

Programmable Controller

**MELSEC iQ-F** MELSEC iQ-F Sample Ladder Reference for FX5 and Power Distribution Measuring Instrument with RS-485 Communication (MODBUS RTU Protocol) (Overseas)

## CONTENTS

CHAPTER 1 SAMPLE LADDER LIST	2
CHAPTER 2 SAMPLE LADDER	4
2.1 Data Read	4
2.2 Data Write	
REVISIONS	
TRADEMARKS	

# **1** SAMPLE LADDER LIST

This program is sample ladder for a system where the MELSEC iQ-F series FX5U/FX5UC CPU module is connected to power distribution measuring instruments with RS-485 communication (MODBUSR RTU protocol) (hereafter "power distribution measuring instruments").

Name	Description	Version
Data Read	Reads measurement data from power distribution measuring instruments.	Ver.1.00A
Data Write	Writes setting values to power distribution measuring instruments.	Ver.1.00A

## System configuration

The following figure shows the system configuration for this sample ladder.



#### Up to 31 instruments

No.	Name	Description
1	FX5U(C)	Built-in RS-485 port
	FX5U + FX5-485-BD	RS-485 communication expansion port
	FX5U(C) + FX5-485ADP	RS-485 communication expansion adapter
2	ME110SSR-MB ME96SSEA-MB ME96SSRA-MB ME96SSHA-MB	Electronic multi-measuring instrument
3	EMU4-BD1-MB EMU4-HD1-MB EMU4-FD1-MB	Energy measuring unit
4	EMU4-BM1-MB EMU4-HM1-MB EMU4-LG1-MB	Energy measuring unit
5	EMU4-A2	Mitsubishi energy measuring unit (energy measuring extension unit for same voltage system)
	EMU4-VA2	Mitsubishi energy measuring unit (energy measuring extension unit for different voltage system)
	EMU4-PX4	Mitsubishi energy measuring unit (pulse input unit)
	EMU4-AX4	Mitsubishi energy measuring unit (analog input unit)

### Prerequisites for using sample ladder

The sample ladder is provided for the model whose name is included in the project name, shown as below.

Ex.

For the following project name, the FX5U/FX5UC model is applicable.

LD-FX5U\_DDD\_DDD\_V100A\_J

Operation of the provided project is not guaranteed for user systems. Check and set device assignments, parameters, and other settings in accordance with the user system specifications.

#### Wiring and communication setting

This program requires wiring and communication settings, such as setting station numbers of a CPU module and power distribution measuring instruments and transmission speed, before communications. For the details on the wiring and communication setting methods, refer to the operating manual of each power distribution measuring instrument, and for the CPU module to the L MELSEC iQ-F FX5 User's Manual (MODBUS Communication).

#### **Related manuals**

MELSEC iQ-F FX5 Programming Manual (Instructions, Standard Functions/Function Blocks)

MELSEC iQ-F FX5 User's Manual (Application)

MELSEC iQ-F FX5 User's Manual (MODBUS Communication)

Electronic Multi-Measuring Instrument User's Manual: Detailed Edition (ME110SSR-MB Series)

Electronic Multi-Measuring Instrument User's Manual: Detailed Edition (ME110SSR-MB Series) (Three phase 4-wire)

Electronic Multi-Measuring Instrument MODBUS Interface specifications (ME110SSR-MB Series)

Electronic Multi-Measuring Instrument User's Manual: Detailed Edition (ME96SSEA-MB Series)

Electronic Multi-Measuring Instrument User's Manual: Detailed Edition (ME96SSRA-MB Series)

Electronic Multi-Measuring Instrument User's Manual: Detailed Edition (ME96SSHA-MB Series)

Electronic Multi-Measuring Instrument MODBUS Interface specifications (ME96SSEA-MB, ME96SSRA-MB, ME96SSHA-MB Series)

Energy Measuring Unit User's Manual (Details) (EMU4-BD1-MB, EMU4-HD1-MB)

Details) (EMU4-BM1-MB, EMU4-HM1-MB) EMU4-HM1-MB)

Energy Measuring Unit User's Manual (Details) (EMU4-LG1-MB)

Energy Measuring Unit User's Manual (Details) (EMU4-A2, EMU4-VA2)

Energy Measuring Unit User's Manual (Details) (EMU4-PX4, EMU4-AX4)

Denergy Measuring Unit EcoMonitorLight/EcoMonitorPlus MODBUS Interface specifications (EMU4-BD1-MB, EMU4-

HD1-MB, EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB, EMU4-A2, EMU4-VA2, EMU4-PX4, EMU4-AX4)

Energy Measuring Unit User's Manual (Details) (EMU4-FD1-MB)

Energy Measuring Unit EcoMonitorLight MODBUS Interface specifications (EMU4-FD1-MB)

#### Notice

This manual includes information related to the functions of the sample ladder. It does not include information on restrictions of use such as combination with programmable controller, each expansion board, expansion adapter or expansion device. Please make sure to read user's manuals for the corresponding products before using the products.

## 2.1 Data Read

### Name

Data Read

## Outline

Reads measurement data from power distribution measuring instruments.

## Programs used

This program is used for the FX5U and FX5UC.

The following table shows the project used in this program.

No.	Project name	Program name	Remark
1	LD-FX5U_e-MEASURE-MB_V100A_J	01_Data Read	This project is created with the FX5U or FX5UC.

### **Devices used**

The following table lists the devices used in this program.

#### ■Input device

No.	Device name	Data type	Туре	Device comment	Remark
1	M0	Bit	Input	Execution Command	ON: The program is activated. OFF: The program is not activated.
2	M1	Bit	Input	Dedicated Instruction Execute Flag	ON: The MODBUS communication is performed using dedicated instructions. OFF: The MODBUS communication is not performed.
3	D0	Word [Signed]	Input	Number of Settings	Specifies the number of the target power distribution measuring instruments to be set with Setting Parameter (R0 to R5099). [Setting range (decimal)] 1 to 255

No.	Device name	Data type	l	Туре	Device o	comment	Remark
4 R0 to R5	R0 to R5099	Word [Signe	ed]	Input	Setting Pa	arameter	Sets the parameters of the connected power distribution measuring instruments (station numbers, numbers of sends/ receives, and register address of measurement item).
		Register the measuremen The followin ■Configurat	e setting d ent circuit. ng shows a tion of Se	ata for the me a configuration tting Paramete	easurement n of the sett er	circuits set with Number	of Settings (D0). Setting Parameter uses 20 words for a single
		Device	Descriptio	on		Setting range	
		S1	Station nu	umber		1 to 32 (decimal)	
		S1+1	Number of	of sends/receives		0 to 16 (decimal)	
		S1+2	Measurer	ment item (1) regis	ster address	The setting range depends	
		S1+3	Measurer	ment item (2) regis	ster address	on the target power	
		S1+4	Measurer	ment item (3) regis	ster address	distribution measuring	
		S1+5	Measurer	ment item (4) regis	ster address	instrument.	
		S1+6	Measurer	ment item (5) regis	ster address	Refer to the MODBUS	
		S1+7	Measurer	ment item (6) regi	ster address	interface specifications of	
		S1+8	Measurer	ment item (7) regis	ster address	each power distribution	Setting data for a
		<u>S1+9</u>	Measurer	ment item (8) regis	ster address	measuring instrument.	> single measurement
		<u>S1+10</u>	Measurer	ment item (9) regis	ster address		circuit (setting 1)
		<u>S1+11</u>	Measurer	ment item (10) reg	jister address	-	
		<u>S1+12</u>	Measurer	ment item (11) reg	gister address	-	
		<u>S1+13</u>	Measurer	ment item (12) reg	jister address	-	
		<u>S1+14</u>	Measurer	ment item (13) reg	lister address	-	
		<u>S1+15</u>	Measurer	nent item (14) reg	lister address	-	
		S1+10 S1+17	Measurer	ment item (15) reg	lister address	-	
		S1+17 S1+19	Spore	nent tterri (16) reg	lister address		
		S1+10 S1+10	Spare				
		S1+19 S1+20	Station n	umbor			
		S1+21	Number o	of sends/receives			
		01121	INdiliber	n sends/receives	:	<u> </u>	~
		S1+n×20-3	Measurer	ment item (16) reg	jister address		Setting data for a
		S1+n×20-2	Spare	. , ,			> single measurement
		S1+n×20-1	Spare				circuit (setting n)

## ■Output device

No.	Device	Data type	Туре	Device comment	Remark			
	name							
1	M100	Bit	Output	Execution Status	ON: The execution command is on. OFF: The execution command is off.			
2	M101	Bit	Output	Normal Completion	When this label is on, it indicates that the processing has been completed.			
3	Y0	Bit	Output	Error Completion	When this label is on, it indicates that an error has occurred in the program.			
4	D100	Word [Signed]	Output	Error Code	Stores the error code that occurred in the program.			
5	R5100 to R13259	Word [Signed]	Output	Output Data	Outputs the measurement data of power distribution measuring instruments. [Initial value] Holds the previous value.			
		Output Data uses 32 When the measureme ■Configuration of Out	words for a si ent data cann tput Data	ngle setting. ot be obtained, the previous output da	ata is held.			
		Device Descriptio	n					
S2, S2+1       Setting 1       Measurement data of the measurement item (1)         S2+2, S2+3       Measurement data of the measurement item (2)         S2+4, S2+5       Measurement data of the measurement item (3)         S2+4, S2+5       Measurement data of the measurement item (4)         S2+4, S2+5       Measurement data of the measurement item (5)         S2+10, S2+11       Measurement data of the measurement item (6)         S2+12, S2+13       Measurement data of the measurement item (7)         S2+14, S2+15       Measurement data of the measurement item (7)         S2+14, S2+15       Measurement data of the measurement item (10)         S2+12, S2+13       Measurement data of the measurement item (11)         S2+20, S2+21       Measurement data of the measurement item (12)         S2+20, S2+21       Measurement data of the measurement item (12)         S2+22, S2+23       Measurement data of the measurement item (12)         S2+24, S2+25       Measurement data of the measurement item (12)         S2+23, S2+33       Setting 1         Measurement data of the measurement item (16)       S2+34, S2+35         Measurement data of the measurement item (16)       S2+34, S2+35         S2+11, S2+11       Measurement data of the measurement item (16)         S2+32, S2+33       Setting 1         Measurement data of the measur				ta of the measurement item (1) ta of the measurement item (2) ta of the measurement item (3) ta of the measurement item (3) ta of the measurement item (3) ta of the measurement item (6) ta of the measurement item (7) ta of the measurement item (10) ta of the measurement item (11) ta of the measurement item (12) ta of the measurement item (13) ta of the measurement item (14) ta of the measurement item (15) ta of the measurement item (16) ta of the measurement item (17) ta of the measurement item (16) ta of the measurement item (17) ta of the measurement item (16) ta of the measurement item (17) ta of the measurement item (16) ta of the measurement item (16) ta of the measurement item (17) ta of the measurement item (16) ta of the measurement item (17) ta of the measurement item (16) ta of the measurement item (17) ta of the measurement item (16) ta of the measurement item (17) ta of the measurement item (18) ta of the measurement item (19) ta of the measurement item (18) ta of t	Output data (setting 1) Output data (setting 2) Output data (setting n) S in Number of Settings (D0). seed for Output Data (R5100 to R13259). Outputs the error codes and error measurement items of the error station.			
		■Configuration of Erro	or Station Out	put				
		Device Description	n measurement iter	m error bit				
		S3         Seturing Threadouring The destine of each bit and measurement item.           Bit         F         E         D         C         B         A         9         8         7         6         5         4         3         2         1         0           Measurement item         (16)         (15)         (14)         (13)         (12)         (11)         (10)         (9)         (8)         (7)         (6)         (5)         (4)         (3)         (2)         (11)           C014         Setting 1 array and         1         (13)         (12)         (11)         (10)         (9)         (8)         (7)         (6)         (5)         (4)         (3)         (2)         (1)						
		S3+1         Setting 1           S3+2         Setting 2	measurement iter	m error bit				
		S3+3 Setting 2	S3+3  Setting 2 error code					
		: S3+n×2-2 Setting n measurement item error bit S3+n×2-1 Setting n error code						
		* S3 corresponds to F	R13260. "n" in	dicates the number of settings in Num	nber of Settings (D0). er Station Output (D12260 to D12760)			
		bit corresponding to the measurement item with an error turns						
		Example: When an er	ror occurs wh ement item er	nue the measurement data of the mea ror bit (S3) turns on.	surement item (1) in the setting 1			
		The error code is stor Error Code	ed in the setti	ng 1 error code (S3+1).				
		Error code (hexadecima	al) Description	1	Action			
		1001H	The station R5099) is c	number in Setting Parameter (R0 to but of the setting range.	Check the station number in Setting Parameter (R0 to R5099).			
		1002H	The numbe (R0 to R50	er of sends/receives in Setting Paramete 99) is out of the setting range.	r Check the number of sends/receives in Setting Parameter (R0 to R5099).			
		error code	The error of MODBUS	ode is the same as that occurs in the serial communication.	Refer to AMELSEC iQ-F FX5 User's Manual (MODBUS Communication).			

#### ■Internal device

No.	Device	Data type	Туре	Device comment	Remark
	name				
1	M200	Bit	Internal	Setting Data Check Command	Holds the check command flag of setting data.
2	M202	Bit	Internal	Execution Command Before Start Main Process	Holds the execution command flag of the process before the start of main process.
3	M204	Bit	Internal	Main Process Execution Completed	Holds the execution completion flag of the main process.
4	M205	Bit	Internal	Program Error	Holds the error flag of the program.
5	M210	Bit	Internal	Program Completion Pulse	Holds the pulse flag of program completion.
6	M211	Bit	Internal	Setting Parameter Read	Holds the read flag of the setting parameter.
7	M212	Bit	Internal	Transition to Next Setting Parameter	Holds the transition flag of the next setting parameter.
8	M213	Bit	Internal	Confirm Program Completion	Holds the confirmation flag of program completion.
9	M214	Bit	Internal	Setting Parameter Error	Holds the error flag of the setting parameter.
10	M215	Bit	Internal	Data Send/Receive	Holds the data send/receive flag.
11	M216	Bit	Internal	Control Data Set	Holds the control data set flag.
12	M217	Bit	Internal	Register Address 4-Byte Data	Holds the flag of register address 4-byte data.
13	M218	Bit	Internal	Register Address Bit Data	Holds the flag of the register address bit data.
14	M219	Bit	Internal	ADPRW Instruction Execution	Holds the ADPRW instruction execution flag.
15	M220	Bit	Internal	ADPRW Instruction Executing	Holds the ADPRW instruction executing flag.
16	M221	Bit	Internal	Register Address H8000 or Higher	Holds the flag of register address H8000 or higher.
17	M222	Bit	Internal	Read Normal Completion	Holds the read normal completion flag.
18	M223	Bit	Internal	Read Error Completion	Holds the read error completion flag.
19	M224	Bit	Internal	Read Completion	Holds the read completion flag.
20	M225 to M227	Bit (02)	Internal	Instruction Completion Flag	Holds the instruction completion flag.
21	D50 to D51	Double word [Signed]	Internal	Setting Parameter Start Address	Holds the start address of the setting parameter.
22	D52 to D53	Double word [Signed]	Internal	Setting Parameter Address Offset	Holds the address offset of the setting parameter.
23	D54 to D55	Double word [Signed]	Internal	Output Data Start Address	Holds the start address of the output parameter.
24	D56 to D57	Double word [Signed]	Internal	Output Data Offset	Holds the offset of the output data.
25	D58 to D59	Double word [Signed]	Internal	Output Data Address Offset	Holds the address offset of the output data.
26	D60 to D61	Double word [Signed]	Internal	Output Data TMP	Holds the output data temporarily.
27	D62 to D63	Double word [Signed]	Internal	Error Station Output Start Address	Holds the output start address of the error station.
28	D64 to D65	Double word [Signed]	Internal	Error Station Output Address Offset	Holds the output address offset of the error station.
29	D66 to D67	Word [Signed] (01)	Internal	Error Station Output TMP	Holds the output from the error station temporarily.
30	D68 to D69	Word [Signed] (01)	Internal	Read Data Storage Device	Holds the read data from the connected devices.
31	D70 to D71	Word [Signed] (01)	Internal	Address Backup	Backs up the address.
32	D72 to D88	Word [Signed] (016)	Internal	Setting Data	Holds the setting data.
33	D89	Word [Signed]	Internal	Number of Settings	Holds the specified number.
34	D90	Word [Signed]	Internal	Access Points	Holds the access points.
35	D91	Word [Signed]	Internal	Read Register Address	Holds the read register address.
36	D92	Word [Signed]	Internal	Number of Data Processing Times	Holds the number of data processing times.
37	D93	Word [Signed]	Internal	Setting Read Count	Holds the setting read count.
38	D94	Word [Signed]	Internal	Error Station Output TMP	Holds the error station output TMP.
39	D95	Word [Signed]	Internal	Number of Transitions to Next Setting Parameter	Holds the number of transitions to the next setting parameters.

No.	Device name	Data type	Туре	Device comment	Remark
40	D96	Word [Signed]	Internal	Setting Station Number	Holds the setting station number.
41	D99	Word [Signed]	Internal	For Z9 Register Backup	Backs up the register Z9.

## **Details of functions**

Item	Description					
Applicable device	CPU module	FX5U CPU, FX5UC CPU				
	Engineering tool	GX Works3 Version 1.031H or later				
Language	Ladder	·				
Number of basic steps	1160 steps The number of steps of the FB in a prog setting in GX Works3. For the option se	gram depends on the CPU module used, input and output definition, and the option tting in GX Works3, refer to 🛄 GX Works3 Operating Manual.				
Processing	<ul> <li>When Execution Command (M0) and Dedicated Instruction Execute Flag (M1) are turned on, this program reads data from power distribution measuring instruments set with Setting parameter (R0 to R5099).</li> <li>If an incorrect value is specified, Error Completion (Y0) turns on and the processing is suspended. In addition, the error code is stored in Error Code (D100).</li> <li>Note: This sample ladder backs up or recovers the index register. When the index register value need not to be held in other programs, the backup/recovery processing is not required.</li> </ul>					
Timing chart of I/O signals	[For normal completion] (Execution Command) (Dedicated Instruction Execute Flag) M100 (Execution Status) MODBUS communication processing R5100 to R13259 (Output Data) (Normal Completion) • When Execution Command (M0) is tu • When Dedicated Instruction Execute • When Dedicated Instruction Execute current processing is completed. • When Dedicated Instruction Execute current processing is completed. • When Dedicated Instruction Execute from the measurement item next to tf • When the MODBUS communication (R5100 to R13259). • When Dedicated Instruction Execute from the measurement item next to tf • When the MODBUS communication and Normal Completion (M101) turns • When Execution Command (M0) is tu is completed Consequently this proc	Setting 1 Setting 1				

Item	Description					
Timing chart of I/O signals	[For error completion]					
	M0 (Execution Command) M100 (Execution Status) Y0 (Error Completion) D100 (Error Code) R13260 to R13769 (Error Station Output) 0H					
	[For MODBUS communication error]					
	M0 (Execution Command) M100 (Execution Status)					
	Y0 (Error Completion)					
	D100 (Error Code)					
	R13260 to R13769 (Error Station Output) 0H Error code					
	<ul> <li>When Execution Command (M0) is turned on, Error Code (D100) and Error Station Output (R13260 to R13769) are reset (0).</li> <li>[For error completion]</li> <li>When an error occurs in the setting parameter, the error code is stored in Error code (D100), Error Completion (Y0) turns on for one pulse, and Execution Status (M100) turns off. Consequently, this program ends.</li> <li>[For MODBUS communication error]</li> <li>The error station and error code are output to Error Station Output (R13260 to R13769), and the next MODBUS communication processing is performed.</li> </ul>					
Restrictions and precautions	This program does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation.					
	This program cannot be used as an interrupt program.					
	<ul> <li>Do not use this program with programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because Execution Command (M0) cannot be turned off and the normal operation cannot be performed. Always use this program with programs that can turn off Execution Command (M0).</li> <li>This program uses the index register Z9.</li> <li>Setting Parameter (P0 to P5090) uses word devices of "value of Number of Settings (D0) × 20".</li> </ul>					
	<ul> <li>Output Data (R5100 to R13259) uses word devices of "value of Number of Settings (D0) × 20.</li> </ul>					
	<ul> <li>Error Station Output (R13260 to R13769) uses word devices of "value of Number of Settings (D0) × 2".</li> <li>Do not use any device in the area where the internal user device, data register (D), and link register (W) are consecutive.</li> </ul>					

Error Code						
Error code (decimal)	Description	Action				
11	A value out of the setting range is set in Number of Settings (D0).	Review Number of Settings (D0), and execute the program again.				
13	No setting is configured in Setting Parameter (R0 to R5099).	Review the setting values (station number setting and number of sends/receives) of Setting Parameter (R0 to R5099), and execute the program again.				

## Version upgrade history

Version	Date	Description
Ver.1.00A	2017/3	First edition

## Program

Write	-	1	2	3	4	5	6	7	8	9	10	11	12
1	*Sample Ladd	er Name: LD-f	FX5U_e-MEA	SURE-MB_V	100A_E								
2	*Function: Dat	ta Read											
3	*Version: Ver.	1.00A											
4	*Process of In	itializing Progr	am										
5												*Execution Cor	mmand of Proce
		MO											
						·						-	M202
~	(0)											DOT	Execution
0	(0)	Execution										Roi	Command
		Command											Main Process
7												*Setting Data (	Check Command
			<u> </u>									-	M200
													Setting Data
8												RST	Check
													Command
0												*Normal Compl	etion: OEE
5												- Norman Compr	
			L									-	M101
													Normal
10												RST	Completion
11												*Error Complet	
												-	VO
													Error
12												RST	Completion
13												*Program Error	OFF
													14005
													1/1/2/05
14												RST	Program Error
14												1.01	

Write	*	1	2	3	4	5	6	7	8	9	10	11	12
15												*Main Process	Execution Com
													1400.1
													Main Presson
16												RST	Execution
													Comp leted
17												*Data Sand/Re	ceive: OFF
1/												Data Genarite	JOSING, OFT
					0 0 0 0 0 0							-	M215
10												DOT	Data
10												No1	Send/Receive
19												*Control Data S	Set: OFF
												-	M216
													Control Data
20												RST	Set
21												*Transition to 1	Vext Setting Pa
												-	M212
22												RST	Transition to
													Parameter
23												*Setting Param	eter Read: OFF
												- cotting r aran	
												-	M211
24												PST	Setting
24												Rot	Parameter Read
25													
23												moetting Haram	eter Enur. Or'F
												-	M214
26												DOT	Setting
26												RST	Parameter Error
27												*ADPRW Instru	ction Execution
												-	M219
													ADPRW
28												RST	Instruction
													Execution
29												*Program Comp	letion Check
													Moto
													MI213
30												SET	Program
													Completion
		1											

Write	- 1	2	3	4	5	6	7	8	9	10	11	12
31	*Process of Program Comp	oletion										
32											*Program Comp	oletion Check
	M213	M220										
33	(45) Confirm Program Completion	ADPRW Instruction Executing									RST	M213 Confirm Program Completion
24											WEynou tion Oto	
34											Mecution Stat	
											-	M100
35											RST	Execution Status
36											*Register Addre	ess 4-byte Dat
											_	M017
37											RST	Register Address 4-Byte Data
20											WDordston Addr	non Rit Doto: O
38											Augister Auure	essibili Dala, O
											-	M218
39											RST	Register Address Bit Data
40											Minstruction Co	mpletion Flag
41											RST	M225 Instruction Completion Flag [0]
42											Winetruction Co	mplotion Flag
72											Panstruction CU	mpletion Flag
43											RST	M226 Instruction Completion Flag [1]
44											Minstruction Co	mnletion Flag
											- Aber aber a ber	mpsecion nag
45											RST	M227 Instruction Completion Flag [2]

Write	<b>*</b>	1	2	3	4	5	6	7	8	9	10	11	12
46			Ì									*Register Add	Iress H8000 or Hi
											-	-	M221
													Register
47												RST	Address H8000
													or Higher
40												WDood Norma	Completion: OFF
40												reau Norma	Completion. OFF
												-	M222
													Read Normal
49												RST	Completion
50												*Read Error (	Completion: OFF
												_	14000
													M223
51												RST	Read Error
51												1.01	Completion
52												*Read Comple	etion: OFF
												-	M224
												DOT	Read
53												RST	Completion
E4 14	Poole in Dimono	f Inday Da							1		<u>.</u>		
134 14	Laukup Fiuues	IS OF INDEX RE	egister										
55	Lackup Frotes	IS OT INDEX RE	egister								*Z9 Register	Backup	
55		SM400	gister								*Z9 Register	Backup	
55		SM400	gister								*Z9 Register	Backup Z9	D99
55		SM400	gister								*Z9 Register	Backup Z9	D99 For Z9 Register
55 56	(83) AI	SM400	gister								*Z9 Register	Backup Z9	D99 For Z9 Register Backup
55	(83) <sub>AI</sub>	SM400 M400 Ways ON	egister								*Z9 Register	Backup Z9	D99 For Z9 Register Backup
55	(83) <sub>A1</sub>	SM400 — I I IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	egister								*Z9 Register MOV	Backup Z9	D99 For Z9 Register Backup
55 56 57	(83) <sub>A1</sub>	SM400 — I I — — Iways ON	egister								*Z9 Register MOV	Backup Z9 Initialize	D99 For Z9 Register Backup
55 56 57	(83) <sub>A1</sub>		gister								*Z9 Register MOV *Z9 Register	Backup Z9 Initialize	D99 For Z9 Register Backup
55 56 57	(83) AI	S OT INDEX RE SM400	gister								*Z9 Register MOV *Z9 Register	Backup Z9 Initialize	D99 For Z9 Register Backup
55 56 57	(83) AI	SM400 M400 Mays ON	gister								*Z9 Register MOV *Z9 Register	Backup 29 Initialize K0	D99 For Z9 Register Backup Z9
55 56 57 58	(83) <sub>A1</sub>	SM400	gister								*29 Register MOV *29 Register MOV	Backup Z9 Initialize K0	D99 For Z9 Register Backup Z9
55 56 57 58	(83) AI	SM400	gister								*29 Register MOV *29 Register MOV	Backup 29 Initialize K0	D99 For Z9 Register Backup Z9
55 56 57 58	(83)	SM400 M400 Iways ON	gister								*29 Register MOV *29 Register MOV	Backup 29 Initialize K0	D99 For Z9 Register Backup Z9
55 56 57 58 59	(83) AI	SM400 SM400 Iways ON Iways ON	and								*29 Register MOV *29 Register MOV	Backup 29 Initialize K0	D99 For Z9 Register Backup Z9
55 56 57 58 59 *	(83) AI	SM400 SM400 Iways ON Iways ON	nand								*29 Register MOV *29 Register MOV	Backup Z9 Initialize K0	D99 For Z9 Register Backup Z9
56 57 58 59 *	(83) AI	SM400 I Iways ON ways ON	and								*29 Register MOV *29 Register MOV	Backup Z9 Initialize K0	D99 For Z9 Register Backup Z9
56 57 58 59 *	(83) AI	SM400 SM400 Iways ON Iways ON Iways ON M0 IN	nand								*29 Register MOV *29 Register MOV	Backup 29 Initialize K0 *Execution Co	D99 For Z9 Register Backup Z9 Z9 mmmand of Proce
56 57 58 59 *	(83) AI	SM400 SM400 Iways ON Iways ON M0 M0	and								*Z9 Register MOV *Z9 Register MOV	Backup 29 Initialize K0 *Execution Co	D99 For Z9 Register Backup Z9 Z9 mmand of Proce M202 Execution
56 57 58 59 * 60	(83) AI	SM400 SM400 Iways ON Iways ON Iw	and								*29 Register MOV *29 Register MOV	Eackup 29 Initialize K0 *Execution Co SET	D99 For Z9 Register Backup Z9 Z9 Mmmand of Proce M202 Execution Command
55           56           57           58           59           60           61	(83) A1	SM400 SM400 Iways ON Iways ON Wo M0 M1 xecution sommand	and								*29 Register MOV *29 Register MOV	Eackup Z9 Initialize K0 *Execution Co SET	D99 For Z9 Register Backup Z9 Z9 M202 Execution Command Before Start Main Breace
56 57 58 59 ¥ 60	(83) AI	SM400 SM400 Iways ON Iways ON Iw	nand								*29 Register MOV *29 Register MOV	Backup 29 Initialize K0 *Execution Co SET	D99 For Z9 Register Backup Z9 Z9 mmand of Proce M202 Execution Command Before Start Main Process
56 57 58 60 61	(83) A1	SM400 SM400 Iways ON Iways ON Iw	and								*Z9 Register MOV *Z9 Register MOV	Backup Z9 Initialize K0 *Execution Co SET *Execution Co	D99 For Z9 Register Backup Z9 Z9 mmand of Proce M202 Execution Command Before Start Main Process
55           56           57           58           59           60           61           62	(83) AI	SM400 SM400 Iways ON Iways ON Iw	and								*29 Register MOV *29 Register MOV	Backup Z9 Initialize K0 *Execution Co SE T *Execution St	D99 For Z9 Register Backup Z9 Z9 mmand of Proce M202 Execution Command Before Start Main Process atus: ON
55         56           57         58           59         *           60         61           62         62	(83) A1	SM400 SM400 Iways ON Iways ON Iways ON Secution Comm M0 IN xecution command	nand								*29 Register MOV *29 Register MOV	Backup Z9 Initialize K0 *Execution Co SET *Execution St	D99 For Z9 Register Backup Z9 Z9 M202 Execution Command of Proce M202 Execution Command Before Start Main Process atus: ON
55         56           57         58           59         ¥           60         61           62         62	(83) A1	SM400 SM400 Iways ON Iways ON Iw	and								*Z9 Register MOV *Z9 Register MOV	Backup Z9 Initialize K0 *Execution Co SET *Execution St	D99 For Z9 Register Backup Z9 Z9 mmand of Proce M202 Execution Command Before Start Main Process atus: ON
56 57 58 60 61 62 63	(83) A1	SM400 SM400 Iways ON Iways ON Iw	and								*Z9 Register MOV *Z9 Register MOV	Eackup Z9 Initialize K0 *Execution Co SET *Execution St SET	D99 For Z9 Register Backup Z9 Z9 mmand of Proce M202 Execution Command Before Start Main Process atus: ON M100 Execution Status
54         2           55         5           56         5           57         5           58         5           60         6           61         6           63         63	(83) A1	SM400 Iways ON ways ON M0 M0 M0 Secution Secution	and								*29 Register MOV *29 Register	Backup Z9 Initialize K0 *Execution Co SE T *Execution St SE T	D99 For Z9 Register Backup Z9 Z9 mmand of Proce M202 Execution Command Before Start Main Process atus: ON M100 Execution Status
55         56           57         58           59         *           60         61           62         63	(83) A1	SM400 SM400 Iways ON Iways ON M0 IN xecution command	nand								*Z9 Register MOV *Z9 Register MOV	Backup 29 Initialize K0 Execution Co SET *Execution St SET	D99 For Z9 Register Backup Z9 Z9 MM202 Execution Command of Proce M202 Execution Command Before Start Main Process atus: ON Execution Status

Write		1	2	3	4	5	6	7	8	9	10	11	12
64	*Process Bet	fore Starting Ma	ain Process	- 			•						
65												*Execution Cor	nmand of Proce
		M202											
66	(109	) Execution Command Before Start										RST	M202 Execution Command Before Start Main Process
		Main Process											
67											*Error Code: C	) (Initialization)	
												1/0	
68											MOV	KU	Error Code
													0 /7 101 10 10
69											*Number of Da	ata Process Time	es: 0 (Initializati
70											MOV	KO	D92 Number of Data Processing Times
													Times
71											*Number of Tr	ransitions to Nex	t Setting Param
												KA	DOF
72											MOV	KU	D95 Number of Transitions to Next Setting Parameter
73											*Setting Parar	meter Address C	ffset: 0 (Initialize)
74											DMOV	КО	D52 Setting Parameter Address Offset
75											*Output Data	Address Offset:	0 (Initialize)
76											DMOV	KO	D58 Output Data Address Offset
			[										
77											*Output Data	Offset: 0 (Initialia	ze)
			Γ										
78											DMOV	КО	D56 Output Data Offset



Write	× 1	2	3	4	5	6	7	8	9	10	11	12
95	*Process of Checking Prese	t Data			-	-				-		
96											*Setting Data (	Check Command
	M200											M000
												M200
97	(190) Setting Data										RST	Setting Data Check
	Check											Command
	Command											
0.0											(4 /b)	
98										*Error Code:	II (Number of Se	ettings Error)
				KÛ	1					-	K11	D100
			Number of	1.00								Error Code
99		<=	Settings							MOV		
					4							
100											*Pmgram Frmm	- ON
											- rogan eno	
			D89	K256	1						-	M205
		\	Number of								057	Program Error
101		>=	Settings								SET	
					4							
102		1								*Error Station	n Output Start Ad	ddress Storage
		M205										
										-	D62	D70
103		Duna								DMOV	Error Station	Address Backup
100		Frogram									Address	
104									*Error St	ation Output T	MP: Number of S	ettings+Number
									-	D89	D89	D94
										Number of	Number of	Error Station
105									+	Settings	Settings	Output TMP
106			-						*Address	: Backup Value	Initialized for En	nr Station Outp
											and a second sec	
									-	K0	@D70	D94
107									EMON.		Address	Error Station
107									FINOV		Backup	Output TMP
108											*Setting Param	eter Read: ON
												M211
109											SET	Setting Parameter Read
												, a amotor riceau



Write	· 1	2	3	4	5	6	7	8	9	10	11	12
127											*Transition to N	lext Setting Pa
128		>=	KO	D96 Setting Station Number							SET	M212 Transition to Next Setting Parameter
120										*Error Station		
129										rror station	Output TMP: HP	
130		<=	K33	D96 Setting Station Number	\$	KO	D96 Setting Station Number			MOV	HOFFFF	D66 Error Station Output TMP
101										N/Course Chatles		~
131										*Error Station	Uutput TMP: HI	wi
132										MOV	H1001	D67 Error Station Output TMP
122											NCotting Domm	tor Error: ON
155											Moetting Farame	
134											SET	M214 Setting Parameter Error
105												
135 2	Process 2 of Reading Setti	ng Parameter						1			NCotting Domm	stor Bood: OEE
150	M211										-voetting raram	ster neau. Or i
137	(334) Setting Parameter										RST	M211 Setting Parameter Read
	Read											
138											*Data Send/Re	ceive: ON
		M212										
139		Transition to Next Setting									SET	M215 Data Send/Receive
140		Parameter							Nr. A. al - I	Dealance Con Ot		+ Em Ch- Ort
140		-							r≁Address	eckup: Err St	a Out Start Adrs	≖⊏rr∋ta ∪ut
141									D+	D62 Error Station Output Start Address	D64 Error Station Output Address Offset	D70 Address Backup
											0 + + 110 +	
142		-								*Error Station	Output TMP: Ad	aréss Backup
				1						-	@D70	D66
143										MOV	Address Backup	Error Station Output TMP
144										sith househows of T		Cattles Dames
144		-								Mumber of Tr	ansitions to Next	Setting Param
145										MOV	KO	D95 Number of Transitions to Next Setting Parameter

Write		1	2	3	4	5	6	7	8	9	10	11	12
146												*Number of Tra	insitions to Nex
147			Transition to Next Setting									INC	D95 Number of Transitions to Next Setting Parameter
140			Parameter									WT romaition to 1	but Sotting Do
140													Vext Setting Fa
149				>=	D95 Number of Transitions to Next Setting Parameter	D89 Number of Settings						RST	M212 Transition to Next Setting Parameter
150											*Ermr Code: 1	13 (No Setting Pa	arameter)
151											MOV	К13	D100 Error Code
152												*Program Error	. ON
152												- Togani Erior	
153												SET	M205 Program Error
154	*Process of [	l Data Send/Rec	eive							<u>.</u>	<u>.</u>		
155												*Data Send/Re	ceive: OFF
		M215										_	M215
156	(386)	) Data Send/Receiv e										RST	Data Send/Receive
157										*Read Re	gister Address	Storage	
158										SFRD	D72 Setting Data	D91 Read Register Address	K17
150												WOostrol Date (	Pot: ON
135													
160												SET	M216 Control Data Set
161												*Register Addn	ess H8000 or Hi
162			>=	K-1	D91 Read Register Address							SET	M221 Register Address H8000 or Higher

Write	· ·	1	2	3	4	5	6	7	8	9	10	11	12
163	*Process1 of	Control Data S	Set										
164												*Register Addre	ess 4-byte Dat
		M216											
165	(409)	Control Data Set										RST	M217 Register Address 4-Byte Data
166												*Register Addre	ess 4-byte Llat
167			<=	H201	D91 Read Register Address	<=	D91 Read Register Address	H207				SET	M217 Register Address 4-Byte Data
168			=	H245	D91 Read Register Address				-				
169			=	H2D5	D91 Read Register Address				-				
170			=	H2E2	D91 Read Register Address				-				
171			=	H2E5	D91 Read Register Address				-				
172			=	H2EB	D91 Read Register Address				-				

Write	-	1	2	3	4	5	6	7	8	9	10	11	12
173			<=	H39D	D91 Read Register Address	<=	D91 Read Register Address	H39F					
174			<=	НЗАА	D91 Read Register Address	<=	D91 Read Register Address	H3B0					
175			=	H40C	D91 Read Register Address								
176			=	H418	D91 Read Register Address								
177			<=	H42A	D91 Read Register Address	<=	D91 Read Register Address	H432					
178			<=	H518	D91 Read Register Address	<=	D91 Read Register Address	H52E					
179			<=	H538	D91 Read Register Address	<=	D91 Read Register Address	H53E					
180			<=	H552	D91 Read Register Address	<=	D91 Read Register Address	H5AE					
181			<=	H5B4	D91 Read Register Address	<=	D91 Read Register Address	H62C					
182			<=	H632	D91 Read Register Address	<=	D91 Read Register Address	H63C					

Write	· · ·	1	2	3	4	5	6	7	8	9	10	11	12
183	*Process 2 of	Control Data S	Set										
184												*Register Addre	ess Bit Data: O
		M216											
185	(527)	Control Data Set										RST	M218 Register Address Bit Data
186												*Register Addre	ess Bit Data: ON
187			=	H20B	D91 Read Register Address							SET	M218 Register Address Bit Data
188			=	H20C	D91 Read Register Address								
189			=	H249	D91 Read Register Address								
190			=	H252	D91 Read Register Address								

Write	*	1	2	3	4	5	6	7	8	9	10	11	12
191	*Process of Re	egister Addres	s H8000 or H	Higher									
	ł							1		1			K7
100	(											FOR	
192	(553)											FOR	
193												*Register Addre	ess 4-byte. Dat.
		M221											
	-	— I I—		H800DZ9	D91		D91	H8011Z9				-	M217
					Read Register		Read Register						Register
194	(557)	Register	<=		Address	<=	Address					SET	Address 4-Byte
		Address											Data
		Houlu or Higher						-					
				H8016Z9	D91		D91	H801AZ9					
					Read Register		Read Register						
195			<=		Address	<=	Address						
				H802BZ9	D91				-				
					Read Register								
196			=		Address								
					<u> </u>								
				H802EZ9	D91								
					Read Register								
197			=		Address								
				H803179	D91								
				11000120	Read Register								
198			=		Address								
									1				
				H803479									
				11000428	Read Revision								
199			=		Address								
				1000570									
				H803EZ9	Deed B								
200			=		Address								
200					AUUIESS								
				H8042Z9	D91				1				
201			=		Read Register								
201					Address								
									1				
				H8046Z9	D91			1	1				
202			_		Read Register								
202			-		Address								
				H8075Z9	D91								
					Read Register								
203			=		Address								
									1				
					<u> </u>				1				
	1		1						1				:

Write	*	1	2	3	4	5	6	7	8	9	10	11	12
204			=	H8078Z9	D91 Read Register Address								
205			=	H807BZ9	D91 Read Register Address								
206			=	H807EZ9	D91 Read Register Address								
207			=	H8096Z9	D91 Read Register Address								
208			=	H80A1Z9	D91 Read Register Address								
209			=	H80A4Z9	D91 Read Register Address								
210			=	H80A7Z9	D91 Read Register Address								
211			<=	H8178Z9	D91 Read Register Address	<=	D91 Read Register Address	H817AZ9					
212			<=	H8218Z9	D91 Read Register Address	<=	D91 Read Register Address	H8234Z9					
213			<=	H823AZ9	D91 Read Register Address	<=	D91 Read Register Address	H8240Z9					
214			<=	H8246Z9	D91 Read Register Address	<=	D91 Read Register Address	H828AZ9					

Write	*	1	2	3	4	5	6	7	8	9	10	11	12
215												*Register Addr	ress Bit Data: ON
		M221											
			-	H8001Z9	D91		D91	H8002Z9				_	M218
216	(703)	Deviates	<=		Read Register	<=	Read Register					SET	Register Address Pit
210	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Address			Address		Address					02.	Data
		H8000 or											
		Higher											
				H8056Z9	D91								
217			_		Read Register								
217			_		Address								
												H700	Z9
210													
210											т		
													-
210	(700)												NEVT
219	(733)												NEXT
220 *Proc	cess 3 of	Control Data	Set					.i			÷		
221												*Control Data	Set: OFF
		M216											
												-	M216
222	(794)											RST	Control Data
222	(704)	Control Data										nor	Set
		Sec											
223												*Register Addr	ress H8000 or Hi
												[	1001
												-	M221
224												RST	Register
221													or Higher
225			N4017								*Access Poin	ts:2	
												H2	D90
												112	Access Points
226			Register								MOV		ACCESS FOR Its
			Address 4-										
			Byte Data										
227			M017								Access Poin	ts: 1	
											-	<u>Ц1</u>	Den
													Access Points
228			Register								MOV		, access r onnes
			Address 4-										
			Byte Data										1
220											WD Dot- C	Harris - Davidson C	(T-1+1-1)
229											i∞Reau Data S	itorage Device: U	(Initialize)
			L		1						-	K0	D68
													Read Data
230											DMOV		Storage Device
221													iction Execution
231												PADERWINST	accom Execution
			Ļ									-	M219
													ADPRW
232												SET	Instruction
													Execution
		1											1

Write		Ŧ	1	2	3	4	5	6	7	8	9	10	11	12
233	*Proces	s of A	DPRW Instruc	tion Executio	n	1		1	-	1				tion Execution
234		(769)	M219	M220	M1								MADPRW Instru	ction Executing
													-	M220
235		(769)			Dedicated								SET	ADPRW Instruction
			Instruction	Instruction	Instruction									Executing
			Execution	Executing	Execute Flag									
236	*Proces	sofA	DPRW Instruc	tion Executin	g			3		.i		÷		3
237			M220					*Data Read Pr	oœss	1				1
									D96	НЗ	D91	D90	D68	M225
220		(770)							Setting		Read	Access Points	Read Data	Instruction
250		(//0/	Instruction					HBITTE	Number		Address		Storage Device	[0]
			Executing											
239													*ADPRWInstru	ction Execution
				M225									_	M010
				•										ADPRW
240				Instruction									RST	Instruction
				Completion Flag [0]										Execution
241														
241													*ADPRW Instru	ction Executing
														M220
242													RST	ADPRW Instruction
														Executing
243													*Read Normal C	ompletion: ON
					M226				-				-	M222
														Read Normal
244					Instruction								SET	Completion
					Flag [1]									
245												*Bit Reset of	Ermr Station Out	nut TMP
215														
													D66	D92
246												BRSTP	Output TMP	Processing
														Times
														-
247												*Output Data	TMP: Read Data	Storage Device
												-	D68	D60
249												DMOVE	Read Data	Output Data
240												Dialoni	Storage Device	TIVIP'
249												*Logical Sum	of HFFFF0000 St	ored in Output
						M217	M218		Deo	Ш0000	1		LINEEEEOOOO	DEO
						*' _	- Ar I		Output	H0000			AVEC 10000	Output Data
250						Register	Register	D>=	Data			DORP		TMP
						Address 4- Byte Data	Address Bit Data							
251											-	1816-bit Dot-t	op of Output Dat	o ThilD without
251						M217						mut Rotati	on or Output Liat	a rivie without
						└──┤├──						-	D60	K16
252						Register						DRORP	Output Data TMP	
						Address 4-								
						⊟yte Data								
253					L. 1007								*Read Error Co	mpletion: ON
						1					<u> </u>		-	M223
254													SET	Read Error
254					Instruction Completion								OE I	Completion
					Flag [2]									
			1			1								



Write			1	2	3	4	5	6	7	8	9	10	11	12
278	*Process	s of Er	rror Station Ou	utput				1						
279			Maga								*Address	: Backup: Err St	a Out Start Adrs	+ Err Sta Out
												D62	D64	D.70
												Error Station	Error Station	Address Backup
280	(	(972)	Read Error								D+	Output Start	Output Address	
			Completion									Address	Offset	
281												#Address Bac	kun Value: Ermr 9	Station Output
201			M214									/		Station Galpat
		ł	— I I—								-	-	D66	@D70
202												DHOV	Error Station	Address Backup
282			Setting									DIVIOV	Output TMP	
			Farameter Error											
												-		
283													*Setting Parame	eter Error: OFF
													-	N/014
														IVIZ14 Setting
284													RST	Parameter Error
285	*Pmcess	s of Re	ead Completio	n								<u> </u>		
286	1100000	1											*Read Completi	on: OFF
			M224											
													-	M224
207	(	(000)	<b>_</b> .										RST	Read
207		(550)	Read Completion										Ron	Completion
			Completion											
288													*Data Send/Rei	ceive: UN
					KO	D72							-[	M215
						Setting Data								Data
289				$\diamond$		_							SET	Send/Receive
							1 1 1 1 1							
290													*Transition to N	ext Setting Pa
		ĺ											-	
					K0	D72								M212
291				=		Setting Data							SET	Transition to Next Setting
														Parameter
202												WEnney Otation	Outrast TMD: O (	Telt le llee 1
292							1					rrur station	roulpul rimP:0(.	nicialize)
												-	КО	D66
														Error Station
293												DMOV		Output TMP

Write	,	· 1	2	3	4	5	6	7	8	9	10	11	12
294	*Process of	Instruction Con	npletion										
295												*Read Normal	Completion: OFF
		M222	M225										
			<u> </u>									-	M222
													Read Normal
296	(1021	) Read Normal	Instruction									RST	Completion
		Completion	Completion										
			Flag [U]										
207												#Read Error Co	moletion: OFF
257		M223										Entroad Entor Oc	inpicción, or i
			_									-	M223
													Read Error
298		Read Error										RST	Completion
		Completion											
200												Mumber of De	ta Process Tim
233												C raineer or ba	
												-	D92
													Number of Data
300												INC	Processing
													limes
301												*Read Complet	tion: ON
						-						-	M224
													Read
302												SET	Completion
303	*Process of	Transition to N	ext Setting Pa	arameter					<u>.:</u>		<u>.</u>	.:	
304												*Transition to I	Vext Setting Pa
		M212											
												-	M212
205	(10.1											DOT	Transition to
305	(104	/Transition to										Roi	Next Setting
		Parameter											i arameter
306											*Number of D	ata Process Tim	es: 0 (Initializati
											-	KO	D92
307											MOV		Number of Data
507											1010 0		Frocessing Times
308											*Setting Para	meter Address C	)ffset: 20
												KOO	DEO
												K20	D52
309											D+		Setting Parameter
													Address Offset
310											*Output Data	Address Offset:	32
											-	100	DEO
												1.02	Output Data
311											D+		Address Offset
24.2												0.1.1.1.0.1.1	05-1-0
312											*Error Station	n Uutput Address	s offset: 2
					ļ.						-	K2	D64
												1/14	Error Station
313											D+		Output Address
													Offset
		1	1										

Write	*	1	2	3	4	5	6	7	8	9	10	11	12
314												*Set Read Cou	nt Increment
315												INC	D93 Setting Read Count
216											West Deed Oo	web: O (Teltiellere)	
310											ASEL Read COL	unit. O (trittalize)	
317			>=	D93 Setting Read Count	D89 Number of Settings						MOV	KO	D93 Setting Read Count
210											Monthing Down	unter Address C	Heats O (Initialize)
510											roetting Farai	neter Address C	(1980. O (Inicialize)
319											DMOV	KO	D52 Setting Parameter Address Offset
320											*Output Data	Address Offset:	(Initialize)
													0 (a #010/120)
321											DMOV	KO	D58 Output Data Address Offset
322											#Ermr Station	Output Address	: Offeet: 0 (Initia
522											-Enor otation		Choce o (Inicia
323											DMOV	KO	D64 Error Station Output Address Offset
324												*Main Process	Execution Com
325						<u> </u>						SET	M204 Main Process Execution Completed
326												*Setting Param	eter Read: ON
020												- ootenig i aran	
327												SET	M211 Setting Parameter Read

Write	*	1	2	3	4	5	6	7	8	9	10	11	12
328	*Process of I	Read Normal/E	rror Complet	ion									
329		M010										*Program Comp	oletion Pulse: O
												-	M210
220	(1112											RST	Program
550	(1112	Completion											Pulse
		Pulse											
331			M204									*Normal Comple	etion: Rising ON
												-	M101
332			Main Process Execution									PLS	Normal Completion
333			Completed									*Error Completi	ion: Rising ON
			M205										V0
													Error
334			Program Error									PLS	Completion
335				1								*Execution Stat	:us: OFF
				]									M100
													Execution
336												RST	Status
337												Whain Process (	Execution Com
557													Excourier com
													M204
338												RST	Execution
													Completed
339												*Program Error:	: OFF
			L									-	M205
240												RST	Program Error
0.0													
341	*Process of (	hecking Progr	am Completic	n			·				<u>.</u>		
342		MOOA										*Program Comp	letion Pulse: ON
			1									-	M210
242	(1140											SET	Program
343	(1142	Main Process Execution										JE I	Completion Pulse
		Completed											
		M205	-										
344		Program											
		Error											
345	*Recovery P	rocess of Index	(Register					1	1			Decemen	
340	(1150	SM400									-29 Register	Recover	
											-	D99	Z9
347	(1150										MOV	For Z9 Register Backup	
													-1040 1
348	(1159	)											

## 2.2 Data Write

## Name

Data Write

## Outline

Writes setting values to power distribution measuring instruments.

## Programs used

This program is used for the FX5U and FX5UC.

The following table shows the project used in this program.

No.	Project name	Program name	Remark
1	LD-FX5U_e-MEASURE-MB_V100A_J	02_Data Write	This project is created with the FX5U or FX5UC.

### **Devices used**

The following table lists the devices used in this program.

### ■Input device

No.	Device name	Data type	Туре	Device comment	Remark
1	M300	Bit	Input	Execution Command	ON: The program is activated. OFF: The program is not activated.
2	D200 to D203	Word [Signe	d] Input	Setting Parameter	Sets the data set to the power distribution measuring instrument.
		■Configurati	on of Setting Parame	ter	
		Device	Description	Setting range	Remark
		S4	Station number	0 to 32	When the station number is set to 0, broadcast communication is performed.
		S4+1	Setting register address	The setting range depends on the target power distribution measuring instrument.	For the details on the setting register address and setting range of setting data, refer to the MODBUS interface specifications of each power
		S4+2 to S4+3	Setting data	The setting range depends on the setting register address.	distribution measuring instrument.
		* S4 corresp	onds to D200.		

## ■Output device

No.	Device name	Data type	Туре	Device comment	Remark
1	M400	Bit	Output	Execution Status	ON: The execution command is on. OFF: The execution command is off.
2	M401	Bit	Output	Normal Completion	When this label is on, it indicates that the processing has been completed.
3	Y10	Bit	Output	Error Completion	When this label is on, it indicates that an error has occurred in the program.
4	D300	Word [Signed]	Output	Error Code	Stores the error code that occurred in the program.

## Internal device

No.	Device name	Data type	Туре	Device comment	Remark
1	M500	Bit	Internal	Setting Data Check Command	Holds the check command flag of setting data.
2	M502	Bit	Internal	Execution Command Before Start Main Process	Holds the execution command flag of the process before the start of main process.
3	M505	Bit	Internal	Program Error	Holds the error flag of the program.
4	M510	Bit	Internal	Program Completion Pulse	Holds the completion pulse flag of the program.
5	M511	Bit	Internal	Confirm Program Completion	Holds the confirmation flag of program completion.
6	M512	Bit	Internal	Control Data Set	Holds the control data set flag.
7	M513	Bit	Internal	Register Address 4-Byte Data	Holds the flag of register address 4-byte data.

No.	Device name	Data type	Туре	Device comment	Remark
8	M514 to M516	Bit (02)	Internal	Instruction Completion Flag	Holds the instruction completion flag.
9	M517	Bit	Internal	Write Normal Completion	Holds the write normal completion flag.
10	M518	Bit	Internal	Write Error Completion	Holds the write error completion flag.
11	M519	Bit	Internal	ADPRW Instruction Execution	Holds the ADPRW instruction execution flag.
12	D250 to D251	Double word [Signed]	Internal	Write Data Storage Device	Holds the data written to the connected devices.
13	D252	Word [Signed]	Internal	Access Points	Holds the access points.
14	D253 to D256	Word [Signed] (03)	Internal	Setting Parameter	Holds the setting parameter.
15	D299	Word [Signed]	Internal	For Z9 Register Backup	Backs up the register Z9.

## Details of functions

Item	Description	
Applicable device	CPU module	FX5U CPU, FX5UC CPU
	Engineering tool	GX Works3 Version 1.031H or later
Language	Ladder	
Number of basic steps	550 steps The number of steps of the FB in a prog setting in GX Works3. For the option set	ram depends on the CPU module used, input and output definition, and the option tting in GX Works3, refer to
Processing	<ul> <li>When Execution Command (M300) is distribution measuring instrument.</li> <li>If an incorrect value is specified, Error code is stored in Error Code (D300).</li> <li>* Note: This sample ladder backs up or a programs, the backup/recovery process</li> </ul>	turned on, the items of Setting Parameter (D200 to D203) are set to the power r Completion (Y10) turns on and the processing is suspended. In addition, the error recovers the index register. When the index register value need not to be held in other ing is not required.
Timing chart of I/O signals	[For normal completion]         M300         (Execution Command)         M400         (Execution Status)         MODBUS         communication         processing         M401         (Normal Completion)         • When Execution Command (M300) is         processing is performed.         • After the MODBUS communication pr         Execution Status (M400) turns off. Co         [For error completion]         (Execution Command)         M400         (Execution Command)         M400         (Execution Status)         Y10         (Error Completion)         D300 (Error Code)         • When Execution Command (M300) is         • The error code is stored in Error Code turns off. Consequently, this program	turned on, Execution Status (M400) turns on and the MODBUS communication rocessing is completed, Normal Completion (M401) turns on for one pulse and nsequently, this program ends.
Restrictions and precautions	<ul> <li>This program does not include the err accordance with the required system</li> <li>This program cannot be used as an in</li> <li>Do not use this program with program because Execution Command (M300) program with programs that can turn of</li> <li>This program uses the index register a</li> </ul>	or recovery processing. Program the error recovery processing separately in operation. Interrupt program. Its that are executed only once, such as a subroutine program or FOR-NEXT loop, ) cannot be turned off and the normal operation cannot be performed. Always use this off Execution Command (M300). Z9.

Error Code											
Error code (decimal)	Description	Action									
14	A value out of the setting range is set in Setting Parameter (D200 to D203).	Review the station number setting of Setting Parameter (D200 to D203), and execute the program again.									
Serial communication error code	The error code is the same as that occurs in the MODBUS serial communication.	Refer to L MELSEC iQ-F FX5 User's Manual (MODBUS Communication).									

## Version upgrade history

Version	Date	Description
Ver.1.00A	2017/3	First edition

## Program

Write	•	1	2	3	4	5	6	7	8	9	10	11	12
1	*Sample Lad	ider Name: LD-I	FX5U e-ME	ASURE-ME	V100A E								-
2	*Function: D	ata Write											
3	*Version: Ve	er.1.00A											
4	*Process of	Initializing Progr	am										
5												*Execution Co	immand of Process Before Starting Mai
-		M300											
												-	M502
6	(0)	Execution Command										RST	Execution Command Before Start Main Process
7												*Setting Data	Check Command: OFF
8												RST	M500 Setting Data Check Command
9												*Normal Com	aletion: OFF
-												- Hormar Comp	
10		-										RST	M401 Normal Completion
												N/Europa Operation	tion OFF
11												<u>I∿⊂rrur Cumple</u>	
12												RST	V10 Error Completion
13												*Program Erro	nr OFF
10												riogamene	
14												RST	M505 Program Error
15												*Control Data	Set: OFF
16												RST	M512 Control Data Set
													9 
17												*Program Con	npletion Check: ON
18												SET	M511 Confirm Program Completion

Write	*	1	2	3	4	5	6	/	8	9	10	11	12
19	*Process of	Program Comp	letion										
20			1.510									*Program Com	pletion Check: OFF
		MSTI	M519										b 455 1 1
			*1										One flow December One lation
21	(27)	Confirm										RST	Confirm Program Completion
		Program	Instruction										
		Completion	Execution										
22												*Execution Sta	atus: OFF
												1	101400
23												RST	Execution Status
24												*Register Addr	ress 4-byte Data: OFF
												_	ME10
													IVID 13 Desistes Address A Data Data
25												RST	Register Address 4-byte Data
26												Minstruction Co	ompletion Flag. OFF
													b4E14
													Instruction Completion Flag [0]
27												RST	ansu decion completion nag [0]
20												Westwert's O	
28												MINSTRUCTION OF	Impletion Flag. OFF
												-	M515
													Instruction Completion Flag [1]
29												RST	
30												Mostruction Cr	Impletion Flag OFF
													M516
~												DOT	Instruction Completion Flag [2]
31												RSI	
32												*Write Normal	Completion: OFF
													M517
33												RST	Write Normal Completion
55												1101	
34												*Write Error Cr	ompletion: OFF
												-	ME19
													Write Error Completion
35												RST	white en or completion

Write	-	1	2	3	4	5	6	7	8	9	10	11	12
36	*Backup Pi	rocess of Index I	Register										
37											*Z9 Regist	er Backup	
		51/1400									-	70	D 200
												20	For 79 Register Backup
38	(56	Always ON									MOV		
39											*Z9 Regist	er Initialize	
											1	KO	Z9
40											MOV		
41	VDmmmm o	 f Execution Con	amond							<u> </u>			
41		I Execution Con	inanu									*Execution Cou	mmand of Process Before Starting Mai
		M300										Diobación do	
		<u> </u> −+†1−−											M502
12	(71											SET	Execution Command Before Start Main
40	() (	/Execution										OL I	Process
		Command											
44												*Execution Sta	itus: UN
			L										M400
													Execution Status
45												SET	
46	*Process E	efore Starting N	/ain Process	}									
4/		M502										*Execution Col	mmand of Process Before Starting Mai
													M502
	(												Execution Command Before Start Main
48	(82	Execution										RST	Process
		Before Start											
		Main Process									_		
49											*Error Coo	le: O (Initializatio	n)
										-		KÜ	D300
													Error Code
50											MOV		
51		l								*Setting F	arameter St	orage	
											D 000	D.0EQ	124
											D200 Sotting	D253 Sotting	K4
52										BMOV	Parameter	Parameter	
53												*Setting Data (	Check Command: ON
			L										M500
54												SET	Setting Data Check Command
54												02,	
		1											

Write			1	2	3	4	5	6	7	8	9	10	11	12
55	*Proo	ess of (	Checking Pres	et Data									-	
56			LIE AA										*Setting Data	Check Command: OFF
			M500										-	MEGO
														Setting Data Check Command
57		(102)	Setting Data										RST	Setting Data Check Command
			Check											
			Command											
50												WErman Co.	do: 1.4 (Sotting F	Joromotor Ermr)
20													ue. 14 (Setting F	
					K0	D253	<b></b>		-			-	K14	D300
						Setting								Error Code
59				>		Parameter						MOV		
							1							
60													*Program Erro	r: ON
					1/20									
					K33	D253							-	M505
61				<=		Parameter							SET	Program Error
						i di di lictor								
62													Wooten Data	Sat: ON
02				M505									-Control Data	
				L-1/	-								-	M512
														Control Data Set
63				Program									SET	
				Error										
64	*Proœ	ess1 o	f Control Data	a Set										
65			100										*Register Addr	ress 4-byte Data: OFF
			M512										-	ME10
														Register Address A-Bute Data
66		(132)	Control Data										RST	Negister Address 4 Dyte Data
			Set											
67													*Register Add	ress 4-byte Data: ON
					H201	D254		D254	H207			-	-	M513
60				/-		Setting	/-	Setting					SET	Register Address 4-Byte Data
68				<=		Parameter	<=	Parameter					SET	
					110.00									
					H245	D254								
69				=		Setting Parameter								
						i arameter								
					H2D5	D254								
						Setting								
70				=		Parameter								
				-			1							
					H2E2	D254								
				_		Setting								
/1				=		Parameter								
						1	1							

Write -	1	2	3	4	5	6	7	8	9	10	11	12
72		=	H2E5	D254 Setting Parameter								
73		=	H2EB	D254 Setting Parameter								
74		=	H40C	D254 Setting Parameter								
75		-	H418	D254 Setting Parameter								
76		<=	H42E	D254 Setting Parameter	<=	D254 Setting Parameter	H432					
77		<=	H518	D254 Setting Parameter	<=	D254 Setting Parameter	H62C					
78		<=	H632	D254 Setting Parameter	<=	D254 Setting Parameter	H63C					

Write		- 1	2	3	4	5	6	7	8	9	10	11	12
79	*Process 2	2 of Control E	ata Set										
												-	K7
80	(205	51										FOR	
	.=												
81		M512										*Register Addr	ess 4-byte Llata: UN
			_ <b>_</b> _	H800D79	D254	1	D254	H801179				-	M513
					Setting		Setting						Register Address 4–Byte Data
82	(209	9) Control Da	ta <=		Parameter	<=	Parameter					SET	
		Set											
				_									
_													
				H8016Z9	D254		D254	H801AZ9					
					Setting		Setting						
83			<=		Parameter	<=	Parameter						
								_					
		1											
				H802BZ9	D254								
04			-		Setting								
04			_		Parameter								
				11000570	D 05 1	-							
				H802EZ9	D254								
85			=		Setting								
					r arameter								
				H903179	D/25/	1							
				H003129	Setting								
86			=		Parameter								
						1							
_													
				H8034Z9	D254	1							
					Setting								
87			=		Parameter								
						4							
						_							
				H803EZ9	D254								
20			-		Setting								
00					rarameter								
		1		1004070	DOE 4	1							
		1		H804229	D254 Settler								
89			=		Parameter								
				_		]							
				H804679	D254	1							
					Setting								
90			=		Parameter								
						L							
_													
				H8075Z9	D254	i							
					Setting								
91			=		Parameter								
						1							

Write	*	1	2	3	4	5	6	7	8	9	10	11	12
92			=	H8078Z9	D254 Setting Parameter								
93			=	H807BZ9	D254 Setting Parameter								
94			=	H807EZ9	D254 Setting Parameter								
95			=	H8096Z9	D254 Setting Parameter								
96			=	H80A1Z9	D254 Setting Parameter								
97			=	H80A4Z9	D254 Setting Parameter								
98			=	H80A7Z9	D254 Setting Parameter								
99			<=	H8178Z9	D254 Setting Parameter	<=	D254 Setting Parameter	H817AZ9					
100			<=	H8218Z9	D254 Setting Parameter	<=	D254 Setting Parameter	H828AZ9					
101											+	H700	Z9
102	(342)												NEXT

Write	-	1	2	3	4	5	6	7	8	9	10	11	12
103	*Process 3 (	of Control Data	Set										
104												*Control Data :	Set: OFF
		M512											
105	(343)	Control Data Set										RST	M512 Control Data Set
106			METO								*Write Dat	ta Storage Devic	e: Setting Parameter
											-	D256	D/250
107			Register Address 4- Byte Data								MOV	Setting Parameter	Write Data Storage Device
108											™Write Dat	ta Storage Devic	e: Setting Parameter
											_	D/255	D/251
109											MOV	Setting Parameter	Write Data Storage Device
110											*Access F	Points: 2	
												110	DOEO
111											MOV	HZ	Access Points
112											≭Write Dat	ta Storage Devic	e: Setting Parameter
			M513										
113			Register Address 4- Byte Data								MOV	D255 Setting Parameter	D250 Write Data Storage Device
114											*Access F	Points: 1	
115											MOV	H1	D252 Access Points
116												*Register Addr	ess 4-byte Data: OFF
117												RST	M513 Register Address 4-Byte Data
118												*ADPRW Instru	uction Execution: ON
119												SET	M519 ADPRW Instruction Execution

Write	-	1	2	3	4	5	6	7	8	9	10	11	12
120	*Process of	ADPRW Instru	iction Execut	ion									
121		1					*Data Write Pro	œss					
		M519											
122	(387)	ADPRW Instruction Execution					ADPRW	D253 Setting Parameter	H10	D254 Setting Parameter	D252 Access Points	D250 Write Data Storage Device	M514 Instruction Completion Flag [0]
123												#ADPR\\/Instru	ction Execution: OEE
125			M514									-ADE NVI IBUU	Contraction: On
124			Instruction Completion Flag [0]									RST	M519 ADPRW Instruction Execution
125												MAirite Normal (	Completion: ON
125				M515								11100101101	
126				Instruction Completion Flag [1]								SET	M517 Write Normal Completion
127												Málrite Ermr Co	moletion: ON
				M516								THIC LIGT CO	
128				Instruction Completion Flag [2]								SET	M518 Write Error Completion
120											*Error Cor	la Stomm	
129												ue otorage	
130					=	K9	SD8503 Serial Communication Operation Mode (CH1)	=	KO	SD8861 Slave Node Address (CH1)	MOV	SD8500 Serial Communication Error Code (CH1)	D300 Error Code
131											*Error Co	de Storage	<u>.</u>
132					=	K9	SD8513 Serial Communication Operation Mode (CH2)	=	KO	SD8871 Slave Node Address (CH2)	MOV	SD8510 Serial Communication Error Code (CH2)	D300 Error Code
100													
133											*Error Co	de Storage	
134					-	K9	SD8523 Serial Communication Operation Mode (CH3)	=	KO	SD8881 Slave Node Address (CH3)	MOV	SD8520 Serial Communication Error Code (CH3)	D300 Error Code
105													
135											*Error Co	de Storage	
136					=	K9	SD8533 Serial Communication Operation Mode (CH4)	=	KO	SD8891 Slave Node Address (CH4)	MOV	SD8530 Serial Communication Error Code (CH4)	D300 Error Code

			-	5	т	3	0	/	0	9	10	11	12
137	*Process of	Write Normal/I	Error Comple	tion									
138												*Program Con	npletion Pulse: OFF
		M510											
139	(491)	Program Completion Pulse										RST	M510 Program Completion Pulse
140												while we all O a way	Intine: Dining ON
140			ME17									*Normal Comp	Dietion: Rising UN
141			Write Normal Completion									PLS	M401 Normal Completion
142												*Execution Sta	atus: OFF
143												RST	M400 Execution Status
144												*Error Comple	ition: Rising ON
			M518										
145			Write Error Completion									PLS	Y10 Error Completion
146												*Execution Sta	atus: OFF
			M505										
147			Program Error									RST	M400 Execution Status
148												∣*Write Normal	Completion: OFF
149												RST	M517 Write Normal Completion
150												×Write Error C	ompletion: OFF
151												RST	M518 Write Error Completion
152												*Program Free	
152												rogram Errc	
153												RST	M505 Program Error

Write	*	1	2	3	4	5	6	7	8	9	10	11	12
154	*Process of	Checking Prog	am Complet	ion									
155												*Program Com	pletion Pulse: ON
		M517											
		$\vdash$									<u></u>	-	M510
													Program Completion Pulse
156	(530)	Write Normal										SET	
		Completion											
		M518											
157													
157		Write Error											
		Completion											
		M505											
			1										
158		Program Error											
		rogramentor											
159	*Recovery I	Process of Index	x Register										
160	(540)										*Z9 Regist	ter Recover	
		SM400											
											-	D299	Z9
			vays ON						For Z9				
161	(540)	Always ON								MOV	Register		
												Backup	
											1		
													(END )
													[2:40]
162	(549)												
102	(343)												

## REVISIONS

Revision date	Revision	Description						
March 2017	А	First edition						
Japanese manual number: JY997D74701A								

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