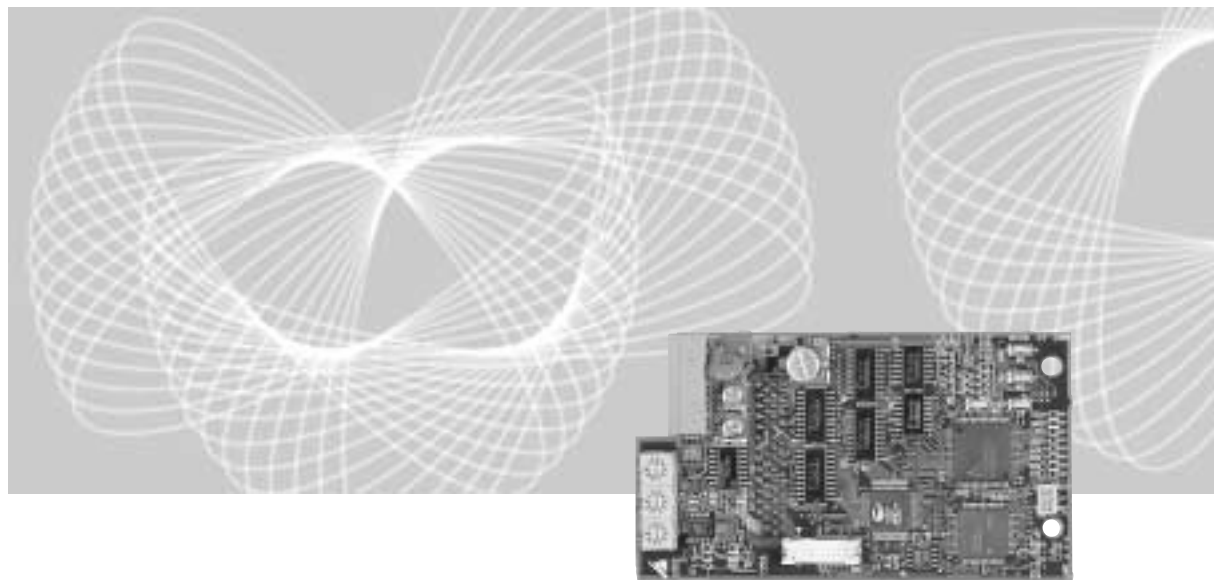


Varispeed G7/F7 OPTION CARD
CC-Link COMMUNICATIONS INTERFACE CARD
USER'S MANUAL

Model: SI-C



YASKAWA

MANUAL NO. SIBP C730600 14A

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INTRODUCTION

This User's Manual describes the operations and specifications of the CC-Link Communications Interface Card (hereafter called the SI-C card). The SI-C card transfers the data between the Varispeed series Intelligent Vector Control General-Purpose Drive and the MITSUBISHI FA Field Network CC-Link (hereafter called the CC-Link). Read this manual carefully and be sure you understand the information provided before attempting any operations.

For the operation of the Inverter, refer to the instruction manual of the drive you are currently using.

General Precautions

- Some drawings in this manual are shown with the protective cover or shields removed, in order to describe the detail with more clarity. Make sure all covers and shields are replaced before operating this product, and operate it in accordance with the instructions in this manual.
- This manual may be modified when necessary because of improvement of the product, modification, or changes in specifications.
- A new version of the manual will be released under a revised manual number when any changes are made.
- Contact your Yaskawa representative or a Yaskawa office listed on the back of this manual to order a new manual if this manual is damaged or lost. Please provide the document number listed on the front cover of this manual when ordering.
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SAFETY INFORMATION


Read this instruction manual thoroughly before installation, operation, maintenance or inspection of the CC-Link Communications Interface Card SI-C. In this manual, NOTES FOR SAFE OPERATION are classified as “WARNING” and “CAUTION.”



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to personnel.



Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury to personnel and damage to equipment.

Even items described in  may result in a vital accident in some situations. In either case, follow these important notes.



: Indicates important information that should be memorized.

■ Receiving



CAUTION

- Do not use any option card which is damaged or has missing parts.
Failure to observe this caution may result in injury.

■ Installation and Wiring

WARNING

- Never touch the inside of the Inverter.
Failure to observe this warning may result in electric shock.
- Disconnect all power before mounting or removing the option card or wiring.
Then wait at least the specified time (specified on the front cover) after the power supply is disconnected and all LEDs and CHARGE LED are extinguished.
Failure to observe this warning may result in electric shock.
- Do not damage or apply excessive stress to the cables. Do not place heavy objects on the cables or place the cables between other objects.
Failure to observe this warning may result in electric shock, malfunction or damage of the equipment.

CAUTION

- Do not touch the elements of the option card with bare hands.
Failure to observe this caution may result in equipment damage caused by static electricity.
- Insert the connectors firmly.
Failure to observe this caution may result in malfunction or damage of the equipment.

■ Setting

CAUTION

- Be careful when changing Inverter settings. The Inverter is factory set to suitable settings.
Failure to observe this caution may result in damage of the equipment.

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Revision History

1 OUTLINE

The SI-C card is an interface card to achieve data communications with the CC-Link master for connecting the Varispeed series Intelligent Vector Control Inverter to the MITSUBISHI FA Field Network CC-Link. The SI-C card is conforming to the CC-Link version 1.10.

Mounting the SI-C card on the Varispeed series Inverter can monitor operation status including running or stopping; or change or read the settings of the drive parameters for the CC-Link master, which can be utilized for various types of applications.

This option card can be used installed to the following product lines:

Varispeed F7 Standard Series Drive Software No. S1013 and later

Varispeed G7 Standard Series

2 RECEIVING

Check the following items as soon as the product is delivered.

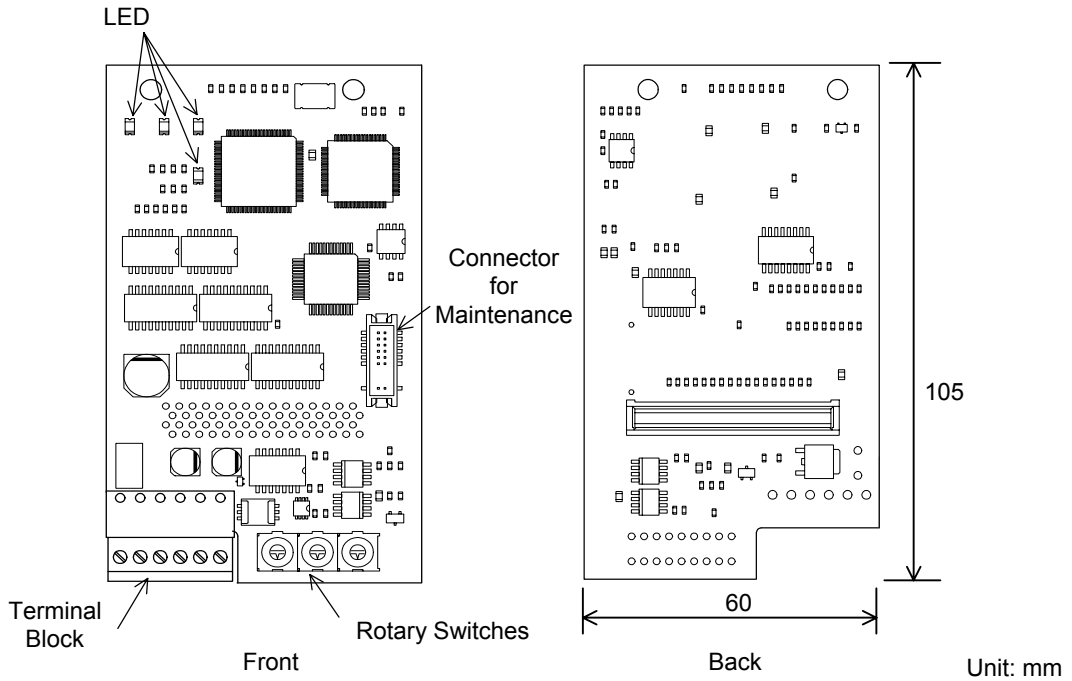
Item	Method
Has the correct model of the SI-C card been delivered?	Compare the model number on your order to the number printed in the lower right corner of the SI-C card. (Refer to 3.1.)
Is the SI-C card damaged in any way?	Inspect the entire exterior of the SI-C card to see if there are any scratches or any other damage resulting from shipping.

If you find any irregularities, contact the agency from which you purchased the Inverter or your Yaskawa representative immediately.

3 NOMENCLATURE AND SETTING

3.1 Components

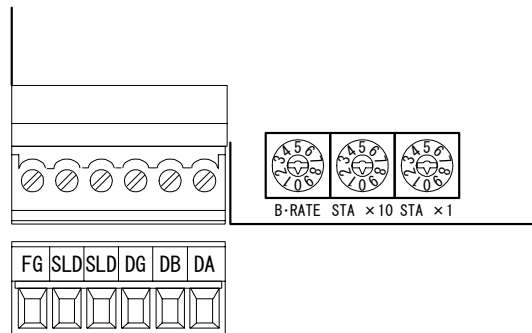
The names of components on the SI-C card are shown in the following figure.



3.2 Terminal Block

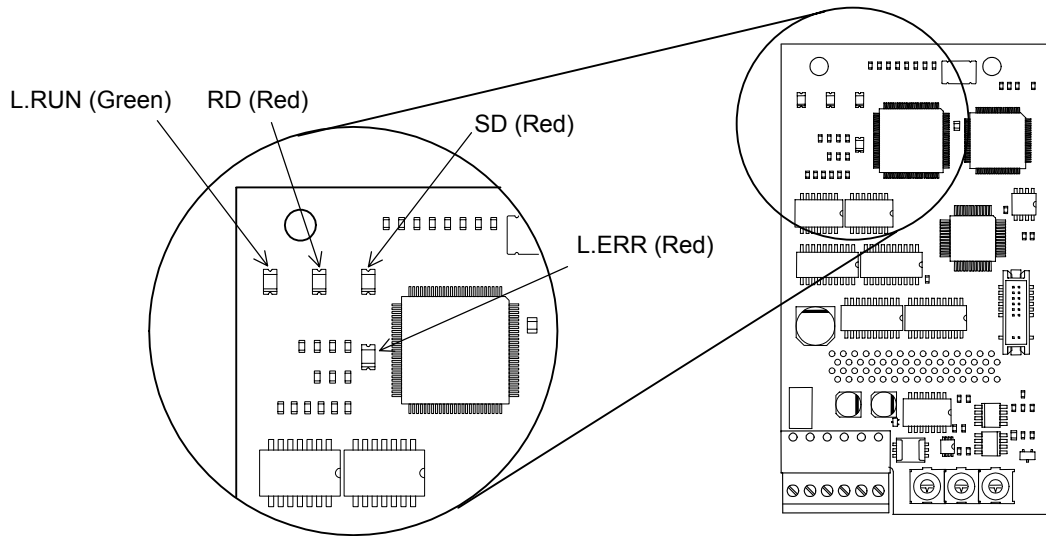
This terminal block connects the SI-C card to the CC-Link communications line.

Terminal No.	Name	Meaning
1	DA	Communications data +
2	DB	Communications data -
3	DG	Signal grounding
4	SLD	Shield
5	SLD	Shield
6	FG	Grounding



3.3 LEADS

These LED indicator lamps indicate the status of the CC-Link or the SI-C card.

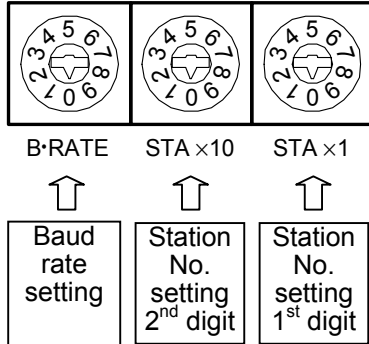


LED display				Meaning	Operator display	Corrective action
L.RUN (Green)	SD (Red)	RD (Red)	L.ERR (Red)			
☀	⦿	⦿	⦿	Normal but an error is occurring.	Normal	Remove the influence of noise.
☀	⦿	⦿	●	Normal	Normal	—
☀	⦿	●	⦿	H/W error	CALL or BUS	Turn the power supply OFF and then ON again.
☀	⦿	●	●	H/W error	CALL or BUS	Turn the power supply OFF and then ON again.
☀	●	⦿	⦿	A CRC error occurred, and the SI-C card cannot reply.	Normal	Remove the influence of noise.
☀	●	⦿	●	Local data cannot be received.	CALL or BUS	Confirm the PLC program.
☀	●	●	⦿	H/W error	CALL or BUS	Turn the power supply OFF and then ON again.
☀	●	●	●	H/W error	CALL or BUS	Turn the power supply OFF and then ON again.
●	⦿	⦿	⦿	Polling response is made but an CRC error occurred in refresh receiving.	Normal	Remove the influence of noise.
●	⦿	⦿	●	H/W error	CALL or BUS	Turn the power supply OFF and then ON again.
●	⦿	●	⦿	H/W error	CALL or BUS	Turn the power supply OFF and then ON again.
●	⦿	●	●	H/W error	CALL or BUS	Turn the power supply OFF and then ON again.
●	●	⦿	⦿	A CRC error occurred in local data.	Normal	Remove the influence of noise.
●	●	⦿	●	Local data is not provided or cannot be received because of noise.	CALL or BUS	Remove the influence of noise.
●	●	●	⦿	H/W error	CALL or BUS	Turn the power supply OFF and then ON again.
●	●	●	●	Data cannot be received because of a disconnection, etc.	CALL or BUS	Check the wiring.
●	●	*	⦿	Baud rate or station number is not correct.	Normal	Correct the setting and turn the power supply OFF and then ON again.
☀	⦿	⦿	⦿	Baud rate or station number was changed after the power supply was turned ON.	Normal	Return the setting to the former setting. Turn the power supply OFF and then ON again.

☀ : Lit ⦿ :Blinking ●:Not lit *: Lit or Not lit

3.4 Rotary Switches

Use these switches to set the baud rate and the station number of the CC-Link.



Before turning ON the inverter's power supply, set these three switches. Do not change the settings after turning ON the power supply. Be sure to change the settings after turning OFF the inverter power supply.

3.4.1 Baud Rate Setting Switches

Switch	0	1	2	3	4
Communications Speed	156 kbps	625 kbps	2.5 Mbps	5 Mbps	10 Mbps

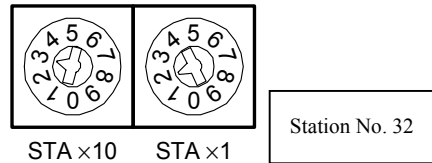
Note: If this switch is set to 5 or higher, the LED lamp "L.ERR" lights resulting in a communications error.

3.4.2 Station No. Setting Switches

- The station number is set in the range of 1 to 64.
 "STA×10" sets the 2nd order of the station number.
 "STA×1" sets the 1st order of the station number.

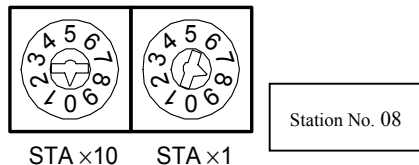
Example 1) Setting the station number to 32:

- Set "STA×10" to 3.
- Set "STA×1" to 2.



Example 2) Setting the station number to 8:

- Set "STA×10" to 0.
- Set "STA×1" to 8.



2. The station number cannot be overlapped. Confirm that the station number has not been set for any other stations.
3. The maximum number of stations to be connected is 42 when the following conditions are satisfied.

$$\{(1 \times a) + (2 \times b) + (3 \times c) + (4 \times d)\} \leq 64$$

- a: Number of the card using the buffer memory for one station
- b: Number of the card using the buffer memory for two stations
- c: Number of the card using the buffer memory for three stations
- d: Number of the card using the buffer memory for four stations

$$\{(16 \times A) + (54 \times B) + (88 \times C)\} \leq 2304$$

- A: Number of remote I/O stations ≤ 64 stations
- B: Number of remote device stations ≤ 42 stations
- C: Number of local stations ≤ 26 stations

4 INSTALLATION AND WIRING

4.1 Installing the SI-C Card

Install the SI-C card is where the operator and the front cover of the Inverter are removed.

Use the following procedure to install the SI-C card.

1. Turn off the main-circuit power supply.
2. Wait one minute (three minutes when using an Inverter whose motor capacity is more than 30kW) before removing the operator and the front cover of the Inverter. Confirm that the CHARGE indicator is OFF.
3. Remove the option clip inside the drive (the clip keeps the C and D options from wiggling free).
4. Insert the spacer, which is provided on the Inverter's control board, into the spacer mounting hole on the SI-C card.
5. Pass the spacer through the spacer mounting hole on the card. Confirm that the connector of the SI-C card (JP1) is aligned with the 2CN connector, and snap it into the correct position. Press it in firmly until you hear it snap into place.
6. Once the SI-C card has been installed, insert the option clip to keep it from wiggling loose.
7. Connect the grounding lead of the SI-C card to the control circuit grounding terminal E(G) on the Drive.
8. Select the terminal resistance, set the address switches 1 and 2, then connect any peripheral devices.
9. Reattach the front cover of the Drive.

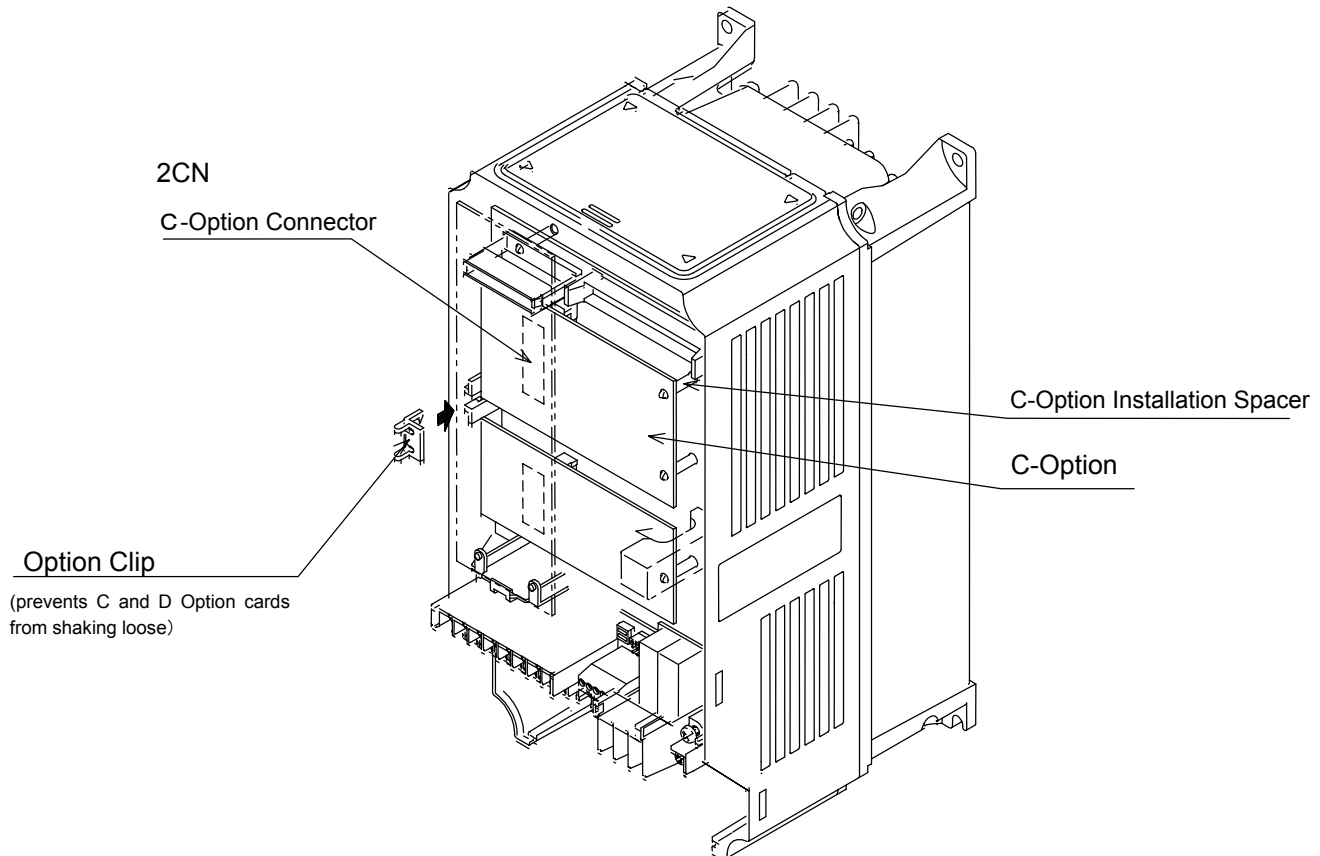


Figure-1: Installing the SI-C CC-Link Communication Interface Card



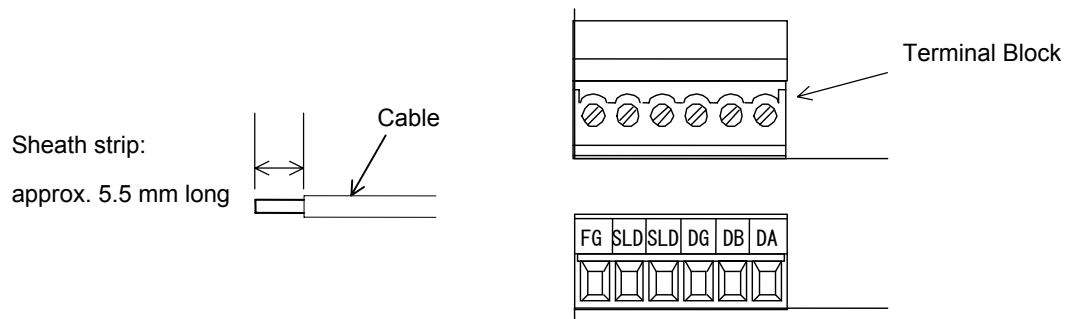
When installing the SI-C card, handle it by the edges to prevent damaging the card.

4.2 Wiring of the Communications Cable

4.2.1 Wiring

Use the following procedure to wire the CC-Link master to the terminal block of the SI-C card.

1. Use a thin flat screwdriver to loosen the terminal screw.
2. Insert the wires from under the terminal block.
3. Tighten the terminal screws firmly.
(Tightening torque: 0.22 to 0.25 [N•m])



- Note: 1 Separate the communications cables from the main circuit wiring or other power cables.
- 2 There is a ruler of 5.5 mm on the top of the terminal block in the front of the SI-C card. Use this ruler to confirm the length of the stripped section of the wire.

4.2.2 Communication Cable Specifications

Be sure to use a cable with the following specifications as the communications cable. Any cable other than recommended cable shown below cannot assure the performance of the CC-Link.

Item	Specifications
Model	FANC-SB 0.5 mm ² ×3 [Manufactured by Kuramo Electric Co., Ltd]
Conductor cross-sectional area	0.5 mm ²
Conductor resistance (at 20°C)	37.8Ω/km or less
Insulation resistance	10000MΩ/km or less
Withstand voltage	500 VDC for one minute
Static electricity (1 kHz)	60nF/km or less
Impedance	100±15Ω
Cross-section	
External dimensions	7 mm
Weight	65 kg/km

4.2.3 Connection of Termination Resistor

When the SI-C card is connected to the communications line as the end unit, connect a termination resistor between terminals DA and DB.

Use the termination resistor provided with the master unit or any 110 Ω, 1/2 W resistor available on the market.

4.2.4 Wiring and Connecting the CC-Link Master Unit

Figure-2 and Figure-3 show how the CC-Link master unit is connected.

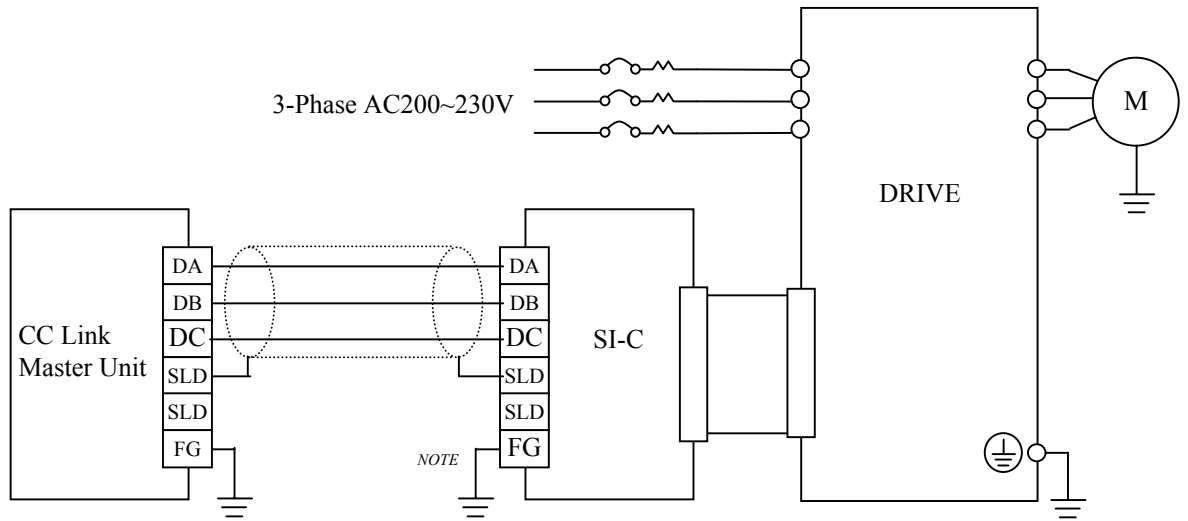


Figure-2: Connecting the Drive

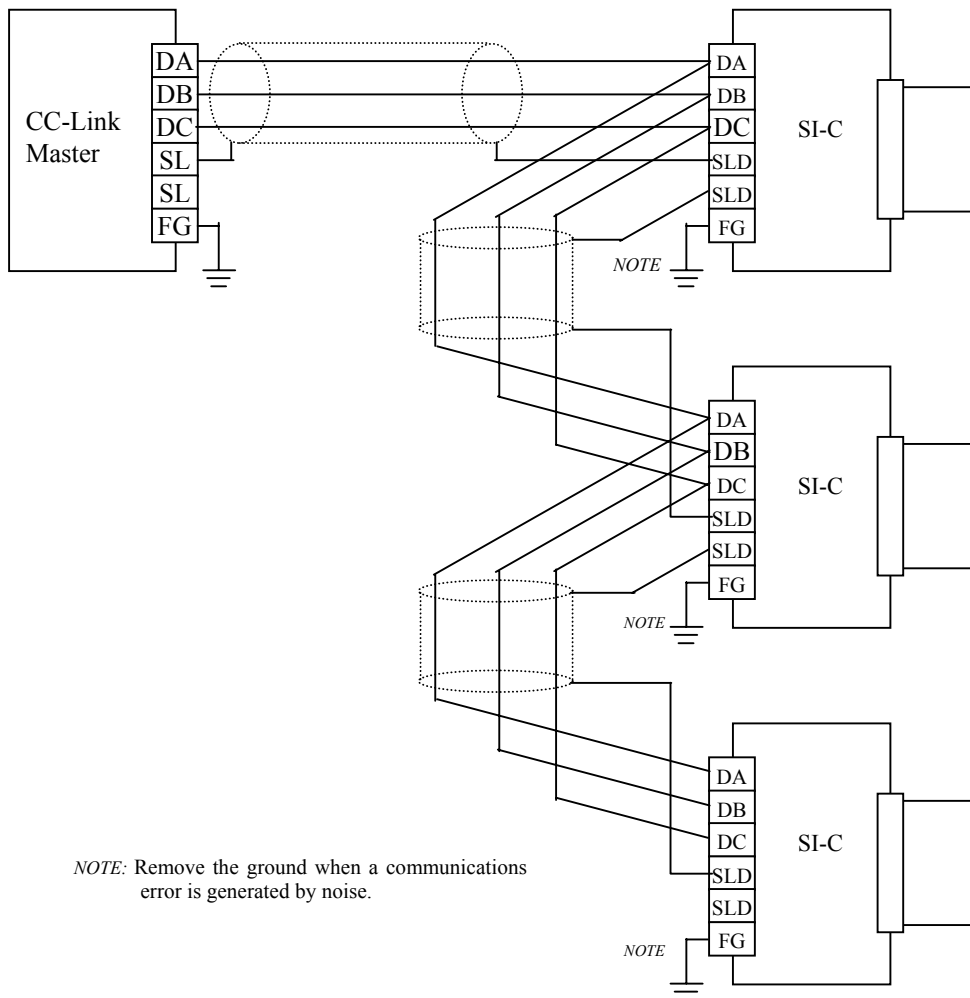


Figure-3: Connecting 3 Separate SI-C Cards (example)

5 FUNCTIONS

The SI-C card is a communications interface card for operations, adjustments, and monitoring using the PLC program with the Varispeed Series as a remote device station for the CC-Link. Both bit data and word data cyclic transmissions are available, and high-speed communications up to 10 Mbps are possible.

5.1 Initial Settings

Set the following parameters whenever necessary, before starting communications between the Inverter and the PLC. It is particularly important to check the settings to parameters b1-01, b1-02, and F6-06.

Parameter	Name	Description	Default	F7	G7
b1-01	Reference selection *1	Sets the input source of the frequency reference. 0: Digital Operator 1: Control circuit terminals (analog inputs) 2: Memobus Communications 3: Option Card 4: Pulse Train Input	1	Y	Y
b1-02	Operation method selection *1	Sets the source of the run command input. 0: Digital Operator 1: Control circuit terminals (sequence inputs) 2: Memobus communications 3: Option Card	1	Y	Y
F6-01	Operation Selection when Communication Error is Detected	Selects the Stop Method when a comm. error is detected (BUS). 0: Deceleration to stop (by the time set to C1-02) 1: Coast to stop 2: Fast stop (using the deceleration time set to C1-09) 3: Continue running *2	1	Y	Y
F6-02	Input Level of External Fault from Communication Option	0: Always detect 1: Detect during operation	0	Y	Y
F6-03	Operation during Communication Option External Fault Input	0: Deceleration to stop 1: Coast to stop 2: Fast Stop. 3: Continue running *2	1	Y	Y
F6-06	Torque Reference / Torque Limit Selection from Communication Cards *3 *4	0: Torque reference/limit from comm. disabled 1: Torque reference/limit from comm. enabled	1	N	Y

*1 Set b1-02 to 3 to run/stop through the CC-Link communications. Set b1-01 to 3 to specify the frequency.

*2 Selecting "Continuous Operation" will allow the operation with the Inverter to continue when a fault occurs.

Provide other measures such as an emergency stop switch for safe operation.

*3 Enabled when A1-02 (Control Mode Selection) is set to 3 (flux vector control) or 4 (open loop vector 2).

In this case, the d5-01 (Torque control selection) setting can be used to select the torque reference or the torque limit.

d5-01 = 0 (Speed control): Torque limit setting

d5-01 = 1 (Torque control): Torque reference value

*4 When F9-06 is set to 1 (default), the motor may rotate unless the torque reference or the torque limit is set from the PLC.

5.2 Basic Functions

The section describes the basic functions that can be done from the PLC using the CC-Link communications function.

5.2.1 Run Command and Frequency Reference

Running or stopping the inverter, or setting or changing the operation frequencies can be done from the PLC.

To perform these operations from the PLC, the right to use the inverter run command and the frequency references must be assigned to the inverter to the PLC side.

The following describes how to switch the right to use the inverter run command and frequency references to the PLC side.

How to Switch the Command Priority/Right

a. Switching via Drive Parameter Settings

Run Command Selection b1-02 = 3: "Option Card" (0: "External terminal" is the factory setting)
 Freq Ref Right Selection b1-01 = 3: "Option Card" (0: "External terminal" is the factory setting)

b. Switching via the external terminals on the Drive

Allocate one of the external control terminals S3 to S12 for the multi-function input function "Option/Inverter Selection" by setting value 2. Turning ON the terminal input at the side for the option card can switch the commanding right setting to the PLC side.

When the inverter is selected, the commanding right setting depends on the settings of the parameters b1-01 and b1-02. If the commanding right setting has been assigned by setting the inverter parameters, the commanding right setting always belongs to the option card.

c. Switching by the PLC (Inverter Parameter Setting)

Run command right selection:

Send write-in data "3" from the the command code "2181h" to the inverter.

The setting of inverter constant b1-02 is changed to 3.

Frequency reference right selection:

Send write-in data "3" from the command code "2180h" to the inverter.

The setting of inverter constant b1-01 is changed to 3.

Priority of PLC Commanding Right Setting

Run Command Rights

Local/Remote Selection	Setting Status			
	Local	Remote	Remote	Remote
b1-02 (Operation method selection)	—	3	All others excluding 3	All others excluding 3
Option/Inverter Selection	—	—	ON Option (communications)	OFF Inverter
Run Command Right	Operator	PLC	PLC	Depends on the setting of b1-02.

Note: "—" indicates that the setting is disregarded.

Frequency Reference Rights

Local/Remote Selection	Setting Status			
	Local	Remote	Remote	Remote
b1-01 (Reference selection)	—	3	All others excluding 3	All others excluding 3
Option/Inverter Selection	—	—	ON Option (communications)	OFF Inverter
Frequency Reference Right	Inverter	PLC	PLC	Depends on the setting of b1-01.

Note: 1 When a multi-step speed reference for the multi-function input is received, the multi-step speed references, d1-01 to d1-09, have priority over any other references.

2 "—" indicates that the setting is disregarded.

3 For more details, refer to the instruction manual for the device you have.

5.2.2 Monitors

Status information can be monitored.

Set the monitor code to RW_{w0} and turn ON the RYC signal, and the data corresponding to the monitor code is stored in the PLC buffer memory.

For the monitor codes and write-in data units, refer to 5.3.3 *List of Monitor Codes and Command Codes*.

5.2.3 Setting and Reading Parameters

Write-in/read-out of the inverter constants and status information, and inverter reset can be performed. From the PLC, you can write in or read out inverter constants and status information and also reset the inverter.

Set the command code to RW_{w2} (and set the write-in data to RW_{w3} too, when necessary) and turn ON the RYF (command code execution request flag) signal, the inverter performs the processing corresponding to the command code and returns the data.

For the command codes and write-in data units and ranges, refer to 5.3.3 *List of Monitor Codes and Command Codes*.

5.3 CC-Link Data List

5.3.1 List of Remote Inputs and Outputs

The inverter uses the PLC buffer memory for one node. The following table lists the inverter inputs and outputs as received by or sent to the PLC.

Refer to the Mitsubishi PLC Programming Manual for details on the PLC buffer memory.

Remote Inputs and Outputs

Remote Output (from PLC to Inverter)			Remote Input (from Inverter to PLC)		
Device No.	Signal Name	Remarks (default)	Device No.	Signal Name	Remarks (default)
RY0	Forward run command	—	RX0	Forward run	—
RY1	Reverse run command	—	RX1	Reverse run	—
RY2	Terminal S3 multi-function input terminal function	Running (H1-01:24)	RX2	Terminals M1-M2 multi-function output	Running (H2-01:0)
RY3	Terminal S4 multi-function input terminal function	Fault reset (H1-02:14)	RX3	Speed agree	—

Remote Output (from PLC to Inverter)			Remote Input (from Inverter to PLC)		
Device No.	Signal Name	Remarks (default)	Device No.	Signal Name	Remarks (default)
RY4	Terminal S5 multi-function input terminal function	Multi-step speed reference 1 (H1-03: 3)	RX4	Reserved	—
RY5	Terminal S6 multi-function input terminal function	Multi-step speed reference 2 (H1-04: 4)	RX5	Reserved	—
RY6	Terminal S7 multi-function input terminal function	Jog Cmd (H1-05: 6)	RX6	Terminal P1-PC multi-function output	Zero speed (H2-02:1)
RY7	Terminal S8 multi-function input terminal function	External baseblock	RX7	Terminal P2-PC multi-function output	Frequency agree (H2-03:2)
RY8	Not used	—	RX8	Not used	—
RY9	Inverter output shutoff	—	RX9	Not used	—
RYA	Not used	—	RXA	Not used	—
RYB	Motor actual rotational speed /output frequency changeover *	RW _{R1} data contents changeover	RXB	Monitoring actual rotation speed	—
RYC	Monitor command	—	RXC	Monitoring	—
RYD	Frequency setting command 1	Writes to RAM	RXD	Completion of frequency setting 1	Writes to RAM
RYE	Frequency setting command 2	Saves Frequency Reference 1	RXE	Completion of frequency setting 2	Saves Frequency Reference 1
RYF	Command code execution request	—	RXF	Completion of command code execution	—
RY10 to RY18	Not used	—	RX10 to RX18	Not used	—
RY19	Multi-function I/O allocation change request	—	RX19	Completion of multi-function I/O allocation change	—
RY1A	Error reset	—	RX1A	Error	—
RY1B	Not used	—	RX1B	Remote station ready	—
RY1C	Not used	—	RX1C	Not used	—
RY1D	Not used	—	RX1D	Not used	—
RY1E	Not used	—	RX1E	Not used	—
RY1F	Not used	—	RX1F	Not used	—

* Enabled when the control mode is set to the V/f control with PG and flux vector control.

List of Remote Registers

From PLC to Inverter			From Inverter to PLC		
Device No.	Signal Name	Execution Request Flag	Device No.	Signal Name	Execution Request Flag
RW _{W0}	Monitor code	RYC	RW _{R0}	Monitor data	RXC
RW _{W1}	Setting frequency	RYD, RYE	RW _{R1}	Output frequency	--
RW _{W2}	Command code	RYF	RW _{R2}	Response code	RXF
RW _{W3}	Write data		RW _{R3}	Read data	

5.3.2 Details of Remote Inputs and Outputs

List of Remote Inputs and Outputs

Remote Outputs (from PLC to Inverter)			
Device No.	Signal Name	Description	Remarks (Defaults)
RY0	Forward run command	ON: Forward run command, OFF: Stop command	—
RY1	Reverse run command	ON: Reverse run command, OFF: Stop command	—
RY2	Terminal S3 multi-function input terminal function	Multi-function input 1: (H1-01) ^{*3}	Running (H1-01: 24)
RY3	Terminal S4 multi-function input terminal function	Multi-function input 2: (H1-02) ^{*3}	Fault reset (H1-02: 14)
RY4	Terminal S5 multi-function input terminal function	Multi-function input 3: (H1-03) ^{*3}	Multi-step speed reference 1 (H1-03: 3)
RY5	Terminal S6 multi-function input terminal function	Multi-function input 4: (H1-04) ^{*3}	Multi-step speed reference 2 (H1-04: 4)
RY6	Terminal S7 multi-function input terminal function	Multi-function input 5: (H1-05) ^{*3}	Jog command (H1-05:6)
RY7	Terminal S8 multi-function input terminal function	Multi-function input 6: (H1-06)	Base block (H1-06:8)
RY8	Not used	—	—
RY9	Inverter output shutoff	ON: Motor coasts to a stop. OFF: Operation restarts when a forward or reverse run command is received.	—
RYA	External Fault	ON: Sets the monitor data indicated by the monitor code to RW _{R1} .	—
RYB	Motor actual rotational speed/output frequency switch	Changes the RW _{R0} data the actual rotational speed or output frequency.	Enabled during operations with PG.
RYC	Monitor reference	Monitor data specified by the monitor code is assigned to RW _{R1} when the power is ON.	—
RYD	Frequency setting reference 1	Assigns the setting frequency of RW _{W1} as the operation frequency.	—
RYE	Frequency setting reference 2 ^{*2}	Assigns the setting frequency of RW _{W1} to d1-01 (frequency reference 1), and as master speed frequency. Note: When the operator has the frequency reference right (b1-01 is set to 0), the frequency will change once RYE is turned on.	Turn ON this flag and all the parameter settings are stored.
RYF	Command code execution request	Requests a command to be carried out.	—
RY10 to 17	Not used	—	—
RY18	Reserved	System reservation	—
RY19	Multi-function I/O allocation change request	Changes the multi-function I/O function to the specified function.	—
RY1A	Error reset	Clears an inverter fault.	—
RY1B to 1F	Not used	—	—

Remote Input (from Inverter to PLC)			
Device No.	Signal Name	Description	Remarks (Defaults)
RX0	Forward run	ON: Forward run, OFF: All others excluding forward run (including DC injection braking)	—
RX1	Reverse run	ON: Reverse run, OFF: All others excluding reverse run (including DC injection braking)	—
RX2	Terminals M1-M2 multi-function output	Multi-function output 1: (H2-01) ^{*3}	During Run (H2-01: 0)
RX3	Speed agree	ON when the output frequency is between the setting frequency to L4-02 setting.	—
RX4, 5	Reserved	—	—
RX6	Terminal P1-PC multi-function output	Multi-function output 2: (H2-02) ^{*3}	Zero speed (H2-02: 1)
RX7	Terminal P2-PC multi-function output	Multi-function output 3: (H2-03) ^{*3}	Frequency agreement (H2-03: 2)
RX8	Not used	—	—
RX9	Not used	—	—
RXA	Not used	—	—
RXB	Actual rotational speed monitoring	ON when the data of RW _{R1} is set to the actual rotational speed. ^{*1}	—
RXC	While Monitoring	ON when the monitor data is being updated.	—
RXD	Completion of frequency setting 1 ^{*2}	ON when assigned as the master speed frequency.	Writes to RAM.
RXE	Completion of frequency setting 2 ^{*2}	ON when the data is set to d1-01 (frequency reference 1). This constant is also assigned as the master speed frequency.	Writes to EEPROM.
RXF	Completion of command code execution	ON when the specified command has been carried out.	—
RX10 to 17	Not used	—	—
RX18	Reserved	System reserved	—
RX19	Completion of multi-function I/O allocation change	ON when the multi-function input has been allocated.	—
RX1A	Error	ON when a fault occurs in the inverter.	—
RX1B	Remote station ready	ON when the inverter is ready for operations.	—
RX1C to 1F	Not used	—	—

*1 Enabled during operations with PG.

*2 Be sure to use frequency setting reference 1 (RYD) when the settings are frequently changed. Only use frequency setting reference 2 (RYE) if necessary. If this setting is used excessively, the life of the Inverter's internal memory will be shortened.

*3 Turn ON/OFF RY19, and the settings for H1-01 to -05 and H2-01 to -03 (the allocation of the Inverter multi-function inputs and outputs) change. Refer to the following table, "Changing RY19 Multi-function I/O Allocation."

Changing RY19 Multi-Function I/O Allocation

The drive's multi-function I/O layout will change as shown below when RY19 is switched on or off.

Parameter	Name	RY19: OFF (Default)	RY19: ON
H1-01	Multi-function input 1	24: External fault	3: Multi-step speed reference 1
H1-02	Multi-function input 2	14: Fault reset	4: Multi-step speed reference 2
H1-03	Multi-function input 3	3: Multi-step speed reference 1	5: Multi-step speed reference 3
H1-04	Multi-function input 4	4: Multi-step speed reference 2	6: Jog command
H1-05	Multi-function input 5	6: Jog command	1A: Accel/decel time selection 2
H1-06	Multi-function input 6	8: Baseblock command	8: Baseblock command
H2-01	Multi-function output 1	0: Running	0: Running
H2-02	Multi-function output 2	1: Zero speed	5: Frequency detection 2
H2-03	Multi-function output 3	2: Frequency agreement	E: Fault
H3-05	Multi-func analog input	0: Auxiliary frequency reference	1F: Analog input is not used.
L4-01	Freq detection level	0.00Hz	6.00Hz

Remote Registers

(From PLC to Inverter)

Remote Register	Name	Description
RW _{w0}	Monitor code	Sets the monitor code. While the monitor execution request flag (RYC) is ON after setting the code, the monitored value is stored in RW _{ro} . While RW _{ro} is being updated, the monitoring signal (RXC) is turned ON.
RW _{w1}	Setting frequency	Sets the operation frequency. If the RYD flag is turned ON now, this data sent to the inverter is assigned as the master speed frequency. Turning ON the RYE flag writes in the setting to frequency reference 1 and stores the data in EEPROM*. However, the unit of the setting depends on the setting of o1-03 (frequency reference setting/display unit selection).
RW _{w2}	Command code	Sets the command code to execute parameter read/write, fault history, or error reset, etc. If the command code execution request flag (RYF) is turned ON, the inverter processes the corresponding command code, and the command code execution completion flag (RXF) is turned ON after the command is carried out.
RW _{w3}	Write data	Assigns the data when necessary for the command code. Turn ON the command code execution request flag (RYF) after setting the command code and write-in data.

* The EEPROM can be written to 100,000 times. Refrain from writing to EEPROM excessively.

From the Drive to PLC

Remote Register	Name	Description
RW _{R0}	Monitor data	Stores the monitor data corresponding to the monitor code of RW _{R1} . While the monitor request flag (RYC) is turned ON, this data are updated and the monitoring signal (RXC) is turned ON.
RW _{R1}	Output frequency	The current output frequency is always set. However, the unit depends on the setting of o1-03 (frequency reference setting/display unit selection). For example, when o1-03 is set to 0, units appear in Hz. When o1-03 is set to 4, r/min is used. The value of motor actual rotation speed (units: r/min) is stored at operation with PG. At this time, RXB is turned ON. Turning ON RYB, the value of RW _{R1} indicates output frequency.
RW _{R2}	Response code	"00h" is set when the command code and write-in data are correct. If any of them is incorrect, "01h" to "03h" is set.
RW _{R3}	Read data	Data corresponding to the command code is set.

List of RW_{R1} Data Contents for Each Setting of o1-03

o1-03 (Frequency reference setting/display unit selection)	Data Contents of RW _{R1} (operation frequency) data
0	Output frequency: 0.01Hz (less than 100Hz) 0.1Hz (100Hz or more)
1	0.01% Output frequency (E1-04) is 100%.
2 to 39 (number of motor poles)	Motor rotational speed (1 r/min)
40 to 39999	User Setting

Note: For more information, refer to the drive instruction manual.

5.3.3 List of Monitor Codes and Command Codes

Monitor Codes

First Monitor Code

Monitor Code	Name	Unit	Remarks (Factory Setting)
0000h	Not used	—	—
0001h	Output frequency	o1-03 setting 0: 0.01Hz (less than 100Hz) : 0.1Hz (100Hz or more) 1: 0.1% 2 to 39: r/min (Sets number of motor poles) 40 to 39999: User Setting	The unit depends on the setting of the o1-03 (frequency reference setting/display unit selection).
0002h	Output current	0.1 A	—
0003h	Output voltage	0.1 V	—
0004h	Reserved	—	—
0005h	Frequency setting	o1-03 setting 0: 0.01Hz (less than 100 Hz) : 0.1Hz (100 Hz or more) 1: 0.01% 2 to 39: r/min (Set number of motor poles) 40 to 39999: User Setting	The unit depends on the setting of the o1-03 (frequency reference setting/display unit selection).
0006h	Speed feedback	1 r/min	A1-02 is enabled when using an encoder.
0007h	Torque reference *1	0.1%	Motor rated torque: 100%
0008h	Main circuit DC voltage	1 V	—
0009h to 000Dh	Reserved	—	—
000Eh	Output power	0.1kW	—
000Fh	Input terminal status	<p>7 6 5 4 3 2 1 0 bit 8 7 6 5 4 3 2 1 RW_{R3} S1 input status ON:1 S2 input status ON:1 S3 input status ON:1 S4 input status ON:1 S5 input status ON:1 S6 input status ON:1 S7 input status ON:1 not used</p>	

Monitor Code	Name	Unit	Remarks (Factory Setting)																		
0010h	Output terminal status	<table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="padding: 2px 5px;">7</td> <td style="padding: 2px 5px;">6</td> <td style="padding: 2px 5px;">5</td> <td style="padding: 2px 5px;">4</td> <td style="padding: 2px 5px;">3</td> <td style="padding: 2px 5px;">2</td> <td style="padding: 2px 5px;">1</td> <td style="padding: 2px 5px;">0</td> <td style="padding: 2px 5px;">bit</td> </tr> <tr> <td style="padding: 2px 5px;">—</td> <td style="padding: 2px 5px;">—</td> <td style="padding: 2px 5px;">—</td> <td style="padding: 2px 5px;">—</td> <td style="padding: 2px 5px;">—</td> <td style="padding: 2px 5px;">26</td> <td style="padding: 2px 5px;">25</td> <td style="padding: 2px 5px;">9</td> <td style="padding: 2px 5px;">RW_{R3}</td> </tr> </table> <div style="margin-left: 150px;"> M1-M2 output status ON:1 P1 output status ON:1 P2 output status ON:1 </div>	7	6	5	4	3	2	1	0	bit	—	—	—	—	—	26	25	9	RW _{R3}	 M1-M2 output status ON:1 P1 output status ON:1 P2 output status ON:1
7	6	5	4	3	2	1	0	bit													
—	—	—	—	—	26	25	9	RW _{R3}													
0011h	—	—	—																		
0012h	Motor exciting current *	0.1%	Motor rated secondary current: 100%																		
0013h	—	—	—																		
0014h	Cumulative operation time	1 hour	Function alternates according to the setting of o2-08 (Cumulative operation time selection). 0: Cumulative time when the Inverter power is on. (factory setting) 1: Cumulative Inverter run time.																		
0015h to 0017h	Reserved	—	—																		
0018h	Motor secondary current	0.1%	Motor rated secondary current: 100%																		

* "00h" when the inverter control mode is set to V/f control.

Second Monitor Code

Monitor Code	Name	Unit	Remarks (Factory Setting)
1000h	PG counter	1	Enabled when PG card is installed.
1001h	Fault alarm 1	Refer to page 31.	—
1002h	Fault alarm 2	Refer to page 31.	—
1003h	Fault alarm 3	Refer to page 31.	—

Command Codes

Item	Code No.	Data	Description
Reading run command right	1181h	0: Operator 1: External terminal 2: Memobus 3: PLC	The current run command right is assigned to RW _{R3} .
Reading frequency reference right	1180h	0: Operator 1: External terminal 2: Memobus 3: PLC	The current frequency reference right is assigned to RW _{R3} .
Writing run command right	2181h	0: Operator 1: External terminal 2: Memobus 3: PLC	The run command right can be changed.
Writing frequency reference right	2180h	0: Operator 1: External terminal 2: Memobus 3: PLC	The frequency reference right can be changed.
Error history 1	0074h	<p>MSB LSB</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px; text-align: center;">b15 to b8</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">b7 to b0</div> </div> <p style="text-align: center;">History 2 (HEX) History 1 (HEX)</p>	Errors codes are assigned to RW _{R3} in the hexagon data. Histories 1 (latest history) and 2 are saved in the lower byte and the upper byte, respectively.
Error history 2	0075h	<p>MSB LSB</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px; text-align: center;">b15 to b8</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">b7 to b0</div> </div> <p style="text-align: center;">History 4 (HEX) History 3 (HEX)</p>	Error codes are assigned to RW _{R3} in the hexagon data. Histories 3 (latest history) and 4 are saved in the lower byte and the upper byte, respectively.
Reading master speed frequency	006Dh	0Hz to 400Hz	Reads out the inverter setting frequency RAM.
Reading frequency reference 1	006Eh	0 Hz to 400Hz	Reads out the inverter frequency reference 1.
Writing master speed frequency	00EDh	0 Hz to 400Hz	Writes in the inverter master speed frequency.
Writing frequency reference 1	00EEh	0 Hz to 400Hz	Writes in the inverter frequency reference 1
Reading parameter	1000h to 150Dh	Each constant setting Refer to paragraph 5.1 List of Command Code Registers.	—
Writing parameter (RAM)	2000h to 250Dh	Range of each constant setting Refer to paragraph 5.1 List of Command Code Registers.	The setting of the constant is written in to the RAM. To store the data in the constant, carry out the command code FFFDh and write in the data to EEPROM. *
Writing EEPROM*	FFFDh	0000h	—
Clearing error histories	00F4h	9696h	—
Drive Reset	00FDh	9696h	—

* The EEPROM can be written to 100,000 times. Refrain from writing to EEPROM excessively.

Extensive Command Codes

Command Code		Name	Data/Unit		Description	
Read	Write					
100h	—	Operation signal status	bit	0	Forward run	Inverter runs forward.
				1	Reverse run	Inverter runs in reverse.
				2	Terminal S3 input	Multi-function input 3
				3	Terminal S4 input	Multi-function input 4
				4	Terminal S5 input	Multi-function input 5
				5	Terminal S6 input	Multi-function input 6
				6	Terminal S7 input	Multi-function input 7
				7	Terminal S8 input	Multi-function input 8
				8	External fault (EF0)	Drive stops when a fault occurs.
				9	Fault reset	Clears the inverter fault.
				A	Terminal S9 input	Multi-function input 9*1
				B	Terminal S10 input	Multi-function input 10*1
				C	Terminal S11 input	Multi-function input 11*1
				D	Terminal S12 input	Multi-function input 12*1
E	Reserved	Write in 0.				
F	Reserved	Write in 0.				
101h	—	Frequency reference	0 Hz to 400.0Hz		Frequency set from the PLC	
102h	202h	Torque reference/torque limit	-300.0% to +300.0%		Limited by the setting of the inverter limit.	
103h	203h	Torque compensation	-300.0% to +300.0%		Limited by the setting of the inverter limit.	
104h	204h	Not used	—		—	
105h	205h	INV terminal 21 analog output	-1540 to 1540 / -11V to 11V		—	
106h	206h	INV terminal 23 analog output	-1540 to 1540 / -11V to 11V		—	
107h	207h	INV terminal multi-function output	bit	0	Terminals M1-M2 output	Set H2-01 to F when writing data.
				1	Terminals P1-PC output	Set H2-02 to F when writing data.
				2	Terminal P2-PC output	Set H2-03 to F when writing data.
				3 to F	Fixed to 0	Write in 0.
108h to 10Fh	208h to 20Fh	Not used	—		—	
110h	—	Inverter status	bit	0	Running	ON while the inverter is running.
				1	Zero speed	ON while the motor is stopped.
				2	Reverse running	ON while running in reverse.
				3	Inputting reset signal	ON while reset signal is being received.
				4	Speed agree	ON when the output frequency is the same as the setting frequency.
				5	Inverter ready	ON when the inverter is ready to run.
				6	Minor fault	ON while an alarm occurs in the inverter.
				7	Major fault	ON while a fault occurs in the inverter.
				8	OPR error	ON when the operator is incorrectly connected.
				9	Recovery from power loss/momentary power loss	ON when recovering from a power loss or momentary power loss.
				A	Remote/local	ON when the operator has the commanding right to run.
				B	Terminals MA/MB output	Terminals M1/M2 output status

Command Code		Name	Data/Unit		Description	
Reading	Writing					
110h (Cont'd)	—	Inverter status (Cont'd)	bit	C	Terminal P1 output	Terminal P1 output status
				D	Terminal P2 output	Terminal P2 output status
				E	Reserved	—
				F	Reserved	—
111h	—	Reserved	—	—	—	
112h	—	Torque monitor *2	-300.0% to +300.0%	—	Sets the current motor torque.	
113h	—	Reserved	—	—	—	
114h	—	Operation frequency set value	0.0Hz to 400.0Hz	—	When the PLC does not have the frequency reference right set to the inverter, the value is determined by the inverter setting.	
115h	—	Output frequency	0.0Hz to 400.0Hz	—	Current output frequency	
116h	—	Output current	0.1A	—	Current output current	
117h	—	INV terminal A1 analog input	0.1%	—	—	
118h	—	Main circuit DC voltage	0.1V	—	Sets the value of the main circuit DC voltage.	
119h	—	Error Alarm 1	Refer to the following table.	—	—	
11Ah	—	Error Alarm 2	Refer to the following table.	—	—	
11Bh	—	Error Alarm 3	Refer to the following table.	—	—	
11Ch	—	INV terminal A3 analog input	—	—	—	
11Dh	—	INV sequence input	bit	0	Terminal S1 input	The input status of terminals S1 to S11 (bits 0 to B) is in HEX data.
				1	Terminal S2 input	
				2	Terminal S3 input	
				3	Terminal S4 input	
				4	Terminal S5 input	
				5	Terminal S6 input	
				6	Terminal S7 input	
				7	Terminal S8 input	
				8	Terminal S9 input*1	
				9	Terminal S10 input*1	
				A	Terminal S11 input*1	
				B	Terminal S12 input*1	
				C to F	Not used	
11Eh	—	INV terminal A1 analog input	-1540 to 1540 / -11V to +11V	—	—	
11Fh	—	PG counter 2	1	—	—	

*1 Applicable only for G7-series Inverters.

*2 Enabled when A1-02 (control mode selection) is set to "3" for flux vector control, "2" for open-loop control or "3" for flux vector control.

Fault Alarm Signals and Currently Occurring Faults

Fault Alarm (Command Code)		Name		Fault Code
Fault Alarm 1 (119H)	bit	0	Fuse blown (PUF)	01H
		1	Main circuit undervoltage (UV1)	02H
		2	Control power supply fault (UV2)	03H
		3	Inrush prevention circuit fault (UV3)	04H
		4	Load short-circuit (SC)	05H
		5	Ground fault (GF)	06H
		6	Overcurrent (OC)	07H
		7	Main circuit overvoltage (OV)	08H
		8	Cooling fin overheating (OH)	09H
		9	Cooling fin overheating (OH1)	0AH
		A	Motor overload (OL1)	0BH
		B	Inverter overload (OL2)	0CH
		C	Overtorque 1 (OL3)	0DH
		D	Overtorque 2 (OL4)	0EH
E	Internal braking transistor fault (RR)	0FH		
F	Installed braking resistor overheating (RH)	10H		
Fault Alarm 2 (11AH)	bit	0	External fault 3 (EF3)	11H
		1	External fault 4 (EF4)	12H
		2	External fault 5 (EF5)	13H
		3	External fault 6 (EF6)	14H
		4	External fault 7 (EF7)	15H
		5	External fault 8 (EF8)	16H
		6	Not used	—
		7	Overspeed (OS)	18H
		8	Excessive speed deviation (DEV)	19H
		9	PG disconnection detected (PGO)	1AH
		A	Input open phase (PF)	1BH
		B	Output open-phase (LF)	1CH
		C	Motor overheating alarm (OH3)	1DH
		D	Operator connection fault (OPR)	1EH
E	EEPROM write error (ERR)	1FH		
F	Motor overheating fault (OH4)	20H		
Fault Alarm 3 (11BH)	bit	0	Communications error (CE)	21H
		1	Option card transmission error (BUS)	22H
		2	Not used	—
		3	Not used	—
		4	Control fault (CF)	25H
		5	Zero servo fault (SVE)	26H
		6	External fault from option card (EF0)	27H
		7	PID Control Feedback Ref Loss Error (FbL)	28H
		8	Undertorque 1 (UL3)	29H
		9	Undertorque 2 (UL4)	2AH
		A	High-slip braking OL (OL7)	2BH
		B	External fault 9 (EF9)	2CH
		C	External fault 10 (EF10)	2DH
		D	External fault 11 (EF11)	2EH
E	External fault 12 (EF12)	2FH		
F	Hardware fault (CPFxx)	30H		

6 SPECIFICATIONS

Item	Specifications
Model	SI-C
Station type	Remote device station
Number of Exclusive Stations	1 station
Communications Speed	156kbps to 10Mbps
Communication power supply	4.75 to 5.25Vdc (supplied by the drive and insulated from the main power supply)
Operating Power Supply	4.75 to 5.25Vdc (supplied from the inverter)
Ambient Temperature	-10°C to +45°C
Humidity	95%RH max. (no condensation)
Storage Temperature	-20°C to +60°C
Application Site	Indoors (no corrosive gases, dust)
Altitude	1000m max.

7 TROUBLESHOOTING

7.1 Inverter Errors

The following table outlines the faults displayed in the Drive's operator and their causes and corrective actions.

Refer to the Drive instruction manual for any faults displayed in the operator other than those described below.

Display	Meaning	Cause	Corrective Action
OPE05 Sequence Select	Option card selection error	The Option card was selected as the frequency reference source by setting b1-01 to 3, but an Option card is not connected.	Connect the Option card to the 2CN connector on the inverter control board.
BUS Option Com Err	Option card Transmission Error	Disconnection of the transmission line PLC power supply is not turned ON or reset.	Confirm that the communications cable is connected. Check the PLC.
EF0 Opt External Flt	External fault from option card	External fault is input from the PLC.	Turn OFF the external fault input.
CPF06 Option Error	Option card connection error	The Inverter and the Option card are not connected correctly.	Turn OFF the inverter power supply and confirm the Option card and Inverter connection. Then turn ON the power supply again. Replace the Option card if the fault occurs again.
CPF20 Option A/D Error	Option card A/D converter error	The Inverter and the Option card are not connected properly. The option card A/D converter is faulty.	Turn OFF the inverter power supply and confirm the Option card and Inverter connection. Then turn ON the power supply again. Replace the Option card if the fault occurs again.
CPF21 Option CPU down	Communication Option card self diagnostic error	Option card fault	Turn ON the inverter power supply again. Replace the Option card if the fault occurs again.
CPF22 Option Type Err	Communication Option card model code error		
CPF23 Option DPRAM Err	Communication Option card DPRAM error		

7.2 CC-Link Interface Card LEDs

This section describes the failures, causes, and corrective actions indicated by the LEDs on the SI-C card.

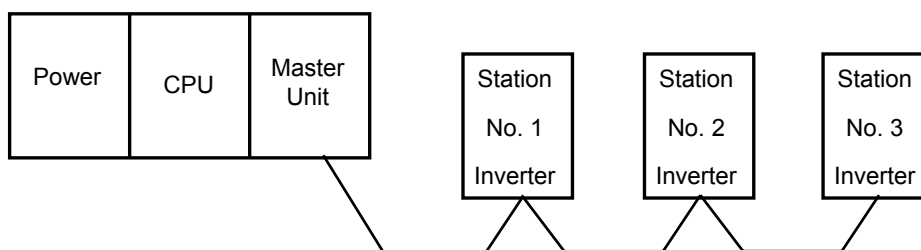
Confirm the following when communications are halted during operation.

- The SI-C card and the twisted pair cable are attached correctly.
Check that there is no faulty contact or disconnection.
- The PLC program has been executed without a failure. The PLC CPU has not been stopped.
- Data communications are not interrupted because of failures such as momentary power loss.

Master Unit		LED Display			Cause	Corrective Action
		Remote Device Station (SI-C)				
		Station No. 1	Station No. 2	Station No. 3		
TIME○ LINE○ or TIME● LINE○	L.RUN ●	L.RUN ☼	L.RUN ●	Station No. 1 and 3 use the same inverter station number.	Turn ON the power supply again after correcting the inverter station numbers.	
	SD *	SD ☼	SD *			
	RD ☼	RD ☼	RD ☼			
	L.ERR ●	L.ERR ●	L.ERR ●			
TIME○ LINE○ or TIME● LINE○	L.RUN ☼	L.RUN ●	L.RUN ☼	The SI-C baud rate setting of Station No. 2 is different from the setting of the master unit.	Correct the baud rate setting and turn ON the inverter power supply again.	
	SD ☼	SD ●	SD ☼			
	RD ☼	RD ☼	RD ☼			
	L.ERR ●	L.ERR ●	L.ERR ☼			
TIME● LINE○ or TIME○ LINE○	L.RUN ●	L.RUN ☼	L.RUN ☼	The settings of the SI-C switches of station No. 3 are changed after the power supply is turned ON.	Return the SI-C switches to the original positions, or turn ON the inverter power supply again.	
	SD ●	SD ☼	SD ☼			
	RD ☼	RD ☼	RD ☼			
	L.ERR ☼	L.ERR ●	L.ERR ●			
TIME○ LINE○ or TIME● LINE○	L.RUN ●	L.RUN ☼	L.RUN ☼	The settings of the SI-C switches of station No. 1 are out of the range (B.RATE: 5 to 9, STA: 65 or more).	Correct the settings of the SI-C switches and turn the power supply ON again.	
	SD ●	SD ☼	SD ☼			
	RD ☼	RD ☼	RD ☼			
	L.ERR ☼	L.ERR ●	L.ERR ●			
TIME● LINE● or TIME○ LINE●	L.RUN ☼	L.RUN ☼	L.RUN ☼	The SI-Cs of two stations are affected by noise. L.RUN may be extinguished.	Ground each inverter and master unit FG.	
	SD ☼	SD ☼	SD ☼			
	RD ☼	RD ☼	RD ☼			
TIME● LINE● or TIME○ LINE●	L.RUN ☼	L.RUN ☼	L.RUN ☼	The transmission cable is affected by noise between the inverters of node 2 and 3. L.RUN may be extinguished.	Confirm the SLD connection of the transmission cable. Also separate the cable from the power cable as much as possible by at least 100mm.	
	SD ☼	SD ☼	SD ☼			
	RD ☼	RD ☼	RD ☼			
TIME○ LINE○ or TIME● LINE○	L.RUN ☼	L.RUN ☼	L.RUN ☼	Failed to attach a termination resistor. L.RUN may be extinguished.	Confirm that the termination resistor is attached.	
	SD ☼	SD ☼	SD ☼			
	RD ☼	RD ☼	RD ☼			
	L.ERR ☼	L.ERR ●	L.ERR ●			

☼ :Lit ☼ :Blinking ● :Not lit * : Lit or Not lit

The following table describes the failures, causes, and corrective actions that can be judged according to the LED of the inverter CC-Link unit (SI-C unit) when the LED display of the master unit SW, M/S or PRM has been extinguished (always set in the master unit), in the system configuration shown below.



Master Unit	LED Display			Cause	Corrective Action
	Remote Device Station(SI-C)				
	Station No. 1	Station No. 2	Station No. 3		
TIMEO LINEO or TIME● LINEO	L.RUN ☀	L.RUN ☀	L.RUN ☀	The drive is operating properly.	—
	SD ☀	SD ☀	SD ☀		
	RD ☀	RD ☀	RD ☀	The SI-C card of station No. 1 is not attached correctly.	Check how it is attached and reattach it correctly if necessary.
	L.ERR ●	L.ERR ●	L.ERR ●		
	L.RUN ●	L.RUN ☀	L.RUN ☀		
	SD ●	SD ☀	SD ☀		
RD ●	RD ☀	RD ☀	The SI-C card of station No. 1 is defective. (Usually all indicator lamps are extinguished.)	Replace the SI-C card.	
L.ERR ●	L.ERR ●	L.ERR ●			
L.RUN *	L.RUN ☀	L.RUN ☀	L.RUN of station No. 2 and other LEDs after it are extinguished. The transmission cable is disconnected between station No. 1 and 2 or is removed from the terminal block.	Refer to the LED lighting status to look for the disconnected part and then correct it.	
SD *	SD ☀	SD ☀			
RD *	RD ☀	RD ☀			
L.ERR *	L.ERR ●	L.ERR ●			
L.RUN ●	L.RUN ●	L.RUN ●	Transmission cable shortcircuits.	Find the shortcircuiting cable among the three communications cables and correct it.	
SD *	SD *	SD *			
RD *	RD *	RD *	Communications cable is connected incorrectly.	Check the wiring in the SI-C card's terminal block and correct the incorrect wiring.	
L.ERR ●	L.ERR ●	L.ERR ●			
L.RUN ●	L.RUN ●	L.RUN ●			
SD *	SD *	SD *			
RD *	RD *	RD *			
L.ERR *	L.ERR *	L.ERR *			

☀ : Lit ☀ : Flashing ● : Not lit * : Either lit or not lit

How to check an error indicated by the LEDs.

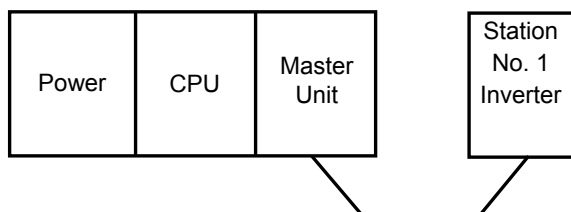
L.RUN: Lit when the refreshed data is successfully received. Extinguished if data communications are interrupted for a specified period of time.

SD : Lit when sending data is "1".

RD : Lit when detecting the receiving data carrier.

L.ERR: Lit when the local data has a CRC abort error.

The following table describes the causes and corrective actions of the failures that can be determined according to the LED status of the SI-C card in a system configuration where one master is connected to one inverter.



LED Display				Meaning	Corrective Actions
L.RUN	SD	RD	L.ERR		
☀	☀	☀	☀	Normal but an error is occurring.	Remove the influence of noise.
☀	☀	☀	●	Communications are functioning normally.	—
☀	☀	●	☀	Hardware error	Turn the power supply OFF and then ON again.
☀	☀	●	●	Hardware error	Turn the power supply OFF and then ON again.
☀	●	☀	☀	A CRC error occurred, and the SI-C card cannot replay.	Remove the influence of noise.
☀	●	☀	●	Local data cannot be received.	Confirm the PLC program.
☀	●	●	☀	Hardware error	Turn the power supply OFF and then ON again.
☀	●	●	●	Hardware error	Turn the power supply OFF and then ON again.
●	☀	☀	☀	Polling response is made but an CRC error occurred in refreshing the data.	Remove the influence of noise.
●	☀	☀	●	Hardware error	Turn the power supply OFF and then ON again.
●	☀	●	☀	Hardware error	Turn the power supply OFF and then ON again.
●	☀	●	●	Hardware error	Turn ON the power supply again.

LED Display				Meaning	Corrective Actions
L.RUN	SD	RD	L.ERR		
●	●	☉	☉	A CRC error occurred in local data.	Remove the influence of noise.
●	●	☉	●	Local data is not provided or cannot be received because of noise.	Remove the influence of noise.
●	●	●	☉	Hardware error	Turn the power supply OFF and then ON again.
●	●	●	●	Data cannot be received because of a disconnection.	Check the wiring.
●	●	*	☉	Baud rate or station number is not correct.	Correct the setting and turn the power supply OFF and then ON again.
☉	☉	☉	☉	Baud rate or station number was changed after the power supply was turned ON.	Return the setting to the former setting. Turn the power supply OFF and then ON again.

☉ : Lit ☉ : Blinking ● : Not lit * : Lit or Not lit

8 APPENDIX

8.1 List of Command Code Registers

8.1.1 Command Data (Read and Write)

Command Code		Description	Drive	
Read	Write		F7	G7
1000H	-	Reserved Complete	Yes	Yes
1001H	-	Run Cmd	Yes	Yes
		0 Forward / Stop Command 1: Run 0: Stop	Yes	Yes
		1 Reverse / Stop Command 1: Run 0: Stop	Yes	Yes
		2 External Fault 1: Fault (EF0)	Yes	Yes
		3 Fault Reset 1: Reset Command	Yes	Yes
		4 Comnet	Yes	Yes
		5 Comctrl	Yes	Yes
		6 Multi-Function Input Command 3 (Terminal S3)	Yes	Yes
		7 Multi-Function Input Command 4 (Terminal S4)	Yes	Yes
		8 Multi-Function Input Command 5 (Terminal S5)	Yes	Yes
		9 Multi-Function Input Command 6 (Terminal S6)	Yes	Yes
		A Multi-Function Input Command 7 (Terminal S7)	Yes	Yes
		B Multi-Function Input Command 8 (Terminal S8)	No	Yes
		C Multi-Function Input Command 9 (Terminal S9)	No	Yes
D Multi-Function Input Command 10 (Terminal S10)	No	Yes		
E Multi-Function Input Command 11 (Terminal S11)	No	Yes		
F Multi-Function Input Command 12 (Terminal S12)	-	-		
1002H	-	Frequency Reference (set the units displayed with parameter o1-03)	Yes	Yes
1003H	-	Not Used	-	-
1004H	-	Not Used	No	Yes
1005H	-	Not Used	No	Yes
1006H	-	PID Desired Value	Yes	Yes
1007H	-	Analog Output 1 Setting (-11V/-1540~11V/1540: Enabled when H4-01 is set to "31")	Yes	Yes
1008H	-	Analog Output 2 Setting (-11V/-1540~11V/1540: Enabled when H4-04 is set to "31")	Yes	Yes
1009H	-	Multi-Function Output Setting	Yes	Yes
		0 Relay Output (Terminal M1-M2) 1: ON 0: OFF	Yes	Yes
		1 PHC1 (Terminal P1-PC) 1: ON 0: OFF	Yes	Yes
		2 PHC2 (Terminal P2-PC) 1: ON 0: OFF	Yes	Yes
		3 PHC3 (Terminal P3-C3) 1: ON 0: OFF	No	Yes
		4 PHC4 (Terminal P4-C4) 1: ON 0: OFF	No	Yes
		5 Not Used	-	-
		6 Fault Relay (Terminal MA-MC) Output. Determined by bit-7: 1: ON, 0: OFF.	Yes	Yes
		7 Fault Relay (Terminal MA-MC) 1: ON 0: OFF	Yes	Yes
8-F Not Used	Yes	Yes		
100AH-100EH	200AH-200EH	Not Used	-	-
100FH	-	Command Selection Setting	Yes	Yes
		0 Not Used	Yes	Yes
		1 PID Desired Value Input 1: Enabled 0: Disabled	Yes	Yes
		2-B Not Used	Yes	Yes
		C 1: Batch Data Transfer Terminal S5 Input 1: Enabled 0: Disabled	Yes	Yes
		D 1: Batch Data Transfer Terminal S6 Input 1: Enabled 0: Disabled	Yes	Yes
		E 1: Batch Data Transfer Terminal S7 Input 1: Enabled 0: Disabled	Yes	Yes
F Not Used	-	-		

NOTE: Any bit that is not used will be written as "0" when saving data to the Command Code.

8.1.2 Status Data (read only)

Command Code		Description		Drive		
Read	Write	BIT	Display	F7	G7	
1010H	-	Drive Status			Yes	Yes
		0	1: During Run	Yes	Yes	
		1	1: Zero Speed	Yes	Yes	
		2	1: While in REV	Yes	Yes	
		3	1: Reset Signal During Input	Yes	Yes	
		4	1: During Speed Agree	Yes	Yes	
		5	1: Drive Ready	Yes	Yes	
		6	1: Alarm	Yes	Yes	
		7	1: Fault	Yes	Yes	
		8-D	Not Used	-	-	
		E	1: Comref Status	Yes	Yes	
F	1: Comctrl Status	Yes	Yes			
1011H	-	Operator Status			Yes	Yes
		0	1: During OPE	Yes	Yes	
		1	Not Used	-	-	
		2	1: PRG mode	Yes	Yes	
3-F	Not Used	-	-			
1012H	-	Openo.			Yes	Yes
1013H	-	Drive Ccode F7 : 2020H G7: 2050H			Yes	Yes
1014H	-	Fault Description 1			Yes	Yes
		0	PUF Fuse Blown	Yes	Yes	
		1	UV1 Main Circuit Undervoltage / Main Circuit MC Operation Error	Yes	Yes	
		2	UV2 Control Power Supply Fault	Yes	Yes	
		3	UV3 Inrush Prevention Circuit Fault	Yes	Yes	
		4	- Not Used	-	-	
		5	GF Ground	Yes	Yes	
		6	OC Overcurrent	Yes	Yes	
		7	OV Main Circuit Overvoltage	Yes	Yes	
		8	OH Heat Sink Overheat	Yes	Yes	
		9	OH1 / Drive Internal Cooling Fan Stop	Yes	Yes	
		A	OL1 Motor Overload	Yes	Yes	
		B	OL2 Drive Overload	Yes	Yes	
		C	OL3 Overtorque 1	Yes	Yes	
		D	OL4 Overtorque 2	Yes	Yes	
E	RR Internal Braking Transistor Fault	Yes	Yes			
F	RH Installed Braking Resistor Overheat	Yes	Yes			
1015H	-	Fault Description 2				
		0	EF3 External Fault (Input Terminal S3)	Yes	Yes	
		1	EF4 External Fault (Input Terminal S4)	Yes	Yes	
		2	EF5 External Fault (Input Terminal S5)	Yes	Yes	
		3	EF6 External Fault (Input Terminal S6)	Yes	Yes	
		4	EF7 External Fault (Input Terminal S7)	Yes	Yes	
		5-6	- Not Used	-	-	
		7	OS Overspeed	Yes	Yes	
		8	DEV Excessive Speed Deviation	Yes	Yes	
		9	PGO PG Disconnect Detection	Yes	Yes	
		A	PF Main Circuit Voltage Fault	Yes	Yes	
		B	LF Output Phase	Yes	Yes	
		C	OH3 Motor Overheat Alarm	Yes	Yes	
		D	OPR Operator Connection Error	Yes	Yes	
E	ERR EEPROM Write Error	Yes	Yes			
F	Oh4 Motor Overheat Fault	Yes	Yes			

Command Code		Description			Drive		
Read	Write	BIT	Display		F7	G7	
1016H	-	Fault Description 3				Yes	Yes
		0	CE	Memobus Communication Error	Yes	Yes	
		1	BUS	Option Communication Error	Yes	Yes	
		2	-	Not Used	-	-	
		3	-	Not Used	-	-	
		4	CF	Control Fault	Yes	Yes	
		5	-	Not Used	-	-	
		6	EFO	External Fault Input from Communication Card	Yes	Yes	
		7	FBL	PID Feedback Command Loss	Yes	Yes	
		8	UL3	Undertorque Detection 1	Yes	Yes	
		9	UL4	Undertorque Detection 2	Yes	Yes	
		A	OL7	High Slip Braking OL	Yes	Yes	
		B-E	-	Not Used	-	-	
F	CPF	Hardware Fault	Yes	Yes			
1017H	-	CPF Description 1				Yes	Yes
		0		Not Used	-	-	
		1		Not Used	-	-	
		2		During CPF02	Yes	Yes	
		3		During CPF03	Yes	Yes	
		4		During CPF04	Yes	Yes	
		5		During CPF05	Yes	Yes	
		6		During CPF06	Yes	Yes	
7-F		Not Used	-	-			
1018H	-	CPF Description 2				Yes	Yes
		0		During CPF20	Yes	Yes	
		1		During CPF21	Yes	Yes	
		2		During CPF22	Yes	Yes	
		3		During CPF23	Yes	Yes	
4-F		Not Used	-	-			
1019H	-	Alarm Description 1				Yes	Yes
		0	UV	Main Circuit Undervoltage	Yes	Yes	
		1	Ov	Main Circuit Overvoltage	Yes	Yes	
		2	OH	Heat Sink Overheat	Yes	Yes	
		3	OH2	Drive Overheat Warning	Yes	Yes	
		4	OL3	During Overtorque 1 Detection	Yes	Yes	
		5	OL4	During Overtorque 2 Detection	Yes	Yes	
		6	EF	Forward / Reverse Command Synchronous Input	Yes	Yes	
		7	Bb	During External Baseblock	Yes	Yes	
		8	EF3	External Fault (Input Terminal S3)	Yes	Yes	
		9	EF4	External Fault (Input Terminal S4)	Yes	Yes	
		A	EF5	External Fault (Input Terminal S5)	Yes	Yes	
		B	EF6	External Fault (Input Terminal S6)	Yes	Yes	
		C	EF7	External Fault (Input Terminal S7)	Yes	Yes	
		D-E	-	Not Used	-	-	
F	OS	Overspeed	Yes	Yes			

Command Code		Description			Drive		
Read	Write	BIT	Display		F7	G7	
101AH	-	Alarm Description 2				Yes	Yes
		0	DEV	Excessive Speed Deviation	Yes	Yes	
		1	PGO	PG Disconnect Detection	Yes	Yes	
		2	OPR	Digital Operator Connection Error	Yes	Yes	
		3	CE	Memobus Communication Error	Yes	Yes	
		4	BUS	Option Card Communication Error	Yes	Yes	
		5	CALL	Waiting for Data via Communications	Yes	Yes	
		6	OL1	Motor Overload	Yes	Yes	
		7	OL2	Inverter Overload	Yes	Yes	
		8	-	Not Used	-	-	
		9	EFO	During Comm. Option Card External Fault Detection	Yes	Yes	
		A	-	Motor Switch During Run	Yes	Yes	
1020H	-	Drive Status				Yes	Yes
		0	1:	During Run	Yes	Yes	
		1	1:	While in Reverse	Yes	Yes	
		2	1:	Drive Ready	Yes	Yes	
		3	1:	Fault	Yes	Yes	
		4	1:	Data Setting Error	Yes	Yes	
		5	1:	Multi-Function Relay Output (M1-M2) ON	Yes	Yes	
		6	1:	Multi-Function PH C1 Output (P1-PC) ON	Yes	Yes	
		7	1:	Multi-Function PH C2 Output (P2-PC) ON	Yes	Yes	
		8	1:	Multi-Function PH C3 Output (P3-C3) ON	No	Yes	
		9	1:	Multi-Function PH C4 Output (P4-C4) ON	No	Yes	
		A-F		Not Used	-	-	
1021H	-	Fault Description				Yes	Yes
		0		Overcurrent (OC) Ground (GF)	Yes	Yes	
		1		Main Circuit Overvoltage (OV)	Yes	Yes	
		2		Inverter Overload (OL)	Yes	Yes	
		3		Heat Sink Overheat, Inverter Internal Cooling Fan Stop (OH (OH1))	Yes	Yes	
		4		Internal Braking Transistor Fault (Rr) Installed Braking Resistor Overheat (Rh)	Yes	Yes	
		5		Fuse Blown (PUF)	Yes	Yes	
		6		PID Feedback Command Loss (FBL)	Yes	Yes	
		7		External Fault (EF0, EF3~EF7)	Yes	Yes	
		8		Hardware Fault (CPF)	Yes	Yes	
		9		Motor Overload (OL1), Overtorque Detection 1 (OL3), Overtorque Detection 2 (OL4)	Yes	Yes	
		A		PG Disconnect Detection (PGO), Overspeed (OS), Excessive Speed Deviation (DEV)	Yes	Yes	
		B		Main Circuit Undervoltage (UV) During Detection	Yes	Yes	
		C		Main Circuit Undervoltage / MC Operation Error (UV1) Control Power Supply Fault (UV2) Inrush Prevention Circuit Fault (UV3)	Yes	Yes	
D		Output Phase (LF)	Yes	Yes			
E		Memobus Comm. Error	Yes	Yes			
F		Operator Connection Error (OPR)	Yes	Yes			
1022H	-	Data Link Status				Yes	Yes
		0		While Saving Data	Yes	Yes	
		1		Not Used	-	-	
		2		Not Used	-	-	
		3		Upper/Lower Limit Fault	Yes	Yes	
		4		Data Compatibility Fault	Yes	Yes	
5-F		Not Used	-	-			

Command Code		Description		Drive	
Read	Write	BIT	Display	F7	G7
1023H	-		Frequency Reference (U1-01)	Yes	Yes
1024H	-		Output Frequency (U1-02)	Yes	Yes
1025H	-		Output Voltage Command (U1-06)	Yes	Yes
1026H	-		Output Current (U1-03)	Yes	Yes
1027H	-		Output Power (U1-08)	Yes	Yes
1028H	-		Torque Reference (U1-09)	Yes	Yes
1029H	-		Not Used	-	-
102AH	-		Not Used	-	-
102BH	-	Sequence Input Status		Yes	Yes
		0	I: Multi-Function Digital Input Terminal S1 ON	Yes	Yes
		1	I: Multi-Function Digital Input Terminal S2 ON	Yes	Yes
		2	I: Multi-Function Digital Input Terminal S3 ON	Yes	Yes
		3	I: Multi-Function Digital Input Terminal S4 ON	Yes	Yes
		4	I: Multi-Function Digital Input Terminal S5 ON	Yes	Yes
		5	I: Multi-Function Digital Input Terminal S6 ON	Yes	Yes
		6	I: Multi-Function Digital Input Terminal S7 ON	Yes	Yes
		7	I: Multi-Function Digital Input Terminal S8 ON	No	Yes
		8	I: Multi-Function Digital Input Terminal S9 ON	No	Yes
		9	I: Multi-Function Digital Input Terminal S10 ON	No	Yes
		A	I: Multi-Function Digital Input Terminal S11 ON	No	Yes
		B	I: Multi-Function Digital Input Terminal S12 ON	No	Yes
	C-F	Not Used	-	-	
102CH	-	Drive Status		Yes	Yes
		0	I: During Run	Yes	Yes
		1	I: During Zero Speed	Yes	Yes
		2	I: During Speed Agree	Yes	Yes
		3	I: User Selection during Speed Agree	Yes	Yes
		4	Frequency Detection 1 1: Output Frequency \leq L4-01	Yes	Yes
		5	Frequency Detection 2 1: Output Frequency \geq L4-01	Yes	Yes
		6	I: Drive Ready	Yes	Yes
		7	I: Undervoltage During Detection	Yes	Yes
		8	I: During Baseblock	Yes	Yes
		9	Frequency Reference Mode 1: External Communications, 0: Communications	Yes	Yes
		A	Run Cmd Mode 1: External Communications, 0: Communications	Yes	Yes
		B	I: Overtorque During Detection	Yes	Yes
		C	I: During Frequency Reference Loss	Yes	Yes
		D	I: During Fault Restart	Yes	Yes
E	I: During Fault	Yes	Yes		
F	I: Memobus Timed Out	Yes	Yes		
102DH	-	Multi-Function Output Status		Yes	Yes
		0	Multi-Function Relay Output (M1-M2) ON	Yes	Yes
		1	Multi-Function Phcoutput (P1-PC) ON	Yes	Yes
		2	Multi-Function Phcoutput (P2-PC) ON	Yes	Yes
		3	Multi-Function Phcoutput (P3-C3) ON	No	Yes
		4	Multi-Function Phcoutput (P4-C4) ON	No	Yes
	5-F	Not Used	-	-	

Command Code		Description	Drive		
Read	Write		F7	G7	
102EH -1030H	-	Not Used	-	-	
1031H	-	Main Circuit DC Voltage	Yes	Yes	
1032H	-	Torque Monitor	Yes	Yes	
1033H	-	Output Power	Yes	Yes	
1034H -1037H	-	Not Used	-	-	
1038H	-	PID Feedback Amount	Yes	Yes	
1039H	-	PID Input Amount	Yes	Yes	
103AH	-	PID Output Amount	Yes	Yes	
103BH	-	Software Number (CPU)	Yes	Yes	
103CH	-	Software Number (Flash)	Yes	Yes	
103DH	-	Comm. Error Description	Yes	Yes	
		0	CRC Error	Yes	Yes
		1	Data Length Error	Yes	Yes
		2	Not Used	Yes	Yes
		3	Parity Error	-	-
		4	Overflow Error	Yes	Yes
		5	Framing Error	Yes	Yes
		6	Timed Out	Yes	Yes
7-F	Not Used	-	-		
103EH	-	KVA Setting	Yes	Yes	
103FH	-	Control Mode	Yes	Yes	

8.1.3 Monitor Data (read only)

For more details, refer to the instruction manual. The digital operator displays the same units as the monitor, with the exception of the units for the output current and frequency related units.

- U1-xx Monitor Details

Command Code		BIT	Description	Drive		
Read	Write			F7	G7	
1040H	-	U1-01	Frequency Reference *2	Yes	Yes	
1041H	-	U1-02	Output Frequency *2	Yes	Yes	
1042H	-	U1-03	Output Current (100%/8192)*1	Yes	Yes	
1043H	-	U1-04	Control Mode	Yes	Yes	
1044H	-	U1-05	Motor Speed *2	Yes	Yes	
1045H	-	U1-06	Output Voltage Command	Yes	Yes	
1046H	-	U1-07	Main Circuit DC Voltage	Yes	Yes	
1047H	-	U1-08	Output Power	Yes	Yes	
1048H	-	U1-09	Torque Reference (Internal)	Yes	Yes	
1049H	-	U1-10	Input Terminal Status	Yes	Yes	
			0	1: Control Circuit Terminal S1 Closed	Yes	Yes
			1	1: Control Circuit Terminal S2 Closed	Yes	Yes
			2	1: Control Circuit Terminal S3 Closed	Yes	Yes
			3	1: Control Circuit Terminal S4 Closed	Yes	Yes
			4	1: Control Circuit Terminal S5 Closed	Yes	Yes
			5	1: Control Circuit Terminal S6 Closed	Yes	Yes
			6	1: Control Circuit Terminal S7 Closed	Yes	Yes
			7	1: Control Circuit Terminal S8 Closed	No	Yes
8-F	Not Used	-	-			
104AH	-	U1-11	Output Terminal Status	Yes	Yes	
			0	1: Control Circuit Terminal M1-M2 Closed	Yes	Yes
			1	1: Control Circuit Terminal P1 Closed	Yes	Yes
			2	1: Control Circuit Terminal P2 Closed	Yes	Yes
			3	1: Control Circuit Terminal P3 Closed	No	Yes
			4	1: Control Circuit Terminal P4 Closed	No	Yes
			5-6	Not Used	-	-
			7	1: Terminal MA/ MB-MC Closed	Yes	Yes
104BH	-	U1-12	Operation Status	Yes	Yes	
			0	1: During Run	Yes	Yes
			1	1: At Zero Speed	Yes	Yes
			2	1: While in REV	Yes	Yes
			3	1: Reset Signal During Input	Yes	Yes
			4	1: During Speed Agree	Yes	Yes
			5	1: Drive Ready	Yes	Yes
			6	1: Alarm	Yes	Yes
7	1: Fault	Yes	Yes			
104CH	-	U1-13	Cumulative Operation Time	Yes	Yes	
104DH	-	U1-14	Software Number (FLASH)	Yes	Yes	
104EH	-	U1-15	Frequency Reference Terminal A1 Input Voltage	Yes	Yes	
104FH	-	U1-16	Multi-Function Analog Input Terminal A2 Input Voltage	Yes	Yes	
1050H	-	U1-17	Multi-Function Analog Input Terminal A3 Input Voltage	No	Yes	

Command Code		BIT	Description	Drive		
Read	Write			F7	G7	
1051H	-	U1-18	Motor Secondary Current (Iq)	Yes	Yes	
1052H	-	U1-19	Motor Excitation Current (Id)	Yes	Yes	
1053H	-	U1-20	Output Frequency after SFS *2	Yes	Yes	
1054H	-	U1-21	Speed Control (ASR) Input	Yes	Yes	
1055H	-	U1-22	Speed Control (ASR) Output	Yes	Yes	
1056H	-	-	Not Used	-	-	
1057H	-	U1-24	PID Feedback Amount	Yes	Yes	
1058H	-	-	Not Used	-	-	
1059H	-	U1-26	Output Voltage Command (Vq)	Yes	Yes	
105AH	-	U1-27	Output Voltage Command (Vd)	Yes	Yes	
105BH	-	U1-28	Software No. (CPU)	Yes	Yes	
105DH	-	-	Not Used	-	-	
105EH	-	-	Not Used	-	-	
105FH	-	U1-32	ACR Output of q-Axis	Yes	Yes	
1060H	-	U1-33	ACR Output of d-Axis	Yes	Yes	
1061H		U1-34	First Parameter Causing an OPE	Yes	Yes	
1062H		U1-35	Zero Servo Pulse Count	No	Yes	
1063H	-	U1-36	PID Input Amount	Yes	Yes	
1064H	-	U1-37	PID Output Amount	Yes	Yes	
1065H	-	U1-38	PID Command	Yes	Yes	
1066H	-	U1-39	Memobus Communication Error Code		Yes	Yes
			0	1: CRC Error	Yes	Yes
			1	1: Data Length Error	Yes	Yes
			2	Not Used	-	-
			3	1: Parity Error	Yes	Yes
			4	1: Overrun Error	Yes	Yes
			5	1: Framing Error	Yes	Yes
			6	1: Timed Out	Yes	Yes
		7	Not Used	-	-	
1067H	-	U1-40	Heatsink Cooling Fan Operation Time	Yes	Yes	
1069H	-	U1-42	Heatsink Temperature	No	Yes	
106AH	-	U1-43	Motor Flux Calculation Values	No	Yes	
106BH	-	U1-44	Motor Flux Current Compensation	No	Yes	
106CH	-	U1-45	ASR Output without Filter	No	Yes	

*1 The output current is defined as 100% divided by 8192, and 100% is the drive's rated current.

*2 When bit zero of command code 100FH/200FH is set to zero, the encoding for the frequency appears in units of 0.1Hz. When bit zero is set to "1" for command code 100FH/200FH, then the units for the frequency will following the value set to parameter o1-03 (no encoding).

• U2-xx Monitor Details

Command Code		BIT	Description	Drive	
Read	Write			F7	G7
1080H	-	U2-01	Current Fault	Yes	Yes
1081H	-	U2-02	Previous Fault	Yes	Yes
1082H	-	U2-03	Frequency Reference at Previous Fault	Yes	Yes
1083H	-	U2-04	Output Frequency at Previous Fault	Yes	Yes
1084H	-	U2-05	Output Current at Previous Fault	Yes	Yes
1085H	-	U2-06	Motor Speed at Previous Fault	Yes	Yes
1086H	-	U2-07	Output Voltage at Previous Fault	Yes	Yes
1087H	-	U2-08	DC Bus Voltage at Previous Fault	Yes	Yes
1088H	-	U2-09	Output Power at Previous Fault	Yes	Yes
1089H	-	U2-10	Torque Reference at Previous Fault	Yes	Yes
108AH	-	U2-11	Input Terminal Status during Fault	Yes	Yes
			0 1: Control Circuit Terminal S1 Closed	Yes	Yes
			1 1: Control Circuit Terminal S2 Closed	Yes	Yes
			2 1: Control Circuit Terminal S3 Closed	Yes	Yes
			3 1: Control Circuit Terminal S4 Closed	Yes	Yes
			4 1: Control Circuit Terminal S5 Closed	Yes	Yes
			5 1: Control Circuit Terminal S6 Closed	Yes	Yes
			6 1: Control Circuit Terminal S7 Closed	Yes	Yes
7 Not Used	-	-			
108BH	-	U2-12	Output Terminal Status when Fault Occurs	Yes	Yes
			0 1: Control Circuit Terminal M1-M2 Closed	Yes	Yes
			1 1: Control Circuit Terminal P1 Closed	Yes	Yes
			2 1: Control Circuit Terminal P2 Closed	Yes	Yes
			3-6 Not Used	-	-
7 1: Terminal MA/MB-MC Closed	Yes	Yes			
108CH	-	U2-13	Run Status when Fault Occurs	Yes	Yes
			0 1: During Run	Yes	Yes
			1 1: At Zero Speed	Yes	Yes
			2 1: While in REV	Yes	Yes
			3 1: Reset Signal During Input	Yes	Yes
			4 1: During Speed Agree	Yes	Yes
			5 1: Drive Ready	Yes	Yes
			6 1: Alarm	Yes	Yes
7 1: Fault	Yes	Yes			
108DH	-	U2-14	Cumulative Operation Time at Previous Fault	Yes	Yes

• U3-xx Monitor Details

Command Code		BIT	Description	Drive	
Read	Write			F7	G7
1090H	-	U3-01	Most Recent Fault (see the following page)	Yes	Yes
1091H	-	U3-02	2nd Most Recent Fault (see the following page)	Yes	Yes
1092H	-	U3-03	3rd Most Recent Fault (see the following page)	Yes	Yes
1093H	-	U3-04	4th Most Recent Fault (see the following page)	Yes	Yes
1094H	-	U3-05	Cumulative Operation Time at Most Recent Fault	Yes	Yes
1095H	-	U3-06	Cumulative Operation Time at 2nd Most Recent Fault	Yes	Yes
1096H	-	U3-07	Cumulative Operation Time at 3rd Most Recent Fault	Yes	Yes
1097H	-	U3-08	Cumulative Operation Time at 4th Most Recent Fault	Yes	Yes

Fault Codes for U2-01, U2-02, and U3-01 through U3-08:

Display	Description	Fault Code	Drive	
			F7	G7
PUF	Fuse Blown	01H	Yes	Yes
UV1	Main Circuit Undervoltage	02H	Yes	Yes
UV2	Control Power Supply Fault	03H	Yes	Yes
UV3	Inrush Prevention Circuit Fault	04H	Yes	Yes
-	Load Short Circuit	05H	Yes	Yes
GF	Ground	06H	Yes	Yes
OC	Overcurrent	07H	Yes	Yes
OV	Overvoltage	08H	Yes	Yes
OH	Heat Sink Overheat	09H	Yes	Yes
OH1	Drive Internal Cooling Fan Overheat	0AH	Yes	Yes
OL1	Motor Overheat	0BH	Yes	Yes
OL2	Inverter Overload	0CH	Yes	Yes
OL3	Overtorque 1	0DH	Yes	Yes
OL4	Overtorque 2	0EH	Yes	Yes
Rr	Internal Braking Transistor Fault	0FH	Yes	Yes
RH	Installed Braking Resistor Overheat	10H	Yes	Yes
EF3	External Fault (Input Terminal S3)	11H	Yes	Yes
EF4	External Fault (Input Terminal S4)	12H	Yes	Yes
EF5	External Fault (Input Terminal S5)	13H	Yes	Yes
EF6	External Fault (Input Terminal S6)	14H	Yes	Yes
EF7	External Fault (Input Terminal S7)	15H	Yes	Yes
-	Not Used	16H	-	-
-	Not Used	17H	-	-
OS	Overspeed	18H	Yes	Yes
DEV	Excessive Speed Deviation	19H	Yes	Yes
PGO	PG Disconnect Detection	1AH	Yes	Yes
PF	Main Circuit Voltage Fault	1BH	Yes	Yes
LF	Output Phase	1CH	Yes	Yes
OPR	Digital Operator Connection Error	1EH	Yes	Yes
ERr	Eepromwriting Error	1FH	Yes	Yes
CE	Memobus Comm. Error	21H	Yes	Yes
BUS	Option Card Comm. Error	22H	Yes	Yes
-	Not Used	23H	-	-
-	Not Used	24H	-	-
CF	Control Fault	25H	Yes	Yes
-	Not Used	26H	-	-
EFO	External Fault Input from Comm. Card	27H	Yes	Yes
FBL	PID Control Feedback Command Loss Fault	28H	Yes	Yes

8.1.4 Parameter Data (possible to both read and write data)

For more information on the setting range, refer to the users manual for the drive.

Command Code			Name	Drive	
Read	Write			F7	G7
1100H	2100H	A1-00	Operator Display Language Selection	Yes	Yes
1101H	2101H	A1-01	Parameter Access Level	Yes	Yes
1102H	2102H	A1-02	Control Method Selection	Yes	Yes
1103H	2103H	A1-03	Initialize	Yes	Yes
1104H	2104H	A1-04	Password	Yes	Yes
1105H	2105H	A1-05	Password Settings	Yes	Yes
1106H-1125H	2106H-2125H	A2-01~32	User Parameter Setting	Yes	Yes
1180H	2180H	b1-01	Frequency Reference Selection	Yes	Yes
1181H	2181H	b1-02	Run Cmd Selection	Yes	Yes
1182H	2182H	b1-03	Stopping Method	Yes	Yes
1183H	2183H	b1-04	Reverse Prohibited Selection	Yes	Yes
1184H	2184H	b1-05	Minimum Output Frequency (E1-09) or Less Operation Selection	No	Yes
1185H	2185H	b1-06	Sequence Input Read Twice Selection	Yes	Yes
1186H	2186H	b1-07	Operation Selection after Switching the Run Command	Yes	Yes
1187H	2187H	b1-08	Program Mode Run Command Selection	Yes	Yes
1189H	2189H	b2-01	Zero Speed Level (DC Braking Start Frequency)	Yes	Yes
118AH	218AH	b2-02	DC Braking Current	Yes	Yes
118BH	218BH	b2-03	DC Braking (Initial Excitation) Time at Start	Yes	Yes
118CH	218CH	b2-04	DC Braking (Initial Excitation) Time at Stop	Yes	Yes
1191H	2191H	b3-01	Speed Search Selection at Start	Yes	Yes
1192H	2192H	b3-02	Speed Search Operation Current	Yes	Yes
1193H	2193H	b3-03	Speed Search Decel Time	Yes	Yes
1195H	2195H	b3-05	Speed Search Wait Time	Yes	Yes
11A3H	21A3H	b4-01	Timer Function ON-Side Delay Time	Yes	Yes
11A4H	21A4H	b4-02	Timer Function OFF-Side Delay Time	Yes	Yes
11A5H	21A5H	b5-01	PID Control Selection	Yes	Yes
11A6H	21A6H	b5-02	Proportional Gain (P)	Yes	Yes
11A7H	21A7H	b5-03	Integral Time (I)	Yes	Yes
11A8H	21A8H	b5-04	Integral Time (I) Upper Limit Value	Yes	Yes
11A9H	21A9H	b5-05	Differential Time (D)	Yes	Yes
11AAH	21AAH	b5-06	PID Upper Limit Value	Yes	Yes
11ABH	21ABH	b5-07	PID Off-Set Tuning	Yes	Yes
11ACH	21ACH	b5-08	PID Primary Delay Time Parameter	Yes	Yes
11ADH	21ADH	b5-09	PID Output Characteristics Selection	Yes	Yes
11AEH	21AEH	b5-10	PID Output Gain	Yes	Yes
11AFH	21AFH	b5-11	PID Output Reverse Selection	Yes	Yes
11B0H	21B0H	b5-12	PID Feedback Command Loss Detection Selection	Yes	Yes
11B1H	21B1H	b5-13	PID Feedback Command Loss Detection Level	Yes	Yes
11B2H	21B2H	b5-14	PID Feedback Command Loss Time	Yes	Yes
11B3H	21B3H	b5-15	Slip Function Operation Level	Yes	Yes
11B4H	21B4H	b5-16	PID Slip Operation Delay Time	Yes	Yes
11B5H	21B5H	b5-17	Accel/ Decel Time for PID	Yes	Yes

Command Code			Name	Drive	
Read	Write			F7	G7
11B6H	21B6H	b6-01	Dwell Reference at Start	Yes	Yes
11B7H	21B7H	b6-02	Dwell Time at Start	Yes	Yes
11B8H	21B8H	b6-03	Dwell Frequency at Stop	Yes	Yes
11B9H	21B9H	b6-04	Dwell Time at Stop	Yes	Yes
11CAH	21CAH	b7-01	Droop Control Level	No	Yes
11CBH	21CBH	b7-02	Droop Control Delay Time	No	Yes
11CCH	21CCH	b8-01	Energy Saving Mode Selection	Yes	Yes
11CDH	21CDH	b8-02	Energy Saving Control Gain	Yes	Yes
11CEH	21CEH	b8-03	Energy Saving Control Filter Time Constant	Yes	Yes
11CFH	21CFH	b8-04	Energy Saving Co-Efficient	Yes	Yes
11D0H	21D0H	b8-05	Power Detection Filter Time	Yes	Yes
11D1H	21D1H	b8-06	Search Operation Voltage Limit	Yes	Yes
11DAH	21DAH	b9-01	Zero Servo Gain	No	Yes
11DBH	21DBH	b9-02	Zero Servo Completion Width	No	Yes
1200H	2200H	C1-01	Accel Time 1	Yes	Yes
1201H	2201H	C1-02	Decel Time 1	Yes	Yes
1202H	2202H	C1-03	Accel Time 2	Yes	Yes
1203H	2203H	C1-04	Decel Time 2	Yes	Yes
1204H	2204H	C1-05	Accel Time 3	Yes	Yes
1205H	2205H	C1-06	Decel Time 3	Yes	Yes
1206H	2206H	C1-07	Accel Time 4	Yes	Yes
1207H	2207H	C1-08	Decel Time 4	Yes	Yes
1208H	2208H	C1-09	Fast Time	Yes	Yes
1209H	2209H	C1-10	Accel/Decel Time Setting Units	Yes	Yes
120AH	220AH	C1-11	Accel/Decel Time Switch Frequency	Yes	Yes
120BH	220BH	C2-01	S-Curve Characteristic at Accel Start	Yes	Yes
120CH	220CH	C2-02	S-Curve Characteristic at Accel End	Yes	Yes
120DH	220DH	C2-03	S-Curve Characteristic at Decel Start	Yes	Yes
120EH	220EH	C2-04	S-Curve Characteristic at Decel End	Yes	Yes
120FH	220FH	C3-01	Slip Compensation Gain	Yes	Yes
1210H	2210H	C3-02	Slip Compensation Primary Delay Time	Yes	Yes
1211H	2211H	C3-03	Slip Compensation Limit	Yes	Yes
1212H	2212H	C3-04	Regen Slip Compensation Selection During Run	Yes	Yes
1213H	2213H	C3-05	Output Voltage Limit Operation Selection	Yes	Yes
1215H	2215H	C4-01	Torque Compensation Gain	Yes	Yes
1216H	2216H	C4-02	Torque Compensation Primary Delay Time Parameter	Yes	Yes
121BH	221BH	C5-01	Speed Control (ASR)のProportional Gain 1 (P)	Yes	Yes
121CH	221CH	C5-02	Speed Control (ASR)のIntegral Time 1 (I)	Yes	Yes
121DH	221DH	C5-03	Speed Control (ASR)のProportional Gain 2 (P)	Yes	Yes
121EH	221EH	C5-04	Speed Control (ASR) Integral Time 2 (I)	Yes	Yes
121FH	221FH	C5-05	Speed Control (ASR) Limit	Yes	Yes
1220H	2220H	C5-06	Speed Control (ASR) Primary Delay Time Parameter	No	Yes
1221H	2221H	C5-07	Speed Control (ASR) Gain Switch Frequency	No	Yes
1222H	2222H	C5-08	Speed Control (ASR) Integral Limit	No	Yes
1223H	2223H	C6-01	Duty Selection	Yes	No
1224H	2224H	C6-02	Carrier Frequency Selection	Yes	Yes
1225H	2225H	C6-03	Carrier Frequency Upper Limit	Yes	Yes
1226H	2226H	C6-04	Carrier Frequency Lower Limit	Yes	Yes
1227H	2227H	C6-05	Carrier Frequency Proportional Gain	Yes	Yes

Command Code			Name	Drive	
Read	Write			F7	G7
1280H	2280H	d1-01	Frequency Reference 1	Yes	Yes
1281H	2281H	d1-02	Frequency Reference 2	Yes	Yes
1282H	2282H	d1-03	Frequency Reference 3	Yes	Yes
1283H	2283H	d1-04	Frequency Reference 4	Yes	Yes
1284H	2284H	d1-05	Frequency Reference 5	Yes	Yes
1285H	2285H	d1-06	Frequency Reference 6	Yes	Yes
1286H	2286H	d1-07	Frequency Reference 7	Yes	Yes
1287H	2287H	d1-08	Frequency Reference 8	Yes	Yes
1288H	2288H	d1-09	Frequency Reference 9	Yes	Yes
128BH	228BH	d1-10	Frequency Reference 10	Yes	Yes
128CH	228CH	d1-11	Frequency Reference 11	Yes	Yes
128DH	228DH	d1-12	Frequency Reference 12	Yes	Yes
128EH	228EH	d1-13	Frequency Reference 13	Yes	Yes
128FH	228FH	d1-14	Frequency Reference 14	Yes	Yes
1290H	2290H	d1-15	Frequency Reference 15	Yes	Yes
1291H	2291H	d1-16	Frequency Reference 16	Yes	Yes
1292H	2292H	d1-17	Jog Frequency Reference	Yes	Yes
1289H	2289H	d2-01	Frequency Reference Upper Limit	Yes	Yes
128AH	228AH	d2-02	Frequency Reference Lower Limit	Yes	Yes
1293H	2293H	d2-03	Main Speed Reference Lower Limit Value	Yes	Yes
1294H	2294H	d3-01	Jump Frequency 1	Yes	Yes
1295H	2295H	d3-02	Jump Frequency 2	Yes	Yes
1296H	2296H	d3-03	Jump Frequency 3	Yes	Yes
1297H	2297H	d3-04	Jump Frequency Width	Yes	Yes
1298H	2298H	d4-01	Frequency Reference Hold Function Selection	Yes	Yes
1299H	2299H	d4-02	+/- Speed Limit	Yes	Yes
129AH	229AH	d5-01	Torque Control Selection	No	Yes
129BH	229BH	d5-02	Torque Reference Delay Time	No	Yes
129CH	229CH	d5-03	Speed Limit Selection	No	Yes
129DH	229DH	d5-04	Speed Limit	No	Yes
129EH	229EH	d5-05	Speed Limit Bias	No	Yes
129FH	229FH	d5-06	Speed / Torque Control Switch Timer	No	Yes
12A0H	22A0H	d6-01	Magnetic Field Weakening Level	Yes	Yes
12A1H	22A1H	d6-02	Magnetic Field Frequency	Yes	Yes
12A2H	22A2H	d6-03	Magnetic Field Forcing Function Selection	No	Yes

Command Code			Name	Drive	
Read	Write			F7	G7
1300H	2300H	E1-01	Input Voltage Setting	Yes	Yes
1302H	2302H	E1-03	V/f Pattern Selection	Yes	Yes
1303H	2303H	E1-04	Max Output Frequency (FMAX)	Yes	Yes
1304H	2304H	E1-05	Max Voltage (VMAX)	Yes	Yes
1305H	2305H	E1-06	Base Frequency (FA)	Yes	Yes
1306H	2306H	E1-07	Mid Output Frequency (FB)	Yes	Yes
1307H	2307H	E1-08	Mid Output Frequency Voltage (VC)	Yes	Yes
1308H	2308H	E1-09	Minimum Output Frequency (FMIN)	Yes	Yes
1309H	2309H	E1-10	Minimum Output Frequency Voltage (VMIN)	Yes	Yes
130AH	230AH	E1-11	Mid Output Frequency 2	Yes	Yes
130BH	230BH	E1-12	Mid Output Frequency Voltage 2	Yes	Yes
130CH	230CH	E1-13	Base Voltage (VBASE)	Yes	Yes
130EH	230EH	E2-01	Motor Rated Current	Yes	Yes
130FH	230FH	E2-02	Motor Rated Slip	Yes	Yes
1310H	2310H	E2-03	Motor De-Coupled Load Current	Yes	Yes
1311H	2311H	E2-04	Number of Motor Poles	Yes	Yes
1312H	2312H	E2-05	Motor Resistance Between Lines	Yes	Yes
1313H	2313H	E2-06	Motor Leakage Inductance	Yes	Yes
1314H	2314H	E2-07	Motor Iron Core Saturation Co-Efficient 1	Yes	Yes
1315H	2315H	E2-08	Motor Iron Core Saturation Co-Efficient 2	Yes	Yes
1316H	2316H	E2-09	Motor Mechanical Loss	No	Yes
1317H	2317H	E2-10	Motor Iron Loss for Torque Compensation	Yes	Yes
1318H	2318H	E2-11	Motor Rated Capacity	Yes	Yes
1319H	2319H	E3-01	Motor 2 Control Mode Selection	Yes	Yes
131AH	231AH	E3-02	Motor 2 Max Output Frequency	Yes	Yes
131BH	231BH	E3-03	Motor 2 Max Voltage	Yes	Yes
131CH	231CH	E3-04	Motor 2 Max Voltage Frequency	Yes	Yes
131DH	231DH	E3-05	Motor 2 Mid Output Frequency	Yes	Yes
131EH	231EH	E3-06	Motor 2 Mid Output Frequency Voltage	Yes	Yes
131FH	231FH	E3-07	Motor 2 Minimum Output Frequency	Yes	Yes
1320H	2320H	E3-08	Motor 2 Minimum Output Frequency Voltage	Yes	Yes
1321H	2321H	E4-01	Motor 2 Rated Current	Yes	Yes
1322H	2322H	E4-02	Motor 2 Rated Slip	Yes	Yes
1323H	2323H	E4-03	Motor 2 De-Coupled Load Current	Yes	Yes
1324H	2324H	E4-04	Motor 2 Poles Count (number of poles)	Yes	Yes
1325H	2325H	E4-05	Motor 2 Resistance Between Lines	Yes	Yes
1326H	2326H	E4-06	Motor 2 Leakage Inductance	Yes	Yes
1327H	2327H	E4-07	Motor 2 Motor Rated Capacity	Yes	Yes

Command Code			Name	Drive	
Read	Write			F7	G7
1380H	2380H	F1-01	PG Parameter	Yes	Yes
1381H	2381H	F1-02	Operation Selection at PG Open Circuit (PGO)	Yes	Yes
1382H	2382H	F1-03	Operation Selection at Overspeed (OS)	Yes	Yes
1383H	2383H	F1-04	Operation Selection at Deviation	Yes	Yes
1384H	2384H	F1-05	PG Rotation Selection	Yes	Yes
1385H	2385H	F1-06	PG Division Rate (PG Pulse Monitor)	Yes	Yes
1386H	2386H	F1-07	Integral Function during Accel/Decel Selection	Yes	Yes
1387H	2387H	F1-08	Overspeed Detection Level	Yes	Yes
1388H	2388H	F1-09	Overspeed Detection Delay Time	Yes	Yes
1389H	2389H	F1-10	Excessive Speed Deviation (DEV) Detection Level	Yes	Yes
138AH	238AH	F1-11	Excessive Speed Deviation (DEB) Detection Time	Yes	Yes
138BH	238BH	F1-12	Number of PG Gear Teeth 1	Yes	Yes
138CH	238CH	F1-13	Number of PG Gear Teeth 2	Yes	Yes
138DH	238DH	F1-14	PG Disconnect Detection Time	Yes	Yes
138FH	238FH	F2-01	Analog Command Card Operation Selection	No	Yes
1390H	2390H	F3-01	Digital Command Card Input Selection	No	Yes
1391H	2391H	F4-01	CH1 Output Monitor Selection	Yes	Yes
1392H	2392H	F4-02	CH1 Output Monitor Gain	Yes	Yes
1393H	2393H	F4-03	CH2 Output Monitor Selection	Yes	Yes
1394H	2394H	F4-04	CH2 Output Monitor Gain	Yes	Yes
1395H	2395H	F4-05	CH1 Output Monitor Bias	Yes	Yes
1396H	2396H	F4-06	CH2 Output Monitor Bias	Yes	Yes
1397H	2397H	F4-07	Analog Output Signal Level CH1	Yes	Yes
1398H	2398H	F4-08	Analog Output Signal Level CH2	Yes	Yes
1399H	2399H	F5-01	CH1 Output Selection	Yes	Yes
139AH	239AH	F5-02	CH2 Output Selection	Yes	Yes
139BH	239BH	F5-03	CH3 Output Selection	Yes	Yes
139CH	239CH	F5-04	CH4 Output Selection	Yes	Yes
139DH	239DH	F5-05	CH5 Output Selection	Yes	Yes
139EH	239EH	F5-06	CH6 Output Selection	Yes	Yes
139FH	239FH	F5-07	CH7 Output Selection	Yes	Yes
13A0H	23A0H	F5-08	CH8 Output Selection	Yes	Yes
13A1H	23A1H	F5-09	DO-08 Output Mode Selection	Yes	Yes
13A2H	23A2H	F6-01	Operation Selection after Communication Error	Yes	Yes
13A3H	23A3H	F6-02	Selection of External Fault from Communication Option Board	Yes	Yes
13A4H	23A4H	F6-03	Stopping Method for External Fault from Communication Option Board	Yes	Yes
13A5H	23A5H	F6-04	Trace Sampling from Communications Option Board	Yes	Yes
13A7H	23A7H	F6-06	Torque Reference/Torque Limit Selection from Communications Option	No	Yes

Command Code			Name	Drive	
Read	Write			F7	G7
1400H	2400H	H1-01	Terminal S3 Function Selection	Yes	Yes
1401H	2401H	H1-02	Terminal S4 Function Selection	Yes	Yes
1402H	2402H	H1-03	Terminal S5 Function Selection	Yes	Yes
1403H	2403H	H1-04	Terminal S6 Function Selection	Yes	Yes
1404H	2404H	H1-05	Terminal S7 Function Selection	Yes	Yes
1405H	2405H	H1-06	Terminal S8 Function Selection	No	Yes
1406H	2406H	H1-07	Terminal S9 Function Selection	No	Yes
1407H	2407H	H1-08	Terminal S10 Function Selection	No	Yes
1408H	2408H	H1-09	Terminal S11 Function Selection	No	Yes
1409H	2409H	H1-10	Terminal S12 Function Selection	No	Yes
140BH	240BH	H2-01	Terminal M1-M2 Function Selection (Relay)	Yes	Yes
140CH	240CH	H2-02	Terminal P1 Function Selection (Open Corrector)	Yes	Yes
140DH	240DH	H2-03	Terminal P2 Function Selection (Open Corrector)	Yes	Yes
140EH	240EH	H2-04	Terminal P3 Function Selection (Open Corrector)	No	Yes
140FH	240FH	H2-05	Terminal P4 Function Selection (Open Corrector)	No	Yes
1410H	2410H	H3-01	Frequency Reference (Voltage) Terminal A1 Signal Level Selection	No	Yes
1411H	2411H	H3-02	Frequency Reference (Voltage) Terminal A1 Input Gain	Yes	Yes
1412H	2412H	H3-03	Frequency Reference (Voltage) Terminal A1 Input Bias	Yes	Yes
1413H	2413H	H3-04	Multi-Function Analog Input Terminal A3 Signal Level Selection	No	Yes
1414H	2414H	H3-05	Multi-Function Analog Input Terminal A3 Function Selection	No	Yes
1415H	2415H	H3-06	Multi-Function Analog Input Terminal A3 Input Gain	No	Yes
1416H	2416H	H3-07	Multi-Function Analog Input Terminal A3 Input Bias	No	Yes
1417H	2417H	H3-08	Multi-Function Analog Input Terminal A2 Signal Level Selection	Yes	Yes
1418H	2418H	H3-09	Multi-Function Analog Input Terminal A2 Function Selection	Yes	Yes
1419H	2419H	H3-10	Frequency Reference (Current) Terminal A2 Input Gain	Yes	Yes
141AH	241AH	H3-11	Frequency Reference (Current) Terminal A2 Input Bias	Yes	Yes
141BH	241BH	H3-12	Analog Input Filter Time Constant	Yes	Yes
141CH	241CH	H3-13	Terminal A1/ A2 Switch	Yes	No
141DH	241DH	H4-01	Multi-Function Analog Output 1 Terminal FM Monitor Selection	Yes	Yes
141EH	241EH	H4-02	Multi-Function Analog Output 1 Terminal FM Monitor Gain	Yes	Yes
141FH	241FH	H4-03	Multi-Function Analog Output 1 Terminal FM Monitor Bias	Yes	Yes
1420H	2420H	H4-04	Multi-Function Analog Output 2 Terminal AM Monitor	Yes	Yes
1421H	2421H	H4-05	Multi-Function Analog Output 2 Terminal AM Monitor Gain	Yes	Yes
1422H	2422H	H4-06	Multi-Function Analog Output 2 Terminal AM Monitor Bias	Yes	Yes
1423H	2423H	H4-07	Multi-Function Analog Output 1 Signal Level Selection	Yes	Yes
1424H	2424H	H4-08	Multi-Function Analog Output 2 Signal Level Selection	Yes	Yes
1425H	2425H	H5-01	Node Address	Yes	Yes
1426H	2426H	H5-02	Communication Speed Selection	Yes	Yes
1427H	2427H	H5-03	Communication Parity Selection	Yes	Yes
1428H	2428H	H5-04	Stopping Method After Communication Error	Yes	Yes
1429H	2429H	H5-05	Communication Error Detection Selection	Yes	Yes
142AH	242AH	H5-06	Drive Transmit Wait Time	Yes	Yes
142BH	242BH	H5-07	RTS Control Y/N	Yes	Yes
142CH	242CH	H6-01	Pulse Train Input Function Selection	Yes	Yes
142DH	242DH	H6-02	Pulse Train Input Scaling	Yes	Yes
142EH	242EH	H6-03	Pulse Train Input Gain	Yes	Yes
142FH	242FH	H6-04	Pulse Train Input Bias	Yes	Yes
1430H	2430H	H6-05	Pulse Train Input Filter Time	Yes	Yes
1431H	2431H	H6-06	Pulse Train Monitor Selection	Yes	Yes
1432H	2432H	H6-07	Pulse Train Monitor Scaling	Yes	Yes

Command Code			Name	Drive	
Read	Write			F7	G7
1480H	2480H	L1-01	Motor Overload Protection Selection	Yes	Yes
1481H	2481H	L1-02	Motor Overload Protection Time	Yes	Yes
1482H	2482H	L1-03	Motor Overheat Alarm Operation Selection	Yes	Yes
1483H	2483H	L1-04	Motor Overheat Fault Operation Selection	Yes	Yes
1484H	2484H	L1-05	Motor Temperature Input Filter Time	Yes	Yes
1485H	2485H	L2-01	Momentary Power Loss Detection Selection	Yes	Yes
1486H	2486H	L2-02	Momentary Power Loss Ridethru Time	Yes	Yes
1487H	2487H	L2-03	Momentary Power Loss Minimum Base Block Time	Yes	Yes
1488H	2488H	L2-04	Momentary Power Loss Voltage Recovery Ramp Time	Yes	Yes
1489H	2489H	L2-05	Undervoltage Detection Level	Yes	Yes
148AH	248AH	L2-06	KEB Deceleration Rate	Yes	Yes
148BH	248BH	L2-07	Momentary Recovery Time	Yes	Yes
148CH	248CH	L2-08	Frequency Reduction Gain at KEB Start	Yes	Yes
148FH	248FH	L3-01	Stall Prevention during Acceleration Function Selection	Yes	Yes
1490H	2490H	L3-02	Stall Prevention during Acceleration Level	Yes	Yes
1491H	2491H	L3-03	Stall Prevention during Acceleration Limit	Yes	Yes
1492H	2492H	L3-04	Stall Prevention during Deceleration Selection	Yes	Yes
1493H	2493H	L3-05	During Run Stall Prevention Function Selection	Yes	Yes
1494H	2494H	L3-06	During Run Stall Prevention Level	Yes	Yes
1499H	2499H	L4-01	Frequency Detection Level	Yes	Yes
149AH	249AH	L4-02	Frequency Detection Width	Yes	Yes
149BH	249BH	L4-03	Frequency Detection Level (+/-)	Yes	Yes
149CH	249CH	L4-04	Speed Agreement Detection Width (+/-)	Yes	Yes
149DH	249DH	L4-05	Operation Selection at Frequency Reference Loss	Yes	Yes
149EH	249EH	L5-01	Number of Auto Restart Attempts	Yes	Yes
149FH	249FH	L5-02	Auto Restart Operation Selection	Yes	Yes
14A1H	24A1H	L6-01	Overtorque / Undertorque Detection Operation Selection 1	Yes	Yes
14A2H	24A2H	L6-02	Overtorque / Undertorque Detection Level 1	Yes	Yes
14A3H	24A3H	L6-03	Overtorque / Undertorque Detection Time 1	Yes	Yes
14A4H	24A4H	L6-04	Overtorque / Undertorque Detection Operation Selection 2	Yes	Yes
14A5H	24A5H	L6-05	Overtorque / Undertorque Detection Level 2	Yes	Yes
14A6H	24A6H	L6-06	Overtorque / Undertorque Detection Time 2	Yes	Yes
14A7H	24A7H	L7-01	Forward Side Motoring Status Torque Limit	Yes	Yes
14A8H	24A8H	L7-02	Reverse Side Motoring Status Torque Limit	Yes	Yes
14A9H	24A9H	L7-03	Forward Side Regen Status Torque Limit	Yes	Yes
14AAH	24AAH	L7-04	Reverse Side Regen Status Torque Limit	Yes	Yes
14ADH	24ADH	L8-01	Installed Braking Resistor Protection (ERF)	Yes	Yes
14AEH	24AEH	L8-02	Inverter Overheat (OH) Alarm Warning Detection Level	Yes	Yes
14AFH	24AFH	L8-03	Inverter Overheat (OH) Alarm Warning Operation Selection	Yes	Yes
14B1H	24B1H	L8-05	Input Phase Protection Selection	Yes	Yes
14B3H	24B3H	L8-07	Output Phase Protection Selection	Yes	Yes
14B5H	24B5H	L8-09	Ground Protection Selection	Yes	Yes
14B6H	24B6H	L8-10	Cooling Fan ON/OFF Control	Yes	Yes
14B7H	24B7H	L8-11	Cooling Fan ON/OFF Delay Time	Yes	Yes
14B8H	24B8H	L8-12	Ambient Temperature	Yes	Yes
14BBH	24BBH	L8-15	OL2 Selection Characteristic Selection at Low Speeds	Yes	Yes
14BFH	24BFH	L8-18	Software CLA Selection	Yes	Yes

Command Code			Name	Drive	
Read	Write			F7	G7
1580H	2580H	n1-01	Hunting Prevention Function Selection	Yes	Yes
1581H	2581H	n1-02	Hunting Prevention Gain	Yes	Yes
1584H	2584H	n2-01	Speed Feedback Detection Control (AFR) Gain	Yes	Yes
1585H	2585H	n2-02	Speed Feedback Detection Control (AFR) Time Constant	Yes	Yes
1586H	2586H	n2-03	Speed Feedback Detection Control (AFR) Time Constant 2	Yes	Yes
1588H	2588H	n3-01	High Slip Braking Deceleration Frequency Width	Yes	Yes
1589H	2589H	n3-02	High Slip Braking Current Limit	Yes	Yes
158AH	258AH	n3-03	High Slip Braking Dwell Time at Stop	Yes	Yes
158BH	258BH	n3-04	High Slip Braking Overload Time	Yes	Yes
159AH	259AH	n4-07	Observer Integral Time	No	Yes
1500H	2500H	o1-01	User Monitor Selection	Yes	Yes
1501H	2501H	o1-02	User Monitor Selection After Power-Up	Yes	Yes
1502H	2502H	o1-03	Digital Operator Display Selection	Yes	Yes
1503H	2503H	o1-04	Setting unit for frequency parameters related to V/F characteristics	No	Yes
1504H	2504H	o1-05	LCD Brightness Adjustment	No	Yes
1505H	2505H	o2-01	Local/Remote Key Function Selection	Yes	Yes
1506H	2506H	o2-02	STOP Key Function Selection	Yes	Yes
1507H	2507H	o2-03	User Parameter Default Value	Yes	Yes
1508H	2508H	o2-04	Drive/kVA Selection	Yes	Yes
1509H	2509H	o2-05	Frequency Reference Setting Method Selection	Yes	Yes
150AH	250AH	o2-06	Operation Selection when Digital Operator is Disconnected	Yes	Yes
150BH	250BH	o2-07	Cumulative Operation Time Setting	Yes	Yes
150CH	250CH	o2-08	Cumulative Operation Time Selection	Yes	Yes
150EH	250EH	o2-10	Cumulative Cooling Fan Operation Time Setting	Yes	Yes
1510H	2510H	o2-12	Fault Trace / Fault History Clear Selection	No	Yes
1515H	2515H	o3-01	Copy Function Selection	Yes	Yes
1516H	2516H	o3-02	Copy Allowed Selection	Yes	Yes
1700H	2700H	T1-00	Motor 1 / Motor 2 Selection	Yes	Yes
1701H	2701H	T1-01	Tuning Mode Selection	Yes	Yes
1702H	2702H	T1-02	Motor Output Power	Yes	Yes
1703H	2703H	T1-03	Motor Rated Voltage	Yes	Yes
1704H	2704H	T1-04	Motor Rated Current	Yes	Yes
1705H	2705H	T1-05	Motor Base Frequency	Yes	Yes
1706H	2706H	T1-06	Number of Motor Poles	Yes	Yes
1707H	2707H	T1-07	Motor Base RPMs	Yes	Yes
1708H	2708H	T1-08	Number of PG Pulses	No	Yes

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The revision dates and numbers of the revised manuals are given on the bottom of the back cover.

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Varispeed G7/F7 OPTION CARD CC-Link COMMUNICATIONS INTERFACE CARD USER'S MANUAL

IRUMA BUSINESS CENTER (SOLUTION CENTER)

480, Kamifujisawa, Iruma, Saitama 358-8555, Japan
Phone 81-4-2962-5696 Fax 81-4-2962-6138

YASKAWA ELECTRIC AMERICA, INC.

2121 Norman Drive South, Waukegan, IL 60085, U.S.A.
Phone 1-847-887-7000 Fax 1-847-887-7370

YASKAWA ELÉTRICO DO BRASIL COMÉRCIO LTD.A.

Avenida Fagundes Filho, 620 Bairro Saude-Sao Paulo-SP, Brazil CEP: 04304-000
Phone 55-11-5071-2552 Fax 55-11-5581-8795

YASKAWA ELECTRIC EUROPE GmbH

Am Kronberger Hang 2, 65824 Schwalbach, Germany
Phone 49-6196-569-300 Fax 49-6196-569-312

YASKAWA ELECTRIC UK LTD.

1 Hunt Hill Orchardton Woods Cumbernauld, G68 9LF, United Kingdom
Phone 44-1236-735000 Fax 44-1236-458182

YASKAWA ELECTRIC KOREA CORPORATION

7F, Doore Bldg. 24, Yeoido-dong, Youngdungpo-Ku, Seoul 150-877, Korea
Phone 82-2-784-7844 Fax 82-2-784-8495

YASKAWA ELECTRIC (SINGAPORE) PTE. LTD.

151 Lorong Chuan, #04-01, New Tech Park 556741, Singapore
Phone 65-6282-3003 Fax 65-6289-3003

YASKAWA ELECTRIC (SHANGHAI) CO., LTD.

No.18 Xizang Zhong Road. Room 1702-1707, Harbour Ring Plaza Shanghai 200001, China
Phone 86-21-5385-2200 Fax 86-21-5385-3299

YASKAWA ELECTRIC (SHANGHAI) CO., LTD. BEIJING OFFICE

Room 1011A, Tower W3 Oriental Plaza, No.1 East Chang An Ave.,
Dong Cheng District, Beijing 100738, China
Phone 86-10-8518-4086 Fax 86-10-8518-4082

YASKAWA ELECTRIC TAIWAN CORPORATION

9F, 16, Nanking E. Rd., Sec. 3, Taipei, Taiwan
Phone 886-2-2502-5003 Fax 886-2-2505-1280



YASKAWA ELECTRIC CORPORATION

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