

# SECTION 5

## FINS Commands

This section provides detailed descriptions of the FINS commands.

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## 5-1 Command Lists

### 5-1-1 FINS Commands

The following table lists the FINS commands.

Type	Command code		Name	Function
	MR	SR		
I/O memory area access	01	01	MEMORY AREA READ	Reads the contents of consecutive I/O memory area words.
	01	02	MEMORY AREA WRITE (See note.)	Writes the contents of consecutive I/O memory area words.
	01	03	MEMORY AREA FILL (See note.)	Writes the same data to the specified range of I/O memory area words.
	01	04	MULTIPLE MEMORY AREA READ	Reads the contents of specified non-consecutive I/O memory area words.
	01	05	MEMORY AREA TRANSFER (See note.)	Copies the contents of consecutive I/O memory area words to another I/O memory area.
Parameter area access	02	01	PARAMETER AREA READ	Reads the contents of consecutive parameter area words.
	02	02	PARAMETER AREA WRITE (See note.)	Writes the contents of consecutive parameter area words.
	02	03	PARAMETER AREA FILL (CLEAR) (See note.)	Writes the same data to the specified range of parameter area words.
Program area access	03	06	PROGRAM AREA READ	Reads the UM (User Memory) area.
	03	07	PROGRAM AREA WRITE (See note.)	Writes to the UM (User Memory) area.
	03	08	PROGRAM AREA CLEAR (See note.)	Clears the UM (User Memory) area.
Operating mode changes	04	01	RUN (See note.)	Changes the CPU Unit's operating mode to RUN or MONITOR.
	04	02	STOP (See note.)	Changes the CPU Unit's operating mode to PROGRAM.
Machine configuration reading	05	01	CPU UNIT DATA READ	Reads CPU Unit data.
	05	02	CONNECTION DATA READ	Reads the model numbers of the device corresponding to addresses.
Status reading	06	01	CPU UNIT STATUS READ	Reads the status of the CPU Unit.
	06	20	CYCLE TIME READ	Reads the maximum, minimum, and average cycle time.
Time data access	07	01	CLOCK READ	Reads the present year, month, date, minute, second, and day of the week.
	07	02	CLOCK WRITE (See note.)	Changes the present year, month, date, minute, second, or day of the week.
Message display	09	20	MESSAGE READ/CLEAR	Reads and clears messages, and reads FAL/FALS messages.
Access rights	0C	01	ACCESS RIGHT ACQUIRE (See note.)	Acquires the access right as long as no other device holds it.
	0C	02	ACCESS RIGHT FORCED ACQUIRE	Acquires the access right even if another device already holds it.
	0C	03	ACCESS RIGHT RELEASE	Releases the access right that has been acquired.
Error log	21	01	ERROR CLEAR (See note.)	Clears errors or error messages.
	21	02	ERROR LOG READ	Reads the error log.
	21	03	ERROR LOG CLEAR (See note.)	Clears the error log pointer.

Type	Command code		Name	Function
	MR	SR		
FINS write access log	21	40	FINS WRITE ACCESS LOG READ	The CPU Unit automatically keeps a log of any access for FINS write commands. This command reads this log.
	21	41	FINS WRITE ACCESS LOG CLEAR (See note.)	Clears the FINS write access log.
File memory	22	01	FILE NAME READ	Reads file memory data.
	22	02	SINGLE FILE READ	Reads a specified length of file data from a specified position within a single file.
	22	03	SINGLE FILE WRITE (See note.)	Writes a specified length of file data from a specified position within a single file.
	22	04	FILE MEMORY FORMAT (See note.)	Formats (initializes) the file memory.
	22	05	FILE DELETE (See note.)	Deletes specified files stored in the file memory.
	22	07	FILE COPY (See note.)	Copies files from one file memory to another file memory in the same system.
	22	08	FILE NAME CHANGE (See note.)	Changes a file name.
	22	0A	MEMORY AREA-FILE TRANSFER (See note.)	Transfers or compares data between the I/O memory area and the file memory.
	22	0B	PARAMETER AREA-FILE TRANSFER (See note.)	Transfers or compares data between the parameter area and the file memory.
	22	0C	PROGRAM AREA-FILE TRANSFER (See note.)	Transfers or compares data between the UM (User Memory) area and the file memory.
	22	15	DIRECTORY CREATE/DELETE (See note.)	Creates or deletes a directory.
	22	20	MEMORY CASSETTE TRANSFER (CP1H CPU Units, CP1L CPU Units only)	Transfers and verifies data between a Memory Cassette and the CPU Unit.
Debugging	23	01	FORCED SET/RESET (See note.)	Force-sets or force-resets bits, or releases force-set status.
	23	02	FORCED SET/RESET CANCEL (See note.)	Cancels all bits that have been force-set or force-reset.
Serial Gateway functions	28	03	CONVERT TO COMPOWAY/F COMMAND	Encapsulates a CompoWay/F command in a FINS command and sends it to a serial port. (The CompoWay/F command is extracted and sent through the serial port at the receiving end.)
	28	04	CONVERT TO MODBUS-RTU COMMAND	Encapsulates a Modbus-RTU command in a FINS command and sends it to a serial port. (The Modbus-RTU command is extracted and sent through the serial port at the receiving end.)
	28	05	CONVERT TO MODBUS-ASCII COMMAND	Encapsulates a Modbus-ASCII command in a FINS command and sends it to a serial port. (The Modbus-ASCII command is extracted and sent through the serial port at the receiving end.)
	Any	Any	CONVERT TO HOST LINK FINS COMMAND (See note 2.)	Sends any FINS command to a PLC connected to the serial port of a Serial Communications Board or Unit (Ver. 1.2 or later only).

- Note**
1. These commands will not be accepted and an end code of 2102 hex (cannot write due to protection) will be returned if the *Write Protection from FINS Commands Sent to CPU Units via Networks* option is selected in the PLC Setup for a CS/CJ-series CPU Unit with unit version 2.0 or later, CP-series CPU Unit, or NSJ Controller.
  2. The Serial Gateway function can be used with Host Link FINS commands only under the following conditions.  
For more details, refer to *3-5 FINS Commands with Host Link Protocol* and the *CS/CJ Series Serial Communications Boards and Serial Communications Units Operation Manual* (W336-E1-05).

### Connecting to the Destination PLC

Connect the destination PLC to the serial port of a Serial Communications Unit or Board (Ver. 1.2 or later) as a Host Link Slave and use the serial gateway mode or protocol macro mode communications.

### Specifying the Destination PLC's FINS Address

- Destination Network Address (DNA):
  - When a routing table is created to treat the serial communications path as a network, the routing table associates this network address with the Serial Communications Unit or Board's serial port.
  - When a routing table is **not** created to treat the serial communications path as a network, this is the unit address of the Serial Communications Unit or Board's serial port.
- Destination Node Address (DA1):
  - When a routing table is created to treat the serial communications path as a network, the node address is the Host Link unit number + 1 (values 1 to 32).
  - When a routing table is **not** created to treat the serial communications path as a network, the node address is still the Host Link unit number + 1 (values 1 to 32).
- Destination Unit Address (DA2):  
Specifies any unit address other than the serial port. (The destination of a FINS message must be an address other than the Serial Communications Unit or Board's serial port.)

## 5-1-2 FINS Command Restrictions

Type	Command code		Name	PLC status						
	MR	SR		RUN mode	MONITOR mode	PROGRAM mode	Access right	Read protection	DIP switch UM write-protection	Write-protected from network
I/O memory area access	01	01	MEMORY AREA READ	OK	OK	OK	OK	OK	OK	OK
		02	MEMORY AREA WRITE	OK	OK	OK	OK	OK	OK	Disabled
		03	MEMORY AREA FILL	OK	OK	OK	OK	OK	OK	Disabled
		04	MULTIPLE MEMORY AREA READ	OK	OK	OK	OK	OK	OK	OK
		05	MEMORY AREA TRANSFER	OK	OK	OK	OK	OK	OK	Disabled
Parameter area access	02	01	PARAMETER AREA READ	OK	OK	OK	OK	OK	OK	OK
		02	PARAMETER AREA WRITE	OK	OK	OK	Disabled	OK	Disabled	Disabled
		03	PARAMETER AREA CLEAR	OK	OK	OK	Disabled	OK	Disabled	Disabled
Program area access	03	06	PROGRAM AREA READ	OK	OK	OK	OK	Disabled	OK	OK
		07	PROGRAM AREA WRITE	Disabled	Disabled	OK	Disabled	OK	Disabled	Disabled
		08	PROGRAM AREA CLEAR	Disabled	Disabled	OK	Disabled	OK	Disabled	Disabled
Operating mode changes	04	01	RUN	OK	OK	OK	Disabled	OK	OK	Disabled
		02	STOP	OK	OK	OK	Disabled	OK	OK	Disabled
Machine configuration reading	05	01	CPU UNIT DATA READ	OK	OK	OK	OK	OK	OK	OK
		02	CONNECTION DATA READ	OK	OK	OK	OK	OK	OK	OK
Status reading	06	01	CPU UNIT STATUS READ	OK	OK	OK	OK	OK	OK	OK
		20	CYCLE TIME READ	OK	OK	Disabled	OK	OK	OK	OK
Time data access	07	01	CLOCK READ	OK	OK	OK	OK	OK	OK	OK
		02	CLOCK WRITE	OK	OK	OK	Disabled	OK	OK	
Message display	09	20	MESSAGE READ/CLEAR	OK	OK	OK	Disabled (MESSAGE CLEAR only)	OK	OK	Disabled
Access rights	0C	01	ACCESS RIGHT ACQUIRE	OK	OK	OK	Disabled	OK	OK	Disabled
		02	ACCESS RIGHT FORCED ACQUIRE	OK	OK	OK	OK	OK	OK	OK
		03	ACCESS RIGHT RELEASE	OK	OK	OK	OK	OK	OK	OK
Error log	21	01	ERROR CLEAR	OK	OK	OK	Disabled	OK	OK	Disabled
		02	ERROR LOG READ	OK	OK	OK	OK	OK	OK	OK
		03	ERROR LOG CLEAR	OK	OK	OK	OK	OK	OK	Disabled

Type	Command code		Name	PLC status						
	MR	SR		RUN mode	MONITOR mode	PROGRAM mode	Access right	Read protection	DIP switch UM write-protection	Write-protected from network
FINS write access log	21	40	FINS WRITE ACCESS LOG READ	OK	OK	OK	OK	OK	OK	OK
	21	41	FINS WRITE ACCESS LOG CLEAR	OK	OK	OK	Disabled	OK	OK	Disabled
File memory	22	01	FILE NAME READ	OK	OK	OK	OK	OK	OK	OK
		02	SINGLE FILE READ	OK	OK	OK	OK	OK	OK	OK
		03	SINGLE FILE WRITE	OK	OK	OK	Disabled	OK	OK	Disabled
		04	FILE MEMORY FORMAT	OK	OK	OK	Disabled	OK	OK	Disabled
		05	FILE DELETE	OK	OK	OK	Disabled	OK	OK	Disabled
		07	FILE COPY	OK	OK	OK	Disabled	OK	OK	Disabled
		08	FILE NAME CHANGE	OK	OK	OK	Disabled	OK	OK	Disabled
		0A	MEMORY AREA-FILE TRANSFER	OK	OK	OK	Disabled	OK	OK	Disabled
		0B	PARAMETER AREA-FILE TRANSFER	OK (note 1)	OK (note 1)	OK	Disabled	OK	OK (note 1)	Disabled
		0C	PROGRAM AREA-FILE TRANSFER	OK (note 2)	OK (note 2)	OK	Disabled	OK	Disabled (note 3)	Disabled
		15	CREATE/DELETE DIRECTORY	OK	OK	OK	Disabled	OK	OK	Disabled
		20	MEMORY CASSETTE TRANSFER (CP1H CPU Units, CP1L CPU Units only)	Disabled	Disabled	OK	Disabled	OK	OK (note 4)	Disabled
Debugging	23	01	FORCED SET/RESET	Disabled	OK	OK	OK	OK	OK	Disabled
		02	FORCED SET/RESET CANCEL	Disabled	OK	OK	OK	OK	OK	Disabled
Serial Gateway	28	03	CONVERT TO COMPO-WAY/F COMMAND	OK	OK	OK	OK	OK	OK	OK
	28	04	CONVERT TO MOD-BUS-RTU COMMAND	OK	OK	OK	OK	OK	OK	OK
	28	05	CONVERT TO MOD-BUS-ASCII COMMAND	OK	OK	OK	OK	OK	OK	OK
	Any	Any	CONVERT TO HOST LINK FINS COMMAND	Depends on the command code used.						

- Note**
1. File-to-memory area transfers are not possible
  2. File-to-program area transfers are not possible
  3. Program area-to-file transfers are possible
  4. Memory Cassette contents cannot be transferred to the program area if program area data is included.
  5. With CS/CJ-series CPU Units with unit version 2.0 or later, CP-series CPU Unit, NSJ Controller, an option is available in the PLC Setup (Write Protection from FINS Commands Sent to CPU Units via Networks) to not received FINS write commands from specified network nodes even if a FINS write command is sent to the CPU Unit. The FINS write commands are the ones listed as *Disabled* in the *Write-protected from network* column above. The enables creating a system in which write/control operations are possi-

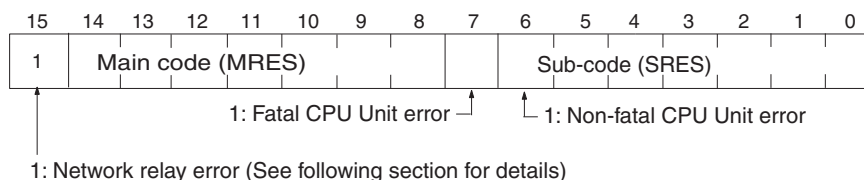
ble only from specific nodes. For details, refer to *1-4-4 Write Protection from FINS Commands Sent to CPU Units via Networks* in the *CS Series PLC Operation Manual* or the *CJ Series PLC Operation Manual*.

### 5-1-3 End Codes

The following table lists the main codes and the sub-codes, which combine to form the end code (response code) returned for a FINS command. The probable cause and corrections for each error code are also given.

Depending on the command, the destination code will sometimes make a request of another node on a network. The other node is referred to as the third node.

**Note** In addition to the end codes listed in the following table, the specific flags in the end code word (bits 6, 7, and 15) may also be ON. If bit 15 is ON, an error has occurred during a network relay operation. If bit 6 or 7 is ON, an error has occurred in the destination CPU Unit. If this occurs, refer to the operation manuals for the CPU Unit where the error occurred and remove the cause of the error. The contents of the end code word are shown in the following diagram.



Main code	Sub-code	Check point	Probable cause	Correction
00: Normal completion	00: Normal completion	---	---	---
	01: Service canceled	---	Service was canceled.	Check the capacity of the destination area in the third node.
		Data link status	Service was canceled.	Check the status of the data link.
01: Local node error	01: Local node not in network	Network status of local node	Local node is not participating in the network.	Connect the node to the network.
	02: Token timeout	Maximum node address	Token does not arrive.	Set the local node to within the maximum node address.
	03: Retries failed	---	Send was not possible during the specified number of retries.	Execute a communications test between the nodes and re-examine the system environment if it fails.
	04: Too many send frames	Number of enabled send frames	Cannot send because maximum number of event frames exceeded.	Check event execution on the network and reduce the number of events per cycle. Increase the maximum number of event frames.
	05: Node address range error	Node address	Node address setting error occurred.	Check the settings of the rotary switches to be sure that the address is within range and that each address is set only once in the same network.
	06: Node address duplication	Node addresses	The same node address has been set twice in the same network.	Change the address of one of the nodes with the same address.

Main code	Sub-code	Check point	Probable cause	Correction
02: Destination node error	01: Destination node not in network	INS indicator on Unit	The destination node is not in the network.	Add the destination node to the network.
	02: Unit missing	Instruction control data	There is no Unit with the specified unit address.	Check the destination unit address.
	03: Third node missing	Instruction control data	The third node does not exist.	Check the unit address of the third node. Check the node address of the third node in the send data for CMND(490).
		Command data	Broadcasting was specified.	Specify only one node for the third node.
	04: Destination node busy	---	The destination node is busy.	Increase the number of retries or review the system so that the destination node does not receive so many messages.
	05: Response timeout	---	The message was destroyed by noise.	Increase the number of retries or test communications between nodes to see if there is too much noise.
		Instruction control data	The response monitor time is too short.	Increase the length of the response monitor time.
		Error history	The send/receive frame was discarded.	Take appropriate measures based on the error history.
03: Controller error	01: Communications controller error	Unit/Board indicators	An error occurred in the communications controller.	Take appropriate measures based on the operation manuals for the related Units/Boards.
	02: CPU Unit error	CPU Unit indicators at destination node	A CPU error occurred in the destination CPU Unit.	Clear the error from the CPU Unit based on its operation manuals.
	03: Controller error	Board indicators	A response was not returned because an error occurred in the Board.	Check network communications status and restart the Board. If the problem persists, replace the Board.
	04: Unit number error	Unit number	The unit number was set incorrectly.	Set the rotary switches correctly, being sure the unit numbers are within range and that each number is used only once.
04: Service unsupported	01: Undefined command	Command code	The Unit/Board does not support the specified command code.	Check the command code.
	02: Not supported by model/version	Unit model and version	The command cannot be executed because the model or version is incorrect.	Check the model number and version.
05: Routing table error	01: Destination address setting error	Routing table	The destination network or node address is not set in the routing tables.	Register the destination network and node in the routing tables.
	02: No routing tables	Routing table	Relaying is not possible because there are no routing tables.	Set routing tables in the source node, designation node, and relay nodes.
	03: Routing table error	Routing table	There is an error in the routing tables.	Set the routing tables correctly.
	04: Too many relays	Network configuration	An attempt was made to send to a network that was over 3 networks away	Reconstruct the networks or change the routing tables so that commands are sent within a range of 3 networks or less.



Main code	Sub-code	Check point	Probable cause	Correction
10: Command format error	01: Command too long	Command data	The command is longer than the maximum permissible length.	Check the command format and correct the command data.
	02: Command too short	Command data	The command is shorter than the minimum permissible length.	Check the command format and correct the command data.
	03: Elements/data don't match	Command data	The designated number of elements differs from the number of write data items.	Check the number of elements and set data for each element.
	04: Command format error	Command data	An incorrect format was used.	Check the command format and correct the command data.
	05: Header error	Routing table	Either the relay table in the local node or the local network table in the relay node is incorrect.	Set the routing tables correctly.
11: Parameter error	01: Area classification missing	Memory area code in command data	The specified word does not exist in the memory area or there is no EM Area.	Check the memory areas and parameter codes in the command and correct the command data.
	02: Access size error	Access size specification in command data	The access size specification is incorrect or an odd word address is specified.	Check the memory areas and access size and correct the access size.
	03: Address range error	Starting address in command data	The start address in command process is beyond the accessible area.	Check the area being processed and set the correct range.
	04: Address range exceeded	Starting address and number of elements in command data	The end address in command process is beyond the accessible area.	Check the area being processed and set the correct range.
		Data link tables	The total number of words is beyond the limit.	Correct the data link tables.
	06: Program missing	Program number in command data	FFFF hex was not specified.	Specify FFFF hex.
	09: Relational error	Command data	A large–small relationship in the elements in the command data is incorrect.	Check the command data and correct the relationship between the elements.
		Data link table	A node not set in the common link parameters is set as a refresh parameter.	Correct the data link tables.
	0A: Duplicate data access	I/O access in CPU Unit	Differential monitoring was specified during data tracing or data tracing was specified during differential monitoring.	Abort the current process or wait until it ends before executing the command.
		Data link tables	The same node address is specified more than once.	Correct the data link tables.
	0B: Response too long	Number of elements in command data	The response format is longer than the maximum permissible length.	Check the command format and correct the number of elements.
	0C: Parameter error	Parameters in command data	There is an error in one of the parameter settings.	Check the command data and correct the parameters.
		Data link table file	There is an error in the file.	Check the contents of the file.

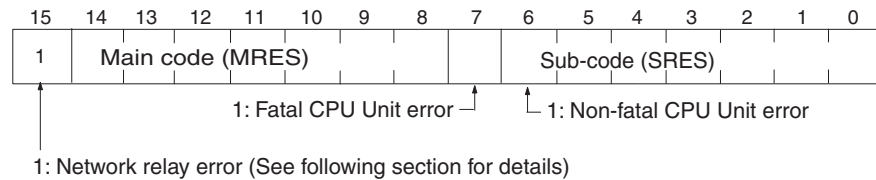
Main code	Sub-code	Check point	Probable cause	Correction
20: Read not possible	02: Protected	---	The program area is protected.	Release protection from a Programming Device and then execute the command.
	03: Table missing	Table	A table has not been registered.	Register a table.
			There is an error in the table.	Correct the table.
	04: Data missing	---	The search data does not exist.	---
	05: Program missing	Program number in command data	A non-existing program number has been specified.	Check the program numbers and specify a valid one.
	06: File missing	File name and file device	The file does not exist at the specified file device.	Check the path and file name, and correct them.
	07: Data mismatch	Contents of memory being compared	A data being compared is not the same.	Check memory contents and use the correct data.
		---	A file read operation failed.	Check the contents of the file.
21: Write not possible	01: Read-only	---	The specified area is read-only.	If the area is protected using a switch setting, release protection and then execute the command. If the area is permanently read-only, the command cannot be executed.
	02: Protected	---	The program area is protected.	Release protection from a Programming Device and then execute the command.
		PLC Setup	Writing is not possible because automatic data link table generation has been specified.	Change the PLC Setup so that the data link tables can be manually written.
	03: Cannot register	Number of files in file device	The file cannot be created because the limit has been exceeded.	Delete any unnecessary files or create more file memory.
		Number of files open	The maximum number of files has already been opened for the system limit.	Close one or more files and then execute the command.
	05: Program missing	Program number in command data	A non-existing program number has been specified.	Check the program numbers and specify a valid one.
	06: File missing	File name	The file does not exist at the specified file device.	Correct the file name and then execute the command.
	07: File name already exists	File name	A file with the same name already exists in the specified file device.	Change the name of the file being written and then execute the command.
	08: Cannot change	Contents of memory being changed	The change cannot be made because doing so would create a problem.	---

Main code	Sub-code	Check point	Probable cause	Correction
22: Not executable in current mode	01: Not possible during execution	---	The mode is incorrect.	Check the mode.
		Data link status	The data link is operating.	Check the status of the data links.
	02: Not possible while running	---	The mode is incorrect.	Check the mode.
		Data link status	The data links are active.	Check the status of the data links.
	03: Wrong PLC mode	---	The PLC is in PROGRAM mode.	Check the modes of the PLC and computer.
	04: Wrong PLC mode	---	The PLC is in DEBUG mode.	Check the modes of the PLC and computer.
	05: Wrong PLC mode	---	The PLC is in MONITOR mode.	Check the modes of the PLC and computer.
	06: Wrong PLC mode	---	The PLC is in RUN mode.	Check the modes of the PLC and computer.
23: No such device	07: Specified node not polling node	---	The specified node is not the polling node.	Check node functioning as the polling node for the network.
	08: Step cannot be executed	---	The mode is incorrect.	Check step status.
	01: File device missing	Unit configuration	The specified memory does not exist as a file device.	Mount memory or format EM as file memory.
	02: Memory missing	---	There is no file memory.	Check the file memory to see if it is mounted.
24: Cannot start/stop	03: Clock missing	---	There is no clock.	Check the model.
		---	---	---
24: Cannot start/stop	01: Table missing	Data link tables	The data link tables have not been registered or they contain an error.	Set the data link tables.

Main code	Sub-code	Check point	Probable cause	Correction
25: Unit error	02: Memory error	Contents of memory being processed	The contents of memory contains an error.	Transfer the correct contents to memory.
	03: I/O setting error	I/O Unit configuration	The registered I/O tables do not agree with the actual I/O configuration.	Correct the I/O tables or the I/O configuration.
	04: Too many I/O points	Number of I/O in registered I/O tables	There are too many I/O points and remote I/O points registered.	Change the registered I/O table so that it is within the limit.
	05: CPU bus error	CPU bus line	An error occurred in data transfer between the CPU and a CPU Bus Unit.	Check Units, Boards, and cables to be sure they are connected correctly and then execute the ERROR CLEAR command.
	06: I/O duplication	Rack numbers, Unit numbers, and I/O addresses in PLC Setup	The same number/address was set more than once.	Check the PLC Setup and correct the numbers/addresses so that each is used only once.
	07: I/O bus error	I/O bus line	An error occurred in data transfer between the CPU and an I/O Unit.	Check Units, Boards, and cables to be sure they are connected correctly and then execute the ERROR CLEAR command.
	09: SYSMAC BUS/2 error	SYSMAC BUS/2 transmission path	An error occurred in data transfer on the SYSMAC BUS/2 line.	Check Units, Boards, and cables to be sure they are connected correctly and then execute the ERROR CLEAR command.
	0A: CPU Bus Unit error	CPU Bus Unit transmission path	An error occurred in data transfer for a CPU Bus Unit.	Check Units, Boards, and cables to be sure they are connected correctly and then execute the ERROR CLEAR command.
	0D: SYSMAC BUS No. duplication	Word settings	The same word is allocated more than once.	Check the I/O tables and correct the allocations.
	0F: Memory error	Status of memory being processed	A memory error has occurred in internal memory, a memory card, or EM file memory.	For internal memory, write the correct data and then execute the command.  For a memory card or EM file memory, the file data has been destroyed. Execute the FILE MEMORY FORMAT command.  If the problem persists, replace the memory.
	10: SYSMAC BUS terminator missing	---	Terminators have not been set.	Set the terminators correctly.

Main code	Sub-code	Check point	Probable cause	Correction
26: Command error	01: No protection	Command protection for program area	The specified area is not protected.	An attempt was made to clear protection on an area that is not protected, i.e., there is no reason to clear protection.
	02: Incorrect password	---	An incorrect password has been specified.	Specify the correct password.
	04: Protected	---	The specified area is protected.	Clear protection from a Programming Device and then execute the command.
		Number of commands being executed	The node receiving the command is already processing 5 commands.	Wait for current processing to end or force the end of a current process and then execute the command.
	05: Service already executing	---	The service is being executed.	Wait for the service to end or force the end of the service and then execute the command.
	06: Service stopped	---	The service is not being executed.	If necessary, start the service.
	07: No execution right	LNK indicator on Unit/Board	The right to execute the service has not been obtained.	The local node is not in the data link. Execute the command from a node that is participating in the data link.
		---	A response was not returned because a buffer error occurred.	Restart the Board. If the problem persists, replace the Board.
	08: Settings not complete	Settings required before execution	The settings required before executing the service have not been made.	Make the required settings.
	09: Necessary items not set	Command data	The required elements have not been set in the command data.	Check the command format and set the required elements in the command data.
	0A: Number already defined	Action numbers and transition numbers of program in program area	The specified action/ transition number has already been registered in a previous program.	Check the action/transition numbers to ones that are not being used and then execute the command.
	0B: Error will not clear	Cause of error being cleared	The cause of the error has not been removed.	Remove the cause of the error and then execute ERROR CLEAR.
30: Access right error	01: No access right	---	The access right is held by another device. (Online editing is being executed from another node or ACCESS RIGHT ACQUIRE or ACCESS RIGHT FORCE ACQUIRE has been executed by another node.)	Wait until the access right is released and then execute the command.  ACCESS RIGHT ACQUIRE or ACCESS RIGHT FORCE ACQUIRE can be executed to obtain the access right, but this may adversely affect processing by the node that previously held the access right.
40: Abort	01: Service aborted	---	Service was aborted with ABORT command.	---

In addition to the above end codes, there are also specific flags in the end code word (bits 6, 7, and 15) that may also be ON. If bit 6 or 7 is ON, an error has occurred in the destination CPU Unit. If bit 15 is ON, an error has occurred during a network relay operation. The contents of the end code word are shown in the following diagram.



### Handling Fatal and Non-fatal CPU Errors

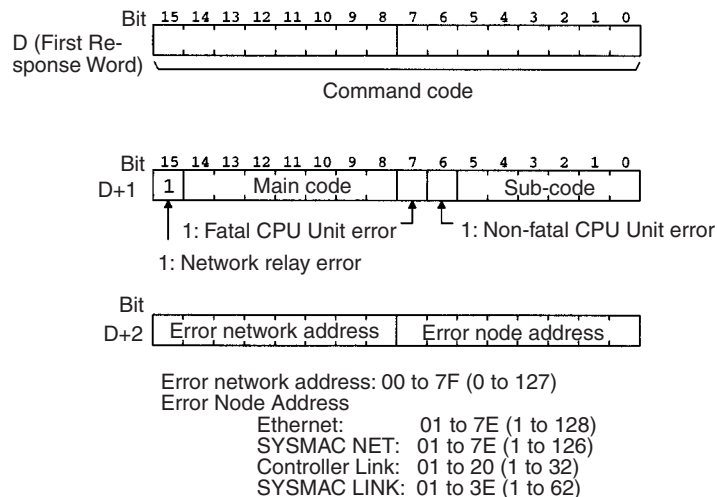
If bit 6 or 7 is ON, an error has occurred in the destination CPU Unit. If this occurs, refer to the operation manuals for the CPU Unit where the error occurred and remove the cause of the error.

### Example of a CPU Unit Error

For example, if a battery error occurs in the destination CPU Unit, bit 6 in the end code will be ON, because a battery error is a non-fatal CPU Unit error. Basically, the end code of a sent command that is completed normally is 0040.

### Handling Network Relay Errors

If bit 15 is ON, an error has occurred during a network relay operation. The end code has an additional two-byte (one word) network relay error code, which can be used to determine the location of the relay error. The following diagram shows the response data when a network relay error occurs when CMND(490) is used.



Use this information to determine the node where the error occurred and take appropriate measures.

**Note** When Using SEND(090) and RECV(098)

Check the path the command took using the routing tables. Check the end code and take appropriate measures for the relay node where the error occurred.

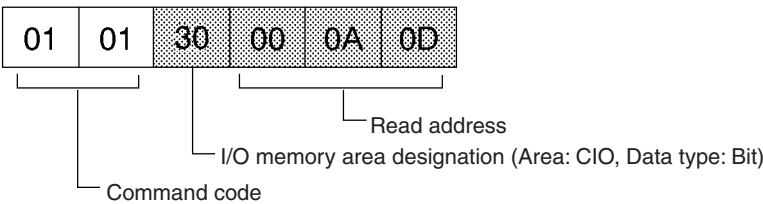
5-2 Designating Command Parameters

5-2-1 Designating I/O Memory (Variable) Area Addresses

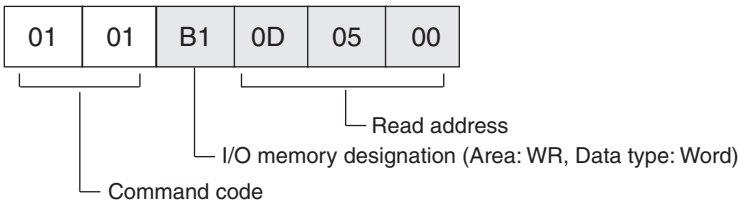
- When reading from and writing to the I/O memory (variable) area, designate I/O memory area addresses as described below.
- I/O memory designation involves the designation of the memory area code and the address within the memory area code.
- Memory area codes are designated in one byte (two digits hexadecimal), as shown in the table in 5-2-2 *I/O Memory Address Designations*.
  - Addresses within memory area codes consist of a total of three bytes (six digits hexadecimal). Of these, two bytes (four digits hexadecimal) designate the word and one byte (two digits hexadecimal) designates the bit.

I/O memory address designation		Memory area code	Address within I/O memory area designation	
			Word	Bit
4 bytes (8 digits hexadecimal)	⇒	1 byte (2 digits hex)	2 bytes (4 digits hex)	1 byte (2 digits hex)
Memory area code + word + bit, in order		Set by classification (CIO, WR, etc.). Note: Also possible with forced status.	From 0000 hex (Upper limit depends on memory area code.)	00 to 0F hex Note: Always 00 hex for word address and Timer/Counter Completion Flags.
Example Bit 13 of CIO 0010: 30000A0D hex		Example CIO: 30 hex	Example 0010: 000A in hexadecimal	Example Bit 13: 0D in hexadecimal

Example: I/O memory reading  
Bit 13 of CIO 0010, i.e., CIO 001013, is read.

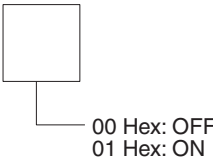


Example: Reading W005



Element Data Configurations

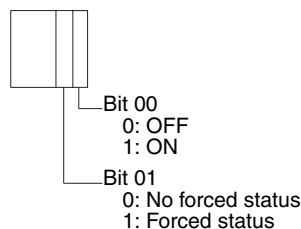
**Bit Designations**  
When bits are designated, each bit is considered a single element. The data for the element is expressed in one byte (ON: 01 hex; OFF: 00 hex). When data is written, this byte is transmitted. When data is read, this byte is returned.



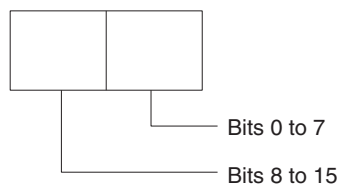
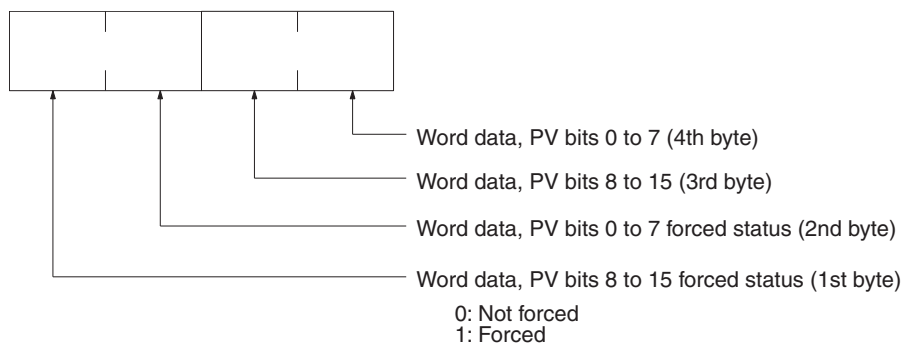
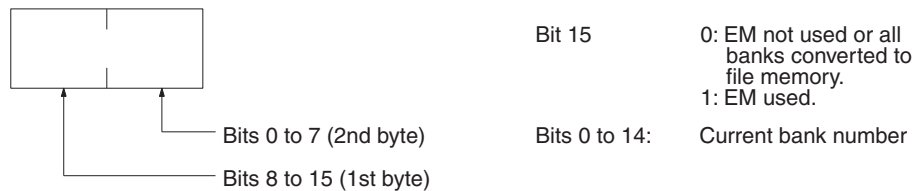
**Bit Data with Forced Status**

When bits are designated, each bit is considered as one element.

The data for each element is expressed in one byte (8 bits). Bit 00 indicates the specified bit data, and bit 01 indicates the forced status. When reading, this one byte is returned.

**Word Designations**

When words are designated, each word is considered a single element. The data for the element is expressed in two bytes. Bits 0 to 15 correspond to bits 0 to 15 of each word. When data is written, these two bytes are transmitted for each word. When data is read, these two bytes are returned.

**Word Data With Forced Status Data, Present Value (4 Bytes)****Current EM Bank Number (2 Bytes)**



## 5-2-2 I/O Memory Address Designations

Area		Data type	CS/CJ/CP/NSJ-series			CVM1/CV-series			Length per element
			Memory area code (hex)	Memory area address	Memory address	Memory area code (hex)	Memory area address	Memory address	
CIO Area	CIO	Bit	30	CIO 000000 to CIO 614315	000000 to 17FF0F	00	CIO 000000 to CIO 255515	000000 to 09FB0F	1
Work Area	WR		31	W00000 to W51115	000000 to 01FF0F	---	---	---	
Holding Bit Area	HR		32	H00000 to H51115	000000 to 01FF0F	---	---	---	
Auxiliary Bit Area	AR		33	A00000 to A44715 (read only)	000000 to 01BF0F	00	A00000 to A44715 (read only)	0B0000 to 0CBF0F	
				A44800 to A95915 (read/write)	01C000 to 03BF0F		A44800 to A95915 (read/write)	0CC000 to 0EBF0F	
CIO Area	CIO	Bit with forced status	70	CIO 000000 to CIO 614315	000000 to 17FF0F	40	CIO 000000 to CIO 255515	000000 to 09FB0F	1
Work Area	WR		71	W00000 to W51115	000000 to 01FF0F	---	---	---	
Holding Bit Area	HR		72	H00000 to H51115	000000 to 01FF0F	---	---	---	
CIO Area	CIO	Word	B0	CIO 0000 to CIO 6143	000000 to 17FF00	80	CIO 0000 to CIO 2555	000000 to 09FB00	2
Work Area	WR		B1	W000 to W511	000000 to 01FF00	---	---	---	
Holding Bit Area	HR		B2	H000 to H511	000000 to 01FF00	---	---	---	
Auxiliary Bit Area	AR		B3	A000 to A447 (read only)	000000 to 01BF00	80	A000 to A447 (read only)	0B0000 to 0CBF00	
				A448 to A959 (read/write)	01C000 to 03BF00		A448 to A959 (read/write)	0CC000 to 0EBF00	
CIO Area	CIO	Word with forced status	F0	CIO 0000 to CIO 6143	000000 to 17FF00	C0	CIO 000000 to CIO 255515	000000 to 09FB00	4
Work Area	WR		F1	W000 to W511	000000 to 01FF00	---	---	---	
Holding Bit Area	HR		F2	H000 to H511	000000 to 01FF00	---	---	---	
Timer Area	TIM	Completion Flag	09	T0000 to T4095	000000 to 0FFF00	01	T0000 to T2047 (T0000 to T1023)	000000 to 07FF00 (000000 to 03FF00)	1
Counter Area	CNT			C0000 to C4095	800000 to 8FFF00		C0000 to C2047 (C0000 to C1023)	080000 to 0FFF00 (080000 to 0BFF00)	

Area		Data type	CS/CJ/CP/NSJ-series			CVM1/CV-series			Length per element
			Memory area code (hex)	Memory area address	Memory address	Memory area code (hex)	Memory area address	Memory address	
Timer Area	TIM	Completion Flag with forced status	49	T0000 to T4095	000000 to 0FFFF0	41	T0000 to T2047 (T0000 to T1023)	000000 to 07FF00 (000000 to 03FF00)	1
Counter Area	CNT			C0000 to C4095	800000 to 8FFFF0		C0000 to C2047 (C0000 to C1023)	080000 to 0FFF00 (080000 to 0BFF00)	
Timer Area	TIM	PV	89	T0000 to T4095	000000 to 0FFFF0	81	T0000 to T2047 (T0000 to T1023)	000000 to 07FF00 (000000 to 03FF00)	2
Counter Area	CNT			C0000 to C4095	800000 to 8FFFF0		C0000 to C2047 (C0000 to C1023)	080000 to 0FFF00 (080000 to 0BFF00)	
DM Area	DM	Bit	02	D0000000 to D3276715	000000 to 7FFF0F	---	---	---	1
	DM	Word	82	D00000 to D32767	000000 to 7FFF00	82	D00000 to D32767	000000 to 7FFF00	2
EM Area	EM bank 0 to bank F	Bit	20 to 2F	E0_0000000 to 3276715 to EF_0000000 to 3276715	000000 to 7FFF0F	---	---	---	1
	EM bank 10 to bank 18		E0 to E8	E10_0000000 to 3276715 to E18_0000000 0 to 3276715	000000 to 7FFF0F	---	---	---	1
	EM bank 0 to bank F	Word	A0 to AF or 50 to 5F (See note 2)	E0_00000 to 32767 to EF_00000 to 32767	000000 to 7FFF00	90 to 97	E0_00000 to 32767 to E7_00000 to 32767	000000 to 7FFF00	2
	EM bank 10 to bank 18		60 to 68	E10_00000 to 32767 to E18_00000 to 32767	000000 to 7FFF00	---	---	---	2
	EM current bank	Bit	0A	E0000000 to E3276715	000000 to 7FFF0F	---	---	---	1
		Word	98	E00000 to E32767	000000 to 7FFF00	98	E000000 to E32767	000000 to 7FFF00	2
	EM current bank No.	Bank No.	BC	---	0F0000	9C	---	000600	2
Task Flag	TK	Bit	06	TK0000 to TK0031	000000 to 001F00	---	---	---	1
	TK	Status	46	TK0000 to TK0031	000000 to 001F00	---	---	---	1

Area		Data type	CS/CJ/CP/NSJ-series			CVM1/CV-series			Length per element
			Memory area code (hex)	Memory area address	Memory address	Memory area code (hex)	Memory area address	Memory address	
Index Register	IR	PV	DC	IR00 to IR15	010000 to 010F00	---	---	---	4
Data Register	DR	PV	BC	DR00 to DR15	020000 to 020F00	9C	DR0 to DR2	000300 to 000500	2
Clock Pulses		Bit	07	1-min clock pulse	000000	---	---	---	1
				1-s clock pulse	000100				
				0.2-s clock pulse	000200				
				0.1-s clock pulse	000300				
				0.02-s clock pulse	000400				
Condition Flags		Bit		Error Flag (ER)	100000	---	---	---	1
				Carry Flag (CY)	100100				
				Greater Than Flag (>)	100200				
				Equals Flag (=)	100300				
				Less Than Flag (<)	100400				
				Negative Flag (N)	100500				
				Overflow Flag (OF)	100600				
				Underflow Flag (UF)	100700				
				Greater Than or Equals Flag (>=)	100800				
				Not Equal Flag (<>)	100900				
				Less Than or Equals Flag (<=)	100A00				
				Always OFF Flag (ON)	100E00				
				Always ON Flag (OFF)	100F00				
		Access Error Flag	200100	---	---	1			

- Note**
1. The only current EM bank that can be read with FINS commands is the current EM bank that is set at the end of the cycle.
  2. On a CJ2 CPU unit only, 50 to 5F can be specified for the memory area code of EM banks 0 to F.

## Examples

Example	Designation	Contents		
		Memory area code	Address within memory area code	
			Word	Bit
CIO 0010	B0000A00 hex	B0 hex	000A hex	00 hex
CIO 001013 (bit 13 of CIO 0010)	30000A0D hex	30 hex	000A hex	0D hex
W010	B10000A00 hex	B1 hex	000A hex	00 hex
W01013 (bit 13 of W010)	31000A0D hex	31 hex	000A hex	0D hex
H010	B2000A00 hex	B2 hex	000A hex	00 hex
H01013 (bit 13 of H010)	32000A0D hex	32 hex	000A hex	0D hex
CIO 001013 (bit 13 of CIO 0010), with forced status	70000A0D hex	70 hex	000A hex	0D hex
CIO 0010, with forced status	F0000A00 hex	F0 hex	000A hex	00 hex
T0010 Completion Flag	09000A00 hex	09 hex	000A hex	00 hex
D00010 value	82000A00 hex	82 hex	000A hex	00 hex
E_3_00010 value	A3000A00 hex	A3 hex	000A hex	00 hex
Current EM bank 00010 value	98000A00 hex	98 hex	000A hex	00 hex

### Number of Elements for I/O MEMORY AREA READ (0101) and I/O MEMORY AREA WRITE (0102)

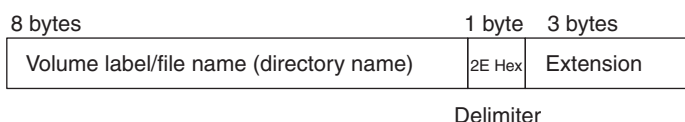
The maximum number of elements that can be specified for reading or writing with I/O MEMORY AREA READ (0101) and I/O MEMORY AREA WRITE (0102) depends on the network that must be passed through.

Network	Max. number of read elements	Max. number of write elements
SYSWAY	269 words	267 words
Ethernet	999 words	997 words
Controller Link	999 words	997 words
SYSMAC LINK	269 words	267 words
DeviceNet	269 words	267 words

If more than one network is passed through to read or write data, the value for the network with the smallest limit will apply.

### Volume Labels and File Names

Volume labels are names registered in file memory. File names consist of 12 bytes, as shown below. Be sure to follow this configuration when designating a file name by means of command parameters.



Start the file name and extension in the most-significant bytes respectively and then fill in any unused bytes with 20 hex.

If the file name or extension in response data is less than 8 or 3 bytes respectively, unused bytes will be filled with 20 hex.

It is not permissible to specify 00 (hex) or E5 (hex) at the beginning of a file name. (Codes of 00 hex or E5 hex means "erased" in DOS.) It is also not per-

missible to specify 7E hex (–) at the first and second characters (consecutive) of a file name.

If a file name has no extension, fill both the period (2E hex) and the extension with 20 hex.

If the file name in response data has no extension, both the period (2E hex) and the extension will be filled with 20 hex.

## 5-3 FINS Commands

### 5-3-1 About this Section

This section describes the command and response formats for FINS commands. For each format, the data is arranged in order from left to right.

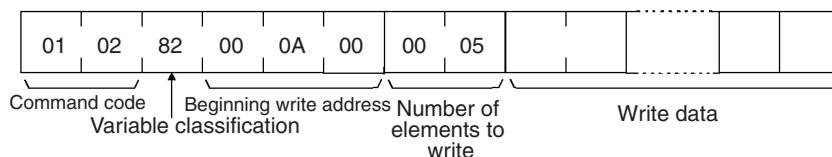
#### Command and Response Formats

##### Using CMND(490)

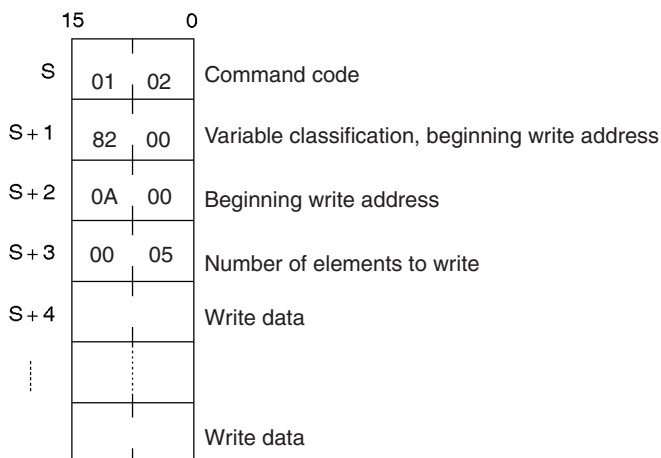
When CMND(490) is used to send a FINS command, the command is stored in I/O memory from the rightmost word to the leftmost word, with a single word represented as two boxes (four digits hexadecimal) in the format diagram.

In the following example, five words of data are written from D00010.

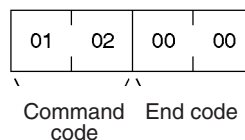
##### Command Format



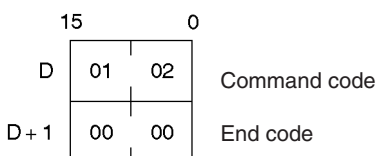
The command format data is stored in the order shown below when CMND(490) is used.



##### Response Format



The response format data is stored in the order shown below when CMND(490) is used.



**Using Host Link Communications**

When a FINS command is sent using Host Link communications, the Host Link header, response wait time, destination node address, and source node address are all placed before the command format, and the frame check sequence (FCS) and terminator are placed after the command format before sending the command from the host computer.

**Execution Conditions**

The *Execution Conditions* tables given for each command tell whether the CPU Unit can or cannot receive commands when it is in RUN, MONITOR, or PROGRAM mode, when another device has the access right, when command protection is in effect, and when the DIP switch is protected.

**Access Right at Other Device**

The *Access right at other device* column tells whether the CPU Unit can or cannot receive a command when another device has the access right to the CPU Unit.

**Note** The access right is the exclusive right of access to a particular device (the CPU Unit in this case) which prevents interruption by another device (i.e., another Peripheral Device or Unit) when multiple commands are executed. When another device has the access right, the local device cannot execute commands marked by a “No” in the “Access right at other device” column. Conversely, other devices cannot execute this command when the local device has the access right.

**UM Read Protection**

The *UM read protection* column tells whether the CPU Unit can or cannot receive the command when UM (user memory) is protected from a Peripheral Device.

**DIP Switch UM write Protection**

The *DIP switch UM protection* column tells whether the CPU Unit can or cannot receive a command when UM is write-protected by turning ON pin 1 of the DIP switch on the CPU Unit's front panel.

**Network Write Protection**

The *Validate FINS Write Protection via Network* parameter in the PLC Setup can be used to set whether the CPU Unit will accept or reject network commands.

**5-3-2 MEMORY AREA READ: 01 01**

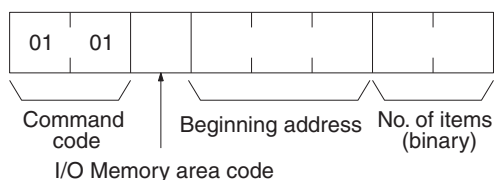
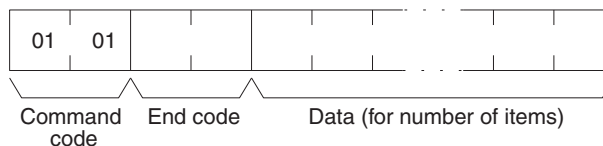
Reads the contents of the specified number of consecutive memory area words starting from the specified word.

**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

**Command Format****Response Format**

**Parameters****I/O memory area code, beginning address, number of items (command)**

Specify the type of data read, the beginning address of the data to be read, and the number of items of data to be read (4 digits hexadecimal).

The memory areas that can be read are given in the following table (*I/O Memory Area Codes*). Refer to *5-2-2 I/O Memory Address Designations* for the specific addresses that can be used.

**Data (response)**

Indicates the data from the specified I/O memory area is returned in sequence starting from the beginning address. The required number of bytes in total is calculated as follows:

Number of bytes required by each item x number of items

For details regarding data configuration, refer to *Element Data Configurations* on page 163.

**End code (response)**

Refer to *5-1-3 End Codes* for information on end codes.

**Note**

1. If the specified number of elements is 0000 hex, nothing will be read and a normal response will be returned.
2. I/O memory can be read regardless of the operating mode of the CPU Unit.



## I/O Memory Area Codes

Area		Data type	CS/CJ/CP/ NSJ-series memory area code (hex)	CVM1/CV- series memory area code (hex)	Bytes per element
CIO Area	CIO	Bit	30	00	1
Work Area	WR		31	---	
Holding Bit Area	HR		32	---	
Auxiliary Bit Area	AR		33	00	
CIO Area	CIO	Word	B0	80	2
Work Area	WR		B1	---	
Holding Bit Area	HR		B2	---	
Auxiliary Bit Area	AR		B3	80	
Timer Area	TIM	Completion Flag	09	01	1
Counter Area	CNT				
Timer Area	TIM	PV	89	81	2
Counter Area	CNT				
DM Area	DM	Bit	02	---	1
	DM	Word	82	82	2
EM Area	EM bank 0 to bank F	Bit	20 to 2F	---	1
	EM bank 10 to bank 18		E0 to E8	---	1
	EM bank 0 to bank F	Word	A0 to AF or 50 to 5F (see note.)	90 to 97	2
	EM bank 10 to bank 18		60 to 68	---	2
	EM current bank	Bit	0A	---	1
		Word	98	98	2
	EM current bank No.	Bank No.	BC	9C	2
Task Flag	TK	Bit	06	---	1
	TK	Status	46	---	1
Index Register	IR	PV	DC	---	4
Data Register	DR	PV	BC	9C	2
Clock Pulses		Bit	07	---	1
Condition Flags		Bit			1

**Note** On a CJ2 CPU unit only, 50 to 5F can be specified for the memory area code of EM banks 0 to F.

### 5-3-3 MEMORY AREA WRITE: 01 02

Writes data to the specified number of consecutive words starting from the specified word.

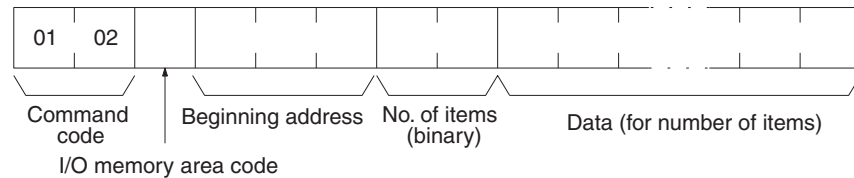
#### Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	No

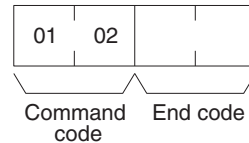
  

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

#### Command Format



#### Response Format



#### Parameters

##### **I/O memory area code, beginning address, number of items (command)**

Specify the type of data written, the beginning address of the data to be written, and the number of items of data to be written (4 digits hexadecimal).

The memory areas that can be written are given in the following table (*I/O Memory Area Codes*). Refer to 5-2-2 *I/O Memory Address Designations* for the specific addresses that can be used.

##### **Data (command)**

The data from the specified I/O memory area is returned in sequence starting from the beginning address. The required number of bytes in total is calculated as follows:

Number of bytes required by each item x number of items

For details regarding data configuration, refer to *Element Data Configurations* on page 163.

##### **End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

#### Comments

If the number of items is designated as 0000 (hex), a normal completion end code will be returned without the write operation being executed.

The MEMORY AREA WRITE command can be executed regardless of the CPU Unit's operating mode. It is the user's responsibility to program steps to prohibit this command from being executed when the CPU Unit is in RUN mode if such protection is necessary. Execute CPU UNIT STATUS READ (command code 0601) to read the CPU Unit's mode. (Refer to 5-3-17 *CPU UNIT STATUS READ: 06 01*.)

When data is written to the Timer/Counter PV Area, the Completion Flags will not be turned OFF (0).

## I/O Memory Area Codes

Area		Data type	CS/CJ/CP/ NSJ-series memory area code (hex)	CVM1/CV- series memory area code (hex)	Bytes per element
CIO Area	CIO	Bit	30	---	1
Work Area	WR		31	---	
Holding Bit Area	HR		32	---	
Auxiliary Bit Area	AR		33	---	
CIO Area	CIO	Word	B0	80	2
Work Area	WR		B1	---	
Holding Bit Area	HR		B2	---	
Auxiliary Bit Area	AR		B3	80	
Timer Area	TIM	PV	89	81	2
Counter Area	CNT				
DM Area	DM	Bit	02	---	1
	DM	Word	82	82	2
EM Area	EM bank 0 to bank F	Bit	20 to 2F	---	1
	EM bank 10 to bank 18		E0 to E8	---	1
	EM bank 0 to bank F	Word	A0 to AF or 50 to 5F (see note)	90 to 97	2
	EM bank 10 to bank 18		60 to 68	---	2
	EM current bank	Bit	0A	---	1
		Word	98	98	2
Index Register	IR	PV	DC	---	4
Data Register	DR	PV	BC	9C	2

**Note** On a CJ2 CPU unit only, 50 to 5F can be specified for the memory area code of EM banks 0 to F.

## 5-3-4 MEMORY AREA FILL: 01 03

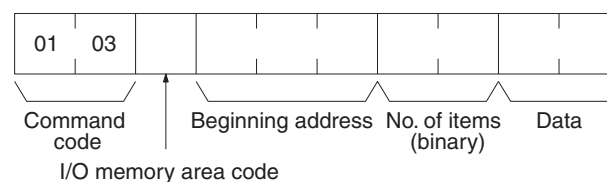
Writes the same data to the specified number of consecutive memory area words.

## Execution Conditions

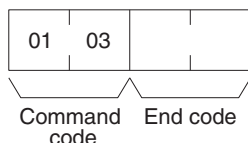
Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	No

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

## Command Format



## Response Format



## Parameters

**I/O memory area code, beginning address, number of items (command)**

Specify the type of data written, the beginning address of the data to be written, and the number of items of data to be written (4 digits hexadecimal).

The memory areas that can be written are given in the following table (*I/O Memory Area Codes*). Refer to 5-2-2 *I/O Memory Address Designations* for the specific addresses that can be used.

**Data (command)**

Specify the data to be written to the memory area starting from the beginning address. The data to be written should consist of two bytes.

For details regarding data configuration, refer to *Element Data Configurations* on page 163.

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

## Comments

If the number of items is designated as 0000 (hex), a normal completion end code will be returned without the write operation being executed.

The MEMORY AREA FILL command can be executed regardless of the CPU Unit's operating mode. It is the user's responsibility to program steps to prohibit this command from being executed when the CPU Unit is in RUN mode if such protection is necessary. Execute CPU UNIT STATUS READ (command code 0601) to read the CPU Unit's mode. (Refer to 5-3-17 *CPU UNIT STATUS READ: 06 01*.)

When data is written to the Timer/Counter PV Area, the Completion Flags will be turned OFF (0).

Data cannot be written if the address is out of range.

If the specified area is force set or reset, clear the force set/reset to write the data.

## I/O Memory Area Codes

Area		Data type	CS/CJ/CP/NSJ-series memory area code (hex)	CVM1/CV-series memory area code (hex)	Bytes per element
CIO Area	CIO	Word	B0	80	2
Work Area	WR		B1	---	
Holding Bit Area	HR		B2	---	
Auxiliary Bit Area	AR		B3	80	
Timer Area	TIM	PV	89	81	2
Counter Area	CNT				
DM Area	DM	Word	82	82	2
EM Area	EM bank 0 to bank F	Word	A0 to AF or 50 to 5F (see note.)	90 to 97	2
	EM bank 10 to bank 18		60 to 68	---	2
	EM current bank	Word	98	98	2

**Note** On a CJ2 CPU unit only, 50 to 5F can be specified for the memory area code of EM banks 0 to F.

### 5-3-5 MULTIPLE MEMORY AREA READ: 01 04

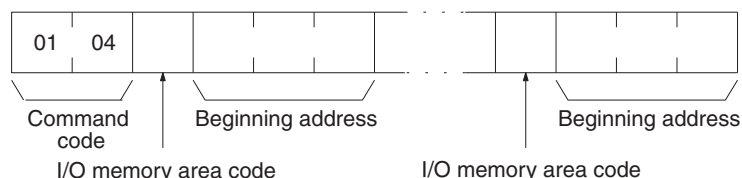
Reads in one batch the contents of the specified number of non-consecutive I/O memory area words, starting from the specified word.

#### Execution Conditions

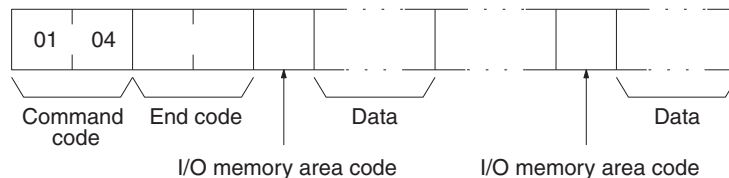
Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

#### Command Format



#### Response Format



#### Parameters

##### I/O memory area code (command)

Specify the type of data to read.

The memory areas that can be read are given in the following table (*I/O Memory Area Codes*). Refer to *5-2-2 I/O Memory Address Designations* for the specific addresses that can be used.

##### Beginning address (command)

Specify the first word/bit/flag to read.

##### I/O memory area code, data (response)

Indicates the data type and contents of the designated I/O memory area(s). The data in the designated memory area(s) will be returned in the sequence specified by the command.

The number of bytes that can be read for each item depends on the I/O memory area that is read. For details regarding data configuration, refer to *Element Data Configurations* on page 163.

##### End code (response)

Refer to *5-1-3 End Codes* for information on end codes.

#### Comments

The maximum number of elements that can be read with each command depends on the network as shown in the following table.

Network	Maximum number of elements
Controller Link Ethernet	167
SYSMAC LINK DeviceNet	89

If nothing is specified after the command code, a normal response will be returned, but nothing will be read.

If there is an error in the I/O memory area code or beginning address, the I/O memory area will not be read.

### I/O Memory Area Codes

Area		Data type	CS/CJ/CP/ NSJ-series memory area code (hex)	CVM1/CV- series memory area code (hex)	Bytes per element
CIO Area	CIO	Bit	30	00	1
Work Area	WR		31	---	
Holding Bit Area	HR		32	---	
Auxiliary Bit Area	AR		33	00	
CIO Area	CIO	Bit with forced status	70	40	1
Work Area	WR		71	---	
Holding Bit Area	HR		72	---	
CIO Area	CIO	Word	B0	80	2
Work Area	WR		B1	---	
Holding Bit Area	HR		B2	---	
Auxiliary Bit Area	AR		B3	80	
CIO Area	CIO	Word with forced status	F0	C0	4
Work Area	WR		F1	---	
Holding Bit Area	HR		F2	---	
Timer Area	TIM	Completion Flag	09	01	1
Counter Area	CNT				
Timer Area	TIM	Completion Flag with forced status	49	41	1
Counter Area	CNT				
Timer Area	TIM	PV	89	81	2
Counter Area	CNT				
DM Area	DM	Bit	02	---	1
	DM	Word	82	82	2
EM Area	EM bank 0 to bank F	Bit with forced status	20 to 2C	---	1
	EM bank 10 to bank 18		E0 to E8	---	1
	EM bank 0 to bank F	Word	A0 to AF or 50 to 5F (see note.)	90 to 97	2
	EM bank 10 to bank 18		60 to 68	---	2
	EM current bank	Bit	0A	---	1
		Word	98	98	2
	EM current bank No.	EM current bank No.	BC	9C	2
Task Flag	TK	Bit	06	---	1
	TK	Status	46	---	1
Index Register	IR	PV	DC	---	4
Data Register	DR	PV	BC	9C	2
Clock Pulses		Bit	07	---	1
Condition Flags		Bit			1

**Note** On a CJ2 CPU unit only, 50 to 5F can be specified for the memory area code of EM banks 0 to F.

### 5-3-6 MEMORY AREA TRANSFER: 01 05

Copies and transfers the contents of the specified number of consecutive I/O memory area words to the specified I/O memory area.

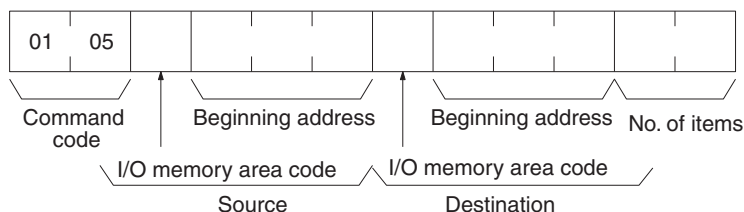
#### Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	No

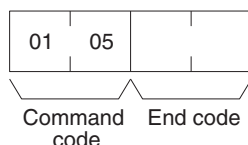
  

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

#### Command Format



#### Response Format



#### Parameters

##### I/O memory area code and Beginning address (command)

Specify the data area to transfer from and the data area to transfer to and specify the positions for beginning the data transfer.

The memory areas that can be transferred are given in the following table (*I/O Memory Area Codes*). Refer to 5-2-2 *I/O Memory Address Designations* for the specific addresses that can be used.

##### Number of items (command)

Specify the number of words of data to transfer. (Each word consists of two bytes.) The specified number of words will be transferred in sequence from the source beginning address onwards to the destination beginning address onwards.

##### End code (response)

Refer to 5-1-3 *End Codes* for information on end codes.

#### Comments

If the number of items is designated as 0000 (hex), a normal completion end code will be returned without the copy operation being executed.

It is the user's responsibility to program steps to prohibit this command from being executed when the CPU Unit is in RUN mode if such protection is necessary. Execute CPU UNIT STATUS READ (command code 0601) to read the CPU Unit's mode. (Refer to 5-3-17 *CPU UNIT STATUS READ: 06 01*.)

Even if data is written to the Timer/Counter PV Area, the Completion Flags will not be turned OFF (0).

## I/O Memory Area Codes

Area		Data type	CS/CJ/CP/ NSJ-series memory area code (hex)	CVM1/CV- series memory area code (hex)	Bytes per element
CIO Area	CIO	Word	B0	80	2
Work Area	WR		B1	---	
Holding Bit Area	HR		B2	---	
Auxiliary Bit Area	AR		B3	80	
Timer Area	TIM	PV	89	81	2
Counter Area	CNT				
DM Area	DM	Word	82	82	2
EM Area	EM bank 0 to bank F	Word	A0 to AF or 50 to 5F (see note.)	90 to 97	2
	EM bank 10 to bank 18		60 to 68	---	2
	EM current bank	Word	98	98	2

**Note** On a CJ2 CPU unit only, 50 to 5F can be specified for the memory area code of EM banks 0 to F.

## 5-3-7 PARAMETER AREA READ: 02 01

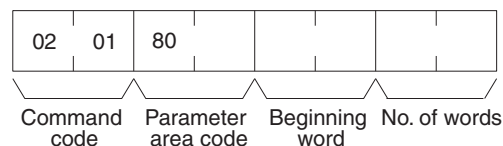
Reads the contents of the specified number of consecutive CPU Unit parameter area words starting from the specified word.

## Execution Conditions

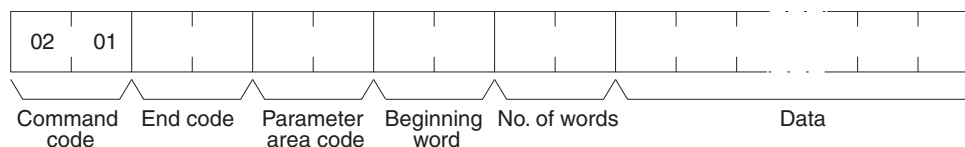
Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

## Command Format



## Response Format



## Parameters

**Parameter area code (command and response)**

Specify the parameter area to read. The parameter area code is designated in two bytes. The leftmost byte is always 80 (hex) and the rightmost byte specifies the parameter area.

**Beginning word (command and response)**

Specify the first word to read. The beginning word address specifies the relative word address, with the beginning of the designated area as 0000 (hex).



**Parameter Areas**

The areas that can be read are shown below, along with their parameter area codes.

	Parameter area code	Address range (Hex)	Parameter area code	Address range (Hex)
PLC Setup Area	8010	0000 to 01FF (512 words)	8000	0000 to 1F3F (8000 words)
I/O Table Registration Area	8012	0000 to 04FF (1,280 words)		
Routing Table Area	8013	0000 to 01FF (512 words)		
CPU Bus Unit Setup Area	8002	0000 to 143F (5184 words)		

**Number of words (command and response)**

Bits 0 to 14 are used to specify the number of words to be read. (Each word consists of 16 bits.) Bit 15 must be OFF (0) in the command format. When the content in the response format contains the last word of data in the specified parameter area, bit 15 will be ON (1). For example, it would indicate that the 512th word of data is contained in the PLC Setup area.

**Data (response)**

The data in the specified parameter area will be returned in sequence starting from the beginning word. The leftmost bits (bits 8 to 15) of each word are read first, followed by the rightmost bits (bits 0 to 7). The required number of bytes in total for each read is calculated as follows:

Number of words x 2 (each word consists of 16 bits)

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

**Comments**

All words in the specified parameter area must be read at the same time to ensure complete data. A maximum of 498 words can be read with each command. (One word = 16 bits.) To read larger parameter areas, use multiple commands and specify the beginning word and number of words for each.

If more than 498 words is specified as the number of elements, the maximum number of words will be read and returned with a response code of 1108 hex.

If the beginning word plus the number of words specified to read exceeds the capacity of the specified area, the data read through the end of the area and the actual number of words read will be returned with a response of 1104 hex.

Except for the routing table area, each area must be read or written in its entirety.

**5-3-8 PARAMETER AREA WRITE: 02 02**

Writes data to the specified number of consecutive CPU Unit parameter area words starting from the specified word.

Data can be written to the I/O table only when the CPU Unit is in PROGRAM mode.

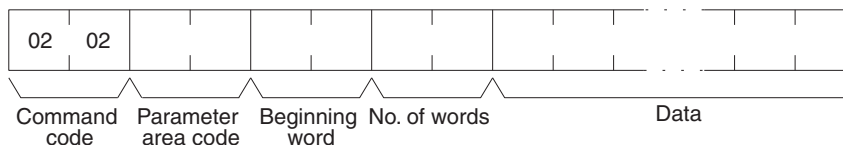
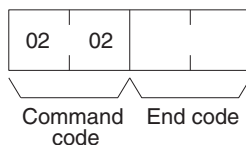
**Note** Some PLC Setup parameters cannot be written in RUN or MONITOR mode.

**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	No	No

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

**Command Format****Response Format****Parameters****Parameter area code (command and response)**

Specify the parameter area to write. The parameter area code is designated in two bytes. The leftmost byte is always 80 (hex) and the rightmost byte specifies the parameter area.

**Beginning word (command and response)**

Specify the first word to write. The beginning word address specifies the relative word address, with the beginning of the designated area as 0000 (hex).

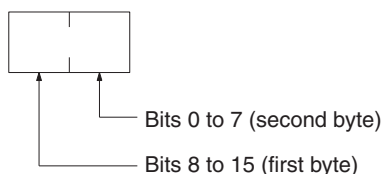
**Parameter Areas**

The areas that can be written to are shown below, along with their parameter area codes.

	Parameter area code	Address range (Hex)	Parameter area code	Address range (Hex)
PLC Setup Area	8010	0000 to 01FF (512 words)	8000	0000 to 1F3F (8000 words)
I/O Table Registration Area	8012	0000 to 04FF (1,280 words)		
Routing Table Area	8013	0000 to 01FF (512 words)		
CPU Bus Unit Setup Area	8002	0000 to 143F (5184 words)		

**Number of words (command)**

Bits 0 to 14 are used to specify the number of words to be written. (Each word consists of two bytes.) Bit 15 must be ON (1) when data is written to the last word in the specified parameter area or no data will be written. If the number of write words is set to 0000, no words will be written and a normal end code will be returned.



Bit 15 OFF (0): Without last word data to be written.  
 Bit 15 ON (1): With last word data to be written.  
 Bits 0 to 14: No. of words to be written

**Data (command)**

The data to be written. The leftmost bits (bits 15 to 8) of each word must be specified first, followed by the rightmost bits (bits 7 to 0). The required number of bytes in total for each write can be calculated as follows:

No. of words x 2 (each word consists of two bytes)

**End code (response)**

Refer to 5-1-3 End Codes for information on end codes.

**Comments**

Parameters will be written regardless of the operating mode of the CPU Unit. There are some settings in the PLC Setup that cannot and will not be written if the CPU Unit is in RUN mode, but the end code will be 0000 nevertheless. It is the user's responsibility to program steps to prohibit this command from being executed when the CPU Unit is in the RUN mode if such protection is necessary. Execute CPU UNIT STATUS READ (command code 0601) to read the CPU Unit's mode. (Refer to 5-3-17 CPU UNIT STATUS READ: 06 01.)

Data can only be written to the I/O registration table when the CPU Unit is in PROGRAM mode.

All words in the specified parameter area must be written at the same time to ensure complete data. A maximum of 498 words can be written with each command. Nothing will be written if more than 498 words are specified. To write larger parameter areas, use multiple commands and specify the beginning word for each.

Except for the routing table area, each area must be read or written in its entirety.

**5-3-9 PARAMETER AREA CLEAR: 02 03**

Writes all zeros to the specified number of consecutive parameter area words to clear the previous data. The I/O table can be cleared only when the CPU Unit is in PROGRAM mode.

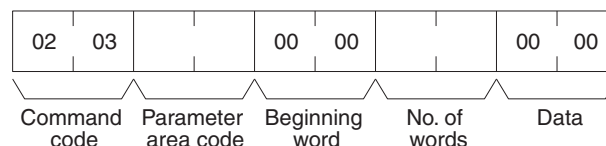
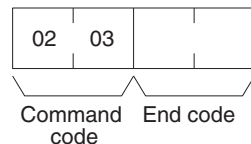
**Note** Some PLC Setup parameters cannot be written in RUN or MONITOR mode.

**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	No	No

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

**Command Format****Response Format****Parameters****Parameter area code (command)**

Specify the parameter area to clear.

**Beginning word (command)**

Always 0000.

**Number of words (command)**

Specify the number of words to clear. (One word = 16 bits.) If the number of write words is set to 0000, no words will be written and a normal end code will be returned.

**Parameter Areas**

The areas that can be written to are shown below, along with their parameter area codes.

	Parameter area code	Address range (Hex)	Parameter area code	Address range (Hex)
PLC Setup Area	8010	0000 to 01FF (512 words)	8000	0000 to 1F3F 8000 words)
I/O Table Registration Area	8012	0000 to 04FF (1,280 words)		
Routing Table Area	8013	0000 to 01FF (512 words)		
CPU Bus Unit Setup Area	8002	0000 to 143F (5184 words)		

**Data (command)**

Set to 0000. The number of words to be cleared is specified by the number of words in the command format. This parameter has two bytes (one word) of data.

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

**Comments**

The PARAMETER AREA CLEAR command can be executed regardless of the CPU Unit's mode. It is the user's responsibility to program steps to prohibit this command from being executed when the CPU Unit is in the RUN mode if such protection is necessary. Execute CPU UNIT STATUS READ (command code 0601) to read the CPU Unit's mode. (Refer to 5-3-17 *CPU UNIT STATUS READ: 06 01*.)

Data can only be cleared from the I/O registration table when the CPU Unit is in PROGRAM mode. When data is cleared from the I/O registration table for CJ-series CPU Units, the CPU Unit enters the status where I/O is automatically allocated at power-ON and the status of mounted Units is reflected in the I/O registration table. It is not simply cleared to 0000 hex.

Each parameter area must be cleared in its entirety.

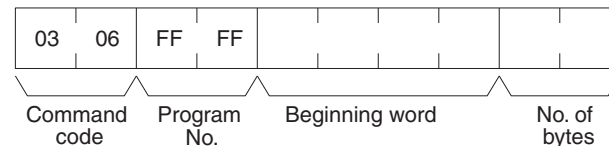
**5-3-10 PROGRAM AREA READ: 03 06**

Reads the contents of the specified number of consecutive program area words starting from the specified word.

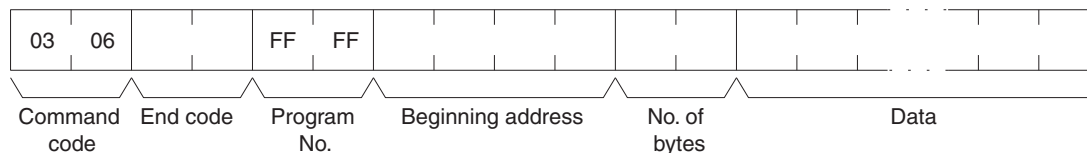
**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	No	OK	OK

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

**Command Format**

## Response Format



## Parameters

**Program No. (command and response)**

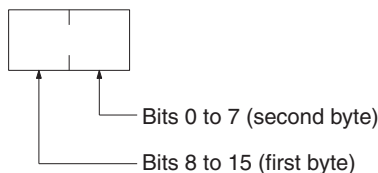
Set to FFFF (hex).

**Beginning address (command and response)**

For the beginning address, the beginning of the program area is specified as a relative address of 00000000 (hex). The beginning address must be a multiple of four.

**Number of bytes (command and response)**

The number of bytes must be a multiple of four, and no greater than 992. The leftmost bit (bit 15) indicates whether the data at the last address in the program area is included. If bit 15 is ON (1) when the response is returned, it indicates that the data at the last address in the program area is included in the read data. Bit 15 must be OFF (0) in the command format.



Bit 15 OFF (0): Without last address data  
 Bit 15 ON (1): With last address data  
 Bits 0 to 14: Number of bytes read

**Data (response)**

The data in the specified program area will be returned in sequence starting from the beginning word.

**End code (response)**

Refer to 5-1-3 End Codes for information on end codes.

## Comments

A maximum of 992 bytes can be read with each command. Partition the data into units of 992 bytes or less and use as many commands as necessary to read from 00000000 (hex) to the final address.

When the “Prohibit from saving into a memory card, and transferring program from PLC” setting is enabled, this command cannot be executed.

## 5-3-11 PROGRAM AREA WRITE: 03 07

Writes data to the specified number of consecutive program area words starting from the specified word.

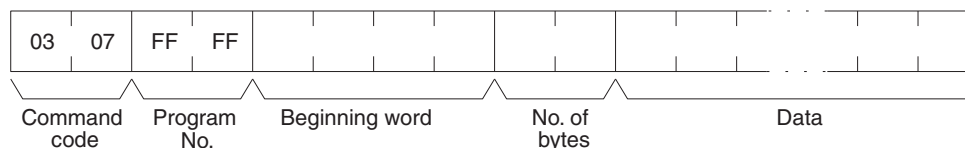
## Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	No	No

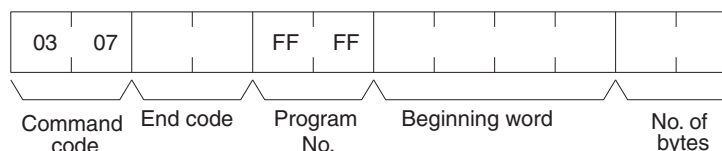
  

RUN mode	MONITOR mode	PROGRAM mode
No	No	OK

## Command Format



## Response Format



## Parameters

**Program No. (command and response)**

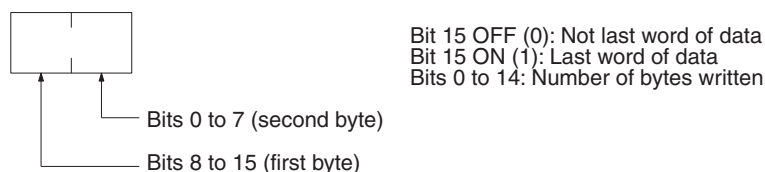
Always FFFF (hex).

**Beginning word (command and response)**

For the beginning address, the beginning of the program area is specified as a relative address of 00000000 (hex). The beginning address must be a multiple of four.

**Number of bytes (command and response)**

Specify the number of bytes of data to write. The number of bytes must be a multiple of 4 and 996 or less. The leftmost bit (bit 15) is used to indicate when program area writing is completed. Bit 15 must be ON (1) the last word of data.

**Data (command)**

Specify the data to be written by designating the beginning address and the number of bytes.

**End code (response)**

Refer to 5-1-3 End Codes for information on end codes.

## Comments

The PROGRAM AREA WRITE command can be executed only when the CPU Unit is in PROGRAM mode.

A maximum of 996 bytes can be written with each command. Partition the data into units of 996 bytes or less and use as many commands as necessary to write from 00000000 (hex) to the final address.

When the "Prohibit from overwriting to a protected program" setting is enabled, this command cannot be executed.

## 5-3-12 PROGRAM AREA CLEAR: 03 08

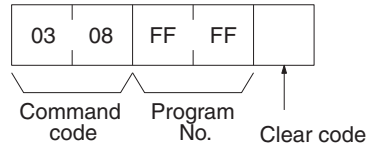
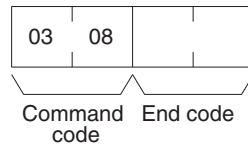
Completely initializes the contents of the program area, from the beginning of the program area to the final program address.

## Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	No	No

RUN mode	MONITOR mode	PROGRAM mode
No	No	OK

**Command Format****Response Format****Parameters****Program No. (command)**

Set to FFFF (hex).

**Clear code (command)**

Without interrupt tasks: 00 (hex)

With interrupt tasks: 10 (hex)

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

**Comments**

The program area can be cleared even if it is read-protected from a Programming Device. When the program area is cleared, protection will also be cleared.

**Without Interrupt Tasks**

In this mode, only one single cyclic task 0 is set up.

Name	Number	Task No.
Power interrupt task	0	---
Scheduled interrupt task	0	---
I/O interrupt task	0	---
Cyclic task	1	0

**With Interrupt Tasks**

In this mode, one single cyclic task 0 and one or several interrupt tasks are set up.

Name	Number	Task No.
Power interrupt task	1	1
Scheduled interrupt task	2	2
		3
I/O interrupt task	32	100
		.
		131
Cyclic task	1	0

**Note** Interrupt tasks and cyclic tasks contain only one END(001) instruction after execution.

When the “*Prohibit from overwriting to a protected program*” setting is enabled, this command cannot be executed.

## 5-3-13 RUN: 04 01

Changes the CPU Unit's operating mode to MONITOR or RUN, enabling the PLC to execute its program.

**Note** The CPU Unit will start operation when RUN is executed. You must confirm the safety of the system before executing RUN.  
When the "prohibit overwriting of protected program" setting is enabled, this command cannot be executed.

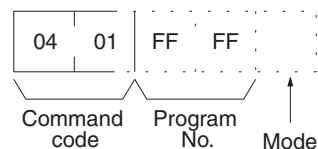
### Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	OK	No

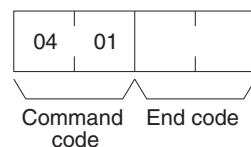
  

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

### Command Format



### Response Format



### Parameters

#### Program number (command)

Always FFFF (hex).

#### Mode (command)

Set the CPU Unit's operating mode as follows:

- 02 (hex): Change to MONITOR mode.
- 04 (hex): Change to RUN mode.

#### End code (response)

Refer to 5-1-3 *End Codes* for information on end codes.

### Comments

If only the command code or only the command code and program number are sent, the mode will be changed to MONITOR mode.

If the CPU Unit's operating mode has already been changed to the intended mode when this command is sent, a normal completion will be returned.

## 5-3-14 STOP: 04 02

Changes the CPU Unit's operating mode to PROGRAM, stopping program execution.

**Note** The CPU Unit will stop operation when STOP is executed. You must confirm the safety of the system before executing STOP.



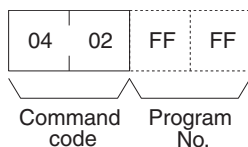
## Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	OK	No

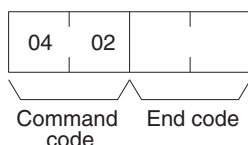
  

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

## Command Format



## Response Format



## Parameters

**Program number (command)**

Always FFFF (hex).

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

## Comments

If the CPU Unit's operating mode has already been changed to the intended mode when this command is sent, a normal completion will be returned.

If only the command code or only the command code and program number are to be sent, the operating mode will be changed to the PROGRAM mode.

## 5-3-15 CPU UNIT DATA READ: 05 01

Reads the following data:

- CPU Unit model
- CPU Bus Unit configuration
- CPU Unit internal system version
- Remote I/O data
- Area data
- CPU Unit information

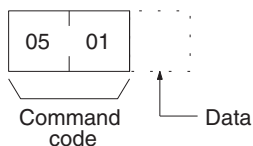
## Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

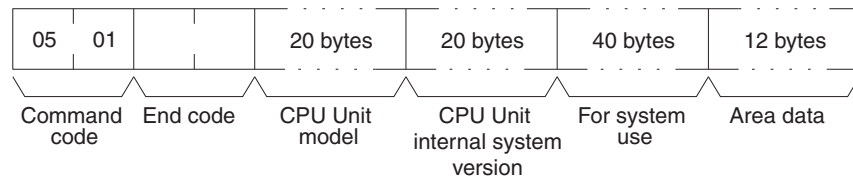
RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

## Command Format

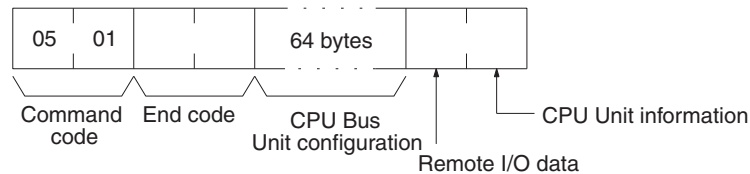


**Response Format**

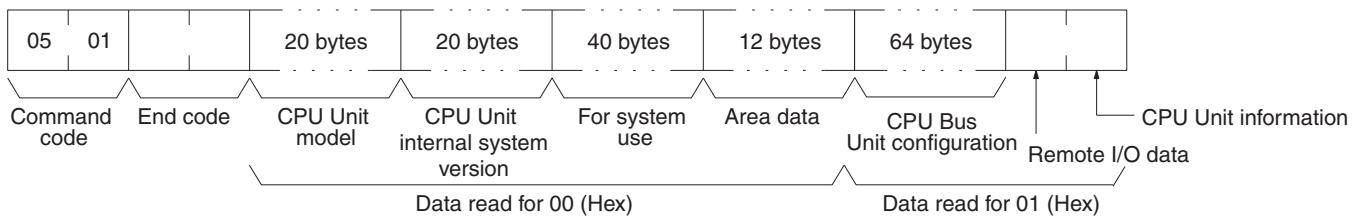
The format is as shown below if 00 (hex) is specified as the data to be read, i.e., from the CPU Unit model to the area data.



The format is as shown below if 01 (hex) is specified as the data to be read, i.e., from the CPU Bus Unit configuration to the CPU Unit information.



The format is as shown below if nothing is entered as the data to be read, i.e., all data from the CPU Unit model to the CPU Unit information.

**Parameters****Data (command)**

Specify the data to be read as follows:

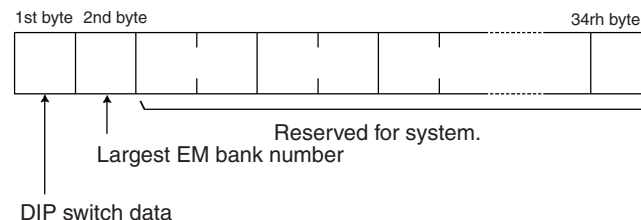
Value	00	01
Data to be read	CPU Unit model CPU Unit internal system version Area data	CPU Bus Unit configuration Remote I/O data CPU Unit information

**CPU Unit model and internal system version (response)**

Each is returned in not more than 20 bytes in ASCII (i.e. 20 ASCII characters). If the model or internal system version requires less than 20 characters, the model field will be filled with spaces and the internal system version field will be filled with null codes.

**For system use (response)**

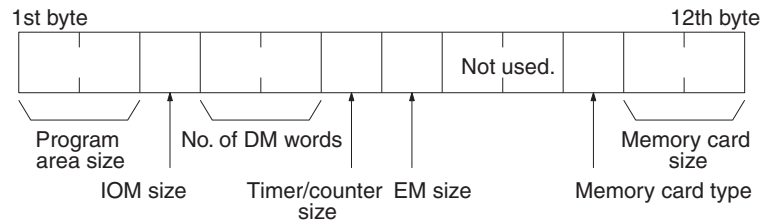
Reserved for system use.



Item	Meaning	Unit
DIP switch data	Status of DIP switch on front panel of CPU Unit: Pins 0 to 7 correspond to bits 0 to 7 (ON: 1; OFF: 0)	---
Largest EM bank number	Largest number, 0 to 19, in CPU Unit's EM area.	Bank

**Area data (response)**

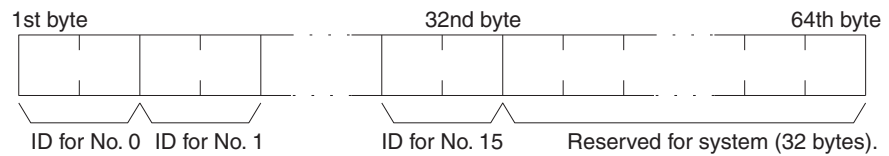
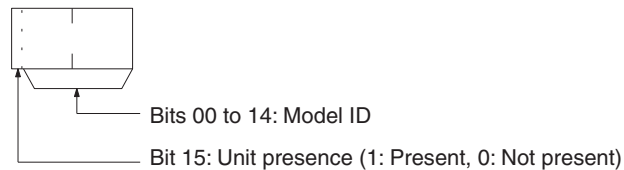
The area data is configured as follows:



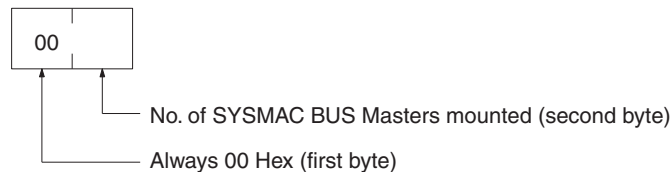
Item	Meaning	Unit
Program area size	Maximum size of usable program area	K words (1K words = 1,024 words)
IOM size	The size of the area (CIO, WR, HR, AR, timer/counter completion flags, TN) in which bit commands can be used (always 23).	K bytes (1K bytes = 1,024 bytes)
Number of DM words	Total words in the DM area (always 32,768)	Words
Timer/counter size	Maximum number of timers/counters available (always 8)	x 1,024
EM non-file memory size	Among the banks in the EM area, the number of banks (0 to D) without file memory.	Banks (1 bank = 32,768 words)
Memory card type	00: No memory card 04: Flash memory	---
Memory card size	Size of the memory card (0000 if there is no memory card)	K byte (1 word = 2 bytes)

**CPU Bus Unit configuration (response)**

Each CPU Bus Unit has a code assigned to it consisting of two ASCII characters (two bytes). These codes are given in the numerical order according to the unit number of the CPU Bus Units (unit 0 to 15).

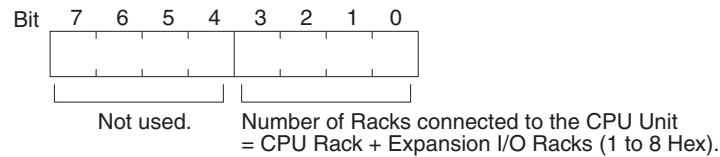
**ID Format****Remote I/O data (response)**

The number of SYSMAC BUS Master Units mounted in remote I/O systems is returned in a single byte (00 to 02 hex) as follows:



**CPU Unit information (response)**

The total number of racks (CPU Racks + Expansion I/O Racks) connected to the CPU Unit is returned in a single byte (8 bits) of data in the configuration shown below.

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

**5-3-16 CONNECTION DATA READ: 05 02**

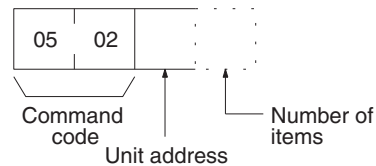
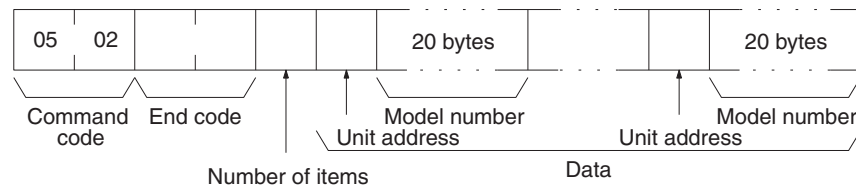
Reads the model number of the specified Units.

**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM protection	Network write protection
OK	OK	OK	OK

**Command Format**

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

**Response Format****Parameters****Unit address (command and response)**

Specify the unit address of the first Unit whose connection data is to be read. If the specified Unit does not exist, the connection data is read from the next Unit. Specify the following for the unit address.

CPU Unit: 00 (hex)

CPU Bus Unit: 10 + unit number (10 to 1F hex)

Special I/O Unit: 20 + unit number (20 to 7F hex)

Inner Board: E1 (hex)

**Number of items (command)**

Specify the number of items to be read. The number of items will be returned in order for the number specified, beginning with the unit address set in the "unit address" parameter. Any number between 01 and 19 (hexadecimal) can be specified. If the number of items is not specified, 19 hex (25) will be used.

**Number of Units (response)**

The number of Units for which the connection data is being returned. If bit 7 is ON (1), it means that the data for the last Unit is being returned. The maximum setting is 19 hex (25). If the number of items is not specified, 19 hex (25) will be used.

**Unit address and model number (response)**

These response parameters show the unit address and model number. The model number is provided in up to 20 ASCII characters.

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

**5-3-17 CPU UNIT STATUS READ: 06 01**

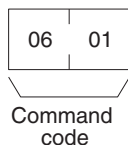
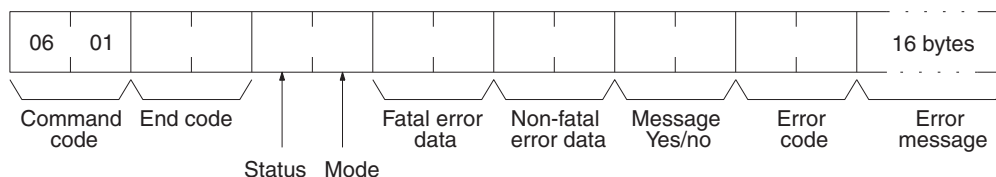
Reads the operating status of the CPU Unit.

**Execution Conditions**

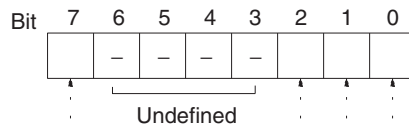
Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

**Command Format****Response Format****Parameters****Status (response)**

The operating status of the CPU Unit is as shown below. Bits 3 to 6 are undefined. Always mask these bits before accessing them.

**Status**

0: Stop (user program is not being executed)

1: Run (user program is being executed)

Built-in flash memory access (CS1-H, CJ1-H, CJ1M, CP1H, NSJ, and CS1D only)

0: Not writing, 1: Writing

Battery status (CS1-H, CJ1-H, CJ1M, CP1H, NSJ, and CS1D only)

0: No battery, 1: Battery present

**CPU status**

0: Normal

1: CPU on standby

(waiting for a signal from a device, such as a SYSMAC BUS Remote I/O Slave Unit).

**Mode (response)**

The CPU Unit operating mode is as follows:

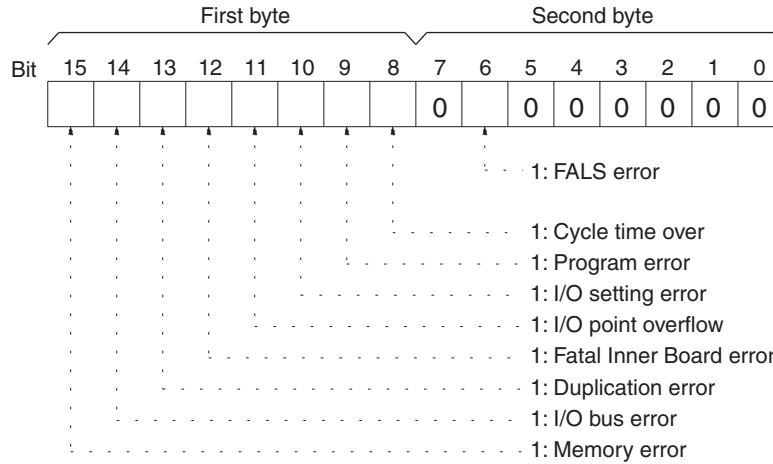
**00:** PROGRAM

**02:** MONITOR

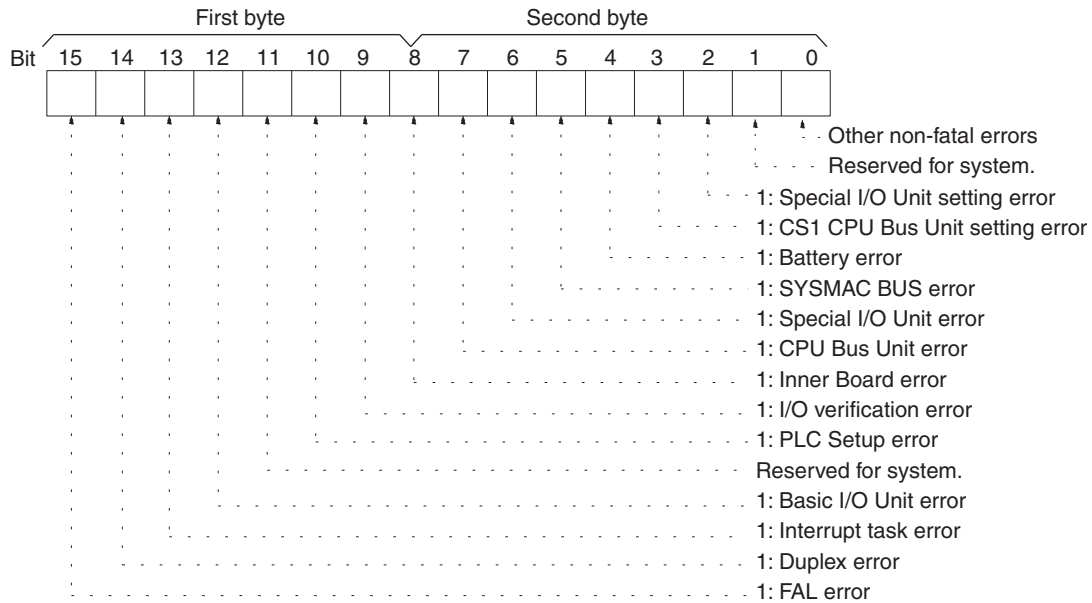
**04:** RUN

**Fatal error data (response)**

Fatal error data for the CPU Unit is configured as follows:

**Non-fatal error data (response)**

Non-fatal error data for the CPU Unit is configured as follows:

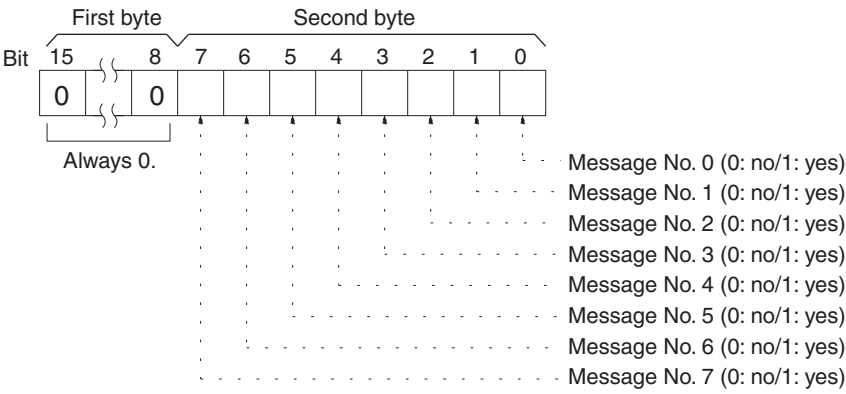


**Note** For details, refer to the CPU Unit's operation manual.

**Message yes/no (response)**

If MSG(046) has been executed, the bit corresponding to the message number will be ON (1) as shown below. To read the messages generated by

MSG(195), execute MESSAGE READ (command code 0920). Refer to 5-3-21  
*MESSAGE READ: 09 20.*



**Error code (response)**

Among errors that occur when the command is executed, the error code indicates the most serious. If there are no errors, it will be 0000 (hex).

**Error message (response)**

Indicates messages from execution of FAL(006) or FALS(007). If there is no error message, or if FAL(006) or FALS(007) are not being executed, 16 spaces (ASCII 20) will be returned.

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

**Comments**

To read the error log, read the appropriate Auxiliary Area words or execute ERROR LOG READ command (command code 2102). Refer to 5-3-28  
*ERROR LOG READ: 21 02.*

**5-3-18 CYCLE TIME READ: 06 20**

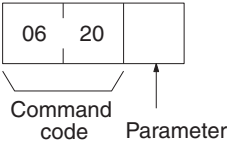
Initializes the PLC's cycle time history or reads the average, maximum, and minimum cycle time.

**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

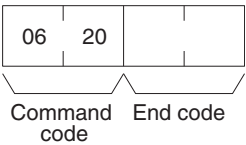
RUN mode	MONITOR mode	PROGRAM mode
OK	OK	No

**Command Format**

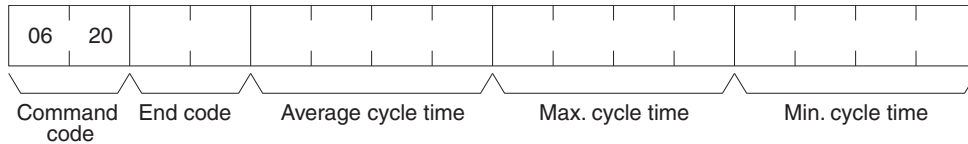


**Response Format**

The response format is as follows when the parameter is 00 hex:



The response format is as follows when the parameter is 01 hex (read):



#### Parameters

##### **Parameter code (command)**

Specify the operations for this command as follows:

**00 (hex):** Initializes the cycle time.

**01 (hex):** Reads the average, maximum, and minimum cycle time.

##### **Average cycle time (response)**

The CPU Unit continuously calculates the cycle time, and remembers the previous eight cycle times. The “average cycle times” is the average of these eight cycle times, expressed as four bytes of binary data in 0.1-ms increments.

The average cycle time is obtained as follows:

$$\text{Average cycle time} = (\text{Sum of 8 previous cycle times})/8$$

In the following example the average cycle time is 65.0 ms.

00	00	02	8A
----	----	----	----

##### **Maximum cycle time**

The maximum cycle time is the maximum value, of the cycle time measured after the cycle time initialize request is received. It is expressed in four binary bytes, in increments of 0.1 ms.

##### **Minimum cycle time**

The minimum cycle time is found in the same way as the maximum cycle time described above.

##### **End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

#### Comments

The maximum and minimum cycle times are initialized when operation is started.

### 5-3-19 CLOCK READ: 07 01

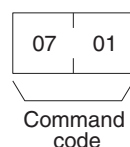
Reads clock information.

#### Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

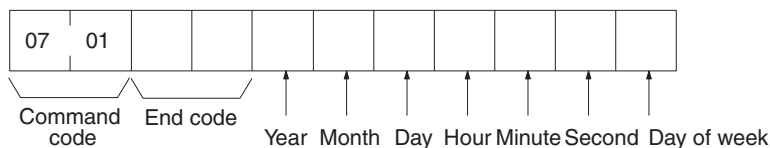
RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

#### Command Format





## Response Format



## Parameters

**Year, month, day, hour, minute, second, day of week (response)**

The year, month, day of month, hour, minute, and second are expressed in BCD.

**Year:** The rightmost two digits of the year. (1998, 1999, and 2000 are expressed as 98, 99, and 00 respectively. 2096 and 2097 will be expressed as 96 and 97.)

**Hour:** 00 to 23 (BCD).

**Day of week:** As follows:

Value (hex)	00	01	02	03	04	05	06
Day of week	Sun	Mon	Tues	Wed	Thur	Fri	Sat

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

## 5-3-20 CLOCK WRITE: 07 02

Writes clock information.

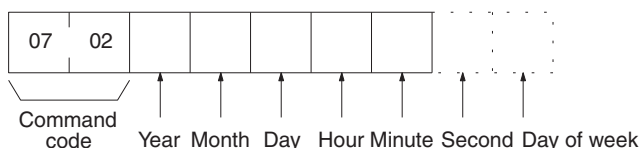
## Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	OK	No

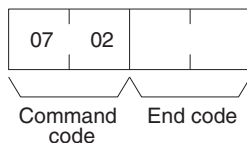
  

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

## Command Format



## Response Format



## Parameters

**Year, month, day, hour, minute, second, day of week (response)**

The year, month, day of month, hour, minute, and second are expressed in BCD.

**Year:** The rightmost two digits of the year. (1998, 1999, and 2000 are expressed as 98, 99, and 00 respectively. 2096 and 2097 will be expressed as 96 and 97.)

**Hour:** 00 to 23 (BCD).

**Day of week:** As follows:

Value (hex)	00	01	02	03	04	05	06
Day of week	Sun	Mon	Tues	Wed	Thur	Fri	Sat

#### **End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

#### **Comments**

If the second and the day of week are not specified, 00 (BCD) will be set as the second and the previous value will be kept for the day.

If the second is specified, but the day of week is omitted, the previous setting will not be changed.

The PLC does not check the day of week from the day of month. This means that no error will occur even if the day of month and the day of week do not agree.

The PLC automatically checks the range of the specified data. If any portion of the data is incorrect, the clock will not be set.

### **5-3-21 MESSAGE READ: 09 20**

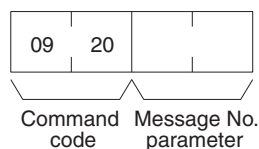
Reads messages generated by MSG(195).

#### **Execution Conditions**

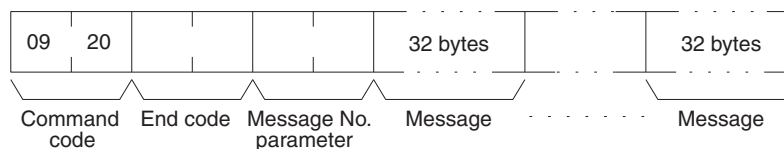
Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

#### **Command Format**



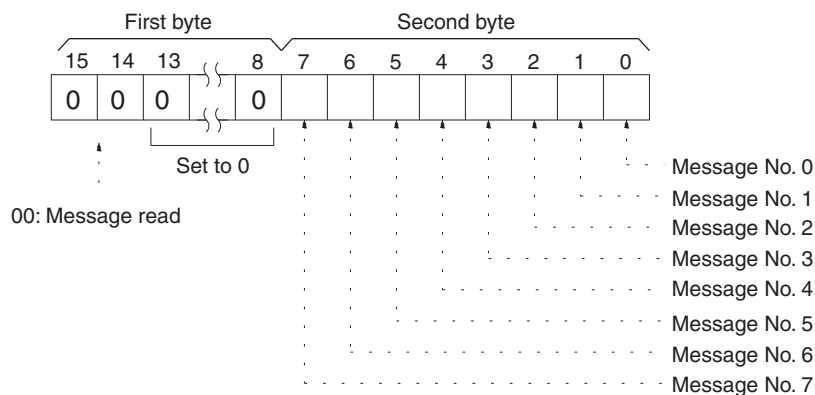
#### **Response Format**



#### **Parameters**

#### **Message number parameter (command and response)**

In the command format, turn ON (1) the bits of the messages to be read. In the response format, the bits of the messages being returned will be ON (1). If no bits are turned ON in the command format, all bits will be OFF (0) in the response format and no further data will be returned.



### Message (response)

Each message is returned in numerical order, from smaller to larger, according to the message number. Each message consists of 32 ASCII characters (32 bytes). The total number of bytes of the messages is calculated as follows:

The number of messages read  $\times$  32 bytes

If a message consists of less than 32 bytes, the remainder will be filled with spaces (20 hex). If no message has been registered for a message number that has been requested, 32 bytes of spaces (20 hex) will be returned.

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

## Comments

The MESSAGE READ, MESSAGE CLEAR (refer to 5-3-22 MESSAGE CLEAR: 09 20), and FAL/FALS READ (refer to 5-3-23 FAL/FALS READ: 09 20) commands share the same command code (0920). They are distinguished by bits 14 and 15 of the two-byte parameter following the command code. To read MSG(195) messages, bits 14 and 15 must be OFF (0).

**5-3-22 MESSAGE CLEAR: 09 20**

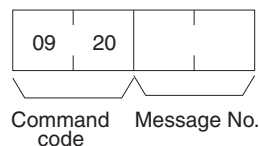
Clears messages generated with MSG(195).

## Execution Conditions

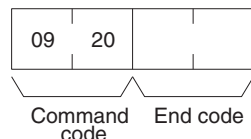
Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No (when clearing messages)	OK	OK	OK

<b>RUN mode</b>	<b>MONITOR mode</b>	<b>PROGRAM mode</b>
OK	OK	OK

## Command Format

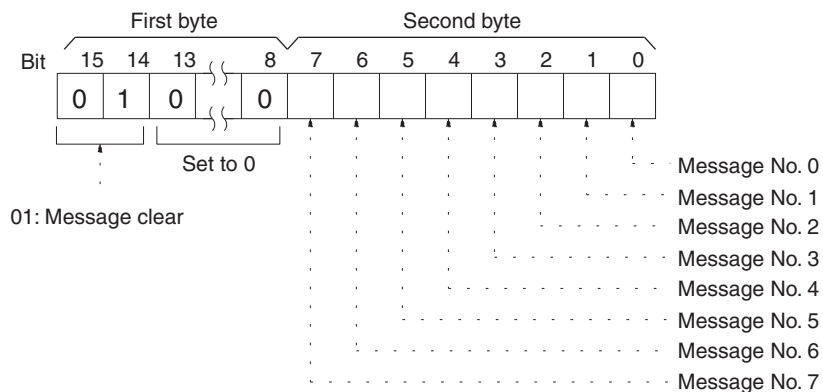


### Response Format



**Parameters****Message number (command)**

Turn ON the bits of the messages to be cleared. Multiple messages can be cleared at one time.

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

**Comments**

The MESSAGE READ, MESSAGE CLEAR (refer to 5-3-22 *MESSAGE CLEAR: 09 20*), and FAL/FALS READ (refer to 5-3-23 *FAL/FALS READ: 09 20*) commands share the same command code (0920). They are distinguished by bits 14 and 15 of the two-byte parameter following the command code. To clear messages, bit 14 must be ON (0) and bit 15 must be OFF (0).

**5-3-23 FAL/FALS READ: 09 20**

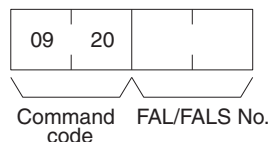
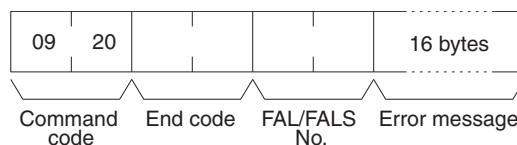
Reads FAL(006)/FALS(007) error messages.

**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

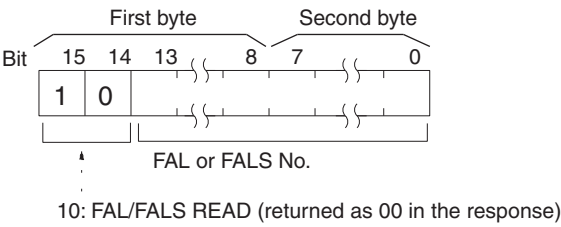
  

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

**Command Format****Response Format****Parameters****FAL/FALS No. (command and response)**

In the command format, specify in hexadecimal in bits 0 to 13 the FAL or

FALS number to be read as shown below. In the response format, the FAL or FALS number is returned.



**Error message (response)**

The error message specified in the FAL(006) or FALS(007) instruction.

A single error message consists of 16 ASCII characters.

If a message consists of less than 16 bytes, spaces (20 hex) will be returned for the remainder. If no message has been registered for a message number that has been requested, 16 bytes of spaces (20 hex) will be returned.

Message data will be returned as is even if a control code such as CR (0D hex) is included in the message data.

**End code (response)**

Refer to 5-1-3 End Codes for information on end codes.

**Comments**

The MESSAGE READ, MESSAGE CLEAR (refer to 5-3-22 MESSAGE CLEAR: 09 20), and FAL/FALS READ (refer to 5-3-23 FAL/FALS READ: 09 20) commands share the same command code (0920). They are distinguished by bits 14 and 15 of the two-byte parameter following the command code. To read FAL/FALS messages, bit 14 must be OFF (0) and bit 15 must be ON (1).

**5-3-24 ACCESS RIGHT ACQUIRE: 0C 01**

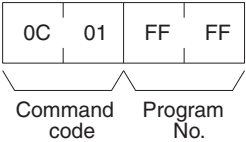
Acquires the access right as long as no other device holds it. Execute the ACCESS RIGHT ACQUIRE command when you need to execute commands continuously without being interrupted by other devices. As soon as the execution of the commands has been completed, execute ACCESS RIGHT RELEASE (command code 0C03) to release the access right. (Refer to 5-3-26 ACCESS RIGHT RELEASE: 0C 03.) If another devices holds the access right, the device will be identified in the response.

**Execution Conditions**

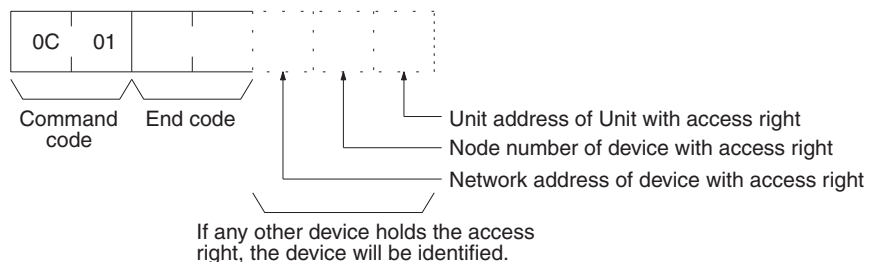
Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	OK	No

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

**Command Format**



## Response Format



## Parameters

**Program No. (command)**

Always FFFF (hex).

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

## Comments

If any other device has the access right, the access right cannot be acquired with this command; use ACCESS RIGHT FORCED ACQUIRE (command code 0C01). (Refer to 5-3-25 *ACCESS RIGHT FORCED ACQUIRE: 0C 02.*)

When ACCESS RIGHT ACQUIRE (command code 0C01) is executed while any other device has the access right, subsequent commands cannot be executed from the other device. This command should generally not be used during normal processing.

The following table shows which FINS commands can be executed even when another device holds the access right.

Command code	Command name	Command execution while another device has access right
0101	MEMORY AREA READ	Yes
0102	MEMORY AREA WRITE	Yes
0103	MEMORY AREA FILL	Yes
0104	MULTIPLE MEMORY AREA READ	Yes
0105	MEMORY AREA TRANSFER	Yes
0201	PARAMETER AREA READ	Yes
0202	PARAMETER AREA WRITE	No
0203	PARAMETER AREA CLEAR	No
0306	PROGRAM AREA READ	Yes
0307	PROGRAM AREA WRITE	No
0308	PROGRAM AREA 5CLEAR	No
0401	RUN	No
0402	STOP	No
0501	CPU UNIT DATA READ	Yes
0502	CONNECTION DATA READ	Yes
0601	CPU UNIT STATUS READ	Yes
0620	CYCLE TIME READ	Yes
0701	CLOCK READ	Yes
0702	CLOCK WRITE	No
0920	MESSAGE READ/CLEAR	No
0C01	ACCESS RIGHT ACQUIRE	No
0C02	ACCESS RIGHT FORCED ACQUIRE	Yes

Command code	Command name	Command execution while another device has access right
0C03	ACCESS RIGHT RELEASE	Yes
2101	ERROR CLEAR	No
2102	ERROR LOG READ	Yes
2103	ERROR LOG CLEAR	No
2140	FINS WRITE ACCESS LOG READ	Yes
2141	FINS WRITE ACCESS LOG CLEAR	No
2201	FILE NAME READ	Yes
2202	SINGLE FILE READ	Yes
2203	SINGLE FILE WRITE	No
2204	FILE MEMORY FORMAT	No
2205	FILE DELETE	No
2207	FILE COPY	No
2208	FILE NAME CHANGE	No
220A	MEMORY AREA-FILE TRANSFER (I/O memory to file transfers only)	No
220B	PARAMETER AREA-FILE TRANSFER	No
220C	PROGRAM AREA-FILE TRANSFER	No
2215	CREATE/DELETE DIRECTORY	No
2220	MEMORY CASSETTE TRANSFER	No
2301	FORCED SET/RESET	Yes
2302	FORCED SET/RESET CANCEL	Yes

**Note** ACCESS RIGHT ACQUIRE is used to prevent Programming Devices or other Units from taking the access right when more than one command is to be executed in succession. When finished, always execute ACCESS RIGHT RELEASE (0C03).

### 5-3-25 ACCESS RIGHT FORCED ACQUIRE: 0C 02

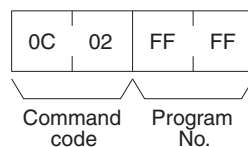
Acquires the access right even if another device already holds it.

#### Execution Conditions

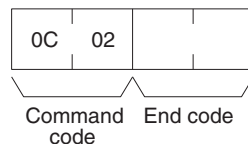
Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

#### Command Format



#### Response Format



**Parameters****Program number (command)**

Always FFFF (hex).

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

**Comments**

Even if any other device has the access right, the access right can be acquired with this command and a normal end code will be returned.

When ACCESS RIGHT FORCED ACQUIRE (command code 0C02) is executed while any other device has the access right, subsequent commands cannot be executed from the other device. This command should generally not be used during normal processing.

The following table shows which FINS commands can be executed even when another device holds the access right.

Command code	Command name	Command execution while another device has access right
0101	MEMORY AREA READ	Yes
0102	MEMORY AREA WRITE	Yes
0103	MEMORY AREA FILL	Yes
0104	MULTIPLE MEMORY AREA READ	Yes
0105	MEMORY AREA TRANSFER	Yes
0201	PARAMETER AREA READ	Yes
0202	PARAMETER AREA WRITE	No
0203	PARAMETER AREA CLEAR	No
0306	PROGRAM AREA READ	Yes
0307	PROGRAM AREA WRITE	No
0308	PROGRAM AREA CLEAR	No
0401	RUN	No
0402	STOP	No
0501	CPU UNIT DATA READ	Yes
0502	CONNECTION DATA READ	Yes
0601	CPU UNIT STATUS READ	Yes
0620	CYCLE TIME READ	Yes
0701	CLOCK READ	Yes
0702	CLOCK WRITE	No
0920	MESSAGE CLEAR	No
0C01	ACCESS RIGHT ACQUIRE	No
0C02	ACCESS RIGHT FORCED ACQUIRE	Yes
0C03	ACCESS RIGHT RELEASE	Yes
2101	ERROR CLEAR	No
2102	ERROR LOG READ	Yes
2103	ERROR LOG CLEAR	No
2140	FINS WRITE ACCESS LOG READ	Yes
2141	FINS WRITE ACCESS LOG CLEAR	No
2201	FILE NAME READ	Yes
2202	SINGLE FILE READ	Yes
2203	SINGLE FILE WRITE	No
2204	FILE MEMORY FORMAT	No
2205	FILE DELETE	No
2207	FILE COPY	No
2208	FILE NAME CHANGE	No



Command code	Command name	Command execution while another device has access right
220A	MEMORY AREA-FILE TRANSFER (I/O memory to file transfers only)	No
220B	PARAMETER AREA-FILE TRANSFER	No
220C	PROGRAM AREA-FILE TRANSFER	No
2215	CREATE/DELETE DIRECTORY	No
2220	MEMORY CASSETTE TRANSFER	No
2301	FORCED SET/RESET	Yes
2302	FORCED SET/RESET CANCEL	Yes

If this command is executed when another device holds the access right, any processing being executed by that other device will be aborted. If possible, wait until all processing has been completed and then execute ACCESS RIGHT ACQUIRE (command code 0C01). (Refer to 5-3-24 ACCESS RIGHT ACQUIRE: 0C 01.)

When the access right is forcibly acquired by this command, the device losing the access right is not notified.

### 5-3-26 ACCESS RIGHT RELEASE: 0C 03

Releases the access right regardless of what device holds it.

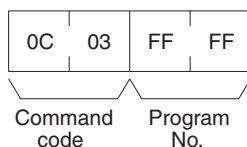
#### Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

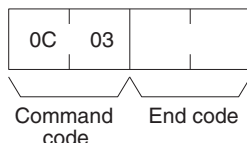
  

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

#### Command Format



#### Response Format



#### Parameters

##### Program number (command)

Always FFFF (hex).

##### End code (response)

Refer to 5-1-3 End Codes for information on end codes.

#### Comments

The access right can be released by this command even when the access right is held by another device. In that case a normal end code will be returned. A normal end code will also be returned if this command is used when the access right is already released.

## 5-3-27 ERROR CLEAR: 21 01

Clears errors or error messages.

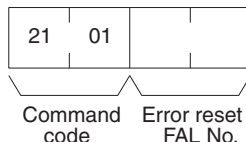
### Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	OK	OK

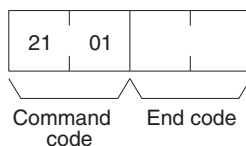
  

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

### Command Format



### Response Format



### Parameters

#### Error code to reset (command)

The code of the error to be reset.

The following codes can be used regardless of the operating mode of the CPU Unit:

Error code (hex)	Meaning
FFFF	All errors cleared. Resets the all errors that are currently recorded. (This code can be used in PROGRAM mode only.)
FFFE	Present error cleared. Resets the highest priority error.
0003	Duplex power supply error
0010	Duplex bus error
0011	Duplex verification error
008A	Built-in analog I/O error
008B	Interrupt task error
009A	Basic I/O error
009B	PLC Setup error
00A0 to 00A1	SYSMAC BUS error
00D1 to 00D2	Option Board error
00E7	I/O verification error <ul style="list-style-type: none"> <li>When the registered I/O tables differs from the actual I/O tables</li> <li>When an I/O Unit has been added or removed</li> </ul>
00F1	Flash memory error
00F7	Battery error
0200 to 020F	CPU Bus Unit error (The rightmost two digits are the unit number in binary of the Unit that has the error.) <ul style="list-style-type: none"> <li>When a error occurs during data transfer between the CPU Bus Unit and CPU Unit.</li> <li>When the CPU Bus Unit has a watchdog timer error</li> </ul>
02F0	Non-fatal Inner Board error

0300 to 035F	Special I/O Unit error (The rightmost two digits are the unit number in binary of the Unit that has the error.)
0400 to 040F	CPU Bus Unit setting error (The rightmost two digits are the unit number in binary of the Unit that has the error.)
0500 to 055F	Special I/O Unit setting error (The rightmost two digits are the unit number in binary of the Unit that has the error.)
0600 to 060F	Duplex communications error (The rightmost two digits are the unit number in binary of the Unit that has the error.)
4101 to 42FF	System error (FAL): FAL(006) was executed.

The following codes can be used only when the CPU Unit is in PROGRAM mode:

Error code (hex)	Meaning
FFFF	All errors cleared.
809F	Cycle time too long.
80C0 to 80C7	I/O bus error. This error occurs when there is an error in an I/O bus check or a Unit has been removed or added when power is turned on to the PLC.
80E0	I/O setting error. This error occurs if the I/O table differs from actual I/O points in the System.
80E1	I/O points overflow
80E9	Duplication error. This error occurs if the same unit number is assigned to more than one Unit or the same word is allocated more than once.
80EA	Basic I/O word duplication resulting from rack first word settings.
80F0	Program error.
80F1	Memory error. This error occurs if an error is found in the user program, PLC Setup, Registered I/O Tables, routing tables, or CPU Bus Unit Setup memory.
82F0	Fatal Inner Board error.
C101 to C2FF	FALS(007) executed.

#### **End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

#### **Comments**

If the specified error is not occurring, a normal end code will be returned.

If the present error is one that can only be cleared when the CPU Unit is in PROGRAM mode, it will not be possible to clear it in MONITOR or RUN mode.

The cause of the error must be removed before executing ERROR CLEAR (command code 2101) or the same error will immediately occur again after the command is executed.

### **5-3-28 ERROR LOG READ: 21 02**

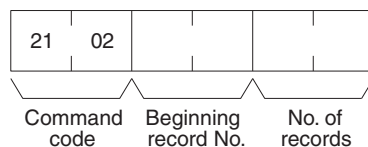
Reads the PLC's error log.

#### **Execution Conditions**

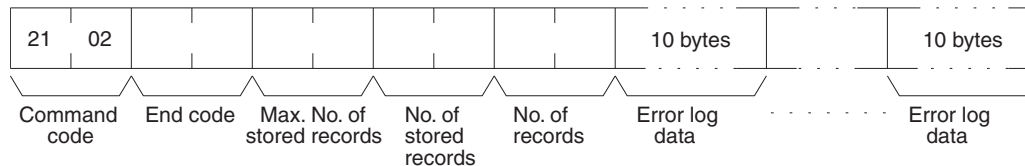
Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

#### **Command Format**

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK



### Response Format



### Parameters

#### **Beginning record number (command)**

Specify the first record to be read. (The first record number is 0000 hex.)

#### **Number of records (command, response)**

Specify the number of records to read. The number of read records will be returned with the response.

#### **Maximum number of stored records (response)**

Indicates the maximum number of records that can be stored. (Always 20 records.)

#### **Number of stored records (response)**

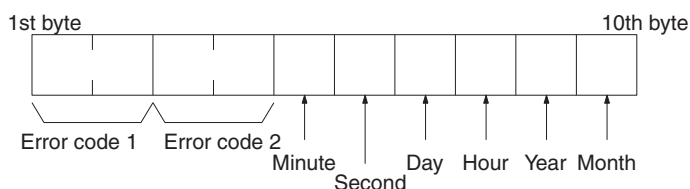
Indicates the number of records recorded at the time the command is executed.

#### **Error log data (response)**

The specified error log records will be returned in sequence starting from the beginning record number. The total number of bytes required is calculated as follows:

$$\text{No. of records} \times 10 \text{ bytes}$$

The configuration of each error record is as follows:



#### **Error code 1, 2**

Refer to 5-3-27 *ERROR CLEAR: 21 01* for information on error codes. Refer to the relevant operation manual or installation guide for more details.

Each data record includes the minute, second, day of month, hour (0 to 23), year (the rightmost two digits), and month in BCD specifying the time that the error occurred.

#### **End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

### Comments

The response will contain only the command code and end code if the beginning record number is higher than the number of records contained in the PLC.

When the PLC does not have the specified number of records, all the records that have been stored in the PLC will be read and an address range overflow error will result.

If the data is too large and exceeds the permissible length of the response format, the part in excess will not be read and a normal response will be returned.

### 5-3-29 ERROR LOG CLEAR: 21 03

Clears all error log pointers to 0.

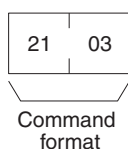
#### Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	OK	No

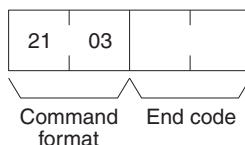
  

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

#### Command Format



#### Response Format



#### End code (response)

Refer to 5-1-3 *End Codes* for information on end codes.

#### Comments

This command clears the number of error log records that are stored. It does not clear data from the error log area.

### 5-3-30 FINS WRITE ACCESS LOG READ: 21 40

The CPU Unit automatically keeps a log of any access for FINS write commands regardless of the setting. This command reads this log, which tells the nodes and time when there was access.

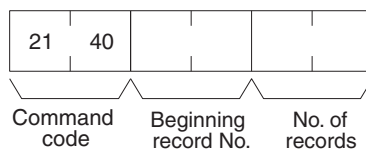
#### Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

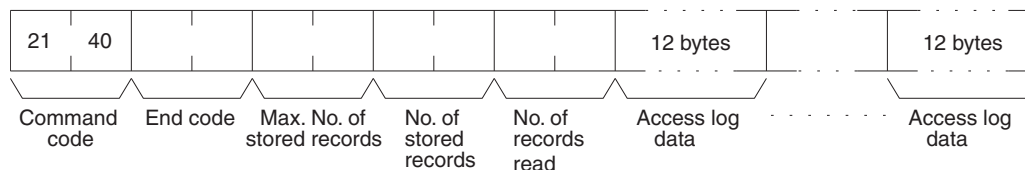
  

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

#### Command Format



### Response Format



## Parameters

**Beginning record number (command)**

Specify the first record to be read. (The first record number is 0000 hex.)

## Number of records (command, response)

Specify the number of records to read. The number of read records will be returned with the response.

**Maximum number of stored records (response)**

Indicates the maximum number of records that can be stored. (Always 20 records.)

**Number of stored records (response)**

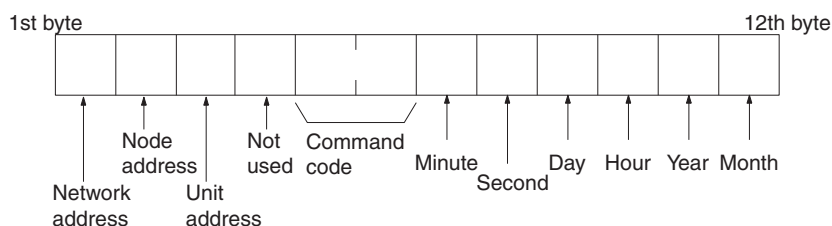
Indicates the number of records recorded at the time the command is executed

### Access log data (response)

The specified access log records will be returned in sequence starting from the beginning record number. The total number of bytes required is calculated as follows:

No. of records x 12 bytes

The configuration of each error record is as follows:



## Network address

The network address of the node that sent the FINS write command.

## Node address

The node address of the node that sent the FINS write command.

## Unit address

The Unit address of the Unit that sent the FINS write command.

### Command code

The command code of the FINS write command that was received (MR and MS).

**Year, month, day, hour, minute, second, day of week**

The year, month, day of month, hour, minute, and second are expressed in BCD.

**Year:** The rightmost two digits of the year. (1998, 1999, and 2000 are expressed as 98, 99, and 00 respectively. 2096 and 2097 will be expressed as 96 and 97.)

**Hour:** 00 to 23 (BCD).

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

**Comments**

An end code of 1103 hex (address range overflow) will be returned if the beginning record number is higher than the number of records contained in the PLC.

When the PLC does not have the specified number of records, all the records that have been stored in the PLC will be read and a normal response will be returned.

If the data is too large and exceeds the permissible length of the response format, the part in excess will not be read and a normal response will be returned.

The following rules apply to records stored in the access log.

- If there is already a record for the same node, the old record will be overwritten with a new one.
- If there is not already a record for the same node, a new record will be created at the end of the log.
- If the log is full (i.e., 20 records have already been stored), the oldest record will be discarded and a new record will be created.

**5-3-31 FINS WRITE ACCESS LOG CLEAR: 21 41**

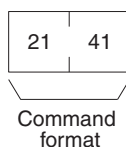
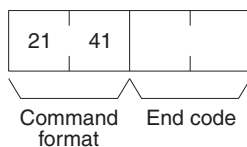
Clears the access log data.

**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	OK	No

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

**Command Format****Response Format****End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

**Comments**

This command clears the access log data for FINS write commands.

**5-3-32 FILE NAME READ: 22 01**

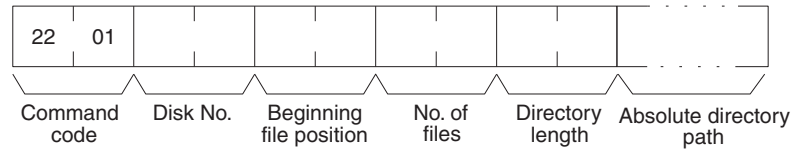
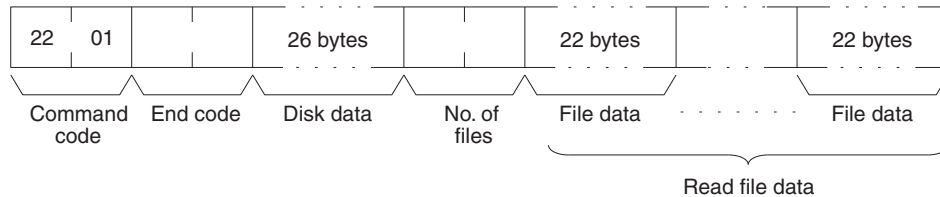
Reads file data such as the names of files saved in file memory.

**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

**Command Format****Response Format****Parameters****Disk number (command)**

The classification of the file memory with the file name to be read is specified as follows:

8000 (hex): Memory card

8001 (hex): EM file memory

**Beginning file position (command)**

The first file to be read. (The first file number is 0000 hex).

**Number of files (command)**

The number of file names to be read between 0001 and 0014 (hex). A maximum number of 20 file names can be read at one time. If there are more file names than that, add one to the number of response files when specifying the next beginning file position. To read disk data only, specify 0000 (hex) for both the beginning file position and the number of file names. A response will be returned for up to the number of files read.

**Directory length**

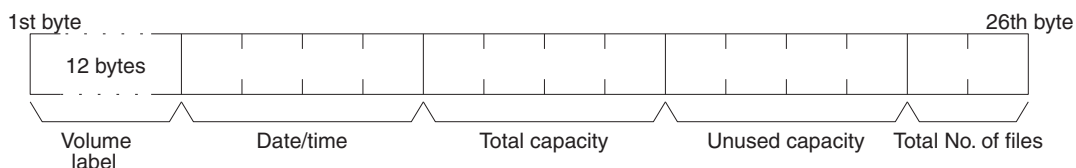
Indicates the length of the absolute directory path. The maximum number of characters is 65. To specify the root directory as the absolute directory path, specify 0000 (hex) as the directory length.

**Absolute directory path**

Indicates the absolute path from the root directory. It begins with \ (5C hex), and the drive name and colon (:) are not required. “\” is used to delimit the lower directory. It is not required at the end of the final absolute path. No setting is required to specify the root directory itself.

**Disk data (response)**

Indicates the file memory data. The configuration is as follows:

**Volume Label**

The volume label is the name registered with the file memory. For details on the configuration, refer to page 168.

**Date and Time**

The date and time show the date and time that the volume label was created.

**Total Capacity and Open Capacity**

The total capacity and open capacity show the total capacity of the file memory being used and the number of bytes still available (hexadecimal).

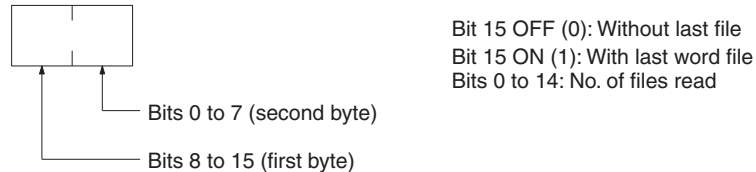


**Total Number of Files**

The number of files recorded in the absolute directory path. Volume labels, hidden files, system files, subdirectories, the current directory (indicated by .), and the parent directory (indicated by ..) are all counted as files. (The root directory can contain a volume label, but not a current directory or parent directory mark.)

**Number of files (response)**

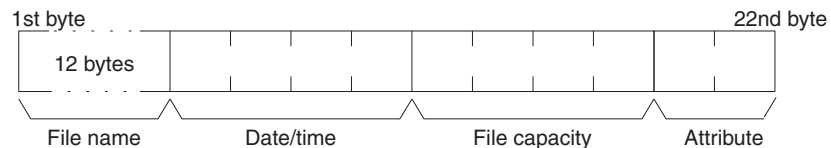
The number of files that have been read. Bit 15 is ON (1) if the last file is included.

**File data (response)**

Each file data consists of 22 bytes. The specified files will be transmitted in sequence starting from the first file. The total number of bytes required is calculated as follows:

$$\text{Number of read files} \times 22 \text{ bytes}$$

The configuration for each file data is as follows:

**File Name**

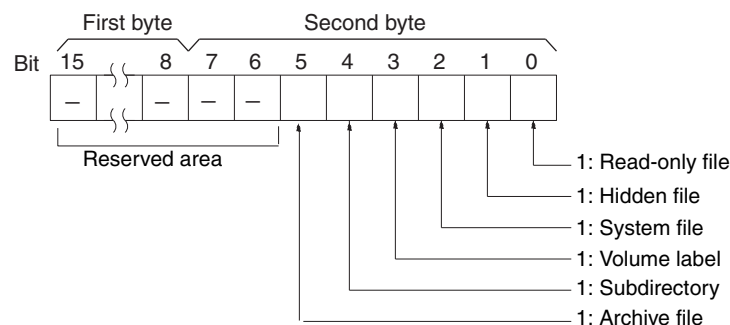
Specify the name of the file. Refer to *Volume Labels and File Names* on page 168 for the structure of file names.

**Date and Time**

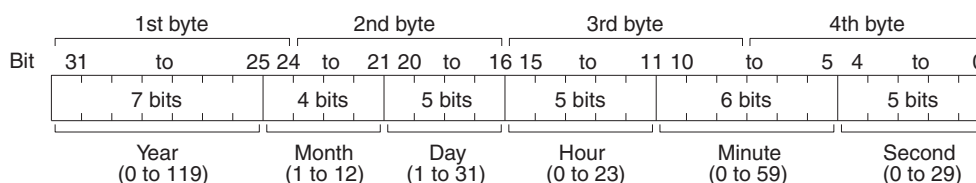
Indicates the date and time at which the file was created. (See the note below for details of the configuration.)

**File Capacity**

Indicates the size (the number of bytes, in four digits hexadecimal) of the file.

**Attribute****Note** Date and Time Configuration:

The data and time consists of 4 bytes (32 bits) and is configured in the way shown below.



All data values are in binary.

**Year:** Add 1980 to the value returned. (The year is the number of years since 1980.)

**Second:** Multiply the value returned by two. (The value returned is expressed in units of two seconds.)

**End code (response)**

Refer to 5-1-3 End Codes for information on end codes.

### 5-3-33 SINGLE FILE READ: 22 02

Reads the contents of a file stored in the file memory.

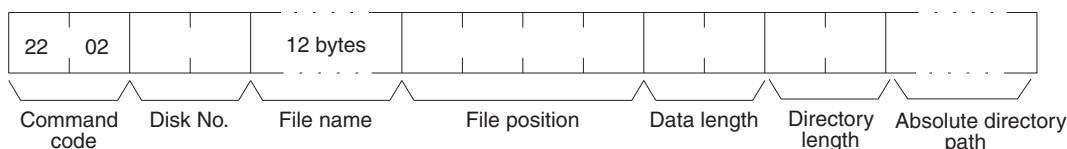
#### Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

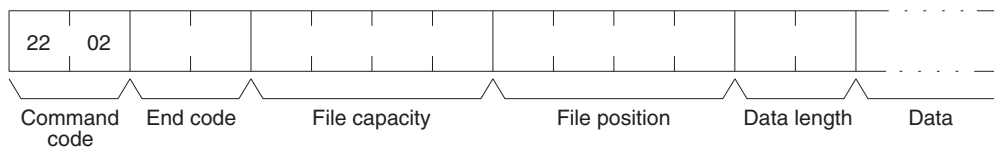
  

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

#### Command Format



#### Response Format



#### Parameters

**Disk number (command)**

The classification of the file memory with the file name to be read is specified as follows:

8000 (hex): Memory card  
8001 (hex): EM file memory

**File name (command)**

Specify the name of the file to be read. For details on the configuration, refer to page 168.

**File position (command)**

Specify the number of bytes (the relative byte address) from the start of the file from which to start reading. (Files start at 00000000 hex.)

**Data length (command)**

Specify the number of bytes of data to read.

**File capacity (response)**

The capacity (bytes) of the file that was read is returned.

**File position (response)**

The position of the first data read is returned.

**Data length (response)**

The number of bytes of data read is returned. If the last data in the file is included, the leftmost bit in this parameter will be ON.

**Data (response)**

The specified data is returned in sequence starting from the specified byte.

**Directory length**

Indicates the length of the absolute directory path. The maximum number of characters is 65. To specify the root directory as the absolute directory path, specify 0000 (hex) as the directory length.

**Absolute directory path**

Indicates the absolute path from the root directory. It begins with \ (5C hex), and the drive name and colon (:) are not required. “\” is used to delimit the lower directory. It is not required at the end of the final absolute path. No setting is required to specify the root directory itself.

**End code (response)**

Refer to 5-1-3 End Codes for information on end codes.

**Comments**

By specifying 0000 (hex) as the file position and data length in the command, is possible to see if the file exists.

**5-3-34 SINGLE FILE WRITE: 22 03**

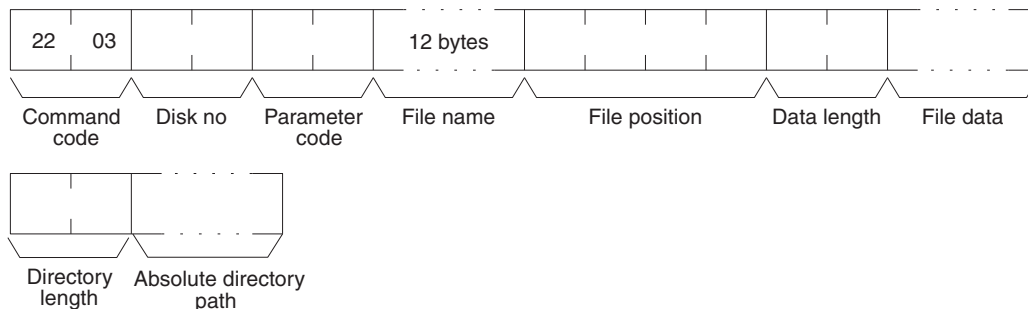
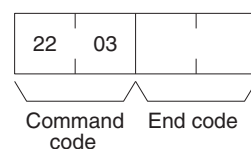
Writes a new file to the file memory or appends or overwrites an existing file stored in the file memory. Designation can be made to protect existing files if an attempt is made to create a new file of the same name as an existing file.

**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	OK	No

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

**Command Format****Response Format**

**Parameters****Disk number (command)**

The classification of the file memory with the file name to be read is specified as follows:

8000 (hex): Memory card

8001 (hex): EM file memory

**Parameter code (command)**

As follows:

**0000 (hex)**

Writes a new file. If a file with the same name already exists, the new file will not be created.

**0001 (hex)**

Writes a new file. If a file with the same name already exists, it will be overwritten.

**0002 (hex)**

Adds data to an existing file.

**0003 (hex)**

Overwrites an existing file.

**File name (command)**

Specifies the name of the file to be written. For details on the configuration, refer to page 168.

**File position (command)**

Specifies the number of bytes from the start of the file from which to start writing. (Files start at 00000000.) To create a new file or add data to an existing file, specify 00000000 as the file position.

**Data length (command)**

Specifies the number of bytes to be written.

**File data (command)**

Specifies the data in sequence from the beginning position, in the amount specified in "data length."

**Directory length (command)**

Indicates the length of the absolute directory path. The maximum number of characters is 65. To specify the root directory as the absolute directory path, specify 0000 (hex) as the directory length.

**Absolute directory path (command)**

Indicates the absolute path from the root directory. It begins with \ (5C hex), and the drive name and colon (:) are not required. "\ " is used to delimit the lower directory. It is not required at the end of the final absolute path. No setting is required to specify the root directory itself.

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

**Comments**

If the amount of data to be added to file memory exceeds the available capacity, an Address Range Exceeded error (end code 1104 hex) will occur and the data will not be written. If that occurs, the previous contents of the file specified to be overwritten will not be changed.

When SINGLE FILE WRITE is executed, the clock data of the CPU Unit will be recorded as the date of the file.

**5-3-35 FILE MEMORY FORMAT: 22 04**

Formats file memory. Always execute FILE MEMORY FORMAT (command code 2204) before using a memory card or EM area as file memory.

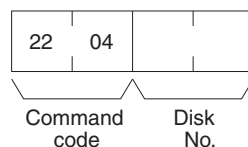
## Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	OK	No

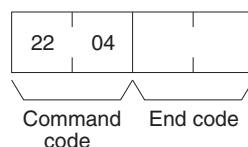
  

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

## Command Format



## Response Format



## Parameters

**Disk number (command)**

The classification of the file memory to be formatted is specified as follows:

8000 (hex): Memory card  
 8001 (hex): EM file memory

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

## Comments

When FILE MEMORY FORMAT (command code 2204) is executed, all data registered to the file memory will be cleared. Before executing this command, check to be sure that it is okay to clear the data. Refer to file memory application procedures in the CPU Unit's operation manual for details on using file memory.

FILE MEMORY FORMAT is also used to return EM memory that has been converted to file memory back to its original form.

Even if only the size of the file memory is changed, the entire file memory will be formatted.

**Note** If the current EM bank is specified for file conversion in the PLC Setup when FILE MEMORY FORMAT is executed for the EM Area, an Area Missing error (end code 1101) will be returned and a PLC Setup setting error will occur in the CPU Unit. These errors, however, will not occur if the current bank is EM0.

## 5-3-36 FILE DELETE: 22 05

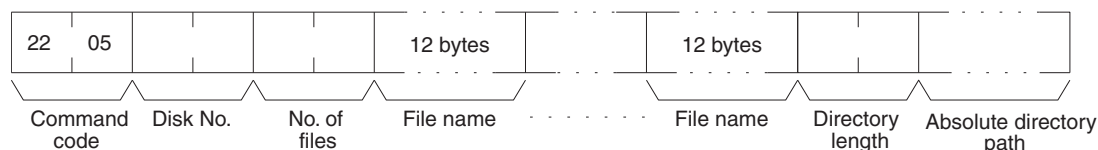
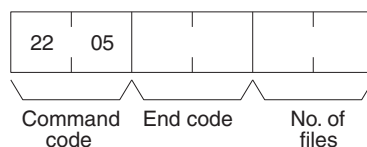
Deletes files registered to file memory.

## Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	OK	No

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

**Command Format****Response Format****Parameters****Disk number (command)**

The classification of the file memory with the file to be deleted is specified as follows:

8000 (hex): Memory card

8001 (hex): EM file memory

**Number of files (command)**

Specify the number of files to be deleted.

**File name (command)**

Specify the name of the file to be deleted. For details on the configuration, refer to page 168.

**Directory length**

Indicates the length of the absolute directory path. The maximum number of characters is 65. To specify the root directory as the absolute directory path, specify 0000 (hex) as the directory length.

**Absolute directory path**

Indicates the absolute path from the root directory. It begins with \ (5C hex), and the drive name and colon (:) are not required. “\” is used to delimit the lower directory. It is not required at the end of the final absolute path. No setting is required to specify the root directory itself.

**Number of files (response)**

Indicates the number of files actually deleted.

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

**Comments**

The specified files will be deleted in sequence. If non-existing file names have been specified, the PLC will ignore them and the operation will continue.

**5-3-37 FILE COPY: 22 07**

Copies a file from one file memory to another file memory connected to the same CPU Unit.

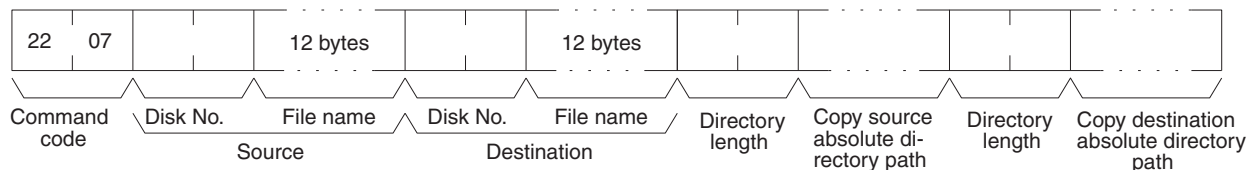
**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	OK	No

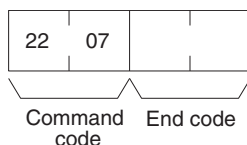
  

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

## Command Format



### Response Format



## Parameters

**Disk number (command)**

The classification of the copy source and copy destination file memory is specified as follows:

8000 (hex):      Memory card

8001 (hex): EM file memory

**File name (command)**

Specify the file to be copied and a new name for the copy destination file.

### Directory length

Indicates the length of the absolute directory path. The maximum number of characters is 65. To specify the root directory as the absolute directory path, specify 0000 (hex) as the directory length.

### Copy source and copy destination absolute directory path

Indicates the absolute path from the root directory. It begins with \ (5C hex), and the drive name and colon (:) are not required. “\” is used to delimit the lower directory. It is not required at the end of the final absolute path. No setting is required to specify the root directory itself.

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

## Comments

The file will not be copied if there is already a file of the same name at the destination.

The file will not be copied if an existing file name is given at the copy destination.

The copy destination file is given the same date as the copy source file.

**5-3-38 FILE NAME CHANGE: 22 08**

Changes a registered file name.

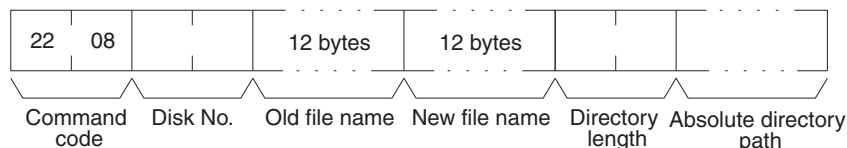
## Execution Conditions

<b>Access right at other device</b>	<b>UM read protection</b>	<b>DIP switch UM write protection</b>	<b>Network write protection</b>
<b>No</b>	<b>OK</b>	<b>OK</b>	<b>No</b>

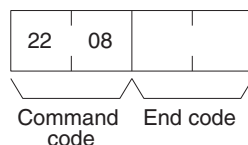
  

<b>RUN mode</b>	<b>MONITOR mode</b>	<b>PROGRAM mode</b>
<b>OK</b>	<b>OK</b>	<b>OK</b>

## Command Format



## Response Format



## Parameters

**Disk number (command)**

The classification of the file memory where the file name to be changed is registered is specified as follows:

8000 (hex): Memory card

8001 (hex): EM file memory

**Old and new file names (command)**

Specify the original file name and a new name for the file. For details on the configuration, refer to page 168.

**Directory length (command)**

Indicates the length of the absolute directory path. The maximum number of characters is 65. To specify the root directory as the absolute directory path, specify 0000 (hex) as the directory length.

**Absolute directory path (command)**

Indicates the absolute path from the root directory. It begins with \ (5C hex), and the drive name and colon (:) are not required. “\” is used to delimit the lower directory. It is not required at the end of the final absolute path. No setting is required to specify the root directory itself.

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

## Comments

The file name will not be changed if an existing file name is specified for the new file.

Even if the name of a file is changed, the date of the file will remain unchanged.

Directory names can also be changed. Specify the directory name in place of the file name.

## 5-3-39 MEMORY AREA–FILE TRANSFER: 22 0A

Transfers or compares data between the I/O memory areas and the file memory.

## Execution Conditions

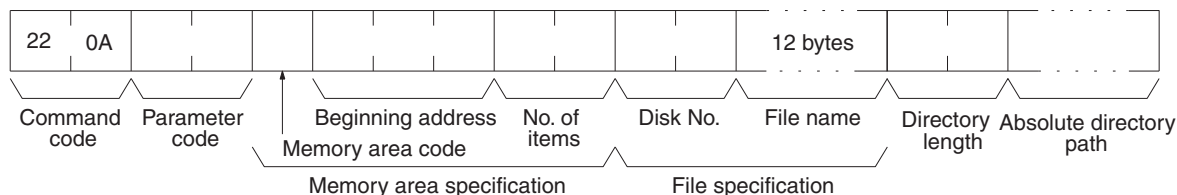
Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	OK	No

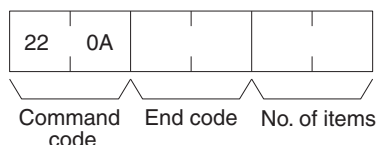
RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK



## Command Format



## Response Format



## Parameters

**Parameter code (command)**

Specify the transfer/compare method as follows:

**0000 (hex)**

Data transfer from the I/O memory area to the file memory.

**0001 (hex)**

Data transfer from the file memory to the I/O memory area.

**0002 (hex)**

Data compared.

**I/O memory area code, Beginning address (command)**

The memory area to be used for data transfer or comparison, and the first address in the memory area to be transferred or compared.

The memory areas that can be written are given in the following table. Refer to *5-2-2 I/O Memory Address Designations* for the specific addresses that can be used.

Area		Data type	Mode memory area code (hex)	Bytes per element
CIO Area	CIO	Word	B0	2
Work Area	WR		B1	
Holding Bit Area	HR		B2	
Auxiliary Bit Area	AR		B3	
Timer Area	TIM	PV	89	2
Counter Area	CNT			
DM Area	DM	Word	82	2
EM Area	EM bank 0 to bank F	Word	A0 to AF or 50 to 5F (see note.)	2
	EM bank 10 to bank 18		60 to 68	2
	EM current bank	Word	98	2

**Note** On a CJ2 CPU unit only, 50 to 5F can be specified for the memory area code of EM banks 0 to F.

**Number of items (command and response)**

In the command format, specify the number of items, in word units, to be transferred or compared. In the response format, this parameter indicates the number of items transferred or successfully compared. Refer to *Element Data Configurations* on page 163 for the configuration of elements.

**Disk number (command)**

The classification of the file memory where the file to be transferred or compared is registered is specified as follows:

8000 (hex): Memory card  
8001 (hex): EM file memory

**File name (command)**

Specify the file to be transferred or compared. For details on the configuration, refer to page 168.

**Directory length**

Indicates the length of the absolute directory path. The maximum number of characters is 65. To specify the root directory as the absolute directory path, specify 0000 (hex) as the directory length.

**Absolute directory path**

Indicates the absolute path from the root directory. It begins with \ (5C hex), and the drive name and colon (:) are not required. “\” is used to delimit the lower directory. It is not required at the end of the final absolute path. No setting is required to specify the root directory itself.

**Comments**

MEMORY AREA–FILE TRANSFER (command code 220A) can be executed regardless of the CPU Unit mode. It is the user’s responsibility to program steps to prohibit this command from being executed when the CPU Unit is in RUN mode if such protection is necessary. Execute CPU UNIT STATUS READ (command code 0601) to read the CPU Unit’s mode. (Refer to 5-3-17 CPU UNIT STATUS READ: 06 01.)

If data is written to the Timer/Counter PV Area, the Completion Flags will not be turned OFF.

The CPU Unit clock data upon completion of MEMORY AREA–FILE TRANSFER (command code 220A) will be recorded as the date of the file that has been transferred.

Files cannot be overwritten when transferring data from a memory area to file memory.

**End code (response)**

Refer to 5-1-3 End Codes for information on end codes.

**5-3-40 PARAMETER AREA–FILE TRANSFER: 22 0B**

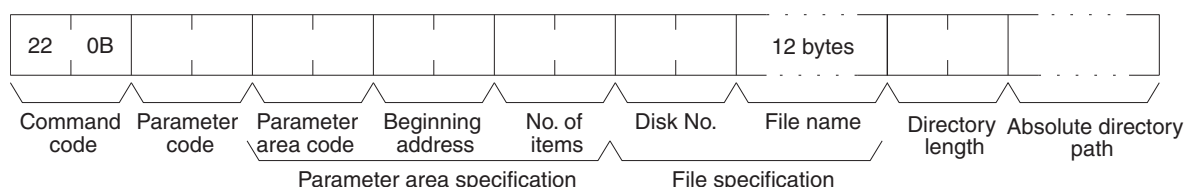
Compares or transfers data between the parameter area and the file memory.

**Execution Conditions**

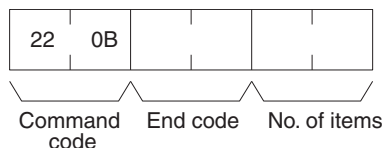
Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	OK (See note.)	No

RUN mode	MONITOR mode	PROGRAM mode
OK (See note.)	OK (See note.)	OK

**Note** Data cannot be transferred from file memory to the parameter area.

**Command Format**

## Response Format



## Parameters

**Parameter code (command)**

Specify the transfer/compare method as follows:

**0000 (hex)**

Data transfer from the parameter area to the file memory.

**0001 (hex)**

Data transfer from the file memory to the parameter area.

**0002 (hex)**

Data compared.

**Parameter area code (command)**

Specify the parameter area to be used for data transfer or comparison. The rightmost byte is always 80 (hex), and the parameter area is specified with the leftmost byte.

**Beginning address (command)**

Specify the position in the parameter area for beginning the transfer or comparison. The beginning of each parameter area is always 0000.

**Parameter Areas**

There are six parameter areas, each of which has consecutive word addresses beginning from 0000. The areas that can be written to are shown below, along with their parameter area codes.

	Parameter area code	Address range (Hex)	Parameter area code	Address range (Hex)
PLC Setup Area	8010	0000 to 01FF (512 words)	8000	0000 to 1F3F (8000 words)
I/O Table Registration Area	8012	0000 to 04FF (1,280 words)		
Routing Table Area	8013	0000 to 01FF (512 words)		
CPU Bus Unit Setup Area	8002	0000 to 143F (5184 words)		

**Number of items (command and response)**

In the command format, the number of items is always FFFF (hex) so that the entire parameter area is specified. In the response format, the number of words transferred is indicated when data is transferred. When data is compared, the response format indicates the position at which a verification error occurs or the number of words compared.

**Disk number (command)**

The classification of the file memory where the file to be transferred or compared is registered is specified as follows:

8000 (hex): Memory card

8001 (hex): EM file memory

**File name (command)**

Specify the file to be transferred or compared. For details on the configuration, refer to page 168.

**Directory length (command)**

Indicates the length of the absolute directory path. The maximum number of characters is 65. To specify the root directory as the absolute directory path, specify 0000 (hex) as the directory length.

**Absolute directory path (command)**

Indicates the absolute path from the root directory. It begins with \ (5C hex), and the drive name and colon (:) are not required. “\” is used to delimit the lower directory. It is not required at the end of the final absolute path. No setting is required to specify the root directory itself.

**End code (response)**

Refer to 5-1-3 End Codes for information on end codes.

**Comments**

The clock data upon completion of a parameter area to file memory transfer will be recorded as the date of the file that has been transferred.

A file can be transferred to the I/O table only when the CPU Unit is in PROGRAM mode.

This command cannot be executed if any other device holds the access right.

Files cannot be overwritten when transferring data from the parameter area to file memory.

**5-3-41 PROGRAM AREA-FILE TRANSFER: 22 0C**

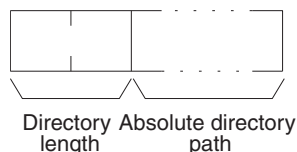
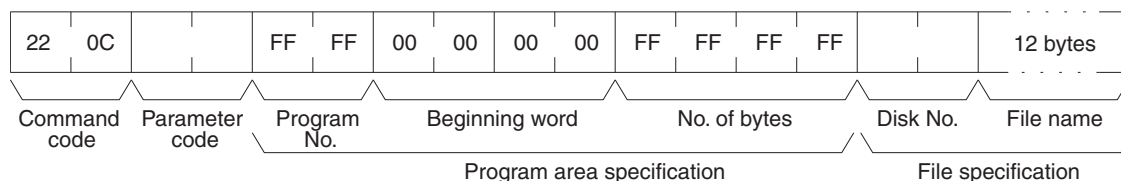
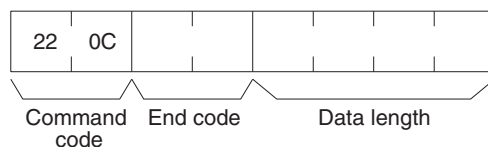
Compares or transfers data between the program area and the file memory.

**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	No (See Note 1.)	No

RUN mode	MONITOR mode	PROGRAM mode
OK (See note 2.)	OK (See note 2.)	OK

- Note**
1. Data can be transferred from the program area to the file memory.
  2. Data cannot be transferred from file memory to the program area in these modes.

**Command Format****Response Format****Parameters****Parameter code (command)**

Specify the transfer/compare method as follows:

**0000 (hex)**

Data transfer from the program area to the file memory.

**0001 (hex)**

Data transfer from the file memory to the program area.

**0002 (hex)**

Data compared.

**Program number and beginning word (command)**

Always FFFF (hex).

**Beginning word (command)**

Always 00000000 (hex).

**Number of bytes (command)**

Specify the number of data bytes to be transferred or compared. Always FFFFFFFF (hex).

**Disk number (command)**

The classification of the file memory where the file to be transferred or compared is registered is specified as follows:

8000 (hex): Memory card

8001 (hex): EM file memory

**File name (command)**

Specify the name of the file to be transferred or compared. For details on the configuration, refer to page 168.

**Data length (response)**

When data is transferred, the data length parameter indicates the number of bytes that have been transferred. When data is compared, this parameter indicates the amount of data that was compared with no errors, or the number of bytes compared in a normal completion.

**Directory length (response)**

Indicates the length of the absolute directory path. The maximum number of characters is 65. To specify the root directory as the absolute directory path, specify 0000 (hex) as the directory length.

**Absolute directory path (response)**

Indicates the absolute path from the root directory. It begins with \ (5C hex), and the drive name and colon (:) are not required. “\” is used to delimit the lower directory. It is not required at the end of the final absolute path. No setting is required to specify the root directory itself.

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

**Comments**

The clock data upon completion of a program area to file memory transfer will be recorded as the date of the file that has been transferred.

This command cannot be executed if any other device holds the access right or when memory is write-protected via pin 1 of the DIP switch on the front panel of the CPU Unit.

PROGRAM AREA-FILE TRANSFER (command code 220C) cannot be executed when the CPU Unit is in the RUN or MONITOR mode.

Files cannot be overwritten when transferring data from the program area to file memory.

When the “*prohibit save to protected memory card and program transfer (PLC to computer)*” setting is enabled, PROGRAM AREA - FILE TRANSFER cannot be executed.

When the “*prohibit overwriting of protected program*” setting is enabled, FILE - PROGRAM AREA TRANSFER cannot be executed.

## 5-3-42 CREATE/DELETE DIRECTORY: 22 15

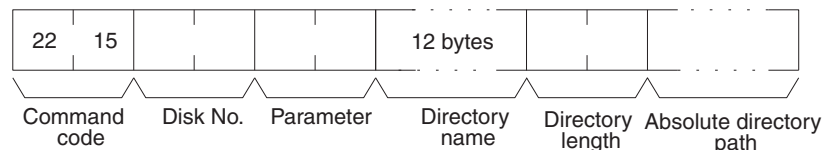
Creates or deletes a directory.

### Execution Conditions

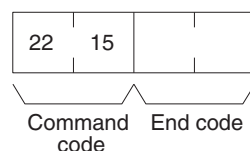
Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	OK	No

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

### Command Format



### Response Format



### Parameters

#### **Disk number (command)**

The classification of the file memory where the directory is to be created or deleted is specified as follows:

8000 (hex): Memory card

8001 (hex): EM file memory

#### **Parameter (command)**

Specify either creation or deletion as follows:

0000 (hex): Create

0001 (hex): Delete

#### **Directory name (command)**

Specify the name of the directory to be created or deleted. For details on the configuration, refer to page 168. If the directory name is less than 12 bytes, fill unused bytes with 20 hex.

#### **Directory length (command)**

Indicates the length of the absolute directory path. The maximum number of characters is 65. To specify the root directory as the absolute directory path, specify 0000 (hex) as the directory length.

#### **Absolute directory path (command)**

Indicates the absolute path from the root directory. It begins with \ (5C hex), and the drive name and colon (:) are not required. “\” is used to delimit the lower directory. It is not required at the end of the final absolute path. No setting is required to specify the root directory itself.

#### **End code (response)**

Refer to 5-1-3 End Codes for information on end codes.

### Comments

The CPU Unit's clock data will be recorded as the date of any directory that is created.

**5-3-43 MEMORY CASSETTE TRANSFER (CP-series CPU Units Only): 22 20**

Transfers or verifies data between a Memory Cassette mounted in a CP-series CPU Unit (see note) and the memory areas in the CP-series CPU Unit. Transfers can go either direction.

**Note** This command is supported only by CP-series CPU Units (Except CP1E CPU Units).

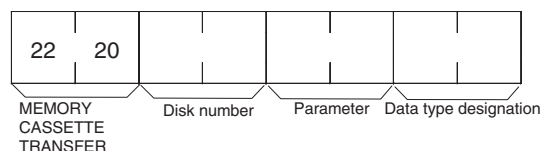
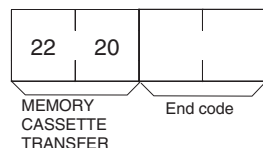
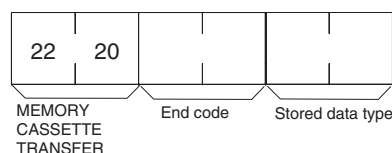
Applicable data	Storage location in CPU Unit
User program	RAM (user program area)
Parameter area (PLC Setup, CPU Bus Unit settings, and routing tables)	RAM (parameter area)
Symbol table	Built-in flash memory (Comment Memory Area)
Comments (I/O comments, row comments, and annotations)	Built-in flash memory (Comment Memory Area)
Program indices (section names, section comments, and program comments)	Built-in flash memory (Comment Memory Area)
Function block sources	Built-in flash memory (Function Block Source Memory Area)
Data memory	RAM (DM Area D0 to D32767)
Data memory initial values	Built-in flash memory (Data memory initial value area)

**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
No	OK	OK (See note.)	No

RUN mode	MONITOR mode	PROGRAM mode
No	No	OK

**Note** Data cannot be transferred from the CPU Unit to the Memory Cassette when the user program is included and DIP switch UM protection is set.

**Command Format****Response Format****Other Memory Cassette Operations (Parameter ≠ 8000 Hex)****Reading the Data Type in the Memory Cassette (Parameter = 8000 Hex)****Parameters****Disk number (command)**

Specify the disk for transfer or verification. Only the Memory Cassette can be specified.

8003 (hex):      Memory Cassette

**Parameter (command)**

Specify the transfer or verification method.

0000 (hex): Transfer (CPU Unit to Memory Cassette)  
 0001 (hex): Transfer (Memory Cassette to CPU Unit)  
 0002 (hex): Verify (between CPU Unit and Memory Cassette)  
 0003 (hex): Initialize Memory Cassette  
 8000 (hex): Read data type in Memory Cassette

**Data type designation (command)**

Bit 15: All or individual area designation (OFF: All, ON: Individual areas)

OFF: All areas for bits 00 and 02 through 07 (See note.)

ON: Only areas specified by bits 00 and 02 through 07 (Multiple bits can be turned ON.)

Bits 14 to 08: Reserved

Bit 07: Data memory initial values

Bit 06: Data memory

Bit 05: Program indices

Bit 04: Comments

Bit 03: Symbol table

Bit 02: parameter area

Bit 01: Reserved

Bit 00: User program + Function block sources

**Note** If bit 15 is OFF and any of bit 02 or bits 02 to 07 is ON, an Other Parameter Error will occur and an end code of 110C hex will be returned.

**End code (response)**

Refer to 5-1-3 End Codes for information on end codes.

**Stored data type (response)**

When reading the data type in the Memory Cassette (parameter = 8000 hex), the following bits corresponding to the stored data will be turned ON. (More than one bit may be turned ON.)

Bit 07: Data memory initial values

Bit 06: Data memory

Bit 05: Program indices

Bit 04: Comments

Bit 03: Symbol table

Bit 02: Parameter area

Bit 01: Function block sources

Bit 00: User program

**5-3-44 FORCED SET/RESET: 23 01**

Force-sets (ON) or force-resets (OFF) bits/flags or releases force-set status. Bits/flags that are forced ON or OFF will remain ON or OFF and cannot be written to until the forced status is released.

**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	No

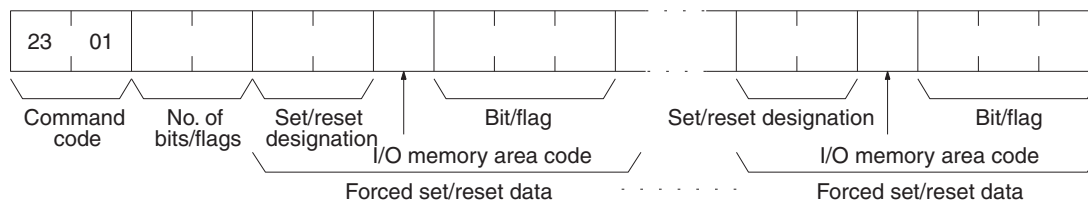
  

RUN mode	MONITOR mode	PROGRAM mode
No	OK	OK

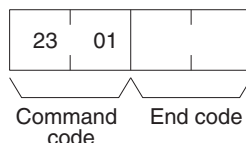
**Note** "Forced status" means that the ON/OFF status of the bit/flag is forcibly retained and writing is prohibited.



## Command Format



## Response Format



## Parameters

**Number of bits/flags (command)**

Specify the number of bits/flags to be controlled.

**Set/reset designation (command)**

Specify the action to be taken for each bit/flag.

Value (hex)	Name	Operation
0000	Forced reset	Turns OFF (0) the bit/flag and places it in forced status. (See note.)
0001	Forced set	Turns ON (1) the bit/flag and places it in forced status.
8000	Forced set/reset OFF release	Turns OFF (0) the bit/flag and releases the forced status.
8001	Forced set/reset ON release	Turns ON (1) the bit/flag and releases the forced status.
FFFF	Forced set/reset release	Releases the forced status while retaining the ON/OFF status.

**I/O memory area code (command)**

Specify the I/O memory area of the bit or flag to be controlled.

**Bit/Flag (command)**

Specify the bit or flag to be controlled. The memory areas in which bits/flags can be controlled are given in the following table. Refer to 5-2-2 *I/O Memory Address Designations* for the specific addresses that can be used.

Area		Data type	CS/CJ/CP/NSJ-series memory area code (hex)	CVM1/CV-series memory area code (hex)	Bytes per element
CIO Area	CIO	Bit	30	00	1
Work Area	WR		31	---	
Holding Bit Area	HR		32	---	
Timer Area	TIM	Completion Flag	09	01	1
Counter Area	CNT				

**End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

**Comments**

To force set/reset multiple bits/flags, specify the “set/reset designation,” the “I/O memory area code,” and the “bit/flag” parameters for the number of bits/flags set in the “number of bits/flags” parameter.

**Note** If “forced set/reset OFF release (8000)” or “forced set/reset ON release (8001)” is exceeded for a bit/flag that does not have forced status, only the bit/flag’s ON/OFF status will be affected.

**5-3-45 FORCED SET/RESET CANCEL: 23 02**

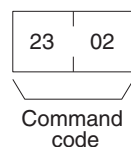
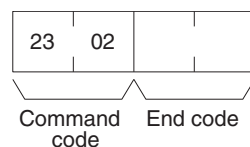
Cancels all bits (flags) that have been forced ON or forced OFF.

**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	No

RUN mode	MONITOR mode	PROGRAM mode
No	OK	OK

**Command Format****Response Format****End code (response)**

Refer to 5-1-3 *End Codes* for information on end codes.

**Comments**

The bits/flags in the following memory areas can be forced set or forced reset, and canceled.

Memory area	Data
Relay areas	Bit status
Timer/Counter	Completion Flag status

**5-3-46 CONVERT TO COMPOWAY/F COMMAND: 28 03**

When this command is sent to a CS/CJ-series CPU Unit with unit version 3.0 or later, serial port C on the Controller Section of an NSJ Controller, built-in serial ports of N-type CP1E CPU Units, serial port 1 or 2 on an Option Board of a CP-series CPU Unit, or a serial port on a Serial Communications Unit/Board (version 1.2 or later), the CPU Unit or Serial Communications Unit/Board removes the FINS header and sends the enclosed CompoWay/F command.

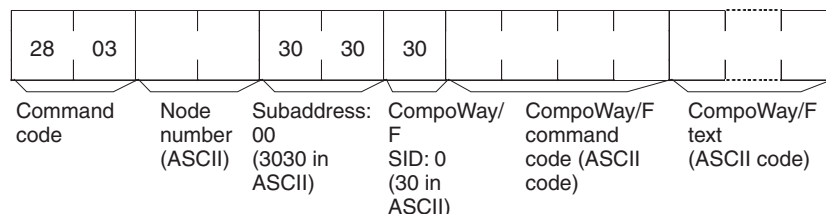
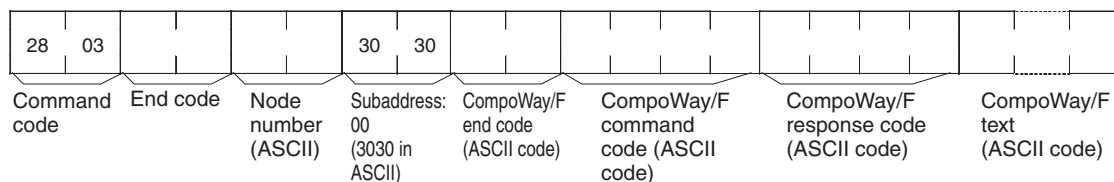
With this command, OMRON components connected to a PLC through CompoWay/F communications can be accessed from a PLC or PT by sending a FINS message containing a CompoWay/F command.

**Execution Conditions**

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

**Command Format****Response Format****Parameters****Command****Node Number**

This is the destination ID number (00 to 99 or XX) in the CompoWay/F system. The characters are specified in ASCII. When sending a broadcast transmission, set the node number to XX (two X's).

**Subaddress**

The subaddress is 00 for most models and the value is specified in ASCII as 3030 hex. For some models, other values must be set.

**CompoWay/F SID (Service ID)**

The Service ID is 0 for most models and the value is specified in ASCII as 30 hex. For some models, other values must be set.

**CompoWay/F Command Code**

This is the CompoWay/F command code. For details, refer to the command manual for the CompoWay/F Slave.

**CompoWay/F Text**

This is the data that follows the command code.

**Response****Node Number**

This is the destination ID number (00 to 99 or XX) in the CompoWay/F system. The characters are specified in ASCII. When a broadcast transmission is sent, the node number is set to XX (two X's).

**Subaddress**

The subaddress is 00 for most models and the value is specified in ASCII as 3030 hex. For some models, other values must be set.

**End Code (Response)**

The end code indicates the command frame's execution result. (The end code is not the same as the response code, which is described below.)

**CompoWay/F Command Code**

This is the CompoWay/F command code. For details, refer to the command manual for the CompoWay/F Slave.

**CompoWay/F Response Code**

The CompoWay/F response code indicates the results of the service requested by the command code. For details, refer to the command manual for the CompoWay/F Slave.

**CompoWay/F Text**

This is the data that follows the response code.

**Precautions**

- FINS Header (Destination Address)  
The following settings are required.
- Destination Network Address (DNA):
  - When a routing table is created to treat the serial communications path as a network, this is the network address associated with the Serial Communications Unit or Board's serial port by the routing table
  - When a routing table is not created to treat the serial communications path as a network, this is the actual network address used to specify the destination PLC.
- Destination Node Address (DA1):
  - When a routing table is created to treat the serial communications path as a network, set 00 hex for communications within the local PLC or the "Host Link unit number + 1" for serial → serial → serial conversion.
  - When a routing table is not created to treat the serial communications path as a network, this is the actual node address used to specify the destination PLC (the "Host Link unit number + 1" for serial → serial → serial conversion).
- Destination Unit Address (DA2):  
This is the serial port's unit address.  
Settings for a Serial Communications Board or Unit:
  - Unit addresses for serial port 1:

Unit number	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Board
Hexadecimal	80	84	88	8C	90	94	98	9C	A0	A4	A8	AC	B0	B4	B8	BC	E4
Decimal	128	132	136	140	144	148	152	156	160	164	168	172	176	180	184	188	228

- Unit addresses for serial port 2:

Unit number	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Board
Hexadecimal	81	85	89	8D	91	95	99	9D	A1	A5	A9	AD	B1	B5	B9	BD	E5
Decimal	129	133	137	141	145	149	153	157	161	165	169	173	177	181	185	189	229

- Sending CompoWay/F Commands with the CMND Instruction
  - Set FINS command code 2803 hex (CONVERT TO COMPOWAY/F) in S.
  - Set the following parameters starting at S+1 in ASCII with the leftmost byte first: CompoWay/F node number (2-byte ASCII), subaddress (2-byte ASCII), SID (2-byte ASCII), CompoWay/F command MRC (2-byte ASCII), CompoWay/F command SRC (2-byte ASCII), and text (ASCII, 2 × n bytes)

Note For CompoWay/F, set SID 0 (1-byte ASCII: 30 hex) in the leftmost byte of S+3 and the most significant digit of the CompoWay/F command code's MRC (1-byte ASCII) in the rightmost byte of S+3. Set the least significant digit of the CompoWay/F command code's MRC (1-byte ASCII) in the leftmost byte of S+4 and the most significant digit of the CompoWay/F command code's SRC (1-byte ASCII) in the rightmost byte of S+4. Be sure to set the remaining data with this 1-byte offset as well.

### 5-3-47 CONVERT TO MODBUS-RTU COMMAND: 28 04

When this command is sent to serial port 1 or 2 on an Option Board of a CP-series CPU Unit, or a serial port on a Serial Communications Unit/Board (version 1.2 or later), the CPU Unit or Serial Communications Unit/Board removes the FINS header and sends the enclosed Modbus-RTU command.

With this command, OMRON components connected to a PLC through Modbus-RTU communications can be accessed from a PLC or PT by sending a FINS message containing a Modbus-RTU command.

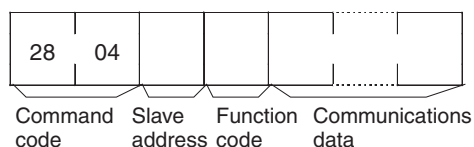
#### Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

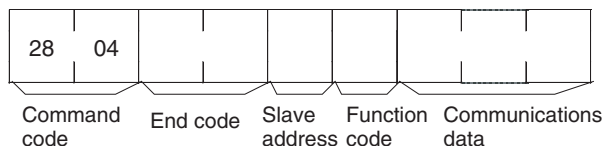
  

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

#### Command Format



#### Response Format



#### Parameters

##### Command

##### **Slave Address**

Specify the Modbus-RTU device address. Set the address in hexadecimal between 01 and F7 hex (1 to 247 decimal).

##### **Function Code**

Specify the function code of the Modbus-RTU command. Set the address in hexadecimal between 01 and FF hex (1 to 255 decimal).

##### **Communications Data**

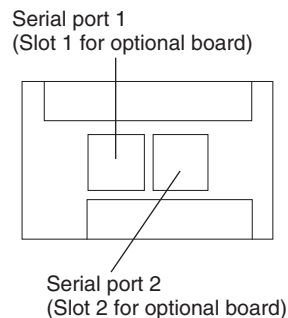
Specify the required parameters associated with the function code. The amount of communications data varies. (In some cases, there is no communications data.)

##### Response

The response is the same as the command except that it contains an end code.

**Precautions**

- **FINS Header (Destination Address) Contents**  
The following settings are required.
- **Destination Network Address (DNA):**
  - When a routing table is created to treat the serial communications path as a network, this is the network address associated with the Serial Communications Unit or Board's serial port by the routing table
  - When a routing table is not created to treat the serial communications path as a network, this is the actual network address used to specify the destination PLC.
- **Destination Node Address (DA1):**
  - When a routing table is created to treat the serial communications path as a network, set 00 hex for communications within the local PLC or the "Host Link unit number + 1" for serial → serial → serial conversion.
  - When a routing table is not created to treat the serial communications path as a network, this is the actual node address used to specify the destination PLC (the "Host Link unit number + 1" for serial → serial → serial conversion).
- **Destination Unit Address (DA2):**  
This is the serial port's unit address.  
Settings for a CP1H CPU Unit and CP1L CPU Unit



CPU Unit port	Unit address of port
Serial port 1	FD hex (253 decimal)
Serial port 2	FC hex (252 decimal)

Settings for a Serial Communications Board or Unit:

- Unit addresses for serial port 1:

Unit number	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Board
Hexadecimal	80	84	88	8C	90	94	98	9C	A0	A4	A8	AC	B0	B4	B8	BC	E4
Decimal	128	132	136	140	144	148	152	156	160	164	168	172	176	180	184	188	228

- Unit addresses for serial port 2:

Unit number	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Board
Hexadecimal	81	85	89	8D	91	95	99	9D	A1	A5	A9	AD	B1	B5	B9	BD	E5
Decimal	129	133	137	141	145	149	153	157	161	165	169	173	177	181	185	189	229

- **Sending Modbus-RTU Commands with the CMND Instruction**
  - Set FINS command code 2804 hex (CONVERT TO MODBUS-RTU COMMAND) in S.
  - Set the following parameters starting at S+1 with the leftmost byte first (see note): Slave address (1 byte), Function code (1 byte), and the communications data (n bytes).

Note For Modbus-RTU, set the Modbus-RTU Slave address (1 byte) in the leftmost byte of S+1 and the function code (1 byte) in the rightmost byte of S+1.

### 5-3-48 CONVERT TO MODBUS-ASCII COMMAND: 28 05

When this command is sent to a serial port on a Serial Communications Unit or Board (Ver. 1.2 or later), the Serial Communications Unit/Board removes the FINS header and sends the enclosed Modbus-ASCII command.

With this command, OMRON components connected to a PLC through Modbus-ASCII communications can be accessed from a PLC or PT by sending a FINS message containing a Modbus-ASCII command.

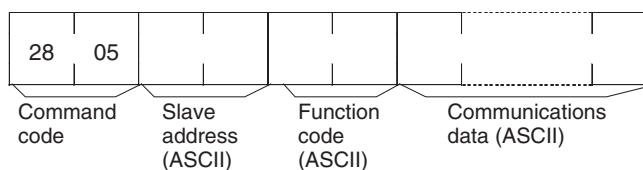
#### Execution Conditions

Access right at other device	UM read protection	DIP switch UM write protection	Network write protection
OK	OK	OK	OK

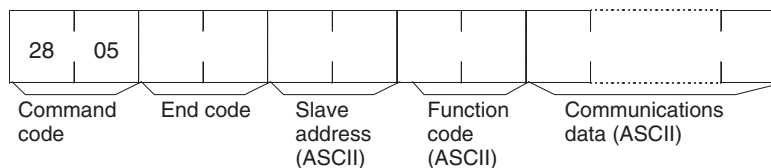
  

RUN mode	MONITOR mode	PROGRAM mode
OK	OK	OK

#### Command Format



#### Response Format



#### Parameters

##### Command

##### **Slave Address**

Specify the Modbus-ASCII device address. Set the address in ASCII between 01 and F7 hex (3031 to 4637 ASCII), which is 1 to 247 in decimal.

##### **Function Code**

Specify the function code of the Modbus-ASCII command. Set the address in ASCII between 01 and FF hex (3031 to 4646 ASCII), which is 1 to 255 in decimal.

##### **Communications Data**

Specify the required parameters (in ASCII) associated with the function code. The amount of communications data varies. (In some cases, there is no communications data.)

##### Response

The response is the same as the command except that it contains an end code.

**Precautions**

- FINS Header (Destination Address) Contents  
The following settings are required.
- Destination Network Address (DNA):
  - When a routing table is created to treat the serial communications path as a network, this is the network address associated with the Serial Communications Unit or Board's serial port by the routing table
  - When a routing table is not created to treat the serial communications path as a network, this is the actual network address used to specify the destination PLC.
- Destination Node Address (DA1):
  - When a routing table is created to treat the serial communications path as a network, set 00 hex for communications within the local PLC or the "Host Link unit number + 1" for serial → serial → serial conversion.
  - When a routing table is not created to treat the serial communications path as a network, this is the actual node address used to specify the destination PLC (the "Host Link unit number + 1" for serial → serial → serial conversion).
- Destination Unit Address (DA2):  
This is the serial ports unit address.
  - Unit addresses for serial port 1:

Unit number	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Bo ard
Hexadecimal	80	84	88	8C	90	94	98	9C	A0	A4	A8	AC	B0	B4	B8	BC	E4
Decimal	128	132	136	140	144	148	152	156	160	164	168	172	176	180	184	188	228

- Unit addresses for serial port 2:

Unit number	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Bo ard
Hexadecimal	81	85	89	8D	91	95	99	9D	A1	A5	A9	AD	B1	B5	B9	BD	E5
Decimal	129	133	137	141	145	149	153	157	161	165	169	173	177	181	185	189	229

- Sending Modbus-ASCII Commands with the CMND Instruction
  - Set FINS command code 2805 hex (CONVERT TO MODBUS-ASCII COMMAND) in S.
  - Set the following parameters in ASCII starting at S+1 with the leftmost byte first: Slave address (2-byte ASCII), Function code (2-byte ASCII), and the communications data (ASCII, 2 × n bytes).

Note For Modbus-RTU, set the Modbus-RTU Slave address (1 byte) in the leftmost byte of S+1 and the function code (1 byte) in the rightmost byte of S+1.