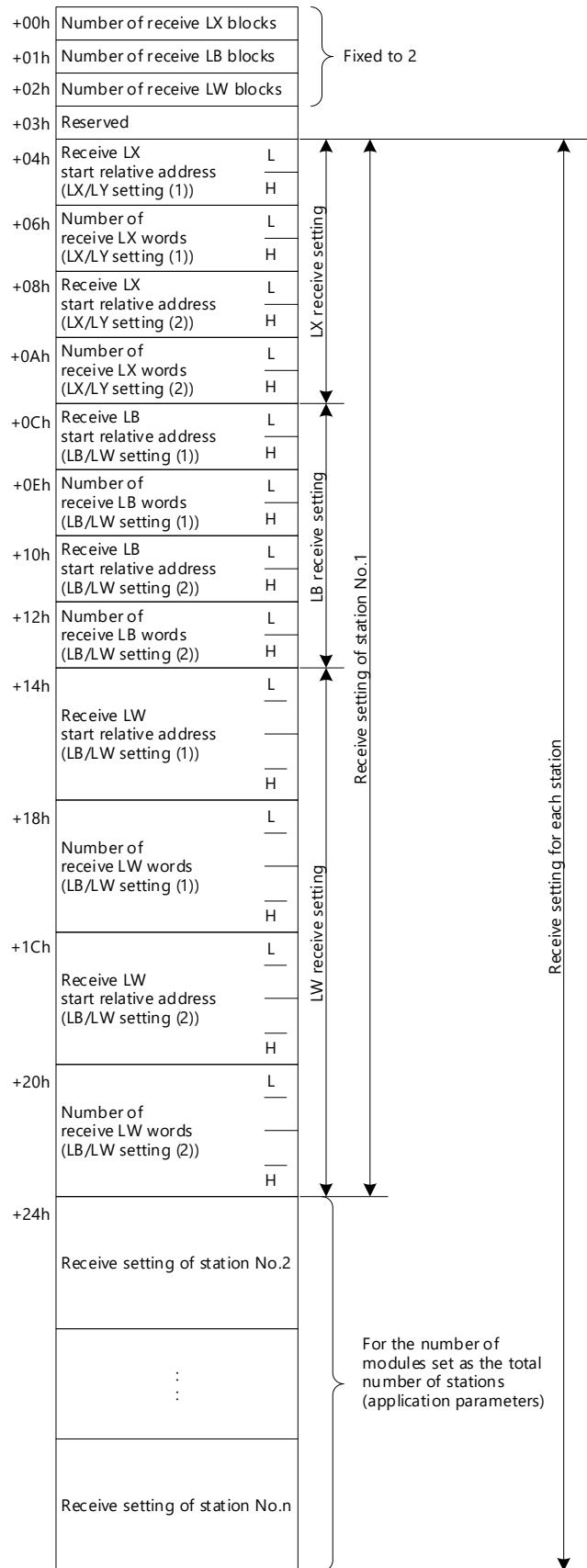
Note

(1) Regardless of the parameter setting status, secure all the send setting areas.

For the empty areas, set the start relative address to FFFFFFFFh and the number of words to 0 (zero).

(2) Each start relative address of LB/LW/LY indicates a distance (in units of bytes) from the start address of each device area.

(d) Each station receive setting
[Data structure]



Note

- (1) For the empty areas, set the start relative address to FFFFFFFFh and the number of words to 0 (zero).
- (2) Each start relative address of LB/LW/LX indicates a distance (in units of bytes) from the start address of each device area.

5.3.3 Parameter setting sequences

Parameters are set by performing a handshake between the driver and the board using the parameter exchange sequences (specific parameter sequence (SPSQ) and common parameter sequence (PRSQ)).

(1) Overview of the parameter setting sequences

Parameter exchange sequences differ between a control station and a normal station.

The following are the parameter exchange sequences used for each station.

Table 5.3.3-1 Control Station

No.	Parameter exchange sequence	Reference
1	Specific parameter sequence (SPSQ)	Section 5.4.1
2	Common parameter sequence (control station) (PRSQ)	Section 5.4.2

The driver has to write the specific parameters first and then write common parameters.

Table 5.3.3-2 Normal Station

No.	Parameter exchange sequence	Reference
1	Specific parameter sequence (SPSQ)	Section 5.4.1
2	Common parameter sequence (normal station) (PRSQ)	Section 5.4.3

When the state of SPSQ transitions to "FEh" or "FFh", the state of PRSQ transitions to 02h or forward. Follow the sequence.

5.4 Parameter Exchange Sequences

This section describes the parameter exchange sequences.

5.4.1 Specific parameter sequence

The following figure shows the exchange sequence and block sequence for setting specific parameters together with interrupt timing.

For details on setting and resetting interrupts, refer to Section 5.1.2 "Interrupt processing".

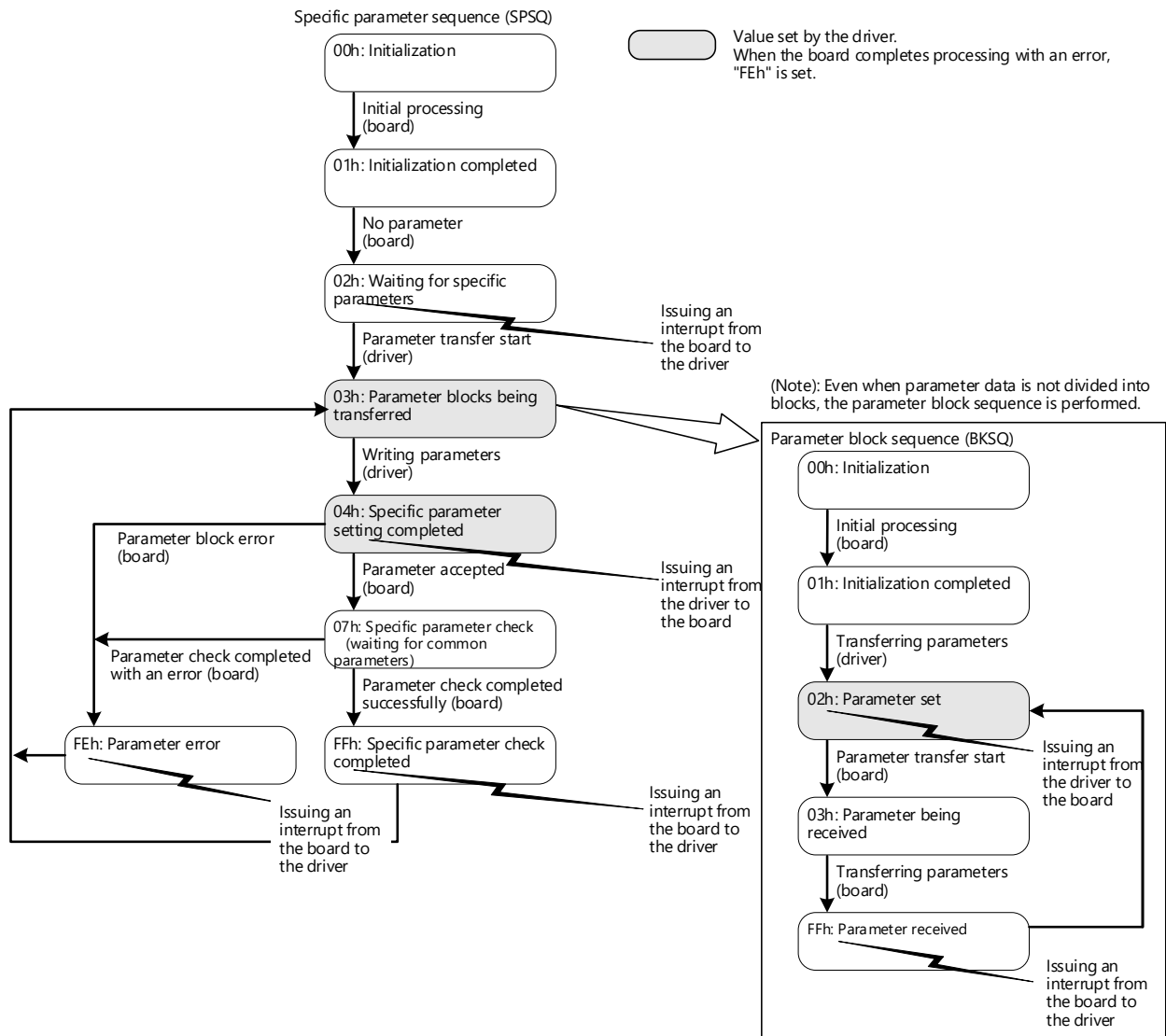


Figure 5.4.1-1 Specific Parameter Sequence

5.4.2 Common parameter sequence (control station)

The following figure shows the exchange sequence and block sequence for setting common parameters (writing parameters to the board) together with interrupt timing.

For details on setting and resetting interrupts, refer to Section 5.1.2 "Interrupt processing".

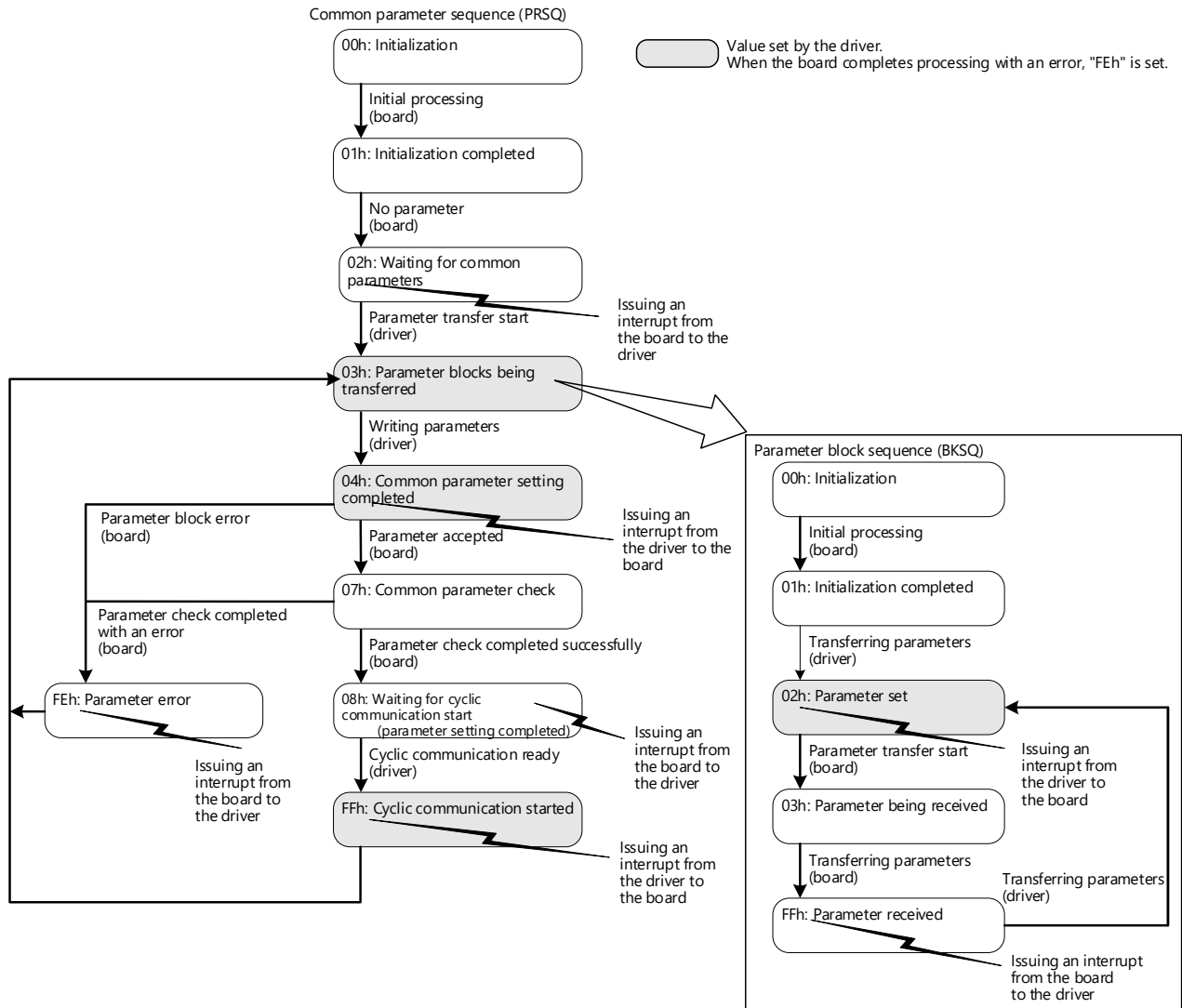


Figure 5.4.2-1 Common Parameter Sequence (Control Station)

5.4.3 Common parameter sequence (normal station)

The following figure shows the exchange sequence for setting common parameters (reading parameters to the driver) together with interrupt timing.

For details on setting and resetting interrupts, refer to Section 5.1.2 "Interrupt processing".

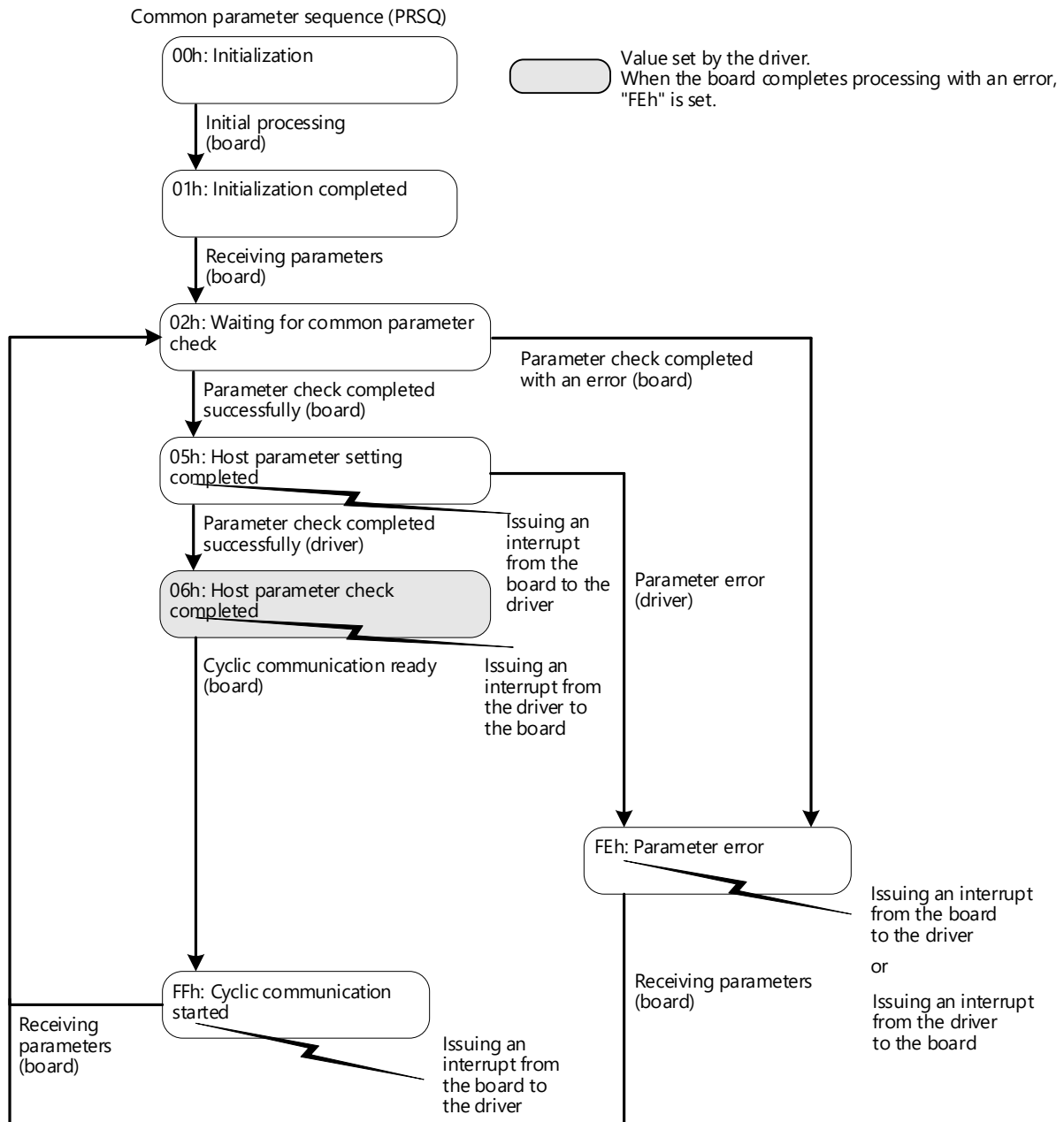


Figure 5.4.3-1 Common Parameter Sequence (Normal Station)

5.4.4 Parameter block sequence

In the common parameter sequence, the actual parameter size is bigger than the parameter setting area size. Therefore, the parameter block sequence is required. This section describes the details of the parameter block sequence.

(1) Parameter block transfer image

When the actual parameter size of the host is bigger than the parameter setting area size of the board, the parameter block sequence is required.

In the figure shown below, the actual parameter size (1748h (5960 bytes)) is bigger than the parameter setting area size (0C00h (3072 bytes)). In this case, the actual parameter size is divided into "0C00h (3072 bytes)" and "0B48h (2888 bytes)" and parameters are set twice.

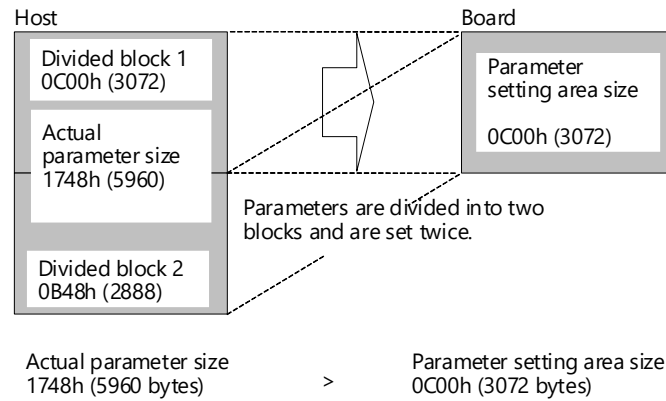


Figure 5.4.4-1 Parameter Block Transfer Image

(2) Details of the parameter block transfer image

The following figure shows the details of the parameter block transfer image.

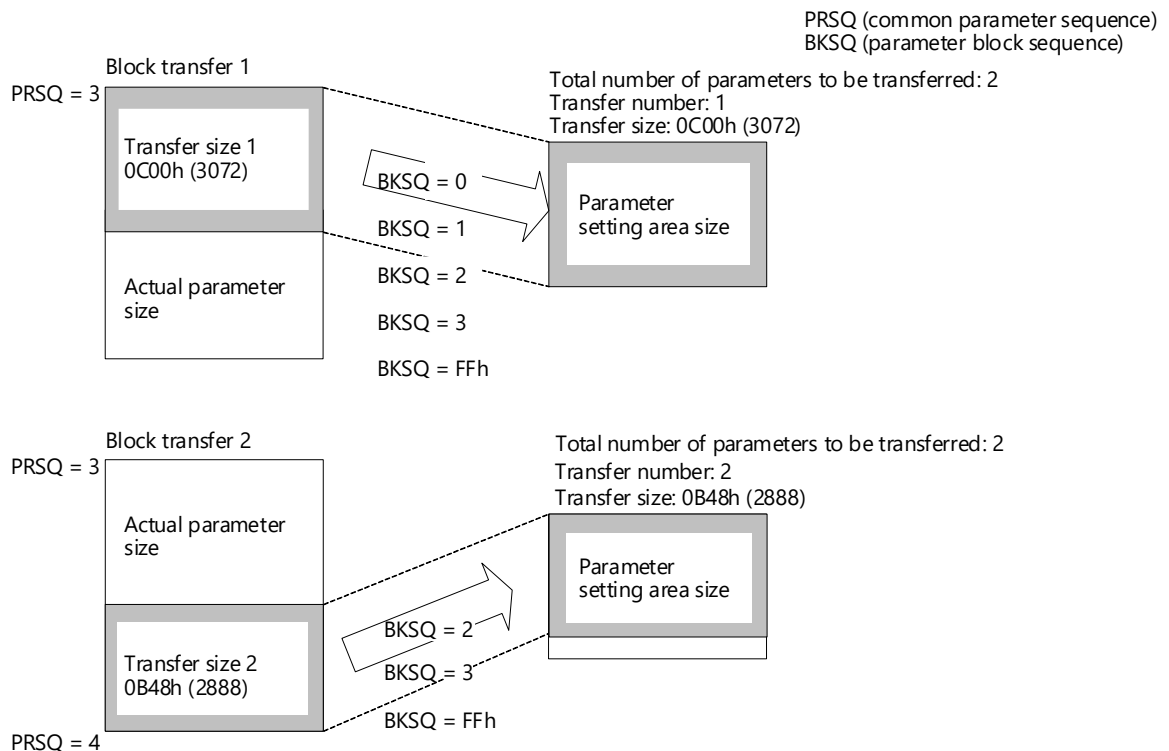


Figure 5.4.4-2 Details of Parameter Block Transfer Image

(3) Parameter block sequence

The block transfer is performed using the data stored in the areas, "Total number of parameters to be transferred", "Transfer number" and "Transfer size", which are specified by the offset addresses in the parameter setting information area.

The following figure shows the parameter block sequence.

Common parameter sequence (PRSQ)

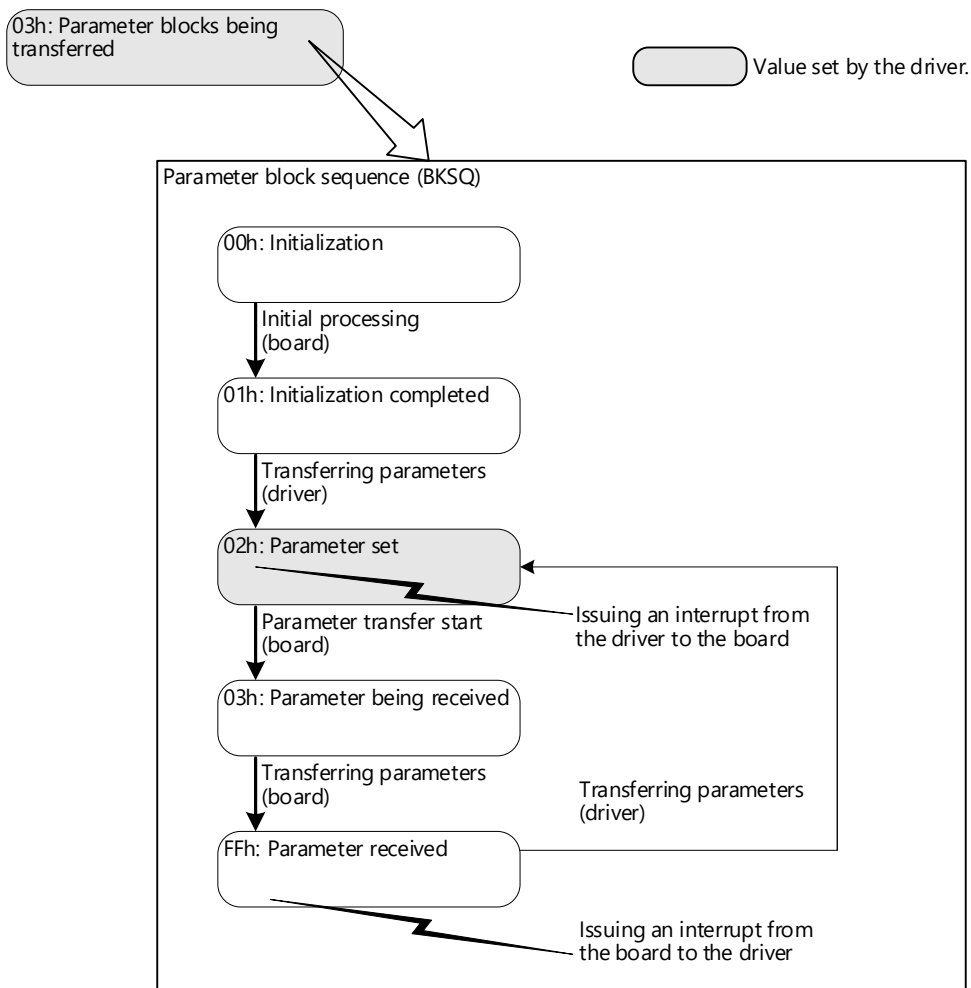


Figure 5.4.4-3 Parameter Block Sequence

5.5 Cyclic Transmission Processing

This function periodically exchanges data among the stations on the same network using link devices (LB/LW/LX/LY) of the board.

To communicate data with other stations, the driver, which is implemented to the own station, reads/writes data from/to the link device area of the 2-port memory.

5.5.1 Data communications of link devices

Data in the link devices (LB/LW/LX/LY) is communicated as follows.

(1) Communication using LB/LW

This function allows each station to write data to its own send range of link devices (LB/LW) to send them to all other stations on the network. The link relay (LB) is for the on/off information. The link register (LW) is for 16-bit data.

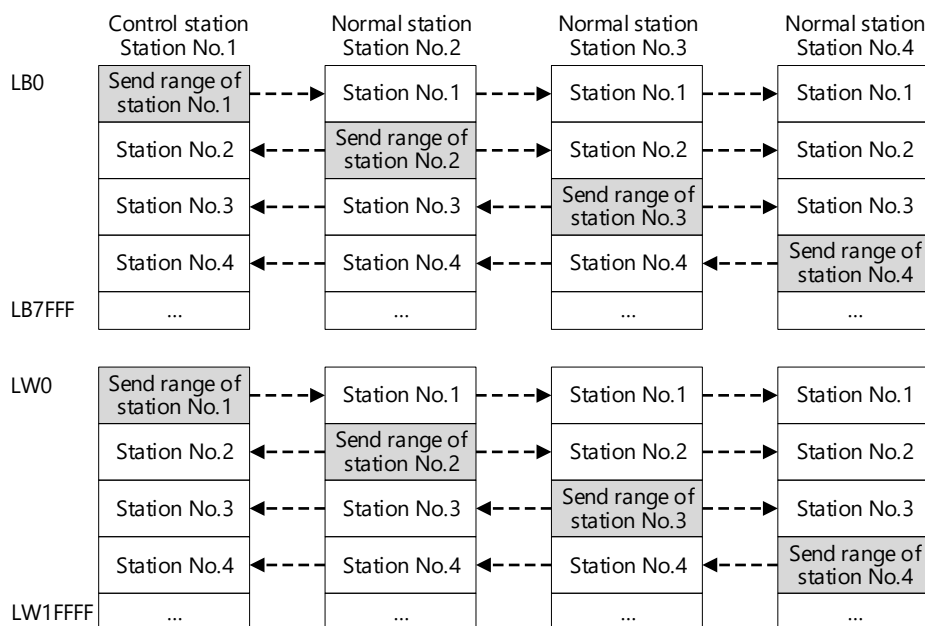


Figure 5.5.1-1 Example of Communication using LB/LW

(2) Communication using LX/LY

This function exchanges data between the I/O master station that controls LX/LY and another station on a one-to-one (1:1) basis.

The link input (LX) is for the information input from each station in a block to the I/O master station. The link output (LY) is for the information output from the I/O master station to each station in a block.

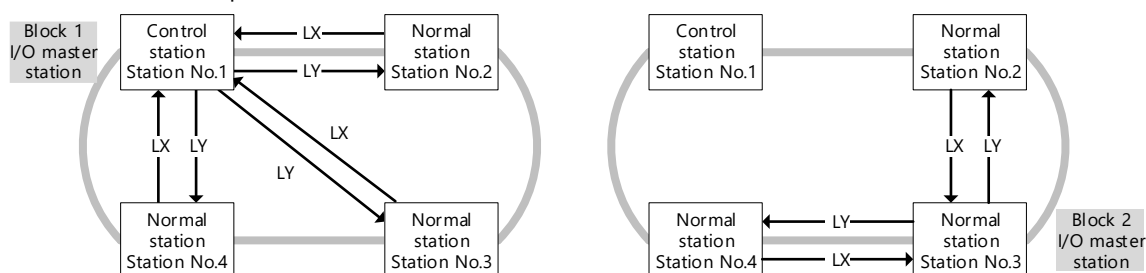


Figure 5.5.1-2 Example of Communication using LX/LY

5.5.2 Cyclic data send/receive processing

(1) Receive processing

The board writes the receive data to the LX/LB/LW areas, and the driver reads the data from these areas. For details on the receive flag, refer to Section 5.5.3 "Assurance of cyclic data integrity".

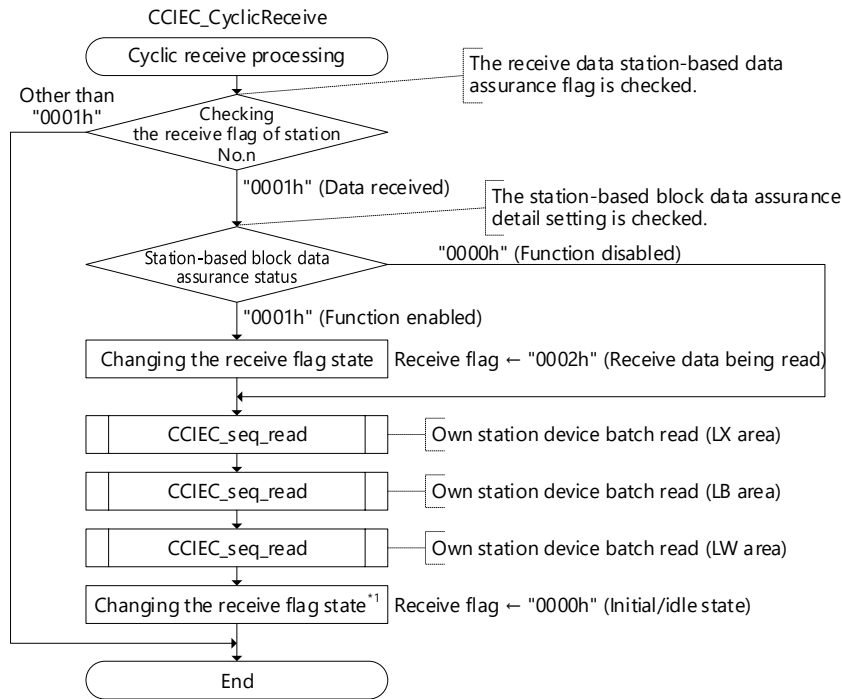


Figure 5.5.2-1 Receive Processing

*1: Even when the station-based block data is not assured, change the receive flag state to "0000h" (Initial/idle state) to read data from the LX/LB/LW areas without fail.

(2) Send processing

The driver writes the send data to the LY/LB/LW areas, and the board reads the data from these areas and send them to other stations. For details on the send flag, refer to Section 5.5.3 "Assurance of cyclic data integrity".

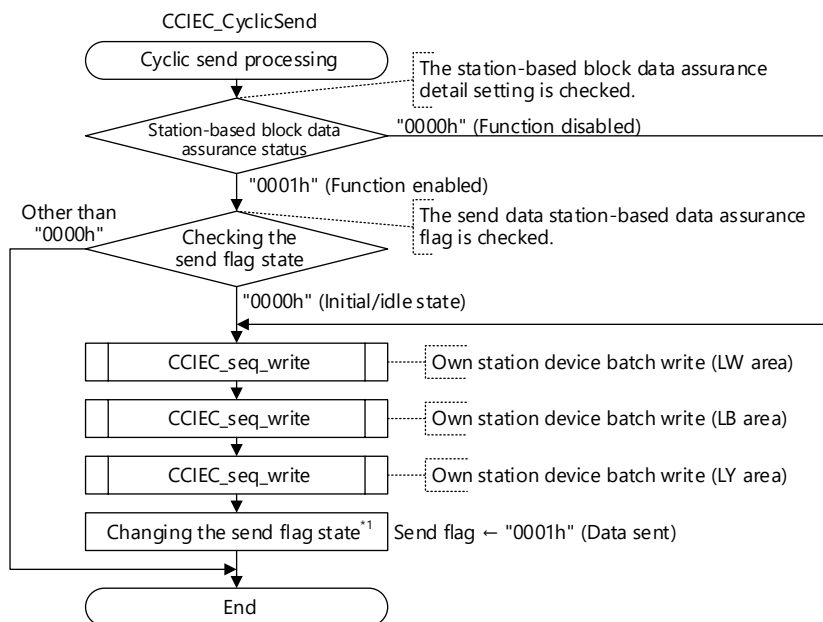


Figure 5.5.2-2 Send Processing

*1: Even when the station-based block data is not assured, change the send flag state to "0001h" (Send data exists) to write data to the LY/LB/LW areas without fail.

5.5.3 Assurance of cyclic data integrity

The link scan of the board and the cyclic data read/write processing of the driver are performed asynchronously. When data of 32 bits (2 words) or more is handled, new data and old data may be mixed in units of 16 bits (1 word) depending on the cyclic data read/write timing.

To prevent this, the following two methods are provided.

Method	Required processing	Implemented to
Station-based block data assurance	Handshake between the driver and the board	Driver
Station-to-station interlock program	Handshake between the own station and another station	Application

(1) Station-based block data assurance

This function assures the cyclic data per station by performing a handshake between the driver and the board during the cyclic data read/write processing.

The function is enabled by setting "1b" (Supported) in application parameters of the control station.

(a) State transition of the receive flag

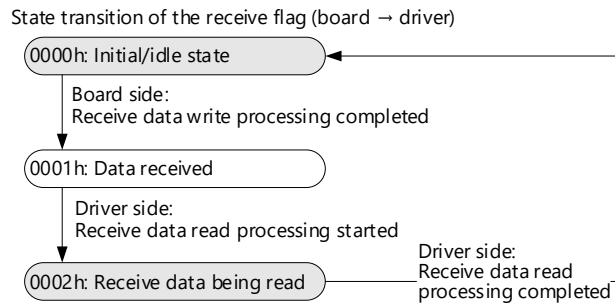


Figure 5.5.3-1 State Transition of the Receive Flag

Table 5.5.3-1 State Transition Details of the Receive Flag

State	State name	Description	Processing performed by the driver/board
0000h	Initial/idle state	The driver has read the receive data from the LB/LW/LX areas, and the board can write the receive data to these areas.	The board changes the flag state to "0001h" upon completion of the receive data write processing.
0001h	Data received	The board has written the receive data to the LB/LW/LX areas, and the driver can read the receive data from these areas.	The driver changes the flag state to "0002h" at the start of the receive data read processing.
0002h	Receive data being read	The driver is reading the receive data from the LB/LW/LX areas.	The driver changes the flag state to "0000h" upon completion of the receive data read processing.

(b) State transition of the send flag

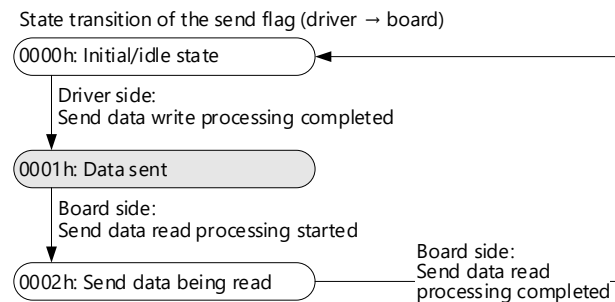


Figure 5.5.3-2 State Transition of the Send Flag

Table 5.5.3-2 State Transition Details of the Send Flag

State	State name	Description	Processing performed by the driver/board
0000h	Initial/idle state	The board has read the send data from the LB/LW/LY areas, and the driver can write the send data to these areas.	The driver changes the flag state to "0001h" upon completion of the send data write processing.
0001h	Data sent	The driver has written the send data to the LB/LW/LY areas, and the board can read the send data from these areas.	The board changes the flag state to "0002h" at the start of the send data read processing.
0002h	Send data being read	The board is reading the send data from the LB/LW/LY areas.	The board changes the flag state to "0000h" upon completion of the send data read processing.

(2) Station-to-station interlock program

When handling cyclic data of 32 bits or more without enabling the station-based block data assurance function, send the cyclic data by programming an interlock in the application.

A handshake using the link relay (LB) can prevent data inconsistency of the link register (LW).

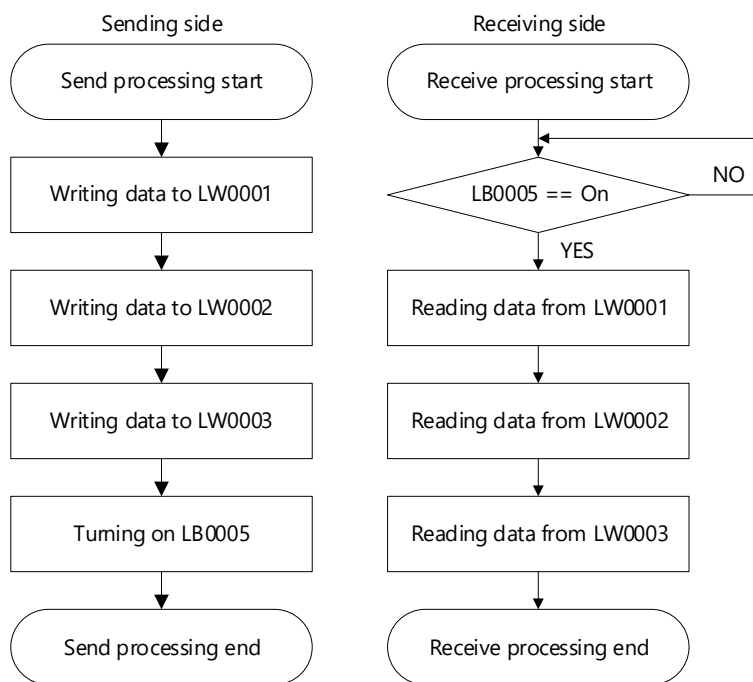


Figure 5.5.3-3 Example of Interlock Procedure using LB/LW

5.5.4 Access to link devices

Follow the steps below to access link devices.

1. Read the device information area start address.
(Refer to Section 3.2.2(3) System area.)
2. Calculate the offset addresses of each address area and size area for link devices from the device information area start address.
(Refer to Section 3.2.5(2) Device information area.)
3. Read data from each address area and size area.

The offset address of link device in the 2-port memory area is stored in each address area. The link device size is stored in each size area. The following figure shows an example of the link device storage location.

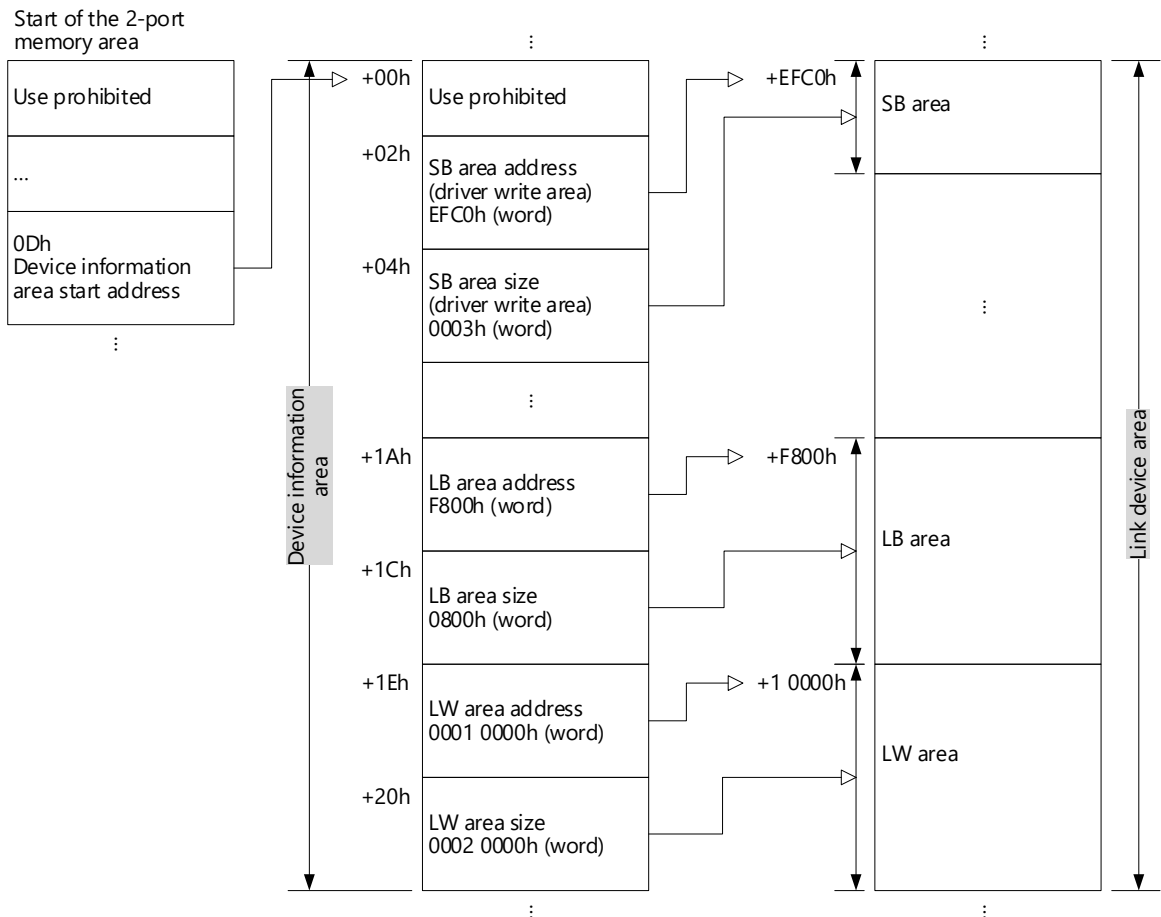


Figure 5.5.4-1 Access to Link Devices

*1: The device information area addresses are the word offset addresses from the system area start address. To access these areas, convert the addresses to the byte offset addresses (double the values).

Point
The address and size of each area shown in the figure are not the fixed value. Acquire them from the device information area.

5.6 Transient Transmission Processing

This function communicates data when the own station receives a communication request from another station or when an application of the own station sends a communication request to another station.

To perform transient transmission, the driver, which is implemented to the own station, reads/writes transient data from/to the transient transmission processing area.

The function described in this manual uses CC-Link compatible transient frames and communicates data with another station using the following five commands.

- Device access information acquisition
- Remote RUN
- Remote STOP
- Device read
- Device write

5.6.1 Overview of the transient transmission processing

- (1) When the own station sends a transient request (when the own station is a client)

The driver writes request data to the transient transmission processing area and sends a request to another station. Another station that has received the request sends a response, and the driver reads the response data from the transient transmission processing area.

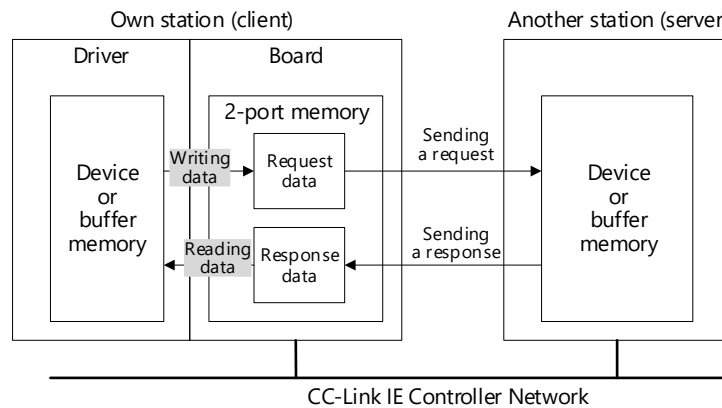


Figure 5.6.1-1 Image of Transient Transmission Request Send/Response Receive

- (2) When the own station receives a transient request from another station (when the own station is a server)

The driver reads request data from the transient transmission processing area.

The driver writes response data to the transient transmission processing area and sends a response to another station.

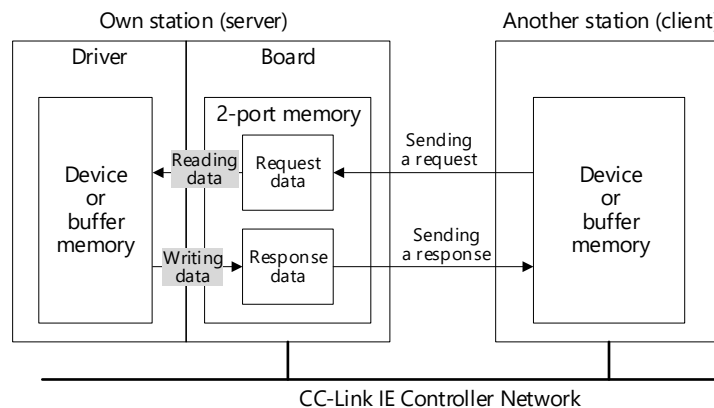


Figure 5.6.1-2 Image of Transient Transmission Request Send/Response Receive

5.6.2 CC-Link compatible transient send/receive processing

Send data and receive data are stored in the transient transmission processing area of the 2-port memory.

The transient transmission processing area has two areas: handshake area and data area.

Each handshake area and data area are divided into eight areas: four areas for send data and four areas for receive data, and the function uses empty areas.

(1) CC-Link compatible transient request send/response receive processing (when the own station is a client)

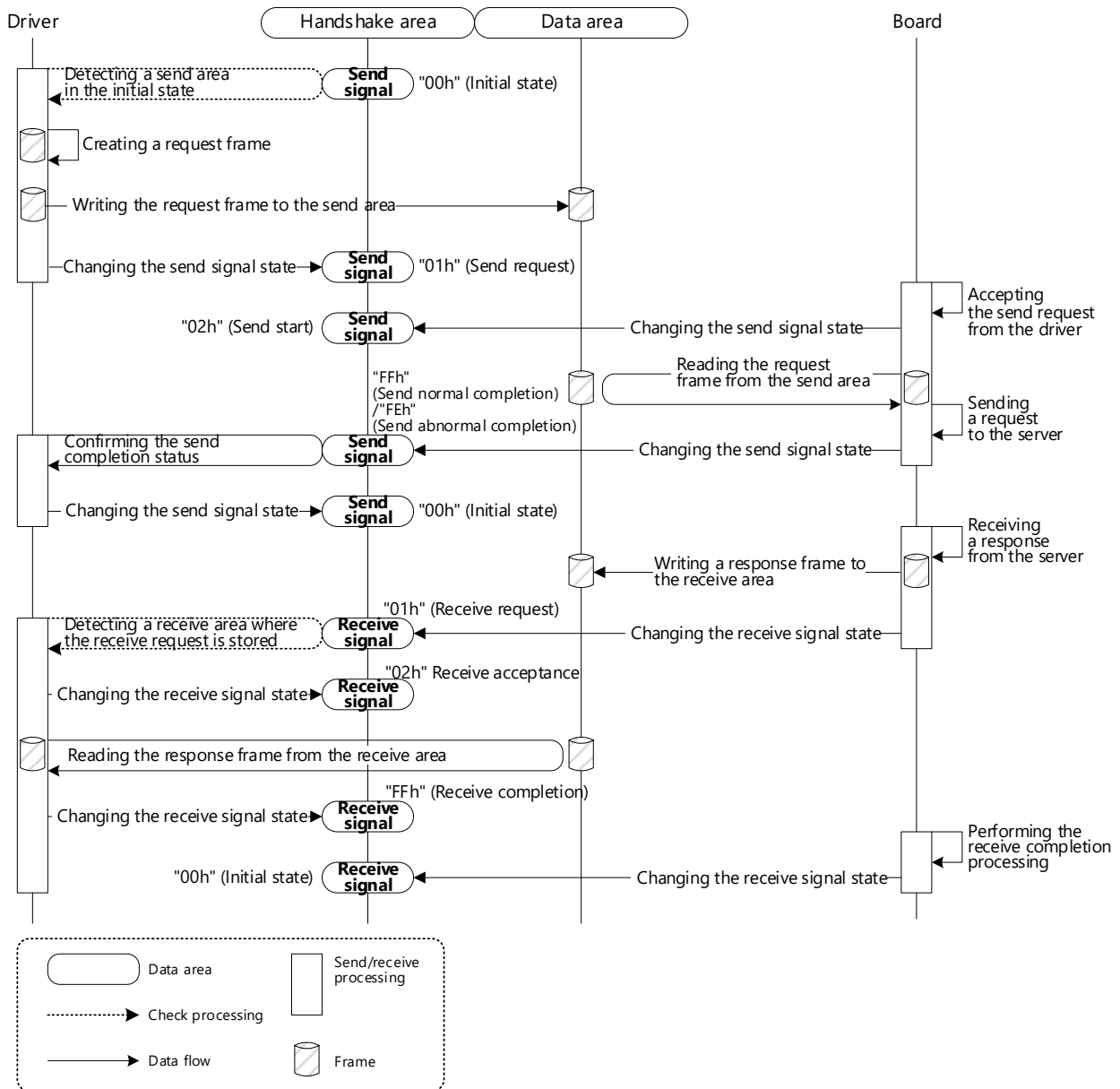


Figure 5.6.2-1 CC-Link Compatible Transient Request Send/Response Receive Processing

(2) CC-Link compatible transient request receive/response send processing (when the own station is a server)

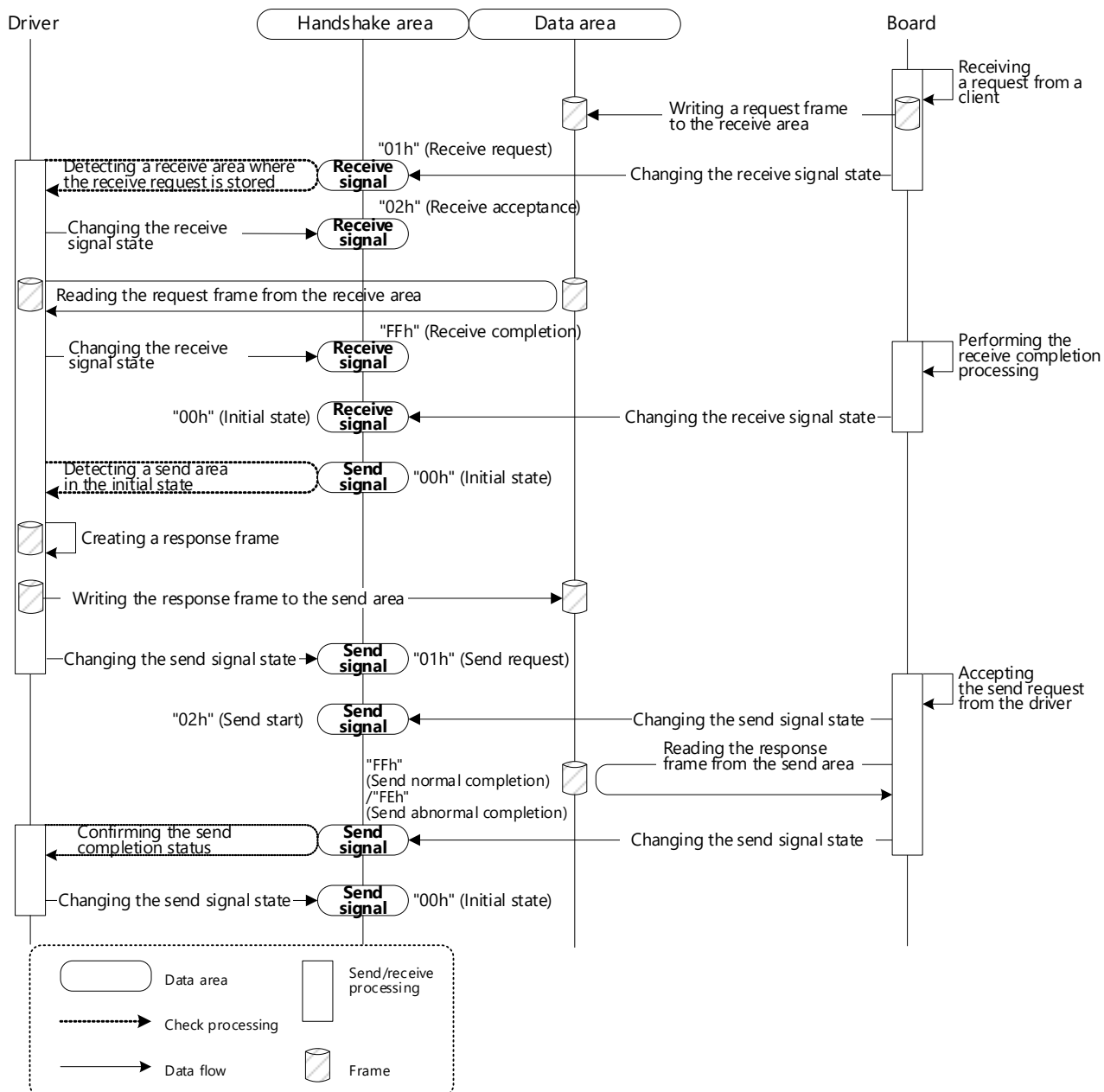


Figure 5.6.2-2 CC-Link Compatible Transient Request Receive/Response Send Processing

5.6.3 CC-Link compatible transient handshake processing

The data read/write processing between the driver and the board uses the send signal and the receive signal to control the state of its processing. A handshake is performed between the driver and the board by changing the state of the send signal and the receive signal.

(1) State transition of the send signal

The following figure shows the state transition of the transient send signal during the request/response send processing. The driver notifies the application of the send completion status ("FFh" (Send normal completion) or "FEh" (Send abnormal completion)). Implement the processing that displays the received information with the application.

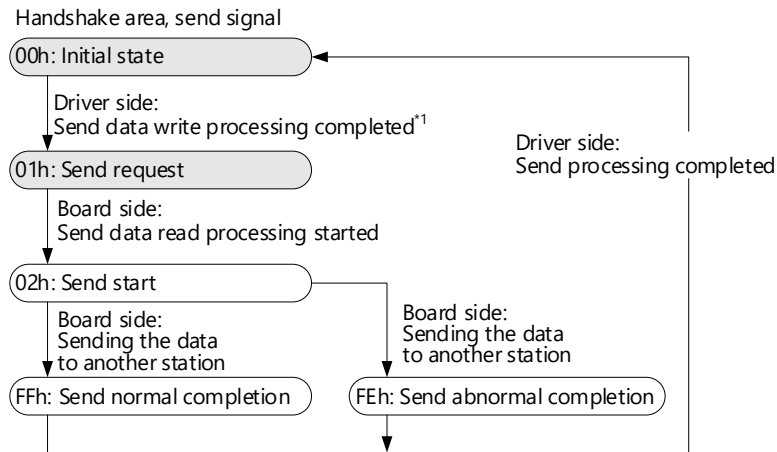


Figure 5.6.3-1 State Transition of the Transient Send Signal During Request/Response Send Processing

*1: For details on the send data, refer to Appendix 3 "Frame Format".

The following table lists the states of the transient send signal during the request/response send processing.

Table 5.6.3-1 States of the Transient Send Signal During Request/Response Send Processing

State	State name	Description
00h	Initial state	Data area is empty. • The board sets the signal to this state at power-on. • After confirming the transient send completion status, the driver sets the signal to this state.
01h	Send request	There is send data in the data area. • After setting the send data in the send data area, the driver sets the signal to this state.
02h	Send start	Transient transmission to another station starts. • After confirming the send request, the board sets the signal to this state.
FFh	Send normal completion	• When transient transmission to another station is completed successfully, the board sets the signal to this state.
FEh	Send abnormal completion	• When transient transmission to another station is completed with an error, the board sets the signal to this state.

(2) State transition of the receive signal

The following figure shows the state transition of the transient receive signal during the request/response receive processing.

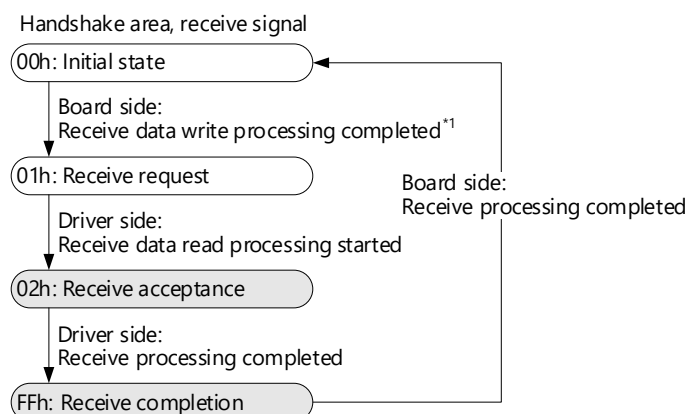


Figure 5.6.3-2 State Transition of the Transient Receive Signal During Request/Response Receive Processing

*1: For details on the receive data, refer to Appendix 3 "Frame Format".

The following table lists the states of the transient receive signal during the request/response receive processing.

Table 5.6.3-2 States of the Transient Receive Signal During Request/Response Receive Processing

State	State name	Description
00h	Initial state	Data area is empty. • The board sets the signal to this state at power-on. • After confirming the data receive completion status, the board sets the signal to this state.
01h	Receive request	There is receive data in the data area. • After setting the receive data in the receive data area, the board sets the signal to this area.
02h	Receive acceptance	The data received from another station is read. • After confirming the receive request, the driver sets the signal to this state.
FFh	Receive completion	•After reading the receive data, the driver sets the signal to this state.

(Note) When reading the receive data, the driver checks that the received response data corresponds to the request data.

5.7 Re-setting Parameters

To re-set parameters, reset the board or cycle the power to the host.

For the board reset procedure, refer to Section 5.2.2 "Details of the firmware initial processing".

5.8 Other Functions

5.8.1 Alive check function

The board detects an error of the host using the timer of the board.

If the timer of the board cannot be reset within the time set for the interval timer (monitoring time), an alive check error occurrence interrupt is issued from the board to the driver. The board outputs the error status to SB and SW so that another station can check the error status of the own station (host).

The following describes the alive check function enablement procedure and the interval timer reset procedure.

(1) Alive check function enablement procedure

The following figure shows how to enable the alive check function.

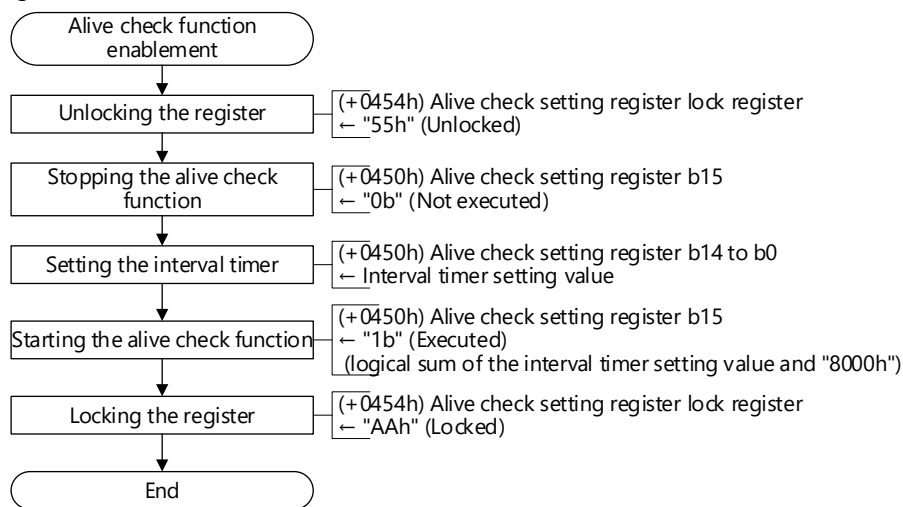


Figure 5.8.1-1 Alive Check Function Enablement Procedure

(2) Interval timer reset procedure

The following figure shows how to reset the interval timer.

Reset the interval timer within the time set for the interval timer.

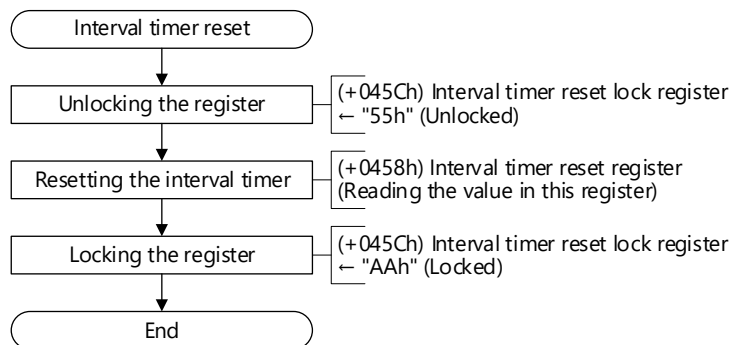


Figure 5.8.1-2 Interval Timer Reset Procedure

(3) Operation at error occurrence

When an alive check error occurs, the following (a) and (b) are performed. 1), 2), and 3) below are the operations of the board at the time of the error.

- (a) An interrupt is issued from the board to the driver and Alive check error interrupt (byte address: 0438h, bit: b3) is set to "1b" (Factor exists). (Refer to Section 3.3.3(7) Board status interrupt factor register.)
- (b) The driver sets Driver operation information (byte address: 20h, 21h, bit: b5 to b0) to "000010b" (Stopped due to a moderate error or a major error). (Refer to Section 3.2.4(2) Driver operation information.)
 - 1) The board stops cyclic transmission and does not send link device data of the own station to other stations.
 - 2) The board continues to perform baton pass and sends a token for sending data to another station.
 - 3) The corresponding bit of SW0100 to SW0107 (Controller operation status of each station (1)) is set to "1" (Stop error).

5.8.2 DMA transfer function

The PCI Express board supports the DMA transfer function.

This function directly transfers data between the 2-port memory area of the board and the work memory of the host, not through the CPU.

With this function, the data transfer time can be shortened compared to the sequential transfer by the CPU, and also the load on performance of the host can be reduced.

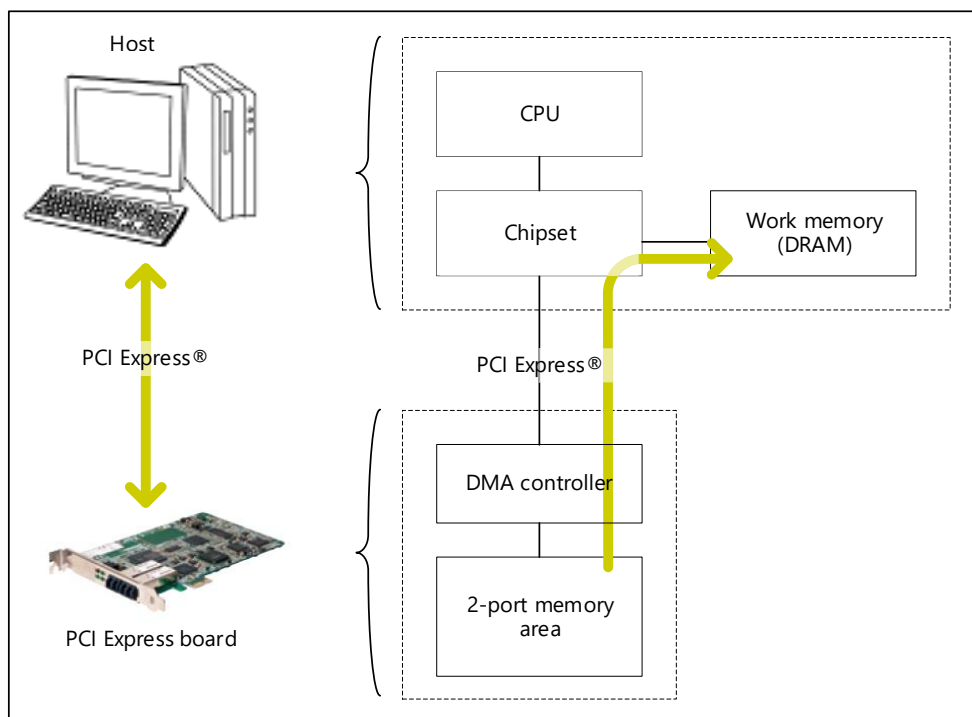


Figure 5.8.2-1 Data Transfer Using the DMA Transfer Function

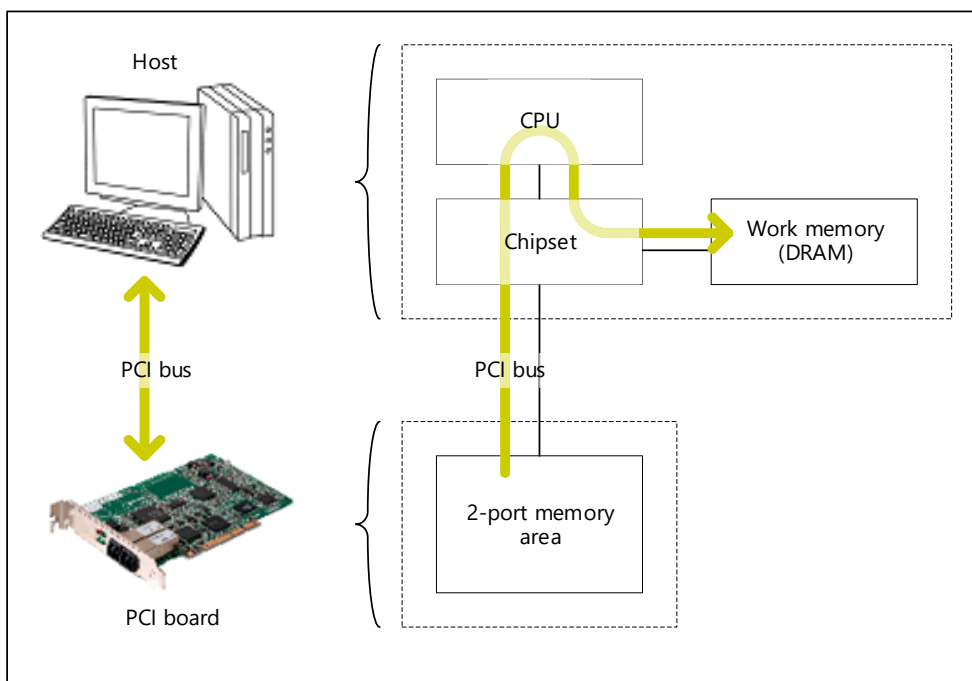


Figure 5.8.2-2 Sequential Data Transfer by the CPU

For how to set and control the DMA transfer function, refer to Section 5.8.2(1) DMA transfer processing procedure (when an interrupt is not used) and Section 5.8.2(2) DMA transfer processing procedure (when an interrupt is used).

Note

Only the PCI Express board supports the DMA transfer function. The PCI board does not support the function.

(1) DMA transfer processing procedure (when an interrupt is not used)
The DMA transfer processing procedure when an interrupt is not used is described below.

(a) DMA start processing

Perform this processing to start the DMA transfer processing.

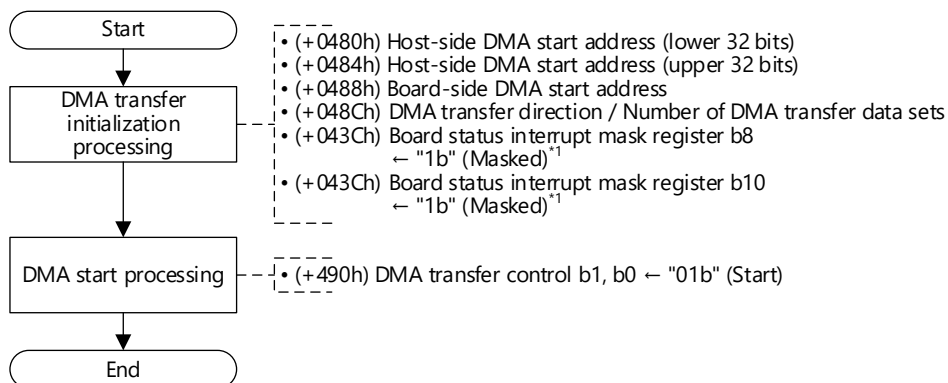


Figure 5.8.2-3 DMA Start Processing (When an Interrupt is not Used)

*1: This processing is implemented in the board reset processing function in sample code.

(b) DMA transfer completion check processing

After the DMA start processing, use this function to check that the DMA transfer processing is completed.

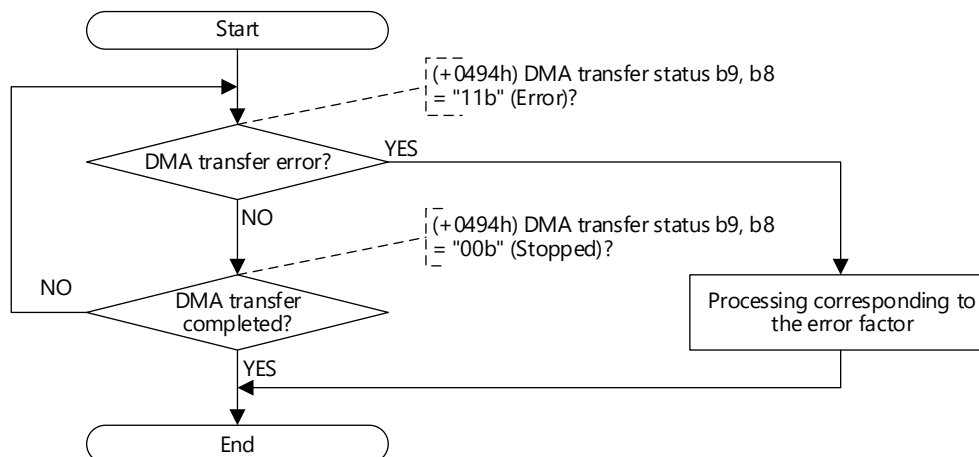


Figure 5.8.2-4 DMA Transfer Completion Check Processing (When an Interrupt is not Used)

(2) DMA transfer processing procedure (when an interrupt is used)
The DMA transfer processing procedure when an interrupt is used is described below.

(a) DMA start processing

Perform this processing to start the DMA transfer processing.

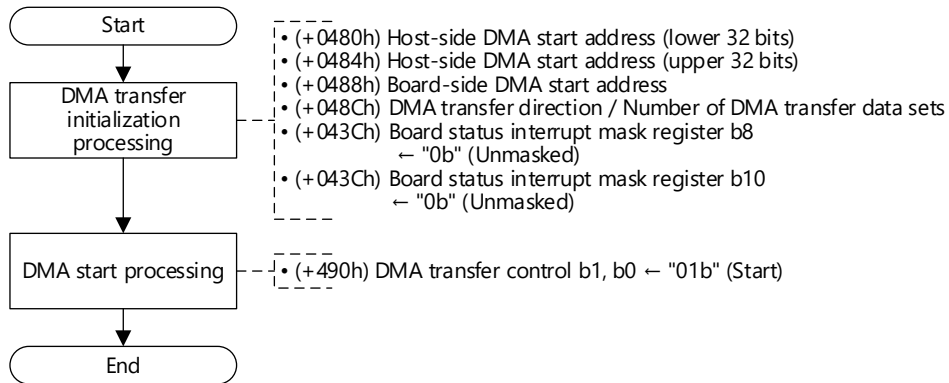


Figure 5.8.2-5 DMA Start Processing (When an Interrupt is Used)

(b) DMA transfer completion check processing

After the DMA start processing, use this function to check that the DMA transfer processing is completed.

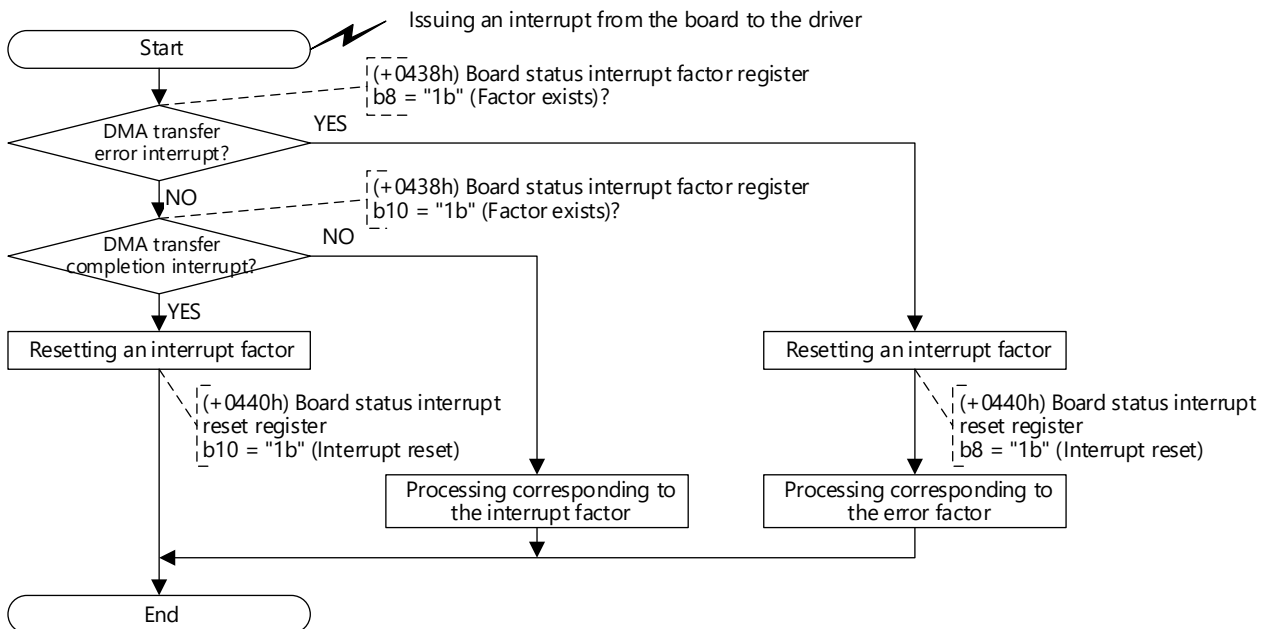


Figure 5.8.2-6 DMA Transfer Completion Check Processing (When an Interrupt is Used)

6 SAMPLE CODE

This chapter describes the specifications of sample code (C language) included with the CD-ROM.

- (1) The sample code is created so that the host can operate as a control station or normal station.
- (2) The sample code has the following functions.
 - Firmware initial processing
 - Parameter exchange
 - Cyclic transmission
 - Transient transmission
- (3) The parameter structures are defined in the sample code. Change the values of structures in accordance with the system used. (Refer to Section 5.3.2 "Parameter information".)
- (4) The sample code is expected to be used in the following environment.
 - Byte addressing, 32-bit processor
 - Little endian

Note

- Use the sample code as a reference to check the logic.
 - Customize the sample code in accordance with the OS used.
- For details, refer to Section 6.3 "Modifying the Sample Code".

6.1 File List

The following table lists the header files and source files of the sample code.

Table 6.1-1 File List

Folder structure		File name	Function
\Source	English	CCIECInit.c	Board initialization
		CCIECDevAcs.c	Cyclic transmission
		CCIECCCTran.c	Transient transmission
		CCIECDUMMYAcs.c	Hardware access dummy function
		Driver.h	Driver header
	Japanese	Same as English	

6.2 Function List

The following table lists the functions of the sample code.

Table 6-2 Function List

File name	Function name	Function type	Overview
CCIECInit.c (Section 6.4.1)	CCIECDevCreate	long	Board device creation processing (dummy)
	BoardReset	void	Board reset processing
	CCIECBoardInit	long	Board initialization processing
	InterruptRequest	void	Interrupt request (to the board firmware)
	nsParameterPartSend	long	Parameter block transfer
	CCIECPrmSet	long	Common parameter setting
	nsIndividualParameterSet	long	Specific parameter setting
	CCIECIsrTask	void	Interrupt processing task (including parameter setting and receive processing)
	CCIEC_HandleIntrpt_Prm	void	Parameter setting interrupt processing
	CCIECStatusCheckTask	void	Data link status monitoring task
CCIECDevAcs.c (Section 6.4.2)	CCIECSeqAcsDevChk	short	Device specification check for batch access processing
	CCIEC_seq_read	short	Own station device batch read
	CCIEC_seq_write	short	Own station device batch write
	CCIECBitAcsDevChk	short	Device specification check for bit device access processing
	CCIEC_bit_set	short	Own station bit device set
	CCIEC_bit_reset	short	Own station bit device reset
	CCIEC_CyclicReceive	short	Cyclic receive processing
	CCIEC_CyclicSend	short	Cyclic send processing
CCIECDUMMYAcs.c (Section 6.4.3)	CCIECGetMem	void	2-port memory area read processing (dummy)
	CCIECSetMem	void	2-port memory area write processing (dummy)
	CCIECGetWord	unsigned short	2-port memory area word data read processing (dummy)
	CCIECSetWord	void	2-port memory area word data write processing (dummy)
	CCIECIOReadDWord	unsigned long	Hardware control memory double word data read processing (dummy)
	CCIECIOWriteDWord	void	Hardware control memory double word data write processing (dummy)
	DMA_Init	void	DMA transfer initialization processing
	DMA_Write	void	DMA write start
	DMA_Read	void	DMA read start
	DMA_Check	unsigned int	DMA transfer status check
CCIECCCTran.c (Section 6.4.4)	SetReqFrame	void	CC-Link compatible transient send request frame initialization processing
	send_set	short	CC-Link compatible transient request send processing
	receive_ans	short	CC-Link compatible transient response receive processing
	CCIEC_tr_seq_read	short	CC-Link compatible transient memory read
	CCIEC_tr_seq_write	short	CC-Link compatible transient memory write
	CCIEC_tr_ctrl_run	short	CC-Link compatible transient remote RUN
	CCIEC_tr_ctrl_stop	short	CC-Link compatible transient remote STOP
	CCIEC_tr_mem_acs	short	CC-Link compatible transient memory access information acquisition
	CCIEC_HandleIntrpt_CCTran	void	CC-Link compatible transient interrupt processing

6.3 Modifying the Sample Code

The sample code provides the board initialization processing, cyclic transmission processing, and transient transmission processing.

The board initialization processing starts with the `CCIECDevCreate()` function. Add the processing to the `CCIECDevCreate()` function in the following steps.

- (1) Add the processing that detects the board installed on the host.
- (2) Read the start addresses of the 2-port memory area and hardware control memory area from the PCI configuration area of the detected board, and set the start addresses to the device descriptor (`CCIECDEV`) structure.
- (3) After the board initialization processing is completed, register the driver in the OS.

Access the 2-port memory area and hardware control memory area with the functions included in the `CCIECDUMMYAcs.c` file. Add OS-dependent processing to all the functions included in the `CCIECDUMMYAcs.c` file.

Perform the cyclic transmission processing with the functions included in the `CCIECDevAcs.c` file.

Perform the transient transmission processing with the functions included in the `CCIECCCTran.c` file.

When the PCI board is used, comment out the line `"#define Q81BD_J71GP21"` in the `Driver.h` file.

6.4 Sample Code Function Specifications

This section describes the specifications of the functions in the sample code. (Note that descriptions of some called subroutine specifications are omitted.)

6.4.1 CCIECInit.c

(1) CCIECDevCreate

Function	Board device creation processing		
Call format	long CCIECDevCreate		
Argument	Name	Variable name	Description
	-	-	-
Return value	Normal end: 0 Abnormal end: Error code		
Description	This function initializes the board and registers the device driver in the OS.		
Called subroutine	Function name	Function type	Description
	CCIECBoardInit	short	Board initialization processing

(2) BoardReset

Function	Board reset processing		
Call format	void BoardReset (IO_PORT1 *io1, IO_PORT2 *io2)		
Argument	Name	Variable name	Description
	IO_PORT1	*io1	Hardware control memory start address
	IO_PORT2	*io2	Hardware control memory start +400h address
Description	This function resets the board.		
Called subroutine	Function name	Function type	Description
	CCIECIOWriteDWord	void	Hardware control memory double word data write processing (dummy)

(3) CCIECBoardInit

Function	Board initialization processing		
Call format	long CCIECBoardInit (CCIECDEV *pstPCIData)		
Argument	Name	Variable name	Description
	CCIECDEV	*pstPCIData	Device descriptor ^{*1}
Return value	Normal end: 0 Abnormal end: Error code		
Description	This function initializes the board.		
Called subroutine	Function name	Function type	Description
	BoardReset	void	Board reset processing
	CCIECIOWriteDWord	void	Hardware control memory double word data write processing (dummy)
	CCIECSetWord	void	2-port memory word data write processing (dummy)
	CCIECGetWord	unsigned short	2-port memory word data read processing (dummy)

^{*1}: A pointer to the structure where the 2-port memory base address register 1, 2-port memory base address register 2, and hardware control memory address read from the PCI configuration area are stored

(4) InterruptRequest

Function	Interrupt request (to the board firmware)		
Call format	void InterruptRequest(CCIECDEV *pstPCIData, UINT nFactor)		
Argument	Name	Variable name	Description
	CCIECDEV	*pstPCIData	Device descriptor* ¹
	UINT	nFactor	Interrupt factor
Return value	Normal end: 0 Abnormal end: Error code		
Description	This function requests an interrupt to the board.		
Called subroutine	Function name	Function type	Description
	CCIECSetWord	void	2-port memory word data write processing (dummy)
	CCIECGetWord	unsigned short	2-port memory word data read processing (dummy)

*1: A pointer to the structure where the 2-port memory base address register 1, 2-port memory base address register 2, and hardware control memory address read from the PCI configuration area are stored

(5) nsParameterPartSend

Function	Parameter block transfer		
Call format	long nsParameterPartSend(CCIECDEV *pstPCIData, void *pParameter, unsigned long ulBytes)		
Argument	Name	Variable name	Description
	CCIECDEV	*pstPCIData	Device descriptor* ¹
	void	*pParameter	Parameter to be sent
	unsigned long	ulBytes	Number of bytes to be sent
Return value	Normal end: 0 Abnormal end: Error code		
Description	This function transfers parameters in blocks.		
Called subroutine	Function name	Function type	Description
	CCIECGetWord	unsigned short	2-port memory word data read processing (dummy)
	CCIECSetWord	void	2-port memory word data write processing (dummy)
	CCIECSetMem	void	2-port memory write processing (dummy)
	InterruptRequest	void	Interrupt request (to the board firmware)

*1: A pointer to the structure where the 2-port memory base address register 1, 2-port memory base address register 2, and hardware control memory address read from the PCI configuration area are stored

(6) CCIECPrmSet

Function	Common parameter setting		
Call format	long CCIECPrmSet(CCIECDEV pstPCIData, CCIECPRM *pstCCIECPrm)		
Argument	Name	Variable name	Description
	CCIECDEV	*pstPCIData	Device descriptor* ¹
Return value	Normal end: 0 Abnormal end: Error code		
Description	This function transfers common parameters to the board using the parameter area.		
Called subroutine	Function name	Function type	Description
	InterruptRequest	void	Interrupt request (to the board firmware)
	nsParameterPartSend	long	Parameter block transfer
	CCIECSetWord	void	2-port memory word data write processing (dummy)
	CCIECGetWord	unsigned short	2-port memory word data read processing (dummy)

*1: A pointer to the structure where the 2-port memory base address register 1, 2-port memory base address register 2, and hardware control memory address read from the PCI configuration area are stored

(7) nsIndividualParameterSet

Function	Specific parameter setting		
Call format	long nsIndividualParameterSet(CCIECDEV *pstPCIData)		
Argument	Name	Variable name	Description
	CCIECDEV	*pstPCIData	Device descriptor* ¹
Return value	Normal end: 0		
	Abnormal end: Error code		
Description	This function sets specific parameters (fixed values). The function is called by the CCIECBoardInit function.		
Called subroutine	Function name	Function type	Description
	CCIECSetWord	void	2-port memory word data write processing (dummy)
	CCIECGetWord	unsigned short	2-port memory word data read processing (dummy)
	nsParameterPartSend	long	Parameter block transfer
	InterruptRequest	void	Interrupt request (to the board firmware)

*1: A pointer to the structure where the 2-port memory base address register 1, 2-port memory base address register 2, and hardware control memory address read from the PCI configuration area are stored

(8) CCIECIsrTask

Function	Interrupt processing task		
Call format	void CCIECIsrTask(CCIECDEV *pstPCIData)		
Argument	Name	Variable name	Description
	CCIECDEV	*pstPCIData	Device descriptor* ¹
Description	This function monitors the interrupt factors (parameter setting request and transient request) in an infinite loop and performs the processing in accordance with the interrupt.		
Called subroutine	Function name	Function type	Description
	CCIECSetWord	void	2-port memory word data write processing (dummy)
	CCIECGetWord	unsigned short	2-port memory word data read processing (dummy)
	CCIEC_HandleIntrpt_Prm	void	Parameter setting interrupt processing
	CCIEC_HandleIntrpt_CCTran	void	CC-Link compatible transient interrupt processing

*1: A pointer to the structure where the 2-port memory base address register 1, 2-port memory base address register 2, and hardware control memory address read from the PCI configuration area are stored

(9) CCIEC_HandleIntrpt_Prm

Function	Parameter setting interrupt processing		
Call format	void CCIEC_HandleIntrpt_Prm(CCIECDEV *pstPCIData)		
Argument	Name	Variable name	Description
	CCIECDEV	*pstPCIData	Device descriptor* ¹
Description	This function receives a parameter setting interrupt from the board.		
Called subroutine	Function name	Function type	Description
	CCIECSetWord	void	2-port memory word data write processing (dummy)
	CCIECGetWord	unsigned short	2-port memory word data read processing (dummy)
	InterruptRequest	void	Interrupt request (to the board firmware)

*1: A pointer to the structure where the 2-port memory base address register 1, 2-port memory base address register 2, and hardware control memory address read from the PCI configuration area are stored

(10) CCIECStatusCheckTask

Function	Data link status monitoring task		
Call format	void CCIECStatusCheckTask (CCIECDEV *pstPCIData)		
Argument	Name	Variable name	Description
	CCIECDEV	*pstPCIData	Device descriptor* ¹
Description	This function changes the state of the station-based data assurance flag for send/receive data when Own station data link status (SB0049) changes.		
Called subroutine	Function name	Function type	Description
	CCIECGetMem	void	2-port memory read processing (dummy)
	CCIECSetWord	void	2-port memory word data write processing (dummy)
	CCIEC_seq_read	short	Own station device batch read processing

*1: A pointer to the structure where the 2-port memory base address register 1, 2-port memory base address register 2, and hardware control memory address read from the PCI configuration area are stored

6.4.2 CCIECDevAcs.c

(1) CCIECSeqAcsDevChk

Function	Device specification check for batch access processing		
Call format	short CCIECSeqAcsDevChk (QB_DEV_TAG *pDevTbl, short sDevType, unsigned long ulDevNo, unsigned long ulSize, unsigned long *offset)		
Argument	Name	Variable name	Description
	QB_DEV_TAG	*pDevTbl	Device information
	short	sDevType	Device type
	unsigned long	ulDevNo	Device number
	unsigned long	ulSize	Number of device points
	unsigned long	*offset	Device memory address
Return value	Normal end: 0 Abnormal end: Error code		
Description	This function checks the range of the device memory specified at the device batch access.		

(2) CCIEC_seq_read

Function	Own station device batch read		
Call format	short CCIEC_seq_read (PCCIECDEV pDev, short sDevType, unsigned long ulDevNo, unsigned long ulSize, short *pBuf)		
Argument	Name	Variable name	Description
	PCCIECDEV	pDev	Initialized device structure
	short	sDevType	Device type
	unsigned long	ulDevNo	Device number
	unsigned long	ulSize	Number of read points (in units of words)
	short	*pBuf	Buffer where read data is stored
Return value	Normal end: 0 Abnormal end: Error code		
Description	This function reads data from the specified device. The function checks whether the specified device is within the device memory range. For bit devices, specify the number of points and the device number in multiple of 16.		

(3) CCIEC_seq_write

Function	Own station device batch write		
Call format	short CCIEC_seq_write (PCCIECDEV pDev, short sDevType, unsigned long ulDevNo, unsigned long ulSize, short *pBuf)		
Argument	Name	Variable name	Description
	PCCIECDEV	pDev	Initialized device structure
	short	sDevType	Device type
	unsigned long	ulDevNo	Device number
	unsigned long	ulSize	Number of write points (in units of words)
	short	*pBuf	Buffer where write data is stored
Return value	Normal end: 0 Abnormal end: Error code		
Description	This function writes data to the specified device. The function checks whether the specified device is within the device memory range. For bit devices, specify the number of points and the device number in multiple of 16.		

(4) CCIECBitAcsDevChk

Function	Device specification check for bit device access processing		
Call format	short CCIECBitAcsDevChk (QB_DEV_TAG *pDevTbl, short sDevType, unsigned long ulDevNo, unsigned long *offset)		
Argument	Name	Variable name	Description
	QB_DEV_TAG	*pDevTbl	Device information
	short	sDevType	Device type
	unsigned long	ulDevNo	Device number
Return value	Normal end: 0		
	Abnormal end: Error code		
Description	This function checks whether the device specified at the bit access is a bit device.		

(5) CCIEC_bit_set

Function	Own station bit device set		
Call format	short CCIEC_bit_set (PCCIECDEV pDev, short sDevType, unsigned long ulDevNo)		
Argument	Name	Variable name	Description
	PCCIECDEV	pDev	Initialized device structure
	short	sDevType	Device type
	unsigned long	ulDevNo	Device number
Return value	Normal end: 0		
	Abnormal end: Error code		
Description	This function turns on the specified bit device. The function checks whether the specified bit device is within the device memory range.		

(6) CCIEC_bit_reset

Function	Own station bit device reset		
Call format	short CCIEC_bit_reset (PCCIECDEV pDev, short sDevType, unsigned long ulDevNo)		
Argument	Name	Variable name	Description
	PCCIECDEV	pDev	Initialized device structure
	short	sDevType	Device type
	unsigned long	ulDevNo	Device number
Return value	Normal end: 0		
	Abnormal end: Error code		
Description	This function turns off the specified bit device. The function checks whether the specified bit device is within the device memory range.		

(7) CCIEC_CyclicReceive

Function	Cyclic receive processing		
Call format	short CCIEC_CyclicReceive(PCCIECDEV pDev, int nStNo)		
Argument	Name	Variable name	Description
	PCCIECDEV	pDev	Initialized device structure
	int	nStNo	Station number
Return value	Normal end: 0 (The device read processing was performed.)		
	Abnormal end: -1 (The device read processing was not performed.)		
Description	This function reads out data in LX, LB, and LW to the work area with the station-based data assured.		

(8) CCIEC_CyclicSend

Function	Cyclic send processing		
Call format	short CCIEC_CyclicSend (PCCIECDEV pDev)		
Argument	Name	Variable name	Description
	PCCIECDEV	pDev	Initialized device structure
Return value	Normal end: 0 (The device write processing was performed.)		
	Abnormal end: -1 (The device write processing was not performed.)		
Description	This function writes data in the work area to LY, LW, and LB with the station-based data assured.		

(1) CCIECGetMem

Function	2-port memory area read processing		
Call format	void CCIECGetMem(unsigned long ulMemAdr, unsigned long ulCount, unsigned short usData[])		
Argument	Name	Variable name	Description
	unsigned long	ulMemAdr	2-port memory address
	unsigned long	ulCount	Read size (number of words)
	unsigned short	usData[]	Pointer to the area where read data is stored
Description	This function reads data from the specified address to usData[] for the specified number of words.		

(2) CCIECSetMem

Function	2-port memory area write processing		
Call format	void CCIECSetMem(unsigned long ulMemAdr, unsigned long ulCount, unsigned short usData[])		
Argument	Name	Variable name	Description
	unsigned long	ulMemAdr	2-port memory address
	unsigned long	ulCount	Write size (number of words)
	unsigned short	usData[]	Pointer to the area where write data is stored
Description	This function writes data from usData[] to the specified address for the specified number of words.		

(3) CCIECGetWord

Function	2-port memory area word data read processing		
Call format	unsigned short CCIECGetWord (unsigned long ulMemAdr)		
Argument	Name	Variable name	Description
	unsigned long	ulMemAdr	2-port memory address
Description	This function reads data from the specified address in units of words.		

(4) CCIECSetWord

Function	2-port memory area word data write processing		
Call format	void CCIECSetWord (unsigned long ulMemAdr, unsigned short usData)		
Argument	Name	Variable name	Description
	unsigned long	ulMemAdr	2-port memory address
	unsigned short	usData	Write data
Description	This function writes data to the specified address in units of words.		

(5) CCIECIOReadDWord

Function	Hardware control memory double word data read processing		
Call format	unsigned long CCIECIOReadDWord (unsigned long ulloAdr)		
Argument	Name	Variable name	Description
	unsigned long	ulloAdr	2-port memory address
Description	This function reads data from the specified address in units of double words.		

(6) CCIECIOWriteDWord

Function	Hardware control memory double word data write processing		
Call format	void CCIECIOWriteDWord (unsigned long ulloAdr, unsigned long ulData)		
Argument	Name	Variable name	Description
	unsigned long	ulloAdr	2-port memory address
	unsigned long	ulData	Write data
Description	This function writes data to the specified address in units of double words.		

(7) DMA_Init

Function	DMA transfer initialization processing		
Call format	void DMA_Init (IO_PORT2* io2)		
Argument	Name	Variable name	Description
	IO_PORT2	*io2	Hardware control memory area address used for DMA transfer
Description	This function registers the hardware control memory area address used for DMA transfer.		

(8) DMA_Write

Function	DMA write start		
Call format	void DMA_Write(unsigned short *ulSrcAddrLow, unsigned long ulDstAddr, long IDMASize)		
Argument	Name	Variable name	Description
	unsigned short	*ulSrcAddrLow	Transfer source (host-side) DMA start address (lower 32 bits)
	unsigned long	ulDstAddr	Transfer destination (board-side) address
	long	IDMASize	Number of transfer data sets
Description	This function writes data to the memory of the PCI Express board by executing the DMA transfer function.		

(9) DMA_Read

Function	DMA read start		
Call format	void DMA_Read(unsigned long ulSrcAddr, unsigned short *ulDstAddrLow, long IDMASize)		
Argument	Name	Variable name	Description
	unsigned long	ulSrcAddr	Transfer source (board-side) address
	unsigned short	*ulDstAddrLow	Transfer destination (host-side) DMA start address (upper 32 bits)
	long	IDMASize	Number of transfer data sets
Description	This function reads data from the memory of the PCI Express board by executing the DMA transfer function.		

(10) DMA_Check

Function	DMA transfer status check		
Call format	unsigned int DMA_Check(VOID)		
Argument	Name	Variable name	Description
	-	-	-
Description	This function returns the DMA transfer status.		

6.4.4 CCIECCTran.c

(1) setReqFrame

Function	CC-Link compatible transient send request frame initialization processing		
Call format	void setReqFrame (PCCIECDEV pDev, MEMREADREQ *readReq, unsigned short usNetNo, unsigned short usStNo)		
Argument	Name	Variable name	Description
	PCCIECDEV	pDev	Initialized device structure
	MEMREADREQ	*readReq	Request frame
	unsigned short	usNetNo	Destination network number
	unsigned short	usStNo	Destination station number
Description	This function sets the initial value of the request frame, network number and station number.		

(2) send_set

Function	CC-Link compatible transient request send processing		
Call format	short send_set (PCCIECDEV pDev, unsigned long ulSize, unsigned short *pReq);		
Argument	Name	Variable name	Description
	PCCIECDEV	pDev	Initialized device structure
	unsigned long	ulSize	Request frame size
	unsigned short	*pReq	Request frame
Return value	Normal end: 0 Abnormal end: Error code		
Description	This function sends a CC-Link compatible transient request frame to another station.		

(3) receive_ans

Function	CC-Link compatible transient response receive processing		
Call format	short receive_ans (PCCIECDEV pDev, unsigned short chan, unsigned long ulSize, unsigned short *pAns, unsigned short usSendReq);		
Argument	Name	Variable name	Description
	PCCIECDEV	pDev	Initialized device structure
	unsigned short	chan	Receive area number
	unsigned long	ulSize	Response frame size
	unsigned short	*pAns	Received response frame storage location
	unsigned short	usSendReq	Application number when a request frame is sent
Return value	No response data received: 0 Response data received: 1		
Description	This function receives a response frame corresponding to the request frame sent by the own station.		

(4) CCIEC_tr_seq_read

Function	CC-Link compatible transient memory read		
Call format	short CCIEC_tr_seq_read (PCCIECDEV pDev, unsigned short usNetNo, unsigned short usStNo, short sDevType, unsigned long ulDevNo, unsigned long ulSize, short *pBuf)		
Argument	Name	Variable name	Description
	PCCIECDEV	pDev	Initialized device structure
	unsigned short	usNetNo	Network number
	unsigned short	usStNo	Station number
	short	sDevType	Device type
	unsigned long	ulDevNo	Device number
	unsigned long	ulSize	Read size (in units of words)
	short	*pBuf	Buffer where read data is stored
Return value	Normal end: 0 Abnormal end: Error code		
Description	This function reads data from the specified device on another station. The maximum data size to be read is 480 words.		

(5) CCIEC_tr_seq_write

Function	CC-Link compatible transient memory write		
Call format	short CCIEC_tr_seq_write (PCCIECDEV pDev, unsigned short usNetNo, unsigned short usStNo, short sDevType, unsigned long ulDevNo, unsigned long ulSize, short*pBuf)		
Argument	Name	Variable name	Description
	PCCIECDEV	pDev	Initialized device structure
	unsigned short	usNetNo	Network number
	unsigned short	usStNo	Station number
	short	sDevType	Device type
	unsigned long	ulDevNo	Device number
	unsigned long	ulSize	Write size (in units of words)
	short	*pBuf	Buffer where write data is stored
Return value	Normal end: 0 Abnormal end: Error code		
Description	This function writes data to the specified device on another station. The maximum data size to be written is 480 words.		

(6) CCIEC_tr_ctrl_run

Function	CC-Link compatible transient remote RUN		
Call format	short CCIEC_tr_ctrl_run (PCCIECDEV pDev, unsigned short usNetNo, unsigned short usStNo, unsigned short usMode, unsigned char ucCmode, unsigned char ucSmode)		
Argument	Name	Variable name	Description
	PCCIECDEV	pDev	Initialized device structure
	unsigned short	usNetNo	Network number
	unsigned short	usStNo	Station number
	unsigned short	usMode	Mode
	unsigned char	ucCmode	Clear mode
	unsigned char	ucSmode	Signal flow mode
Return value	Normal end: 0 Abnormal end: Error code		
Description	This function remotely runs the specified controller on another station.		

(7) CCIEC_tr_ctrl_stop

Function	CC-Link compatible transient remote STOP		
Call format	short CCIEC_tr_ctrl_stop (PCCIECDEV pDev, unsigned short usNetNo, unsigned short usStNo, unsigned short usMode)		
Argument	Name	Variable name	Description
	PCCIECDEV	pDev	Initialized device structure
	unsigned short	usNetNo	Network number
	unsigned short	usStNo	Station number
	unsigned short	usMode	Mode
Return value	Normal end: 0 Abnormal end: Error code		
Description	This function remotely stops the specified controller on another station.		

(8) CCIEC_tr_mem_acs

Function	CC-Link compatible transient memory access information acquisition		
Call format	short CCIEC_tr_mem_acs (PCCIECDEV pDev, unsigned short usNetNo, unsigned short usStNo, unsigned short *pusSize, short sDevice[])		
Argument	Name	Variable name	Description
	PCCIECDEV	pDev	Initialized device structure
	unsigned short	usNetNo	Network number
	unsigned short	usStNo	Station number
	unsigned short	*pusSize	Read size (in units of words)
	short	sDevice[]	Buffer where memory access information is stored
Return value	Normal end: 0 Abnormal end: Error code		
Description	This function reads memory access information of the specified controller on another station.		

(9) CCIEC_HandleIntrpt_CCTran

Function	CC-Link compatible transient interrupt processing		
Call format	void CCIEC_HandleIntrpt_CCTran (CCIECDEV *pstPCIData);		
Argument	Name	Variable name	Description
	PCCIECDEV	*pstPCIData	Initialized device structure
Description	This function processes an interrupt from the board when CC-Link compatible transient data is received.		

Appendix 1 Link Special Relay (SB)

The link special relay stores the data link status by bit status (on/off).

The device information D3C0h to D3FFh of the system area in the 2-port memory corresponds to SB0000 to SB01FF.

Table Appendix 1-1 List of Link Special Relay (SB) Areas

No.	Name	Description	Availability	
			Control station	Normal station
SB0000	Link startup (own station)	Restarts cyclic transmission of the own station. Off: Startup not requested On: Startup requested (valid at rising edge) (Conditions) <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held. For SB0000 to SB0003, only one of the areas can be turned on. 	○	○
SB0001	Link stop (own station)	Stops cyclic transmission of the own station. Off: Stop not requested On: Stop requested (valid at rising edge) (Conditions) <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held. For SB0000 to SB0003, only one of the areas can be turned on. 	○	○
SB0002	System link startup	Restarts cyclic transmission of the entire system. The station where cyclic transmission is started is specified in Link stop/startup direction (SW0000 to SW0008) or Group specification for link stop/startup (SW0012 and SW0013). Off: Startup not requested On: Startup requested (valid at rising edge) (Conditions) <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held. For SB0000 to SB0003, only one of the areas can be turned on. 	○	○
SB0003	System link stop	Stops cyclic transmission of the entire system. The station where cyclic transmission is stopped is specified in Link stop/startup direction (SW0000 to SW0008) or Group specification for link stop/startup (SW0012 and SW0013). Off: Stop not requested On: Stop requested (valid at rising edge) (Conditions) <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held. For SB0000 to SB0003, only one of the areas can be turned on. 	○	○
SB0006	Clear communication error count	Clears the communication error count that is displayed in CC-Link IE Controller Network module diagnostics to 0. Off: Clear not requested On: Clear requested (The number of errors is not counted during on.)	○	○
SB0007	Clear transmission counter IN-side error	Clears the IN-side line error detection areas (SW0068, SW0069, SB006E, SB0140, SW0074, and SW0140 to SW0147) to 0. Off: Clear not requested On: Clear requested (The number of errors is not counted during on.)	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SB0008	Clear transmission counter OUT-side error	Clears the OUT-side line error detection areas (SB006F, SB0150, SW006A, SW006B, SW0084, and SW0150 to SW0157) to 0. Off: Clear not requested On: Clear requested (The number of errors is not counted during on.)	○	○
SB0009	Clear loop switching counter	Clears the path switching detection areas of the own station (SB008E, SB0160, SW006E, and SW0160 to SW0167) to 0. Off: Clear not requested On: Clear requested (The number of switching is not counted during on.)	○	○
SB000A	Clear transmission counter transient error	Clears the transient transmission error areas of the own station (SB008F, SB0170, SW006F, and SW0170 to SW0177) to 0. Off: Clear not requested On: Clear requested (The number of errors is not counted during on.)	○	○
SB000C	Normal connection information refresh instruction period	Updates the normal connection information of the own station. Off: No refresh direction On: Refresh direction (valid at rising edge) When this relay is executed while the conditions for acquiring the normal connection information are not satisfied, the information will be cleared.	○	○
SB0020	Board status	Stores the board status. Off: Normal On: Error	○	○
SB0043	Online switch (own station)	Stores the mode of the own station. Off: Online On: Other than online	○	○
SB0044	Station setting (own station)	Stores the network type set by network parameters of the own station. Off: Normal station On: Control station	○	○
SB0047	Baton pass status (own station)	Stores the baton pass status (transient transmission availability) of the own station. Off: Normal On: Error When this relay is turned on, the error cause can be checked with Baton pass status (own station) (SW0047) and Cause of baton pass interruption (SW0048).	○	○
SB0048	Control station status (own station)	Stores the network type (current status) of the own station. Off: Normal station On: Control station (when SB0044 is on) Sub-control station (when SB0044 is off) (Conditions) • This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.	○	○
SB0049	Own station cyclic transmission status	Stores the cyclic transmission status of the own station. Off: Normal On: Error When this relay is turned on, the error cause can be checked with Cause of data link stop (SW0049).	○	○
SB004C	Cyclic transmission start accept status (own station)	Turned on when a start request for cyclic transmission using Link startup (own station) (SB0000) is accepted. Off: Not accepted (SB0000 is off) On: Accepted (SB0000 is on) (Conditions) • This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SB004D	Cyclic transmission start completion status (own station)	<p>Turned on when Cyclic transmission start accept status (own station) (SB004C) is turned on and the startup of cyclic transmission is completed.</p> <p>Off: Startup not completed (SB0000 is off)</p> <p>On: Startup completed (SB0000 is on)</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. <p>When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○
SB004E	Cyclic transmission stop accept status (own station)	<p>Turned on when a stop request for cyclic transmission using Link stop (own station) (SB0001) is accepted.</p> <p>Off: Not accepted (SB0001 is off)</p> <p>On: Accepted (SB0001 is on)</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. <p>When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○
SB004F	Cyclic transmission stop completion status (own station)	<p>Turned on when Cyclic transmission stop accept status (own station) (SB004E) is turned on and the cyclic transmission stop is completed.</p> <p>Off: Stop not completed (SB0001 is off)</p> <p>On: Stop completed (SB0001 is on)</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. <p>When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○
SB0050	Cyclic transmission start accept status (system)	<p>Turned on when a start request for cyclic transmission using System link startup (SB0002) is accepted.</p> <p>Off: Not accepted (SB0002 is off)</p> <p>On: Accepted (SB0002 is on)</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. <p>When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○
SB0051	Cyclic transmission start completion status (system)	<p>Turned on when Cyclic transmission start accept status (system) (SB0050) is turned on and the cyclic transmission startup is completed.</p> <p>Off: Startup not completed (SB0002 is off)</p> <p>On: Startup completed (SB0002 is on)</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. <p>When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○
SB0052	Cyclic transmission stop accept status (system)	<p>Turned on when a stop request for cyclic transmission using System link stop (SB0003) is accepted.</p> <p>Off: Not accepted (SB0003 is off)</p> <p>On: Accepted (SB0003 is on)</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. <p>When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SB0053	Cyclic transmission stop completion status (system)	<p>Turned on when Cyclic transmission stop accept status (system) (SB0052) is turned on and the cyclic transmission stop is completed. Off: Stop not completed (SB0003 is off) On: Stop completed (SB0003 is on)</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. <p>When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○
SB0054	Parameter receive status	<p>Stores the parameter receive status. For the control station, the parameter receive status from the host is stored. For the normal station, the parameter receive status from the control station is stored. Off: Received On: Not received</p>	○	○
SB0055	Received parameter error	<p>Stores the received parameter status. (Own parameter status is stored for the control station.) Off: Parameter normal On: Parameter error</p>	○	○
SB0056	Communication status	<p>Stores the transient transmission status. Off: Transient transmission by the control station On: Transient transmission by the sub-control station</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. <p>When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○
SB005C	I/O master station (Block 1)	<p>Stores the I/O master station setting status of block 1. Off: Not set On: Set When this relay is turned on, the station number is stored in I/O master station (Block 1) (SW005C).</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Own station cyclic transmission status (SB0049) is off. 	○	○
SB005D	I/O master station (Block 2)	<p>Stores the I/O master station setting status of block 2. Off: Not set On: Set When this relay is turned on, the station number is stored in I/O master station (Block 2) (SW005D).</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Own station cyclic transmission status (SB0049) is off. 	○	○
SB0060	Communication mode	<p>Stores the constant link scan status. Off: Constant link scan is invalid On: Constant link scan is valid</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Own station cyclic transmission status (SB0049) is off. 	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SB0061	Cyclic transmission punctuality assurance	Stores the status of cyclic transmission punctuality assurance. Off: Cyclic transmission punctuality not assured On: Cyclic transmission punctuality assured (Conditions) • This relay is enabled when Own station cyclic transmission status (SB0049) is off.	○	○
SB0064	Own station's loop status	Stores the transmission path status of the own station. Off: Normal On: Error When this relay is turned on, the error definition can be checked with Own station's loop status (SW0064).	○	○
SB0065	Loopback status	Stores the loopback execution status. (Including own station) Off: All stations normal On: Station where loopback is performed exists (Conditions) • This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.	○	○
SB0066	Own station's IN-side link-up status	Stores the IN-side link-up status of the own station. Off: Link-up On: Link-down	○	○
SB0067	Own station's OUT-side link-up status	Stores the OUT-side link-up status of the own station. Off: Link-up On: Link-down	○	○
SB0068	Own station's IN-side link establishing status	Stores the IN-side link establishing status of the own station. Off: Link establishment completed On: Link establishing	○	○
SB0069	Own station's OUT-side link establishing status	Stores the OUT-side link establishing status of the own station. Off: Link establishment completed On: Link establishing	○	○
SB006A	Own station's IN-side cabling status	Stores the IN-side cabling status of the own station. Off: Normal On: Inserted incorrectly	○	○
SB006B	Own station's OUT-side cabling status	Stores the OUT-side cabling status of the own station. Off: Normal On: Inserted incorrectly	○	○
SB006C	Own station's IN-side error frame reception status	Stores whether an error frame has been received on the IN-side of the own station. Off: Not been received On: Been received	○	○
SB006D	Own station's OUT-side error frame reception status	Stores whether an error frame has been received on the OUT-side of the own station. Off: Not been received On: Been received	○	○
SB006E	Own station's IN-side error frame detection	Stores whether an error frame has been received on the IN-side of the own station from power-on to the present. Off: Not been received On: Been received	○	○
SB006F	Own station's OUT-side error frame detection	Stores whether an error frame has been received on the OUT-side of the own station from power-on to the present. Off: Not been received On: Been received	○	○
SB008E	Path switching detection flag	Stores the path switching detection status. Off: Path switching not detected On: Path switching detected When Clear loop switching counter (SB0009) is turned on, the stored value will be cleared.	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SB008F	Transient transmission error	Stores the transient transmission error detection status. Off: Error not detected On: Error detected When this relay is turned on, the number of errors can be checked with Transient transmission error (SW006F).	○	○
SB0090	Hardware test completion status	Stores the hardware test completion status. Off: Not executed or being executed On: Completed When this relay is turned on, the completion status can be checked with Hardware test normal/error completion status (SB0091).	○	○
SB0091	Hardware test normal/error completion status	Stores the hardware test completion status. Off: Completed successfully On: Completed with an error (Conditions) • This relay is enabled when Hardware test completion status (SB0090) is on.	○	○
SB0092	Self-loopback test completion status	Stores the self-loopback test completion status. Off: Not executed or being executed On: Completed When this relay is turned on, the completion status can be checked with Self-loopback test normal/error completion status (SB0093).	○	○
SB0093	Self-loopback test normal/error completion status	Stores the self-loopback test completion status. Off: Completed successfully On: Completed with an error (Conditions) • This relay is enabled when Self-loopback test completion status (SB0092) is on.	○	○
SB0094	Circuit test completion status	Stores the circuit test completion status. Off: Not executed or being executed On: Completed When this relay is turned on, the completion status can be checked with Circuit test normal/error completion status (SB0095).	○	○
SB0095	Circuit test normal/error completion status	Stores the circuit test completion status. Off: Completed successfully On: Completed with an error (Conditions) • This relay is enabled when Circuit test completion status (SB0094) is on.	○	○
SB0097	Station-to-station test normal/error completion status	Stores the station-to-station test completion status. 0: Completed successfully 1: Completed with an error	○	○
SB0098	Circuit test request from other station	Stores the request status of the circuit test from the control station. Off: Request not received On: Request received	×	○
SB0099	Station-to-station test request from other station	Stores the request status of the station-to-station test from the other station. Off: Request not received On: Request received	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SB00A0	Baton pass status of each station	<p>Stores the baton pass status of each station. Off: All stations normal On: Faulty station exists When this relay is turned on, the status of each station can be checked with Baton pass status of each station (SW00A0 to SW00A7).</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held. Reserved stations and stations with a number equal to or greater than the maximum station number are ignored. 	○	○
SB00B0	Cyclic transmission status of each station	<p>Stores the cyclic transmission status of each station. Off: Cyclic transmission of all stations being performed On: Station where cyclic transmission is not performed exists When this relay is turned on, the status of each station can be checked with Cyclic transmission status of each station (SW00B0 to SW00B7).</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held. Reserved stations and stations with a number equal to or greater than the maximum station number are ignored. 	○	○
SB00C0	Reserved station specification	<p>Stores whether a reserved station exists. Off: No reserved station On: Reserved station exists When this relay is turned on, the status of each station can be checked with Reserved station specification (SW00C0 to SW00C7).</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Own station cyclic transmission status (SB0049) is off. 	○	○
SB00D0	Parameter communication status of each station	<p>Stores the parameter communication status of each station. Off: Parameter communications completed or not performed in all stations On: Station during parameter communications exists When this relay is turned on, the status of each station can be checked with Parameter communication status of each station (SW00D0 to SW00D7).</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held. Reserved stations and stations with a number equal to or greater than the maximum station number are ignored. 	○	×

No.	Name	Description	Availability	
			Control station	Normal station
SB00E0	Parameter status of each station	<p>Stores the parameter status of each station. Off: All stations normal On: Faulty station exists When this relay is turned on, the status of each station can be checked with Parameter error status of each station (SW00E0 to SW00E7).</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. <p>When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p> <ul style="list-style-type: none"> Reserved stations and stations with a number equal to or greater than the maximum station number are ignored. 	○	×
SB00F0	Application RUN state of controller on each station	<p>Stores the application RUN state of controller on each station. Off: All stations are in RUN or STEP-RUN state On: Station in STOP or PAUSE state exists When this relay is turned on, the status of each station can be checked with Application RUN state of controller on each station (SW00F0 to SW00F7).</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. <p>When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○
SB0100	Controller operation status of each station (1)	<p>Stores the stop error status of the controller on each station. Off: All stations normal On: Station with a stop error exists When this relay is turned on, the status of each station can be checked with Controller operation status of each station (1) (SW0100 to SW0107).</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. <p>When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○
SB0110	Controller operation status of each station (2)	<p>Stores the continuation error status of the controller on each station. Off: All stations normal On: Station with a continuation error exists When this relay is turned on, the status of each station can be checked with Controller operation status of each station (2) (SW0110 to SW0117).</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. <p>When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○
SB0120	Current IN-side error frame reception status	<p>Stores whether an error frame has been received in the IN-side transmission path of each station. Off: Not received at all stations On: Station where an error frame has received exists When this relay is turned on, the status of each station can be checked with Current IN-side error frame reception status (SW0120 to SW0127).</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. <p>When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SB0130	Current OUT-side error frame reception status	<p>Stores whether an error frame has been received in the OUT-side transmission path of each station. Off: Not received at all stations On: Station where an error frame has received exists When this relay is turned on, the status of each station can be checked with Current OUT-side error frame reception status (SW0130 to SW0137).</p> <p>(Conditions) • This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○
SB0140	IN-side error frame reception detection status	<p>Stores whether an error frame has been received in the IN-side transmission path of each station from power-on to the present. Off: Not received at all stations On: Been received When this relay is turned on, the status of each station can be checked with IN-side error frame reception detection status (SW0140 to SW0147).</p> <p>When Clear IN-side transmission error counter (SB0007) is turned on, the stored value will be cleared.</p> <p>(Conditions) • This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○
SB0150	OUT-side error frame reception detection status	<p>Stores whether an error frame has been received in the OUT-side transmission path of each station from power-on to the present. Off: Not received at all stations On: Been received When this relay is turned on, the status of each station can be checked with OUT-side error frame reception detection status (SW0150 to SW0157).</p> <p>When Clear OUT-side transmission error counter (SB0008) is turned on, the stored value will be cleared.</p> <p>(Conditions) • This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SB0160	Path switching detection flag for each station	<p>Stores the path switching detection status of each station. (Including own station) Off: Path switching not detected On: Path switching detected When this relay is turned on, the status of each station can be checked with Path switching detection status of each station (SW0160 to SW0167).</p> <p>When Clear loop switching counter (SB0009) is turned on, the path switching detection status of the own station is cleared. When Clear loop switching counter (SB0009) is turned on in each station and the path switching detection status for all stations is cleared, the stored value will be cleared.</p> <p>(Conditions) • This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○
SB0170	Transient transmission error of each station	<p>Stores the transient transmission error detection status of each station. (Including own station) Off: Error not detected On: Error detected When this relay is turned on, the status of each station can be checked with Transient error detection status of each station (SW0170 to SW0177).</p> <p>When Clear transient transmission error counter (SB000A) is turned on, the transient error detection status of the own station is cleared. When Clear transient transmission error counter (SB000A) is turned on in each station and the transient error detection status for all stations is cleared, the stored value will be cleared.</p> <p>(Conditions) • This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○
SB0180	External power supply information	<p>Stores the external power supply status of the CC-Link IE Controller Network module for each station. Off: No external power supplied to any station On: External power supplied to station(s) When this relay is turned on, the status of each station can be checked with Power supply status of each station (SW0180 to SW0187).</p> <p>(Conditions) • This relay is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SB0190	Power status consistency check of each station	<p>Stores the external power supply status of the CC-Link IE Controller Network module with external power supply function for each station. Off: External power supplied to all stations (normal) On: No external power supplied to some station(s) (error) When this relay is turned on, the status of each station can be checked with Power status consistency check of each station (SW0190 to SW0197).</p> <p>(Conditions)</p> <ul style="list-style-type: none"> This relay is enabled when Baton pass status (own station) (SB0047) is off. <p>When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.</p>	○	○

Appendix 2 Link Special Register (SW)

The link special register stores the data link status by bit word information.

The device information D400h to D5FFh of the system area in the 2-port memory corresponds to SW0000 to SW01FF.

Table Appendix 2-1 List of Link Special Register (SW) Areas

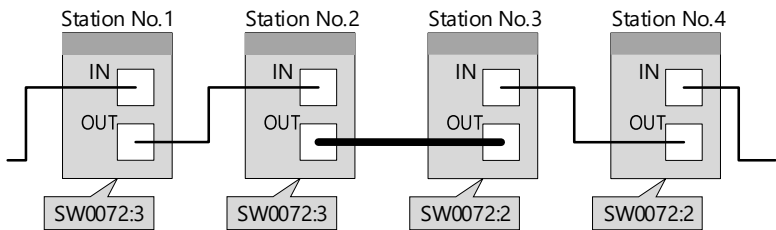
No.	Name	Description	Availability																																																																																																																																																										
			Control station	Normal station																																																																																																																																																									
SW0000	Link stop/startup direction	Sets station to stop or start cyclic transmission. 00h: Own station 01h: All stations 02h: Specified station 03h: Specified group 80h: Own station (forced link start) 81h: All stations (forced link start) 82h: Specified station (forced link start) 83h: Specified group (forced link start) Cyclic transmission stop/startup is performed with System link startup (SB0002) or System link stop (SB0003).	○	○																																																																																																																																																									
SW0001 to SW0008	Link stop/startup direction	Sets a station number that stops or starts cyclic transmission when 02h or 82h is set in Link stop/startup direction (SW0000). 0: Stop or startup not directed 1: Stop or startup directed <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0001</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0002</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0003</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0004</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0005</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0006</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0007</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0008</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td></tr></table> Each number in the table represents a station number.		b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW0001	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW0002	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW0003	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW0004	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW0005	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW0006	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW0007	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW0008	-	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	○	○
	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0																																																																																																																																													
SW0001	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1																																																																																																																																													
SW0002	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17																																																																																																																																													
SW0003	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33																																																																																																																																													
SW0004	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49																																																																																																																																													
SW0005	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65																																																																																																																																													
SW0006	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81																																																																																																																																													
SW0007	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97																																																																																																																																													
SW0008	-	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114																																																																																																																																													
SW0012, SW0013	Group specification for link stop/startup	Sets a group number that stops or starts cyclic transmission when 03h or 83h is set in Link stop/startup direction (SW0000). 0: Stop or startup not directed 1: Stop or startup directed <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0012</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0013</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr></table> Each number in the table represents a group number.		b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW0012	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW0013	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	○	○																																																																																																						
	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0																																																																																																																																													
SW0012	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1																																																																																																																																													
SW0013	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17																																																																																																																																													
SW0020	Board status	Stores the board status. 0: Normal 1 or greater: Error (👉 Section 4.1 "Error Codes") FFh: Module failure	○	○																																																																																																																																																									
SW0040	Network No.	Stores the network number of the own station. Range: 1 to 239	○	○																																																																																																																																																									
SW0041	Group No.	Stores the group number of the own station. 0: No group specification 1 to 32: Group number	○	○																																																																																																																																																									
SW0042	Station No.	Stores the station number of the own station. 1 to 120: Own station number (Station No. setting status (own station) (SB0070) is off) 255: Station number not determined (Station No. setting status (own station) (SB0070) is on)	○	○																																																																																																																																																									
SW0043	Mode status	Stores the mode of the own station. 0: Online 2: Offline 5: Station-to-station test 6: Circuit test 7: Self-loopback test 9: Hardware test	○	○																																																																																																																																																									

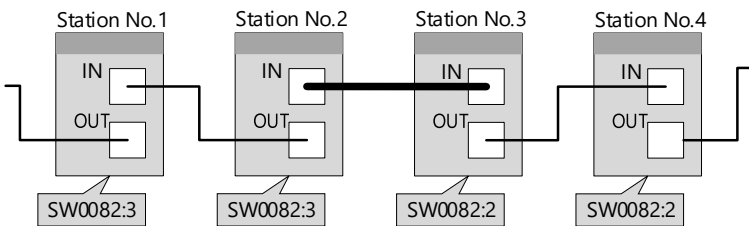
No.	Name	Description	Availability	
			Control station	Normal station
SW0044	Station setting	<p>Stores the setting status of the own station.</p> <p>SW0044</p> <p>Network type (01: CC-Link IE Controller Network)</p> <p>Station type (0: Normal station, 1: Control station)</p>	○	○
SW0046	Module type	<p>Stores the hardware status of the own station.</p> <p>SW0046</p> <p>Transmission path information 1 (00: Optical)</p> <p>Transmission path information 2 (0: Duplex system)</p> <p>Topology (0: Loop)</p> <p>Cable type (0: 1000BASE-SX compatible)</p> <p>External power supply function (0: Not supported, 1: Supported)</p> <p>Device type (10: Board)</p>	○	○
SW0047	Baton pass status (own station)	<p>Stores the communication status of the own station.</p> <p>0: Data link in progress 1: Data link stopped 2: Baton pass in progress 3: Baton pass stopped 4: Test in progress 5: Offline</p>	○	○
SW0048	Cause of baton pass interruption	<p>Stores the cause of interruption in the communication (baton pass) of the own station.</p> <p>00h: Normal communication 30h: At cable disconnection or power-on 31h: Cable insertion error 32h: Cable IN-OUT checking 33h: Disconnection or return in progress 40h: Offline mode 41h: Hardware test 42h: Self-loopback test 50h: Self-diagnostics in progress</p>	○	○
SW0049	Cause of data link stop	<p>Stores the cause of data link stop of the own station.</p> <p>00h: Normal communication 01h: Stop direction 02h: Monitoring time timeout 03h: Circuit test in progress 10h: Parameter not received 11h: Out of the range of own station number 12h: Reserved station setting of the own station 13h: Own station number duplication 14h: Control station duplication 15h: Control station and own station number duplication 16h: Station number not set 17h: Network number invalid 18h: Parameter error 19h: Parameter communication in progress</p>	○	○

No.	Name	Description	Availability	
			Control station	Normal station
SW004A	Data linking stop request station	Stores the station number of the station that performed the cyclic transmission stop request to the own station. Range: 1 to 120 Cyclic transmission stop request is performed by System link stop (SB0003). (Conditions) • This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.	○	○
SW004B	Controller operation status of own station	Stores the controller status of the own station. 01h: STOP (normal) 02h: STOP (stop error) 03h: STOP (continuation error) 04h: RUN (normal) 05h: RUN (continuation error) 06h: STEP-RUN 07h: PAUSE 0Eh: Controller being reset 0Fh: Controller initial processing	○	○
SW004D	Data linking start status (own station)	Stores the results when cyclic transmission is started by Link startup (own station) (SB0000). 0: Normal 1 or greater: Error (☞ Section 4.1 "Error Codes") (Conditions) • This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.	○	○
SW004F	Data linking stop status (own station)	Stores the results when cyclic transmission is stopped by Link stop (own station) (SB0001). 0: Normal 1 or greater: Error (☞ Section 4.1 "Error Codes") (Conditions) • This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.	○	○
SW0051	Data linking start status (entire system)	Stores the results when cyclic transmission is started by System link startup (SB0002). 0: Normal 1 or greater: Error definition in own station (☞ Section 4.1 "Error Codes") (Conditions) • This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.	○	○
SW0053	Data linking stop status (entire system)	Stores the results when cyclic transmission is stopped by System link stop (SB0003). 0: Normal 1 or greater: Error definition in own station (☞ Section 4.1 "Error Codes") (Conditions) • This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.	○	○
SW0054	Parameter information	Stores the parameter information.	○	○

No.	Name	Description	Availability	
			Control station	Normal station
		<p>(Conditions)</p> <ul style="list-style-type: none"> • This register is enabled when Received parameter error (SB0055) is off. 		
SW0055	Parameter setting status	<p>Stores the parameter status.</p> <p>0: Normal</p> <p>1 or greater: Error (☞ Section 4.1 "Error Codes")</p> <p>(Conditions)</p> <ul style="list-style-type: none"> • This register is enabled when Received parameter error (SB0055) is on. 	○	○
SW0056	Current control station	<p>Stores the station number of the station that is actually operating as a control station.</p> <p>(Including sub-control station)</p> <p>Range: 1 to 120</p>	○	○
SW0057	Designated control station	<p>Stores the station number of the control station that is set using network parameters.</p> <p>0: Control station or sub-control station does not exist on a network</p> <p>1 to 120: Station number</p>	○	○
SW0059	Total number of link stations	<p>Stores the total number of link stations that is set using network parameters.</p> <p>Range: 2 to 120</p>	○	○
SW005A	Maximum baton pass station	<p>Stores the maximum station number of the station where the baton pass is performed.</p> <p>Range: 2 to 120</p> <p>(Conditions)</p> <ul style="list-style-type: none"> • This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held. 	○	○
SW005B	Maximum cyclic transmission station	<p>Stores the maximum station number of the station where cyclic transmission is performed.</p> <p>Range: 1 to 120</p> <p>(Conditions)</p> <ul style="list-style-type: none"> • This register is enabled when Own station data link status (SB0049) is off. 	○	○
SW005C	I/O master station (Block 1)	<p>Stores the station number of the I/O master station of block 1.</p> <p>0: No I/O master station</p> <p>1 to 120: Station number</p> <p>(Conditions)</p> <ul style="list-style-type: none"> • This register is enabled when Own station data link status (SB0049) is off. 	○	○
SW005D	I/O master station (Block 2)	<p>Stores the station number of the I/O master station of block 2.</p> <p>0: No I/O master station</p> <p>1 to 120: Station number</p> <p>(Conditions)</p> <ul style="list-style-type: none"> • This register is enabled when Own station data link status (SB0049) is off. 	○	○
SW0060	Maximum link scan time	<p>Stores the maximum value of the link scan time during cyclic transmission.</p> <p>(Unit: ms)</p> <p>(Conditions)</p> <ul style="list-style-type: none"> • This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held. 	○	○
SW0061	Minimum link scan time	<p>Stores the minimum value of the link scan time during cyclic transmission.</p> <p>(Unit: ms)</p>	○	○

No.	Name	Description	Availability	
			Control station	Normal station
		(Conditions) • This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.		
SW0062	Current link scan time	Stores the current value of the link scan time during cyclic transmission. The stored value contains a maximum error of 1 ms. (Unit: ms) (Conditions) • This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.	○	○
SW0063	Communication mode	Stores the setting value of the constant link scan that is set by the supplementary setting. 0: Not set 1 to 500: Setting value of constant link scan (Unit: ms) (Conditions) • This register is enabled when Own station data link status (SB0049) is off.	○	○
SW0064	Own station's loop status	Stores the transmission path status of the own station. 00h: Normal 12h: IN-side loopback (OUT-side cable disconnection) 13h: IN-side loopback (OUT-side cable insertion error) 14h: IN-side loopback (OUT-side line establishing) 21h: OUT-side loopback (IN-side cable disconnection) 31h: OUT-side loopback (IN-side cable insertion error) 41h: OUT-side loopback (IN-side line establishing) 22h: Disconnecting (IN-side cable disconnection, OUT-side cable disconnection) 23h: Disconnecting (IN-side cable disconnection, OUT-side cable insertion error) 24h: Disconnecting (IN-side cable disconnection, OUT-side line establishing) 32h: Disconnecting (IN-side cable insertion error, OUT-side cable disconnection) 33h: Disconnecting (IN-side cable insertion error, OUT-side cable insertion error) 34h: Disconnecting (IN-side cable insertion error, OUT-side line establishing) 42h: Disconnecting (IN-side line establishing, OUT-side cable disconnection) 43h: Disconnecting (IN-side line establishing, OUT-side cable insertion error) 44h: Disconnecting (IN-side line establishing, OUT-side line establishing)	○	○
SW0065	Loopback information	Stores the network loop status. 0: Normal 1: Loopback 2: Errors on all stations	○	○
SW0068	IN-side line error occurrence rate (Max.)	Stores the occurrence rate (maximum value) of received error frames on the IN-side of the own station. (Unit: %) When Clear IN-side transmission error counter (SB0007) is turned on, the accumulation of errors will be cleared.	○	○
SW0069	IN-side line error occurrence rate (present.)	Stores the occurrence rate (present value) of received error frames on the IN-side of the own station. (Unit: %) When Clear IN-side transmission error counter (SB0007) is turned on, the accumulation of errors will be cleared.	○	○
SW006A	OUT-side line error occurrence rate (Max.)	Stores the occurrence rate (maximum value) of received error frames on the OUT-side of the own station. (Unit: %) When Clear OUT-side transmission error counter (SB0008) is turned on, the accumulation of errors will be cleared.	○	○
SW006B	OUT-side line error occurrence rate (present.)	Stores the occurrence rate (present value) of received error frames on the OUT-side of the own station. (Unit: %)	○	○

No.	Name	Description	Availability	
			Control station	Normal station
		When Clear OUT-side transmission error counter (SB0008) is turned on, the accumulation of errors will be cleared.		
SW006E	Number of loop switches	Stores the accumulative number of switching communication paths. When Clear loop switching counter (SB0009) is turned on, the stored value will be cleared.	○	○
SW006F	Transient transmission error	Stores the accumulative number of transient transmission errors. When Clear transient transmission error counter (SB000A) is turned on, the stored number will be cleared. While SB000A is on, the number of errors is not counted.	○	○
SW0070	IN-side loopback station No.	Stores the station number of the station where loopback is being performed on the IN-side. 0: No loopback stations 1 to 120: Station number (Conditions) • This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.	○	○
SW0071	IN-side loopback factor	Stores the cause of loopback on the IN-side. 00h: No loopback stations 02h: OUT-side cable disconnection 03h: OUT-side cable insertion error 04h: OUT-side line establishing (Conditions) • This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.	○	○
SW0072	OUT-side mis-cabling station No.	Stores the station number of the station where the OUT-side cable is incorrectly inserted. The station number to be stored is the one of the target station where the cable is connected to.  0: No station connects cable incorrectly 1 to 120: Station number (Conditions) • This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held. • This register is enabled when IN-side loopback factor (SW0071) is 03h (OUT-side cable insertion error).	○	○
SW0074	IN-side cable disconnection detection count	Stores the accumulative number of detecting cable disconnection on the IN-side. When Clear IN-side transmission error counter (SB0007) is turned on, the stored value will be cleared.	○	○
SW0080	OUT-side loopback station No.	Stores the station number of the station where loopback is being performed on the OUT-side. 0: No loopback stations 1 to 120: Station number (Conditions) • This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data	○	○

No.	Name	Description	Availability																																																																																																																																																										
			Control station	Normal station																																																																																																																																																									
		prior to error is held.																																																																																																																																																											
SW0081	OUT-side loopback factor	<p>Stores the cause of loopback on the OUT-side.</p> <p>00h: No loopback stations 20h: IN-side cable disconnection 30h: IN-side cable insertion error 40h: IN-side line establishing</p> <p>(Conditions)</p> <ul style="list-style-type: none">This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.	○	○																																																																																																																																																									
SW0082	IN-side mis-cabling station No.	<p>Stores the station number of the station where the IN-side cable is incorrectly inserted.</p> <p>The station number to be stored is the one of the target station where the cable is connected to.</p> <div><div>Station No.1</div><div>Station No.2</div><div>Station No.3</div><div>Station No.4</div></div>  <p>0: No station connects cable incorrectly 1 to 120: Station number</p> <p>(Conditions)</p> <ul style="list-style-type: none">This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.This register is enabled when OUT-side loopback factor (SW0081) is 30h (IN-side cable insertion error).	○	○																																																																																																																																																									
SW0084	OUT-side cable disconnection detection count	<p>Stores the accumulative number of detecting cable disconnection on the OUT-side.</p> <p>When Clear OUT-side transmission error counter (SB0008) is turned on, the stored value will be cleared.</p>	○	○																																																																																																																																																									
SW0096	Station-to-station test station	<p>Stores the station number of the target station where the station-to-station test is performed. (Enabled only for the station-to-station test)</p> <p>When an executing station is monitored, the station number of the executed station is stored.</p> <p>When an executed station is monitored, the station number of the executing station is stored.</p> <p>0: No station number set 1 to 120: Destination station number of station-to-station test</p>	○	○																																																																																																																																																									
SW00A0 to SW00A7	Baton pass status of each station	<p>Stores the baton pass status of each station.</p> <p>0: Baton pass normal station 1: Baton pass faulty station</p> <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW00A0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00A1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00A2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00A3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW00A4</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW00A5</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW00A6</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW00A7</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table> <p>Each number in the table represents a station number.</p> <p>(Conditions)</p> <ul style="list-style-type: none">This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.		b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW00A0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW00A1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW00A2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW00A3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW00A4	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW00A5	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW00A6	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW00A7	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113	○	○
	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0																																																																																																																																													
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SW00B0 to SW00B7	Cyclic transmission status of each station	<p>Stores the cyclic transmission status of each station.</p> <p>0: Cyclic transmission normal station</p> <p>1: Cyclic transmission faulty station</p> <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW00B0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00B1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00B2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00B3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW00B4</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW00B5</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW00B6</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW00B7</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td></tr></table> <p>Each number in the table represents a station number.</p> <p>When the power supply of the controller where a CC-Link IE Controller Network module with external power supply function is mounted is turned off, the time period in which a data link error is detected may be delayed. To detect a data link error immediately, program an interlock using the link relay (LB) in the send range of each station.</p> <p>(Conditions)</p> <ul style="list-style-type: none">This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.Reserved stations and stations with a number equal to or greater than the maximum station number are ignored.		b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW00B0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW00B1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW00B2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW00B3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW00B4	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW00B5	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW00B6	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW00B7	-	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	○	○
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SW00C0 to SW00C7	Reserved station specification	<p>Stores the setting status of the reserved station.</p> <p>0: Other than reserved stations</p> <p>1: Reserved station</p> <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW00C0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00C1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00C2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00C3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW00C4</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW00C5</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW00C6</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW00C7</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td></tr></table> <p>Each number in the table represents a station number.</p> <p>(Conditions)</p> <ul style="list-style-type: none">This register is enabled when Own station data link status (SB0049) is off.Reserved stations and stations with a number equal to or greater than the maximum station number are ignored.		b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW00C0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW00C1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW00C2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW00C3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW00C4	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW00C5	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW00C6	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW00C7	-	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	○	○
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SW00D0 to SW00D7	Parameter communication status of each station	Stores the parameter communication status of each station. 0: Parameter communications completed or not performed 1: Parameter communications in progress	○	×																																																																																																																																																									
		<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW00D0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00D1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00D2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00D3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW00D4</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW00D5</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW00D6</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW00D7</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>				b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW00D0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW00D1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW00D2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW00D3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW00D4	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW00D5	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW00D6	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW00D7	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113
					b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0																																																																																																																																									
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		SW00D3			64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49																																																																																																																																									
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		SW00D5			96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81																																																																																																																																									
		SW00D6			112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97																																																																																																																																									
SW00D7	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113																																																																																																																																													
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SW00E0 to SW00E7	Parameter error status of each station	Stores the parameter status of each station. 0: Parameter normal 1: Parameter error	○	×																																																																																																																																																									
		<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW00E0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00E1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00E2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00E3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW00E4</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW00E5</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW00E6</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW00E7</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>				b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW00E0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW00E1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW00E2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW00E3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW00E4	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW00E5	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW00E6	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW00E7	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113
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			Control station	Normal station																																																																																																																																																									
SW00F0 to SW00F7	Application RUN state of controller on each station	Stores the application RUN state of controller on each station. (Including own station) 0: RUN, STEP-RUN 1: STOP, PAUSE, stop error	○	○																																																																																																																																																									
		<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW00F0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00F1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00F2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00F3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW00F4</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW00F5</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW00F6</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW00F7</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>				b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW00F0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW00F1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW00F2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW00F3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW00F4	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW00F5	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW00F6	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW00F7	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113
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		SW00F6			112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97																																																																																																																																									
SW00F7	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113																																																																																																																																													
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SW0100 to SW0107	Controller operation status of each station (1)	Stores the stop error status of the controller on each station. (Including own station) 0: Normal 1: Stop error	○	○																																																																																																																																																									
		<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0100</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0101</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0102</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0103</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0104</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0105</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0106</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0107</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>				b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW0100	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW0101	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW0102	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW0103	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW0104	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW0105	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW0106	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW0107	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113
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			Control station	Normal station																																																																																																																																																									
SW0110 to SW0117	Controller operation status of each station (2)	Stores the continuation error status of the controller on each station. (Including own station) 0: Normal 1: Continuation error	○	○																																																																																																																																																									
		<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0110</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0111</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0112</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0113</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0114</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0115</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0116</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0117</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>				b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW0110	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW0111	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW0112	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW0113	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW0114	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW0115	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW0116	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW0117	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113
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		SW0114			80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65																																																																																																																																									
		SW0115			96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81																																																																																																																																									
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SW0117	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113																																																																																																																																													
Each number in the table represents a station number.																																																																																																																																																													
(Conditions)																																																																																																																																																													
• This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.																																																																																																																																																													
• This register is enabled only for normal stations in Baton pass status of each station (SW00A0 to SW00A7).																																																																																																																																																													
• Reserved stations and stations with a number equal to or greater than the maximum station number are ignored.																																																																																																																																																													
SW0120 to SW0127	Current IN-side error frame reception status	Stores whether an error frame has been received in the IN-side transmission path of each station. 0: Not been received 1: Been received	○	○																																																																																																																																																									
		<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0120</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0121</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0122</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0123</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0124</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0125</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0126</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0127</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>				b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW0120	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW0121	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW0122	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW0123	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW0124	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW0125	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW0126	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW0127	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113
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		SW0124			80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65																																																																																																																																									
		SW0125			96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81																																																																																																																																									
		SW0126			112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97																																																																																																																																									
SW0127	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113																																																																																																																																													
Each number in the table represents a station number.																																																																																																																																																													
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No.	Name	Description	Availability																																																																																																																																																										
			Control station	Normal station																																																																																																																																																									
SW0130 to SW0137	Current OUT-side error frame reception status	Stores whether an error frame has been received in the OUT-side transmission path of each station. 0: Not been received 1: Been received	○	○																																																																																																																																																									
		<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0130</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0131</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0132</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0133</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0134</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0135</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0136</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0137</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>				b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW0130	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW0131	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW0132	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW0133	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW0134	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW0135	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW0136	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW0137	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113
					b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0																																																																																																																																									
		SW0130			16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1																																																																																																																																									
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SW0135	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81																																																																																																																																													
SW0136	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97																																																																																																																																													
SW0137	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113																																																																																																																																													
Each number in the table represents a station number.																																																																																																																																																													
(Conditions)																																																																																																																																																													
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• This register is enabled only for normal stations in Baton pass status of each station (SW00A0 to SW00A7).																																																																																																																																																													
SW0140 to SW0147	IN-side error frame reception detection status	Stores whether an error frame has been received in the IN-side transmission path of each station from power-on to the present. When Clear IN-side transmission error counter (SB0007) is turned on, the stored value will be cleared. 0: Not been received 1: Been received	○	○																																																																																																																																																									
		<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0140</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0141</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0142</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0143</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0144</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0145</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0146</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0147</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>				b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW0140	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW0141	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW0142	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW0143	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW0144	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW0145	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW0146	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW0147	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113
					b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0																																																																																																																																									
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		SW0142			48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33																																																																																																																																									
		SW0143			64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49																																																																																																																																									
		SW0144			80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65																																																																																																																																									
SW0145	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81																																																																																																																																													
SW0146	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97																																																																																																																																													
SW0147	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113																																																																																																																																													
Each number in the table represents a station number.																																																																																																																																																													
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• This register is enabled only for normal stations in Baton pass status of each station (SW00A0 to SW00A7).																																																																																																																																																													

No.	Name	Description	Availability																																																																																																																																																										
			Control station	Normal station																																																																																																																																																									
SW0150 to SW0157	OUT-side error frame reception detection status	Stores whether an error frame has been received in the OUT-side transmission path of each station from power-on to the present. When Clear OUT-side transmission error counter (SB0008) is turned on, the stored value will be cleared. 0: Not been received 1: Been received	○	○																																																																																																																																																									
		<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0150</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0151</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0152</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0153</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0154</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0155</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0156</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0157</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>				b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW0150	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW0151	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW0152	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW0153	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW0154	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW0155	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW0156	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW0157	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113
					b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0																																																																																																																																									
		SW0150			16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1																																																																																																																																									
		SW0151			32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17																																																																																																																																									
		SW0152			48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33																																																																																																																																									
		SW0153			64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49																																																																																																																																									
		SW0154			80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65																																																																																																																																									
SW0155	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81																																																																																																																																													
SW0156	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97																																																																																																																																													
SW0157	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113																																																																																																																																													
Each number in the table represents a station number.																																																																																																																																																													
(Conditions)																																																																																																																																																													
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• This register is enabled only for normal stations in Baton pass status of each station (SW00A0 to SW00A7).																																																																																																																																																													
SW0160 to SW0167	Path switching detection status of each station	Stores whether path switching has been detected in each station from power-on to the present. When Clear loop switching counter (SB0009) is turned on, the path switching detection status of the own station is cleared. Turn on Clear loop switching counter (SB0009) in other stations to clear the path switching detection status of other stations. 0: Path switching not detected 1: Path switching detected	○	○																																																																																																																																																									
		<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0160</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0161</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0162</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0163</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0164</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0165</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0166</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0167</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>				b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW0160	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW0161	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW0162	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW0163	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW0164	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW0165	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW0166	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW0167	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113
					b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0																																																																																																																																									
		SW0160			16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1																																																																																																																																									
		SW0161			32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17																																																																																																																																									
		SW0162			48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33																																																																																																																																									
		SW0163			64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49																																																																																																																																									
		SW0164			80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65																																																																																																																																									
SW0165	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81																																																																																																																																													
SW0166	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97																																																																																																																																													
SW0167	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113																																																																																																																																													
Each number in the table represents a station number.																																																																																																																																																													
(Conditions)																																																																																																																																																													
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No.	Name	Description	Availability																																																																																																																																																										
			Control station	Normal station																																																																																																																																																									
SW0170 to SW0177	Transient error detection status of each station	Stores whether a transient transmission error has been detected in each station from power-on to the present. When Clear transient transmission error counter (SB000A) is turned on, the transient error detection status of the own station is cleared. Turn on Clear transient transmission error counter (SB000A) in other stations to clear the transient error detection status of other stations. 0: Error not detected 1: Error detected	○	○																																																																																																																																																									
		<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0170</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0171</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0172</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0173</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0174</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0175</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0176</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0177</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>				b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW0170	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW0171	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW0172	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW0173	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW0174	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW0175	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW0176	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW0177	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113
					b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0																																																																																																																																									
		SW0170			16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1																																																																																																																																									
		SW0171			32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17																																																																																																																																									
		SW0172			48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33																																																																																																																																									
		SW0173			64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49																																																																																																																																									
		SW0174			80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65																																																																																																																																									
		SW0175			96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81																																																																																																																																									
		SW0176			112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97																																																																																																																																									
SW0177	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113																																																																																																																																													
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• This register is enabled when Baton pass status (own station) (SB0047) is off. When Baton pass status (own station) (SB0047) is turned on (error), data prior to error is held.																																																																																																																																																													
SW0180 to SW0187	Power supply status of each station	Stores the external power supply status of the CC-Link IE Controller Network module for each station. 0: No external power supplied 1: External power supplied This register is always off for the CC-Link IE Controller Network module without external power supply function.	○	○																																																																																																																																																									
		<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0180</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0181</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0182</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0183</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0184</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0185</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0186</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0187</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>				b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW0180	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW0181	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW0182	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW0183	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW0184	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW0185	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW0186	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW0187	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113
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• Reserved stations and stations with a number equal to or greater than the maximum station number are ignored.																																																																																																																																																													

No.	Name	Description	Availability																																																																																																																																																										
			Control station	Normal station																																																																																																																																																									
SW0190 to SW0197	Power status consistency check of each station	Stores the external power supply status of the CC-Link IE Controller Network module with external power supply function for each station. 0: External power supplied (normal) 1: No external power supplied (error) This register is always off for the CC-Link IE Controller Network module without external power supply function.	○	○																																																																																																																																																									
		<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0190</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0191</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0192</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0193</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0194</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0195</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0196</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0197</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>				b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SW0190	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SW0191	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	SW0192	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	SW0193	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	SW0194	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	SW0195	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	SW0196	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	SW0197	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113
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		SW0191			32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17																																																																																																																																									
		SW0192			48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33																																																																																																																																									
		SW0193			64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49																																																																																																																																									
		SW0194			80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65																																																																																																																																									
		SW0195			96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81																																																																																																																																									
		SW0196			112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97																																																																																																																																									
SW0197	-	-	-	-	-	-	-	-	120	119	118	117	116	115	114	113																																																																																																																																													
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Appendix 3 Frame Format

The following is the basic format of CC-Link compatible transient frames.

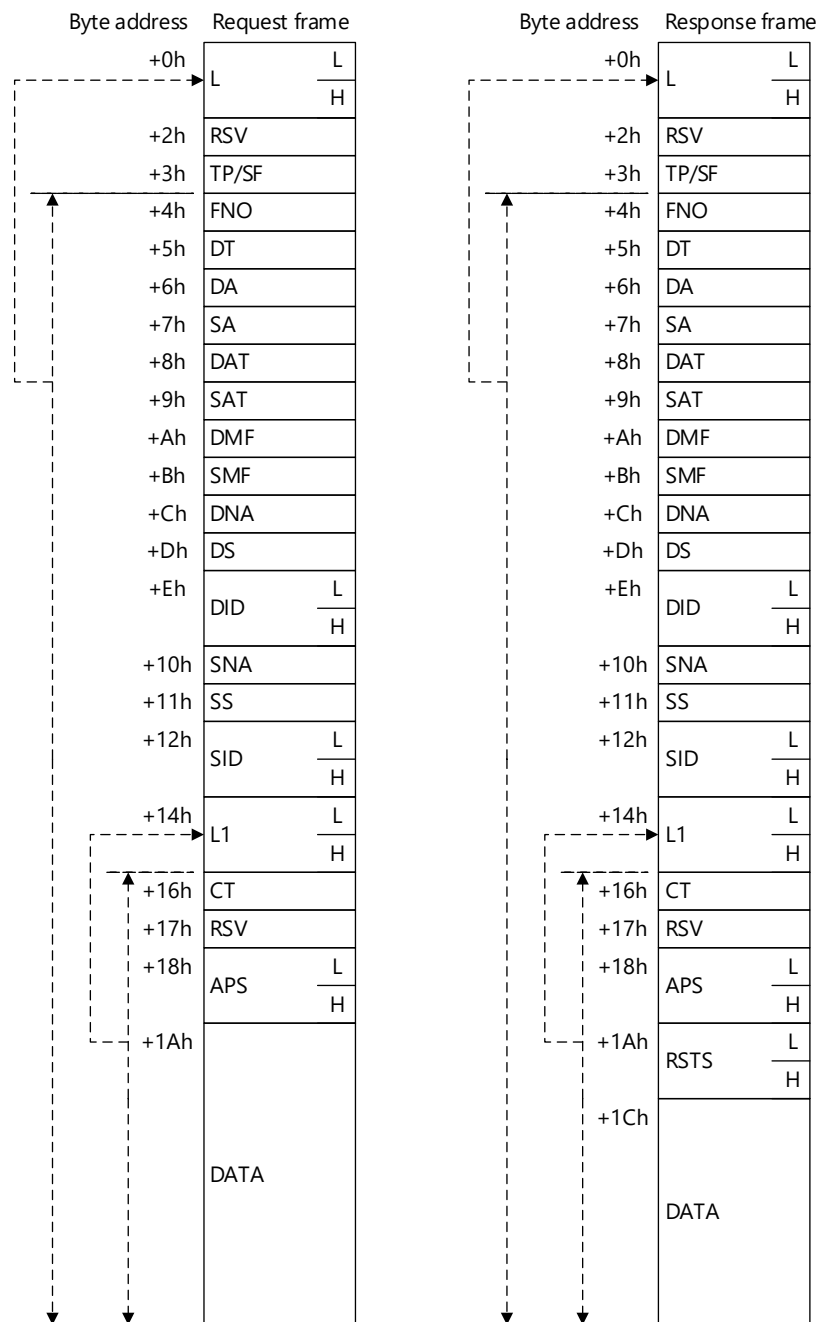


Figure Appendix 3-1 Basic Format of CC-Link Compatible Transient Frames

(1) Items in the frames

The following table lists the items defined in the basic format of CC-Link compatible transient frames.

Table Appendix 3-1 Items Defined in the Basic Format of CC-Link Compatible Transient Frames

Item	Description	Setting value
L	Frame length	Data length after FNO (in units of bytes)
RSV	Reserved	Fixed to 00h
TP/SF	Type/sequence number	Fixed to 00h
FNO	Start frame ID/divided frame number	Fixed to 00h
DT	Priority/response frame necessity	Fixed to 00h
DA	Destination station number 01	Transient transmission destination station number (same value as DS) 1 to 120: Station number
SA	Source station number 01	Transient transmission source station number (same value as SS) 1 to 120: Station number
DAT	Destination application type	Fixed to 22h
SAT	Source application type	Fixed to 22h
DMF	Execution module destination flag	Execution module destination 00h: Inside the board 01h: Inside the controller (inside the host)
SMF	Execution module source flag	Execution module source 00h: Inside the board 01h: Inside the controller (inside the host)
DNA	Destination network number	Network number to which the transient transmission destination station belongs 1 to 239: Network number
DS	Destination station number 02	Transient transmission destination station number 1 to 120: Station number
DID	System specifications area/destination ID number	Fixed to 03FFh
SNA	Source network number	Network number to which the transient transmission source station belongs 1 to 239: Network number
SS	Source station number 02	Transient transmission source station number 1 to 120: Station number
SID	System specifications area/source ID number	Fixed to 03FFh
L1	Data length	Data length after CT (in units of bytes)
CT	Command type	Transient transmission command type. For details, refer to (2) Command type (CT) in this section.
RSV	Reserved	Fixed to 00h
APS	Application number	Application ID number b15 to b8: Fixed to 00h b7 to b0: 00h to FFh (application number)
RSTS	Return code	Response code returned from the board. When the code is returned, refer to (3) Return code (RSTS) in this section. 00h: Normal Other than 00h: Error code (Refer to Section 4.1 "Error Codes".)

(2) Command type (CT)

The following figure shows the data structure of the command type (CT).

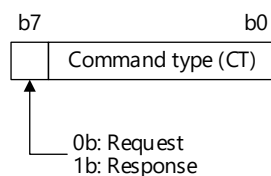


Figure Appendix 3-2 Data Structure of the Command Type (CT)

The following table lists the CC-Link compatible transient commands used in this manual.

For the frame format of each command, refer to Appendix 3.1 "Device access information acquisition" and later sections.

Table Appendix 3-2 Command List

Command	Description
04h	Device access information acquisition request
84h	Device access information acquisition response
08h	Remote RUN request
88h	Remote RUN response
09h	Remote STOP request
89h	Remote STOP response
10h	Device read request
90h	Device read response
12h	Device write request
92h	Device write response

(3) Return code (RSTS)

When an error exists in the request frame sent from a client, the server stores the corresponding error code in this area of the response frame.

[When the own station is a client]

The error code corresponding to the error in the request frame sent from the own station is stored at execution of the response frame receive processing.

Correct the request frame creation processing or the request send processing, referring to the user's manuals for the request destination device (manufactured by either Mitsubishi Electric or partner maker) used.

[When the own station is the server]

Store the error code corresponding to the error in the request frame sent from a client at execution of the response frame send processing. Error codes can be determined by the user.

Appendix 3.1 Device access information acquisition

This command (CT = 04h) acquires the devices and access codes that can be used by the communication target controller.

The following are the request and response frames of the command.

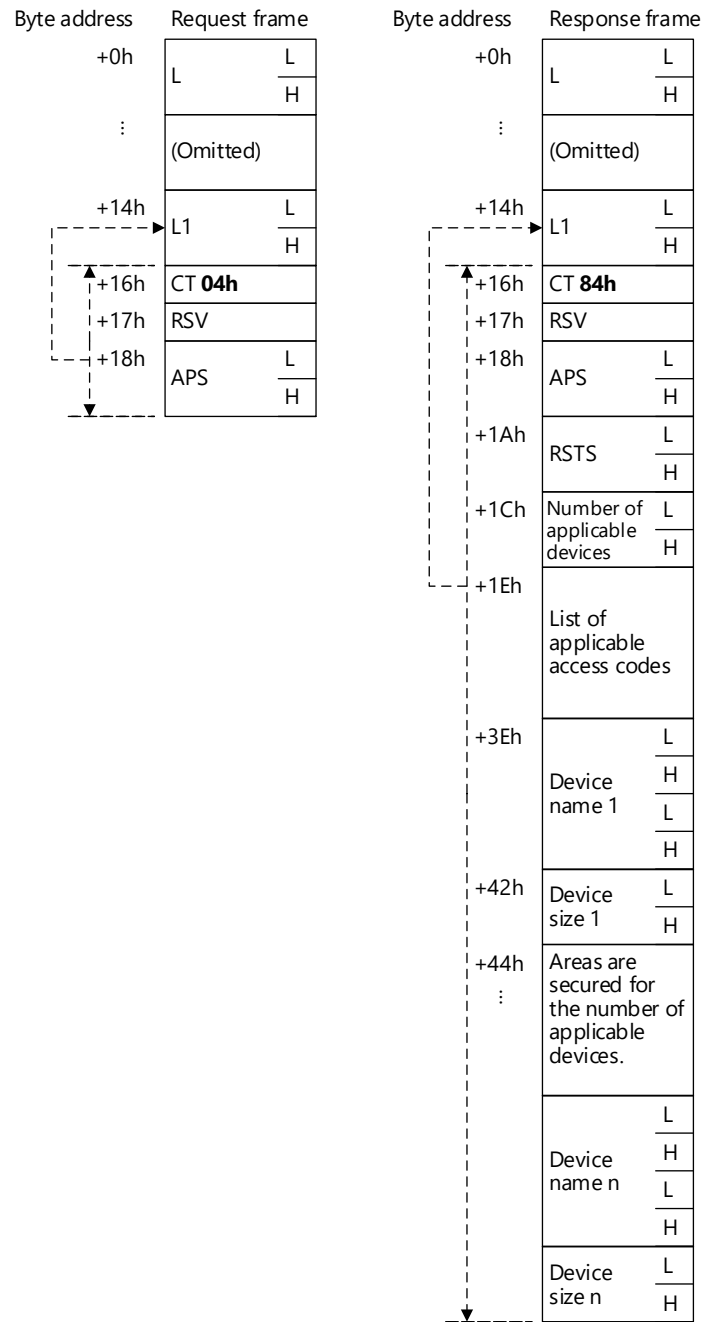


Figure Appendix 3.1-1 Request and Response Frames of the Device Access Information Acquisition Command

The following table lists the data items to be set in the response frame of the device access information acquisition command.

Table Appendix 3.1-1 Setting Data of the Device Access Information Acquisition Command (Response Frame)

Address	Item	Description																																																																																																																																																																																																																																																																																																	
+1Ch, +1Dh	Number of applicable devices	The number of applicable devices that can be used by the device read/write commands is stored.																																																																																																																																																																																																																																																																																																	
+1Eh to +3Dh	List of applicable access codes	The access codes (00h to FFh) of the applicable devices in the controller on the communication target station are stored in a bit pattern. For the applicable access codes, "1b" is stored. For the non-applicable access codes, "0b" is stored.																																																																																																																																																																																																																																																																																																	
		<table><tr><td>b15</td><td colspan="15"></td><td>b0</td></tr><tr><td>+1Eh</td><td>0Fh</td><td>0Eh</td><td>0Dh</td><td>0Ch</td><td>0Bh</td><td>0Ah</td><td>09h</td><td>08h</td><td>07h</td><td>06h</td><td>05h</td><td>04h</td><td>03h</td><td>02h</td><td>01h</td><td>00h</td></tr><tr><td></td><td>1Fh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>10h</td></tr><tr><td></td><td>2Fh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>20h</td></tr><tr><td></td><td>3Fh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>30h</td></tr><tr><td></td><td>4Fh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>40h</td></tr><tr><td></td><td>5Fh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>50h</td></tr><tr><td></td><td>6Fh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>60h</td></tr><tr><td></td><td>7Fh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>70h</td></tr><tr><td></td><td>8Fh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>80h</td></tr><tr><td></td><td>9Fh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>90h</td></tr><tr><td></td><td>AFh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>A0h</td></tr><tr><td></td><td>BFh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>B0h</td></tr><tr><td></td><td>CFh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>C0h</td></tr><tr><td></td><td>DFh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>D0h</td></tr><tr><td></td><td>EFh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>E0h</td></tr><tr><td>+3Dh</td><td>FFh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>F0h</td></tr></table> 0b: Non-applicable access code 1b: Applicable access code	b15																b0	+1Eh	0Fh	0Eh	0Dh	0Ch	0Bh	0Ah	09h	08h	07h	06h	05h	04h	03h	02h	01h	00h		1Fh															10h		2Fh															20h		3Fh															30h		4Fh															40h		5Fh															50h		6Fh															60h		7Fh															70h		8Fh															80h		9Fh															90h		AFh															A0h		BFh															B0h		CFh															C0h		DFh															D0h		EFh															E0h	+3Dh	FFh															F0h
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+44h to +47h	Device name 2	The device name is stored in ASCII code which is four digits long.																																																																																																																																																																																																																																																																																																	
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*1: The start addresses can be calculated by using the following calculation formulas.

Device name n: +3Eh + (06h × n)

Device size n: +3Eh + (06h × n) + 04h

Appendix 3.2 Remote RUN

This command (CT = 08h) remotely runs the controller on another station.
The following are the request and response frames of the command.

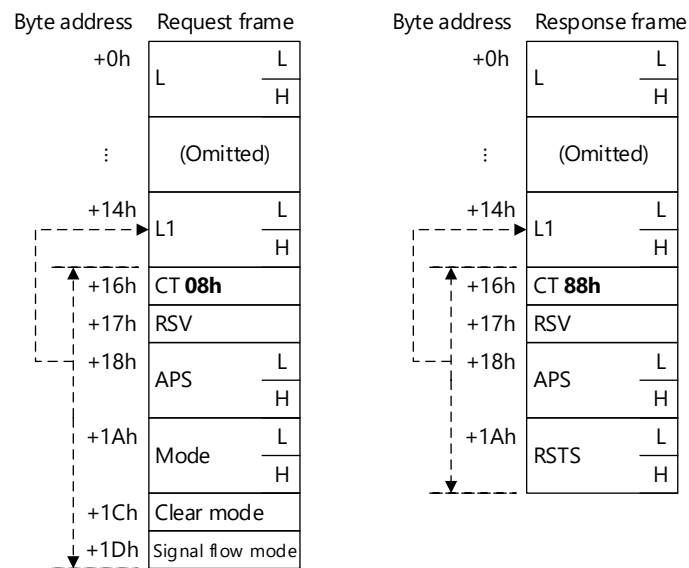


Figure Appendix 3.2-1 Request and Response Frames of the Remote RUN Command

The following table lists the data items to be set in the request frame of the remote RUN command.

Table Appendix 3.2-1 Setting Data of the Remote RUN Command (Request Frame)

Address	Item	Description	Setting value
+1Ah, +1Bh	Mode	Set whether to forcibly execute the remote RUN command to the controller stopped by another station.*1	1: Forced RUN 3: Normal RUN
+1Ch	Clear mode	Set whether to initialize the devices in the controller at execution of the remote RUN command.	0: Do not initialize 1: Initialize devices other than the latch device 2: Initialize all devices
+1Dh	Signal flow mode	Specify how to initialize the devices set in clear mode.	0: Hold status before command execution 1: All 0 (off) 2: All 1 (on)

*1: The remote RUN command can be executed normally (in normal RUN mode) to the controller that has been remotely stopped by the own station. However, to the controller that has been remotely stopped by another station, forcibly execute the remote RUN command (in forced RUN mode).

Appendix 3.3 Remote STOP

This command (CT = 09h) remotely stops the controller on another station.
The following are the request and response frames of the command.

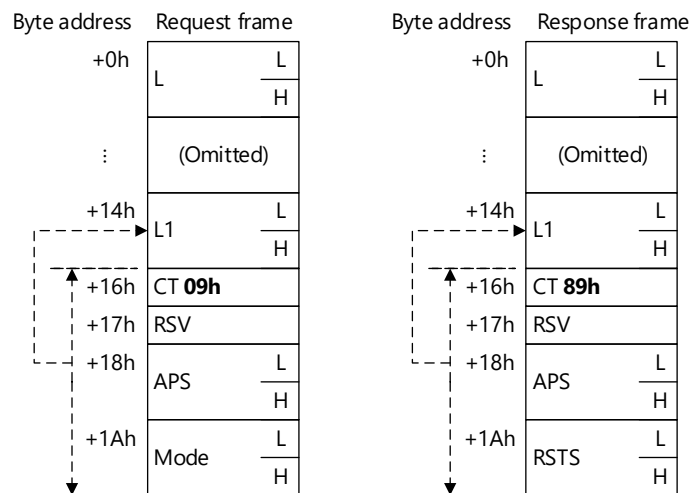


Figure Appendix 3.3-1 Request and Response Frames of the Remote STOP Command

The following table lists the data items to be set in the request frame of the remote STOP command.

Table Appendix 3.3-1 Setting Data of the Remote STOP Command (Request Frame)

Address	Item	Description	Setting value
+1Ah, +1Bh	Mode	Set whether to forcibly execute the remote STOP command to the controller run by another station.	1: Forced STOP 3: Normal STOP

Appendix 3.4 Device read

This command (CT = 10h) reads data from a device in the controller on another station.
The following are the request and response frames of the command.

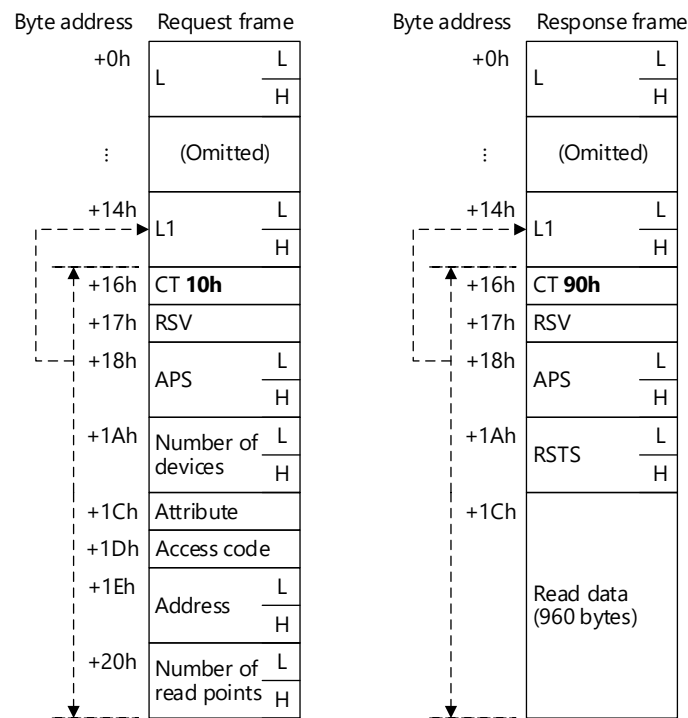


Figure Appendix 3.4-1 Request and Response Frames of the Device Read Command

The following table lists the data items to be set in the request frame of the device read command.

Table Appendix 3.4-1 Setting Data of the Device Read Command (Request Frame)

Address	Item	Description	Setting value
+1Ah, +1Bh	Number of devices	Set the number of read target devices.	Fixed to 0001h
+1Ch	Attribute	Set the attribute. Set the attribute for each applicable device in the controller on the device read request destination station.	*1
+1Dh	Access code	Set the access code. Set the access code for each applicable device in the controller on the device read request destination station.	*1
+1Eh, +1Fh	Address	Set the start address of the read target device. Set the address within the access range.*2	Value set by the user
+20h, +21h	Number of read points	Set the number of read points. Set a value within the access range.	Value set by the user

*1: For details, refer to Appendix 3.6 "Access codes and attributes".

*2: Specify the address of a bit device with 0 or multiples of 16, and specify the address of a byte device with 0 or multiples of 2.

Appendix 3.5 Device write

This command (CT = 12h) writes data to a device in the controller on another station.
The following are the request and response frames of the command.

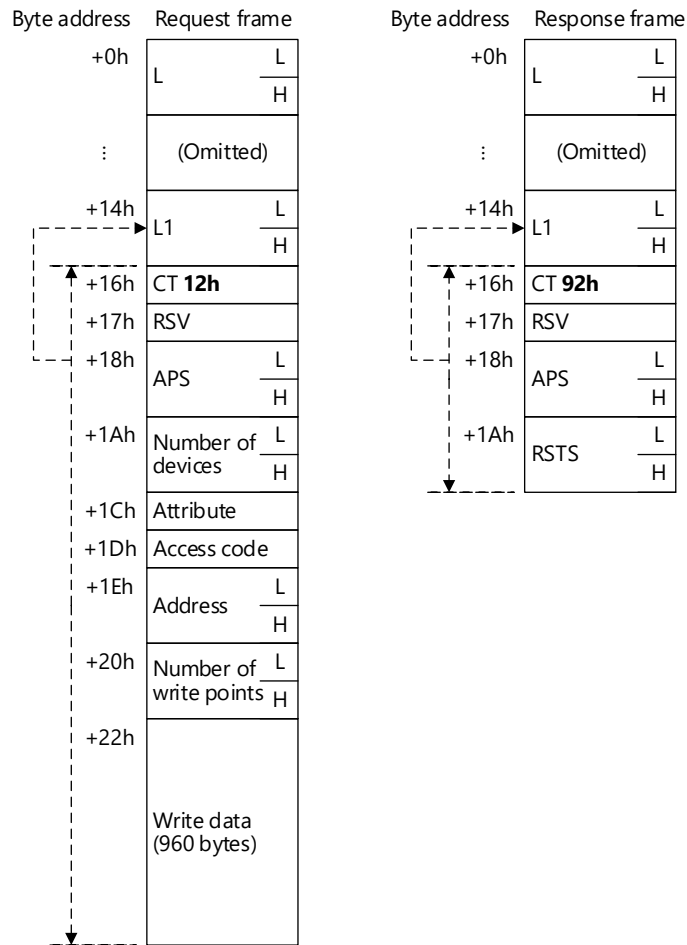


Figure Appendix 3.5-1 Request and Response Frames of the Device Write Command

The following table lists the data items to be set in the request frame of the device write command.

Table Appendix 3.5-1 Setting Data of the Device Write Command (Request Frame)

Address	Item	Description	Setting value
+1Ah, +1Bh	Number of devices	Set the number of write target devices.	Fixed to 0001h
+1Ch	Attribute	Set the attribute. Set the attribute for each applicable device in the controller on the device read request destination station.	*1
+1Dh	Access code	Set the access code. Set the access code for each applicable device in the controller on the device write request destination station.	*1
+1Eh	Address	Set the start address of the write target device. Set the address within the access range.*2	Value set by the user
+20h, +21h	Number of write points	Set the number of write points. Set a value within the access range.	Value set by the user
+22h	Write data	Set the data to be written.	Value set by the user

*1: For details, refer to Appendix 3.6 "Access codes and attributes".

*2: Specify the address of a bit device with 0 or multiples of 16, and specify the address of a byte device with 0 or multiples of 2.

Appendix 3.6 Access codes and attributes

The following are the definitions of an access code and an attribute.

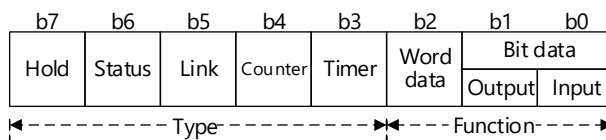


Figure Appendix 3.6-1 Access Code Definitions

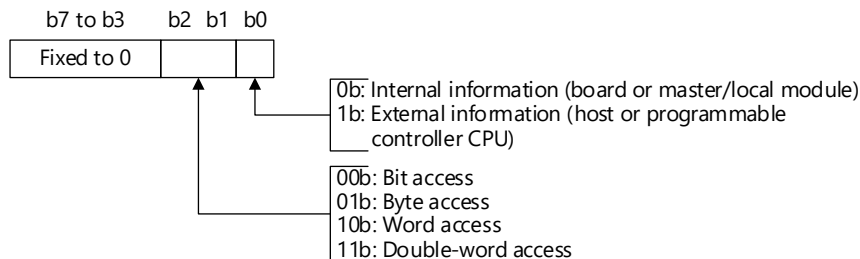


Figure Appendix 3.6-2 Attribute Definitions

[When the own station is the server]

Set the access code and attribute of its own so that another station can access the own station by using the device read command and the device write command.

[When the own station is a client]

To access another station, which is a product manufactured by Mitsubishi Electric (MELSEC product), by using the device read command and the device write command, refer to the following table. Note that the device size (number of points) varies depending on the programmable controller used. For the device access range, refer to the user's manuals for the programmable controller used.

To access another station, which is not a product manufactured by Mitsubishi Electric, refer to the user's manuals for the product used on the access target station.

Table Appendix 3.6-1 Access Codes of Devices in MELSEC Products

Device name	Symbol	Type		Notation	Access code*1	Attribute*1
		Bit	Word			
Input	X	○	-	Hexadecimal	01h	05h
Output	Y	○	-	Hexadecimal	02h	
Internal relay	M	○	-	Decimal	03h	
Latch relay	L	○	-	Decimal	83h	
Link relay	B	○	-	Hexadecimal	23h	
Timer (contact)	T	○	-	Decimal	09h	
Timer (coil)	T	○	-	Decimal	0Ah	
Timer (current value)	T	-	○	Decimal	0Ch	
Retentive timer (contact)	ST	○	-	Decimal	89h	
Retentive timer (coil)	ST	○	-	Decimal	8Ah	
Retentive timer (current value)	ST	-	○	Decimal	8Ch	
Counter (contact)	C	○	-	Decimal	11h	
Counter (coil)	C	○	-	Decimal	12h	
Counter (current value)	C	-	○	Decimal	14h	
Data register*2	D	-	○	Decimal	04h	
Link register*2	W	-	○	Hexadecimal	24h	
File register	R	-	○	Decimal	84h	
Link special relay	SB	○	-	Hexadecimal	63h	
Link special register	SW	-	○	Hexadecimal	64h	
Special relay	SM	○	-	Decimal	43h	
Special register	SD	-	○	Decimal	44h	

*1: When the target station is not a master/local module, refer to the user's manuals for the product used on the access target station.

*2: The extended data register D65536 or later and the extended link register W10000 or later cannot be specified.

Revisions

* The manual number is given on the bottom left of the back cover.

Print date	*Manual number	Revision
February 2009	SH(NA)-080819ENG-A	First edition
October 2020	SH(NA)-080819ENG-B	Overall modification
September 2023	SH(NA)-080819ENG-C	Modified Safety Precautions, Conditions of Use for the Product, Usage Precautions

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Warranty

Please confirm the following product warranty details before using the personal computer board.

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 sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion.

Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for thirty-six (36) months 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 forty-two (42) 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 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.
 5. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
 6. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by 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 available after production is discontinued.

3. Customer service

- (1) When the cause of failure requires an investigation, Mitsubishi shall conduct the investigation using the personal computer board unit only. Please bring the personal computer board removed from the product to which it was incorporated to Mitsubishi. Mitsubishi will not conduct business travel in connection with the investigation.
- (2) 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 loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to:

- (1) Damages caused by any cause found not to be the responsibility of Mitsubishi.
- (2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.
- (3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.
- (4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

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

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Ethernet Based Open Network
CC-Link IE Compatible Product Development Reference Manual

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MODEL	Q80BD-GP21-SX-DRV-E
MODEL CODE	13JV22
SH(NA)-080819ENG-C(2309)MEE	

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